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ABSTRACT

What Makes Work Meaningful and Why Economists Should Care about It*

We demonstrate why meaningful work, i.e. job-related activities that individuals view as purposeful and worthwhile, matters to labour economists. Building on self-determination theory, which specifies the roles of autonomy, competence, and relatedness as preconditions for motivation, we are the first to explore the determinants of work meaningfulness. Specifically, using three waves of the European Working Conditions Survey, we show that autonomy, competence, and relatedness explain about 60 percent of the variation in work meaningfulness perceptions. Meanwhile, extrinsic factors, such as income, benefits, and performance pay, are relatively unimportant. Meaningful work also predicts absenteeism, skills training, and retirement intentions, which highlights the concept's economic significance. We provide new insights that could help organise the future of work in a meaningful and dignifying way and propose concrete avenues for future research on meaningful work in economics.

JEL Classification: J01, J30, J32, J81, I30, I31, M50

Keywords: meaningful work, motivation, non-monetary benefits of work, labour economics, labour market outcomes, self-determination theory

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1 Introduction

The concept of meaningful work—activities that individuals view as purposeful and worthwhile — has received relatively little attention in modern economics.[1] While organisational psychologists have long examined the meaning people derive from their jobs (Rosso et al., 2010), modern economists typically conceive of work as a disutility, i.e. as an unpleasant activity that must be endured as a means to earn an income and finance consumption. Nevertheless, studies relying on self-reported and experimental data have challenged the assumption that only monetary motivations matter in the labour market (Binder, 2016; Bradler et al., 2016; Hamermesh, 2018; Hamilton, 2000; Kosfeld et al., 2017; Preston, 1989; Stern, 2004). In fact, one convincing piece of evidence for the intrinsic value of work is the enormous psychological cost of becoming unemployed, which by far exceeds income losses (Clark, 2001; Kassenboehmer and Haisken-DeNew, 2009; Knabe and Rätzel, 2011a,b; Nikolova and Ayhan, 2019; Winkelmann and Winkelmann, 1998).

Nevertheless, despite the recent attention to non-monetary work-incentives (Lazear, 2018), only two economics papers have called for incorporating work meaningfulness in standard labour supply models (Cassar and Meier, 2018; Spencer, 2015). Meanwhile, the empirical research on meaningful work in organisational psychology has left several knowledge gaps (Lysova et al., 2019). While important, these studies rely on small non-representative samples, lack a unified definition of work meaningfulness, and use divergent measurement scales that often conflate meaningfulness with other constructs such as calling (Bailey et al., 2019a,b). This is unfortunate because it limits our understanding of which factors contribute to work meaningfulness and whether it is conducive to behaviours such as increased effort and delayed retirement.

This paper closes these knowledge gaps by making a threefold contribution to the literature: first, we are the first to investigate the determinants and consequences of meaningful work using a cross-country nationally representative dataset of workers from 30 European countries in 2005, 2010, and 2015. Conceptually, we rely on self-determination theory (Deci and Ryan, 1985; Ryan and Deci, 2000), which outlines the conditions leading to motivation and work meaningfulness. Empirically, we construct an index of meaningful work based on survey statements about perceptions of doing useful work and having feelings of "a job well done" (fulfillment) (see Appendix Table A2 and Figure 1). As such, we are the first to quantify the relative importance of job characteristics that enhance or diminish work meaningfulness, which could help inform policies and interventions to promote work meaningfulness. We find that autonomy, competence, and relatedness are about 4.6 times more important for meaningfulness at work than compensation, benefits, career advancement, job insecurity, and working hours. Relatedness, which reflects supportive relationships with colleagues and superiors, emerges as the most important factor for work meaningfulness. These findings highlight the greater salience of self-efficacy and intrinsic motivation for meaningfulness compared to objective working conditions and monetary rewards.

Second, we show that perceptions of meaningful work have implications for labour economics because they meaningfully predict retirement intentions, absenteeism, and skills training. For example, a ten-point increase in work meaningfulness reduces absenteeism by about one day per year and raises the intended retirement age by 2.5 years, on average. These findings not only validate the usefulness of work meaningfulness in economics but also have relevant implications for employers and policy-makers. Our third contribution is that we outline the conceptual and methodological steps that can contribute to a future research agenda in meaningful work in economics.

[1] Throughout this paper, by "meaningful work," we mean the individual's own perceptions of being engaged in meaningful work.

2 Conceptual Framework

2.1 Worker well-being and meaningful work

While well-being is a latent construct, there are two main approaches to conceptualising and measuring it, which have their own advantages and disadvantages (Brown et al., 2007, 2012; Green, 2006; Knox et al., 2015). According to the *objective* approach, worker well-being is about having the capabilities and freedoms that allow individuals to meet specific needs, such as autonomy and skills development (Brown et al., 2007, 2012; Green, 2006). This framework draws on Sen's (1999) capability approach, which conceptualises well-being in terms of having the capabilities and freedoms to achieve "functionings", i.e. states of being and doing that the individual values. In the objective approach, worker well-being can be evaluated based on whether the job furnishes workers with the capabilities and material security to achieve their goals and fulfill their needs (Brown et al., 2012; Budd and Spencer, 2015; Eurofound, 2012; Green, 2006). As such, the objective approach relies on "job quality" measures, i.e. job characteristics and working conditions (De Bustillo et al., 2011b; Felstead et al., 2019; Green, 2006; Howell and Kalleberg, 2019). For example, based on Sen's capability approach, Green (2006) defines job quality in terms of earnings, skill, effort, autonomy, security, and personal discretion. The extent to which a person's job provides these factors determines their ability to achieve well-being (Budd and Spencer, 2015). To date, several multi-dimensional job quality indices have been created (De Bustillo et al., 2011b; Eurofound, 2012; Leschke and Watt, 2014). Nevertheless, the main challenges of the objective approach concern the choice and measurement of the characteristics that comprise job quality (Budd and Spencer, 2015; Clark, 2011). In particular, the final list of selected job quality measures may reflect data availability and researcher discretion, rather than worker preferences. Challenges may also arise when picking what weights the job quality measures should receive to form a comprehensive multi-dimensional job quality index (Leschke and Watt, 2014; De Bustillo et al., 2011a). Because it focuses on job characteristics, the objective approach has also been criticised for being job-centric and for ignoring the broader meanings that work has in people's lives (Budd and Spencer, 2015).

In contrast, the subjective well-being approach assumes that people themselves are the best judges of their working and living environments (Graham et al., 2018; Graham and Nikolova, 2015; MacKerron, 2012; OECD, 2013; Stone and Mackie, 2014). In the work domain, subjective measures of well-being include self-reported feelings and evaluations of the overall working conditions. In economics, the most common subjective well-being measure in the work domain is job satisfaction (Clark, 2001, 2005, 2011, 2015; Sousa-Poza and Sousa-Poza, 2000; Wanous et al., 1997).[2] Job satisfaction is a reflective assessment of one's overall working environment that also incorporates expectations, norms, values, alternatives, and the outcomes and rewards of work (Angrave and Charlwood, 2015; Weiss, 2002). The fact that job satisfaction predicts labour market behaviours such as job quits (Clark, 2001; Green, 2010; Lévy-Garboua et al., 2007) implies that this measure reflects workers' preferences (Clark, 2015). Job satisfaction is also instrumentally important for productivity (Böckerman and Ilmakunnas, 2012). The job satisfaction literature has examined how different working conditions and arrangements influence job satisfaction. For example, analyses of the 1997 International Social Survey Program show that an interesting job and good relations with management are the biggest predictors of job satisfaction (Clark, 2005; Sousa-Poza and Sousa-Poza, 2000). Similarly, relying on German panel data, Cornelißen (2009) identifies relationships

[2] In the psychology literature, a common measure of subjective well-being is the multidimensional scale by Green et al. (2016); Warr (2007, 1990), which comprises enthusiasm/depression, and anxiety/comfort dimensions. Meanwhile, single-item measures of job satisfaction are typically as valid and reliable as their multi-item counterparts (Wanous et al., 1997).

with colleagues and managers, job insecurity, and task diversity as the most influential satisfaction determinants. Clark (2011) proposes that job satisfaction is a comprehensive summative measure reflecting objective and subjective job quality, though this view has not remained unchallenged (Brown et al., 2012). The main critique of using job satisfaction as a proxy for worker well-being is that workers may report being satisfied with jobs that are objectively bad. Specifically, individuals may adapt to low job quality and learn to be satisfied with poor working conditions (Brown et al., 2012). Therefore, job satisfaction reflects both well-being at work and the norms and expectations that employees have when answering such questions, which is something that should be kept in mind when interpreting these data (Brown et al., 2012). Nevertheless, subjective measures provide a valuable bottom-up perspective on workers' own understanding of well-being. The objective and subjective approaches are not mutually exclusive and are often used in complementary ways (Green, 2006; Green et al., 2016).

