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RESEARCH PAPER

Temporary Employment, Informal Work and Subjective Well-Being Across Europe: Does Labor Legislation Matter?

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Abstract
Taking the individual data from the European Social Survey of 2004 and 2010, the authors of this paper investigate how employment type (permanent, temporary or informal employment) affects subjective well-being in respect to employment protection legislation across European countries. Our study outcomes are in line with previous research disclosing the negative impact of being temporally or informally employed on subjective well-being. The additional contribution of this study is the rigorous analysis of how employment protection legislation (EPL) moderates this effect by applying the multilevel modeling approach for 27 countries. In countries with strict EPL temporary and informal workers are significantly less satisfied with their lives than permanent employees. In countries with liberal EPL no significant decreasing effect from temporary or informal employment on people's subjective well-being was found.

Keywords Subjective well-being · Temporary work · Informal employment · Employment protection legislation · Multilevel modeling · Europe

1 Introduction

Along with GDP per capita, a country's development can be measured by the subjective well-being (SWB)[1] of its population, (Easterlin 1995; Inglehart and Welzel 2005; OECD 2011). While SWB depends on many aspects, a job is one of the major determinants of overall life satisfaction and happiness (Argyle 2001; Radcliff 2005; Kalleberg 2011; Sousa-Poza 2000).

More knowledge-intensive work, accompanied by technological progress, expansion of the service sector, greater diversification of the labor force, and shifts toward greater individualism at work, have all radically transformed the nature of work into more flexible

[1] Following OECD guidelines, we define subjective well-being as the combination of happiness level and the level of overall life satisfaction (OECD 2006).

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employment arrangements. Migration and economic changes all over the world have stimulated the rapid growth of temporary contracts and informal jobs (Boyce et al. 2007; Giesecke 2009; Houseman and Osawa 2003; Kalleberg 2000, 2011; Yu 2012). Temporary jobs are those with a limited duration and informal employment is a job without any formal contract (ILO 2008; Kalleberg 2011). The nature of such jobs is that they tend to be unstable and insecure in terms of long-term work guarantees (Giesecke 2009; Yu 2012).

Temporary and informal employment is usually associated with income instability, lower wages, lack of social security, and social exclusion (Booth et al. 2002; Brown et al. 2006; Guell 2000; Houseman 2001; Kalleberg and Sørensen 1979; OECD 2000; Kalleberg 2000, 2011; Karabchuk 2012; LaRochelle-Côté and Uppal 2011; Lindbeck and Snower 2002). Lower wages and social exclusion in turn lead to unhappiness and life dissatisfaction (Fumham 1991; Kalleberg 2011; LaRochelle-Côté and Uppal 2011; Menaghan and Parcel 1990; Secret and Green 1998; Warr and Parry 1982).

The share of temporary and informal employment in a country is mostly determined by its labor legislation (Cahuc and Postel-Vinay 2001; Kahn 2007). The degree of employment protection legislation (EPL) rigidity varies considerably across European countries and these differences are likely to contribute to the variations of SWB in Europe on the macro level. Our assumption is that in countries with a high level of EPL, temporary and informal employees will have a lower level of individual SWB in comparison to permanent workers while in countries with low level of EPL there will be no difference between the subjective well-being of permanent and temporary or informal workers. This paper contributes to the ongoing debate in the literature by deepening the analysis of SWB between permanent workers and temporary or informal workers and testing the moderating effect of EPL on SWB through employment status in Europe.

The paper is organized as follows. First, we provide theoretical background for our hypotheses. Then we describe the data and the methodology we apply. Finally, we discuss the results of the estimated conditional effects from the multilevel models and come up with the conclusions for policy making.

2 Theoretical Background and Hypotheses

2.1 EPL and Temporary and Informal Work

EPL is a multidimensional institution comprised of a set of norms and procedures that regulate hiring and firing processes for different types of employees in a certain labor market (see more Boeri and Van Ours 2008). Labor market rigidity is measured by separate EPL indices for permanent and temporary workers (OECD 2000, 2006).[2]

EPL on dismissals refers to the primary sector and permanent employees, meaning the strictness of the labor laws on firings in a country. The EPL index on temporary contracts refers to the opportunities for the employers to hire workers on a temporary basis. It does not reflect the protection of the temporary workers; it speaks more for the rigidity of the legislation on how free an employer is to use temporary contracts.

Among other macro-occupational outputs EPL affects the share of temporary and informal employment in the country. Labor market with a stricter employment legislation face

[2] The two indices reflect two different aspects of the labor legislation system and do not correlate with each other. The correlation is 0.2 between *EPL_dismissals* and *EPL_temps*.

higher rates of temporary contracts and informal work (Bergmann and Mertens 2011; Cahuc and Postel-Vinay 2001; Cazes and Nesporova 2003, 2007; Cazes et al. 2012; Kahn 2007). This explanation stems from the fact that labor markets with a very rigid EPL are more segmented into core and periphery markets (Doeringer 1986; Doeringer and Piore 1971; Gebel and Giesecke 2016; Lindbeck and Snower 2002; Sorensen 1983). The core employees of the primary sector are well protected by the labor legislation what leads to very high firing and hiring costs for employers. Thus, employers are more reluctant to recruit new permanent workers but more willing to hire personnel on a temporary basis with fixed-term contracts or without any contracts at all. Such labor force flexibility allows firms to adapt to market uncertainty and achieve higher profits. As a result, the share of fixed-term contracts and informal employment is higher in countries with high EPL (Avdagic 2012; Boeri and Jimeno 2005; DiPrete et al. 2006; Dolado et al. 2002; Giesecke 2009; Gimpelson et al. 2010; Yu 2012).

Employment legislation in one country could be rigid on dismissals for permanent workers and liberal on temporary contracts. In this case, the legislation stimulates the growth of temporary work by restricting hiring on a permanent basis and promoting hiring on a temporary basis (Barbieri and Cutuli 2016).

Recently most continental European countries have worked towards the EPL deregulation but mainly as part of flexible working arrangements, whilst the standard employment rules remained largely unchanged (Barbieri and Cutuli 2016). These partial deregulation strategies tend to cause an increase in the substitution of permanent jobs by temporary employment (Gebel and Giesecke 2011, 2016; Kahn 2010). Thus we witness the rise of temporary employment and informal work in countries with strict EPL for regular workers and flexible EPL for temporary contractors.

