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DO GAYS AND LESBIANS EXPERIENCE MORE FREQUENT AND LONGER UNEMPLOYMENT?

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ABSTRACT. Purpose. The purpose of this study is to compare the probability of unemployment and duration of joblessness between partnered gays, lesbians and their straight peers in the EU. Design/methodology/approach. Existence of potential differences in the outcomes is tested by multilevel logistic regression model (probability of unemployment) and multilevel linear regression model (length of joblessness) using the EU Labour Force Survey data from 2008 to 2015. Findings. Gays have been found to have a significantly higher unemployment probability and (weakly significantly) a longer duration of joblessness than comparable straight men. No significant difference was identified in unemployment probabilities of lesbians and heterosexual women but the joblessness duration appears to be significantly shorter in lesbians. Originality/value. Previous research indicated that lesbians and gays face barriers in access to employment. To author's knowledge this is the first study which investigates whether gay people experience prolonged joblessness.

JEL Classification: J71**Keywords:** discrimination, employment discrimination, gay, lesbian, unemployment

Introduction

Academic studies using various methods provide robust evidence that a negative bias towards gay people limits their access to the labour market. Gays have a lower probability of being employed than their straight counterparts. For lesbians – despite discrimination in hiring – there is (non-conclusive) evidence that they have a higher probability of being employed than comparable heterosexual women (see the literature review by Fric, 2017). To the author's knowledge, no research study has explored whether discrimination against gays and lesbians in access to the labour market translates into a longer duration of unemployment.

To address this deficit, we investigate whether cohabiting lesbians (gays)¹ have a significantly different joblessness length than cohabiting straight women (men) while controlling for relevant individual and contextual characteristics. This question is especially compelling with regard to lesbians – the theorised mechanism (which we discuss in the next section) does not clearly indicate how their length of joblessness will relate to that of straight

¹ Due to data limitations, our analysis takes into account only individuals who are cohabiting with same-sex or different-sex partners. See the section Data for a more detailed explanation.

women. We also partly replicate and verify previous research, comparing the unemployment probabilities of lesbians / gays and their heterosexual counterparts.

Unemployment is one of three labour force statuses – employed, unemployed and inactive – as distinguished by Laurent & Mihoubi (2017). We assume that the subjects of our research are mobile between these statuses and with a certain probability are likely to have a given status. We have chosen to look at unemployment because it has a large negative effect on subjective wellbeing (Powdthavee & Wooden, 2014).

The length of unemployment has important implications for individuals' well-being. Longer unemployment has been linked to a greater risk of mental illness (particularly depression and anxiety disorders), alcoholism (Herbig, Dragano, & Angerer, 2013), isolation, social exclusion (Clasen, Gould, & Vincent, 1997), suicide and suicide attempt (Milner, Page, & LaMontagne, 2013). Longer also unemployment makes it more difficult to become re-employed because it signals to employers that something may be “wrong” with the applicant (Goffman, 2009).

Differences in unemployment probability and length can be a consequence of unequal treatment or of inherent differences between gays, lesbians and straight people. In the theoretical section we discuss this in more detail. Hereby we predominantly build on theories of labour market discrimination and neoclassical theories of family, human capital and labour supply (the latter incorporating Festinger's theory of cognitive dissonance).

1. Theoretical background

This section discusses the theories that could explain why sexual orientation may induce differences in the unemployment probabilities and unemployment length². We have arranged the theories into two groups. One group relates to access to employment and the other to transition from employment to unemployment. In some cases, the theorised mechanisms may work differently for gays and lesbians and where applicable we will explore these differences.

A person's probability of being unemployed at a given moment will depend on her propensity to lose a job and/or not being able to access a job. *Ceteris paribus*, a person is more likely to be unemployed than another individual if (a) it is more difficult for her to access a job and / or (b) she is more likely to lose a job. If we examine respondents' employment status at a given moment (rather than the number of unemployment spells over a period of time), the unemployment probability that we gauge will also be influenced by the length of the unemployment spells. Someone's length of unemployment is determined by their possibilities of accessing employment. The more difficult it is for an unemployed person to find a (suitable) job, the longer unemployment duration she is likely to experience. However, there are certain circumstances through which a job seeker's transition to unemployment (such as discriminatory job loss) can have negative repercussions for their ability to find a subsequent job.

In the following paragraphs, we discuss theoretical approaches that compare access to employment and transition from employment to unemployment between gays, lesbians and straight people. The theoretical insight will be used to formulate our hypotheses.

² In our theoretical model we refer to the length of unemployment. Due to data limitations we use joblessness length instead of unemployment length in our empirical model. See the section Data for a more detailed explanation.

1.1. Access to employment

The differences in access to employment can relate to labour supply and labour demand factors.

Labour demand. Differences in labour demand for gay and straight employees are generally related to labour market discrimination. We talk about discrimination when two equally qualified individuals are treated differently in the labour market on the basis of their sexual orientation, assuming that sexual orientation itself is unrelated to productivity (Arrow, 1973). Two major economic theories try to explain the mechanisms of discrimination:

Firstly, discrimination theory (Becker, 1971) relates discriminatory behaviour to people's preferences. A person may feel disutility from association with lesbians or gays and may prefer being associated with heterosexuals. An employer such as this – maximising her utility (instead of profit) – would choose to hire straight employees even if they had lower productivity and / or a higher reservation wage. The extent of employers' distaste against lesbians and gays would influence their willingness to discriminate. Empirical research consistently indicates that homosexuality evokes negative attributions about the target (Ragins, Singh, & Cornwell, 2007) and that negative attitudes are more pervasive toward gays than lesbians, especially in heterosexual men (Herek, 1988, 2000, 2002; Kite & Whitley, 1996; LaMar & Kite, 1998).

Secondly, the theory of statistical discrimination (Arrow, 1973; Phelps, 1972) suggests that employers do not have perfect information on job applicants' productivity. They may believe that productivity varies between gays, lesbians and straight people due to for example different household structures, gender nonconforming behaviours or stereotypes. If employers use such beliefs as a proxy for estimating productivity, this can result in unequal treatment of gay and lesbians job candidates.

Encountered or potential discrimination (see the conceptual model by Chung, 2001) in access to employment lengthens the job search duration and unemployment duration of discriminated individuals. A stereotyped vacancy description can lead to self-elimination of candidates who do not meet the required stereotypes. Job seekers may avoid applying for jobs where they believe that they would face discrimination. During the résumé selection process, equally qualified gay candidates may be assessed less positively, rejected, or invited to an interview only as a back-up option. During the job interview, gay applicants may be treated less helpfully, subjected to interpersonal discrimination or rejected by potential employers. When offering a job, an employer may offer gay candidates less attractive conditions or offer no employment at all.

