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Botti, Fabrizio and Conte, Anna and D'Ippoliti, Carlo

Department of Economics, University of Perugia, WBS, EQM Department, University of Westminster, London, Department of Statistics, University of Rome "La Sapienza"

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Fabrizio Botti
Department of Economics, University of Perugia, Italy (fabrizio.botti@unipg.it)

Anna Conte
WBS, EQM Department, University of Westminster, London (a.conte@westminster.ac.uk)

and Carlo D'Ippoliti
University of Rome "La Sapienza" (carlo.dippoliti@uniroma1.it), corresponding author
Department of Statistics, Viale Regina Elena 295, 00161 Rome

Abstract: The present study contributes to the literature on the economics of discrimination by considering some consequences of sexual orientation discrimination. Specifically, we analyse LGB people's decision to "come out" within an identity utility theoretical framework, and estimate the model on a representative sample of the EU population. We aim to investigate the factors that systematically affect a person's inclusion in competing definitions of LGB people and the potential role of sample selection biases, such as the one leading to the commonplace mistaken assumption of the affluence of gay men. Interval regression estimates of the risk attitude coefficient within the choice to come out suggest that heterogeneity in the objective dimensions of socio-economic welfare may explain a sample selection between "out" and "closeted" LGB people, which lies behind the "myth of gay affluence".

JEL codes: J16, J15, D81

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1. Introduction

Within the expanding literature on the economics of discrimination, the discrimination faced by lesbian, gay and bisexual people (LGB henceforth)[1][2] is mostly overlooked. This is the result of very problematic issues connected with the availability of data which pose major statistical constraints to researchers' ability to produce quantitative studies. Klawitter (2015) reports that, in refereed-journal published papers on the topic, researchers had to settle for as few as 20 relevant observations to estimate wage gaps for gay or lesbian workers.

While other disciplines have analysed the life experiences of LGB people with qualitative methods, quantitative studies on sexual orientation discrimination are specifically rare due to the intrinsic characteristics of the LGB population. Difficulties in gathering and analysing data on LGB people arise from the sheer dimension of such a population (SMART 2009; Joloza et al. 2010).[3] Further difficulties arise from the fact that, given the often hostile environment that they perceive to live in, LGB people may choose to lie in scientific surveys. This may depend, for example, on the interview method (Berg and Lien 2006; Coffman *et al.* 2013).

The aforementioned problem is compounded with a larger, conceptual issue in the very description of the universe under study. Indeed, at least three competitive definitions of who is an LGB person can be found in the literature (Klawitter 2015). The most diffused definition in empirical studies is based on people's *behaviour*. This sometimes refers to their *sexual* behaviour but, as it is more common in economic studies, it may instead concern co-living or being in a same-sex relationship. Differently, psychological and sociological studies often carry out empirical analyses relying on *identity*-based definitions (e.g., self-declaration or self-representation as an LGB person) and/or on definitions related to the responder's inner *feelings* (e.g., having ever felt attracted by someone of the same/opposite sex, etc.). Screening a sample of people on the basis of these three definitions produces overlapping but in no way identical sub-samples, as for example a person may engage in sexual activities with people of the same sex and yet she may not perceive herself as homo- or bisexual.

These issues add to the difficulties of studying the LGB population. As documented by Carpenter (2012), estimates of the LGB wage gap in the USA based on self-reported definitions of sexuality (i.e., identity-based definitions) tend to produce larger differences between LGB workers' incomes and the heterosexual population than definitions based on behaviour. Similarly, from a meta-analysis of 63 published studies, Klawitter (2015) reports a statistically significant impact of the definition of a person's sexuality on the parameter estimates of wage regressions.

By studying which factors systematically affect a person's inclusion in one or more of the above-mentioned aggregates of LGB people, and specifically the relation between behavioural- and identity-based definitions, the present paper contributes to the literature on sexual orientation discrimination. In particular, the object of investigation is whether and how these differences may arise from a sample selection bias.

However, despite these difficulties, a growing number of studies document substantial sexual orientation discrimination in the labour market, both in the field of human resources policies (see, e.g., Ahmed *et al.* 2013, Patacchini *et al.* 2012, Drydakis 2009, and Weischselbaumer 2003)

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[2] The acronym is not exhaustive of the broad range of possible gender identities commonly investigated and identified in queer studies and the so-called LGBI community. The present work focuses on sexual orientation discrimination and the life experiences of LGB only due to issues of data availability. For a review of the literature on the discrimination against transsexual and transgender people, see e.g. Botti and D'Ippoliti (2016).

[3] The small size of the LGB population makes general population surveys virtually ineffective as a data collection method, unless very large samples are collected. However, overly large samples specifically aimed at collecting a minimum number of observations for this (or other) minority often imply very low cost efficiency, while recourse to non-representative, *ad hoc* or convenience samples is purposely avoided because the generalizability of the results is often unclear (SMART 2009). For these reasons, the UK Office for National Statistics recommended the inclusion of relevant questions in a wide range of surveys that are already recurrently carried out by national statistics offices (Joloza et al. 2010).

and earnings (see Klawitter 2015 for a recent review), and the housing market (Leppel 2007, and Ahmed and Hammarstedt 2009), as well as several other domains such as health or education (see Botti and D'Ippoliti 2014 for a comprehensive review). Fewer studies focus on gender identity discrimination, possibly because the abovementioned empirical constraints are even stricter when one wants to study the life experiences of trans people (Lombardi *et al.* 2001, Botti and D'Ippoliti *forthcoming*).