The situation when both indices of EPL on regular dismissals and EPL on temporary contracts usage are high means that firings are very costly and temporary employment is very restricted. In this case employers often opt for informal work relationships. Therefore, strong employment protection regulation on firings and use of temporary contracts is likely to stimulate the increase of informal employment.[3]

2.2 SWB of Temporary and Informal Workers and EPL

The former studies showed that temporary and informal employees usually perform low qualified jobs, have lower wages and less job satisfaction, have lack of career development, face more income inequality and higher earnings polarization, they also struggle with job insecurity and income uncertainty which in turn can decrease their SWB (Booth et al. 2002; De Graaf-Zijl 2005; Hagen 2002; Houseman 2001; Kalleberg 2000; Karabchuk 2012; Karabchuk and Soboleva 2014; Krstic and Sanfey 2007, 2011; Lukiyanova 2013; Menaghan and Parcel 1990; OECD 2000, 2011; Secret and Green 1998; Scherer 2009; Warr and Parry 1982; Zudina 2013).

The outcomes of the previous studies on the relationship between SWB and temporary or informal work mostly show negative association, however, in some countries it is very

[3] When we speak about informal employment, EPL is not the only one factor influencing its proportions, the tax system and law enforcement contribute a lot to the growth of this type of jobs. But in this paper, we concentrate not on pure informal work but on precarious VS permanent employment and labor market regulations that are responsible for the labor market system in a country. That is why we speak here only about EPL as a main country-level predictor.

weak or not significant. Such diversity of results stems from the different methodology (panel or linear regression) and data used (cross-sectional or longitudinal). Cross-sectional studies show that temporary and informal employees are less satisfied with their lives than permanent workers (Karabchuk and Soboleva 2014; Krstic and Sanfey 2007; Scherer 2009; Silla et al. 2009; Voßemer et al. 2017). While other studies demonstrate no or very week association between temporary work and SWB (Bardasi and Francesconi 2004; De Cuyper and De Witte 2006a; Green and Heywood 2011; Dawson et al. 2017). Furthermore, Dawson et al. revealed that the negative effect of temporary work on SWB disappears when job security is taken into account (Dawson et al. 2017).

The direct relationship between SWB and EPL is also not so clear. According to Scherer (2009), higher EPL is associated with lower life satisfaction for temporary employees in 16 Western European countries. At the same time, Flavin et al. (2014) analyzing employees on a different sample (all OECD countries), showed that a higher index of EPL leads to a higher SWB (Flavin et al. 2014). Sjöberg (2010) showed no significant relationship between EPL and SWB for several European countries but focusing on unemployment benefits rather than on EPL.

The recent paper by Voßemer et al. (2017) investigates the moderating effect of EPL on life satisfaction of unemployed and insecure workers (meaning temporary employment and workers without any contract) using the European Social Survey data. One of their hypotheses on 'the stronger the EPL for regular workers the stronger the negative effect of insecure jobs on well-being and health' was not confirmed by the linear regression models they applied. We argue that the list of individual level variables as well as country level variables, that were included into the models (see table 1 in Voßemer et al. 2017) might lead to biased results. For instance, past unemployment experience would affect the current employment status, as well as the unemployment rate in the country will correlate with the employment status. Thus, in this paper we took only employed people in the sample and focus on the interrelationship between SWB and temporary and informal employment moderated by *EPL* to shed more light on the differences in life satisfaction between permanent and insecure workers.

Our hypothesis is that a strict EPL causes higher rates of temporary and informal work and stimulates the negative effects of temporary and informal work on SWB. Strict labor market regulations account for difficult entrance and re-entrance into the labor market for vulnerable groups like newcomers, temporary and informal workers. High proportions of both temporary and informal workers decrease job and income stability in a country, which in turn causes a lower level of happiness and life satisfaction.

Furthermore, in countries with strict employment legislation, temporary work is mostly involuntary, and this would further decrease the individual SWB of temporary and informal workers (Gash and Inanc 2013). Therefore, the difference in life satisfaction and happiness between temporary/informal workers and permanent workers will be larger under strict labor market regulation.

In countries with more liberal employment legislation, there is less need for temporary contracts or informal employment as employers are less restricted in recruitment and dismissals. Even though liberal labor markets are highly competitive and one can easily lose a job and become unemployed, they provide more opportunities for job shifts and reduce the duration of unemployment compared to markets with strict EPL (Avdagic 2012; Boeri and Jimeno 2005; Cazes et al. 2012).

In this context people are less concerned by the prospect of dismissal, as they will be able to find a new job due to the availability of vacancies. We can assume that the temporary or informally employed would not feel very different from those with permanent

positions in terms of their perceptions of employment insecurity and income instability because they all could be fired any time. It should reduce the gap in SWB between temporary/informal employees and permanent workers. In addition, the voluntary nature of temporary jobs in more liberal EPL systems should also reduce this gap (Gash and Inanc 2013).

The tested hypothesis could be formulated as follows: *in countries with high EPL scores (both EPL on dismissals and EPL on temporary work) temporary and informal workers have a lower level of individual SWB than permanent employees while in countries with low EPL scores (both EPL on dismissals and EPL on temporary hiring) temporary/informal workers are not significantly different on their SWB levels compared to permanent workers.*

We would also expect a bigger gap in SWB between temporary/informal workers and permanent employees in countries with strict employment protection regulation specifically for men and less educated people. Due to the higher risks of being employed on fixed term contracts or without any contracts, men and less educated people would experience stronger moderating effects of EPL than women or people with university degree.

3 Data and Methodology

We use two waves of the European Social Survey[4] (ESS) data of 2004 and 2010 as the basis for our empirical analysis. The ESS is the only available nationally representative dataset containing information on the contract type, happiness and life satisfaction across European countries as well as Russia and Israel. This dataset allows us to identify permanent employment (unlimited duration contracts), temporary workers (fixed-term contracts) and informal employees[5] (no written contracts).

We merge the ESS 2004 and 2010[6] together to have more countries on the second level of analysis and have a bigger sample on the individual level.[7] We take these 2 years-waves as they contain rotating module on job characteristics that we use in the

[4] The ESS is a household survey conducted every 2 years in almost all European countries. The questionnaire consists of a collection of questions that can be classified into two main parts—a core section (repeated regularly) and a rotating section. Sampling on the ESS is guided by the following key principals: samples must be representative of all persons aged 15 and over (no upper age limit); individuals must be residents within private households in each country, regardless of their nationality, citizenship or language; individuals are selected by strict random probability methods at every stage; sampling frames of individuals, households and addresses may be used; all countries provide a minimum 'effective achieved sample size' of 1500 or 800 for countries with populations of less than 2 million after discounting for design effects; quota sampling is not permitted at any stage; substitution of non-responding households or individuals (whether 'refusals', 'non-contacts' or 'ineligibles') is not permitted at any stage. More information can be obtained from http://www.europeansocialsurvey.org/methodology/.