Sexual orientation is usually viewed as an invisible trait. Still, awareness of or suspicion about job applicants' or employees' homosexuality can be spread via multiple channels such as rumours or inference based on appearance or behaviour. People infer sexual orientation based on body movements (Johnson, Gill, Reichman, & Tassinari, 2007), voice (Fasoli, Maass, Paladino, & Sulpizio, 2017) or facial cues (Freeman, Ambady, Johnson, & Rule, 2010), even during a mock job interview (Sylva, Rieger, Linsenmeier, & Bailey, 2010). Someone's living situation or civil status provides further indication. Job candidates aged 30 or older who aren't married or living together (Kirk & Madsen, 1989) as well as respondents who are in a registered partnership may be suspected of being lesbian / gay. The accuracy of these suspicions is questionable, but they may trigger discriminatory behaviour.

The empirical research provides rather strong evidence of decreased demand for gay employees due to discrimination (Fric, 2017). An experiment by Drydakis (2012) suggests that this is due to taste-based rather than statistical discrimination. These factors lower gay people's flow from unemployment to employment both directly and indirectly – prolonged

unemployment makes it more difficult to become re-employed as lengthy unemployment signals that something is “wrong” with the applicant (Goffman, 2009).

Labour supply. Other theories relate the differences in labour market outcomes to the labour supply side.

Probably the most important inherent difference between gay and straight people is a different household composition in terms of gender. Individuals’ gender is thought to affect their labour market behaviour. In Becker's (1981) neoclassical theory of family, women in mixed-sex couples traditionally specialize in household production and men are involved in market production. Women (men) tend to invest less (more) into their human capital and have worse (better) labour market outcomes in terms of wages or employment rates. Because no biological sex differences exist in same-sex couples, specialisation in same-sex couples is limited compared to straight couples (Giddings, Nunley, Schneebaum, & Zietz, 2014; Jaspers & Verbakel, 2012). Gays (lesbians) are thus expected to invest less (more) into their labour market human capital³ than straight men (women) (Black, Sanders, & Taylor, 2007). This could negatively (positively) affect their average labour market outcomes.

Empirical data show that lesbians and gays tend to sort to different occupations than their straight counterparts – gay people are more likely to supply work in gay-friendly contexts to avoid experiencing potential negative bias (Badgett & King, 1997; Y. Chung, 1995; Martell, 2014; Plug, Webbink, & Martin, 2014). Searching for such occupations may result in longer expected periods of unemployment for lesbians and gays as compared to their straight counterparts.

The neoclassical theory of labour supply extended by the concept of cognitive dissonance predicts that experienced unfair treatment may lead to a reduction of an individual’s labour supply (Goldsmith, Sedo, Darity Jr, & Hamilton, 2004). Labour market discrimination may thus impact someone’s incentive to find or keep a job, or be discouraging enough for them to drop out of the labour force (Laurent & Mihoubi, 2017; Leppel, 2009).

Because gays receive lower wages than comparable straight men (Klawitter, 2015), a lower proportion of gays may accept a given job (the so-called substitution effect⁴), leading to a lower labour market participation. We theorise an opposite effect in lesbians because their wages are higher on average than those of straight women. Due to the gender income gap (on average, men earn higher wages than women), partnered gays (lesbians) may have, on average, a lower (higher) incentives to find a job quickly than their straight counterparts because their partner has a “male” (“female”) income. Finally, gay workers may experience more disutility from work in prejudiced environments leading to a higher reservation wage in hostile environments and a lower labour supply.

Altogether, labour supply factors are theorised to put lesbians (gays) at a (dis)advantage compared to straight men in access to employment, leading to higher and longer unemployment. The factors relating to cognitive dissonance, personal development and social bias work in the opposite way. The total effect will depend on the relative strengths of each of these factors.

1.2. Transition from employment to unemployment

Gay people may have a higher probability of transition from employment to unemployment than straight people. The higher flow from employment to unemployment may

³ This theoretical prediction is not fully confirmed by empirical findings – on average, both lesbians and gays are better educated than their heterosexual counterparts (Black et al., 2007).

⁴ This is under the assumption that gays and straight men have the same reservation wage. However, once in employment gays may supply more working hours due to the income effect.

originate either from discrimination (the most serious form of which is discriminatory job loss) or from a lower incentive for discriminated workers to keep working in an unpleasant environment (Laurent & Mihoubi, 2017).

When the sexual orientation of a gay worker is progressively becoming known to the employer, colleagues and customers, gay employees may experience unpleasant working conditions, social exclusion, harassment, glass ceilings, or even pressure to resign (for example Frank, 2004; Hara, Aksoy, Carpenter, Frank, & Lustig, 2019). This may cause a higher turnover of gays workers. Bell, Berry, Marquardt, & Green (2013) suggest that stigmatised groups (such as gay people) will *ceteris paribus* be more likely to separate from jobs than employees from non-stigmatised groups due to *discriminatory job loss* (involuntary separation due to inequitable treatment based on personal factors that are irrelevant to performance). Higher turnover or discriminatory job loss may negatively impact an employee's labour market prospects by inducing the stigma limiting the pool of potential employers and by negatively affecting the employee's self-esteem and self-efficacy which play an important role in access to employment (Wilson, 2005). This may lead to a longer period of unemployment and lower re-employment quality.

1.3. Formulation of hypotheses

There is rather consistent empirical evidence that gays are disadvantaged compared to heterosexual men (see overviews by Fric, 2017 and Drydakis, 2014). The position of lesbians compared to heterosexual women seems to be more questionable Fric, 2017; Drydakis, 2014). This implies that the challenges gays and lesbians face in the labour market are not identical. For this reason we have formulated hypotheses and the analytical models separately for gays and lesbians.

For gays, the theories relating to access to employment and transition from employment to unemployment suggest that social bias and labour market bias will leave them at a comparative disadvantage to straight men (see for example the models in Burn, 2014; Sansone, 2018). Barriers in access to employment, along with a higher probability of transition to unemployment, may lead to a longer expected job search duration, unemployment duration and a higher unemployment rate. We hypothesise that:

Hypothesis 1A: *Ceteris paribus*, gays will have a higher probability of being unemployed than heterosexual men.

Hypothesis 1B: *Ceteris paribus*, gays without a job will report a longer length of time since they last worked than heterosexual men.

For lesbians the theories point in different directions. First, based on household composition and labour market investment, we expect that lesbians will have a lower probability of being unemployed and a shorter length of joblessness than heterosexual women. Second, outcomes in opposite directions are predicted due to an aversive bias against lesbians in society and the labour market. The outcomes observed in the real world will depend on which of these effects will prevail. Because discriminatory tastes against lesbians seem to be less severe than against gays, We hypothesise that:

Hypothesis 2 A: *Ceteris paribus*, lesbians will have a lower probability of being unemployed than heterosexual women.

Hypothesis 2 B: *Ceteris paribus*, lesbians without a job will report a shorter length of time since they last worked than heterosexual women.

2. Data

Research into the labour market position of lesbians and gays is severely limited by the lack of (large scale) data sets that allow identification of sexual orientation. For this reason, the researchers have to make assumptions and use proxies to utilize conventional data sets.