In this paper, we study self-reported perceptions of work meaningfulness and as such, we draw on the subjective approach, while also recognising the critiques and insights of its objective counterpart. A key limitation of both the objective and subjective approaches to job quality is the lack of attention to work as a source of meaning.[3] This general neglect of work meaningfulness is unfortunate, because it severely limits our understanding of the true spectrum of work well-being measures and the particular position of meaningful work in that spectrum. It is also surprising, given that the notion of work meaningfulness is not new in the social sciences and can be traced back at least to Karl Marx who believed that labour was inherently purposeful and a source of fulfillment, rather than just a means to satisfy material needs (Spencer, 2009).[4]

Nevertheless, the fact that self-reported measures of job satisfaction are well-established raises the question of the value-added of research on meaningful work perceptions. Indeed, job satisfaction captures the overall subjective evaluation of the working environment. However, the concept of work meaningfulness goes above and beyond job satisfaction. For example, a person can be dissatisfied with the general working conditions, and find their daily duties stressful and unpleasant, yet deem the nature of the tasks as meaningful or impactful. Individuals working in occupations involving teaching of nursing easily fit this description. Conversely, an individual can be satisfied with the working conditions on the job but still perceive their work activities as meaningless. This may explain why, for example, many people do not quit their jobs despite finding them socially useless (Dur and van Lent, 2019). Empirically, Allan et al. (2019) provide evidence that different scales of meaningful work are correlated with but distinct from job satisfaction. We find similar results with our data: the correlation between meaningful work and satisfaction with working conditions is 0.33 (see Table A5).

Therefore, like Steger et al. (2012), we argue that meaningful work is a *eudaimonic* dimension of (perceived) worker well-being. Eudaimonia generally entails flourishing and living a life that realises one's potential (Deci and Ryan, 2008; Graham and Nikolova, 2015; Ryan et al., 2008), and contrasts with *hedonic* and *evaluative* dimensions of subjective well-being. Typically, eudaimonic subjective well-being is captured using survey questions about whether the respondent has meaning and purpose in life. For example, Graham and Nikolova (2015) find that the biggest predictor of eudaimonic well-being is belief in hard work as a means of getting ahead in life, highlighting the connection between efforts in the work domain and having a life purpose. By contrast, life satisfaction is an evaluative measure of well-being and is a reflective assessment of one's overall life

[3] To our knowledge, the only notable exception is the newly-created job quality index by the Gallup organisation, which includes having a sense of purpose and dignity at work as one of the ten job quality indicators (Rothwell and Crabtree, 2019).

[4] According to Marx, capitalism eroded people's ability for self-actualisation and control over their work—a process known as "alienation" (Spencer, 2009, 2015).

circumstances. Therefore, just like life satisfaction is distinct from having meaning and purpose in life (Graham and Nikolova, 2015), job satisfaction is conceptually different from work meaningfulness. Evaluative and eudaimonic measures also differ from hedonic well-being, i.e. positive and negative feelings at a particular point in time, such as stress or anger, or happiness and joy triggered by specific events (Graham et al., 2018). Hedonic well-being in the workplace refers to feelings, such as stress, engagement, and enthusiasm. Table A5 demonstrates that the correlations between meaningful work and stress, engagement, and enthusiasm range between 0.1 and 0.4, highlighting the difference between hedonic and eudaimonic subjective well-being at work.

2.2 The preconditions for meaningful work

Our understanding of meaningful work is based on self-determination theory (Deci and Ryan, 1985; Ryan and Deci, 2000). According to this theory, satisfying three innate psychological needs —competence, autonomy and relatedness —underpins intrinsic motivation and eudaimonic well-being (Ryan and Deci, 2000). Without competence, autonomy, and relatedness, individuals are unable to derive utility from meaning. This justifies the conceptual and empirical examination of work meaningfulness in the context of these three preconditions.

In self-determination theory, *competence* refers to the perceived ability to successfully overcome challenging tasks at work and contribute to a cause, which creates feelings of mastery (Martela and Riekki, 2018; Rosso et al., 2010; Ryan and Deci, 2000). It entails a belief in having the right skills to make an impact. Moreover, people satisfy their need for *autonomy* when they perceive that they have choices and authority over what to do. Autonomy is empirically linked to meaningfulness (Martela and Riekki, 2018; Martela et al., 2018; Ryan and Deci, 2000) because it allows for self-expression, control over the work content and process, and the ability to choose how and when to apply different skills and capabilities. This is in stark contrast with *heteronomy*, a condition whereby behaviour is regulated by forces that the worker perceives as over-imposed, as would be the case with heavy top-down management, for example. Finally, *relatedness* is about the interpersonal relationships at work (Martela and Riekki, 2018; Ryan and Deci, 2000). Workers feel related if they experience genuine care from their bosses or colleagues, and that they care about their superiors and co-workers in return.

Importantly, autonomy, competence, and relatedness are not externally determined objective targets, but rather strongly depend on each individual's innate needs. This implies that there is no single policy in the workplace that employers can adopt to meet the needs of all employees. In addition to autonomy, competence, and relatedness, environmental circumstances and extrinsic rewards facilitate or forestall self-motivation. Therefore, motivation is formed through the interplay between the work environment created by the employer and the satisfaction of the person-specific needs for autonomy, relatedness and competence.

According to Ryan and Deci (2000), there is an intricate relationship between different states of motivation and meaning. First, when work completely fails to satisfy people's innate needs, they are *amotivated*, meaning that they are passive and unwilling to work at any level of pay. Second, when workers are in a state of *controlled motivation*, their needs for autonomy, relatedness, and competence are partially satisfied. However, in this state, workers can only be extrinsically motivated through monetary rewards because they do not find their tasks inherently purposeful. Finally, workers are in a state of *autonomous motivation* when their psychological needs are fulfilled and they feel that the purpose of their tasks matches their personal values and purpose. At that point, their tasks become meaningful. Autonomous motivation is impossible at low levels of autonomy, competence, and relatedness, because people cannot experience self-efficacy: they fail to see how their personal actions affect the outcome, which implies that their effort is meaningless.

Therefore, the three basic needs for autonomy, competence, and relatedness, need to be satisfied to derive meaning from work.

Extrinsic factors such as financial incentives and rewards may be additional preconditions to achieving work meaningfulness (Cassar and Meier, 2018; Spencer, 2015). For instance, an insufficient income level limits the ability to meet basic consumption needs and thwarts people's efforts to achieve their goals and work independently (Vohs et al., 2006). Financial incentives matter for intrinsic motivation and effort (Lazear, 2018), and psychologists show that pecuniary aspects are more important than non-pecuniary ones to workers who have less income to begin with (Rosso et al., 2010). The flipside of this argument is that jobs deprived of intrinsic rewards would only matter to workers through the monetary compensation they offer (Cassar and Meier, 2018). Other extrinsic factors—hours of work, career progression possibilities, and job insecurity —also influence the ability to derive work meaningfulness (Spencer, 2015). For instance, individuals will work longer or more intensely if they feel motivated, compared to a state when they are only working to finance their consumption and leisure (Cassar and Meier, 2018). Nevertheless, long working hours can lead to exhaustion and limit the ability for creative work. Finally, job insecurity can negatively affect certain health outcomes (Caroli and Godard, 2016), including mental health (Reichert and Tauchmann, 2017), which may leave little scope for meaningfulness.

2.3 Meaning and labour economics: an overview of the extant literature

The extant literature provides some intuition into how meaningful work perceptions can affect workers' choices and behaviours. First, experimental studies have documented that viewing one's work as meaningful (i.e. task meaning) increases effort and productivity (Ariely et al., 2008; Bäker and Mechtel, 2018; Chadi et al., 2016; Chandler and Kapelner, 2013; Grant, 2008; Kosfeld et al., 2017) For example, Ariely et al. (2008) conducted two experiments manipulating the meaningfulness of the task (finding consecutive occurrences of the letter 's' in Experiment 1 and assembling Legos in Experiment 2) by acknowledging or destroying the final product, which revealed to participants its meaningfulness. Indeed, labour supply was higher and reservation wages were lower when the experimenters signalled the meaningfulness of the task. Second, theoretical work in economics has proposed that people have an innate drive for sense-making (Chater and Loewenstein, 2016; Karlsson et al., 2004). Thus, fulfilling the need for meaning is part of an individual's utility function and decision-making.

Our paper is related to but substantively different from four recent contributions. First, using pooled cross-sectional data from the International Social Survey Program (ISSP), Dur and van Lent (2019) document that about one in ten employees finds their job useless, with the share being the highest among those engaging in routine tasks as well as those in sales, finance, public relations, and marketing. The authors furnish suggestive evidence that the share of socially useless jobs may increase with the output gap, which they interpret as evidence for labour hoarding, i.e. the retention of more workers than necessary in times of economic turmoil. Dur and van Lent's (2019) study differs from ours in that it focuses on the determinants of a different concept —socially useless jobs —and utilizes a different dataset.

Several studies have relied on time use data to study meaningfulness during work episodes. For example, Kaplan and Schulhofer-Wohl (2018) rely on the American Time Use Survey and find that since the 1950s, women have switched to occupations that have provided high non-pecuniary benefits of working, including more episodes of meaningfulness. The conclusion is more nuanced for men who have shifted to occupations that generate less meaningfulness and happiness and more stress, but fewer feelings of pain and tiredness. Nevertheless, Bryce (2018) surprisingly documents that while working is in itself negatively associated negatively associated with meaning, community

and social service, legal, education, and healthcare occupations are considered the most meaningful (relative to transportation jobs) in the American Time Use Survey. The unexpected negative association between working and meaningfulness is likely due to the fact that time use surveys capture the *hedonic* and not *eudaimonic* work aspects.

Using German time use data, Wolf et al. (2019) document that along with childcare and exercising, working is among the most meaningful activities in people's daily lives, which contrasts with the findings of Bryce (2018). Wolf et al. (2019) find that individuals reporting no meaning at all and those reporting very high meaning are more likely to derive pleasure at work. They explain this seemingly paradoxical finding by noting that some individuals do not experience utility from meaning.

