

Sexual Orientation, Unemployment and Participation: Are Gays Less Employable than Straights?

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Abstract This paper is the first attempt to assess, in a unified econometric framework, the existence and the magnitude of both the sexual orientation participation gap and the sexual orientation unemployment gap. Having identified male same-sex couples using the Employment Survey, we use a bivariate probit selection model where the labor supply and the employment equation are jointly estimated for the French labor market. The results show that both participation and employment probabilities are significantly lower for gay employees compared to their heterosexual counterparts. Further investigations indicate that young gay workers, particularly, are more exposed to the unemployment risk than older ones. The beginning of a professional career and the subsequent entry to the labor market appear to be difficult steps to overcome for gay workers who spend more time than their heterosexual counterparts to find the *good job*.

Keywords Employment discrimination · Sexual orientation · Queer economics

JEL classification J7 · J15

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Introduction

Gay men and lesbians have repeatedly claimed that they were either fired, not hired or not promoted because of their sexual orientation. The analysis of claims filed with State Enforcement Agencies from 1999 to 2007 in the US, reveals that sexual orientation non-discrimination laws are used by lesbian and gay workers at frequencies comparable to the frequencies at which race and sex rights laws are utilized (Ramos et al. (2008)).

Despite these facts,¹ with few exceptions (Tebaldi and Elmslie (2006), Leppel (2008)), the econometric literature on the effects of sexual orientation in the labor market has focused essentially on wage differentials, neglecting to analyze the effect of sexual orientation on employment status. One thus has little evidence about the difficulties that lesbian and gay people may face in obtaining or keeping a job.

This is a damaging omission because potential differences in the access to employment, between homosexual and heterosexual people, may create inequalities which play a crucial role in adversely affecting the wellbeing of homosexual populations.² Focusing exclusively upon wages differences to assess sexual orientation discrimination may therefore inadvertently hide some of the main discrimination mechanisms that operate within the labor market and influence the careers of gays and lesbians.

The aim of this paper is to evaluate the impact of sexual orientation on the labor supply and the probability of being unemployed. The study is conducted on the French labor market for men only, using public data from the INSEE employment survey.

The first section summarizes the existing literature; the second is devoted to the construction of the database and to the presentation of the main statistical characteristics of homosexual and heterosexual populations. The third section presents the main results, while the last section is devoted to measuring the impact of the age on the magnitude of the gap between the employment probabilities of heterosexual and gay men.

Literature

Labor Force Status and Sexual Orientation

Discrimination in the workplace can affect labor force status - employment, unemployment and non-participation - both directly and indirectly. First, discriminatory hiring practices may result in lower flows from unemployment to employment for homosexual workers resulting in higher unemployment rate for gay people.³ If employers believe that there is a negative gap between homosexual and heterosexual employees, in a valuable characteristic for the firm (productivity, work commitment, job stability

¹ If as it is noticed by Tilcsik (2011), self-reports or complaint rates do not necessarily represent the actual incidence of discrimination, there is no doubt that they can be seen at least as indicators of a potential problem.

² The relationship between unemployment and well-being is studied in Van der Meer (2014), while the specific impact of discrimination on the well-being of LGBT people is documented in Sears and Mallory (2011)

³ Badgett et al. (2007) points out that when surveyed 8 % to 17 % of LGBT people report having been fired – or denied employment – because of their sexual orientation. Drydakis (2009) and Drydakis (2011), highlight that gays and lesbians face lower access to occupations in Greece. Section 1.3 thereafter provides a complete overview of the main results obtained concerning employment discrimination based on sexual orientation.

etc.) they will be reluctant to hire lesbian or gay workers (Drydakis (2014)). Such practices, which increase the expected length of job search, and thus the associated costs for homosexual workers have a negative impact on the incentive to work which lowers labor force participation and the labor supply.

From a more general point of view the relationship between job search and unemployment shed a light on the key role played by all kinds of discrimination based on sexual orientation - wage discrimination⁴ as well as hiring discrimination. Affecting negatively both the probability of getting a job during a certain length of time and the return associated to a given job, any kind of discrimination based on sexual orientation lowers the job search efforts of gay applicants on the labor market leading to a higher rate of unemployment among homosexual workers than among their heterosexual counterparts. In this case as pointed out by Gordon and Morton (1974), discrimination does not only affect wages and occupational type and attainment, but also the employment level.

Hull (2005), points out the specific stress experienced by homosexual workers when tracking a job. Internalization of the society's homophobia may lead to an emotional inhibition and a deficit of self-confidence (see Diplacido (1998)), which plays negatively during the hiring process and thus lowers the hiring probability compared to straight workers.

If one switches now to the analysis of the flows from employment toward unemployment one key issue concerns the impact of sexual orientation in the firing process. It is now well documented that hiring a homosexual employee may be perceived by some employers as an extra cost for the firm⁵:

- If a significant proportion of heterosexual employees is homophobic, hiring homosexual workers can lead to a decrease in individual productivity of both homosexuals (harassment, depression, lack of motivation, *etc.*) and heterosexuals (lack of concentration, lost time, *etc.*).
- If consumers experience a disutility from being in contact with gay employees, the employment of such personnel may result in a partial loss of customers to the company. In such a case, the employer, in order to maximize the profit of his firm, can express indirectly a preference for discrimination that merely reflects that of its customers.
- The employer may use sexual orientation as the signal of a greater likelihood of HIV infection which is associated with lower profits (higher absenteeism and/or turnover rate, lower productivity due to fatigue associated with the illness, *etc.*).⁶

⁴ As noticed by Leppel (2008) wage discrimination affects unemployment indirectly: lower wages received by gay employees reduces the incentive to work and thus (i) the labor force participation; (ii) for people in the labor force, their endogenous job search effort which increases the probability of unemployment.

⁵ The first two points refers to a *taste for discrimination*; originally developed by Becker (1957), this approach relies directly on a "disaffection" with the gay identity and/or the homosexual lifestyle, leading to a strict preference for discrimination. The third point refers to the theory of *statistical discrimination* originally developed by Phelps (1972) and Arrow (1973). See, for example, Drydakis (2014), section 3, for a presentation of these two types of discrimination.

⁶ Leonard (1985) underlined that one of the manifestations of the public fear surrounding AIDS victims is employment discrimination against persons with AIDS, persons perceived as having AIDS and persons who are members of publicly identified "risk groups" such as gay people. Vest et al. (2006) highlights that a possible explanation of differences in termination rates between homosexual and heterosexual employees relies on the managers' fear of AIDS and their beliefs about employees with AIDS ability to perform their job. They provide strong support that fear of AIDS as well as expectancies about disruptions in the workplace and reductions in revenue were related significantly to likelihood of firing employee with AIDS.

However, as sexual orientation is not always fully observable during the hiring process, an employer may hire “involuntarily” a gay employee. By progressively acquiring, through a learning process, more information on the sexual orientation of his employee, the employer may then be tempted to directly fire the “unwanted” worker or to pressure him to resign.

In the same line, it must be noted that discrimination based on sexual orientation (glass ceiling *etc.*) and harassment in the workplace may have a positive impact on the incentive for employed gay people to leave their job, raising both the turnover of gay employees compared to their heterosexual counterparts and their unemployment rate.⁷ Moreover, negotiating within a hostile workplace, some LGB employees may take potentially costly actions in terms of individual productivity (concealment, limited social interaction, forced mobility, continuous vigilance) resulting in a higher rate of fired employees among homosexual workers than among heterosexual workers.

Concerning now the flows between non-participation and employment or between non-participation and unemployment, Klawitter and Flatt (1998) point out that gay men, unlike heterosexual men, may share their home with other males and pool two male-sized incomes. Due to this income sharing, and perhaps in anticipation of not serving as a primary household earner, gay men are generally characterized by a lower participation rate and a lower labor supply in the labor market (Tebaldi and Elmslie (2006), Leppel (2008), Laurent and Mihoubi (2012)). Labor market flows from “non-participation” to “participation” (whether toward employment or unemployment) should thus be lower for gays than for male heterosexuals. For the same reason the share of discouraged unemployed workers shifting from “Unemployment” to “Non-participation” must be greater among homosexual unemployed workers than among their heterosexual counterparts.

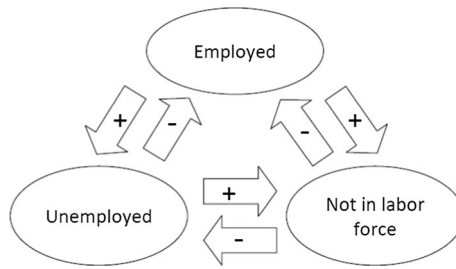
Eventually the flow from “Employment” to “Non-Participation” should be greater for gays than for heterosexuals because (i) the higher probability for a gay employee to be fired (see above) and (ii) the lower incentive for gay workers to participate to the labor market *i.e.* to remain unemployed once they are fired. The Graph 1 provides a summary of labor market flows between labor force status, with + or - indicating if the considering flow is higher or lower for gays than for heterosexuals.

Finally, it is interesting to keep in mind that wage discrimination based on sexual orientation may partly reflect discriminatory hiring decisions by employers *i.e.* hiring discrimination. For example if skilled homosexual job seekers, expecting a hiring discrimination on high skill jobs, search for downgraded jobs, wage discrimination occurs. For the same level of education (but not the same occupation), homosexual employees display a lower wage than their heterosexual counterparts.

Remarks

First of all, we must be very careful when analyzing the impact of sexual orientation on the unemployment rates of workers. It can be tempting to interpret any significant and

⁷ The « Corporate Leavers Survey » of the *Level Playing Field Institute*, conducted in 2007 – devoted to an in-depth look at (i) the effect of unfairness upon an employee’s decision to leave his employer, (ii) the financial cost to employers due to voluntary turnover based on unfairness – estimated that employees’ turnover due to workplace discrimination costs U.S. employers \$64 billion on an annual basis.



Graph 1 Labor market flows and labor force status

unexplained difference in the unemployment rates between homosexual workers and their heterosexual counterparts, as an *employment discrimination* and to see it as the equivalent (in terms of access to jobs) of the traditional *wage discrimination*.

Such an interpretation would be misleading and would probably lead to wrong conclusions. We need to keep in mind that even if the existing flows between different labor force statuses contribute to explain unemployment rates, they are not all necessarily originating in a sexual orientation based discrimination mechanism. For example, the fact that the incentive to find a job, and thus the job search effort, may be lower for gays than for heterosexuals – explaining a potentially lower flows from “unemployment” to “employment” for homosexual workers – can possibly rely on (i) the existence of a hiring discrimination as well as (ii) the income sharing mechanism inside same-sex couples that generates a lower need to find a job quickly.

Symmetrically a higher flow from “Employment” to “Unemployment” for gay workers may originate in (i) a sexual orientation bias affecting the firing process or, (ii) a lower incentive to keep working in an unpleasant environment for gay employees.

