Productivity Gains from Job Satisfaction in Europe

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Productivity gains from job satisfaction in Europe *

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Abstract

This paper investigates the relationship between well-being in the work place and labour productivity in a combined dataset covering the business economies of 30 European countries. The dataset combines information on working conditions and on the structure and performance of industries in manufacturing, construction and services. Data are sourced from representative surveys on individuals' working conditions and official structural business statistics. Regressions of labour productivity on measures of workers well-being - job satisfaction and a multidimensional index of job quality - provide evidence that a link between the two variables operates at the aggregate level: industries where workers are more satisfied with their jobs have higher levels of labour productivity. This results implies that well-being is not only desirable in itself, but it also contributes to labour productivity. This is relevant to firms, managers, unions, and policy makers, as industry-level labour productivity growth is a source of aggregate productivity growth.

Keywords: subjective well-being; job satisfaction; job quality; labour productivity; combined data; Europe.

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1 Introduction

This paper investigates the relation between workers' well-being and labour productivity in European countries using a matched dataset which combines information on working conditions and economic performance from representative surveys.

Well-being on the working place carries societal and economic consequences. Well-being at work is increasingly recognised as being connected to health, socio-economic outcomes, and the overall well-being of the population. Workers' well-being has gained further relevance due to the transformations of jobs (emerging of the gig economy, increase of zero-hour contracts), and, recently, the COVID-19 pandemic. These developments have led to dramatic changes in working conditions and practices, but also in workers' attitudes to their jobs, and pose major challenges to decision makers. As an example, in many countries manufacturing and service firms are facing dramatic labour shortages - what has been referred to as "the Great Resignation" - which impact the overall economy.[1] Among economic outcomes, the relationship between well-being and productivity is not only of interest to firms, managers, and unions, but also to policy makers. This is because firm- and industry-level labour productivity are sources of aggregate productivity growth. The link well-being - productivity is the focus of this article.

The relation between workers well-being, incentives and performance on the workplace has been addressed by several disciplines, from psychology to organisational sciences and economics, both in theoretical and empirical settings.

Many studies in the field of psychology investigate the link between well-being on the workplace - conceptualised as positive emotions, affect and engagement - to job performance from an individual perspective. These studies show that happier workers are more pragmatic, less absent, change job less often, are more accurate, earn more money, have better relationships with colleagues and customers (Bateman and Organ, 1983; George and Brief, 1992; Pavot and Diener, 1993; Spector, 1997; Wright and Cropanzano, 2000). All these aspects are linked to productivity and profitability. Judge et al. (2001) provide an overview of studies on the relationship job performance – job satisfaction in organisational psychology. They conduct a meta-analysis on 312 samples and find a mean correlation of 0.3 between the two variables. (Job performance's

[1] https://www.theguardian.com/money/2021/nov/01/the-great-resignation-almost-one-in-four-workers-planning-job-change?

assessment is mainly based on supervisors' evaluation.)

Oswald et al. (2015) provide experimental evidence showing that positive shocks to happiness generate productivity gains. Such gains stem from increased effort rather than from higher precision in executing standardised tasks. The authors find that productivity is affected by short-run and artificially-induced increases in happiness, as well as by long-lasting shocks such as family bereavement, parental divorce and health problems.

The studies above have been conducted on individual-level data and focused on individual performances. Other studies have addressed the link between workers' well-being and workplace performances. Using a meta-analysis approach, Harter et al. (2020) studies the relationship between workers' engagement and various indicators of business outcomes. The authors show that companies in which employees report higher engagement with their jobs experience less absenteeism, higher employees retention, higher customers' satisfaction, less safety incidents, less thefts, and higher product quality. What's more, engagement positively correlates with workers' well-being and organisational participation, on the one hand, and broader business outcomes such as profitability and sales on the other.

For the period 1984-2009, Edmans (2011) show that companies listed in the "100 Best Companies to Work For in America" exhibit superior long-run stock market returns (compared to a benchmark), which suggests that employees' satisfaction has a significant positive impact on firm value.

All the studies above suggest the existence of a link between workers' well-being and a variety of workers and firms outcomes. The evidence, however, is primarily based on small samples, case study, or experiments, and as such is not generalisable. Studies based on representative datasets are scarce. Among the latter, two notable analysis are those of Bryson et al. (2017) and Bockerman and Ilmakunnas (2012): these authors study the link between job satisfaction and labour productivity for, respectively, the United Kingdom and Finland using establishment-level data. Bockerman and Ilmakunnas (2012) find a positive effect of job satisfaction on labour productivity in a sample of finnish manufacturing plants. The study is conducted on a matched dataset which combines a measure of job satisfaction from a survey on European households to plant-level administrative data, from 1996 to 2001. The authors find that one point increase in job satisfaction increases plants' labour productivity by nearly 5 percentage points. The positive significant effect of job satisfaction on labour productivity remains when

applying an instrumental variable approach. Bryson et al. (2017) analyse data from the Workplace Employment Relations Survey, conducted on a sample of British workplaces from 2004 to 2011. The authors measure job satisfaction by aggregating employees' satisfaction scores concerning nine aspects of their working environment, and by an indicator of affect. They estimate cross-section and panel regressions (to account for unobservables), and find that job satisfaction has a positive and significant effect on the various (evaluative) measures of business performance. In contrast, job-related affect is never significant.

Another stream of literature investigates the link between productivity and intangible factors of production using firm and plant-level data. Recently, these studies have increasingly focused on the role of human factors and workplace practices, including management and HR practices, in explaining productivity patterns and variations. Overall, they find that intangibles human factors do impact productivity. For example, Black and Lynch (2001) address the relationship between productivity, workplace practices, human capital and the adoption of information technology by estimating a production function on data from a representative sample of US businesses. They evidence that employee participation and profit sharing, aspects that are linked to workers satisfaction, are associated with higher productivity at establishment level. Other contributions investigate the role of management (Bloom et al., 2019), workers' skills (Criscuolo et al., 2021), and specific aspects of working conditions (see Bloom and VanReenen, 2006, on work-life balance).

This article contributes to the literature on productivity and workers' well-being by providing evidence that the relationship exists at the aggregate (industry) level. This evidence is based on a matched dataset that combines well-founded standard measures of labour productivity with indicators of well-being in the work place, namely job satisfaction and job quality, from official statistics and nationally representative surveys.

Data on working conditions and well-being are sourced from the 2010 and 2015 waves of the European Working Conditions Survey (EWCS). We use EWCS data to measure job satisfaction, and to build an index of job quality, which combines several dimensions of working conditions, from salary to health and safety and social dialogue. Data on labour productivity, employment, investment and other structural and performance indicators come from Eurostat's Structural Business Statistics (SBS) for the year 2010-2018. The resulting dataset covers the business economies — 68 manufacturing, service,

and construction industries — of 30 European countries. We estimate an empirical model of labour productivity using this combined dataset.

Regression results show that industries with better working conditions - as measured by safety and ethics of employment, income, working hours, safety, social dialogue, stress, etc. - and higher job satisfaction display higher levels of labour productivity levels. What's more, job satisfaction predicts productivity growth, with industries with higher satisfaction displaying higher future growth. This result has policy relevance as it shows that workers' well-being is not only a desirable goal *per se*, but it also contributes to productivity growth and, as a result, to economic prosperity. This suggests that a virtuous circle of increasing well-being and growth can be established with appropriate actions.

In what follows, Section 2 describes the data, then Section 3 and Section 4 presents the empirical framework and results from the analysis, finally Section 5 gives concluding remarks.

2 Data

The dataset used in this analysis includes information on labour productivity and factors used in production, measures of job satisfaction, working conditions and workforce characteristics derived from different sources. Observations are at the industry level and cover manufacturing, construction and service industries for a large set of European countries. The economic and working conditions variables are compiled, respectively, from Eurostat's Structural Business Statistics (SBS) and the European Working Conditions Survey (EWCS). To the best of our knowledge, no single representative cross-country dataset is available which permits to observe both productivity and job satisfaction, so we combined information from the two datasets.