For the analysis we use pooled European Union Labour Force Survey (EU LFS) microdata by (Eurostat, 2017) from years 2008 to 2015. This was the most recent available data when the author applied for the EU LFS microdata. The EU LFS does not normally address the sexual orientation of the respondents. However, it provides information on the relationship between the respondents and other members of their household. We identify respondents' sexual orientation using the so-called cohabitation method. We compare genders of the respondent and of their cohabiting partners. If respondents and their partners are of same gender, we assume that they are lesbian / gay (depending on their gender). If they have different genders, we assume that they are heterosexual. This method has been used by a number of different studies, including (Antecol & Steinberger, 2013; Dillender, 2015; Giddings et al., 2014; Hammarstedt, Ahmed, & Andersson, 2015; Jepsen & Jepsen, 2015; Laurent & Mihoubi, 2017; Leppel, 2009; Tebaldi & Elmslie, 2006). Carpenter (2004) tested the validity of this method and demonstrated that same-sex cohabiting couples are likely gay or lesbian – regarding their behaviour. This method does not allow determining the sexual orientation of non-cohabiting persons. Hence, persons who are not cohabiting with a partner are not included in the analysis and the results are representative only for the cohabiting population and not for single individuals.

The EU LFS covers all EU countries but some countries do (did) not register same-sex couples in the survey. In the final sample we only kept individuals from NUTS 2 regions with gay persons present in the sample⁵. We dropped irregular observations (duplicated observations, observations with an inconsistent sexual orientation over time or with unknown (partner's) gender, observations with inconsistencies in age, etc.). The final *main sample* included 4.2 million observations and was used to estimate the effect of an individual's characteristics on their probability of being unemployed.

Besides EU LFS microdata we used the variable *unemployment rate* (in %) in a given year at NUTS2 level (or a higher level where NUTS 2 disaggregation was not available), which was based on the Eurostat database. We included a variable summarising the social attitudes towards gay and bisexual people. We calculated this as a national average of the answers to question QC13.10 from the Eurobarometer 83.4 survey⁶ that was held in the EU Member States in 2015. The question asked how comfortable the respondents would be around a gay, lesbian or bisexual person at work.

The EU LFS data collection procedures vary between EU Member States. The selected households may be interviewed multiple times before being rotated out of the sample. It is desirable to control for individual effects and to link interviews of a given individual over time. The Eurostat dataset doesn't allow the linking of observations for a single individual if they took place in different years. Additionally, the sequence numbers of members of a given household are not consistent and can vary between interviews. We tracked the individuals by using the household identifier and several individual characteristics that are rather stable over time (gender, country of birth, education levels of parents, etc.). If

⁵ This resulted in inclusion of the following countries: Austria, Belgium, Bulgaria, Cyprus, Czechia, Germany, Estonia, Spain, France, Croatia, Hungary, Ireland, Lithuania, Luxembourg, Latvia, Malta, the Netherlands, Poland, Portugal, Romania, Slovenia and the UK.

⁶ European Commission, Brussels (2016): Eurobarometer 83.4 (2015). TNS opinion, Brussels [Producer]. GESIS Data Archive, Cologne. ZA6595 Data file Version 2.0.0, doi:10.4232/1.12442

these characteristics were not specific enough to uniquely identify household members, all observations were treated as different individuals. From a total amount of 4,238,552 observations we were able to identify 2,864,910 unique individuals (1,476,876 males and 1,388,034 females), almost 31% of whom had more than 1 observation.

For a better insight into how our sample compares to other gay and lesbian samples, we refer to Fischer (2016). Our sample has over 17 thousand (0.59%) respondents in total with a same-sex cohabiting partner. The proportion was similar for both men (0.61%) and women (0.57%) and is lower than the proportion of individuals in same-sex relationships identified by Fischer (2016) in the European Social Survey (1.41%) and Generations and Gender Programme (1.01%). The reason for this could be that we have included 22 European countries, some of which have very small proportions of same-sex couples. Fischer (2016) limited her analysis to Belgium, Czechia, Germany, France, the Netherlands and Norway. In our sample, the proportions of individuals living in same-sex households are also higher in these countries (with the exception of Czechia and Germany) (see Figure 1). In half of the countries included in our study the proportion of individuals living in same-sex households is very low (less than 0.2%). This proportion is not necessarily unrealistic and is reflected in surveys used by Fischer (2016). The cross-country variation can be explained by different readiness of respondents to acknowledge in an interview that they have a same-sex partner and likely also by differences in the incidence of same-sex cohabitation. Such self-selection of respondents could bias the results of our analysis. We have checked whether the findings would change if we include only countries where the proportion of gay individuals exceeds 0.4%. This had no effect on the direction of the effect of explanatory variables (with the exception of the variable *degree of urbanisation*) but the effect of sexual orientation got weaker in estimations with trimmed data. This could be due to a smaller sample of gay individuals in trimmed data.

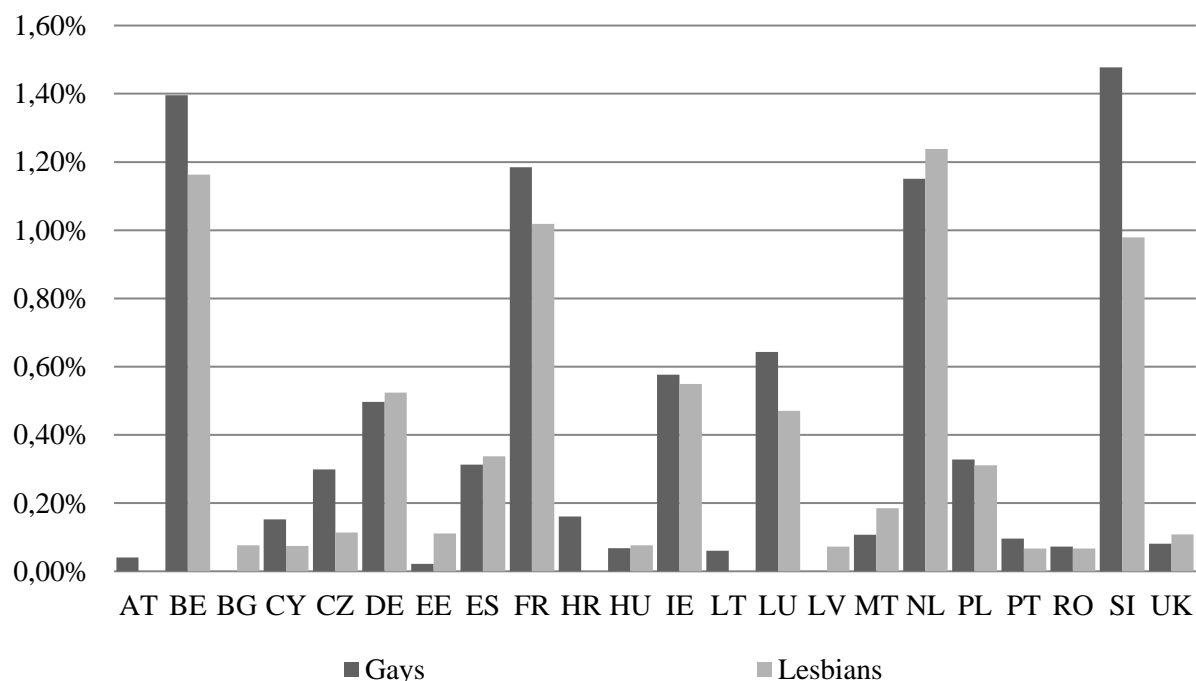


Figure 1. Proportion of gays (lesbians) in the total of male (female) respondents in the main sample; split by country