More recent works tend to evidence how being open about one's belonging to the LGB population is a significant correlate of wellbeing in its multi-faceted acceptations. Botti and D'Ippoliti (2014) concentrate on its more purely economic aspects, Mills *et al.* (2004) on the psychological perspective, Gusmano (2009), instead, examines the risk of being subject to discrimination. Studies focusing on the role played by individual income in the process of disclosure raise valuable pieces of evidence that challenge the common assumption that gay men and lesbians are more affluent than heterosexuals (Badgett 2001, Badgett *et al.* 2013, Botti e D'Ippoliti 2014). However, these studies lack a formal theoretical approach.

In this work, we study LGB people's decision to "come out" within an identity utility theoretical framework. This assumes that being out increases individuals' identity utility.[4] Since Akerlof and Kranton's (2000) seminal contribution, social identity models have been applied to the investigation of various subjects of economic concern (see Akerlof and Kranton 2010 for an overview) and the relevance of this framework has been assessed in several laboratory experiments (Chen and Chen 2011, Chen and Li 2009, Currarini and Menge 2012). We frame the individual decision as a risky choice, in so far as "out" LGB people face a higher risk of discrimination than "closeted" LGB people. Accordingly, we develop a model of expected identity utility and estimate it on a representative sample of the EU population.

2. The decision to come out

2.1. Disclosure in the literature

In recent years, a growing body of literature focused on the relationship between sexual orientation and earnings, discussing on the possible causes of a LGB wage penalty (for a comprehensive review see Botti and D'Ippolti, 2014; see Klawitter, 2015 for a meta-review).

Few studies discriminate between disclosed and closeted individuals within the LGB population, thus possibly being exposed to the risk of producing biased empirical results. Plug and Berkhout (2008) collect information on the workplace disclosure of male graduates in the Netherlands in order to distinguish possible discrimination and selection effects in the LGB earnings gap. Comolli (2005) explores the relationship between LGB earnings and disclosure in US cities, though ignoring possible differences with the heterosexual workers. In the framework of a multidimensional assessment of social exclusion, Botti and D'Ippoliti (2014) distinguish between LGB people who are open about their sexuality and those who choose not to declare it. All these studies highlight strong heterogeneity within the LGB population, between people who are out and those who are not.

A handful of studies explored the decision-making process of disclosure and its effects. Coming out is a complex process of acceptance and disclosure of an individual's sexual orientation; the economic literature mostly focused on disclosure of sexual orientation in the working environment. Studies of nondisclosure in other disciplines have documented negative health and psychological effects from concealing one's sexual orientation also in healthcare settings documenting differential patterns of nondisclosure within the LGB population (see Durso and Meyer 2013).

[4] The issue of voluntary disclosure is in principle more connected to identity than to behaviour, given the political relevance of "coming out" in the LGB movement since the '70s of last century (Badgett, 1996).

Escoffier (1975) suggests that individual preferences with respect to disclosure affect occupational choices according to the different degree of tolerance in alternative categories of jobs (with the distinction of "conservative", "liberal", and "ghetto" occupations). Several studies relate coming out in the workplace to greater job performance and productivity (Drydakis 2011, Everly *et al.* 2012), and to a safer and cooperative working environment (Day & Schoenrade, 1997; Griffith & Hebl, 2002, Rostosky & Riggle, 2002; for a comprehensive review see Ozeren 2014), while underperformance is associated to LGB employees' cognitive efforts to hide their sexual orientation (Madera, 2010).

Extant literature especially fails to capture the role of individuals' socioeconomic status in the decision to come out. According to a cost-benefit approach carried out by Badgett (1996), income potentially affects the decision process of disclosure in the workplace in a conflicting way: on the one hand, individuals with higher income face higher potential opportunity costs, e.g. in terms of job loss (Schneider, 1986); on the other hand, greater ability to overcome negative reactions to disclosure is associated to wealth, authority and power. In the framework of an investment model of disclosure (Woods, 1993) explicitly accounting for risk (income at risk as a result of coming out) and future benefits (psychological and political), individuals with higher income are more able to pay for disclosure.

In Plug and Berkohout (2008) the earnings gap suffered by gay and bisexual people is mainly driven by closeted LGB workers, while those who came out in the workplace exhibit wages equivalent to heterosexual workers even in a labour market that discriminates. The authors consider Akerlof and Kranton's (2000) identity utility model as a possible interpretation of the selection mechanism.

According to Badgett (2001), those who enjoy better socio-economic conditions are more likely to disclose their sexual orientation. Accordingly, the direction of causality would proceed from greater earnings to being out. This would give rise to stereotypical and misleading impression that LGB people would be richer than average, due to a "sample selection" issue (the "myth of gay affluence"). The stereotype is however challenged by evidence of a significant earnings gap as well as of a sexual orientation "poverty gap", recently reported by Badgett *et al.* (2013). For the case of Italy, Botti and D'Ippoliti (2014) detect a distinctly higher social exclusion suffered by closeted LGB people (although only emerging when objective variables, and not psychological well-being, are considered). Their data also suggest the existence of a selection effect, since those who are open about their sexual orientation often exhibit average or good levels of social inclusion.

2.2. Data sources and descriptive statistics

We use data from Eurobarometer 71.2 (June 2009) and 77.4 (June 2012), collecting information on a representative sample of the EU population aged 15 years and over in 2009 and 2012 respectively. Eurobarometer is a recurrent survey commissioned by the European Commission to assess EU citizens' opinions on a number of topics of interest for European policymakers. In the two waves selected, at separate stages of the interview interviewees were asked two relevant questions:

> *i*) if the person considers herself to be part of any among seven listed minority groups (among which "other", "none" and "don't know" were included), including the option "a sexual minority (like being a gay, lesbian, or bisexual)";
> *ii*) if during the previous 12 months the person has personally felt discriminated against or harassed on the basis of one or more among 11 possible grounds, among which "sexual orientation (being gay, lesbian or bisexual)".