The SBS is a harmonised dataset which provides information on the business economy's performance and structure, including labour productivity, turnover, value added, investments, and employment at the industry level (NACE 2-digit).[2] It is compiled from surveys conducted on firms by the EU and EEA National Statistical offices, and covers manufacturing and construction, and business services. The survey does not cover

[2]Industries are classified according to the classification of economic activities known as NACE rev.2. One can see `https://ec.europa.eu/eurostat/documents/3859598/5902521/KS-RA-07-015-EN.PDF`. According to NACE, SBS covers Sections B to N and Division S95 of NACE Rev.2.

agriculture, financial services, public administrations and certain non-market activities (culture, health and personal services). The frequency of the observations is yearly. Here, we use the waves from 2010 until 2018, the latest available.

The European Working Conditions Survey (EWCS) (Eurofound, 2015, 2010) is a nationally-representative survey conducted by Eurofound every five years on random samples of workers of many European countries. (The latest survey interviewed about 44000 workers in 35 countries.)[3] The survey provides vast information on respondents' working conditions, employment status, characteristics of the workplace, and selected socio-demographics. Thus, it is the workhorse of studies on job quality for the EU countries (Wright et al., 2017). It has, however, limitations in terms of periodicity and sample sizes (Warhurst et al., 2018). Here, we use the 2010 and 2015 waves.[4]

As EWCS and SBS units of observations differ, we combined the two datasets by first aggregating the information from the EWCS data at the NACE 2-digit level, then by matching the datasets by industry-country, using the NACE and country codes available in both datasets. In other words, we use the country-NACE code as matching variables, as the SBS data are only available at the industry level. The frequency of the observations also differ, so we used the EWCS information for the year 2010 and 2015, but we also exploited the SBS data over a longer period, from 2010–2018, to compute growth rates of the economic variables of interest.

The final dataset consists of 4080 observations covering 68 manufacturing, construction and service industries for 30 countries.[5] It includes observations on labour productivity, investment, persons employed, selected employees' and business characteristics, working conditions and workers well-being. The observations refer to the years 2010 and 2015. The dataset includes also the growth rates of productivity, investment and employment for the 3-periods ahead, i.e. for the periods 2010-2013 and 2015-2018. The geographic and economic scope of the dataset is determined by the SBS, which limits the coverage of the combined dataset. Despite its limitations, the dataset has the

[3]One can see https://www.eurofound.europa.eu/surveys/european-working-conditions-surveys/sixth-european-working-conditions-survey-2015. A useful summary of the survey methodological features is available at https://www.eurofound.europa.eu/sites/default/files/wpef17036.pdf.

[4]We did not consider previous waves because we would have not been able to construct comparable job quality indices due to missing information. To mitigate EWCS sample size concerns, involving number of individual observations available at the industry level, we have run the analysis on a restricted sample of industries, as well as at the NACE 1-digit level. Overall, results of this analysis are robust.

[5]The country coverage had to be narrowed down to 28 countries due to missing productivity observations. Countries in the dataset are listed in the Appendix.

advantage of combining information on working conditions and job satisfaction with a conventional measure of productivity, which would not be available otherwise.[6]

Throughout the paper, workers well-being is measured by a subjective indicator of well-being, job satisfaction, and composite indicator of job quality.[7]

Job satisfaction, is compiled from answers to the question "On the whole, are you very satisfied, satisfied, not very satisfied or not at all satisfied with working conditions in your main paid job?". Individual answers are coded on a scale ranging from 1 to 4, where higher scores indicate higher well-being. Job satisfaction is regarded as one of the satisfaction domains contributing to subjective well-being - an overall, self-reported evaluative measure of how people fare with their life as a whole. Previous studies indicate that single-item questions on job satisfaction provide valid and reliable measures of people's experience on the workplace (Van Saane et al., 2003; Dolbier et al., 2005).

The job quality index combines information on several dimensions of the working experience and, thus, provide a more comprehensive description of working conditions. It is compiled based on respondents' answers to questions covering six dimensions of the working environment: income and benefits, working time and work-life balance, social dialogue, skills development and training, safety and ethics, and stress at work. The construction of the index follows the framework outlined in the United Nations Handbook on measuring quality of employment (UNECE, 2015), adapted to the data at hand. Compared to the UN framework, we added a stress dimension to capture mental well-being, but we could not account for the domains on employment-related relationships and motivation, and security of employment and protection, due to data availability. One should note that the literature lacks consensus on a widely accepted definition of job quality, which also reflects on data collection, quality and availability (Warhurst et al., 2018). [8] Despite these limitations, the job quality index in this study

[6]The industries in the sample account for, on average, 60 percent of the economies' total employment, and 50 percent of total value added. The country-level employment coverage varies from lows of 48 percent for Greece, to highs of 73 percent for Latvia. We have also analysed patterns of missing values in the combined dataset and in the EWCS. In the combined dataset, missing values are more frequent for Eastern European countries, and for Mining and Quarrying activities (section B of the NACE) for the productivity variables. For job satisfaction and job quality variables, missing values are more frequent for certain service activities (sections B, J, M and N). This analysis is available from the authors upon request.

[7] According to Warhurst et al. (2017), job satisfaction captures "well-being in work", while job quality index accounts for the many dimensions contributing to the quality of employment.

[8]On the notion and operationalisation of job quality one can see Warhurst et al. (2017) and Wright

allows us to check the robustness of our findings to a different indicator of working conditions. Section A in the appendix provides further details on the construction of the job quality index.

We measure labour productivity by gross value added per employee. We also check results for value added per person employed, which yields the same results. We control for workforce and industry characteristics: age of employees; workforce education level; firm size; industries' employment share; investment per worker; sector (manufacturing, construction and services).

Table 1 presents pairwise correlations for the main variables in the dataset. All correlations in the table are positive and significant. One can see that the correlation between the two measures of workers well-being, job quality and job satisfaction, is about 0,5 and significant.

Table 1: Correlation table: selected variables

	Labour prod.	Labour prod. (p.e.)	Job quality	Job satisfaction
Labour prod.	1			
Labour prod. (p.e.)	0.9968	1		
Job quality	0.1143	0.1134	1	
Job satisfaction	0.1021	0.0972	0.4774	1

Note: Labour prod. (p.e.) denotes labour productivity per person employed, an alternative measure of labour productivity in the dataset.

Table 2 presents descriptive statistics for the dataset's main variables, calculated by pooling the observations across countries and years. On average, labour productivity grew by 1 percent yearly, and by 2 percent over a 3-years period. The "average" worker is 41 years old with a secondary degree. On average, the proportion of large firms is 20 percent. The average level of reported labour satisfaction is 3, corresponding to "satisfied" (with a standard deviation of 0.45).

et al. (2017). Warhurst et al. (2017) recommends the following dimensions to construct job quality indicators for the UK: pay and other rewards; intrinsic characteristics of work; terms of employment; health and safety; work-life balance; and representation and voice. Bryson et al. (2017) use the following domains of job satisfaction: pay, sense of achievement, scope for using initiative, influence over the job, training, opportunity to develop skills, job security, involvement in decisions, and the work itself.

Table 2: Descriptive statistics (pooled sample)

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Labour productivity	3,495	69.38	213.20	−355.71	23.68	77.73	10,686.05
Labour prod (gwth)	3,368	0.02	0.29	−4.52	−0.08	0.13	5.05
Labour prod (avg gwth)	3,308	0.01	0.13	−1.50	−0.03	0.04	4.50
Investment per worker	3,389	16.90	80.66	0.00	2.16	10.40	3,494.00
Investment pw (gwth)	3,253	−0.01	0.64	−4.16	−0.28	0.28	4.13
Investment pw (avg gwth)	3,143	0.04	0.28	−1.32	−0.08	0.12	5.17
Labour share	3,376	0.02	0.02	0.00	0.003	0.02	0.22
Labour share (change)	3,279	−0.001	0.003	−0.03	−0.001	0.0002	0.05
Job quality	3,188	6.32	1.60	0.00	5.33	7.31	12.00
Job satisfaction	3,241	3.03	0.45	1.00	2.83	3.25	4.00
Age	3,239	41.94	7.21	18.00	38.00	46.00	72.00
Education	3,185	2.12	0.48	1.00	1.88	2.43	3.00
Large firms	2,895	0.20	0.28	0.00	0.00	0.33	1.00

Note: Labour productivity is gross value added per employee, in thousands of Euros (in volume); *Investment pw* is the investment per employee, also in thousands of Euros; *Labour share* is the employment share of a given industry in a country; *Age* is in years; *Education* is coded from 1 to 3 (1: primary and lower secondary, 2: secondary, 3: tertiary education); *Large firms* is the proportion of large firms (≥ 250 employees) in a given industry. Other abbreviations and symbols denote respectively: *avg* average, *gwth* growth rate. *Labour prod avg gwt* and *Labour prod gwt* denote respectively: the yearly average growth of labour productivity computed over a 3-year period; the cumulated growth over a 3-years period. Note that observations are at the industry-country-year level.