Moreover, when testing for discrimination it may not be sufficient to control for human capital only. As pointed out by Weichselbaumer (2004), specific personality traits may contribute as well to success in the labor market. It can thus be difficult to be sure that an observed differential treatment between gays and straight employees is actually due to discrimination and not to personal characteristics which have not been used as control variables. Psychologists highlighted that the degree of congruence between the gender of the applicant and the “sex type” of a job is one key factor in determining who is hired for the job.⁸ If the share of “masculine jobs” in the economy is greater than the share of “feminine jobs”, some male homosexuals may face a penalty in the hiring process if they display more feminine personality traits than their heterosexual counterparts.⁹ In this case, is it the sexual orientation or the personality that explains the differential treatment between gays and straights?

Table 1 below summarizes the impact of different types of factors on labor market flows: direct discriminatory practices (hiring, firing), indirect or self-integrated discriminatory practices (effects of harassment in the workplace, pressures to resign, wage discrimination, gay glass ceiling *etc.*), personality (gender, masculinity, clothing, sociability *etc.*) and preferences or way of life (specific characteristics like income sharing mechanism inside same-sex couples, mobility *etc.*)

⁸ See Horvath and Ryan (2003), Weichselbaumer (2004).

⁹ Gay men are commonly stereotyped as feminine or effeminate (Madon (1997)), while lesbians are often believed to be overly masculine (Ward (2009)).

Table 1 Effects of different factors on labor market flows

Flows	Direct discriminatory practices	Indirect or self-integrated discriminatory practices	Personality	Preferences, way of life
Unemployment to Employment	✓	✓	✓	✓
Employment to Unemployment	✓	✓	✓	✓
Non participation to Unemployment		✓		✓
Unemployment to Non participation		✓		✓
Non participation to Employment		✓	✓	✓
Employment to Non participation		✓	✓	✓

As it is difficult, and in fact impossible, when one notices some unexplained differences in unemployment rates between homosexual and heterosexual populations, to clearly separate,

- what is due to sexual orientation discrimination,
- what relies on the existence of a heterocentrist bias in the labor market that negatively impacts the incentive to find or keep a job for gay employees,
- what originates in uncontrollable differences in preferences between the two populations or in specific personality traits,

it is cautious to avoid speaking of *employment discrimination* and to use a more neutral expression like *unexplained employment gap*.

A more general problem when studying the impact of sexual orientation in the labor market arises from the fact that, unlike gender or ethnic origin, sexual orientation is not a characteristic perfectly and directly observable by employers. Of course this does not mean that discriminatory practices cannot occur in the workplace.¹⁰ Even if sexual orientation is not always immediately and fully observable, an employer may progressively acquire such information through a learning process: inference from other observable variables (marital status, existence of children, neighborhood of residence, status with respect to the military and national service), rumors reported by other employees, absence of any reference by homosexual employees to their private lives, lower participation in the social life of the firm, *etc.*

Nevertheless, as some homosexual workers are not identified as such on the labor market, an “employment rate gap” between homosexual and heterosexual workers, measured in a sample of all homosexual employees, probably represents an

¹⁰ Exploring employment discrimination against LGBT Utahns ROSKY ET AL. (2011) highlight a very crucial point: LGB respondents seem to have experienced consistent percentages of discrimination in the workplace regardless how open they are about their sexual orientation or gender identity in the workplace. This finding shows that discrimination based on sexual orientation may occur even when employees do not disclose their sexual orientation in the workplace.

underestimate of the actual employment rate gap experienced by gay workers whose sexual orientation is clear and well known to everybody.

Previous Results

This subsection aims to provide an overview of the different kinds of results previously obtained concerning the impact of sexual orientation on employment/unemployment rates. Three types of studies can be identified.

Survey Studies of Homosexual People Reporting the Existence of Employment Discrimination

In the early seventies Saghir and Robins (1973) found that 12 % of the LGB members of their US sample were asked to resign, were fired, or were given warnings after detection of their sexual orientation, while Weinberg and Williams (1974) mentioned a 16 % job-loss rate related to homosexuality.

A decade later Levine and Leonard (1984) in a study devoted to discrimination against lesbians in the workforce note that 60 % of the lesbians of their sample expected discrimination if their sexual orientation were discovered; among these women, 75 % anticipated problems with their supervisors and 66 % expected to be fired. On the 50 women of the sample reporting actual discrimination, 29 % were not hired for a job, were fired or were forced to resign *i.e.* about 7 % of the whole sample.

More recently the analysis of 121 surveys completed by residents of Topeka (KS) from October 2003 to January 2004 (Colvin (2004)) points out that 16 % of respondents reported that they were denied employment because of their sexual orientation or gender identity and 15 % reported that they were fired for those reasons; moreover 31 % reported that they have observed someone being denied employment and 24 % that they have observed someone being fired for the same reasons.

Herek et al. (2007) notes that 16 % of lesbians and gay men and 5 % of bisexual people reported being fired or denied a job because of their sexual orientation. In 2009, an unpublished analysis conducted by the *Williams Institute* using the 2008 General Social Survey highlights that 12 % of gay and lesbian people reported losing a job because of their sexual orientation in the last five years.

The role of sexual stigma, defined as a cultural belief system through which homosexuality is discredited and socially constructed as invalid relative to heterosexuality, is studied by Herek (2009). Across the sexual orientations groups, gay men reported a high level of enacted stigma (15.7 % reporting employment discrimination) and felt stigma (17.7 % disagreed that “*most employers will hire qualified sexual minority individuals*”).

Exploring the issue of employment discrimination against LGBT citizens of South Dakota, Goldberg et al. (2010), pointed out that people who live in same-sex couples are 15 % less likely to be employed than married different-sex couples despite higher levels of education. Data collected through a 2010 Utah survey and analyzed in Rosky et al. (2011) show that 43.5 % of LGB respondents reported having been fired, denied a job or not promoted because of their sexual orientation. Some respondents even reported being fired after trying to sign up a partner for domestic partner benefits.

Table 2 summarizes the main results of US surveys measuring employment discrimination against lesbian and gay employees based on sexual orientation.

Table 2 Self-reported LGB experiences of employment discrimination in the US

	Denied employment	Fired	Pressured to quit	Denied employment, fired or pressured to quit	Denied employment or fired	Fired or pressured to quit
Saghir & Robins [1973]						12%
Bell & Weinberg [1978]		7%				
Levine [1979]				17%		
Schneider [1981]		10%				
Levine & Leonard [1984]				7%		
Badgett & al. [1992]	5%-24%					8%-19%
Karp & al. [1997]	15%	9%				
Empire State Pride Survey [2001]		8%				
Mays & al. [2001]	13%	8%				
New Jersey Supreme Court [2001]	17%					
H.J Kaiser Family Foundation [2001]				18%		
Out & Equal Advocates [2003]		9%	8%			
Colvin [2004]	16%	15%				
Herek [2009]					16%	
Williams Institute [2009] (quoted in Rosky et al. [2011])		12%				

In their paper focusing on employment discrimination based on sexual orientation in Hong-Kong, Lau and Stotzer (2010) shed a light on the kind of penalties faced by employees reporting such discrimination: 7.7 % reported having been rejected for a job, 2.6 % reported being fired or asked to leave work and another 4.9 % reported having been pressured to leave a job. Rates of reported discrimination varied based on respondents' level of sexual orientation disclosure: only 8 % of respondents which have not disclosed their sexual orientation in the workplace reported experiencing employment discrimination, against 34 % of the disclosed employees.

In France, the extent and consequences of homophobia in the workplace have been underlined by the recent report of the French *Equal Opportunities and Anti-Discrimination Commission* (HALDE). The report highlights that 12 % of the gays and lesbians surveyed report having been passed over for an internal promotion, 8 % report discrimination during a hiring process, 4.5 % claim they were fired. In a 2004 poll,¹¹ 23 % of respondents stated “*homosexuals should be banned from certain occupations involving constant contact with children*”.

As pointed out by Badgett et al. (2007), although useful all these surveys have intrinsic limitations: (i) most of the samples used are not representative of the homosexual populations (victims of sexual orientation discrimination may be characterized

¹¹ IPSOS survey conducted in 2004 for the newspaper *Têtu*, on a national sample of 1002 persons, representative of the French population over 15 years of age.

by a higher participation rate to such surveys), (ii) they capture subjective perceptions, rather than the actual incidence of discrimination.¹²

Controlled Experiments and Experimental Research

Adam's (1981) pioneering article on the discrimination by sex and sexual orientation in the Ontario legal profession is one of the first studies focusing on the *measurement* of the effect of sexual orientation on hiring. Using a testing method (sending identical resumes, except for the sexual orientation of the applicants, to a sample of Ontario law firms) the author shows that the non-labeled male applicant received 1.6 times as many interview offers as the gay-labeled male, while the non-labeled females received twice as many interview offers as lesbian applicants. The discrimination against lesbians and gays appearing especially obvious in Toronto were the non-labeled male rate rises to 2.9 times the gay-labeled male rate, while the non-labeled female rate rises to 3.5 times the lesbian rate.

Crow et al. (1998) instructed a sample of US managers and supervisors to hire six of eight candidates for an accounting position. Requiring the selection of six out of eight candidates meant that each respondent had to "discriminate" by eliminating the two candidates they considered the least desirable. Results show that regardless of sex and race, respondents were more likely to eliminate homosexual candidates than heterosexual candidates.

Observing that the psychological literature on attitudes towards homosexuality allows formulating a model that predicts sexual orientation discrimination in the hiring process, Horvath and Ryan (2003) initiated an experimental research on hiring discrimination on the basis of sexual orientation. The results show that college student participants' rating of resumes differs, depending on the sexual orientation of the applicant: overall participants rated gay male applicants less positively (−5 %) than heterosexual male applicants. Religiosity, gender role beliefs and previous exposure to lesbians and gay men were strongly related to attitude towards lesbians and gays which in turn was related to beliefs about employing lesbians and gay men.

Using a correspondence testing method, Weichselbaumer (2003) investigates hiring discrimination against lesbians in the Austrian labor market. Correspondence testing allows comparing the labor market outcomes of applicants who are identical in all their productive characteristics but differ only in their sexual orientation. The results show that indicating a lesbian identity reduces one's invitation rate by about 12 %, which corresponds to Adam's (1981) findings of a 11 % reduction of invitation rates for females in the city of Toronto.

By using the same methodology to provide an evaluation of the discrimination faced by gay men when applying for jobs in the Greek private sector, Drydakakis (2009) shows that the estimated probability for gay applicants of receiving an invitation for an interview is lower by 23 % compared to heterosexuals.¹³

Developing a field experiment on sexual orientation discrimination in the hiring process in Sweden Ahmed et al. (2011) show that hiring discrimination against gays and lesbians appears only in the private sector and varies across different occupations. Moreover gay applicants appear to be discriminated against in *typical male-dominated* occupations whereas lesbians appear to be discriminated against in *typical female-dominated*

¹² Employees who believe that they suffer discrimination may misperceive the motives of their employers, perceiving discrimination when none existed or, on the other hand, underestimating the actual discrimination.