Question *i*) in fact asks individuals about their sexual orientation and/or gender identity, and the interviewees' answers are both a measure of their identity and of their willingness to disclose it

to the interviewer. Question *ii*) is posed at a much earlier stage of the interview, and concerns more life experiences than identity. Yet, obviously the answer to this question may indirectly convey information on the person's sexual orientation.

As noted in the introduction, previous literature already remarked that there is no a priori reason to expect an exact overlapping of the distributions of answers to the two questions. Indeed, Table 1 shows how in a merged 2009 and 2012 dataset, containing more than 56,000 observations, less than 1% of the sample selected the relevant answer to one of the two questions, and 0,2% to both. Overall, 1,056 individuals directly or indirectly affirmed their LGB identity, of which 520 did so directly (i.e. choose the corresponding answer to question *i* above) and 536 did only indirectly (i.e. they declared of having felt discriminated against because of their sexual minority identity).

In what follows, for ease of terminology we will refer to the condition of an out LGB person who experienced discrimination as "scenario *a*", an out LGB person who did not experience discrimination as "scenario *b*" and a person who only indirectly communicated her identity to the interviewer (i.e. she is not out, but she experienced discrimination anyways) as "scenario *c*". The last cell in table 1 comprises "scenario *d*": it includes all people of which we do not know the sexual orientation, because they may be heterosexual (and therefore not part of a "sexual minority", in the questionnaire's words) or they are LGB people who chose not to disclose their identity and they did not experience discrimination (or they do not wish to reveal about it).

Table 1. Distribution of the sample by scenario

		Experienced discrimination: **Yes**	Experienced discrimination: **No**	**Total**
Self-identified ("out") LGB	**Yes**	Scenario *a*: 0.20%	Scenario *b*: 0.73%	0.92%
	No	Scenario *c*: 0.95%	Scenario *d*: 98.13%	99.08%
	Total	1.15%	98.85%	N = 56,390

Notes: shaded areas denote the "LGB sample". Pearson $Chi^2(1) = 1900$***

Descriptive statistics of these subsamples (reported in table A1 in the online appendix) show that LGB people exhibit a lower mean and median age and a relatively higher share of men than the rest of the sample. These differences are more marked for the out LGB subsample, and indeed restricting the comparison to non-out LGB individuals (i.e. those whom we observe, that is who declared they were discriminated against), the sex distribution is not statistically different from the rest of the sample.

Comparing the available information on individuals' economic conditions, it emerges that LGB people exhibit a statistically significant lower share of homeowners (the only indicator for accumulated wealth in the survey). However, a divarication emerges between out and non-out LGB people in other domains. Considering the accumulation of human capital, it emerges that out LGB have significantly higher educational attainments than the rest of the sample, whereas non-out LGB people do not. Similarly, self-perceived social status (on a scale from 1 to 10) is significantly higher for out LGB people than the average, while for non-out LGB people it is not different from the rest of the population.

These findings are confirmed by simple probit estimates of the probability of being out (for the whole sample and for LGB people only) and of having experienced sexual orientation discrimination. Concerning the former, educational attainments are found to significantly increase the probability of being out, jointly with a positive time trend (denoted by a "year 2012" dummy variable) and the person's political orientation. The latter variable is measured in the survey on a 1

to 10 left-right ordinal scale, and it emerges that self-defined politically "centre" people as well as those who refuse to answer or do not know what to answer exhibit significantly lower probabilities of being out. Accordingly, given the politicization of LGB rights issues in most EU Member States, it may be possible that individual preferences impact on the decision to come out.

Concerning the factors associated with a higher risk of experiencing discrimination, education is not found as a significant correlate, whereas certain occupations are. Not surprisingly, being out is estimated to increase the probability of being discriminated against by as much as 150%.

In conclusion, it would seem that Eurobarometer data provides some evidence in favour of the "myth of gay affluence" hypothesis, in so far as it emerges that out LGB people fare, in economic terms, better than the average, whereas non-out LGB people do not. However, a descriptive analysis must necessarily suffer from the potential bias – of unknown empirical relevance – arising from sample selection issues. Indeed, as already noted, any investigation employing random population surveys cannot observe the whole LGB population, because a number of LGB people may decide not to disclose their identity to the interviewer. In our case, "scenario *d*" in Table 1 encompasses both heterosexual and closeted LGB people, and therefore even our "LGB sample" does not comprise the whole LGB population in the sample.

In order to overcome this potential source of bias, and to study causal links, the next section describes an economic model of the decision to come out, which is then estimated in section 4.

Table 2. Probit estimates of the probabilities of being "out" and of experiencing discrimination, marginal effects