Figures 1 and 2 summarise the distributions of job satisfaction and job quality by country.[9] Figures 3 and 4 summarise the distributions of the two measures of well-being by economic activity. Overall, job satisfaction is higher in the group of Western European countries (denoted by blue boxes), with some notable exceptions, such as Italy (for which the highest value 4 is never attained) and France. In contrast, the groups of Scandinavian countries, Belgium, the Netherlands, the UK and Ireland, have higher job satisfaction. The distribution of job quality provides a similar picture. When considering the distribution of workers' well-being by sector of activity, the data suggests that job satisfaction is highest for services, and lowest for manufacturing. This effect is more marked in Eastern European countries. Job quality is highest for services, and lowest for construction workers.

Figure 5 depicts the distribution of labour productivity by country. Western European countries are characterised by higher levels of labour productivity compared to Eastern European countries. The lowest levels of productivity are recorded for Makedonia, followed by Bulgaria and Romania, while highest levels are those of Norway, Belgium and the Netherlands. One also notices the wide variations of industries' performances within countries.

[9] Countries are denoted by the ISO Alpha-2 codes. The codes and corresponding country names are listed in Appendix C

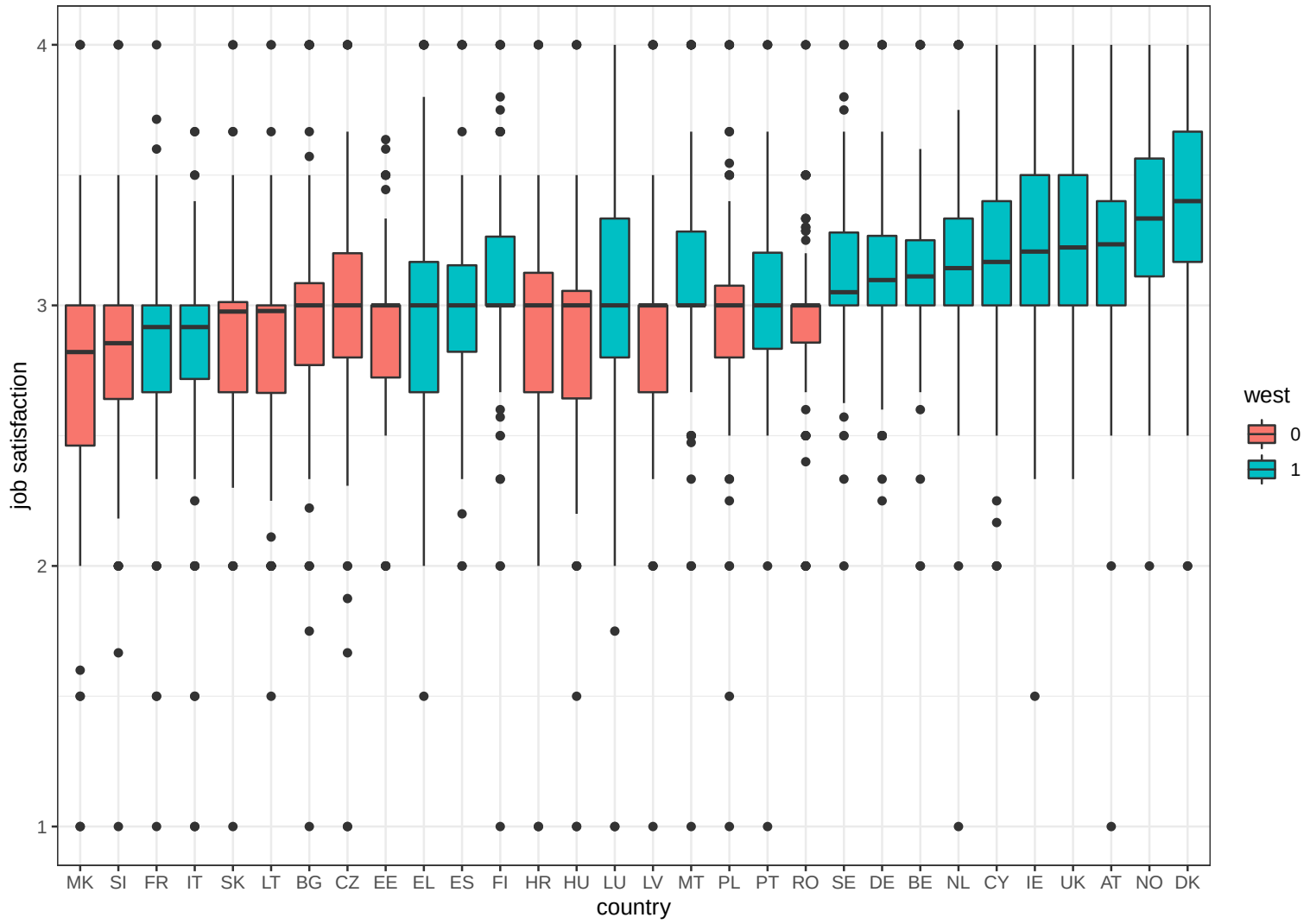

Figure 1: Job satisfaction: distribution by country

Note: Boxplots of industries' averages of job satisfaction by country (pooled sample). The blue and red boxes denote, respectively, Western and Eastern European countries.