¹³ Furthermore, exploring differences in responses to gay applicants by employer gender, the paper highlights that males discriminate more than females.

occupations. As mentioned by the authors, the results suggest that gays to some extent face the same obstacles on the labor market as heterosexual women. Compared to Weichselbaumer (2003) and Drydakis (2009) (Drydakis 2011) the observed discrimination in the Swedish labor market is small in magnitude as shown in the Table 3 below.

In a large-scale audit study¹⁴ devoted to employment discrimination against openly gay men in the US, Tilcsik (2011) points out important variations in the level of hiring discrimination across US areas reflecting regional differences in both attitudes and antidiscrimination laws. The study shows that listing involvement in a gay campus organization had a significant negative effect on the success of applicants even when controlling for numerous job-related and area characteristics. Moreover the study provides evidence about the powerful role of stereotypes in sexual orientation discrimination: employers who seek applicants with stereotypically male heterosexual traits are particularly likely to engage in discrimination. Where a heterosexual applicant had a 10 % chance of receiving a positive response for a given job, the corresponding probability for an equally qualified gay applicant for a comparable job is only 6.3 % (−37 %).

Although these experiments represent an important step to directly assess discrimination in hiring, they suffer (as it is the case for works based on LGBT surveys) from significant intrinsic limitations: they test whether job applicants who appear to be gay are treated differently than equally qualified straight men but only at the very first stage in the employee selection process. Moreover the way of signaling sexual orientation in some of these studies may lead to biased results: the reason for discrimination can be a bias against political activists rather than a bias against gay men.¹⁵ In pure experimental studies the decision makers are generally neither employers nor even representatives of the employers; moreover they know that they are part of an experiment and that their choices have no real effects; it is not obvious they would have made the same hiring choices in a real position of manager facing profitability and incentive constraints.

Econometric Studies

Econometric studies on the impact of sexual orientation on labor force statuses are very few and recent. Studying the effects of sexual orientation on labor supply in the US Tebaldi and Elmslie (2006) find empirical evidence that supports the argument that sexual orientation affects individual employment status and labor supply. Using the Current Population Survey they show that gay men have a lower labor supply than married and unmarried heterosexual men¹⁶: gay men are about 5 % less likely to choose full-time jobs, 4 % more likely to choose

¹⁴ The author submitted a total of 3538 resumes, responding to 1769 job postings by private employers. The sample included jobs in five occupations and seven states. The five occupations in the sample were managers, business and financial analysts, sales representatives, customer service representatives, and administrative assistants. The sampled states included four states in the Northeast and the West (New York, Pennsylvania, California, Nevada) and three states in the Midwest and the South (Ohio, Florida, Texas), all with a relatively high number of job postings on the recruitment websites used. The number of job postings in a state ranged from 131 (Nevada) to 347 (Florida), with at least 200 observations in each state other than Nevada.

¹⁵ As underlined by Badgett et al. (2007) participation in a gay organization, for example, might be associated with progressive, liberal, or leftist political views and observed differences in callbacks may thus be attributable to discrimination based on either sexual orientation or political affiliation: it is impossible to determine the net effect of sexual orientation.

¹⁶ A symmetrical result holds for women. Lesbians supply more labor and are more likely to be employed full-time than their heterosexual counterparts. See Antecol and Steinberger (2009) for a more detailed study on female labor supply differences by sexual orientation.

Table 3 Differences between LG and heterosexual applicants

Responses from employers	Weichselbaumer (2003)	Drydakis (2009), (Drydakis 2011)	Ahmed et al. (2011)	Tilesik (2011)
Male heterosexual compared to gay	na	+186 %	+14 %	+59 %
Female heterosexual compared to lesbian	+31 %	+123 %	+22 %	na

part-time employment and 1 % more likely to choose not to work than are married men. A deeper modeling of labor supply allows to show that gay men work about 8 % fewer hours than married men and about 6 % fewer hours than unmarried heterosexual men. These findings are consistent with the so-called theory of specialization but can also be the consequence of the existence of discriminatory practices in the labor market. As mentioned earlier, wage discrimination based on sexual orientation or harassment in the workplace can result in lowering participation rates to the labor force for gay people.

Leppel (2008) uses the US 2000 Decennial Census data and the logit analysis to explore the impact of sexual orientation on the employment status *i.e.* on the probabilities of being employed, unemployed and not in the labor force. Concerning labor supply, the probability of not being in the labor force is estimated to be greater for gays (7.7 %) than for male heterosexuals (respectively 6.2 % for members of unmarried opposite-sex couples and 4.5 % for members of married couples). The reverse is true for lesbians with 11 % of the members of same-sex couples not in the labor force *vs* 14.4 % for the members of opposite-sex couples. Concerning unemployment the results are less clear: the probability to be unemployed is twice as high for gays than for married heterosexual males (2.7 % *vs.* 1.4 %) but lower for gays than for unmarried male members of opposite-sex couples (2.7 % *vs.* 3.1 %). The same patterns hold for women.

Ahmed et al. (2011) examine whether there are differences in occupational rank between homosexuals and heterosexuals. The paper fills a gap between wage discrimination and employment discrimination by analyzing the impact of sexual orientation on the access to “quality” jobs. The results show that gay men are less likely than heterosexual men to hold an occupation that demands a longer university education or a management position. All things being equals gays are not as successful as straight men.

Finally, Drydakis (2012), finds significant evidence that homosexual men have higher unemployment rates than their heterosexual counterparts, in the Athenian labor market. In average, homosexuals face a 17.3 % unemployment rate, to be compared to 10.0 % for heterosexuals. The estimated probability of unemployment for gay men - obtained by using a two-stage estimation procedure proposed by Heckman - appears to be lower by -0.342 than that for heterosexuals, corresponding to a marginal effect on the order of -8.1 percentage points. These results suggest that sexual orientation discrimination could explain the differences in hiring between equally qualified homosexual and heterosexual men.

Data

Database

In this paper we use the Employment Survey conducted by the French National Institute of Statistics and Economic Studies (INSEE)¹⁷ that provides information about the characteristics of the household members, their situation on the labor market and, for the employees, about their firm. The *Employment Survey* is the French equivalent of the US Current Population Survey (CPS). This survey provides a report on the Employment situation. In 2003 the Employment Survey has been changed:

- Before 2003, the survey was done every year, with a sampling rate of 1/200 and the third of the sample was renewed each year. This implies that a household was interviewed during three consecutive years.
- Since 2003, the survey is conducted every quarter with a sampling rate of 1/600 and the 1/6 of the sample is renewed each quarter. A household is then present during 6 consecutive quarters in the survey. A detailed description of the Employment survey is available in Laurent and Mihoubi (2012)

Measuring the impact of sexual orientation on the probability to be employed on French data is a difficult exercise since there are no surveys which both identify the sexual orientation of employees and also provide sufficient economic and individual information on them. In particular, sexual orientation is not an observable variable in the *Employment Survey*. An indirect identification of sexual orientation may, however, be achieved by identifying same-sex couples (see, for example Toulemon et al. (2005), Laurent and Mihoubi (2012)). This is the method used in this paper: we define as gay couples all households of two same-sex male adults reporting a *friend* relationship.¹⁸ Among these same-sex households only 3 % of men have children. This finding is consistent with the available French statistics on homosexual parenting.

The identification of homosexuals based on same-sex cohabitation may of course lead to wrongly considering some individuals sharing the same dwelling as gays when in fact they are not. The most frequent case is that of cohabitation for economic reasons or linked to some characteristics of their occupations: students, migrant workers, seniors, farmers, *etc.* To minimize the probability of wrongly classifying some heterosexual employees as gays, we first identified all households constituted only of two adults of the same gender (with or without children) who report sharing a friendship, and we then imposed the following filters:

¹⁷ The Employment Survey is the French equivalent of the US Current Population Survey (CPS). The purpose of the survey (annual before 2003 and quarterly since 2003) is to observe both the structural and economic situation of people in the French employment market. It forms part of the *Labor Force Surveys* defined by the European Union. This is the only source that provides a measurement for the concepts of activity, unemployment, employment and inactivity as defined by the International Labour Organization (ILO). Questions cover employment, unemployment, social origin, wages, family situations, qualifications, education, hours worked, location *etc.* See. <http://www.insee.fr/en/methodes/default.asp?page=sources/ope-enq-emploi-continuu.htm> and <http://idsc.iza.org/metadata/PDF/762.pdf?PHPSESSID=556e6b4432dfecbae1c8bfa39f20371>.

¹⁸ For a complete and detailed presentation of the identification process of homosexuals by using the Employment Survey, see Laurent and Mihoubi (2012), section 2.3.

- Exclude couples where one member is a student, apprentice, farmer or retired person;
- Require that members of the couple are older than 28;
- Require that neither member of the couple be over sixty years old;
- Require that both members of the couple be French; and
- Select only households with an income higher than 1000 € /month¹⁹

After applying these filters, and given the restrictive measure of the number of homosexual couples we adopted, the resulting database contains only a small number of gay couples for each year. We then built an aggregated database covering the period 1996–2009 by stacking the data. The final database that we used in our econometric analysis includes 409 individuals belonging to same-sex couples, whom 384 are salaried employees.

Characteristics of Populations

The sample of heterosexuals was subjected to exactly the same selection constraints as those described above for same-sex couples. The main characteristics of the two populations (“male heterosexuals” vs. “male homosexuals”) constituting our samples are presented in Table 4. These statistics are expressed as a % of the total of all employees (*i.e.* private sector employees + civil servants) except for (*i*) characteristics denoted by * which are expressed as values and (*ii*) characteristics indicated by # which are expressed as a % of all individuals constituting the relevant population. The standard deviation appears in parentheses in each table cell. For example, 47.93 % of heterosexual male worker did complete high school, while this is true for only 43 % of the gays²⁰; 8.90 % of all gays are unemployed and 4.50 % are inactive, *etc.*

Same-sex couples represent 0.38 % of all the couples of our sample, *i.e.*, more or less the middle of the range corresponding to the studies of Digoix et al. (2004) – who estimate at 0.56 % the ratio of same-sex couples in France – and Toulemon et al. (2005) who evaluates this ratio at about 0.08 %. Given the weights applied, we finally obtained an estimate of about 26,000 gay couples in France; our estimate is very similar to what we find in the ACSF²¹ survey, where 0.3 % of men surveyed reported they “*live in a couple with a same-sex partner*”, leading to an estimate of about 30,000 gay couples in France.