	Probability of being out			Probability of experiencing discrimination		
	Whole sample	**LGB**	**Discriminated**	**Whole sample**	**LGB**	**Out**
Year: 2012	0.171***	0.406***	0.523***	0.0269	-0.325***	-0.0327
	[0.0364]	[0.105]	[0.181]	[0.0343]	[0.105]	[0.182]
Age	-0.0187***	-0.0140	-0.0454**	-0.00600	-0.0263	-0.0692**
	[0.00621]	[0.0149]	[0.0225]	[0.00629]	[0.0169]	[0.0286]
Age quadratic	0.0111*	0.00583	0.0380	0.00346	0.0309*	0.0682**
	[0.00666]	[0.0160]	[0.0243]	[0.00652]	[0.0179]	[0.0313]
Woman	-0.0561	0.0338	-0.0450	-0.0578*	-0.0689	-0.0417
	[0.0351]	[0.0866]	[0.141]	[0.0343]	[0.0901]	[0.153]
Education: secondary	0.0827*	0.244**	0.371*	-0.0262	-0.172	0.127
	[0.0495]	[0.114]	[0.190]	[0.0436]	[0.118]	[0.219]
Education: tertiary	0.0911*	0.202*	0.409**	-0.00951	-0.0731	0.244
	[0.0517]	[0.122]	[0.203]	[0.0477]	[0.125]	[0.223]
Occupation: manager	0.0714	0.104	0.261	-0.00686	-0.0460	0.513
	[0.0853]	[0.208]	[0.425]	[0.0830]	[0.209]	[0.454]
Occupation: white collar	0.119	0.0251	0.954**	0.127*	0.329	1.167***
	[0.0821]	[0.199]	[0.392]	[0.0751]	[0.203]	[0.437]
Occupation: manual worker	0.108	0.186	0.788**	-0.00797	0.0373	0.718*
	[0.0763]	[0.184]	[0.379]	[0.0709]	[0.184]	[0.416]
Occupation: house person	0.0313	-0.00741	0.702*	0.114	0.242	0.987**
	[0.101]	[0.227]	[0.426]	[0.0848]	[0.233]	[0.502]
Occupation: unemployed	0.109	-0.165	0.517	0.175**	0.372*	1.014**
	[0.0878]	[0.207]	[0.400]	[0.0780]	[0.214]	[0.458]
Occupation: retired	0.0457	0.0748	0.499	0.0241	0.102	0.678
	[0.0907]	[0.213]	[0.427]	[0.0807]	[0.217]	[0.479]
Occupation: student	-0.00463	0.0602	0.770*	0.00105	0.00407	0.290
	[0.100]	[0.239]	[0.448]	[0.0969]	[0.245]	[0.487]
Home ownership	-0.0994**	-0.0713	-0.103			
	[0.0395]	[0.0980]	[0.157]			
Political orientation: centre	-0.0989**	-0.181*	-0.155			
	[0.0435]	[0.109]	[0.183]			
Political orientation: right	-0.0191	-0.0927	-0.0196			
	[0.0472]	[0.120]	[0.201]			
Political orientation: no answer	-0.250***	-0.296**	-0.0361			
	[0.0567]	[0.134]	[0.211]			
Out LGB				1.499***		
				[0.0665]		
Constant	-1.734***	0.472	-0.434	-2.131***	0.939**	-0.0116
	[0.178]	[0.419]	[0.686]	[0.187]	[0.473]	[0.819]
Observations	56,201	1,052	536	56,390	1,050	478
Correctly classified	99.07%	68.06%	81.34%	98.85%	68.67%	79.29%

*** p<0.01, ** p<0.05, * p<0.1

Notes: Standard errors in brackets. Reference categories: left-wing political orientation (values 1-4), primary education, self-employed. Control variables include country fixed effects (33), 3 dummy variables denoting the size of the community in which the person lives, 15 dummy variables denoting the structure of the household in which the person lives. Missing observations with respect to table 1 have been dropped in the estimation because of perfect prediction.

3. A model of Expected Identity Utility

Following Akerlof and Kranton (2000, 2005), we assume that individuals gain utility not only from their actions (consumption, leisure time, etc.) but also from those aspects of social life that may be traced back to their identity. Accordingly, an individual *i*'s utility is defined as

$$U_i = U(X_i, I_i) \quad (1)$$

where X_i is a matrix including *i*'s actions (a_i), other individuals' actions (a_{-i}) and possibly a number of social or contextual variables. I_i is the argument of individual *i*'s utility function that is related to her identity, determining the "identity utility". Similarly to X_i, I_i depends on *i*'s and other individuals' actions, but it also depends on *i*'s individual characteristics (b_i) and a number of social categories (c_i) to which she belongs and/or she identifies herself with:

$$I_i = I(a_i, a_{-i}, b_i, c_i) \quad (2)$$

We focus on a specific social group with which the individual may identify, that is LGB people. Accordingly, c_i can take on two values: $c_i = 1$ if *i* is an LGB person, and $c_i = 0$ otherwise. For $c_i = 1$, among *i*'s several possible actions, we focus on the decision to come out, denoted by the variable O_i, which can take on the value 1 if *i* publicly declares her belonging to the LGB social category, and 0 otherwise. Among other people's actions that may impact on *i*'s utility, we single out acts of discrimination on grounds of *i*'s sexual orientation (*disc*). Accordingly, a_{-i} takes on value *disc*, if *i* experiences discrimination, and 0 otherwise.

In our baseline model, we assume that for all LGB people (i.e., if $c_i = 1$) identity utility is higher if they decide to come out (the assumption will be relaxed at a later stage):

$$I_i(O_i = 1 \mid a_{-i}, b_i) > I_i(O_i = 0 \mid a_{-i}, b_i) \quad (3)$$

For all individuals, we assume that being discriminated against reduces utility, producing psychological costs and/or objective economic damage:

$$U_i(a_{-i} = 0 \mid X_i, I_i) > U_i(a_{-i} = disc \mid X_i, I_i) \quad (4)$$

We can therefore define the utility of an out LGB person who suffered discrimination as

$$U_i[X_i, disc, I(b_i, c_i, O = 1)] \quad (6)$$

and the utility of an out LGB person who did not experience discrimination as

$$U_i[X_i, 0, I(b_i, c_i, O = 0)] \quad (6)$$

In analogy with the four scenarios described in section 2.2, to simplify notation, let us define $U_i[X_i, disc, I(b_i, c_i, O = 1)] \equiv U_i(a)$, and $U_i[X_i, 0, I(b_i, c_i, O = 0)] \equiv U_i(b)$. Given [4], $U_i(a) < U_i(b)$. Depending on a number of observable individual characteristics (e.g., living in a household composed of only two adults of the same sex, etc.), anyone may fall victim of discrimination on other people's assumption of her sexual orientation (regardless of the assumption being true or wrong). Thus, assuming rational expectations, for each LGB person the expected probability of being discriminated if she comes out, $p_i(a)$, is a function of her relevant observable characteristics, including being out, with $p_{i|O=1} > p_{i|O=0}$. Or, using the same symbols adopted for *U*, $p_i(a) > p_i(c)$.