Source: *European Labour Force Survey (waves 2008 to 2015), adjusted sample*

Because of data constraints, we lack a direct measure of the unemployment duration, i.e. the length of the period when someone is without work, available for work and actively searching for work. We use the duration of joblessness instead, i.e. the length of the period when someone is without work. We have formulated the hypotheses accordingly. Lengths of unemployment and joblessness are closely related and a discrepancy between them may arise due to periods when an individual is not available for employment or doesn't actively search for employment.

For the analysis of the duration of joblessness, we only used respondents who at the time of the interview were unemployed, seeking work, unemployed due to dismissal or expiry of a fixed term contract and for whom the length of time since they last worked was known. We refer to this subsample of respondents as the *unemployed sample*. The unemployed sample is considerably smaller than the main sample and contains about 152 thousand unique individuals (82,328 males and 70,069 females), about one quarter of whom has more than one observation.

Variable *leavtime* in the EU LFS measures the elapsed length of joblessness in months at the moment of the survey. The coding of this variable is inconsistent for joblessness durations between 24 and 36 months and depends on the period of the year when the interview with a respondent took place. We corrected for this inconsistency and ran the analysis with both corrected and original variables. This had a marginal effect on the results.

Table 1 provides an overview of selected demographic and socio-economic characteristics of the main and unemployed samples split by gender. The characteristics of same-sex individuals in our main sample resemble samples in Fischer (2016) with regards to age, education attainment, presence of children in the household and the partner's professional status. Remarkably, both gays and lesbians in the main sample have a lower probability of being unemployed than their heterosexual counterparts. Our analysis will investigate how the unemployment differential across sexual orientation will change after controlling for relevant characteristics.

Table 1. Overview of respondents' main demographic and socio-economic characteristics; split by gender, sample and sexual orientation

Variable/ category	Males				Females			
	Main Sample		Unemployed sample		Main Sample		Unemployed sample	
	Straight	Gay	Straight	Gay	Straight	Lesbian	Straight	Lesbian
Age category								
15-30 years	8.5%	15.4%	11.1%	20.6%	11.6%	18.8%	15.7%	27.5%
30-50 years	56.3%	60.0%	53.6%	54.1%	58.4%	56.8%	58.2%	54.4%
50-70 years	35.2%	24.7%	35.3%	25.2%	30.0%	24.5%	26.1%	18.1%
Education								
ISCED 1 or lower	7.1%	2.9%	17.4%	6.8%	5.5%	3.0%	11.5%	6.9%
ISCED2	13.9%	10.6%	26.0%	18.2%	12.5%	10.6%	22.5%	18.1%
ISCED3	46.4%	39.8%	39.4%	44.4%	43.0%	38.5%	43.5%	41.4%
ISCED4	3.5%	3.7%	4.1%	1.7%	5.0%	4.0%	3.0%	3.1%
ISCED5 or higher	29.2%	43.0%	13.1%	28.9%	34.0%	43.9%	19.4%	30.6%
Children younger than 18 years present in respondent's household								
Yes	54.6%	14.6%	57.3%	17.2%	50.8%	27.9%	55.1%	32.5%

No	45.4%	85.4%	42.7%	82.8%	49.2%	72.1%	44.9%	67.5%
Professional status of respondent's partner								
Non-active	29.6%	18.5%	47.7%	31.1%	16.3%	19.5%	29.6%	34.4%
Active	70.4%	81.5%	52.3%	68.9%	83.7%	80.5%	70.4%	65.6%
Unemployed following the ILO definition								
Yes	6.9%	6.1%			6.7%	6.1%		
No	93.1%	93.9%			93.3%	93.9%		
Total	1,467,805	9,071	81,916	412	1,380,079	7,955	69,709	360

Note: for respondents with multiple observations we report the values of chronologically the first observation

Source: own compilation based on European Labour Force Survey (waves 2008 to 2015), adjusted sample

3. Method

The analysis aims to estimate whether gays and lesbians experience a different probability of being unemployed and a different elapsed length of joblessness than their straight counterparts.

3.1. Data hierarchy

The data that we use have a nested structure. Observations for a single individual i are collected at several points of time t . The individuals are nested within households and the households are nested within countries.

Because we calculate separate models for males and females, the partners from mixed-sex households – which form the majority of the sample – are not included in the same sample. This is not the case for same-sex households where both members are included in the same sample and the observations are correlated (Laurent & Mihoubi, 2017; Leppel, 2009). This issue is more prominent in the *main sample* than in the *unemployed sample* (in only 5% of households both partners are unemployed). We discuss how we address nesting into households in the section about the unemployment probability models.

To determine whether it would make sense to perform multi-level analysis with individuals and countries as separate levels, we calculated intercept-only models. The variance partitioning coefficient showed that about 76% of the total variance of unemployment probability lies at the individual level and only about 3% at the country level (for both men and women). In the case of the elapsed length of joblessness in males (females), 90% (91%) of the variance lies at the individual level and 6% (4%) at the country level. For this reason we calculate multilevel models with a separate level for individuals but not for countries. This approach is reasonable because the multilevel model assumes a random sample at each level and a sample of sufficient size at the highest level⁷. In the case of our research, this condition is not fulfilled with respect to countries – we have a non-random sample of just above 20 countries. Instead, we control for country effects by adding dummy variables.

⁷ Sample of 50 or less units at a higher level were shown to lead to biased estimates of the higher-level standard errors (Maas & Hox, 2005).

3.2. Selection of the models

Based on the theoretical considerations, we selected predictors that were expected to influence the dependent variable. Because using all theorised predictors would result in an extensive model, we reduced the complexity by selecting predictors that best fit our data. We applied the forward selection method. The forward selection method is a data driven predictor selection method which capitalizes on the chance relations in the sample. However, the chance relations may not exist in the population, so the results need to be considered as tentative until they are cross-validated in a new sample (Flora, 2017).

This method implied that we initially fitted a simple multilevel model with no independent variables as a benchmark and then compared it with models with one additional predictor. We compared AIC, BIC, conditional and marginal R^2 (calculated according to Nakagawa & Schielzeth (2013)) and p-values between the models with different predictors and selected one with the best fit. We repeated this procedure until the effect of an additional predictor did not substantially improve the model's fit. Because the variable *gay* is the main dependent variable of interest, we included it in all tested models with predictors.