[5] For example, European Value Study or World Value Survey data do not contain any questions on type of contract but only allow to identify part-timers and full-timers.

[6] ESS Round 2: European Social Survey Round 5 Data (2004). ESS Round 5: European Social Survey Round 5 Data (2010). Norwegian Social Science Data Services, Norway – Data Archive and Distributor of ESS data. Only these two rounds out of the six contain a special module of questions on job characteristics that we are using to describe temporary and informal workers.

[7] We estimated the same models for 2 years separately at the first stage of the analysis and results proved to be the same and consistent with the merged sample. Having two rounds together for empirical analysis allowed us to perform a robustness check, on the one hand, and to control for changes in EPL between 2004 and 2010, on the other hand.

models (importance of job security while applying for a job). We restrict our sample to the employed individuals of the standard working age interval of 15–65 years old.

We control for the year and impute the country values of EPL and HDI for the respective years.[8] To test our hypothesis, we use EPL indices, produced by the OECD for 2004 and 2010 as country level predictors for each year respectively, that reduces our sample size to 33,388 respondents from 27 countries (the EPL scores are not available for Bulgaria, Cyprus, Croatia, Lithuania and Ukraine for 2004/2010).

We introduce two sub-indices as discussed in the theoretical part above: EPL on dismissals (*EPL_dismissals*) and EPL on temporary contracts (*EPL_temps)* (see country rates in "Appendix" Table 5). The first one, *EPL_dismissals,* concerns the regulations for individual dismissals and incorporates eight data items.[9] The second, *EPL_temps* indicator measures the strictness of regulation on the use of fixed-term and temporary work agency contracts and includes six data items.[10] We take both indicators simultaneously in our models as they reflect two different aspects of protection and strictness.[11]

As for the SWB, we follow the OECD recommendations (OECD 2011) and use life satisfaction and happiness as the two indicators to comprise the index of SWB. The OECD suggests taking into the index both measures of happiness that reflect short-term feelings, and life satisfaction that relates to longer periods of personal life perception. Life satisfaction is a more cognitive evaluation of SWB and reflects the satisfaction of an individual with the objective characteristics of his or her life (Haller and Hadler 2006), while happiness refers mostly to the emotional state of a person. Even though happiness and life satisfaction are treated as two distinct concepts, the correlation between them is very high[12] (Inglehart and Klingemann 2000).

ESS measures life satisfaction by the question: "All things considered, how satisfied are you with your life as a whole nowadays?" (0—extremely dissatisfied, 10—extremely satisfied). The indicator for happiness is the question: "Taking all things together, how happy would you say you are?" (0—extremely unhappy, 10—extremely happy). We took the

[8] However only four countries out of 27 experienced deregulation of the EPL on temporary employment. So there is almost no variation between 2004 EPL and 2010 EPL in the sample. In order to control for crisis effects we also did test for the dynamics of informal and temporary work for all available 2002–2012 rounds of ESS, the data is closely aligned with official statistics: there is no sharp increase in temporary/informal work during the 2008–2010 period, meaning that the financial crisis did not stimulate the growth of informal/temporary work. The crisis effect was much higher for involuntary part-time work (Gash and Inanc 2013).

[9] The items for *EPL_dismissals* include: (1) Notification procedures, (2) Delay involved before notice can start, (3) Length of the notice period at 9 months tenure, (4) Length of the notice period at 4 years tenure, (5) Length of the notice period at 20 years tenure, (6) Severance pay at 9 months tenure, (7) Severance pay at 4 years tenure, (8) Severance pay at 20 years tenure. We do not take EPL index on dismissals that includes regulation of collective dismissals because the focus of the paper is on individual subjective well-being and individual employment practices, moreover collective dismissals are very rare. The regulation process of individual hiring and firing is the main important thing for this paper.

[10] The items for *EPL_temps* include: (1) Valid cases for use of fixed-term contracts, (2) Maximum number of successive fixed-term contracts, (3) Maximum cumulated duration of successive fixed-term contracts, (4) Types of work for which temporary work agency (TWA) employment is legal, (5) Restrictions on the number of renewals of TWA assignments, (6) Maximum cumulated duration of TWA assignments.

[11] The diversification of the EPL indices allows to speak in detail on countries difference in terms of institutional regulations. Collapsing the two indices to EPL gap is not of our focus as well as the EPL on collective dismissals in not in focus of our research.

[12] The bi-variate correlation analysis by countries showed that the correlation coefficient between happiness and life satisfaction varies from 0.58 in Portugal to 0.76 in Austria, with 0.71 for all countries sample.

average of these two questions to derive the SWB index ranging from 0 to 10. We did run the models separately for life satisfaction and happiness and the results proved to be same and consistent.

We construct our main tested independent variable at the individual level as contract type with three possible outcomes: (1) permanently employed, (2) temporary employed, (3) informally employed. Each respondent can belong to only one category at a time and these categories do not overlap with each other. We follow the International Labor Organization definitions that are widely used in labor economics and labor sociology literature to identify each outcome of the employment status in the data set.

A person is ascribed to permanent employment if he/she had a job within the past week, was not self-employed, and had a working contract of *unlimited duration*.[13] A person is identified as a temporary employee if he/she had a job within the previous week, was not self-employed, and had a working contract with *limited duration*. Informal worker is identified as a person who declared he/she had a job within the previous week but was employed *without any written contract*. In our models, we used permanent workers as a reference category, so that we compare them with temporary and informal workers.

Based on the results from previous studies we use the following individual level characteristics as control predictors of subjective well-being: gender, age, education, subjective health, marital status,[14] self-reported degree of religiosity, and type of settlement (Bardasi and Francesconi 2004; Brereton et al. 2008; Booth and Van Ours 2008; Inglehart and Welzel 2005; Kalleberg 2011; Peiro 2006; Pouwels et al. 2008). Age usually produces a U-shaped effect with the younger and older generations being happier. That is why we also include the age squared variable to control for the U-shaped dependency. Previous research demonstrated that the degree of religiosity, marital status, a person's good health as well as income have a positive effect on SWB (Inglehart and Welzel 2005; Peiro 2006; Pouwels et al. 2008). Due to the large number of missing answers to the question on income and the strong correlation between income and type of contract, we did not include it in the final model as a control variable.[15] The same logic applies to the questions on social capital, which is known to have an impact on SWB but also correlates with the type of employment (Sarracino 2013, 2014).