Accordingly, the expected utility of an LGB person *i*, in case she decides to come out, is

$$EU_{i \mid O=1} = p_i(a) \cdot U_i(a) + [1 - p_i(a)] \cdot U_i(b) \quad (7)$$

If i decides not to disclose her sexual orientation, she also faces a risky prospect, of which the expected utility is given by

$$EU_{i\,|\,O=0} = p_i(c) \cdot U_i[X_i, disc, I(b_i, c_i, O = 0)] + [1 - p_i(c)] \cdot U_i[X_i, 0, I(b_i, c_i, O = 0)] \equiv$$
$$\equiv p_i(c) \cdot U_i(c) + [1 - p_i(c)] \cdot U_i(d) \quad (8)$$

If i has expected utility preferences, she will decide to come out if

$$\Delta U_i = EU_{i\,|\,O=1} - EU_{i\,|\,O=0} > 0 \quad (9)$$

In this model, the decision to come out depends on the values of $p_i(a)$ and $p_i(c)$, which determine the risk of the two lotteries, and i's preferences towards risk. The model can be extended to allow for heterogeneity in individual preferences. For example, one may allow for individuals to simultaneously identify with more than one social category.

Specifically, we extend the identity utility function in [2] by considering a second social category with which i may identify, summarising her political orientation (lr_i).[5] Accordingly, we allow for heterogeneity in individuals' preferences towards coming out by replacing the hypothesis in [3], that all LGB individuals gain identity utility from coming out, with the following:

$$I_i(O_i = 1 \mid a_{-i}, b_i, lr_i) \gtreqless I_i(O_i = 0 \mid a_{-i}, b_i, lr_i) \quad (3 \text{ bis})$$

In this extended model, the identity utility gains from coming out vary across individuals: they are mediated by i's political self-placement, and for some individuals they may even take on negative values (denoting identity utility losses). Accordingly, the individual will decide to disclose her sexual orientation if:

$$\Delta U_i = \{p_i(a) \cdot U_i\,(a \mid lr_i) + [1 - p_i(a)] \cdot U_i\,(b \mid lr_i)\} - \{p_i(c) \cdot U_i\,(c \mid lr_i) + [1 - p_i(c)] \cdot U_i\,(d \mid lr_i)\} > 0$$
(9 bis)

3.1. Estimation strategy

We proxy individuals' expectations of suffering sexual orientation discrimination if they come out and if they do not, denoted by $p_i(a)$ and $p_i(c)$, respectively, through the predicted values of the probit models discussed in section 2.2. $p_i(a)$ is estimated on out LGB individuals only, whereas $p_i(c)$ is estimated on the whole sample of non-out LGB individuals because we do not assume that closeted LGB individuals systematically exhibit a probability of being discriminated against different from heterosexual individuals if this cannot be explained by some observable characteristic. Available evidence for Austria (Weichselbamer 2003), Greece (Drydakis 2011), Italy (Patacchini *et al.* 2012), and Sweden (Ahmed et al., 2013), and suggests that heterosexual individuals who carry visible indicators of a potential homosexual or bisexual orientation risk being discriminated against not dissimilarly from LGB people.

We estimate the payoffs in [9] and [9 bis] by the linear predictions of ordered probit models of individuals' self-assessed life satisfaction. In the Eurobarometer survey, the latter is measured on a 1 to 4 ordinal scale, respectively denoting the answers "very satisfied", "fairly satisfied", "not very satisfied" and "not satisfied at all" (with a further "don't know" option). As noted in section 2.2, for scenario d (not out LGB, not discriminated against) it is impossible to distinguish the answers by closeted LGB individuals from those of their heterosexual counterparts. However, while

[5] As noted in section 2.2, in the Eurobarometer survey *lr* is measured on a one-dimensional 1 to 10 left-right ordinal scale (allowing for individual non response and including a residual "don't know" answer).

this constraint was not relevant for the estimated probabilities of being discriminated, it poses additional limitations to our analysis. Specifically, in order to obtain unbiased estimates of $U_i\ (d)$ and $U_i\ (d \mid lr_i)$, it is necessary to make two further assumptions.

The first assumption is that for each person the identity utility gain (loss) from coming out, given all other variables, is independent of the possible subsequent experience of discrimination. As a consequence, with reference to the extended model:

$$\Delta I_i = (O_i = 1 \mid disc, b_i, lr_i) - I_i(O_i = 0 \mid disc, b_i, lr_i) = (O_i = 1 \mid 0, b_i, lr_i) - I_i(O_i = 0 \mid 0, b_i, lr_i) \quad (10)$$

In other words, for each individual (though not necessarily across individuals) $U_i\ (a \mid lr_i) - U_i\ (c \mid lr_i) = U_i\ (b \mid lr_i) - U_i\ (d \mid lr_i)$.

The second necessary assumption is that for each person the utility loss from being discriminated against, given all other relevant variables, is independent of being out, that is (with reference again to the extended model):

$$\Delta U_i = U_i(a_{-i} = 0 \mid X_i, I_i, O_i = 1) - U_i(a_{-i} = disc \mid X_i, I_i, O_i = 1) = U_i(a_{-i} = 0 \mid X_i, I_i, O_i = 0) - U_i(a_{-i} = disc \mid X_i, I_i, O_i = 0) \quad (11)$$

In other words, for each individual, $U_i\ (a \mid lr_i) - U_i\ (b \mid lr_i) = U_i\ (c \mid lr_i) - U_i\ (d \mid lr_i)$. Given [10] and [11], for each person the four U_i can be proxied by the linear predictions from the ordered probit regressions reported in table A2 in the online appendix. For each individual, these values are standardized to take on values between 0 and 1 (Wakker, 2008). Descriptive statistics of the resulting payoffs are reported in table A3.