3.3. Probability of unemployment models

Hypotheses 1a and 2b are tested by a model that estimates the probability of unemployment. The dependent variable *unemp* is a dichotomous variable that equals 1 when an individual is unemployed and 0 when she is employed (not to be confused with the regional *unemployment rate*, which is another variable). Because the dependent variable is dichotomous we use a logit model. Based on the results of the predictor selection stage, we estimated distinct models for males and females.

For males, the model can be described by the following equations:

$$\text{logit}(unemp_{ti}) = \ln\left(\frac{\Pr(unemp_{ti})}{1-\Pr(unemp_{ti})}\right) = \pi_{0i} + \beta_{1i}economic\ sector_{ti} + \beta_{2i}working\ partner_{ti} + e_{ti} \quad 1a$$

$$\pi_{0ir} = \beta_{00} + \beta_{01}age_i + \beta_{02}age\ residence_i + \beta_{03}country_i + \beta_{04}urbanisation_i + \beta_{05}education_i + \beta_{06}gay_i + \beta_{07}unemployment\ rate_i + u_{0i} \quad 1b$$

Here, t stands for the quarter when the observation took place and i stands for individual. The variables are described in *Table 2*.

For females, the best fitting model that was selected for the analysis is almost identical – only the variable *child* was added at the level t . To understand possible combined effects of sexual orientation with other factors, we tested models with inclusion of interaction terms between the variable *gay* and other predictors. None of these alternatives outperformed the model specified above.

To address the nesting of both partners from same-sex households in the same sample we estimated the model with two different procedures. The first procedure was a multilevel model including all respondents of a given gender where both partners from a same-sex household were included in the same sample. To control that the correlation between partners doesn't alter the results, we used the second procedure – a bootstrapped multilevel model according to a procedure used by Laurent & Mihoubi (2012a). The bootstrapped multilevel model addressed the correlation between partners by resampling the observations. From the main sample, we randomly selected 65,000 households (a smaller sample allowed a quicker calculation) – 60,000 households where respondents were only straight, 3,860 households with only gay respondents and 1,140 households containing both gay and straight

respondents. From each of these households we randomly selected one respondent. On this sample we estimated the model. We repeated this procedure 1,000 times. The resulting coefficients and their variances were averaged and are reported below.

Table 2. Description of variables used in the unemployment probability model

Variable name	Description
<i>unemp</i>	Employment status
<i>economic sector</i>	Sector of economic activity in current job (employed sample) or previous job (unemployed sample)
<i>working partner</i>	Employment status of subject's cohabiting partner
<i>age</i>	Subject's age
<i>age residence</i>	The age at which subjects last established their usual residence in their current country
<i>country</i>	Country of subject's residence
<i>urbanisation</i>	Degree of urbanisation
<i>education</i>	The highest education level achieved by the subject
<i>gay</i>	Sexual orientation of the subject
<i>unemployment rate</i>	Unemployment rate (in %) in the NUTS2 region where the subject resides in a given year
<i>child</i>	Whether at least one child (younger than 18 years) is present in subject's household

To fit the models we used R software, version 3.3.2 and the command *glmer* from the package *lme4*. This command allows the fitting of generalized linear mixed-effects models. Because of the dataset size, model complexity and computational capacity available, the actual computation was very time consuming. For this reason we used the *bobyqa* optimizer and selected 0 points per axis for evaluating the adaptive Gauss-Hermite approximation to the log-likelihood (Bates, Mächler, Bolker, & Walker, 2014; for a similar method of calculation see von Grundherr, Geisler, Stoiber, & Schäfer, 2017). This allowed a faster – but less exact – form of parameter estimation.

3.4. Length of joblessness models

Hypotheses 1B and 2B are tested by a model with the elapsed length of joblessness as a dependent variable. The model has two levels – time t and individual i . We do not control for nesting within households because in more than 95% of them there was only one unemployed individual. We account for country effects by including dummy variables. The model is estimated separately for men and women. It can be specified as:

$$leavtime_{ti} = \pi_{0i} + \beta_{1i}method_{ti} + \beta_{2i}quarter_{ti} + \beta_{3i}economic\ sector_{ti} + \beta_{4i}working\ partner_{ti} + e_{ti} \quad (2a)$$

$$\pi_{0i} = \beta_{00} + \beta_{01}age_i + \beta_{02}country_i + \beta_{03}urbanisation_i + \beta_{04}education_i + \beta_{05}gay_i + \beta_{06}unemployment\ rate_i + u_{0i} \quad (2b)$$

for men and

$$leavtime_{ti} = \pi_{0i} + \beta_{1i}child_{ti} + \beta_{2i}method_{ti} + \beta_{3i}quarter_{ti} + \beta_{4i}economic\ sector_{ti} + \beta_{5i}working\ partner_{ti} + e_{ti} \quad (3a)$$

$$\pi_{0i} = \beta_{00} + \beta_{01}age_i + \beta_{02}country_i + \beta_{03}urbanisation_i + \beta_{04}education_i + \beta_{05}gay_i + \beta_{06}unemployment\ rate_i + u_{0i} \quad (3b)$$

for women. The variable *method* represents the number of methods that the respondent used to find work in the 4 weeks preceding the survey. Both models were fit with R software, using the command *lmer* from the package *lme4*.

We estimate the elapsed length of joblessness on data that sample a stock of (un)employed respondents. Due to the length-time bias when sampling the stock, individuals with a longer period of joblessness have a higher probability of being in the sample, leading to biased estimates of the length of joblessness (Burgess & Rees, 1996; Cameron & Trivedi, 2005). Assuming that the bias affects the magnitude (and not the sign of the estimate), we can rely only on the directions of the effects of dependent variables and their magnitude and statistical significance can be seen only as indicative.

4. Results

The results of the multilevel and bootstrapped multilevel model both indicate that gays are *ceteris paribus* more probable to be unemployed than their heterosexual counterparts (see Fig. 2 or Table 3 in the Annex). This difference is consistent with hypothesis 1A and is statistically significant even when controlling for relevant personal characteristics, job search effort and contextual factors. The parameters of the majority of other predictors are in the expected direction – unemployment probability relates positively to unemployment rate and the age of settling in one's country. In men, the unemployment is negatively related to having a working partner, being middle-aged and having a higher education. Men living in towns, suburbs and rural areas are *ceteris paribus* less likely to be unemployed. We also observed a mixed effect of individual sectors and countries. We calculated the goodness of fit statistics for the model according to Nakagawa & Schielzeth (2013), yielding a marginal R² of 0.067 and conditional R² of 0.820. The marginal R² is associated with the proportion of variance explained by the fixed effects while the conditional R² relates to both fixed and random effects.

In women, both the multilevel and bootstrapped multilevel models do not show any statistically significant difference between the unemployment probability of lesbian and straight women. Effects of other predictors are comparable to the model with male respondents. An exception is the degree of urbanisation – *ceteris paribus* women living in rural areas are more likely to be unemployed than women in urban areas and in towns. The model for females also controlled for the presence of a child in the respondents' household and the results suggest that women living in households with children are more likely to be unemployed than those living in childless households. The model fit for females was comparable with that of the model with male respondents, yielding a marginal R² of 0.060 and conditional R² of 0.801. The results do not support hypothesis 2B.