Variables' description box

[13] The exact question on contract type is formulated like this: "Do you have a working contract of limited, unlimited duration, or, do you have no contract?".

[14] Despite that previous research has shown that subjective health, marital status, having children are affected by temporary employment, we use them as controls as their inclusion improves the model fit. However, to eliminate the possible so called "overcontrol bias" from these endogenous variables we tested the models for the sensitivity of our results with respect to the inclusion of those variables (see Elwert and Winship 2014).

[15] There is no data on family income for Portugal. Moreover, income variables usually have a high non-response rate. In our case, it would reduce the sample to 25,000 respondents and that would require multiple imputation techniques to deal with this problem. Another problem here is that the close relationship between family income and employment status of a person that might also bias the results. We excluded income from our final model in order to keep the number of countries and number of cases. However, we did estimate the models with family income to check for robustness and the tested effects for precarious work remained the same.

Individual level variables	
SWB	The summative index of life satisfaction and happiness divided by two, scale from 0 to 10
Being male	1 = male, 0 = female
Age	In years
Age squared	In years
Having university diploma	1 = having a university diploma, 0 = no university diploma
Having a partner/being married	1 = having a spouse/partner, 0 = not having a spouse/partner
Having good health	1 = having good or very good health, 0 = not having good health
Being religious	0 = not religious at all, 10 = very religious
Living in a city	1 = living in big or small city, 0 = living in countryside or village
Importance of job security while applying for a job	1 = not important at all, 5 = very important
Permanent employment	1 = having unlimited contract, 0 = not having unlimited contract
Temporary work	1 = having fixed-term contract, 0 = not having fixed-term contract
Informal work	1 = having no contract, 0 = not having no contract
Country-level variables	
HDI	Human Development Index
EPL_dismissals	OECD indicator: EPL on dismissals of regular workers. Varies from 0 (minimum) to 6 (maximum).
EPL_temps	OECD indicator: EPL on usage of temporary employees. Varies from 0 (minimum) to 6 (maximum).

Source: Our own illustration

We ran multilevel modeling with random effects for 27 countries.[16] Despite only 27 countries in the sample we still considered it safe to use multilevel modeling as there are only three second level predictors in our models: two EPL indices and the Human Development Index (HDI).[17] This approach follows Snijders and Bosker (2012, p. 48), who claim that to have more than 20 s level units (N) is acceptable for multilevel modeling with random effects under the condition of enough numbers of individual level units (n) for each second level group (N) (it should be more than 100) and not too many second level predictors (in our case we have three). We provide all the descriptive statistics for variables we used in the "Appendix" in Table 7.

First, we run the basic model for the SWB including both individual level variables and country level variables (Model 1 in Table 1). Second, we introduce interaction terms between employment dummies and *EPL_dismissals* and *EPL_temps* into the model to test the hypothesis[18] (Model 2 in Table 1). We also estimate model with temporary employment

[16] We also checked the results for their robustness by applying OLS regressions with clustered errors for the same specifications. The main effects as well as all others for control variables were same in terms of coefficients size and significance.

[17] We have chosen HDI because it reflects not only the material wealth of the country but also the level of development of human capital. This aspect is especially relevant in respect of research focused on labor markets. The HDI increases the individual levels of happiness and life satisfaction, which is in line with previous research by Easterlin and others (Easterlin 1995; Sarracino 2013).

[18] EPL remains one of the most influential factor in terms of regulations of job creation and job opportunities in the labor market, and it mainly defines the choices between permanent and temporary employment. The limitation of the study might be that we did not include into the models any indicators for active or passive labor market policies, which are much more important for the unemployment outcomes. Since unemployment is not the focus of the paper and we can include only a few country-level variables into the analy-

Table 1 Coefficients of multilevel modeling on subjective well-being, ESS data, pooled 2004 and 2010

Models	(1)	(2)	(3)	(4)
Individual level variables				
Being male	−0.0427*	−0.0434*	−0.0434*	−0.0434*
Age	−0.0960***	−0.0961***	−0.0961***	−0.0961***
Age squared	0.00102***	0.00103***	0.00103***	0.00103***
Having university diploma	0.262***	0.263***	0.263***	0.263***
Having a partner/being married	0.636***	0.636***	0.636***	0.636***
Having good health	0.853***	0.852***	0.852***	0.852***
Being religious	0.0538***	0.0538***	0.0538***	0.0538***
Living in a city	−0.0989***	−0.0991***	−0.0991***	−0.0991***
Importance of job security	0.0474***	0.0472***	0.0472***	0.0472***
Permanent employment			0.0832	− 0.0871
Temporary work	− 0.168***	− 0.0832		−0.170
Informal work	−0.0906*	0.0871	0.170	
Country-level variables				
HDI	9.223***	9.098***	9.098***	9.098***
EPL_dismissals	− 0.205**	− 0.205**	−0.217**	− 0.226*
EPL_temps	0.0253	0.0344	0.00201	− 0.0435
Cross-level interactions				
Temp.work * EPL_dis		−0.0123		0.00869
Temp.work * EPL_temp		−0.0324		0.0455
Inf.work * EPL_dismis		−0.0210	−0.00869	
Inf.work * EPL_temps		−0.0778*	−0.0455	
Permanent * EPL_dismis			0.0123	0.0210
Permanent * EPL_temps			0.0324	0.0778*
cons	0.345	0.444	0.361	0.531
N	33,388	33,388	33,388	33,388
N_clust	27	27	27	27
AIC	123,531.1	123,531.5	123,531.5	123,531.5
BIC	123,674.2	123,708.2	123,708.2	123,708.2

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

and informal work as basic categories to trace the EPL effects for insecure workers (see Models 3 and 4 in Table 1). Then we calculate the conditional effects[19] to interpret the significance of the main effects of temporary and informal work from the models with interaction terms (Table 2) for countries with high and low EPL. Finally, we estimate the conditional effects from temporary and informal employment on SWB for males and females and

Footnote 18 (continued)
sis in order to provide a better model fit for multilevel modeling, we limited the country level characteristics to the three of them: HDI, *EPL_dismissals* and *EPL_temps*.