Denoting the predicted payoffs respectively by U_a, U_b, U_c and U_d, and assuming a power-law functional form for the bernoullian utility (i.e., constant relative risk aversion, CRRA), the individual decides to disclose her sexual orientation if

$$\left\{p_i(a) * U_a^{\beta} + [1 - p_i(a)] * U_b^{\beta}\right\} - \left\{p_i(c) * U_c^{\beta} + [1 - p_i(c)] * U_d^{\beta}\right\} > 0 \quad (12)$$

where β is a parameter measuring individuals' attitude towards risk, and $\alpha = 1 - \beta$ is usually interpreted as a measure of risk aversion.

For each individual in the LGB sample we observe one choice: either she is out or not. Given the predicted expected identity utilities, we compute for each person what range of values of β, i.e. what degree of risk aversion, is compatible with the observed choice. This approach is a variant of the Random Preference approach (see, among others, Moffatt et al. 2002), commonly used in experimental economics.

4. Main results and discussion

Given individuals' predicted probabilities of experiencing discrimination and payoffs, their observed choice to disclose (or not) their sexual orientation allows us to identify a set of values of their risk aversion parameter that might have produced such choice. These values are typically half-closed intervals, denoting a minimum or maximum value for β.

For between 48% and 49% of the sample we cannot ascertain whether the observed choice is a clear indication of risk aversion, risk neutrality or risk seeking attitudes, because the intervals of βs compatible with the observed choice include zero (risk neutrality) and positive and/or negative values, as shown in table 3.

For the rest of the sample, the baseline model predicts a substantially higher share of risk-adverse individuals (roughly 50%) with respect to the model with heterogeneity (33%). Such result is not surprising, given that the former model implies that if an individual with a relatively low

probability of experiencing discrimination decides not to disclose her sexual identity, it must be because she is markedly risk adverse (and vice versa). By contrast, the latter model allows for the individual to only weakly desire to come out (or even, in extreme cases, not to obtain utility from coming out at all).

Table 3. Interval estimates of the risk aversion parameter

	Baseline model	**With heterogeneity**
Risk-adverse	50.28%	33.14%
Risk-seeking	0.85%	18.84%
Undetermined	48.86%	48.01%
Left-censored observations	518	472
Right-censored observations	514	564
Interval observations	17	12
Min. uncensored β: mean	-0.033	-0.052
Min. uncensored β: min	-2.241	-2.413
Min. uncensored β: max	0.001	0.001
Max. uncensored β: mean	0.001	0.045
Max. uncensored β: min	-0.001	-0.001
Max. uncensored β: max	1.486	2.259
Observations	1049	1048

For both models considered here, we run interval regression estimates on the sets of feasible βs to investigate whether observable individual characteristics systematically affect LGB people's risk aversion in their crucial choice to come out.

For the baseline model (table 4), age is found to have a very small negative impact on the propensity to risk, while the 2012 time dummy exhibits a small positive impact. A slightly positive constant is found to be not significantly different from zero when other control variables are added.[6]

We subsequently control for objective indicators of economic resources, i.e. human capital and home ownership, subjective assessments of a person or her family's economic and financial security, and subjective assessments of the country's macroeconomic situation.

As shown in table 4, having completed at least secondary education reduces the variance of the estimation errors, but apart from this none of these variables is found to systematically impact on LGB people's risk attitude.

[6] Some country fixed effects turn out to significantly affect the risk aversion parameter both in the baseline model and when allowing for heterogeneity in preferences: further results are available from the authors upon request.