Our research fundamentally differs from these contributions. Specifically, we explicitly focus on meaningful work rather than related concepts such as socially useless work as in Dur and van Lent (2019). Moreover, we demonstrate that meaningful work determines relevant economic outcomes, such as retirement, training, and absenteeism. This implies that subjective evaluations of meaningful work relate to important behavioural consequences and, as such, are of interest to labour economists.

3 Data

We rely on three waves of the European Working Conditions Survey (EWCS), conducted in 2005, 2010, and 2015 (European Foundation for the Improvement of Living and Working Conditions, 2019, 2007, 2012, 2017). The EWCS is a well-known data source for studying the well-being implications of working conditions (see, for example, Aleksynska (2018), Caroli and Godard (2016), Cottini and Lucifora (2013)). While the survey is performed every five years since 1990/1, our analysis is constrained to the 2005-2015 waves due to the availability of key variables for our research. We note that the related dataset—International Social Survey Programme (ISSP)—which included work orientations modules in 1989, 1997, 2005, and 2015, asks respondents whether their job is useful to society (Dur and van Lent, 2019), but not about other aspects of engaging in meaningful work such as job fulfillment. Another disadvantage of this dataset is that the country coverage has changed over time.

Our final analysis sample focuses on the common set of countries included in all three EWCS waves: the 28 EU Member States, Turkey, and Norway. We limit the analysis to this country set to ensure that our results are not driven by changes in the sample composition across the waves. In addition, this sample restriction is useful when implementing pseudo panel techniques.

For each wave, the survey polled about 1,000 individuals in each country. In some years, certain countries are over-sampled and therefore have a larger number of observations. While we have no control over the way in which the survey is conducted, in Model (1) of Table 3 we show that the differences in the number of observations across countries do not drive our main results.

The analysis sample comprises individuals who formally work part- or full-time. We exclude the unemployed and those out of the labour force. While our main analysis sample excludes respondents with missing information on any of the variables, in Appendix Table A4 we also provide analyses addressing any concerns related to bias arising from item non-response. The main analyses automatically exclude the self-employed as this group were not asked questions relating to relationships with colleagues and superiors, permanent contracts, or benefits. Nevertheless, because the relationship between self-employment and meaningfulness is interesting, we offer additional analyses with the sub-set of available variables in Table 2. Table A1 in the Appendix details the number of observations per country and year in the final analysis sample (N=48,420).

4 Variables

4.1 Measuring meaningfulness

Shedding light on the causes and consequences of meaningful work requires appropriately measuring the underlying concept. At the outset, we acknowledge that this is a challenging task because of the lack of consensus on the concept's measurement. The most well-established and widely-used scale in the psychology literature is the Work and Meaning Inventory (WAMI) (Bailey et al., 2019a; Steger et al., 2012). WAMI captures aspects of positive meaning (i.e. having a career that one considers meaningful), meaning-making through work (i.e. work that helps the respondent to make sense of the world around him/her), and greater good motivations (i.e. having a job that is useful to society). Unfortunately, no nationally representative survey to date has included the WAMI questionnaire and it is unclear whether this scale is indeed valid and reliable in such contexts.

Ours is the first attempt to systematically study meaningful work perceptions using existing nationally-representative data and should be seen as the starting point for future investigations. Our meaningfulness of work measure is therefore based on available questions from the EWCS that most closely match the conceptual definition of meaningful work based on the literature.

Specifically, we identified one question reflecting greater good motivations – having the feeling of doing useful work. Second, we include a variable based on whether work is a source of fulfillment, i.e. whether the respondent's job gives the feeling of work well done. These two variables were also the basis of a summative meaningful work index used by Eurofound (2012) based on the 2010 EWCS. While the 2015 survey contains a question about not doubting the importance of one's work, which would have also been relevant to us, we choose these two variables as they are consistently available in all three survey waves that we use.

Figure 1 is a violin plot detailing the distribution of responses at each answer category for the two variables underlying the meaningful work index. A violin plot is a combination of box and density plots. The white dot represents the median and the box denotes the interquartile range. The majority of responses and the medians for both variables are concentrated in the "strongly agree" or "agree" categories, which indicates low variation in the distribution of responses. About 5 percent of respondents disagree or strongly disagree about the usefulness of their job and work giving them the feeling of work well done.

We combine the two variables into an index by extracting the first component of a polychoric principal component analysis (PCA), which is a well-established data reduction procedure. Standard PCA assumes that the underlying data are continuous and normally distributed. As this is not the case for our variables, we relied on the polychoric version of PCA, which assumes that variables are ordered measurements of an underlying continuum and is therefore better suited for categorical variables (Olsson, 1979). Polychoric PCA exploits the linear combinations of the polychoric correlation matrix of the input variables and preserves the ordinal or binary nature of the variables (Olsson, 1979). The two variables that we use to create the index – the perceptions of doing useful work and a job well done — are relatively highly correlated: the simple Pearson's correlation coefficient is 0.6 and Cronbach's α=0.75, which is a good starting point for using PCA. The first principal component accounts for 85 percent of the total variance (eigenvalue = 1.71). Meanwhile, the second component explained only 15 percent of the total variance and had an eigenvalue of 0.29. Following the Kaiser rule, we keep only the first principal component, which we rescale to range between 0 and 100 for ease of interpretation. The violin plot in Figure 2 demonstrates that the majority of observations are concentrated in the range between 75 to 100 and the median respondent in our sample is at about 90.

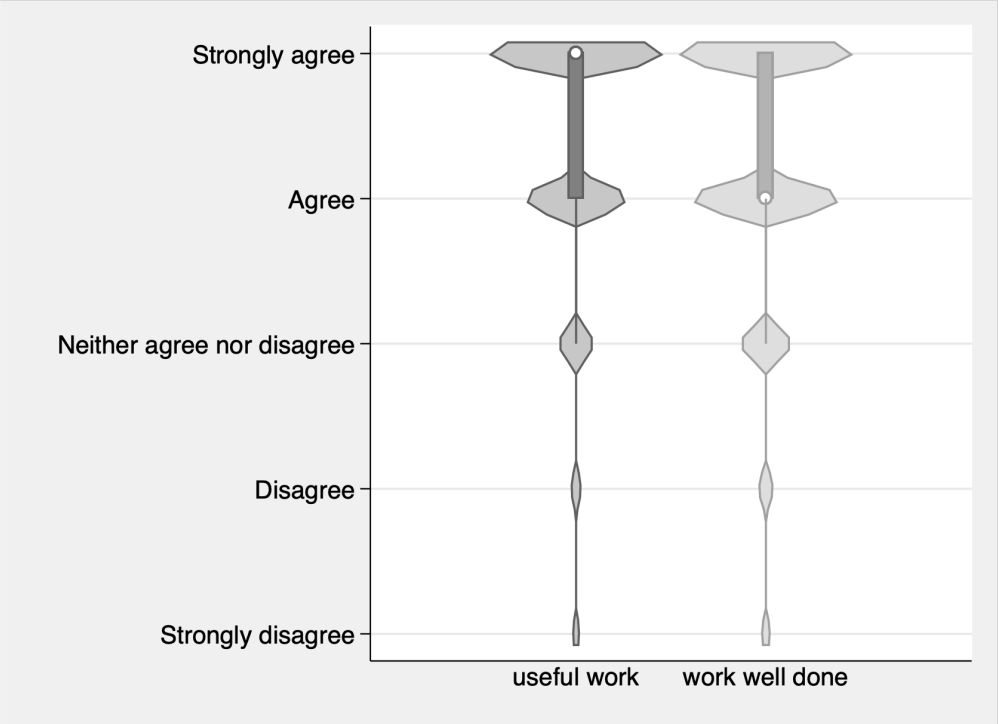

Figure 1: **Violin plots, feelings of work well done and doing useful work**

Source: Authors based on European Working Conditions Surveys (EWCS) 2005-2015

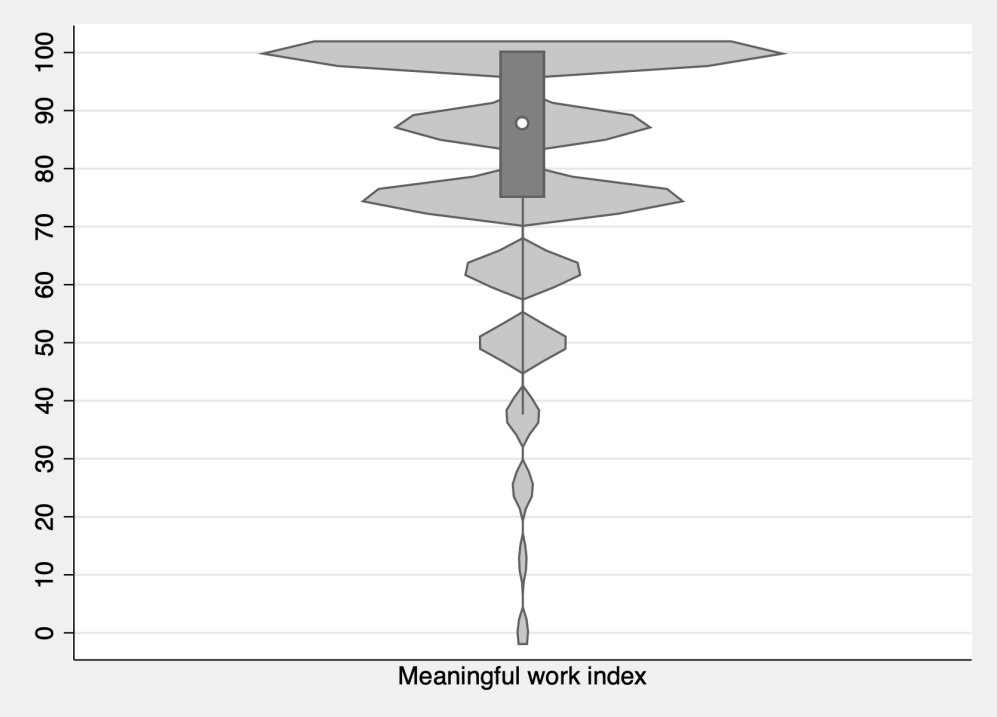

Figure 2: **Violin plot, meaningful work index**

Source: Authors based on European Working Conditions Surveys (EWCS) 2005-2015

4.2 Independent variables

Following the conceptual framework outlined in Section 2.2., our key independent variables include measures of autonomy, competence, and relatedness, which we construct using polychoric PCA (see Table A2 in the Appendix).