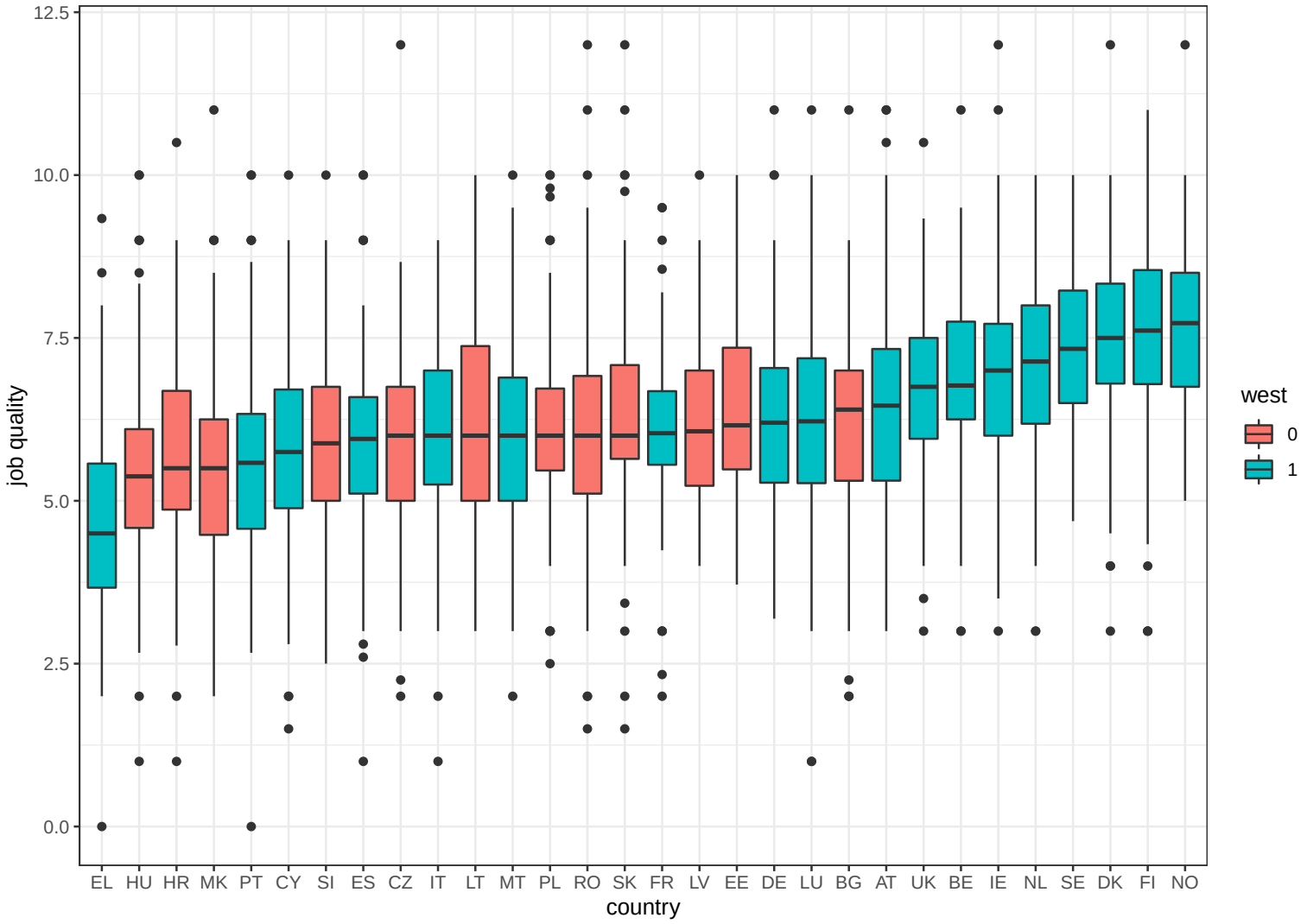

Figure 2: Job quality: distribution by country

Note: Boxplots of industries' averages of job quality by country (pooled sample). The blue and red boxes denote, respectively, Western and Eastern European countries.