Table 4. Interval regression of the risk aversion parameter, baseline model

	β	ln(σ)	β	ln(σ)	β	ln(σ)	β	ln(σ)
Age	-0.000700*	-0.00492	-0.000708*	-0.00506	-0.000831*	-0.00488	-0.000855*	-0.00556
	[0.000376]	[0.00590]	[0.000416]	[0.00663]	[0.000463]	[0.00658]	[0.000471]	[0.00661]
Woman	-0.00493		-0.00255		-0.000738		-0.000219	
	[0.00738]		[0.00711]		[0.00699]		[0.00692]	
Year: 2012	0.0300*		0.0257*		0.0311*		0.0304*	
	[0.0165]		[0.0148]		[0.0166]		[0.0162]	
Education: secondary		-0.591**	0.0277	-0.793***	0.0271	-0.734***	0.0259	-0.698***
		[0.254]	[0.0172]	[0.282]	[0.0172]	[0.271]	[0.0166]	[0.267]
Education: tertiary		0.0485	0.0196	-0.114	0.0184	-0.338	0.0169	-0.302
		[0.293]	[0.0171]	[0.340]	[0.0165]	[0.347]	[0.0159]	[0.347]
Home owner		-0.305	-0.00245	-0.391	-0.00775	-0.173	-0.00757	-0.155
		[0.240]	[0.00925]	[0.263]	[0.00934]	[0.240]	[0.00923]	[0.238]
Social status: middle					0.00681		0.00653	
					[0.00974]		[0.00959]	
Social status: high					0.0185		0.0175	
					[0.0130]		[0.0127]	
Social status: na/dk					-0.0306		-0.0299	
					[0.0251]		[0.0248]	
HH fin. situation: rather good					-0.0216		-0.0200	
					[0.0162]		[0.0157]	
HH fin. situation: rather bad					-0.0299		-0.0274	
					[0.0199]		[0.0193]	
HH fin. situation: very bad					-0.0397		-0.0370	
					[0.0252]		[0.0244]	
HH financial situation: na/dk					-0.0247		-0.0260	
					[0.0409]		[0.0408]	
Job situation: rather good					-0.00253		-0.00266	
					[0.0121]		[0.0121]	
Job situation: rather bad					0.00376		0.00699	
					[0.0142]		[0.0146]	
Job situation: very bad					-0.00623		-0.00171	
					[0.0175]		[0.0176]	
Job situation: na/dk					0.0161		0.0197	
					[0.0191]		[0.0198]	
Country: bad empl. situation							-0.00107	
							[0.00855]	
Country: bad econ. situation							-0.00994	
							[0.00948]	
Occupation: manager			0.0187		0.0144		0.0159	
			[0.0186]		[0.0180]		[0.0183]	
Occupation: white collar			0.0179		0.0185		0.0175	
			[0.0173]		[0.0179]		[0.0177]	
Occupation: manual worker			0.0212		0.0233		0.0234	
			[0.0167]		[0.0177]		[0.0178]	
Occupation: house person			-0.000893		0.00278		0.00261	
			[0.0180]		[0.0184]		[0.0183]	
Occupation: unemployed			-0.00192		0.00279		0.00251	
			[0.0166]		[0.0172]		[0.0172]	
Occupation: retired			0.0227		0.0225		0.0219	
			[0.0183]		[0.0190]		[0.0187]	
Occupation: student			0.0262		0.0178		0.0164	
			[0.0260]		[0.0233]		[0.0232]	
Country fixed effects	Yes		Yes		Yes		Yes	
Constant	0.0469*	-1.773***	0.00564	-1.587***	0.0236	-1.745***	0.0293	-1.767***
	[0.0280]	[0.571]	[0.0275]	[0.597]	[0.0317]	[0.600]	[0.0328]	[0.595]
Observations	1,049	1,049	1,049	1,049	1,049	1,049	1,049	1,049

*** p<0.01, ** p<0.05, * p<0.1

Notes: Standard errors in brackets. Reference categories: primary education, self-employed, "low" social status, "very good" personal job situation, "very good" household financial conditions. Control variables include country fixed effects (33) and 3 dummy variables denoting the size of the community in which the person lives.

Table 5. Interval regression of the risk aversion parameter, model with heterogeneity in preferences

	β	ln(σ)	β	ln(σ)	β	ln(σ)	β	ln(σ)
Age	-0.000657	-0.00905	-0.000440	-0.0184*	-0.000600*	-0.0794**	-0.000631**	-0.0817*
	[0.000562]	[0.00999]	[0.000458]	[0.00975]	[0.000308]	[0.0343]	[0.000308]	[0.0439]
Woman	0.00261		0.00637		0.00219		0.00292	
	[0.0124]		[0.00830]		[0.00277]		[0.00288]	
Year: 2012	0.0356		0.0216		0.0105*		0.00885*	
	[0.0266]		[0.0163]		[0.00565]		[0.00525]	
Education: secondary		-1.775***	0.0283	-2.413***	-0.00264	-3.312***	-0.000747	-3.436**
		[0.644]	[0.0405]	[0.632]	[0.00670]	[1.121]	[0.00706]	[1.381]
Education: tertiary		-1.033	0.0280	-1.040*	-0.00660	-4.057***	-0.00619	-4.433***
		[0.635]	[0.0477]	[0.598]	[0.00749]	[1.122]	[0.00766]	[1.489]
Home owner		0.343	0.0111	0.971**	0.0103*	3.128***	0.0105*	3.235***
		[0.392]	[0.0101]	[0.449]	[0.00585]	[0.483]	[0.00582]	[0.461]
Social status: middle					-0.00552		-0.00571	
					[0.00645]		[0.00743]	
Social status: high					0.00139		-0.000202	
					[0.00657]		[0.00742]	
Social status: na/dk					0.00143		-0.000583	
					[0.0111]		[0.0128]	
HH fin. situation: rather good					-0.0105		-0.0109*	
					[0.00643]		[0.00616]	
HH fin. situation: rather bad					-0.00836		-0.00753	
					[0.00655]		[0.00564]	
HH fin. situation: very bad					-0.0111		-0.0118	
					[0.00836]		[0.00857]	
HH financial situation: na/dk					-0.0257		-0.0212	
					[0.0234]		[0.0199]	
Job situation: rather good					0.00286		0.00359	
					[0.00374]		[0.00367]	
Job situation: rather bad					-0.00488		-0.00214	
					[0.00574]		[0.00547]	
Job situation: very bad					-0.000886		0.00109	
					[0.00545]		[0.00502]	
Job situation: na/dk					0.0176*		0.0209*	
					[0.00953]		[0.0108]	
Country: bad empl. situation							-0.00172	
							[0.00350]	
Country: bad econ. situation							-0.00476	
							[0.00336]	
Occupation: manager			0.0519		-0.00272		-0.00256	
			[0.0382]		[0.00661]		[0.00585]	
Occupation: white collar			0.0270		-0.00249		-0.00438	
			[0.0242]		[0.00556]		[0.00585]	
Occupation: manual worker			0.0228		-0.00487		-0.00566	
			[0.0208]		[0.00528]		[0.00500]	
Occupation: house person			0.00446		0.000165		-0.00395	
			[0.0188]		[0.00514]		[0.00548]	
Occupation: unemployed			-0.000220		-0.0258**		-0.0242**	
			[0.0206]		[0.0128]		[0.0119]	
Occupation: retired			0.0293		0.00402		0.00328	
			[0.0250]		[0.00529]		[0.00454]	
Occupation: student			0.160		0.0121		0.00962	
			[0.104]		[0.00991]		[0.00841]	
Country fixed effects	Yes		Yes		Yes		Yes	
Constant	0.00933	-0.330	-0.0496	-0.218	0.0410*	2.137	0.0444*	2.359
	[0.0299]	[0.754]	[0.0508]	[0.752]	[0.0240]	[2.291]	[0.0251]	[3.082]
Observations	1,048	1,048	1,048	1,048	1,048	1,048	1,048	1,048

*** p<0.01, ** p<0.05, * p<0.1

Notes: Standard errors in brackets. Reference categories: primary education, self-employed, "low" social status, "very good" personal job situation, "very good" household financial conditions. Control variables include country fixed effects (33) and 3 dummy variables denoting the size of the community in which the person lives.