With an average age of 37, the members of homosexual couples are younger than those of heterosexual couples, whose average age is 41.8. They are also better educated (23 % have Master degrees or a PhD, against only 12.6 % of heterosexuals) and more urban (43 % live in the Paris metropolitan area, compared with 16 % for straight men). One recognizes here the main “features” of homosexual populations, observed not only

¹⁹ The threshold value of 1000€ has been indexed in accordance with the evolution of the average wage. As the French Employment Survey does not provide any information about non-wage incomes, a lump-sum income of 300 €/month, corresponding to a reservation income, has been attributed to inactive members of the couples. Similarly, a lump-sum income of 1000€/month has been attributed to independent workers.

²⁰ Throughout this article, we use the terms “male homosexuals” or gays to denote the members of our sample of same-sex couples.

²¹ *Survey on Sexual Behavior in France (ACSF)*, conducted in 1992 (*cf. Les comportements sexuels en France*, SPIRA A., BAJOS N. and the ACSF team, La Documentation Française, Paris, 1993).

Table 4 Descriptive statistics^a

Variables			Heterosexuals		Homosexuals	
			Mean	Std-Dev	Mean	Std-Dev
Sample		Population size / Ratio (%)	106,342	99.62 %	409	0.38 %
Individual characteristics	Age	≤ 30	3.97 %	0.001	13.36 %	0.017
		30–34	17.23 %	0.001	31.12 %	0.024
		35–39	20.09 %	0.001	24.33 %	0.022
		40–44	19.95 %	0.001	14.80 %	0.019
		45–49	19.02 %	0.001	6.84 %	0.013
		≥ 50	19.74 %	0.001	9.55 %	0.015
		Average age* (years)	41.75	0.025	36.99	0.375
	Partner age	≤ 30	7.42 %	0.001	16.94 %	0.019
		30–34	21.05 %	0.001	35.13 %	0.025
		35–39	20.87 %	0.001	20.71 %	0.021
		40–44	19.49 %	0.001	14.57 %	0.019
		45–49	17.35 %	0.001	5.45 %	0.011
		≥ 50	13.83 %	0.001	7.19 %	0.013
		Average age	41.75	0.025	36.99	0.375
	Degrees	Master's, PhD	12.60 %	0.001	22.87 %	0.022
		College	11.59 %	0.001	14.92 %	0.018
		High school	47.93 %	0.002	43.00 %	0.026
		No degree	27.88 %	0.002	19.20 %	0.020
		Average degree	1.50	0.004	0.05	0.015
	Family situation	Married	78.87 %	0.001	1.37 %	0.006
		With children (vs. no children)	79.43 %	0.001	2.84 %	0.008
		Average number of children *	1.50	0.004	0.05	0.015
		Two children or more of less than 6 years old	32.54 %	0.002	1.37 %	0.006
		Average number of children	1.50	0.004	0.05	0.015
	Location	Region with high unemployment rate	20.62 %	0.001	17.46 %	0.020
		Region with low unemployment rate	4.18 %	0.001	2.62 %	0.007
		Paris metropolitan area	16.32 %	0.001	42.81 %	0.026
Urban commune (excluding Paris metropolitan area)		57.48 %	0.002	45.36 %	0.026	
Rural commune		26.20 %	0.001	11.83 %	0.016	
Real estate capital	Home owner	22.04 %	0.001	10.56 %	0.015	
	Homebuyer	40.04 %	0.002	21.98 %	0.022	
Situation on the labor market of the partner	Inactive	17.00 %	0.001	6.41 %	0.004	
	Unemployed	6.60 %	0.001	11.87 %	0.012	
	Employment	76.30 %	0.014	81.72 %	0.013	
Qualification of the partner	Craftsman, merchant, Self-employed	14.00 %	0.001	21.61 %	0.022	
	Highly skilled	15.48 %	0.001	22.74 %	0.022	

Table 4 (continued)

Variables		Heterosexuals		Homosexuals		
		Mean	Std-Dev	Mean	Std-Dev	
	Social capital (<i>qualification of the father</i>)	Skilled	68.73 %	0.002	52.60 %	0.026
		Unskilled	1.79 %	0.000	3.05 %	0.008
		Highly skilled	11.85 %	0.001	18.73 %	0.021
		Skilled	10.62 %	0.001	14.98 %	0.019
		Unskilled	59.54 %	0.002	50.90 %	0.026
	Birth place	Craftsman. merchant. Self-employed	17.99 %	0.001	15.39 %	0.018
		France	93.12 %	0.001	93.89 %	0.012
		Western countries excluding France	1.57 %	0.000	0.88 %	0.005
		African countries	4.19 %	0.001	3.67 %	0.010
	Labor market and employment	Sector / Labor market status	Other countries	1.12 %	0.000	1.56 %
Industry (vs. Services)			37.28 %	0.002	14.12 %	0.019
		Employees private sector #	75.31 %	0.001	68.23 %	0.024
		Employees public sector #	21.66 %	0.001	21.53 %	0.021
		Non-employees private sector #	3.03 %	0.001	10.25 %	0.015
		Unemployed	3.09 %	0.001	8.90 %	0.015
Firm size		Inactive	1.43 %	0.000	4.50 %	0.012
		< 50 employees	37.79 %	0.002	45.08 %	0.028
		50–500	24.90 %	0.001	17.06 %	0.021
		> 500	25.86 %	0.002	20.62 %	0.023
Working hours	Na	11.45 %	0.001	17.25 %	0.022	
	Full time. > 30 h / week	96.92 %	0.001	92.29 %	0.016	
	Part-time. 15–30 h / week	2.91 %	0.001	7.71 %	0.016	
	Part-time. < 15 h / week	0.16 %	0.000	0.00 %	0.000	
Qualification (<i>of the previous job for unemployed</i>)	Special work schedule (vs. Normal)	14.67 %	0.001	22.73 %	0.024	
	Highly skilled	22.57 %	0.001	22.45 %	0.022	
	Skilled	49.91 %	0.002	30.75 %	0.024	
	Unskilled	22.73 %	0.001	37.12 %	0.025	
Type of job	Other	4.79 %	0.001	9.69 %	0.015	
	Blue collar (vs White collar)	46.38 %	0.002	27.67 %	0.025	
	Short term labor contract (vs. Fixed-term. Long term)	0.87 %	0.000	1.50 %	0.007	
Job tenure	< 1 year	6.70 %	0.001	12.22 %	0.018	
	1 to 5 years	20.46 %	0.001	36.70 %	0.028	
	> 5 years	72.85 %	0.002	51.08 %	0.029	
	Average time* (months)	151.62	0.395	87.59	5.079	

Table 4 (continued)

Variables		Heterosexuals		Homosexuals	
		Mean	Std-Dev	Mean	Std-Dev
Situation 1 year before	Unemployment	1.59 %	0.000	4.79 %	0.011
Gross job flow	Employment outflow	1.00 %	0.000	4.20 %	0.011
	Job to job flow	5.20 %	0.001	9.16 %	0.015

in most foreign studies (see Laurent and Mihoubi (2012)) but also in France (see Digoix et al. (2004) and Toulemon et al. (2005)).

Although only few homosexuals have children, the percentage is not negligible: nearly 3 % of gays are parents (to compare to 10 % of lesbians. Cf. Laurent and Mihoubi (2012)). We find here, again, a typical characteristic of homosexual populations: parenthood is more prevalent among women than men: 18 % vs. 4 % (Elmslie and Tebaldi (2007)), 23 % vs. 0.5 % (Ahmed and Hammarstedt (2009)), 28 % vs. 8 % (Carpenter (2004)); measured by “*presence of children in the household*”, Toulemon et al. (2005) also note that this fact characterizes about 6 % of lesbians but nearly 0 % of gays.

Gays are also more likely to work part time or to be “inactive or unemployed”. The apparent participation gap between gays and heterosexual men is not negligible (−3.07 % for gays). The same remark applies also for the unemployment gap (+5.81 % for gays).²² The gross flows on the labor market for gays are much higher than for straight men. The employment outflows for gays represent 4.20 % of their employment each year against 1 % for heterosexual men. The job to job flows are nearly two times bigger for gay workers compared to heterosexual men. Finally, the time spent within the same firm is twice as low among gay employees as among heterosexuals: only 51 % of the former have had the same employer for more than five years, against nearly 73 % of the latter.²³

As we consider a male population, the inactivity and the unemployment rates of the partner are quite different between heterosexual and homosexual couples. The inactivity rate of women in heterosexual couples is much higher than for partners in gay couples (17 % versus 6.4 %), but the unemployment rate for women in heterosexual couples (6.6 %) is much lower than the 11.9 % for partners in same sex-couples.²⁴

If we focus now on job characteristics, only 14 % of gays have a job in the industrial sector, while 37 % of male heterosexual workers have jobs of this type. Gays are less likely to be blue collar workers or to work in the private sector. It is interesting to note that we find here, although attenuated, some features commonly attributed to females in the labor market, and often explained by the role played by women in the domestic sphere (see the so-called specialization theory: Becker (1965), (Becker 1981)).

²² To be compared to +7.3 % in Drydakis (2012)

²³ In an imperfect information framework such a difference could be explained by a strategic behavior of gay employees, to prevent their employers from accumulating over time a sufficient amount of information, leading to the revelation of their sexual orientation.

²⁴ The differences in the situation on the labor market for the individual and the partner in same sex couples is related to the fact that about 10 % of the same-sex couples sample contains only one member of the couple.

Results

Econometric Method

In order to measure the employment probability gap between gay men and heterosexual men, living together as a couple, we estimate a model where the probability to be employed is explained by a set of variables related to the worker characteristics including the sexual orientation. If we note U_i the net gain to employ worker i (the gap between his productivity - or the employer utility - and his wage cost), $X_{1,i}$ the variables describing the characteristics of worker i (age, degrees, family situation, location, etc.) and Gay_i a variable indicating the sexual orientation (which takes the value 1 for same-sex couples and 0 for other couples), the linear model is the following:

$$U_i = X_{1,i}\beta_1 + Gay_i\beta_2 + u_i$$

with β_1 a vector of unknown coefficients measuring the return of each characteristic on net gain, β_2 the coefficient measuring the net gain involved by the sexual orientation and u_i the residual term measuring the unobserved influences on the net gain U_i . u_i is supposed to be normally distributed with zero mean and unit variance. Because the net gain U_i is unobservable, we have to reformulate the model in terms of probability for worker i to be employed. If $U_i > 0$ worker i is employed ($E_i = 1$), otherwise ($U_i \leq 0$) he is unemployed ($E_i = 0$):

$$\begin{aligned} P[E_i = 1 | X_{1,i}, Gay_i] &= P[U_i > 0 | X_{1,i}, Gay_i] = P[X_{1,i}\beta_1 + Gay_i\beta_2 + u_i > 0] \\ &= P[u_i > -X_{1,i}\beta_1 - Gay_i\beta_2] = 1 - P[u_i \leq -X_{1,i}\beta_1 - Gay_i\beta_2] \end{aligned}$$

Because, u_i follows a standard normal distribution, the probability to be employed is:

$$P[E_i = 1 | X_{1,i}, Gay_i] = 1 - \Phi(-X_{1,i}\beta_1 - Gay_i\beta_2) = \Phi(X_{1,i}\beta_1 + Gay_i\beta_2) \quad (1)$$

where $\Phi(\bullet)$ represents the cumulative distribution of standard normal distribution.