Importantly, the measures of autonomy, relatedness, and competence do not reflect personal needs or the objective working conditions that employers have created, but rather reflect the interplay between the needs and the environment. Therefore, the self-reported index of autonomy reflects the match between the working conditions and the worker's personal need for autonomy. As such, the measures for autonomy, competence, and relatedness reflect the degree to which the worker perceives their innate needs to be satisfied.

The autonomy index is based on variables capturing process and decision autonomy, such as the freedom to take a break at will, change or choose tasks, methods of work, and the speed of work, conducting self-assessments, and applying one's own ideas at work. The Cronbach's α, the scale reliability coefficient is 0.66. The first principal component accounts for 56 percent of the total variance (eigenvalue = 3.36). Meanwhile, the second component explained only 15 percent of the total variance and had an eigenvalue of 0.91. Other components explained even less of the variance, which is why we only kept the first extracted principal component.

Our competence measure is based on workers' assessments of their skills, problem-solving, and learning. While the Cronbach's α of 0.4 is moderate, these variables capture the learning and self-efficacy aspects of self-determination theory. We extracted the first principal component after applying polychoric PCA (eigenvalue = 1.70), which explained 56 percent of the total variation. Finally, we construct a relatedness index based on variables indicating whether the respondent receives help and support from colleagues and their boss. While the wording of these questions is slightly different in the 2005 questionnaire, these variables were the only ones in the EWCS questionnaire reflecting relatedness ($\alpha = 0.73$). We extracted the first polychoric principal component (eigenvalue= 1.69), which accounted for 85 percent of the total variation.

In addition, we incorporate variables capturing monetary compensation and effort, as well as proxies for career advancement prospects and job insecurity, as discussed in Spencer (2015). Our analyses also feature standard socio-economic, demographic, and job controls such as age, gender, education, tenure, household size, presence of children in the household, marital status, whether the respondent is a public employee, the number of people the respondent supervises, company size, an indicator for having a permanent contract, and industry and occupation dummies. We do not include an indicator for part-time work due to the large number of missing observations in 2010. In addition, to account for meaningfulness spillovers, we control for whether the respondent has other jobs and whether they volunteer in their free time. We also include the following interview controls: interviewer fixed effects, the duration of the interview (in minutes), the presence of other people during the interview, and the interview month and day. All of these factors could influence subjective well-being responses (Conti and Pudney, 2011; Rehdanz and Maddison, 2005), which necessitates their inclusion in the regressions. Finally, we incorporate survey wave and country dummies, which adjust for any common temporal shocks (e.g. recessions) over time and differences in labour market features and institutions between countries, such as the presence of minimum wage laws and employment protection programmes. We adjust for cost-of-living differences in income across countries by dividing income by the Eurostat's Purchasing Power Parity index (see Table A2). Appendix Table A3 provides summary statistics for key variables used in the analysis.

5 Empirical Approach

We model the perceived meaningfulness of work M of individual i living in country c in survey wave t as:

$$M_{ict} = \beta_0 + I_{ict}\gamma + E_{ict}\delta + Z_{ict}\alpha + S_{ict}\omega + \pi_c + \mu_t + \varepsilon_{ict} \quad (1)$$

where I is a vector of the preconditions for motivation based on self-determination theory (autonomy, competence, and relatedness) and E is a vector of extrinsic factors (income, benefits, working hours, job insecurity, and career prospects). Finally, Z is a vector of socio-demographic and job characteristics, such as gender, age, education, marital status, firm size, permanent contract, and others; π and μ denote country and year dummies, respectively; S is a vector of interviewer fixed effects and interview controls, and ε is the stochastic error term. Since the dependent variable ranges from 0 to 100, we estimate equation (1) using an Ordinary Least Squares (OLS) estimator.

In addition, given that we have repeated cross sections, in robustness checks we also implement a pseudo panel approach (Deaton, 1985), whereby we treat as a cohort workers sharing the same characteristics, such as birth year, age, or gender. The group-averages of these cohort variables are the new unit of analysis in the pseudo panel. The repeated cohort-level information implies that fixed effects estimators are possible. In this paper, we define the cohort based on age, gender, marital status, education, and country of residence. The results are reported in Table 3, Model (2).

Our results are correlational, as opposed to causal, for several reasons. First, individuals who value meaningful work likely self-select into jobs that provide intrinsic rewards and meaning. Therefore, traits such as intelligence, motivation, or pro-sociality could influence both job choice and meaningfulness perceptions. The pseudo panel strategy is an attempt to mitigate such concerns. Second, while intrinsic and extrinsic work rewards may influence meaningfulness, perceiving one's job as meaningful may influence effort, which in turn influences pay and intrinsic rewards. Ideally, we would have preferred to have individual-level panel data and exogenous variation in working conditions that would have allowed us to control for time-invariant unobserved heterogeneity and certain self-selection issues. Nevertheless, even though we only have pooled cross-sections, to the extent possible, we mitigate endogeneity issues by including a large set of covariates, country dummies, and interview controls.

6 Results

6.1 Main results

Table 1 details our main results. Model (1), which is the basis for the computationally-intensive Shapley R^2 decomposition shown in Figure 4, includes a parsimonious set of controls. Model (2) is our baseline specification that features all key independent variables based on our conceptual framework, as well as the full set of socio-demographic controls, year and country fixed effects, and interview controls. Models (3)-(5) add interaction terms, which absorb additional variation in work meaningfulness and account for further heterogeneity. Model (3) considers the possibility of differences in meaningfulness perceptions across workers in the same industry, but in different occupations. In Model (4), the *education* × *occupation* dummies account for differences in meaningful work perceptions across people with the same level of education, but working in different occupations. In Model (5), we allow for the possibility of meaningfulness differences across people working in the same occupation, but living in different countries.

Table 1 demonstrates that both the magnitudes and the statistical significance of the coefficient estimates remain stable across these different specifications. Autonomy, relatedness, and compe-

	(1) No interview controls	(2) With interview controls	(3) Industry × occupation	(4) Education × occupation	(5) Country × occupation
Autonomy	0.138***	0.126***	0.127***	0.126***	0.127***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Competence	0.043***	0.039***	0.037***	0.039***	0.035***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Relatedness	0.192***	0.166***	0.166***	0.166***	0.165***
	(0.004)	(0.005)	(0.004)	(0.004)	(0.004)
Log monthly income (PPP-adjusted)	0.059	0.269	0.174	0.290	0.126
	(0.115)	(0.231)	(0.223)	(0.223)	(0.224)
Benefits and performance pay	-0.059	-0.007	-0.013	-0.004	-0.023
	(0.189)	(0.212)	(0.210)	(0.210)	(0.210)
Job insecurity	-3.486***	-3.454***	-3.450***	-3.451***	-3.435***
	(0.250)	(0.264)	(0.233)	(0.233)	(0.233)
Career advancement	3.902***	4.740***	4.700***	4.742***	4.648***
	(0.171)	(0.186)	(0.191)	(0.191)	(0.191)
Log weekly hours	-2.574***	-2.332***	-2.387***	-2.343***	-1.882***
	(0.269)	(0.321)	(0.312)	(0.312)	(0.315)
Number of workdays per week		0.142	0.186	0.142	0.189
		(0.134)	(0.127)	(0.127)	(0.128)
Public employee		0.616***	0.537**	0.616***	0.527**
		(0.235)	(0.239)	(0.238)	(0.238)
Number of employees: Ref: 1-9 emp					
10-249 employees		-1.072***	-1.122***	-1.068***	-1.082***
		(0.207)	(0.203)	(0.203)	(0.203)
250 and more employees		-2.236***	-2.264***	-2.246***	-2.088***
		(0.305)	(0.293)	(0.293)	(0.294)
Permanent contract		0.060	0.038	0.072	-0.057
		(0.262)	(0.247)	(0.247)	(0.247)
Log number people supervised		0.157	0.176	0.156	0.151
		(0.106)	(0.116)	(0.116)	(0.117)
Other jobs		-0.313	-0.320	-0.308	-0.247
		(0.307)	(0.304)	(0.305)	(0.304)
Volunteer		-0.080	-0.070	-0.078	-0.079
		(0.196)	(0.196)	(0.196)	(0.196)
Tenure		0.020*	0.020*	0.021*	0.017
		(0.011)	(0.011)	(0.011)	(0.011)
Age		0.158***	0.158***	0.158***	0.163***
		(0.010)	(0.010)	(0.010)	(0.010)
Male		-0.296	-0.408**	-0.320*	-0.322*
		(0.200)	(0.195)	(0.194)	(0.194)
Education: Ref: Primary or less					
Secondary education		-1.242***	-1.250***	-0.897	-1.342***
		(0.312)	(0.287)	(1.508)	(0.291)
Tertiary education		-2.821***	-2.758***	-4.073**	-2.826***
		(0.448)	(0.432)	(1.614)	(0.437)
Household size		0.102	0.106	0.103	0.131
		(0.093)	(0.088)	(0.088)	(0.088)
Spouse/partner in household		0.569**	0.551***	0.572***	0.588***
		(0.222)	(0.212)	(0.212)	(0.212)
Children in household		0.249	0.223	0.252	0.333
		(0.212)	(0.206)	(0.206)	(0.205)
N	48,420	48,420	48,420	48,420	48,420
Adj.R^2	0.205	0.354	0.355	0.354	0.361