[19] We can interpret the main effect from the second interacted variable only when the first of the interacted variables equals zero (Jaccard 2001). Thus, we estimate the impact of temporary/informal employment on SWB for countries with rigid EPL and countries with liberal EPL via the calculation of conditional effects in order.

Table 2 Temporary and informal employment effects on life satisfaction, happiness and subjective well-being in European countries, ESS data, pooled 2004 and 2010

	Conditional effects (for interaction)			
	EPL_D—min EPL_T—min	EPL_D—max EPL_T—max	EPL_D—max EPL_T—min	EPL_D—min EPL_T—max
Subjective well-being				
Temporary employment	−0.110	−0.295**	−0.149	−0.257*
Informal employment	0.0329	−0.385**	−0.0329	−0.319

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Table 3 Temporary and informal employment effects on subjective well-being for socio-demographic groups in European countries, ESS data, pooled 2004 and 2010

	Conditional effects (for interaction)			
	EPL_D—min EPL_T—min	EPL_D—max EPL_T—max	EPL_D—max EPL_T—min	EPL_D—min EPL_T—max
For males				
Temporary employment	−0.167	−0.318	−0.199	−0.275
Informal employment	−0.0489	0.0194	0.379	−0.452*
For females				
Temporary employment	−0.0573	−0.277	−0.0921	−0.242
Informal employment	0.0711	−0.737***	−0.363	−0.303
For people with university diploma				
Temporary employment	−0.0803	−0.153	0.305	−0.538**
Informal employment	−0.161	−0.244	−0.601	0.196
For people without university diploma				
Temporary employment	−0.136	−0.316*	−0.298**	−0.154
Informal employment	0.121	−0.455**	0.0947	−0.429*

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

for those with university diploma and those without it (Table 3). That allows us to identify for which population groups the strictness of the labor market regulation might play a crucial role in the distinction between the SWB of permanent and temporary/informal workers.

The EPL index varies from 0 (minimum) to 6 (maximum). In fact, none of the countries has an EPL index equal to zero. Therefore, to estimate the effects in countries with the lowest level of EPL we need to set the minimum to zero. The minimum *EPL_dismissals* and *EPL_temps* can be observed in UK with values of 1.198 and 0.375 accordingly for 2004 and 2010. The same applies to the maximum EPL rate: there is no country with EPL equal to 6 in Europe. The observed maximum of *EPL_dismissals* both in 2004 and in 2010 was in Portugal (4.417 and 4.131 respectively). The maximum of *EPL_temps* was in Turkey (4.875) in 2004 and in France (3.625) in 2010.

In order to estimate the conditional effects for countries with the highest and lowest EPL rates, we calculated the models, first, with the respective minimum of *EPL_dismissals* and *EPL_temps* equal to zero and, then with the respective maximum of *EPL_dismissals* and *EPL_temps* equal to zero. And finally, we calculated conditional effects for the situations when *EPL_dismissals* is very liberal (minimum set to zero) but *EPL_temps* is very rigid

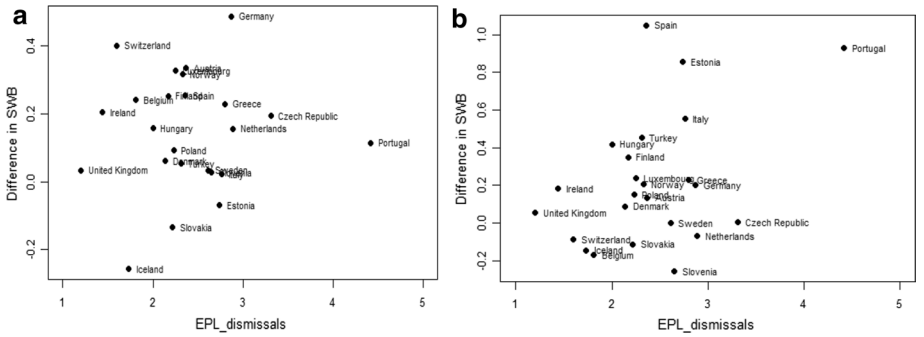

Fig. 1 Difference in SWB of permanently employed and **a** temporary, **b** informally employed in countries with different *EPL_dismissals*, ESS data 2004 (own calculations)

(maximum equal to zero) and vice versa. Thus, we could interpret the size, significance and sign of the main effects for temporary and informal employment on SWB for countries with high/low *EPL on dismissals* and high/low *EPL on temporary contracts*.

4 Results and Discussion

The average rate of SWB for the population of 15–65 year olds differs noticeably in the countries included in our analysis. We see that in 2010 it ranges from the lowest rate of 5.82 (on the scale from 0 to 10) in Greece to the maximum of 8.9 in Denmark (see more in Table 5 in the "Appendix"). EPL rates are diverse as well. The countries with the strictest *EPL individual dismissals* scores are Portugal, Czech Republic, Netherlands, Germany, Greece and Russia. The strictest regulation of temporary contracts can be found in Turkey, Luxemburg, France, Spain and Poland (Table 5 in the "Appendix"). It is interesting to note that according to the ESS data, which is in line with the official statistics, the highest rates for temporary work are in the same country list of Poland, Portugal, Turkey and Spain (Table 5 in the "Appendix"). The most liberal employment protection legislation for individual dismissals of employees is found in the UK, Ireland, Iceland, Switzerland and Estonia. The least restrictive legislation on temporary contracts is in the UK, Ireland, Iceland, Sweden and Israel (Table 5 in the "Appendix").

Figures 1a, b and 2a, b give an idea of the difference between a country's average subjective well-being for permanent and temporary employees and permanent and informal workers in countries with low or high *EPL on dismissals* of permanent employees and in the countries with low or high *EPL on temporary contracts*. We take EPL indicators separately in Figs. 1a, b and 2a, b as well as in the multilevel modelling following Voßemer et al. (2017) as they both work in the same direction of strictness of the EPL but with different dimensions (firings of permanent workers and hiring of temporary workers) complementing each other. The gap can still be small if both indicators have high scores, as well as when both indicators have low scores, but the effects or the meaning of each is completely different for the labor markets. From Figs. 1a, b and 2a, b we see a positive association between the differences in SWB of informal and permanent workers and both *EPL on dismissals* and *EPL on temporary contracts.* The same finding is true for the differences in subjective well-being of permanent and temporary employees in relation to *EPL_dismissals* but less clear dependency on *EPL_temps*.