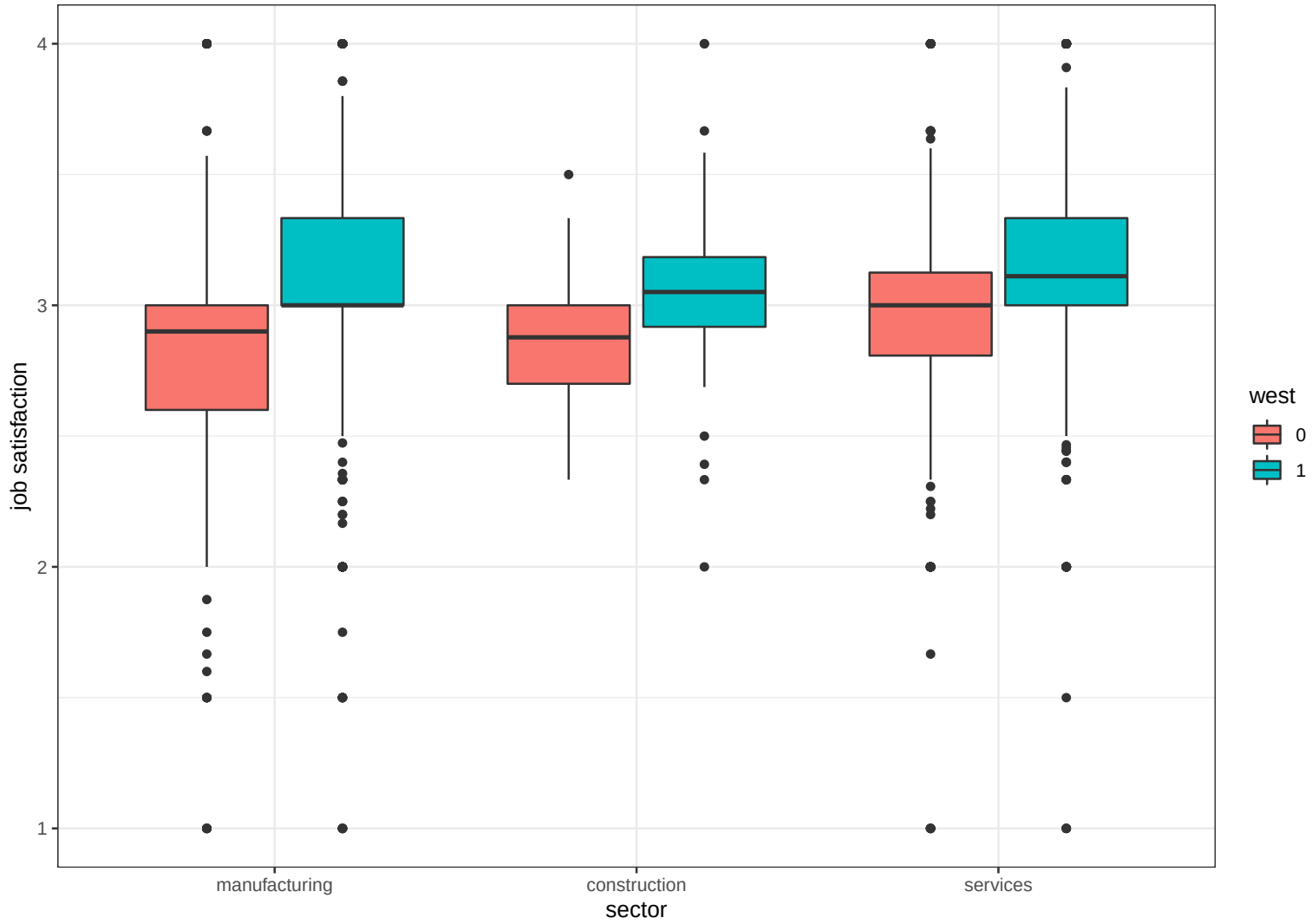

Figure 3: Job satisfaction: distribution by sector

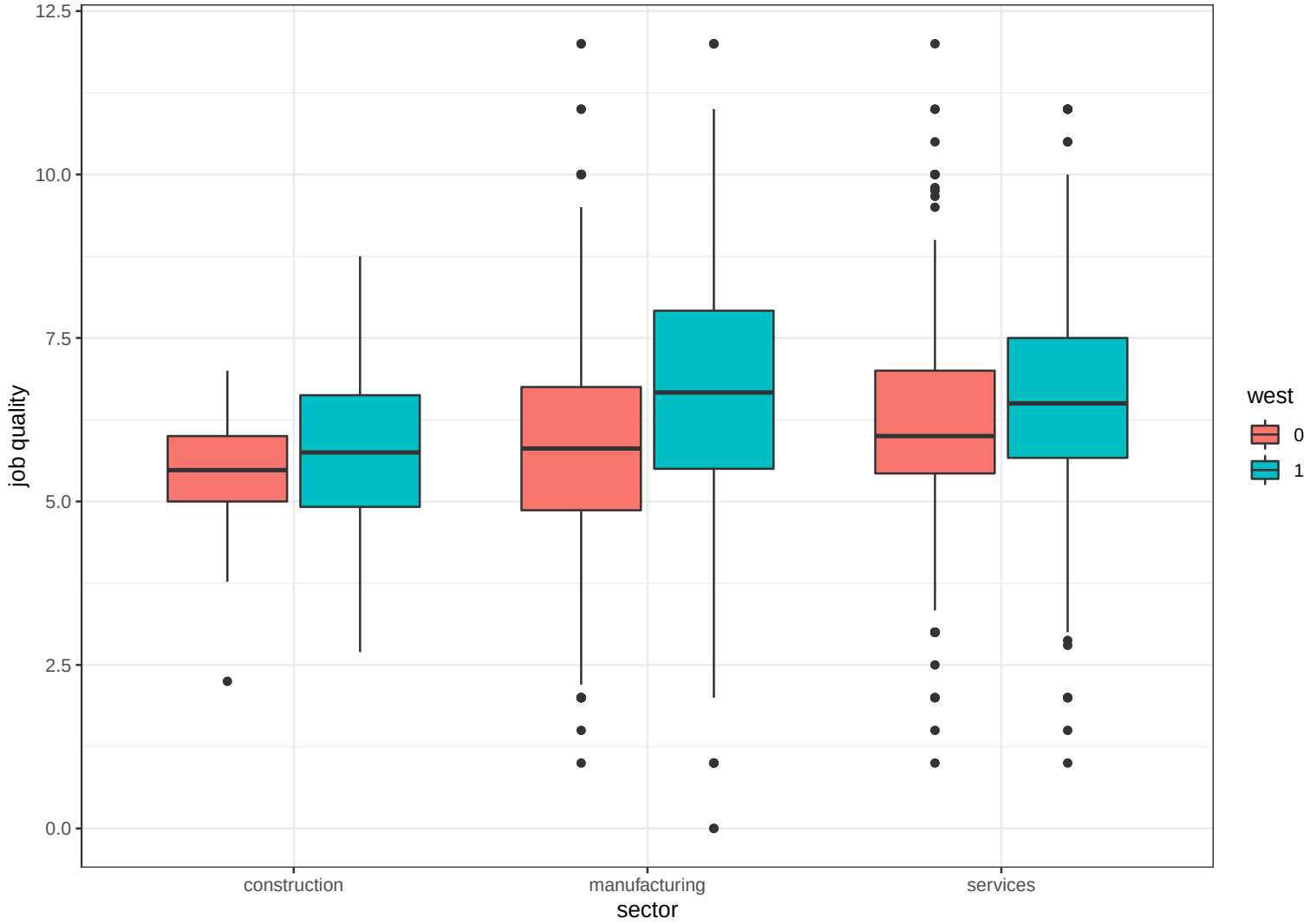

Figure 4: Job quality: distribution by sector

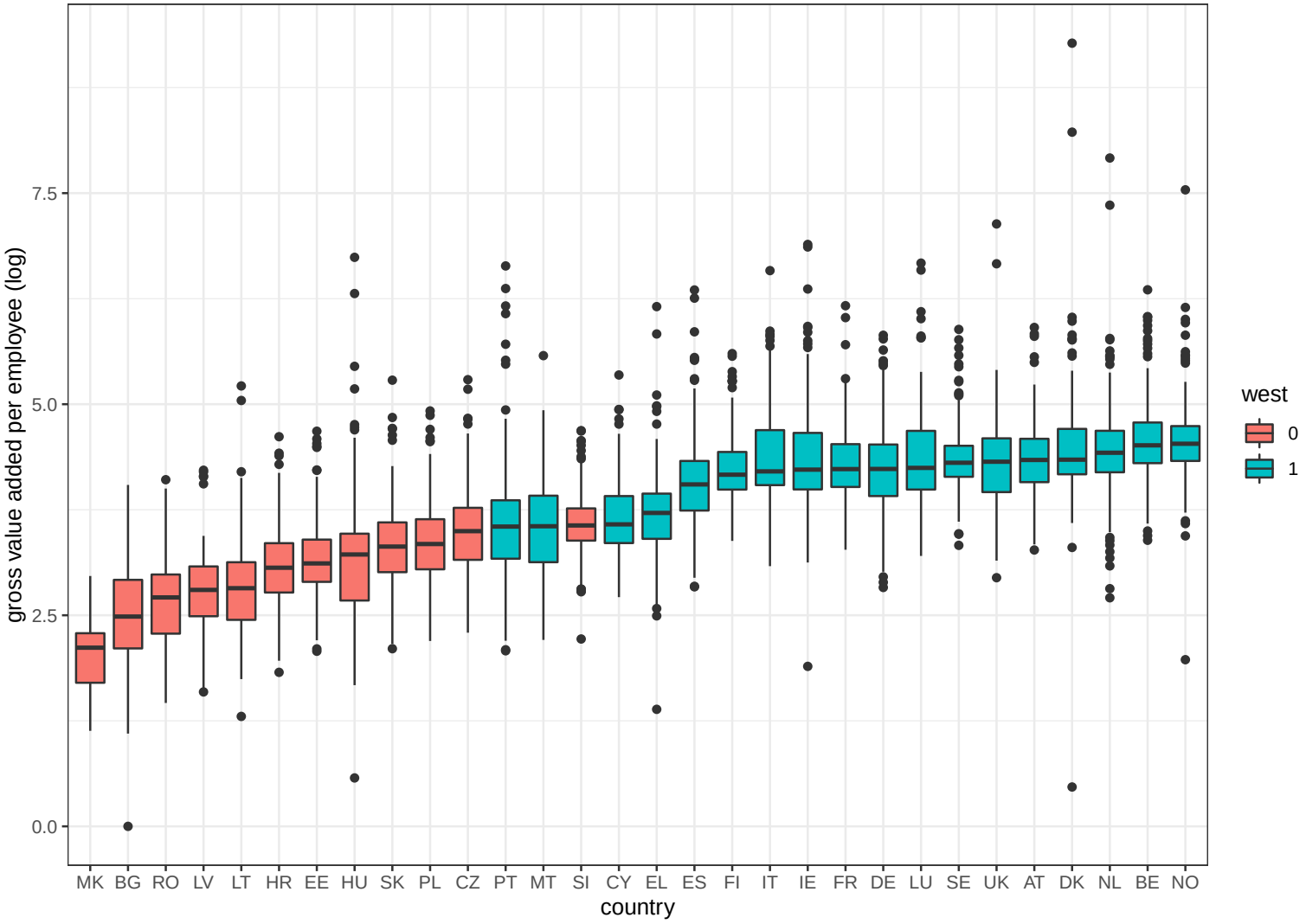

Figure 5: Labour productivity: distribution by country

Note: labour productivity in in logs; the blue and red boxes denote, respectively, Western and Eastern European countries.

3 Method

We base the empirical analysis on a standard model of labour productivity, derived from a Cobb-Douglas production function. The function links output to standard inputs to production — capital stock and labour — and to a residual, which typically depends on intangible factors (for example, human capital).[10] The function is as follows:

$$Y = e^{A(JS)} * K^{\alpha} * L^{(1-\alpha)}$$

where we assume constant returns to scale in labour and capital, and that the factor A depends on well-being (JS). This amounts to conceptualise well-being as an intangible factor to production.[11] Dividing by L and taking logs we obtain:

$$ln(Y/L) = A(JS) + \alpha * ln(K/L)$$

Based on the equation above, labour productivity growth can be expressed as the sum of (a function of) capital deepening (the change in capital per worker) and the change in the "residual" A, which depends on the intangible factors:

$$\Delta ln(Y/L) = \Delta A(JS) + \alpha \Delta ln(K/L)$$

The framework above lays the ground for our empirical models. Our baseline model is a regression of the level of labour productivity on average job satisfaction and a set of controls:

$$ln(Y/L)_j = \alpha + \beta ln(I/L)_j + \gamma JS_j + \rho X_j + \epsilon_j,$$

where labour productivity depends on investment per worker (I/L), workers' well-being (JS — which denotes either job satisfaction or job quality), and a vector of control variables X. The vector of controls includes workforce characteristics (age and education), the proportion of large firms in the industry j, and the industries' labour shares. The characteristics of the workforce are known to affect economic outcomes, so it is reasonable to include them in the regression. In addition, large firms are typically

[10] At the aggregate level, we find human capital and skills, technology, ICT, R&D typically listed as intangibles. At the level of firms, we find also management and HR practices, reputation etc.

[11] One could specify the function $A(JS)$ as follows $A = \delta * JS^{\lambda}$.

characterised by higher productivity. The labour share captures the use of the labour input by industries. The dataset does not include capital stock, so we approximate capital stock by investment. ϵ is the error term. The subscript j denotes the industry.

The model also includes year, country and sector dummies. Dummies allow us to capture sector-specific effects and country-level characteristics. Country dummies capture countries' institutional features. The inclusion in the model of the sector dummy is motivated by the descriptives presented in the the previous section.

We also specify and estimate models for the response variable's growth rates. We regress labour productivity growth on the levels of job satisfaction and the controls:

$$\Delta ln(Y/L)_{j,t} = \alpha' + \beta' \Delta ln(I/L)_{j,t} + \gamma' JS_{j,t} + \rho' Z_{j,t} + \epsilon'_j \quad t = 2010, 2015.$$

where the vector Z includes controls for industry-workforce characteristics, as for the model in levels. Additionally, we control for the initial level of productivity and the change in industries' employment shares. The initial level of productivity is included in empirical models of labour productivity to capture convergence mechanisms, or "starting" conditions at the level of industry. The changes in industries' employment shares, i.e. in the number of workers employed by each industry, possibly capture between-industries reallocation effects. We also include year, country, and sector dummies. We compute labour productivity growth in two different ways: we take the cumulated (log) change in productivity between t and $t+3$, and the yearly growth rate of labour productivity computed by averaging the labour productivity growth of the three periods ahead, $t : t+1, t+1 : t+2, t+2 : t+3$.