Source: Authors based on the European Working Conditions Surveys (EWCS) 2005-2015.
Notes: Robust standard errors in parentheses. The dependent variable in all models is perceptions of being engaged in meaningful work, which is an index measured on a scale of 0 to 100. See Table A2 for variable definitions. All regressions include occupation, industry, country, and year fixed effects. Models (2)-(5) also include interview controls (duration, number of people present during interview, interview month, and interview day, interviewer fixed effects), and individual control. Model (3) includes *industry* × *occupation* fixed effects, Model (4) includes *education* × *occupation* fixed effects, and Model (5) includes *country* × *occupation* fixed effects. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 1: **Determinants of meaningful work perceptions**

tence are all positively associated with meaningfulness, whereby, for example, a 10-point increase in autonomy corresponds to an increase of 1.3-1.4 points in meaningfulness, which appears rather modest in magnitude. Nevertheless, autonomy accounts for a significant share of the variation in meaningfulness, as shown in Figure 4 below. Meanwhile, income and benefits are not associated with meaningfulness, which is an interesting result. The raw correlation coefficient between income and meaningfulness is also rather low ($\rho = 0.04$), which suggests that meaningfulness mostly reflects non-pecuniary work aspects. Future research should explore in greater detail the relationship between work meaningfulness and income and whether and to what extent income is a necessary precondition for motivation and meaning.

Perceptions of career advancement and job insecurity matter for meaningfulness in the expected directions, and longer working hours decrease meaningfulness, suggesting that excessive work intensity may limit the ability to derive work meaningfulness. Tenure, the number of working days, being a public employee, having a permanent contract, working multiple jobs, and supervising others do not influence work meaningfulness, but respondents working in smaller firms have higher meaningfulness perceptions, compared to those working in larger firms. This finding may at first appear at odds with the positive relationship between relatedness and meaningfulness. Nevertheless, the negative coefficient on the firm size dummies is likely capturing aversion to hierarchy and preferences for autonomy (Benz & Frey, 2008).

Furthermore, more educated respondents experience their jobs as *less* meaningful compared to workers with an elementary education, which is a finding worthy of further explorations. This seemingly paradoxical result is consistent with models of job crafting, according to which low-skilled individuals are able to see beyond their immediate tasks and find meaningfulness and purpose in seemingly menial tasks (Both-Nwabuwe et al., 2017; Wrzesniewski and Dutton, 2001). Finally, women experience their jobs as more meaningful, compared to men with the same working conditions.

Model (2) of Table 1 also includes occupation and industry fixed effects. Figure 3 graphically summarises the differences in meaningfulness between occupations and industries, based on the regression coefficients from Model (2) in Table 1. Plant and machine operators, professionals, service and sales workers, and technicians find their jobs more meaningful compared to managers. The craft and related trades industry is the occupation with the greatest meaningfulness score, likely due to the creative nature of these jobs. In addition, workers in all industries except certain services industries find their jobs less meaningful than those working in the agricultural sector. In summary, the occupational and industry fixed effects point to a pattern whereby workers in the service industry and those in occupations providing creativity and autonomy tend to have greater meaningfulness perceptions.

Next, using Shapley-based decompositions (Israeli, 2007; Shorrocks, 2013) we empirically demonstrate the relative importance of key job characteristics for meaningful work. The Shapley-based decomposition method extracts the separate contribution to the explained variation in meaningfulness of each included independent variable. Specifically, Figure 4 indicates the relative contribution to the overall R^2 explained by the different factors in Model (1) in Table 1. Our proxies for autonomy, competence, and relatedness account for 60 percent of the variation in meaningfulness of work. Income and benefits together account for less than half a percent. All in all, income, benefits, job insecurity, career advancement, and working hours explain about 13 percent of the variation in meaningfulness. The key insight from Figure 4 is that intrinsic rewards from work are about 4.6 times more important for meaningfulness compared with compensation and other extrinsic factors. Meanwhile, relatedness is the most important determinant of work meaningfulness.

Our main analyses exclude the self-employed because of a lack of information on the questions comprising the relatedness index, as well as those pertaining to benefits and performance pay and

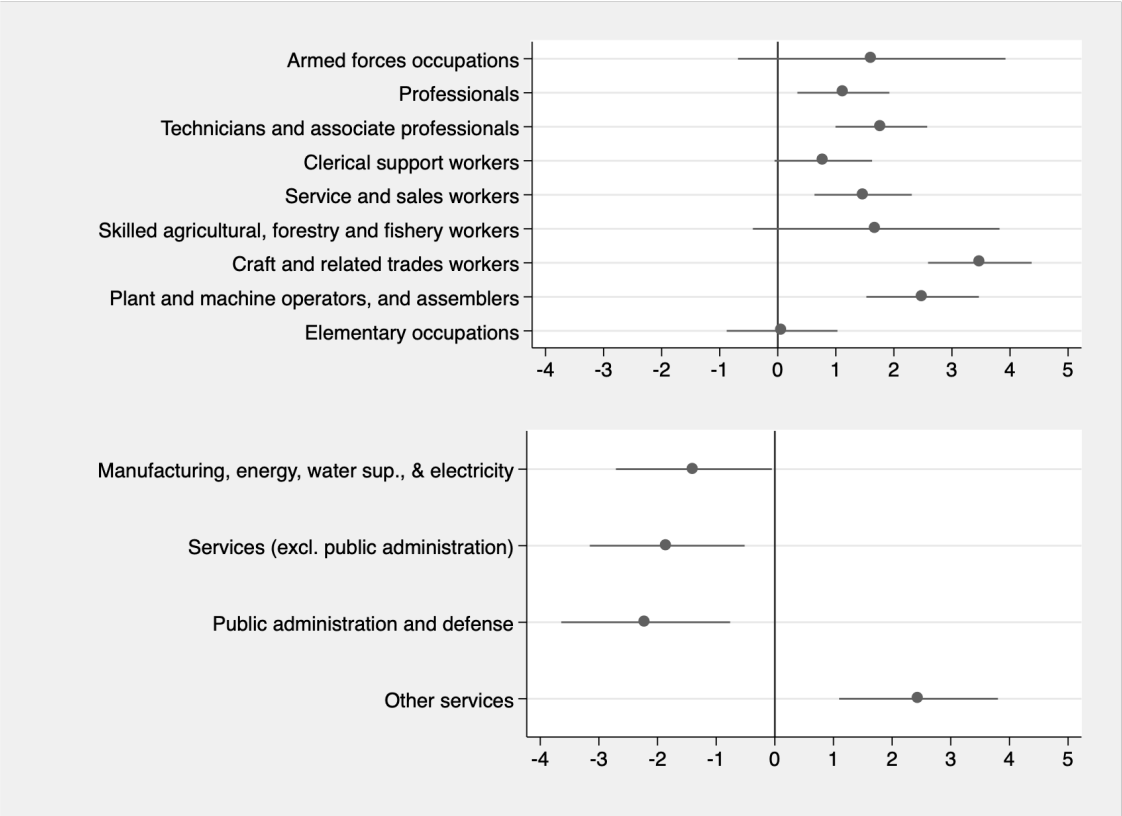

Figure 3: **Regression-adjusted differences in meaningfulness, by occupation and industry, with 95% confidence intervals**

Source: Authors based on European Working Conditions Surveys (EWCS) 2005-2015
Notes: The figure shows the regression coefficients on the occupation and industry fixed effects from Table 1, Model (2). The reference category Panel A is managers and in Panel B: agriculture, hunting, forestry, and fisheries.

permanent contracts. Nevertheless, the self-employed enjoy greater mental health and subjective well-being compared to similar regular employees (Benz and Frey, 2008; Binder and Coad, 2013; Blanchflower and Oswald, 1998; Hessels et al., 2018; Nikolova and Graham, 2014; Nikolova, 2019). This well-being premium is often attributed to the utility of being your own boss and having autonomy and flexibility (Benz and Frey, 2008; Hyytinen et al., 2013). More recently, Wolfe and Patel (2019) demonstrate that, rather contradictorily, the self-employed are slightly more likely to perceive their jobs as socially useful, but are not more likely than regular employees to rate their work as important. These differences are likely due to the differences in sample composition in the two regressions used as the authors rely on both the ISSP and the EWCS data.

In light of these studies, we explore the relationship between self-employment and work meaningfulness by omitting the control variables that are not available for the self-employed sample, namely the relatedness index, benefits and performance pay, and permanent contracts. To our knowledge, this is the first exploration of work meaningfulness differences related to self-employment. Model (1) in Table 2 demonstrates that the self-employed enjoy higher levels of work meaningfulness, compared to private- and public-sector employees with similar working conditions and autonomy and competence levels.