Model [1] is a simple probit model and will be used in a first step as a direct estimation strategy. Obviously, this model ignores the fact that all workers considered here have in common that they participate to the labor market. In other words, they are employed or unemployed but looking for a job. We face with this model a well-known selection bias. The individuals are not randomly selected in the population, but are subject to the same selection criterion.

To overcome this selection bias, we have to complete the model with a selection equation (de Ven and Praag (1981) and Dubin and Rivers (1990)): the participation equation. Using an approach similar to the one previously developed, we get the following participation equation:

$$V_i = X_{2,i}\alpha_1 + Gay_i\alpha_2 + v_i$$

With V_i the utility of worker i if he participates to the labor market, $X_{2,i}$ the variables describing the characteristics of worker i (age, degrees, family situation, location, *etc.*), α_1 a vector of unknown coefficients measuring the return of each characteristic on the workers' utility, α_2 the coefficient measuring the specific labor supply of gays in terms of utility loss and v_i the residual term measuring the unobserved influences on the worker utility V_i .

Here also V_i is a latent variable, so the model can be restated in terms of probability to participate to the labor market. Worker i will participate ($P_i = 1$) if $V_i > 0$, otherwise he will be inactive ($P_i = 0$).

$$P[P_i = 1 | X_{2,i}, Gay_i] = 1 - \Phi(-X_{2,i}\alpha_1 - Gay_i\alpha_2) = \Phi(X_{2,i}\alpha_1 + Gay_i\alpha_2) \quad (2)$$

The selection bias arises because some unobservable characteristics (or characteristics omitted in the selection equation) can play a role in the probability to participate to the labor market and the probability to be employed. Therefore, the sample of participating individuals may include people with personal characteristics X_i rather unfavorable to participate and to access to employment, but whose unobservable (or omitted) characteristics are favorable to participation and employability. Such individuals are characterized by significant disturbance terms v_i and u_i , incorporating these omitted or unobservable variables. The direct consequence of such a situation is similar to the problem caused by the omission of the correlation between the two residuals: the impact of (observed) personal characteristics X_i (including sexual orientation) is biased.²⁵

The overall bivariate probit selection model has the following form:

$$\begin{cases} V_i = X_{2,i}\alpha_1 + Gay_i\alpha_2 + v_i \\ U_i = X_{1,i}\beta_1 + Gay_i\beta_2 + u_i \end{cases}$$

the residuals are supposed to be serially uncorrelated but correlated (with a correlation coefficient equal to ρ) and jointly normal distributed. So:

$$(v_i, u_i) \sim N\left(\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 & \rho \\ \rho & 1 \end{pmatrix}\right)$$

The bivariate observed endogenous variables (P_i, E_i) are related to the latent variables (V_i, U_i) by the following rules:

$$P_i = \begin{cases} 1 & \text{if } V_i > 0 \\ 0 & \text{otherwise} \end{cases}$$

And,

$$E_i = \begin{cases} 1 & \text{if } U_i > 0 \text{ and } V_i > 0 \\ 0 & \text{if } U_i \leq 0 \text{ and } V_i > 0 \end{cases}$$

²⁵ Note that the cause of the selection bias is not the consequence of having a non-random sample, but arises merely because individuals whose observable characteristics are unfavorable have a large error term in the selection equation

The bivariate probit model with sample selection is formed by the Eq. (1), (2):

$$\begin{cases} P [P_i = 1 | X_{2,i}, Gay_i] = 1 - \Phi (-X_{2,i}\alpha_1 - Gay_i\alpha_2) = \Phi (X_{2,i}\alpha_1 + Gay_i\alpha_2) \\ P [E_i = 1 | X_{1,i}, Gay_i, P_i = 1] = 1 - \Phi (-X_{1,i}\beta_1 - Gay_i\beta_2) = \Phi (X_{1,i}\beta_1 + Gay_i\beta_2) \end{cases}$$

As usual when dealing with selection (Heckman (1979) for linear outcome equation and Holm and Jæger (2011) for a probit outcome equation), if $\tilde{X}_{1,i}$ and $\tilde{X}_{2,i}$ are identical the identification relies on the nonlinearities of the effect of selection in the employment equation. In other words, the form of the nonlinearity, which is completely exogenous, is the sole basis to separate the outcome effects from the selection effects. A way to improve identification is to add in the selection equation at least one specific variable which does not appear in the employment equation. The addition of these new variables can be viewed as the introduction of exclusion constraints in the employment equation necessary for identification. In our model we introduce three set of variables in the participation equation:

- The qualifications of the partner, a proxy variable for partner income, which should have a negative effect on the labor supply of the individual;
- The situation of the partner on the labor market (employed, unemployed or inactive) is closely related to the previous variable. The labor supply should be increased in case of unemployed or inactive partner.
- The home-ownership situation of the individual. This variable has two effects:
 - i. Ownership, in contrast to rental, reduces the mobility of job seekers and negatively affects the probability of finding a job in the labor market. Some discouraged jobseekers may thus reduce their labor supply.
 - ii. Homebuyers compared to owners or tenants, have a stronger incentive to participate in the labor market, due to specific expenses induced by loan repayment.

Table 12 (see *appendix*) summarizes all the variables used in the participation and employment equations and presents the characteristics of the base case. A close examination of identifying constraints and their impact on the coefficients related to sexual orientation is performed in the following section.

It should be stressed that the return of individual characteristics on participation and employment is not a linear function of parameter values. This is directly linked to the nonlinearity in the relationship between probabilities to participate and to be employed and the independent variables. In the simple probit model the return of the worker characteristics on the probability to be employed is equal to $\partial\Phi(X_i\beta_1 + Gay_i\beta_2)/\partial\beta_1$ if X_i is a continuous variable or to $\Phi(X_i\beta_1 + \beta_2) - \Phi(X_i\beta_1)$ for a discrete variable like the sexual orientation Gay_i . These are the marginal effects.²⁶

Univariate Probit Analysis

In a first step, we use a direct econometric strategy where the only employment equation is estimated on the French economy, ignoring the potential selection bias.

²⁶ The computation of the marginal effects and their variance-covariance matrix on survey Data is available on request (cf. Mihoubi (2014))

Because we focus on the employment equation, we consider in this model a population composed of employed and unemployed but not inactive individuals. This raises the issue of unemployment definition. In the *French Employment Survey*, unemployment is measured according to the following ILO (International Labour Organization) definition: (i) to be without any job during the week of the interview, (ii) to be available in the next 15 days to get a job and (iii) to have actively searched a job during the previous month using at least one mean of job search among 15 proposed items including for example “watching ads for jobs”, “taking advice from a public institution to find a job” *etc.*

With this definition, we cannot exclude that part of unemployed persons are in fact job-seekers characterized by a very low search intensity *i.e.* persons declared as unemployed but without really looking for a job. We thus consider the ILO definition as a *broad* unemployment definition. In order to rule out from our unemployment sample such job-seekers, we consider a *narrow* unemployment definition by restricting the initial set of 15 items of the third ILO condition to the following set of only five items:

- to have made a direct approach with an employer,
- to have published an ad to find a job,
- to have participated to a hiring process,
- to have answered a job advertisement,
- to have studied the advertisements of vacancies.

The results associated with the two definitions of unemployment are reported in Table 5. The coefficient related to sexual orientation is negative and significant with both unemployment definitions. It is a little bit higher with the narrow unemployment definition (−0.34) than with the broad unemployment definition (−0.29). However, those coefficients cannot be interpreted in a straightforward and direct manner in terms of employment or unemployment probabilities. Therefore we have to consider instead the corresponding marginal effects. It turns out that the marginal effects are quite identical with the two definitions of unemployment: −1.64 pp. (percentage points) *vs* − 1.58 pp. In other words, gays living as a couple see their probability to be employed reduced by 1.58 pp. compared to their heterosexual counterparts. Equivalently, it means that being gay increases by 1.58 pp. the probability to be unemployed.²⁷ This unemployment probability gap between gays and straight men could be viewed as rather small. However we have to compare this gap to the unemployment probability for the base case *i.e.* 1.92 % for the broad unemployment definition and 1.50 % for the narrow unemployment definition. *For the base case, the fact to be gay implies an unemployment probability multiplied by 1.8 with the broad definition of unemployment and by 2 with the narrow definition.*

²⁷ Laurent and Mihoubi (2012) notice that, as same-sex marriage was not allowed in France at that time, the marriage premium could logically be added to such an estimation, leading to estimate an upper bound for the unemployment probability gap between gays and straight men. Here, the marriage premium measured with the marginal effect associated to the married variable range from +1.16 pp. (narrow definition of unemployment) to +1.56 pp. (broad definition). We would thus get an upper bound for the unemployment gap between gays and straights equal to +2.74 pp. with the narrow definition of unemployment *vs.* +3.14 pp. with the broad definition.