As shown in table 2, human capital is found as a significant correlate of the probability to be out. Thus, its lack of impact on individuals' risk propensity signals that LGB people with higher

educational attainments face an 'easier' choice, i.e. for them the expected value of the identity utility of coming out is higher and/or the risk of coming out is lower than for people with lower educational attainments, as shown in table 6. Such less risky choice on the side of higher educated individuals may also explain the lowering impact of educational attainments on the variance of the residuals. Jointly, these results suggest that heterogeneity within the LGB population in objective dimensions of socio-economic welfare may explain the "sample selection" between out and closeted LGB people that lies behind the "myth of gay affluence" (first denounced by Badgett 2001).

Allowing for heterogeneity in individual preferences on coming out (table 5), similar results are obtained concerning demographic variables and the constant term. Concerning the indicators of economic resources, it is found that uncertainty (or unwillingness to answer) on one's job position has a small, mildly significant impact on the propensity to risk. However, a larger, more statistically significant and negative impact is found for the condition of being unemployed. Thus, it would seem that at least for the unemployed the myth of gay affluence is not only a matter of constraints (as found above) but of preferences (towards risk) too.

Table 6. Human capital and the choice to come out

	Primary education			**Secondary education**			**Tertiary education**		
	Mean	*St. Dev.*	*Median*	*Mean*	*St. Dev.*	*Median*	*Mean*	*St. Dev.*	*Median*
				Baseline model					
U(a)	0.8745	0.0098	0.8717	0.8735	0.0075	0.8717	0.8829	0.0218	0.8717
U(b)	1	0	1	1	0	1	1	0	1
U(c)	0.8204	0.0140	0.8164	0.8189	0.0108	0.8164	0.8325	0.0313	0.8164
U(d)	0.9459	0.0042	0.9447	0.9454	0.0032	0.9447	0.9495	0.0094	0.9447
EU(Out)	0.9693	0.0118	0.9707	0.9700	0.0119	0.9730	0.9740	0.0123	0.9759
EU(Closeted)	0.9438	0.0049	0.9431	0.9434	0.0039	0.9433	0.9479	0.0101	0.9436
				Model with heterogeneity					
U(a)	0.8813	0.0175	0.8857	0.8824	0.0161	0.8857	0.8927	0.0262	0.8857
U(b)	0.9940	0.0116	1	0.9955	0.0104	1	0.9960	0.0099	1.0000
U(c)	0.8297	0.0414	0.8119	0.8259	0.0401	0.8119	0.8356	0.0493	0.8226
U(d)	0.9423	0.0437	0.9261	0.9389	0.0429	0.9261	0.9389	0.0428	0.9261
EU(Out)	0.9664	0.0167	0.9715	0.9686	0.0163	0.9736	0.9730	0.0166	0.9760
EU(Closeted)	0.9405	0.0436	0.9253	0.9371	0.0428	0.9253	0.9375	0.0428	0.9257
				Predicted probability to experience discrimination					
P(a)	0.2420	0.0883	0.2286	0.2355	0.0907	0.2108	0.2152	0.0846	0.1975
P(c)	0.0162	0.0116	0.0125	0.0156	0.0131	0.0106	0.0130	0.0107	0.0094

5. Conclusions

So far, quantitative economic studies on social orientation discrimination have been affected by major statistical challenges mostly connected with the availability and quality of data. The small size of the population spiced with problems of misreporting and non-response on the one hand, and the alternative definitions of the target group on the other hand, both undermine statistical analyses that aims to capture the effects of discrimination.

The present paper aimed at identifying the factors that systematically determine a person's inclusion in one or more of the possible aggregates of LGB people. Complying with a certain definition and being consequently included or excluded in the sample object of investigation may

generate severe selection biases, e.g. between out and closeted LGB people. We maintain that the "myth of gay affluence", that is the widespread belief that lesbians and gay men are more affluent than the general population, is a consequence of such biases.

Following Akerlof and Kranton (2000), we study LGB people's decision to "come out" by means of an expected identity utility model. In such model, the decision to come out depends on the risk of experiencing discrimination as well as the identity utility of freely expressing one's sexual orientation.

We estimate such model on Eurobarometer data, collected from a representative sample of the EU population aged 15 years and over in 2009 and 2012. For each individual, given the observed choice to disclose (or not) her sexual orientation, the probabilities (predicted from the data) of experiencing discrimination and the payoffs associated with each outcome, we identify a range of values of the coefficient of risk attitude compatible with her observed choice. The ranges so obtained are used as dependent variables in an interval regression model. The purpose of this exercise is to investige whether observable objective indicators of economic resources systematically affect LGB people's attitude to risk and, consequently, their decision to disclose their sexual identity.

We find that the disclosure decision by higher educated individuals is shown to be significantly less risky, while being unemployed makes people more risk adverse. Our analysis suggests that heterogeneity in objective dimensions of socio-economic welfare may explain different disclosure patterns in the context of an identity utility approach. Thus, our findings unveil the "sample selection" between out and closeted LGB people that lies behind the "myth of gay affluence".

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