Furthermore, in Models (2) and (3) we explore whether autonomy and competence matter more for the self-employed compared to private and public employees. Both autonomy and income seem

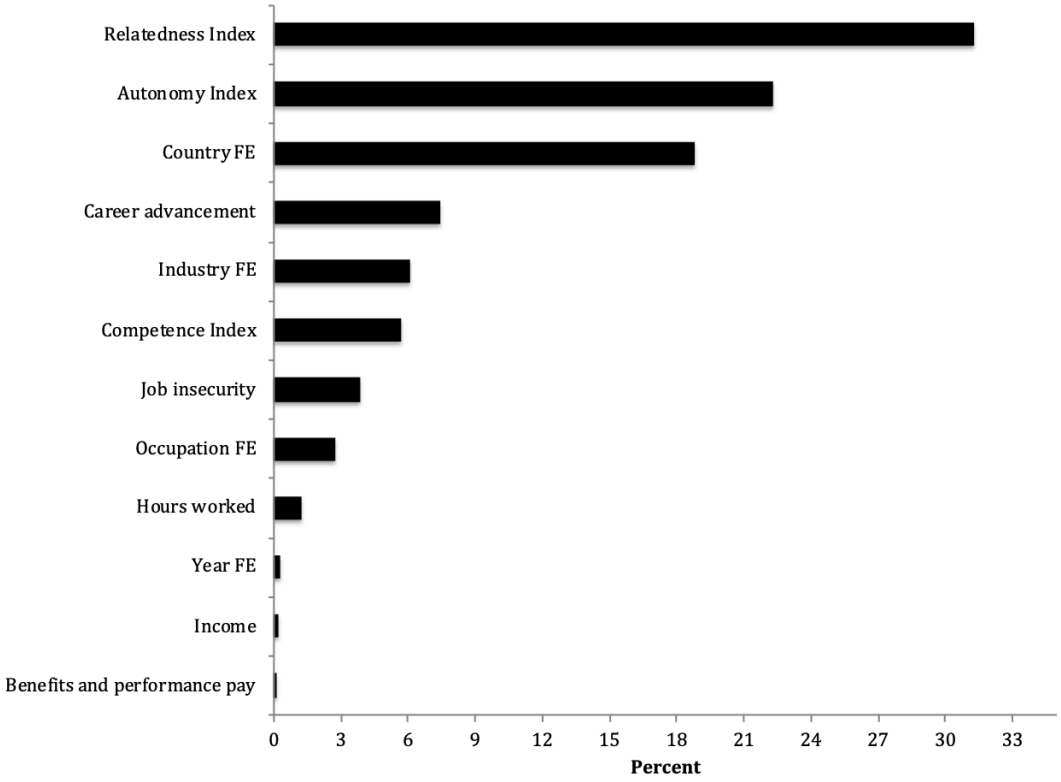

Figure 4: **Shapley-based decompositions, $R^2 = 0.205$**

Source: Authors based on European Working Conditions Surveys (EWCS) 2005-2015
Notes: The figure shows the Shapley decompositions based on Model (1) in Table (1).

to have stronger associations with work meaningfulness in the self-employed sample, yet career advancement possibilities and working hours are more strongly associated with meaningfulness for the non-self-employed group. Income is statistically significant in these regressions likely due to the omission of the performance pay and benefits variable. It also matters more for the meaningfulness of the self-employed.

6.2 Robustness checks

Even though our estimation strategy only allows us to show conditional correlations rather than causal results, in Table 3 we present several robustness checks, which increase confidence in our results and conclusions. First, in Model (1), we adjust for the possibility that the results are driven by differences in the sample sizes across countries. Specifically, we re-estimate our main regressions using the inverse of the number of observations per country as a weight. The results remain virtually unaltered compared to those in Model (2) of Table 1, with the only notable difference being the marginally statistically significant coefficient estimate for income.

Furthermore, in Model (2) of Table 3, we create a pseudo panel whereby the level of analysis is a cohort comprised of respondents of the same age group, gender, marital status, education level, and living in the same country. The results are very similar to our baseline specifications. While we do not have a panel data set with observations on the same individuals followed over time, the pseudo panel findings provide suggestive evidence that our main conclusions will likely hold in a

	(1)	(2)	(3)
		Sub-sample	
	Self-employed control	Self-employed	Non Self-employed
Autonomy	0.149***	0.263***	0.144***
	(0.003)	(0.018)	(0.003)
Competence	0.046***	0.038***	0.047***
	(0.004)	(0.015)	(0.004)
Self-employed	1.520***		
	(0.294)		
Log monthly income (PPP-adjusted)	0.712***	1.411***	0.451**
	(0.183)	(0.482)	(0.216)
Job insecurity	-3.817***	-3.910***	-4.007***
	(0.214)	(0.931)	(0.227)
Career advancement	5.542***	3.871***	5.750***
	(0.176)	(0.683)	(0.189)
Log weekly hours	-2.148***	-1.202	-2.351***
	(0.262)	(0.732)	(0.302)
N	57,867	6,661	51,206
$Adj.R^2$	0.323	0.347	0.322

Source: Authors based on the European Working Conditions Surveys (EWCS) 2005-2015.

Notes: Robust standard errors in parentheses. The dependent variable in all models is perceptions of being engaged in meaningful work, which is an index measured on a scale of 0 to 100. See Table A2 for variable definitions. All regressions include country and year fixed effects, interview controls (duration, number of people present during interview, interview month, and interview day, interviewer fixed effects), individual controls, and occupation and industry fixed effects. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 2: **Meaningful work and self-employment**

panel setting as well.

Next, in Model (3), we report the results using the simple average of the variables comprising the meaningful work index. The results are virtually identical to the main findings in Model (2) in Table 1, likely due to the fact that we only use two variables to construct the index. In the case of two inputs, the PCA and the simple average of the inputs often give similar results. In Model (4), we also address the concern that satisfaction with working conditions already captures objective and subjective working conditions, which may render work meaningfulness superfluous. If this was true, controlling for job satisfaction would yield the coefficient estimates on the key independent variables statistically insignificant. Model (4) in Table 3 demonstrates that this is not the case. Therefore, autonomy, relatedness, and competence matter for work meaningfulness above and beyond job satisfaction.

Finally, Models (5) and (6) of Table 3 differentiate between respondents who started a new job in the past two years vs. those working in the same firm for at least 2 years. Through these specifications we test whether there is a honeymoon effect after a job switch (Chadi and Hetschko, 2018; Georgellis and Yusuf, 2016), whereby respondents perceive their jobs as meaningful due to the excitement related to the new job (i.e. the "magic of the new") rather than the actual working

	(1) Weighted	(2) Pseudo Panel	(3) Alternative DV	(4) Working conditions satisfaction control	(5) At least 2 years on the job	(6) Less than 2 years on the job
Autonomy	0.127***	0.132***	0.126***	0.103***	0.121***	0.158***
	(0.004)	(0.022)	(0.004)	(0.004)	(0.004)	(0.015)
Competence	0.042***	0.055**	0.039***	0.044***	0.034***	0.047***
	(0.004)	(0.023)	(0.004)	(0.004)	(0.005)	(0.016)
Relatedness	0.163***	0.208***	0.166***	0.127***	0.161***	0.184***
	(0.005)	(0.021)	(0.005)	(0.004)	(0.005)	(0.018)
Log monthly income (PPP-adjusted)	0.420*	0.128	0.269	-0.246	0.365	-0.615
	(0.249)	(0.370)	(0.231)	(0.226)	(0.258)	(0.850)
Benefits and performance pay	-0.004	0.990	-0.007	-0.172	-0.015	0.597
	(0.228)	(1.291)	(0.212)	(0.206)	(0.229)	(0.898)
Job insecurity	-3.464***	-6.200***	-3.456***	-1.957***	-3.416***	-3.308***
	(0.282)	(1.345)	(0.264)	(0.258)	(0.303)	(0.862)
Career advancement	4.759***	6.305***	4.742***	3.196***	4.399***	5.982***
	(0.199)	(1.204)	(0.186)	(0.183)	(0.203)	(0.783)
Log weekly hours	-2.293***	-1.501	-2.336***	-1.408***	-2.349***	-2.917**
	(0.336)	(1.578)	(0.321)	(0.308)	(0.355)	(1.163)
Working conditions satisfaction: Ref: not at all satisfied						
Not very satisfied				7.357***		
				(0.774)		
Somewhat satisfied				14.238***		
				(0.750)		
Very satisfied				19.588***		
				(0.769)		
N	48,420	2,776	48,420	48,284	40,427	7,993
R^2	0.461	0.252	0.451	0.480	0.468	0.706

Source: Authors based on the European Working Conditions Surveys (EWCS) 2005-2015.
Notes: Robust standard errors in parentheses. The dependent variable in Models (1), (2), and (4), is perceptions of being engaged in meaningful work, which is an index measured on a scale of 0 to 100. See Table A2 for variable definitions. All regressions include country and year fixed effects, interview controls (duration, number of people present during interview, interview month, and interview day, interviewer fixed effects), individual controls, and occupation and industry fixed effects. Model (1) is a weighted regression using the inverse of the number of observations per country as a weight. Model (2) is based on a pseudo panel whereby the unit of observation is a cohort, defined as people in the same age group, gender, education level, marital status, and country. Model (3) uses a different dependent variable - the simple average of feeling of work well done and feeling of doing useful work, rescaled to range between 0 and 100. Model (4) controls for satisfaction with working conditions and Models (5) and (6) split the sample according to the respondent's duration of employment with the current employer. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3: **Robustness checks**