Table 5 Univariate probit model

Variables	Broad definition of unemployment				Narrow definition of unemployment			
	Estimation results		Marginal effects		Estimation results		Marginal effects	
	Coefficient	t-student Delta method	Coefficient	t-student Delta method	Coefficient	t-student Delta method	Coefficient	t-student Delta method
Sexual orientation	-0.294	-2.78	-1.64 pp	-2.13	-0.335	-2.98	-1.58 pp	-2.17
Age								
< 30	-0.157	-2.89	-0.74 pp	-2.50	-0.150	-2.56	-0.57 pp	-2.21
35–39	-0.056	-1.54	-0.23 pp	-1.49	-0.043	-1.09	-0.14 pp	-1.06
40–44	-0.081	-2.21	-0.35 pp	-2.10	-0.076	-1.88	-0.26 pp	-1.79
45–49	-0.151	-3.99	-0.68 pp	-3.63	-0.178	-4.33	-0.66 pp	-3.85
≥ 50	-0.183	-4.55	-0.84 pp	-4.07	-0.203	-4.68	-0.76 pp	-4.11
Birth place								
Western countries (excluding France)	-0.032	-0.39	-0.14 pp	-0.38	-0.013	-0.14	-0.04 pp	-0.14
African countries	-0.221	-4.90	-1.12 pp	-4.02	-0.239	-5.01	-0.99 pp	-4.01
Degrees								
Other countries	-0.362	-4.55	-2.15 pp	-3.32	-0.390	-4.60	-1.95 pp	-3.23
No degree	-0.486	-3.81	-2.56 pp	-2.99	-0.575	-4.13	-2.59 pp	-3.05
College	0.043	1.16	0.17 pp	1.20	0.010	0.25	0.03 pp	0.25
Master's, PhD	0.132	3.05	0.49 pp	3.40	0.097	2.09	0.29 pp	2.27
Qualification								
Age x No degree	0.009	3.21	0.04 pp	3.21	0.011	3.54	0.04 pp	3.54
Unskilled	-0.187	-7.21	-0.85 pp	-6.49	-0.189	-6.75	-0.69 pp	-6.04
Highly skilled	-0.068	-1.91	-0.29 pp	-1.84	-0.058	-1.51	-0.19 pp	-1.45
Other	-1.188	-35.96	-14.63 pp	-19.42	-1.084	-29.89	-10.51 pp	-15.79
Family situation								
Married	0.309	9.31	1.53 pp	7.75	0.293	8.14	1.16 pp	6.78
Number of children	0.069	5.60	0.28 pp	5.59	0.069	5.13	0.23 pp	5.12
At least 2 children ≤ 5 years old	-0.071	-2.61	-0.30 pp	-2.54	-0.081	-2.72	-0.27 pp	-2.64

Table 5 (continued)

Variables	Broad definition of unemployment				Narrow definition of unemployment			
	Estimation results		Marginal effects		Estimation results		Marginal effects	
	Coefficient	t-student Delta method	Coefficient	t-student Delta method	Coefficient	t-student Delta method	Coefficient	t-student Delta method
Social capital (qualification of the father)	0.094	2.26	0.36 pp	2.44	0.103	2.27	0.31 pp	2.48
	0.106	3.19	0.44 pp	3.12	0.129	3.64	0.43 pp	3.52
	-0.023	-0.56	-0.10 pp	-0.55	0.029	0.64	0.09 pp	0.66
	0.078	1.99	0.30 pp	2.11	0.136	3.20	0.40 pp	3.54
Location	-0.109	-3.65	-0.48 pp	-3.37	-0.121	-3.78	-0.43 pp	-3.44
	0.006	0.23	0.02 pp	0.23	0.001	0.05	0.00 pp	0.05
	0.059	1.35	0.23 pp	1.43	0.123	2.49	0.35 pp	2.82
	-0.032	-1.25	-0.13 pp	-1.23	-0.012	-0.42	-0.04 pp	-0.42
	-3.170	-68.01	-82.54 pp	-74.75	-3.144	-64.47	-79.59 pp	-61.29
Situation during the previous year								
Intercept	2076	37.32			2.170	36.04		
Sample size	105,277				104,556			

This sizeable unemployment probability gap between gays and heterosexual men is in line with Leppel (2008). Using the US 2000 Decennial Census data, she finds an unemployment probability equals to 2.7 % for male same-sex couples vs. 1.4 % for married heterosexual men. This also implies for the base case an unemployment probability twice greater for gays.²⁸

The sign and the magnitude of the coefficients related to the other characteristics are rather usual on French data. The employment probability is lower for young workers (−0.6 pp) and seniors (−0.8 pp), for workers born in non-western countries (−1 pp. for African countries and −2 pp. for other non-western countries), for workers with little education²⁹ (−2.6 pp), for low or unreported skilled (−10 pp), for a father with a skilled and highly skilled qualification,³⁰ for a location in Paris metropolitan area (−0.45 pp), and for unemployed worker the previous year (−80 pp). This latter characteristic has a huge impact on the employment rate, inducing a quasi-hysteretic unemployment in France.

Sexual orientation has the most important negative impact on employment probability. The impact on employment probability of being born in an African country (from −1 pp. to −1.12 pp) or of being older than fifty (−0.76 pp. to −0.84 pp) are weaker than to be gay (−1.58 pp. to −1.64 pp).

Bivariate Probit Analysis

So far we have ignored the potential selection bias affecting our estimates. We consider in this section the complete bivariate probit selection model. In addition, to assess the magnitude of the selection bias and its effects on the employment probability gap related to sexual orientation, it provides also an insight about the effect of sexual orientation on the labor supply.

The results reported in Table 6, clearly indicate a significant correlation between the residuals of the participation equation (labor supply equation) and the employment equation.³¹ It is worth noting that the estimated correlation coefficient of −0.83 does not state that a high probability to participate in the labor market makes the worker less likely to get a job. This coefficient measures only the correlation among the unobserved factors in each equation. The unobserved factors that make him more likely to participate make him less likely to be employed. For instance, the total household incomes, not observed here, can contribute, if they are low, to a higher participation rate. However, low incomes, can be related to low productive abilities and therefore induce a weak probability to be employed.

²⁸ It is worth noting that the upper bound for the unemployment probability gap is much higher in France (+2.74 pp. to +3.15 pp) than in the US (+1.3 pp).

²⁹ The absence of degrees has a negative impact on the employment probability. The magnitude of the negative impact decreases with age (interaction term between age and “no degree” equal to 0.03 pp). For older workers, the fact that they do not hold any degree is less stigmatizing than for younger workers.

³⁰ This negative impact may be related to a higher initial endowment with a skilled or highly skilled father, diminishing the intensity of job search for an unemployed worker.

³¹ The delta method used to compute the variance of the estimates and the marginal effects is based on a linear approximation of the model. Because our model is very non-linear, we check the robustness of the delta method using an alternative computation of the variances of the estimates and the marginal effects based on a bootstrap method, which does not require any linear approximation but is much more expensive in computational time.

Table 6 Bivariate probit selection model (delta method vs bootstrap)

Variables	Participation equation				Employment equation				
	Estimation results		Marginal effects		Estimation results		Marginal effects		
	Coefficient	t-student	Coefficient	t-student	Coefficient	t-student	Coefficient	t-student	
	Delta method	Bootstrap method	Delta method	Bootstrap method	Delta method	Bootstrap method	Delta method	Bootstrap method	
Sexual orientation									
Gay	-0.276	-2.30	-2.25	-1.92 pp	-0.296	-2.52	-2.63	-1.45 pp	-2.04
Age									
< 30	0.017	0.25	0.26	0.08 pp	-0.139	-2.38	-2.36	-0.59 pp	-2.09
35–39	-0.015	-0.37	-0.37	-0.06 pp	-0.045	-1.18	-1.24	-0.18 pp	-1.20
40–44	-0.081	-2.06	-1.95	-0.39 pp	-0.076	-1.93	-1.90	-0.30 pp	-1.81
45–49	-0.177	-4.56	-4.33	-0.90 pp	-0.172	-4.30	-4.35	-0.72 pp	-3.94
≥50	-0.366	-9.54	-9.33	-1.96 pp	-0.189	-4.45	-4.22	-0.78 pp	-3.84
Birth place									
Western countries (excluding France)	0.099	1.10	0.99	0.42 pp	-0.003	-0.04	-0.04	-0.01 pp	-0.04
African countries	-0.103	-2.06	-1.91	-0.51 pp	-0.223	-4.73	-4.73	-1.01 pp	-3.98
Other countries	-0.175	-1.81	-1.91	-0.93 pp	-0.364	-4.22	-4.11	-1.90 pp	-3.11
Degrees									
No degree	-0.115	-4.88	-4.63	-0.55 pp	-0.551	-4.03	-3.97	-2.80 pp	-2.78
College	0.155	3.96	3.97	0.64 pp	0.007	0.17	0.18	0.03 pp	0.18
Master's, PhD	0.256	6.13	5.95	0.99 pp	0.086	1.89	1.93	0.31 pp	2.05
Qualification									
Age x No degree					0.011	3.49	3.45	0.06 pp	2.43
Unskilled					-0.179	-6.56	-6.60	-0.74 pp	-6.10
Highly skilled					-0.052	-1.40	-1.46	-0.20 pp	-1.43
Other					-1.061	-28.57	-29.44	-9.85 pp	-16.35
Family situation									
Married	0.152	5.69	5.42	0.76 pp	0.272	7.62	7.39	1.18 pp	6.45

Table 6 (continued)

Variables	Participation equation			Employment equation							
	Estimation results		Marginal effects	Estimation results		Marginal effects					
	Coefficient	t-student	Coefficient	Coefficient	t-student	Coefficient					
							Delta method	Bootstrap	Delta method	Bootstrap	
Number of children	-0.004	-0.32	-0.31	-0.31	-0.31	0.065	5.02	4.75	0.27	pp	4.30
At least 2 children ≤ 5 years old						-0.077	-2.66	-2.71	-0.30	pp	-2.64
Never Married x Children						0.102	2.26	2.15	0.36	pp	2.30
Social capital (qualification of the father)						0.127	3.65	3.65	0.49	pp	3.54
Highly skilled						0.026	0.60	0.58	0.10	pp	0.60
Craftsman, merchant, entrepreneur, self-employed						0.138	3.32	3.44	0.48	pp	3.65
Real estate capital											
Home owner	0.080	2.64	2.68						0.36	pp	2.78
Homebuyer	0.182	6.89	6.73						0.80	pp	6.99
Other incomes (qualification of the partner)											
Unskilled	0.028	0.95	0.94						0.01	pp	0.94
Highly skilled	-0.140	-3.71	-3.73						-0.70	pp	-3.44
Craftsman, merchant, entrepreneur, self-employed	-0.588	-10.76	-9.87						-4.41	pp	-6.66
Situation of the partner											
Unemployed	-0.410	-4.68	-4.64						-4.54	pp	-1.24
Employed	-0.993	-14.03	-13.76						-7.56	pp	-1.90
Location											
Paris metropolitan area	0.028	0.86	0.91						0.13	pp	0.93
Rural commune	-0.056	-2.23	-2.15						-0.26	pp	-2.11
									-0.121		-3.90
						0.006	0.21	0.22	-0.49	pp	-3.51
									0.02	pp	0.22

Table 6 (continued)

Variables	Participation equation			Employment equation						
	Estimation results		Marginal effects	Estimation results		Marginal effects				
	Coefficient	t-student	Coefficient	t-student	Coefficient	t-student				
		Delta method		Bootstrap method		Bootstrap				
Region with low unemployment rate	-0.019	-0.43	-0.41	-0.09 pp	-0.41	0.118	2.47	2.51	0.40 pp	2.78
Region with high unemployment rate	-0.126	-4.91	-4.95	-0.62 pp	-4.66	-0.007	-0.26	-0.27	-0.03 pp	-0.27
Situation during the previous year	-1.504	-37.77	-38.02	-22.29 pp	-20.43	-2.565	-39.74	-37.91	-58.97 pp	-25.19
Intercept	3.006	34.00	32.78			-2.174	36.93	36.38		
Residual correlation (ρ)						-0.828	-18.11	-16.45		
Number of observations	106,751					104,556				

The effect of the selection bias on the estimated parameter and the marginal effects³² is very weak. The marginal effect of sexual orientation (−1.45 pp) is very close to that obtained with the direct estimation strategy implemented before (−1.64 pp. and −1.58 pp).