Considering the relation between job satisfaction in a given period and the *change* in labour productivity in the following periods is interesting *per se*. This amounts to check whether industries "endowed" with different amounts of job satisfaction exhibit significant differences in productivity growth. Moreover, the specifications in growth rates allow us to mitigate the possible presence of reverse causality. [12]

The models are estimated on the pooled datasets for the years 2010 and 2015 using Ordinary Least Squares (OLS) and robust standard errors clustered by year.[13]

[12] The lack of sufficient time lags does not allow us to estimate a fixed-effect model. In other words, our dataset, which observes working conditions variables in two periods only, does not permit to fully exploit the time series dimension in the data.

[13] Overall, empirical results are not very sensitive to the errors' variance-covariance matrix specification for the model including job satisfaction. In contrast, results do change for the model with job quality, which now retains significance across specifications, compared to the assumption of ho-

4 Results

Table 3 reports results from the estimation of the regression models in levels. The coefficients of both job satisfaction and job quality are small, but positive and statistically significant. The magnitude of the coefficients is, respectively, 0.05 and 0.04. Roughly, the coefficient indicates that a unit increase in average job satisfaction in an industry results in a 5 percentage point increase in labour productivity. As job satisfaction is measured on a scale from 1 to 4, one would need a considerable increase in job satisfaction to generate an increase of 5 percent in productivity.[14] Controls have the expected signs. *Ceteris paribus*, industries with higher proportions of large firms and more educated workers are characterised by higher productivity levels. Industries with higher intensity of investment (higher investment per worker) are more productive. In contrast, industries which employ larger shares of workers are less productive. Our baseline results is comparable with the estimate of Bockerman and Ilmakunnas (2012), which report a coefficient on job satisfaction on standard labour productivity of 5 percent in the baseline OLS regression (though job satisfaction is measured on a 1 to 6 Likert scale in their study).

Tables 4 and 5 present estimation results for the models where the dependent variable, productivity, is specified in growth rates (respectively a three-year period growth and average yearly growth over three years). The job quality coefficient remains positive and significant, albeit smaller in magnitude. The job satisfaction coefficient remain positive and significant, with a similar magnitude as found for the model in levels (0.047). The coefficients on job quality and job satisfaction for the model in average yearly growth are positive, significant, but lower in magnitude at, respectively, 0.002 and 0.024 (table 5). Controls have the expected signs.

The regression results show a positive statistically significant association exists between well-being and labour productivity at the aggregate, industry level. In other words, industries where workers are on average happier, are also characterised by higher levels of labour productivity. Moreover, they are characterised by higher labour productivity growth.

The last columns in tables 3 — 5 report results for regressions where the explanatory variable of interest is the share of satisfied and highly satisfied workers within an indus-

moskedasticity.

[14] While individual responses are ordinal, we take averages at the industry level, so we can regard the well-being variables as continuous, albeit bounded.

try. One can see that the variable retains its positive significant effect on productivity in all specifications. This shows that results are robust to an alternative specification of the variable of interest.

The tables in Appendix B present regression results in detail, as controls are included in the regressions incrementally. Results indicate that job satisfaction and job quality remain positive and significant following the inclusion of the controls, although the magnitude of the coefficient decreases.

We ran separate regressions replacing the country dummies with a "west" dummy (a dummy for the group of western European countries), in light of the systematic differences in the average value of the outcome variable between the two regions, as presented in Section 2. The estimation of the models yields positive and significant coefficients for both measures of well-being.[15]

Overall, these results indicate that job satisfaction/job quality are positively associated to productivity and productivity growth, so that increases in the quality of work are correlated to higher productivity levels or growth rates.

[15]Results not reported for reasons of space but available from the authors.

Table 3: Regression of labour productivity on job quality and job satisfaction (levels)

	Dependent variable:		
	Labour productivity		
	(1)	(2)	(3)
job quality	0.041***		
	(0.002)		
job satisfaction		0.050***	
		(0.003)	
satisfied (share)			0.065***
			(0.014)
age	0.000	0.001***	0.001***
	(0.000)	(0.000)	(0.000)
education	0.256***	0.267***	0.271***
	(0.033)	(0.035)	(0.035)
large firms	0.089***	0.116***	0.115***
	(0.029)	(0.024)	(0.024)
employment share	−2.419***	−2.576***	−2.587***
	(0.085)	(0.099)	(0.096)
investment p.w.	0.327***	0.334***	0.335***
	(0.004)	(0.006)	(0.006)
sector: construction	0.025	0.007	0.006
	(0.016)	(0.016)	(0.016)
sector: services	0.026**	0.034***	0.036***
	(0.011)	(0.011)	(0.011)
Country dummies	*Yes*	*Yes*	*Yes*
Year dummy	*Yes*	*Yes*	*Yes*
Constant	*Yes*	*Yes*	*Yes*
Observations	2,256	2,285	2,285
R^2	0.828	0.824	0.824
Adjusted R^2	0.825	0.822	0.821

Note: *p<0.1; **p<0.05; ***p<0.01. Clustered standard errors in parentheses. *pw* denotes *per worker*.

Table 4: Regression of labour productivity on job quality and job satisfaction (cumulative growth)

	Dependent variable:		
	Labour productivity growth		
	(1)	(2)	(3)
job quality	0.005^{***}		
	(0.001)		
job satisfaction		0.047^{***}	
		(0.005)	
satisfied (share)			0.076^{***}
			(0.006)
labour prod. (t_0)	-0.088^{***}	-0.090^{***}	-0.089^{***}
	(0.011)	(0.012)	(0.013)
age	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
education	0.029^{*}	0.025	0.028
	(0.016)	(0.018)	(0.020)
large firms	-0.025^{*}	-0.031	-0.032
	(0.015)	(0.023)	(0.023)
empl. share	-0.525^{**}	-0.513^{***}	-0.522^{***}
	(0.204)	(0.181)	(0.190)
Δ empl. share	-3.190^{***}	-3.078^{***}	-3.090^{***}
	(0.525)	(0.613)	(0.543)
Δ invest. p.w.	0.067^{***}	0.068^{***}	0.068^{***}
	(0.007)	(0.009)	(0.009)
sector: construction	0.023^{***}	0.020^{***}	0.020^{***}
	(0.002)	(0.003)	(0.003)
sector: services	0.033	0.030	0.032
	(0.030)	(0.031)	(0.031)
Country dummies	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes
Constant	Yes	Yes	Yes
Observations	2,191	2,220	2,220
R^2	0.185	0.184	0.183
Adjusted R^2	0.171	0.170	0.169

Note: *p<0.1; **p<0.05; ***p<0.01. Clustered standard errors in parentheses. *pw* denotes *per worker*.

Table 5: Regression of labour productivity on job quality and job satisfaction (average yearly growth)

	Dependent variable:		
	Labour productivity growth		
	(1)	(2)	(3)
job quality	0.002***		
	(0.000)		
job satisfaction		0.024***	
		(0.002)	
satisfied (share)			0.031***
			(0.005)
labour prod. (t_0)	−0.039***	−0.039***	−0.038***
	(0.007)	(0.007)	(0.008)
age	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
education	0.016***	0.013***	0.015***
	(0.003)	(0.005)	(0.005)
large firms	−0.001	−0.001	−0.001
	(0.003)	(0.005)	(0.005)
empl. share	−0.275**	−0.274**	−0.276**
	(0.122)	(0.113)	(0.118)
Δ empl. share	−3.585***	−3.373***	−3.409***
	(0.002)	(0.105)	(0.010)
Δ invest. p.w.	0.044***	0.046***	0.046***
	(0.005)	(0.005)	(0.005)
sector: construction	0.010***	0.009***	0.008***
	(0.001)	(0.001)	(0.001)
sector: services	0.014	0.013	0.014
	(0.011)	(0.011)	(0.011)
Country dummies	*Yes*	*Yes*	*Yes*
Year dummy	*Yes*	*Yes*	*Yes*
Constant	*Yes*	*Yes*	*Yes*
Observations	2,120	2,147	2,147
R^2	0.149	0.154	0.150
Adjusted R^2	0.133	0.139	0.135

Note: *p<0.1; **p<0.05; ***p<0.01. Clustered standard errors in parentheses. *pw* denotes *per worker*.