	(1) Log sick days	(2) Work when sick (average marginal effects)	(3) Participate in training (average marginal effects)	(4) Retirement age
Perceptions of meaningful work	-0.004***	-0.002***	0.001***	0.025***
	(0.000)	(0.000)	(0.000)	(0.004)
Mean dependent variable	8.172	0.486	0.553	63.109
N	40,564	29,952	46,493	17,543
R^2/Pseudo R^2	0.338	0.162	0.257	0.422

Source: Authors based on the European Working Conditions Surveys (EWCS) 2005-2015.
Notes: Robust standard errors in parentheses. The dependent variable in Model (1) is the natural logarithm of the number of days the respondent was sick and absent from work in the past year; in Model (2), it is the probability of reporting to have worked while sick in the past year. This variable is only available for 2010 and 2015. In Model (3), it is the probability that the respondent participated in skills training in the previous year, and in Model (4), it is the age at which the respondent wishes to retire, whereby respondents who reported that they would like to keep working as late as possible are coded as wanting to retire at "80". Information for this variable is only available for 2015. The controls included are the same as Model (2) in Table 1. See Table A2 for variable definitions. Models (2) and (3) are estimated using a logistic regression and the average marginal effects are reported. Models (1) and (4) are estimated using OLS. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 4: **Meaningful work as a predictor of labour market outcomes**

conditions. Comparing the coefficient estimates in Models (5) and (6) indicates that the associations between autonomy, competence, and relatedness are slightly stronger for new employees, providing some support of the "magic of the new" hypothesis. Nevertheless, the differences between Models (5) and (6) and those in the main specification appear minimal.

In an additional robustness check shown in Appendix Table A4, we also address the issue of loss of information and potential bias arising from dropping observations with missing information. Specifically, we create an additional category for missing information for all control variables except autonomy, relatedness, and competence. Where the original variable is continuous, we create quartiles, and treat the variable as categorical with missing observations being the fifth category. The missing category for these variables has no particular interpretation but only serves to preserve the number of observations. The results demonstrate that the main patterns we identify in Model (2) of Table 1 still hold when we account for missing observations.

6.3 The labour market consequences of work meaningfulness

In this section, we demonstrate that meaningfulness perceptions are important for economists because they predict labour market behaviours in expected ways. Specifically, we estimate the relationship between perceptions of meaningful work and the number of sick days, the probability of reporting working when sick, the likelihood of participating in training, and the desired retirement age. As such, we provide the first validation of meaningful work perceptions and highlight their usefulness for labour economists. Ideally, in line with the job satisfaction literature, we would have tested how well meaningful work perceptions predict actual or intended job quits (Böckerman and Ilmakunnas, 2009; Clark, 2001; D'Ambrosio et al., 2018; Green, 2010; Lévy-Garboua et al., 2007). For example, Dur and van Lent (2019) show that individuals with socially useless jobs are more likely to report that they would like to change their jobs if they had the opportunity. Unfortunately, the EWCS lacks information on actual and intended job quits.

Table 4 details the results. First, in Model (1), we show that individuals who perceive their work as meaningful are likely to report fewer sick days. By exponentiating the coefficient estimate of 0.004, we find that a ten-point increase in the meaningfulness index corresponds to a decrease in the number of sick days by 10 percent. Evaluated at the mean of about 8 days, a ten-point increase in work meaningfulness reduces absenteeism by almost one day a year. Nevertheless, respondents who find their work more meaningful are in fact less likely to work when sick. A ten-point increase in meaningfulness decreases the probability of working while sick by 2 percent (from a baseline probability of about 50 percent). Taken together, these results suggest that meaningful work increases effort (through reducing absenteeism), but not at the cost of damaging health (i.e. workers still remain home when sick).

Furthermore, in Model (3), we demonstrate that a ten-point increase in meaningfulness corresponds to a 1 percent increase in the likelihood of participating in skills training programs. Finally, Model (4) shows that a ten-point increase in meaningfulness corresponds to a 2.5-year increase in the desired retirement age. The average intended retirement age in the sample is 63.1 years, which suggests that a ten-point increase in work meaningfulness could extend the age at which individuals wish to leave the workforce to about 66. While relatively small in magnitude, these results have important implications for policymakers faced with rising life expectancy and a greater share of older workers in the economy.

7 Conclusion and avenues for future research

We are the first to empirically investigate the factors influencing meaningful work using nationally representative samples of working-age adults in 30 European countries. Using data from the 2005, 2010, and 2015 European Working Conditions Surveys, our findings show that the non-monetary aspects of work, such as relatedness, autonomy, and competence, have a 4.6 times stronger association with the meaningfulness of work than income, job insecurity, benefits, and working hours. Importantly, we demonstrate that work meaningfulness predicts workers' effort, as measured by absenteeism, skills training, and retirement intentions. As such, we identify perceptions of having meaningful work as an important complement to extant measures of job quality.

Our study provides the first insights on the topic of work meaningfulness in economics. As such, it opens an exciting new research agenda, which, in our view, should prioritise three aspects. First, this paper's insights could inform the development of a theoretical model that formally integrates self-determination theory into utility functions, which can guide future explorations of work meaningfulness in economics. Such a theoretical framework could extend the insights in Cassar and Meier (2018) by formally incorporating self-determination theory. Cassar and Meier (2018) follow the classical opportunity-cost view of labour and model individuals as deriving utility from both meaning and income and experiencing disutility from exerting effort. Each worker maximises utility by choosing an optimal level of effort (Cassar and Meier, 2018). In contrast, self-determination theory posits that individuals are motivated when they feel that their own actions directly impact their personal goals, i.e. when they experience self-efficacy (Ryan and Deci, 2000). Therefore, a model of meaningful work should take into account that the disutility of exerting effort is decreasing in motivation: the cost of effort is lower for more motivated workers. Furthermore, according to self-determination theory, there is a minimum level of motivation required to experience any utility from meaning. This threshold is a crucial element in modelling meaningful work; its omission severely limits our understanding of how and why workers might make decisions based on the meaningfulness of their work.

Second, collecting and analysing longitudinal information on meaningful work perceptions is a

logical extension of our research. A major advantage of the longitudinal design will be the repeated information on the same individuals over time, which should net out the influence of reporting bias in answering meaningful work questions as well as the influence of time-invariant norms and expectations. A panel dataset will also be helpful in studying the short-term and long-term stability and consistency in responses to meaningful work questions within and across individuals. Moreover, it will facilitate the exploration of whether current meaningful work levels predict labour market behavior in subsequent survey waves.

Third, future research should investigate the interplay between the role of norms and expectations on the one hand and changing working conditions on the other for explaining variation in work meaningfulness. While self-reported meaningful work answers in part reflect these norms and expectations, unpacking the role of norms and expectations from that of actual working conditions is a crucial next step. Brown et al. (2012) provide two approaches to deepening our understanding of the role of norms and expectations in job satisfaction research, which can be applied to the study of work meaningfulness. First, they suggest complementing econometric analyses of job satisfaction with qualitative interviews about the role of extrinsic and intrinsic factors for job satisfaction answers. Second, the authors recommend explicitly controlling for norms and expectations in regression analyses by including variables measuring work orientations and job values. This is likely to be a viable way forward, yet it will be contingent on the clear conceptualisation and measurement of work orientations.

In short, we envision that our contribution will inspire a new line of research into the causes and consequences of meaningful work. This research agenda can provide timely novel insights into how to organise the future of work in a meaningful and dignifying way at a juncture that the future of work is in flux. Meaningful work is becoming increasingly salient in light of the ongoing processes of automation and digitalisation, which are altering the nature of paid and unpaid work activities. Against this backdrop, understanding what job characteristics enhance or diminish meaningfulness can provide important guidance to policy-makers and employers regarding boosting organisational performance and social functioning. Specifically, previous research shows that meaningful work is associated with higher productivity and lower turnover (Ariely et al., 2008; Rosso et al., 2010). In addition, this paper shows that those engaged in meaningful work are likely to remain longer in the workforce, which has implications for health and well-being and can help solve current demographic challenges related to ageing populations and rising dependency ratios (Nikolova and Graham, 2014). We also demonstrate that meaningful work can increase effort through reducing absenteeism and increasing the likelihood of participating in skills training.

By furnishing not only material means, but also social identity and individual self-esteem, work is a pivotal part of human life. Since most adults spend a large part of their waking hours in work-related activities, understanding what factors make work a life-enriching and dignifying experience or, on the contrary, a degrading and meaningless one, can help design policies to enhance workers' well-being, boost organisational performance, and increase civic engagement and social welfare. Our findings underscore the importance of intrinsic factors for meaningfulness. Objective working conditions related to hierarchy, job insecurity, and working hours can create an important foundation enabling workers to gain meaningfulness from their jobs. However, it is autonomy, competence, and especially relationships at work that nourish and sustain meaningfulness. Future research should prioritise exploration of employer policies to encourage the satisfaction of these three innate needs, to promote meaningfulness in the workplace.