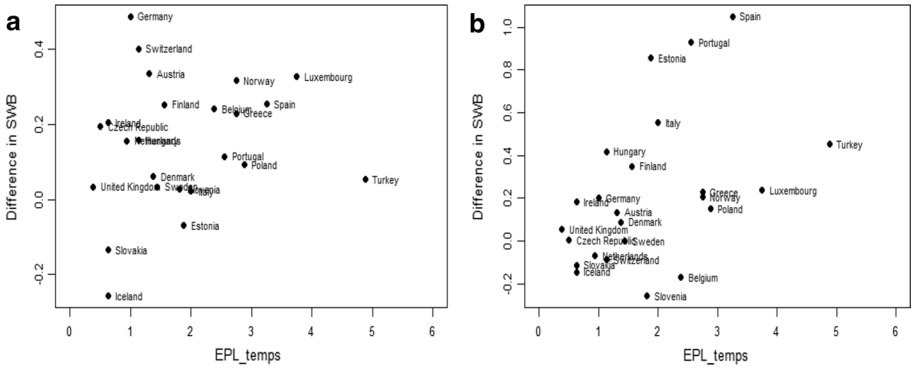

Fig. 2 Difference in SWB of permanently employed and **a** temporary, **b** informally employed in countries with different *EPL_temps,* ESS data 2004 (own calculations)

The results of the multilevel modeling are presented in Tables 1, 2 and 3. We begin our empirical analysis by testing the basic model on SWB without cross-level interactions (see model 1 in Table 1).

Temporary employment decreases SWB in comparison with permanent work by 0.186 points respectively on the scale from 0 to 10. We also found a negative impact of informal employment on SWB equal to −0.096 points. From these outcomes, we can state that temporary and informal work negatively affect SWB, or that temporary and informal employees are less happy and less satisfied with their lives than permanent workers[20] in Europe. These results are in line with previous theoretical and empirical papers on the growth of precarious work and its effect on SWB (Bardasi and Francesconi 2004; Scherer 2009; Silla et al. 2009; Kalleberg 2011; De Graaf-Zijl 2012; Voßemer et al. 2017).

Multilevel modelling showed that *EPL dismissals* has significant negative coefficients on SWB (−0.217 and −0.226) for temporary and informal workers (Table 1). An unexpected result was to find that there is a significant negative impact of *EPL dismissals* on SWB for permanent workers as well (−0.205). *EPL on temporary contracts* does not have any direct effect on SWB, what fits with the previous studies dedicated to the effects of deregulation of the EPL on temporary contracts. Indeed, the liberalization of the relegations on usage of temporary contracts did not bring those positive effects that were expected by the policy makers (Barbieri and Cutuli 2016; Voßemer et al. 2017).

As the second step, we added the interaction effects of temporary and informal employment with protection legislation indices into models (Models 2 Table 1). We found insignificant effects for both main and interaction terms for temporary and informal employment and EPL. But at this stage we cannot interpret them. Thus, we calculated the conditional effects (Table 2).

The results demonstrate that in countries with the highest EPL rates for dismissals and temporary contracts, the SWB of temporary and informal workers is significantly lower than the SWB of permanent employees. In other words, in countries with rigid EPL on firings of regular workers and considerable restrictions on temporary contracts, being

[20] Along with the main results, we can claim that younger or older age groups (compared to 36–45 year olds), tertiary education, good health and religiosity positively influence subjective well-being. At the same time, men and residents in big cities show lower levels of SWB. We underline that these results are consistent and stable in all further models we estimated. Moreover, they are in line with previous findings (Bardasi and Francesconi 2004; Brereton et al. 2008; Andersson 2008; etc.).

temporarily employed or working without a contract decreases happiness and life satisfaction by −0.295 and −0.385 points respectively (Table 2).

In countries with low EPL scores both for regular workers' firings and temporary workers' hiring there is no significant difference in life satisfaction and happiness between permanent and temporary or informal workers, as the effects remain insignificant. In countries with high *EPL on dismissals* and low *EPL on temporary contracts* the effects of temporary or informal employment on SWB are insignificant (however the sign of the coefficients is always negative). Unexpectedly, we found that in countries with very strict labor legislation on temporary contracts (high *EPL_temps*) and liberal labor legislation on dismissals (low *EPL_dismissals*) temporary workers have significantly lower level of SWB compared to permanent ones (−0.257).

Finally, we estimated the conditional effects of temporary and informal employment on SWB from cross-level interaction models separately for males, females and for those with a university diploma and those without a university diploma (Table 3). We discovered that the negative effect from informal employment has strong negative impact for women in countries with overregulated labor markets decreasing their SWB by 0.737 points. Being a temporary worker does not significantly reduce the SWB among males and females what does not allow us to confirm our assumption regarding importance of permanent contracts for men.

Another important outcome shown in the Table 3 is the significant negative association between temporary or informal work and SWB for people without a university degree in countries with strict EPL. Fixed-term contracts and informal employment reduce life satisfaction and happiness of workers by 0.316 and 0.455 points correspondently in comparison to permanent employees. We should also note that for those with higher education, temporary employment reduces SWB (by −0.538 points) in countries with high restrictions on the use of temporary contracts for employers and liberal regulation of dismissals for permanent employees. And we know that people with a university diploma comprise usually one third or up to 45% of the population in European countries (OECD 2016). It means that more than half of European labor force having no university diplomas and have higher risks to suffer from temporary or informal working arrangements.

To sum up our results we can say that in countries with strict employment protection legislation both temporary and informal workers have significantly lower levels of SWB in comparison with permanent employees. This result is perfectly in line with our theoretical assumptions and it confirms our hypotheses.

Strict labor market regulation with strong and explicit segmentation into primary and secondary labor sectors, and with difficult and restricted mobility between these sectors, leads to the situation where temporary and informal workers are often trapped in their insecure jobs (Baranowska-Rataj et al. 2016; Barbieri and Cutuli 2016), suffer from this insecurity (Dawson et al. 2017; Silla et al. 2009) and have lower SWB. This outcome is the main contribution from this paper to the on-going debate in the literature on the influence of temporary and informal employment on SWB for different labor market regimes.