5 Conclusions and discussion

The review of the literature evidences two main obstacles to studies of the link between well-being and economic outcomes. Firstly, observing jointly job satisfaction and sound measures of economic performance in representative datasets is difficult. It is very difficult to carry out analysis on this issue without resorting to statistical matching. The only authors that observe both variables in a representative dataset are Bryson et al. (2017), at the expenses, however, of having to use self-reported measures of firm performances. Secondly, the bulk of the evidence reports statistical correlations, rather than a "causal" effect. The relationship between well-being and economic outcomes, however, could suffer from an endogeneity bias stemming from reverse causality or omitted/unobservable variables. Data availability makes it difficult to address this issue. The only study which addresses reverse causality and is based on a representative dataset at the plant level is the one by Bockerman and Ilmakunnas (2012), but this evidence is limited to one country, and is for the period 1996–2001.

This article contributes evidence on the economic consequences of an important dimension of well-being, namely well-being at work, by analysing a novel dataset built by matching two waves of the European Working Conditions Survey with information on the business economy from Eurostat's Structural Business Statistics. Among the different measures of economic outcomes considered in the literature, the use of SBS data allows us to include in the study an official measure of labour productivity, an important variable for decision makers.

We estimate regressions of labour productivity on two measures of well-being at work, namely job quality - an indicator of overall working conditions - and job satisfaction, and various controls. The results vary depending on the measure of well-being employed and on model specification. For a model in levels, the effects of both measures are positive, statistically significant, and of similar magnitude. Job satisfaction also correlates significantly with future productivity growth.

The value added of this article summarises as follows: 1) a novel matched dataset based on representative surveys; 2) a composite indicator of job quality based on the EWCS, a very rich source of information on workers' conditions; 3) evidence that job satisfaction and job quality predicts productivity level, and that job satisfaction predicts productivity growth, at the aggregate-industry level.

The study has several limitations which one should keep in mind when reading

results. There are data limitations. Firstly, the coverage of the Structural Business Statistics is limited in terms of the economic activities surveyed, which restricts the coverage of our dataset. SBS does not include economic activities which might account for large shares of certain economies in the sample, such as those countries that are service-intensive, or where public administrations and non-market services are very large. However, an analysis of the relationship between productivity and job satisfaction would also be limited by the difficulties of measuring productivity for the industries not covered by the SBS. Indeed, it is well known that the extension of the concept and measurement of productivity to activities such as non-market and financial services is difficult, if possible at all. Secondly, sample sizes for the EWCS can be severely restricted at the industry level. A further issue concerns the measure of job quality adopted in the paper. This broadly follows the relevant dimensions indicated by the UN framework, partly departing from it due to data availability issues. The literature lacks consensus on a definition of multidimensional job quality and implementations vary. Thus, a further limitation is that it is difficult to compare results from this paper to other studies in the literature, due to the varied definitions of workers well-being adopted by different studies.

Despite its limitations, we believe this study contributes to the literature on economic outcomes of well-being, and to building a body of evidence based on the relationship between well-being in the working place and economic performance. The results of this study are relevant for managers and policy makers alike as industry-level labour productivity is a source of aggregate productivity growth. Subjective well-being and economic efficiency (productivity) are often perceived as competing objectives. We show instead that subjective well-being has positive impacts on industry-wide productivity. Economic development and well-being do not need to be alternatives; they can reinforce each other.

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A The job quality index

The job quality index used in this analysis has been compiled using data from the last two waves of the European Working Conditions Survey administered by Eurofund. The index consists of respondents' answers to questions concerning six dimensions of job quality: income and benefits, working time and work-life balance, social dialogue, skills development and training, and safety and ethics. The dimensions have been selected based on the framework outlined in UNECE (2015). Compared to the UN framework, we dropped two dimensions due to data availability, namely relationship and work motivation and security of employment. We did add a stress dimension, to capture mental well-being. Note that, while the choice of the dimension is inspired on the UN framework, the computation of individuals and aggregate indices had to be adapted to the information provided by the EWCS. Essentially, this has been done by assigning scores to mainly evaluative answers.

The index was built as follows. Firstly, we selected the questions conveying the relevant information to assess the six dimensions cited above. Then, we built individual scores, by summing the scores "earned" by respondents for each of the dimensions. The scores range from 0 to 2, from lowest satisfaction to highest satisfaction. As a result, the individual job quality index ranges between 0 and 12, where 0 indicates the lowest job quality and 12 the highest. Finally, the aggregate job quality index at industry-country level is compiled by averaging the individual scores.

What follows provide additional details on the construction of the scores for each component of the job quality index. (We refer to the questionnaire of the 2010 wave.)

- Income and benefits. This dimension provides information on overall earnings composition and satisfaction with salary/pay. Respondents indicate whether earnings from their main job include additional sources than their basic salary, and whether they are satisfied with their income by rating the statement "I am well paid for the work I do". Answers to the latter question range from 1 (strongly disagree) to 5 (strongly agree). Here, we assign a score of one to the payment of at least two types of the benefits indicated, and to a score of 5 in the question on income. Information on benefits and income are derived, respectively, from questions EF7 and 77.[16]

[16]Here, we have considered as benefits both extra payments and benefits in kind as described in the

- Working time and work-life balance. Work-life balance is evaluated based on answers to questions on whether working hours fit family and social commitments, on the presence of flexible arrangements, and on whether workers work during their free time to meet demands. For this dimension, we use questions 41, 42, 43 to assess life-work balance, and 51F and 51G to assess quality of the working time. Each earns a score of one if respondents choose the two most favourable categories. (For example, 51F produces a score of one if respondents indicate that they can take a break if they wish so at all times or most of the time.) The overall scores obtained range from 0 and 5. These are converted in the 0-2 scale by assigning values of 1 and 2 to, respectively, final scores of 3, 4 and 5.

- Safety and ethics. This dimension summarises information on the following aspects: discrimination, safety, and health and safety. the discrimination score is based on question 65. Question 70 is used to assess safety, e.g. whether the respondent has been the subject of abuse and/or threatening or humiliating behaviour. Health and safety has been assessed using question 23, which enquiries about exposures to high temperatures, fumes, dangerous or infectious substances, etc., and question 67, which asks a self-evaluation of whether work affects health.

- Social dialogue. Scores are based on questions 63 and 64.

- Skills development and training. Scores are based on answers to questions 61A and 61C.

- Stress. Questions 45A and 45B provide an objective measure of stress. Question 51N is a subjective measure.

EWCS questionnaire, rather than the sick and paid leave payments described in the UN framework, to reflect the institutional context.

B Additional regression results

Tables in this section presents results of the regressions of labour productivity (in levels and growth rates) on job quality and job satisfaction when control variables are incrementally introduced in the empirical model.

Table 6: Regression of labour productivity on job satisfaction (levels)

	Dependent variable:						
	Labour productivity						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
job satisfaction	0.197***	0.198***	0.127***	0.136***	0.137***	0.053***	0.050***
	(0.029)	(0.029)	(0.017)	(0.021)	(0.024)	(0.004)	(0.003)
age		0.003***	0.005***	0.005***	0.003***	0.001***	0.001***
		(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
education			0.324***	0.300***	0.264***	0.277***	0.267***
			(0.044)	(0.039)	(0.034)	(0.039)	(0.035)
large firms				0.331***	0.286***	0.105***	0.116***
				(0.036)	(0.037)	(0.020)	(0.024)
employment share					−4.473***	−2.438***	−2.576***
					(0.239)	(0.056)	(0.099)
investment p.w.						0.331***	0.334***
						(0.007)	(0.006)
sector: construction							0.007
							(0.016)
sector: services							0.034***
							(0.011)
Country dummies	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year dummy	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Constant	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	2,285	2,285	2,285	2,285	2,285	2,285	2,285
R^2	0.573	0.573	0.595	0.604	0.619	0.824	0.824
Adjusted R^2	0.567	0.568	0.589	0.598	0.614	0.821	0.822

Note: *p<0.1; **p<0.05; ***p<0.01. Clustered standard errors in parentheses.