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Appendix

Country	2005	2010	2015
Austria	307	401	465
Belgium	469	1,591	1,214
Bulgaria	539	461	496
Croatia	445	558	422
Cyprus	346	499	536
Czech Republic	347	431	414
Denmark	601	734	601
Estonia	287	486	457
Finland	577	487	522
France	387	1,238	874
Germany	384	991	775
Greece	448	396	300
Hungary	595	598	253
Ireland	502	430	472
Italy	387	518	347
Latvia	513	537	353
Lithuania	376	406	467
Luxembourg	290	324	453
Malta	342	499	606
Netherlands	559	523	488
Poland	470	584	395
Portugal	514	446	321
Romania	372	366	381
Slovakia	541	482	414
Slovenia	324	859	816
Spain	404	423	1,254
Sweden	682	495	586
UK	378	613	806
Turkey	321	882	799
Norway	558	664	672

Source: Authors based on the European Working Conditions Surveys (EWCS) 2005-2015

Table A1: **Number of observations per country and year in the main analysis sample**

Table A2: Variable definitions

Variables	**Explanation**
Dependent variable	
Meaningful work index	A summary index created by extracting the first component of a polychoric principal component analysis (PCA) based on the statements (1) "your job gives you the feeling of work well-done" and (2) "you have the feeling of doing useful work." Both variables are originally measured on a scale, whereby 1=Never, 2=Rarely, 3=Sometimes, 4=Most of the time, 5=Always. The index is rescaled to range between 0-100 (higher score indicates a higher degree of perceived meaningfulness).
Key independent variables	
Autonomy	A summary index created by extracting the first component of a polychoric principal component analysis (PCA) of the following variables: (1) able to choose or change order of tasks, (2) able to choose or change methods of work, (3) able to choose or change speed or rate of work, (4) main paid job involves "assessing yourself the quality of your own work," (5) "you can take a break when you wish," (6) "you are able to apply your own ideas in your work." Variables (1)-(4) are originally measured on a scale 0=No, 1=Yes. Variables (5)-(6) are originally measured on a scale, whereby 1=Never, 2=Rarely, 3=Sometimes, 4=Most of the time, 5=Always. The index is rescaled to range between 0-100 (higher score indicates a higher degree of perceived autonomy).
Competence	A summary index created by extracting the first component of a polychoric principal component analysis (PCA) of the following variables: (1) respondent has appropriate skills to cope with current or more demanding duties, (2) main paid job involves "solving unforeseen problems on your own," (3) main paid job involves "learning new things." Variable (1) is originally measured on a scale 0=No, 1=Yes. Variables (2)-(3) are originally measured on a scale, whereby 1=Never, 2=Rarely, 3=Sometimes, 4=Most of the time, 5=Always. The index is rescaled to range between 0-100 (higher score indicates a higher degree of perceived competence).
Relatedness	A summary index created by extracting the first component of a polychoric principal component analysis (PCA) of the following variables: (1) "your colleagues help and support you", (2) "your manager helps and supports you." Both variables are originally measured on a scale, whereby 1=Never, 2=Rarely, 3=Sometimes, 4=Most of the time, 5=Always. In 2005, the questions underlying these variables had a slightly different wording, (1) "you can get assistance from colleagues if you ask for it" and (2) "you can get assistance from your superior/boss if you ask for it." The index is rescaled to range between 0-100 (higher score indicates a higher degree of relatedness)

Continued on next page

Table A2 – *Continued from previous page*

Variables	**Explanation**
Log monthly income	Log monthly income in Euros, and PPP-adjusted using Purchasing power parities (PPPs), price level indices and real expenditures for ESA 2010 aggregates, actual individual consumption from Eurostat. The income information for 2005 is based on taking the midpoint of the country-specific income intervals and then converting them to Euros. In 2010 and 2015, respondents reported their actual income amounts. Those who refused to do so were prompted to indicate their income on an interval. For 2010 when income was missing, we took the midpoint of all income intervals and added this information to the continuous income variable. In 2015, when income was missing, we added the median of each income interval based on the 1991-2015 cumulative file.
Benefits and performance pay	The variable is coded as 1 if the respondent reported receiving any of the following: performance pay, profit sharing, income from company shares, advantages such as medical services, access to shops. The variable is coded as 0 if the respondent receives none of these benefits. 0= no fringe benefits/bonus; 1=some fringe benefits/bonus.
Career advancement	A binary indicator variable based on the statement "My job offers good prospects for career advancement." The response has been recoded from the original agree-disagree scale, whereby 1 denotes if the respondent strongly agrees or agrees with the statement and 0 if they are neutral, disagree, or strongly disagree with the statement. 0=no career advancement opportunities; 1=career advancement opportunities.
Job insecurity	A binary indicator variable based on the statement "I might lose my job in the next 6 months." The response has been recoded from the original agree-disagree scale, whereby 1 denotes if the respondent strongly agrees or agrees with the statement and 0 if they are neutral, disagree, or strongly disagree with the statement. 0=will not lose job; 1=may lose job in the next six months.
Log weekly work hours	Log of usual weekly hours worked per week in the main job.
Control variables	Age (in years); male (0 = female and 1 = male); household size (number of people in household); spouse in household (1=spouse/partner; 0=no spouse/partner); presence of children in the household (1=yes, 0=no); education (1= primary education or less (no education, early childhood education and primary education); 2= secondary (lower secondary education and upper secondary education), 3=tertiary (post-secondary non-tertiary education, short cycle tertiary education, bachelor or equivalent, master or equivalent, and doctorate or equivalent), occupation dummies (ISCO 88 one-digit categories); industry of employer dummies; permanent contract (1=yes, 0=no); log of number of people supervised at work; company size indicators; public employee indicator (1=public employee; 0=not a public employee); number of days worked per week; work tenure (number of years with the current company); whether the respondent has other jobs (1=yes, 0=no); whether the respondent is involved in voluntary or charitable activity (1=yes, 0=no); interview duration (in minutes), number of people present during the interview; interview month; interview day; interviewer fixed effects.

Variable	Mean	Std. Dev.
Meaningful work index	81.422	20.291
Autonomy	64.044	28.517
Competence	57.297	26.014
Relatedness	73.804	24.477
Monthly income (in Euros, PPP-adjusted)	3,373.150	19,270.250
Benefits and performance pay	0.302	0.459
Job insecurity	0.181	0.385
Career advancement	0.335	0.472
Log weekly hours	38.265	10.391
Age	41.026	11.286
Male	0.481	0.500
Primary education or less	0.149	0.357
Secondary education	0.711	0.453
Tertiary education	0.140	0.347

Source: Authors based on the European Working Conditions Surveys (EWCS) 2005-2015.
Notes: See Table A2 for variable definitions. N=48,420. Income and weekly hours are logged in the regression analyses.

Table A3: **Summary statistics, selected variables**

	(1)
Autonomy	0.131***
	(0.003)
Competence	0.043***
	(0.003)
Relatedness	0.169***
	(0.004)
Income: Ref: bottom 25%	
Q2	0.721***
	(0.222)
Q3	0.567**
	(0.242)
Top 25 %	0.791***
	(0.279)
Income quartile missing	1.175***
	(0.308)
Benefits and performance pay = Yes	-0.147
	(0.166)
Benefits and performance pay = Missing information	0.113
	(0.750)
Job insecurity = Yes	-3.538***
	(0.212)
Job insecurity = Missing information	-0.804***
	(0.311)
Career advancement = Yes	4.814***
	(0.148)
Career advancement = Missing Information	2.409***
	(0.452)
Weekly hours: Ref: bottom 25%	
Q2	-0.827***
	(0.211)
Q3	-1.618***
	(0.245)
Top 25 %	-1.958***
	(0.225)
Weekly hours missing	-0.183
	(0.653)
N	75,250
$Adj.R^2$	0.426

Source: Authors based on the European Working Conditions Surveys (EWCS) 2005-2015.
Notes: Robust standard errors in parentheses. The dependent variable is perceptions of being engaged in meaningful work, which is an index measured on a scale of 0 to 100. See Table A2 for variable definitions. All regressions include country and year fixed effects, interview controls (duration, number of people present during interview, interview month, and interview day, interviewer fixed effects), individual controls, and occupation and industry fixed effects. To prevent loss of information, all control variables except autonomy, relatedness, and competence, include a missing values indicator. This indicator has no economically meaningful interpretation. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A4: **Robustness check with missing values indicator**

	Meaningful work index	Satisfaction with working conditions	Stress at work††	Health satisfaction†	Work engagement†	Job enthusiasm†
Meaningful work index	1					
Satisf. with working conditions	0.328*	1				
Stress at work††	-0.081*	-0.218*	1			
Health satisfaction†	0.121*	0.276*	-0.109*	1		
Work engagement†	0.340*	0.251*	-0.042*	0.112*	1	
Job enthusiasm†	0.443*	0.436*	-0.113*	0.189*	0.426*	1

Source: Authors based on the European Working Conditions Surveys (EWCS) 2005-2015.
Notes: † variable only available in the 2015 survey.†† variable available in 2010 and 2015. Meaningful work index measures perceptions of being engaged in meaningful work, which is an index measured on a scale of 0 to 100. See Table A2 for variable definition. Satisfaction with working conditions is measured on a scale of 1 (completely dissatisfied) to 4 (completely satisfied). Stress at work is measured on a frequency scale, whereby 1=Never, 2=Rarely, 3=Sometimes, 4=Most of the time, 5=Always. Health satisfaction is measured on a scale of 1=very bad to 5=very good (with the middle category being "fair"). Work engagement is based on answers to the statement "Time flies when I am working," whereby 1=Never, 2=Rarely, 3=Sometimes, 4=Most of the time, 5=Always. Job enthusiasm is based on the statement "I am enthusiastic about my job," whereby 1=Never, 2=Rarely, 3=Sometimes, 4=Most of the time, 5=Always. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A5: **Correlations table, meaningful work and other subjective well-being measures**