If discrimination against lesbians and gays is caused by prejudice, the proportion of employers who are ready to discriminate should be higher in contexts with more hostile attitudes towards homosexuality. The magnitude of the straight-gay differential in unemployment probability should then relate to hostility against gays and lesbians in a given context. We estimated a model (outcomes are not reported here, but available upon request) with an interaction term between the variables *gay* and *attitude*. Contrary to our expectations, the effect of the interaction term was not statistically significant for either males or females, suggesting no relationship between the social attitudes towards homosexuality and the magnitude of the straight-gay differential in unemployment probability.

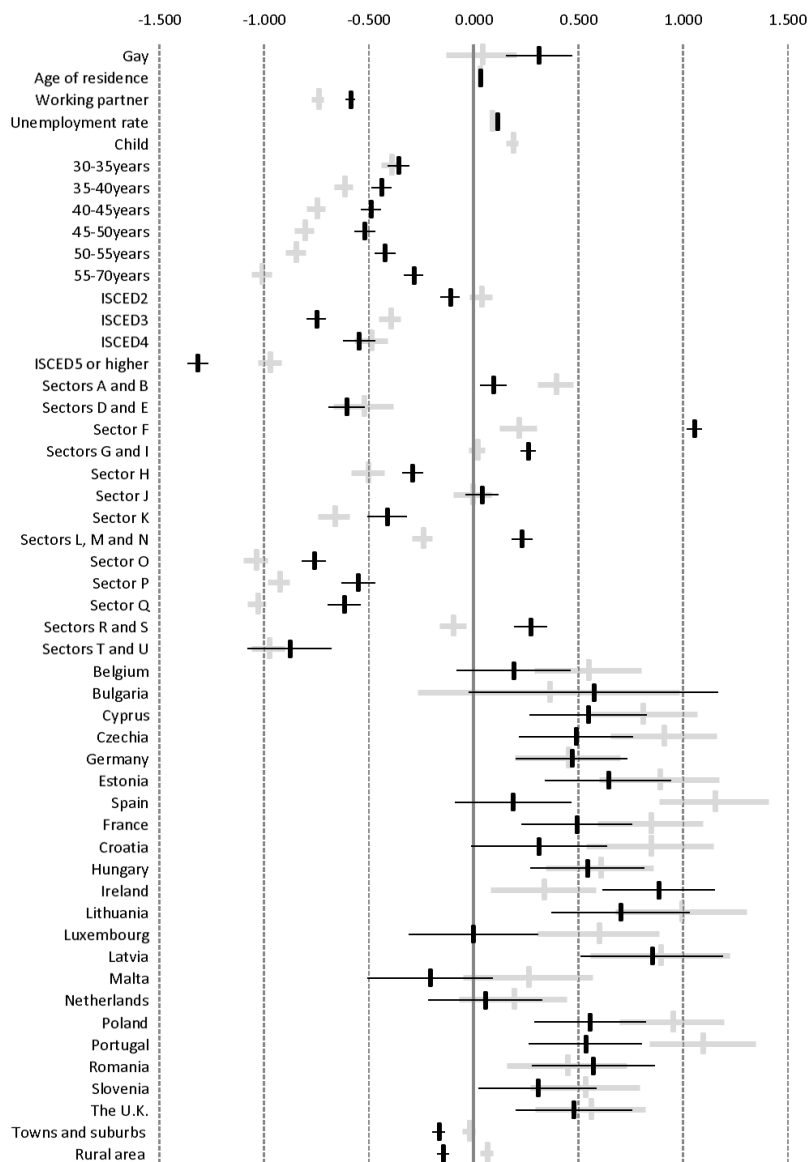


Figure 2. A graphical display of parameters (with 95% confidence intervals) for the multilevel model for unemployment probability of males (black lines and markers) and females (grey lines and markers), deviation from the base line. Bases are: age = younger than 30 years, education = ISCED 1 or lower, economic sector = C, country = Austria, degree of urbanisation = city)

The parameters of the model estimating the length of time since the respondents last worked reveal a pattern consistent with hypotheses 1B and 2B (see *Table 4* in the Annex). For men, the length of time since they last worked is positively related to being gay. This suggests that gays may experience longer periods of joblessness than straight men with comparable traits ($\beta_{05} = 1.627$ with $s = 0.934$). This difference is however only weakly statistically significant ($p = 0.027$) and the statistical significance may be inflated due to length-biased sampling (see the section 3. Method). For lesbians, the time of joblessness appears to be shorter than for comparable straight women ($\beta_{05} = -2.822$ with $s = 1.101$) and this difference is statistically significant at the 1% level (subject to possible inflation as in case of men).

5. Discussion

The academic research has so far provided relatively strong evidence that gays have a lower probability of labour market participation and of being employed than comparable straight men. In the case of women, the evidence is rather mixed. Lesbian women were found to be more likely to participate in the labour market by some studies and less likely by others. The evidence suggests that they are more or equally likely to be employed than comparable heterosexual women (see review by Fric, 2017).

We are not aware of any study that directly investigates whether the length of joblessness differs across sexual orientation. Several experimental studies have checked whether gay and lesbian job applicants have a different probability of being called for an interview than comparable heterosexuals. The majority found a call-back penalty for homosexual applicants. This indicates that due to labour demand factors the transition from unemployment to employment is *ceteris paribus* more difficult for gay than straight job seekers.

Consistent with this prediction we found that gays are more likely to be unemployed and that their duration of joblessness is longer than in the case of straight men. Our study constitutes another piece of research suggesting that gays have less favourable labour market outcomes than comparable heterosexual men. This finding is remarkable because aggregated statistics indicate the opposite (see *Table 1*). We explain this discrepancy by different demographic and socio-economic characteristics of gays as compared to heterosexual men. The statistics may also suffer from auto-selection when only gays with certain characteristics reveal their sexuality and from the fact that we have looked only at individuals with cohabiting partners (whose characteristics may vary between straight and gay populations).