Table 7: Regression of labour productivity on job quality (levels)

	Dependent variable:						
	Labour productivity						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
job quality	0.110***	0.110***	0.087***	0.082***	0.077***	0.041***	0.041***
	(0.008)	(0.008)	(0.006)	(0.006)	(0.004)	(0.002)	(0.002)
age		0.001***	0.004***	0.004***	0.002***	0.000	0.000
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
education			0.292***	0.276***	0.247***	0.264***	0.256***
			(0.030)	(0.027)	(0.025)	(0.037)	(0.033)
large firms				0.276***	0.235***	0.079***	0.089***
				(0.028)	(0.029)	(0.025)	(0.029)
employment share					−4.148***	−2.297***	−2.419***
					(0.206)	(0.033)	(0.085)
investment p.w.						0.325***	0.327***
						(0.005)	(0.004)
sector: construction							0.025
							(0.016)
sector: services							0.026**
							(0.011)
Country dummies	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year dummy	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Constant	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	2,256	2,256	2,256	2,256	2,256	2,256	2,256
R^2	0.595	0.595	0.612	0.618	0.632	0.828	0.828
Adjusted R^2	0.590	0.590	0.607	0.613	0.626	0.825	0.825

Note: *p<0.1; **p<0.05; ***p<0.01. Clustered standard errors in parentheses.

Table 8: Regression of labour productivity on job satisfaction (cumulative growth)

	Dependent variable:								
	Labour productivity growth								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
job satisfaction	0.037***	0.056***	0.056***	0.050***	0.048***	0.049***	0.049***	0.049***	0.047***
	(0.005)	(0.003)	(0.003)	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)	(0.005)
labour prod. (t_0)		−0.092***	−0.092***	−0.097***	−0.095***	−0.097***	−0.098***	−0.093***	−0.090***
		(0.017)	(0.017)	(0.015)	(0.013)	(0.013)	(0.013)	(0.015)	(0.012)
age			−0.000	0.000***	0.000**	0.000	0.000	0.000**	0.000
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
education				0.032***	0.035***	0.033***	0.035***	0.035***	0.025
				(0.010)	(0.008)	(0.008)	(0.009)	(0.009)	(0.018)
large firms					−0.038	−0.039	−0.040	−0.042	−0.031
					(0.034)	(0.034)	(0.033)	(0.034)	(0.023)
empl. share						−0.220***	−0.370***	−0.363***	−0.513***
						(0.002)	(0.027)	(0.019)	(0.181)
Δ empl. share							−2.689***	−2.746***	−3.078***
							(0.945)	(1.056)	(0.613)
Δ invest. p.w.								0.067***	0.068***
								(0.008)	(0.009)
sector: construction									0.020***
									(0.003)
sector: services									0.030
									(0.031)
Country dummies	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year dummy	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Constant	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	2,220	2,220	2,220	2,220	2,220	2,220	2,220	2,220	2,220
R^2	0.106	0.154	0.154	0.157	0.158	0.159	0.160	0.181	0.184
Adjusted R^2	0.094	0.143	0.142	0.145	0.146	0.146	0.147	0.168	0.170

Note: *p<0.1; **p<0.05; ***p<0.01. Clustered standard errors in parentheses.

Table 9: Regression of labour productivity on job quality (cumulative growth)

	Dependent variable:								
	Labour productivity growth								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
job quality	−0.003	0.007***	0.007***	0.004***	0.005***	0.005***	0.005***	0.005***	0.005***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
labour prod. (t_0)		−0.089***	−0.089***	−0.094***	−0.092***	−0.094***	−0.095***	−0.091***	−0.088***
		(0.015)	(0.015)	(0.013)	(0.012)	(0.012)	(0.012)	(0.014)	(0.011)
age			−0.000	0.000	0.000	0.000	0.000	0.000	0.000
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
education				0.038***	0.039***	0.038***	0.040***	0.040***	0.029*
				(0.006)	(0.005)	(0.006)	(0.006)	(0.006)	(0.016)
large firms					−0.033	−0.035	−0.036	−0.038	−0.025*
					(0.026)	(0.027)	(0.026)	(0.027)	(0.015)
empl. share						−0.212***	−0.366***	−0.362***	−0.525**
						(0.021)	(0.054)	(0.049)	(0.204)
Δ empl. share							−2.766***	−2.841***	−3.190***
							(0.844)	(0.941)	(0.525)
Δ invest. p.w.								0.066***	0.067***
								(0.006)	(0.007)
sector: construction									0.023***
									(0.002)
sector: services									0.033
									(0.030)
Country dummies	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year dummy	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Constant	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	2,191	2,191	2,191	2,191	2,191	2,191	2,191	2,191	2,191
R^2	0.109	0.153	0.153	0.157	0.158	0.158	0.160	0.182	0.185
Adjusted R^2	0.097	0.141	0.141	0.144	0.145	0.145	0.146	0.168	0.171

Note: *p<0.1; **p<0.05; ***p<0.01. Clustered standard errors in parentheses.

Table 10: Regression of labour productivity on job satisfaction (average yearly growth)

	Dependent variable:								
	Labour productivity growth								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
job satisfaction	0.020^{***}	0.028^{***}	0.028^{***}	0.025^{***}	0.024^{***}	0.025^{***}	0.025^{***}	0.025^{***}	0.024^{***}
	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)
labour prod. (t_0)		-0.037^{***}	-0.037^{***}	-0.040^{***}	-0.039^{***}	-0.041^{***}	-0.042^{***}	-0.040^{***}	-0.039^{***}
		(0.009)	(0.009)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.007)
age			-0.000	0.000	0.000	0.000	0.000	0.000	0.000
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
education				0.017^{***}	0.018^{***}	0.017^{***}	0.017^{***}	0.017^{***}	0.013^{***}
				(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.005)
large firms					-0.003	-0.005	-0.005	-0.005	-0.001
					(0.008)	(0.009)	(0.009)	(0.009)	(0.005)
empl. share						-0.184^{***}	-0.235^{***}	-0.209^{***}	-0.274^{**}
						(0.039)	(0.057)	(0.054)	(0.113)
Δ empl. share							-2.913^{***}	-2.923^{***}	-3.373^{***}
							(0.521)	(0.609)	(0.105)
Δ invest. p.w.								0.046^{***}	0.046^{***}
								(0.005)	(0.005)
sector: construction									0.009^{***}
									(0.001)
sector: services									0.013
									(0.011)
Country dummies	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year dummy	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Constant	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	2,147	2,147	2,147	2,147	2,147	2,147	2,147	2,147	2,147
R^2	0.082	0.129	0.129	0.134	0.134	0.136	0.137	0.151	0.154
Adjusted R^2	0.070	0.117	0.116	0.121	0.120	0.122	0.123	0.136	0.139

Note: *p<0.1; **p<0.05; ***p<0.01. Clustered standard errors in parentheses.

Table 11: Regression of labour productivity on job quality (average yearly growth)

	Dependent variable:								
	Labour productivity growth								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
job quality	−0.000	0.004***	0.004***	0.003***	0.003***	0.003***	0.003***	0.003***	0.002***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
labour prod. (t_0)		−0.036***	−0.036***	−0.039***	−0.039***	−0.041***	−0.041***	−0.040***	−0.039***
		(0.008)	(0.008)	(0.008)	(0.007)	(0.008)	(0.008)	(0.008)	(0.007)
age			−0.000	0.000	0.000	0.000	0.000	0.000	0.000
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
education				0.021***	0.021***	0.020***	0.021***	0.021***	0.016***
				(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
large firms					−0.004	−0.006	−0.006	−0.006	−0.001
					(0.007)	(0.008)	(0.008)	(0.008)	(0.003)
empl. share						−0.174***	−0.228***	−0.204***	−0.275**
						(0.044)	(0.066)	(0.064)	(0.122)
Δ empl. share							−3.074***	−3.111***	−3.585***
							(0.404)	(0.478)	(0.002)
Δ invest. p.w.								0.044***	0.044***
								(0.005)	(0.005)
sector: construction									0.010***
									(0.001)
sector: services									0.014
									(0.011)
Country dummies	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year dummy	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Constant	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	2,120	2,120	2,120	2,120	2,120	2,120	2,120	2,120	2,120
R^2	0.079	0.122	0.122	0.129	0.129	0.131	0.132	0.145	0.149
Adjusted R^2	0.067	0.110	0.109	0.116	0.115	0.117	0.118	0.130	0.133

Note: *p<0.1; **p<0.05; ***p<0.01. Clustered standard errors in parentheses.

C Country and country codes

CODE	COUNTRY
AT	Austria
BE	Belgium
BG	Bulgaria
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
EL	Greece
ES	Spain
FI	Finland
FR	France
HR	Croatia
HU	Hungary
IE	Ireland
IT	Italy
LT	Lithuania
LU	Luxembourg
LV	Latvia
MK	FYROM-Macedonia
MT	Malta
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia
UK	United Kingdom