Indeed the ESS data showed that only 48–56% of informal and 42–44% of temporary workers perceive their current jobs as secure, as opposed to 65–72% of permanent workers (Table 4). At the same time both temporary and informal workers report that job security is more important for them compared to permanent workers. That allows us to comment on the predominantly involuntary nature of temporary and informal jobs in European countries. Another indicator of lower security for temporary and informal workers is the ease with which their employers can replace them. Average self-evaluations for both groups are higher on this indicator than for permanent employees. Additionally, on average temporary and informal employees declare less opportunities for advancement at their current jobs (Table 4).

Table 4 Share and average evaluations on job security, job opportunities, replacement risks for permanent, temporary and informal workers, ESS data, pooled countries, for 2004 and 2010

	Share of those who agreed that the current job is secure		Good opportunities for advancement at current job (1 = strongly agree, 5 = strongly disagree)		How difficult/easy for employer to replace you if you left (1 = extremely difficult, 10 = extremely easy)		Important if choosing job: Secure job (1 = not important, 5 = very important)	
	2004 (%)	2010 (%)	2004	2010	2004	2010	2004	2010
Permanent employees	71.7	64.6	3.21	3.15	6.25	6.08	4.35	4.39
Temporary workers	44.8	42.5	3.25	3.22	6.59	6.67	4.3	4.4
Informal workers	56.2	48.3	3.33	3.27	6.63	7	4.4	4.5

Temporary employment reduces SWB in countries with liberal *EPL on dismissals* and strict legislation on temporary contracts. It appears that over-restricted use of temporary contacts decreases the SWB for temporary workers. At the same time in totally deregulated labor markets (where both *EPL on dismissals* and *EPL on temporary contracts* are low) the SWB of temporary and informal workers is not significantly lower than of permanent employees. This outcome contributes and stimulates further discussion on the effectiveness of the labor market legislation deregulation (Barbieri and Cutuli 2016; Gebel and Giesecke 2016; Tangian 2010; Voßemer et al. 2017).

In countries with strict EPL on individual dismissals and flexible regulation of temporary contracts, temporary and informal employment does not have significant associations with SWB. That might mean that partial deregulation of the EPL does make sense in reducing inequalities in SWB between permanent and insecure workers. At the same time, our findings are in line with Gebel and Giesecke (2016) arguing that deregulation of dismissals of permanent workers decreases the difference in SWB and risks of insecurity.

5 Conclusion

This paper analyzes the impact of temporary and informal work on SWB across European countries with respect to the country-specific labor legislation systems. The study is based on European Social Survey pooled data of 2004 and 2010, which includes 27 countries. The dependent variable of SWB was constructed from two questions on happiness and life satisfaction. We used multilevel modeling to test the hypothesis and explain the differences in SWB between European countries. We incorporated into the models the countries' rates of *EPL for individual dismissals and EPL for temporary contracts*, produced by the OECD for 2004 and 2010 respectively as main macro level predictors. Finally, we estimated conditional effects to verify our assumptions on different effects of temporary and informal employment in countries with rigid or liberal employment regulations on dismissals and temporary contracts.

The outcomes show an overall negative impact of both temporary and informal employment on individual SWB level. Based on previous research results, which demonstrated that the difference in well-being between permanent and temporary employees

could be explained by differences in job security (Dawson et al. 2017; Silla et al. 2009), we interpret the findings as follows: temporary and informal employees feel less secure and less stable compared to those employed on a permanent basis as the value of job security is very important to be happy and satisfied with life. They are also paid less (Booth et al. 2002; Brown et al. 2006; Guell 2000; Karabchuk 2012) and as a result they declare lower SWB. Indeed, this result is in line with previous findings, where temporary and informal work decreases subjective well-being (Boyce et al. 2010; De Cuyper and De Witte 2006a, b; Pouwels et al. 2008; Silla et al. 2009).

Strict EPL on regular contracts' dismissals has stable negative direct effect on subjective wellbeing of all types of contracts. It remains significant and reduces the SWB for about 0.2 points on average for permanent, temporary and informal workers.

The multilevel modeling showed that the difference in SWB between permanent and temporary/informal workers is much stronger in countries with strict *EPL* both on dismissals and temporary contracts. In such countries, informal and temporary workers report lower levels of life satisfaction and happiness than in countries with liberal employment legislation systems. Moreover, in countries with strict labor regulations on temporary contracts and liberal regulations on dismissals, temporary employment creates a significant negative effect on SWB. This means that the stricter the labor regulation is in a country, the deeper and stronger the polarization of SWB between permanent and temporary or informal workers. Such results are supported by our theoretical explanation, that in societies with rigid EPL the number of vacancies for secure permanent jobs is fewer due to high labor costs (Boeri and Jimeno 2005; Botero et al. 2004; Gimpelson et al. 2010). Employers in these economies make a rational choice for flexible, fixed-term contracts or oral arrangements, which give them more opportunities to adapt to current market conditions. Thus, strict EPL causes higher rates of temporary and informal employment stimulating further job polarization and job insecurity.

In countries with liberal labor market systems we did not find any significant association between the employees' happiness and life satisfaction and their employment type. This finding confirms our tested hypothesis: temporary or informal workers do not have significantly different subjective wellbeing compared with permanent workers in countries where the labor market legislation is deregulated. It could be explained through the easier process of entering the labor market in countries with more flexible protection legislation (Boeri and Jimeno 2005; Botero et al. 2004).

This outcome might lead the policy makers to think of the possibility to deregulate labor market legislations in order to reduce inequality in subjective well-being across the types of contracts. As low employment protection enhances equality in the perceptions of job insecurity and uncertainly between permanent workers and insecure job holders.

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Appendix

Tables 5, 6 and 7.