Concerning the participation equation, most of the estimates and marginal effects have the expected signs and magnitudes. The same-sex couples members have a labor supply reduced by −1.80 pp. compared to their heterosexual counterparts. As recalled in section 1.1. this negative effect of homosexuality on the labor supply originates in several non-exclusive mechanisms: negative impact on the incentive to work due to wage discrimination based on sexual orientation,³³ specific sharing of domestic tasks inside gay households,³⁴ and reduced labor force participation for people living with HIV/AIDS *etc.*

These findings strongly contrast with those of Tebaldi and Elmslie (2006) stating that sexual orientation has no significant effect on the probability to be inactive. However, they also found that the interactions for “gay” and “dependent”, “gay” and “location” and “gay” and “unemployed during the previous period” have a strong positive effect on the probability to be inactive.

Developments

The first part of this section investigates the impact on the robustness of the results of three main econometric issues: heteroskedasticity, correlation between members of same-sex couples and identification constraints in the selection equation. The second part is devoted to the analysis of the mechanisms through which the employment probability gap between gay and heterosexual men occurs.

Heteroskedasticity

Cross section data, such as *Employment Survey*, are frequently heteroskedastic. The previous model ignores this potential problem. However, the consequences of heteroskedasticity on estimators for probit model are severe: the standard errors estimates are wrong and the estimators are both biased and inconsistent, involving inconsistent estimates and erroneous marginal effects. To check for heteroskedasticity, we complete our model by adding two equations describing heteroskedasticity in both the participation equation and the employment equation. The heteroskedasticity is explained by the following variables:

- For the participation equation: age, birth place, degree and number of children.

³² The marginal effect of past unemployment on employment probability is however reduced: 60 pp. instead of 80 pp. with the direct estimation strategy.

³³ Laurent and Mihoubi (2012) have found strong evidence of a wage discrimination against gays on the French labor market

³⁴ Contrary to heterosexual couples where the domestic tasks are usually performed by women, such a specialization is not working in male same-sex couples. As a consequence, members of a gay couple participate more than heterosexual men in domestic task and thus may reduce their labor force participation.

- For the employment equation: characteristic of the region concerning the unemployment situation (region with low vs high unemployment rates), qualification, birth place, degree and number of children.

The residual of the participation equation does not seem to be heteroskedastic and as a result, none of the explanatory variables have a significant impact on the heteroskedasticity (Table 7). For the employment equation the degree (“Master/PhD”) and the qualification have a significant impact on the heteroskedasticity. “Master/PhD degree” and “Unskilled qualification” reduce the individual residual variance whilst “High skilled” and “Other qualifications” seem to increase the individual residual variance. “Master/PhD degree” and “Low skill” imply a relative homogeneity in the employment probability. At the opposite, there is a marked heterogeneity in the employment probability for high skilled workers.

It is worth noting that the potential heteroskedasticity does not modify our findings concerning the effect of sexual orientation on participation and employment probabilities. The coefficients are very close to the ones obtained without taking into account heteroskedasticity. For the participation equation, it is not a surprise: the coefficient related to sexual orientation in the model accounting for heteroskedasticity (−0.275) is not significantly different from the one obtained without heteroskedasticity modeling (−0.276). As a consequence, the marginal effect is quasi-identical. Concerning the employment probability equation the same remark applied: the coefficient in the heteroskedastic case (−0.289) is not statistically different from the one in the homoskedastic case (−0.296).

Accounting for Correlated Observations

A second econometric issue originates in the fact that, when working with same-sex couples members, both members of each couple are present in the same sample. The participation and employment behaviors of members of a same couple being highly correlated, the gay sample - contrary to the male heterosexual sample - contains correlated observations.³⁵ So far, we have not taken into account this correlation. A first solution is to amend the likelihood of the correlation between members of same-sex couples. However, because we have to consider both correlations between members and between participation and employment, this solution implies the evaluation of a trivariate cumulative normal distribution which is costly in computational time. Another solution to overcome the correlated observations issue has been suggested by Leppel (2008) - it consists in a bootstrap approach described by the following three steps method:

1. Randomly select one member for each same-sex couples and keep all the heterosexual men
2. Estimate the bivariate probit selection model and the marginal effects on this sample

³⁵ This econometric issue does not arise when working, for example, on gender discrimination because the two members of a couple cannot belong to the same sample: one member belongs to the female sample while the other is in the male sample.

Table 7 Bivariate probit selection model (heteroskedastic case, delta method)

Variables	Participation equation				Employment equation				
	Estimation results		Heteroskedastic equation		Estimation results		Heteroskedastic equation		
	Coefficient	t-student	Coefficient	t-student	Coefficient	t-student	Coefficient	t-student	
Sexual orientation									
Age									
	Gay	-0.275	-2.13	-1.038	-2.63	-0.289	-2.09	0.184	0.87
	< 30	0.570	1.63	0.130	0.55	-0.169	-2.71	-0.061	-0.47
	35–39	-0.017	-0.41	0.280	0.98	-0.052	-1.27	0.264	1.12
	40–44	-0.065	-1.26	0.112	0.39	-0.083	-1.98	-0.057	-0.88
	45–49	-0.161	-3.64	-1.027	-2.64	-0.188	-4.36	0.127	1.34
	≥50	-0.376	-9.61	0.735	1.48	-0.197	-4.29	0.233	2.19
Birth place	Western countries (excluding France)	0.553	1.42	-1.027	0.39	0.006	0.05	0.832	9.18
	African countries	0.172	0.51	0.735	1.48	-0.248	-4.67	-0.522	-3.95
	Other countries	0.381	1.14	1.139	3.65	-0.324	-2.74	1.291	9.24
Degrees	No degree	-0.105	-3.78	0.153	1.29	-0.636	-4.32	0.068	4.90
	College	0.155	3.87	0.044	0.16	0.008	0.18	-0.019	-1.05
	Master's, PhD	0.266	5.42	0.145	0.85	0.059	1.14	-0.082	-2.69
Qualification	Age x No degree					0.012	3.71		
	Unskilled					0.115	1.84		
	Highly skilled					0.048	0.66		
	Other					-0.598	-5.89		
Family situation	Married	0.148	5.39			0.281	7.17		
	Number of children	-0.013	-0.84	-0.121	-1.08	0.068	4.90		
	At least 2 children ≤ 5 years old								

Table 7 (continued)

Variables	Participation equation			Employment equation		
	Estimation results	Heteroskedastic equation	t-student	Estimation results	Heteroskedastic equation	t-student
	Coefficient	Coefficient	t-student	Coefficient	Coefficient	t-student
Social capital (<i>qualification of the father</i>)	Never Married x Children			0.100		2.10
	Unskilled			0.133		3.57
	Highly skilled			0.020		0.43
Real estate capital	Craftsman, merchant, entrepreneur, self-employed			0.149		3.32
	Home owner	0.083	2.71			
	Homebuyer	0.186	6.94			
Other incomes (<i>qualification of the partner</i>)	Unskilled	0.025	0.83			
	Highly skilled	-0.142	-3.71			
	Craftsman, merchant, entrepreneur, self-employed	-0.579	-10.18			
Situation of the partner	Unemployed	-0.444	-5.04			
	Employed	-1.038	-14.15			
	Paris metropolitan area	0.029	0.88	-0.141		-4.23
Location	Rural commune	-0.059	-2.29	-0.001		-0.05
	Region with low unemployment rate	-0.022	-0.49	0.119	2.30	-0.024
	Region with high unemployment rate	-0.129	-4.98	-0.009	-0.30	0.002
Situation the previous year	Unemployed	-1.577	-36.61	-2.674		-45.68
Intercept		3.075	31.64	2.206		34.89
Residual correlation (ρ)				-1.69		-9.90
Number of observations		106,751		104,556		

3. Repeat L times the steps 1 and 2

The moments of the empirical distributions of estimates and marginal effects obtained with this procedure for $L = 1000$ are reported in Table 8. The mean and the standard-deviation of the empirical distribution are reported in the Coefficient and Std-Dev columns respectively. As expected, the marginal effects and the coefficients for all the variables except sexual orientation are nearly identical (with a very low dispersion) to those reported in Table 6 *i.e.* without correcting for correlated observations. The sexual orientation (Gay variable) is the most sensitive coefficient of the model in this exercise. The marginal effects in the participation equation (-2.10 pp. *vs.* -1.92 pp) and the employment equation (-1.92 pp. *vs.* -1.45 pp) remain very close and have small standard-errors (0.006 and 0.004 respectively). In addition, no estimated coefficient related to the sexual orientation among $L = 1000$ displays a positive value.

Identification Constrains

In the bivariate probit model the identification of the two equations relies on the exclusion constraints imposed on the employment equation for the variables appearing only in the participation equation: the qualifications of the partner, the status on the labor market of the partner and the home-ownership situation of the individual. However some of these variables can be misinterpreted and/or are not suited for identification purpose. For instance, we cannot exclude that the home-ownership situation could be related to the situation on the labor market as soon as the causal relation between the situation on the labor market and the ownership status is inverted: the fact that a household is a homebuyer or a homeowner may be a consequence of the fact to be employed. In the results reported in Table 6, being a homebuyer individual has a strong positive impact on the labor supply, as expected.³⁶ The status of homeowner has a smaller positive effect on the participation, but not the expected negative one. This latter result can be a consequence of a correlation between the homeowner status and unobserved productive characteristics that contribute to higher participation rate.

In addition, the examination of the results reported in Table 6 suggests that the real estate status, the qualification of the partner and his/her status on the labor market appear to be important factors explaining the participation probability.

To assess the role played by the identification constraints we have carried out a sensitivity analysis of the gay coefficients in selection and in employment equations to the set of identification constraints considered. The results reported in Table 9, point out that the effect of the sexual orientation on participation and employment probabilities are rather insensitive to the identification restrictions considered.

We have estimated the conditional biprobit model using different subsets of identification constraints. The coefficient related to the sexual orientation in the participation equation ranges between -0.27 and -0.3 and its marginal effect is in the vicinity of

³⁶ The positive correlation between unemployment and homeowner status observed at the macro level Oswald (1996), has been refuted when controlling for the unobserved heterogeneity and for potential endogeneity between residential status and labor market situation.