In contrast, no significant difference was identified in the unemployment probability between lesbians and straight women and the length of joblessness appears to be shorter for lesbians. This contradicts the predictions of labour demand theories which suggest that lesbians will have a higher unemployment probability and longer unemployment durations. This has important theoretical implications – discrimination theories on their own cannot explain the empirical observations. The evidence suggests that the labour supply factors (different household structure, investment in human capital, etc.) play a considerable role and even outweigh labour market discrimination against lesbian women. The literature offers several explanations. First, Antecol & Steinberger (2013) demonstrated a substantial level of specialisation in lesbian households – primary earners were more attached to the labour market and supplied more hours than their partners. Specialisation of partners in lesbian (and presumably in gay male) couples seems to play an important role in determining their human capital investment and labour market outcomes. It is possible, that partnered lesbians have more advantageous labour market outcomes than partnered heterosexual women because the former are more likely to be primary household earners than the latter⁸. Second, Laurent & Mihoubi (2012b) point out that the differences can be due to income-sharing in gay households. Due to the gender income gap (on average, men earn higher wage than women), unemployed gays (lesbians) can rely on a partner who has a “male” (“female”) income. As a result, gays (lesbians) may have a lower (higher) need to find a job quickly than comparable straight men (women). This could work in favour of lesbians compared to straight women and explain why discrimination in access to employment doesn’t translate to adverse labour market outcomes (such as the labour market participation rate or (un)employment rate) for

⁸ The partners in a same-sex household will tend to divide labour because such specialisation is economically beneficial (Antecol & Steinberger, 2013; Becker, 1981, 1985). In opposite-sex households, the majority of women are assumed to be secondary earners (Antecol & Steinberger, 2013).

lesbians. Yet another explanation for the observed phenomena could be that lesbians avoid discrimination by concealing their sexual orientation in the workplace (see the model by Y. Chung, 2001). However, this explanation is not supported by the empirical evidence – 86% of lesbians in the EU28 are fully or selectively open about their sexual orientation at work, compared to 81% of gay men (FRA, 2020b).

One can look at the results from another point of view. Between-group differences in unemployment probability can be caused by two factors. Firstly, a difference in the length of unemployment, which is subject to (among others) discrimination in hiring. Secondly, a difference in job separation rate, which occurs when one group experiences transition from employment to unemployment more often than another group. Our findings imply that the higher likelihood of unemployment in gays may (partly) relate to a longer duration of joblessness. We are not able to gauge whether the job separation rate differs between gay and straight men. In the case of women, we didn't identify any statistically significant difference in unemployment probability between lesbian and heterosexual women. In light of the shorter average joblessness of lesbians, this indicates that lesbians may have a higher (voluntary or involuntary) job separation rate. This is supported by Fric (2021) who found that lesbians and gays have significantly shorter employer tenure than their straight counterparts.

Our results didn't reveal a link between attitudes towards homosexuality and the magnitude of the straight-gay differential in unemployment probability (the variable *attitude* wasn't included in the final model because it wasn't significant – nor did it improve the explanatory power – for any of the tested models. This adds to mixed research findings on how public attitudes relate to labour market outcomes (see Fric, 2017 for review). Our result could be affected by the crudeness of the measure of attitudes towards homosexuality that we used. Only attitudes at the national level were measured and variations across regions, time, gender, sectors and occupations, which may significantly affect respondents' immediate environment, were not captured.

The reader should keep in mind that labour market discrimination against gay respondents cannot be directly identified in the outcomes of our analysis. The residual difference in the unemployment rate and the elapsed length of joblessness that is not explained by observable productivity-related characteristics only suggest the existence of discrimination. However, omitted variables, unobserved heterogeneity, measurement error, feedback effects and pre-labour market discrimination could all confound residual-based estimates of labour market discrimination (Antecol, Cobb-Clark, & Helland, 2014; Habtegiorgis & Paradies, 2013).

Non-traditional division of labour in same-sex households may complicate the interpretation of our findings. Unfortunately, the EU LFS data doesn't allow distinguishing between primary and secondary earners in same-sex households. Hence it is difficult to determine to what extent the adverse labour market outcomes of gays are driven by the free choice of secondary earners to specialise in household work. It is likely that not all differences in the unemployment rate between gay and straight men are caused by discrimination and that part of them relates to labour supply factors.

Specific challenges relate to the concept of respondents' sexual orientation. Given the stigma associated with homosexuality, some respondents may not reveal true information about their sexual orientation in a survey. Our results can thus be generalised only to openly gay and lesbian people. Due to a lack of sufficient microdata on the labour market outcomes of lesbians and gays, we use the cohabitation method to determine the sexual orientation of respondents in a general population survey. This means that we depend on respondents' self-reported information. The choice of cohabitation and / or marriage may be endogenous to labour market outcomes. This could lead to a bias if the propensity for cohabitation / marriage is different between same-sex and mixed-sex couples. An additional drawback of our method

is that single / celibate individuals and individuals with non-cohabiting partners cannot be classified. We may also misclassify people who have a same-sex relationship but fail to report it as well as those who self-identify as gay while being in a heterosexual relationship (Ragins & Wiethoff, 2005). As a result, the presented estimates may not be representative of the whole population of lesbians and gays. Because homosexual individuals have more incentives to hide their sexual orientation in homophobic contexts, the bias is likely to be larger in countries with less tolerant attitudes towards homosexuality.

Another complicating factor is that our approach didn't take into account that sexual orientation is usually a non-observable characteristic. In the workplace, gays and lesbians can control the extent to which they disclose information about their sexual orientation (see the model by Chung, 2001). They will become a potential target of discrimination because of their sexual orientation only if others perceive or suspect them to be homosexual. The data that we used doesn't allow us to infer to what extent lesbians and gays disclosed their sexual orientation at work. We assume that they would be relatively open about their sexual orientation at work, given the fact that they disclosed having a same-sex partner to the survey interviewer. It is also plausible that our estimates underestimate the level of potential discrimination because gays and lesbians tend to conceal their sexual orientation more in hostile workplaces where discrimination most likely occurs (Fric, 2019).

Future research could refine our findings. More exhaustive data could replicate the analysis on how attitudes towards lesbians and gays relate to their labour market outcomes. Using data that sample the flow out of unemployment rather than a stock of employed and unemployed persons, future research could compare the total length of joblessness or – preferably – unemployment (i.e. accounting for periods when an individual is available to work and actively searching for employment). Research could also shed more light on differences in job separation rates between gay and straight individuals. This should preferably be done with longitudinal data. Yet another challenge for future studies is to use quantitative data that have a substantial sample and allow a more precise and less exclusive identification of subjects' sexual orientation and identity management in the workplace.

Conclusion

The findings of this article regarding the unemployment probability of gays and lesbians are largely consistent with the existing literature. The main empirical contribution is comparing the length of joblessness between heterosexual and homosexual unemployed people. To author's knowledge this comparison has not been made in the literature before. Gays were found to have significantly longer joblessness than straight men, while joblessness was significantly shorter in lesbians than in comparable straight women. The model controlled for the relevant individual and contextual characteristics as well as someone's job search effort. Moreover, the findings are based on data from a large-scale survey that was conducted in several European countries providing a sufficient sample to test our hypotheses.

Previous research suggests that lesbians and gays face discrimination in the labour market, including in the access to employment. The findings in this article suggest that worse labour market outcomes for gay men compared to heterosexual men are at least partially driven by longer durations of unemployment which indicates existence of discrimination. For lesbians it seems that due to labour supply factors discrimination doesn't translate into an increased unemployment probability and duration compared to straight women.