Table 5 European countries characteristics for 2004 and 2010. *Source*: OECD (2013) and authors calculations based on ESS data (countries are sorted by SWB mean scores 2004)

		2004						2010					
		EPL_dismissals	*EPL_temps*	HDI	SWB (mean score)	% of temps	% of informal	*EPL_dismissals*	*EPL_temps*	HDI	SWB (mean score)	% of temps	% of informal
1.	IS	1.73	0.63	0.89	8.46	11.1	7.9	Not in the sample					
2.	DK	2.14	1.38	0.89	8.39	6.2	2.8	2.14	1.38	0.90	8.31	4.2	1.4
3.	FI	2.17	1.56	0.87	8.03	8.7	0.4	2.17	1.56	0.88	7.95	6.3	0.2
4.	CH	1.60	1.13	0.90	8.02	3.9	1.1	1.60	1.13	0.92	8.10	3.9	0.8
5.	SE	2.61	1.44	0.89	7.84	6.6	0.3	2.61	0.81	0.90	7.91	6.2	0.4
6.	IE	1.44	0.63	0.89	7.81	5.7	14.2	1.27	0.63	0.90	6.65	3.7	9.6
7.	LU	2.25	3.75	0.88	7.79	4.6	1.5	Not in the sample					
8.	NO	2.33	2.75	0.94	7.78	5.3	3.6	2.33	3.00	0.94	7.97	5.6	1.7
9.	BE	1.81	2.38	0.87	7.59	4.5	1.2	2.00	2.38	0.88	7.67	4.8	1.0
10.	NL	2.89	0.94	0.89	7.58	6.2	1.6	2.82	0.94	0.90	7.74	5.6	0.9
11.	AT	2.37	1.31	0.85	7.46	4.0	2.2	Not in the sample					
12.	ES	2.36	3.25	0.84	7.23	11.5	2.6	2.36	3.00	0.86	7.45	10.1	0.8
13.	GB	1.20	0.38	0.89	7.20	5.6	6.4	1.20	0.38	0.90	7.25	4.5	3.9
14.	SI	2.65	1.81	0.86	7.04	7.1	1.4	2.65	1.81	0.87	7.13	7.5	0.4
15.	DE	2.87	1.00	0.89	6.86	5.2	0.6	2.87	1.00	0.90	7.24	7.5	1.0
16.	FR	2.47	3.63	0.87	6.79			2.39	3.63	0.88	6.60	5.8	1.3
17.	CZ	3.31	0.50	0.85	6.61	7.4	0.3	3.05	1.31	0.86	6.45	6.7	0.3
18.	GR	2.80	2.75	0.85	6.57	3.9	11.2	2.80	2.75	0.86	5.82	3.7	7.4
19.	TR	2.31	4.88	0.69	6.50	24.2	8.6	Not in the sample					
20.	PL	2.23	2.88	0.80	6.48	11.4	1.8	2.23	2.88	0.83	7.16	13.4	1.2
21.	IT	2.76	2.00	0.86	6.30	5.9	1.4	Not in the sample					
22.	EE	2.74	1.88	0.82	6.08	4.4	1.0	1.81	1.88	0.83	6.71	5.1	1.6
23.	PT	4.42	2.56	0.79	6.05	8.7	1.7	4.13	1.94	0.82	6.24	6.1	4.1

Table 5 (continued)

		2004						2010					
		EPL_dismissals	*EPL_temps*	HDI	SWB (mean score)	% of temps	% of informal	*EPL_dismissals*	*EPL_temps*	HDI	SWB (mean score)	% of temps	% of informal
24.	HU	2.00	1.13	0.81	6.02	4.5	2.2	2.00	1.13	0.82	6.14	7.3	0.6
25.	SK	2.22	0.63	0.80	5.92	6.9	0.7	2.22	1.63	0.83	6.54	4.2	0.2
26.	IL	Not in the sample						2.04	0.88	0.88	7.52	4.7	14.0
27.	RU	Not in the sample						3.06	1.13	0.77	5.88	5.5	2.6

Table 6 Mean subjective well-being by employment type in European countries, ESS data for 2004 and 2010

	2004			2010		
	Permanent employment	Temporary employment	Informal employment	Permanent employment	Temporary employment	Informal employment
Austria	7.50	7.17	7.37	Not in the sample		
Belgium	7.60	7.36	7.77	7.72	7.25	7.63
Czech Republic	6.58	6.39	6.58	6.38	6.11	6.48
Denmark	8.39	8.33	8.31	8.37	7.81	8.26
Estonia	5.93	6.00	5.08	6.61	6.84	6.81
Finland	8.12	7.87	7.77	8.03	7.63	7.87
France	No questions on contract type			6.62	6.33	6.07
Germany	6.93	6.45	6.51	7.28	6.70	7.30
Greece	6.74	6.51	5.48	5.94	5.79	5.60
Hungary	5.90	5.74	8.56	6.20	5.67	5.60
Iceland	8.41	8.67	7.69	Not in the sample		
Ireland	7.87	7.67	5.89	6.42	6.91	6.80
Italy	6.45	6.42	7.52	Not in the sample		
Israel	Not in the sample			7.32	7.50	7.64
Luxembourg	7.76	7.44	7.66	Not in the sample		
Netherlands	7.59	7.43	7.63	7.78	7.55	7.80
Norway	7.84	7.52	6.25	8.00	7.69	8.07
Poland	6.40	6.31	5.20	7.14	7.08	6.69
Portugal	6.13	6.02	5.93	6.32	6.33	5.51
Russia	Not in the sample			5.79	5.78	5.32
Slovakia	5.82	5.95	7.23	6.49	6.38	6.90
Slovenia	6.97	6.94	6.39	7.04	7.25	7.82
Spain	7.44	7.19	7.84	7.59	7.28	7.08
Sweden	7.84	7.81	8.16	7.93	7.68	7.98

Table 6 (continued)

	2004			2010		
	Permanent employment	Temporary employment	Informal employment	Permanent employment	Temporary employment	Informal employment
Switzerland	8.07	7.67	6.22	8.05	8.06	8.21
Turkey	6.67	6.62	4.75	Not in the sample		
United Kingdom	7.21	7.18		7.27	7.32	7.22

Table 7 Summary statistics for the variables included in the multilevel modeling, ESS data, pooled 2004 and 2010

Variable	Num. obs.	Mean	SD	Minimum	Maximum
SWB	34,478	7.257.976	1.762.447	0	10
Being male	34,679	.5060123	.4999711	0	1
Age	34,699	410.066	1.134.242	16	65
age_2	34,699	1.810.188	9.410.981	256	4225
Having university diploma	34,505	.3474569	.4761693	0	1
Being married (living with partner)	34,609	.6662429	.4715609	0	1
Having good health	34,672	.7669301	.4227925	0	1
Being religious	34,434	4.269.269	29.009	0	10
Living in a city	34,664	.6593584	.4739318	0	1
Importance of job security	34,171	4.364.139	.7448981	1	5
Temporary employment	34,699	.1234618	.3289712	0	1
Informal employment	34,699	.0603476	.2381331	0	1
HDI	34,699	.8642186	.0420992	.687	.939
EPL_dismissals	34,699	2.392.485	.6489228	1.198	4.417
EPL_temps	34,699	1.660.871	.9461042	.375	4.875

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