Experienced direct and indirect discrimination can have far-reaching consequences for one's life that go beyond the realm of employment. As discussed in the introduction, the scientific literature has manifested the adverse effects of unemployment on physical health, psychological well-being and economic welfare for unemployed people and their families (see

also Ström, 2003; Wilson & Walker, 1993; Winkelman & Winkelman, 1998). To prevent labour market discrimination several policy actions could be taken. Companies could adopt equality policies that explicitly cover sexual orientation, also in the realm of recruitment. Personnel involved in recruitment could receive diversity training (also addressing unconscious bias). Awareness among employees could be raised about what discrimination is, why it is undesirable and how it can be countered. Finally, governments could take an active role in preventing discrimination and in safeguarding equal rights for everyone.

Declarations

Availability of data and material

The datasets analysed during the current study are available from Eurostat and are subject to special licence access.

Eurostat. (2017). The European Union Labour Force Survey (EU LFS): Special Licence Access. <http://ec.europa.eu/eurostat/web/microdata/european-union-labour-force-survey>

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

The author analysed the data and was the sole contributor to the writing of the manuscript. The author read and approved the final manuscript.

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Annex

Table 3. Results of the multilevel logistic regression model and the bootstrapped multilevel logistic model estimating the unemployment probability (truncated version, sector and country are not reported)

Variable	Males						Females							
	Multilevel model			Bootstrapped multilevel model			Multilevel model			Bootstrapped multilevel model				
	Estimate	95% Wald confidence intervals		z-value	Estimate	Efron's non-parametric bias-corrected, accelerated 95% CI		Estimate	95% Wald confidence intervals		z-value	Estimate	Efron's non-parametric bias-corrected, accelerated 95% CI	
		Low	High			Low	High		Low	High			Low	High
Stand. dev. Random term	3.711			4.243			3.591				-3.857	-3.881	-3.833	
Intercept	-3.965	-4.237	-3.692	0.000	-4.404	-4.432	-4.377	-3.355	-3.614	-3.097	0.000	0.199	0.196	0.202
Gay	0.311	0.152	0.47	0.000	0.359	0.355	0.364	0.04	-0.127	0.207	0.639	0.122	0.117	0.127
Age of residence	0.031	0.03	0.032	0.000	0.032	0.032	0.032	0.029	0.028	0.03	0.000	0.032	0.031	0.032
Spouse labour status	-0.589	-0.614	-0.564	0.000	-0.623	-0.625	-0.62	-0.742	-0.771	-0.712	0.000	-0.731	-0.734	-0.727
Unemployment rate	0.114	0.11	0.118	0.000	0.129	0.128	0.129	0.088	0.084	0.092	0.000	0.096	0.095	0.096
Child in household								0.187	0.158	0.217	0.000	0.199	0.196	0.202
Age category (reference category: younger than 30 years)														
30-35years	-0.359	-0.41	-0.308	0.000	-0.4	-0.405	-0.395	-0.392	-0.438	-0.345	0.000	-0.407	-0.412	-0.403
35-40years	-0.44	-0.49	-0.39	0.000	-0.489	-0.493	-0.484	-0.618	-0.665	-0.572	0.000	-0.673	-0.678	-0.669
40-45years	-0.49	-0.54	-0.441	0.000	-0.534	-0.539	-0.529	-0.75	-0.796	-0.704	0.000	-0.819	-0.824	-0.815
45-50years	-0.52	-0.569	-0.47	0.000	-0.596	-0.601	-0.592	-0.807	-0.852	-0.761	0.000	-0.882	-0.886	-0.877
50-55years	-0.423	-0.472	-0.374	0.000	-0.51	-0.515	-0.506	-0.848	-0.895	-0.8	0.000	-0.945	-0.95	-0.941
55-70years	-0.286	-0.332	-0.239	0.000	-0.4	-0.405	-0.396	-1.009	-1.059	-0.959	0.000	-1.119	-1.124	-1.114
Education (reference category: ISCED 1 or lower)														
ISCED2	-0.113	-0.16	-0.066	0.000	-0.098	-0.103	-0.093	0.037	-0.017	0.091	0.178	0.079	0.073	0.084
ISCED3	-0.751	-0.797	-0.704	0.000	-0.793	-0.798	-0.789	-0.397	-0.449	-0.345	0.000	-0.423	-0.428	-0.418
ISCED4	-0.547	-0.624	-0.469	0.000	-0.526	-0.533	-0.518	-0.488	-0.568	-0.407	0.000	-0.443	-0.451	-0.435
ISCED5 or higher	-1.316	-1.368	-1.265	0.000	-1.379	-1.384	-1.374	-0.971	-1.027	-0.915	0.000	-1.03	-1.036	-1.025
Degree of urbanisation (reference category: Cities)														
Towns and suburbs	-0.167	-0.198	-0.136	0.000	-0.167	-0.171	-0.164	-0.022	-0.053	0.009	0.164	-0.015	-0.018	-0.012
Rural area	-0.146	-0.177	-0.116	0.000	-0.16	-0.163	-0.157	0.064	0.034	0.095	0.000	0.066	0.063	0.069

Table 4. Results of the multilevel linear regression model estimating the length of time since the respondent last worked (measured in months) for males and females (truncated version, sector and country are not reported)

Variable	Males			Females		
	Estimate	Std. Error	p-value	Estimate	Std. Error	p-value
Intercept	4.881	2.205	0.027	9.331	2.395	0.000
Gay	1.627	0.934	0.081	-2.822	1.101	0.010
Unemployment rate	0.277	0.019	0.000	0.227	0.021	0.000
Working partner	-1.184	0.096	0.000	-1.010	0.117	0.000
Child	N/A	N/A	N/A	2.161	0.163	0.000
Search method	-0.102	0.016	0.000	-0.133	0.020	0.000
Age category (reference category: younger than 30 years)						
30-35years	2.137	0.279	0.000	2.988	0.293	0.000
35-40years	3.428	0.270	0.000	3.756	0.288	0.000
40-45years	4.519	0.268	0.000	3.770	0.285	0.000
45-50years	5.721	0.269	0.000	4.652	0.287	0.000
50-55years	7.603	0.268	0.000	6.550	0.298	0.000
55-70years	9.721	0.251	0.000	9.123	0.314	0.000
Education (reference category: ISCED 1 or lower)						
ISCED2	-0.845	0.220	0.000	-0.232	0.300	0.440
ISCED3	-2.746	0.224	0.000	-1.704	0.299	0.000
ISCED4	-2.697	0.392	0.000	-1.507	0.540	0.005
ISCED5 or higher	-4.297	0.269	0.000	-3.370	0.331	0.000
Urbanisation (reference category: Cities)						
Towns and suburbs	-0.610	0.171	0.000	-0.495	0.199	0.013
Rural area	-2.988	0.166	0.000	-1.501	0.193	0.000
Quarter (reference category: First quarter)						
Second quarter	2.142	0.047	0.000	2.154	0.056	0.000
Third quarter	4.129	0.054	0.000	4.189	0.064	0.000
Fourth quarter	6.145	0.058	0.000	6.066	0.069	0.000