Table 8 Bivariate probit *à la* Leppel (bootstrap)

Variables	Participation equation			Employment equation				
	Estimation results		Marginal effects	Estimation results		Marginal effects		
	Coefficient	Std-Dev	Coefficient	Std-Dev	Coefficient	Std-Dev		
Sexual orientation	-0.336	7.39 % (-4.55)	-2.10 pp	0.57 % (-3.63)	-0.363	6.42 % (-5.65)	-1.92 pp	0.44 % (-4.30)
Age								
< 30	0.011	0.58 %	0.05 pp	0.03 %	-0.136	0.69 %	-0.57 pp	0.03 %
35–39	-0.019	0.30 %	-0.09 pp	0.01 %	-0.048	0.20 %	-0.18 pp	0.01 %
40–44	-0.083	0.33 %	-0.40 pp	0.02 %	-0.080	0.17 %	-0.31 pp	0.01 %
45–49	-0.181	0.27 %	-0.92 pp	0.01 %	-0.174	0.21 %	-0.73 pp	0.01 %
≥ 50	-0.369	0.28 %	-1.97 pp	0.02 %	-0.192	0.18 %	0.79 pp	0.01 %
Birth place								
Western countries (excluding France)	0.098	0.07 %	0.42 pp	0.00 %	-0.005	0.12 %	-0.02 pp	0.00 %
African countries	-0.103	0.21 %	-0.52 pp	0.01 %	-0.225	0.13 %	-1.02 pp	0.01 %
Other countries	-0.184	0.84 %	-0.99 pp	0.05 %	-0.365	1.03 %	-1.90 pp	0.07 %
Degrees								
No degree	-0.112	0.13 %	-0.53 pp	0.01 %	-0.558	0.69 %	-2.84 pp	0.05 %
College	0.161	0.38 %	0.66 pp	0.01 %	0.004	0.25 %	0.02 pp	0.01 %
Master's, PhD	0.255	0.22 %	0.99 pp	0.01 %	0.079	0.35 %	0.28 pp	0.01 %
Age x No degree								
Unskilled					0.011	0.01 %	0.06 pp	0.00 %
Highly skilled					-0.180	0.17 %	-0.74 pp	0.01 %
Other					-0.052	0.13 %	-0.20 pp	0.01 %
Family situation					-1.060	0.26 %	-9.82 pp	0.04 %
Married	0.152	0.07 %	0.75 pp	0.00 %	0.275	0.15 %	1.19 pp	0.01 %
Number of children	-0.003	0.04 %	-0.02 pp	0.00 %	0.066	0.03 %	0.27 pp	0.00 %
At least 2 children ≤ 5 years old					-0.076	0.05 %	-0.29 pp	0.00 %
Never Married x Children					0.104	0.20 %	0.37 pp	0.01 %

Table 8 (continued)

Variables	Participation equation				Employment equation			
	Estimation results		Marginal effects		Estimation results		Marginal effects	
	Coefficient	Std-Dev	Coefficient	Std-Dev	Coefficient	Std-Dev	Coefficient	Std-Dev
Social capital (<i>qualification of the father</i>)					0.123	0.29 %	0.47 pp	0.01 %
Highly skilled					0.028	0.41 %	0.10 pp	0.01 %
Craftsman, merchant, entrepreneur, self-employed					0.135	0.28 %	0.47 pp	0.01 %
Real estate capital								
Home owner	0.083	0.21 %	0.37 pp	0.01 %				
Homebuyer	0.183	0.11 %	0.81 pp	0.00 %				
Unskilled	0.031	0.18 %	0.14 pp	0.01 %				
Highly skilled	-0.142	0.16 %	-0.71 pp	0.01 %				
Craftsman, merchant, entrepreneur, self-employed	-0.585	0.13 %	-4.37 pp	0.01 %				
Situation of the partner								
Unemployed	-0.409	0.54 %	-2.65 pp	0.05 %				
Employed	-0.996	0.33 %	-2.72 pp	0.01 %				
Location								
Paris metropolitan area	0.031	0.24 %	0.14 pp	0.01 %	-0.125	0.19 %	-0.50 pp	0.01 %
Rural commune	-0.057	0.07 %	-0.27 pp	0.00 %	0.005	0.10 %	0.02 pp	0.00 %
Region with low unemployment rate	-0.020	0.07 %	-0.09 pp	0.00 %	0.116	0.11 %	0.39 pp	0.00 %
Region with high unemployment rate	-0.126	0.13 %	-0.62 pp	0.01 %	-0.005	0.19 %	-0.02 pp	0.01 %
Situation the previous year								
Unemployed	-1.507	0.27 %	-22.33 pp	0.07 %	-2.564	0.42 %	-58.90 pp	0.15 %
Intercept	3.01	0.41 %			2.18	0.39 %		
Residual correlation (ρ)					-0.83	0.55 %		
Number of observations	106,751				104,556			

Table 9 Impact of the identification constraints on the gay coefficients (bootstrap)

List of identification constraints		Participation equation gay coefficient		Employment equation gay coefficient		Correlation		
Status of the partner on the labor market	Qualification of the partner	Housing	Age of the partner	Coefficient	Marginal effect	Coefficient	Marginal effect	
✓	✓	✓		-0.276 (-2.25)	-1.92 pp. (-1.79)	-0.296 (-2.63)	-1.45 pp. (-2.04)	-0.83 (-18.11)
✓	✓			-0.272 (-2.20)	-1.58 pp. (-1.76)	-0.296 (-2.63)	-1.45 pp. (-2.04)	-0.83 (-16.91)
✓		✓		-0.272 (-2.24)	-1.60 pp. (-1.79)	-0.295 (-2.63)	-1.44 pp. (-2.04)	-0.86 (-18.91)
	✓	✓		-0.305 (-2.52)	-1.90 pp. (-1.96)	-0.314 (-2.90)	-1.55 pp. (-2.21)	-0.55 (-4.70)
	✓			-0.301 (-2.48)	1.87 pp. (-1.93)	-0.313 (-2.88)	-1.55 pp. (-2.20)	-0.58 (-4.94)
		✓		-0.303 (-2.56)	-1.91 pp. (-1.99)	-0.316 (-2.93)	-1.57 pp. (-2.23)	-0.54 (-3.23)
✓				-0.269 (-2.20)	-1.58 pp. (-1.76)	-0.296 (-2.63)	-1.45 pp. (-2.04)	-0.86 (-19.44)
✓	✓	✓	✓	-0.274 (-2.22)	-1.60 pp. (-1.77)	-0.296 (-2.63)	-1.45 pp. (-2.04)	-0.83 (-16.38)

–1.80 pp. In the employment equation the coefficient varies from -0.30 to -0.32 with a marginal effect ranging from -1.45 pp. to -1.57 pp.

We have also examined the potential impact of an additional variable explaining the participation but with no direct impact on the probability to be employed, namely the “age of the partner”. The fact that the age of the partner can have an impact on the participation rate of an individual is consistent with labor supply modeling:

- In the classical unitary models the individual labor supply is the outcome of the maximization of a unique utility function for the whole household. As a consequence the age of the partner has an impact on the participation of the individual. Young or old partner, with low participation rate, should have a positive impact on the probability to participate of the individual.
- In contrast to the unitary models, the collective model (Chiappori (1988), (Chiappori 1992)), considers the individual behavior inside the household. Each individual has a bargaining power depending on the outside opportunities or on social and legal factors, such as the relative contribution to the non-labor income of the household or the age difference between household members. In such a case the labor supply is the outcome of an intra-household bargaining process and the age of the household members could have a strong effect on the labor supply. Oreffice (2011) shows that, for same sex couples in the US, the younger and the richer member of the household has the higher outside opportunity and thus the lower labor supply.

The last row of the Table 9, reports the impact of the additional identification variable, the age of the partner, on the gay coefficient in the participation and the employment equations; compared to the initial setup (first row of Table 9), this new identification constraint has a very little effect on the gay coefficient whether in the participation equation or the employment equation. This result is not a surprise since the age of the partner (or the difference between the individual and his partner) has not a significant impact on the participation equation.

Age and Turnover

The purpose of this subsection is to determine if members of same-sex couples are identically exposed to the employment probability gap during all their working life. To address this question we have split in two the sexual orientation variable: gays under 40 years old (young workers) vs. over 40 years old (old workers). The results reported in Table 10 clearly show that:

- Gays under forty years old have a strong employment probability penalty (-2.4 pp. vs. -1.5 pp. in the homogeneous case) and an identical participation probability (-1.94 pp. vs. -1.92 pp. in the homogenous case).
- For gays older than forty years old there is neither employment probability gap, nor participation probability gap, compared to their heterosexual counterparts. The coefficients related to sexual orientation and their marginal effects are non-significant.

Table 10 The effect of age: Bivariate probit (delta method vs bootstrap)

Variables	Participation equation				Employment equation						
	Estimation results		Marginal effects		Estimation results		Marginal effects				
	Coefficient	t-student	Coefficient	t-student	Coefficient	t-student	Coefficient	t-student			
		Delta method	Bootstrap			Delta method	Bootstrap				
Sexual orientation	Gay <40	-0.319	-2.15	-2.08	-1.94 pp	-1.65	-0.426	-3.30	-3.52	-2.36 pp	-2.50
	Gay ≥40	-0.217	-1.14	-1.10	-0.12 pp	-0.97	0.064	0.25	0.25	0.06 pp	0.25
Age	< 30	0.019	0.29	0.29	0.09 pp	0.29	-0.135	-2.31	-2.29	-0.57 pp	-2.04
	35–39	-0.015	-0.39	-0.39	0.07 pp	-0.38	-0.047	-1.21	-1.28	-0.18 pp	-1.24
	40–44	-0.083	-2.12	-2.01	-0.40 pp	-1.92	-0.083	-2.11	-2.08	-0.33 pp	-1.99
	45–49	-0.178	-4.59	-4.35	-0.91 pp	-3.92	-0.178	-4.43	-4.50	-0.75 pp	-4.06
Birth place	≥ 50	-0.367	-4.67	-9.30	-1.97 pp	-7.86	-0.195	-4.57	-4.36	-0.81 pp	-3.95
	Western countries (excluding France)	0.100	1.10	1.00	0.42 pp	1.14	-0.002	-0.03	-0.03	-0.01 pp	-0.03
Degrees	African countries	-0.102	-2.05	-1.90	-0.51 pp	-1.77	-0.223	-4.73	-4.74	-1.01 pp	-3.98
	Other countries	-0.171	-1.77	-1.86	-0.91 pp	-1.63	-0.359	-4.14	-4.04	-1.86 pp	-3.06
	No degree	-0.115	-4.88	-4.63	-0.55 pp	-4.49	-0.555	-4.06	-4.01	-2.82 pp	-2.80
	College	0.156	3.96	3.97	0.64 pp	4.43	0.007	0.17	0.18	0.03 pp	0.18
Qualification	Master's, PhD	0.256	6.13	5.95	1.00 pp	7.05	0.085	1.88	1.92	0.30 pp	2.03
	Age x No degree						0.110	3.51	3.48	0.06 pp	2.45
	Unskilled						-0.179	6.56	-6.60	-0.74 pp	-6.11
	Highly skilled						-0.053	-1.42	-1.47	-0.20 pp	-1.44
	Other						-1.060	-28.55	-29.40	-9.85 pp	-16.34

Table 10 (continued)

Variables	Participation equation				Employment equation				
	Estimation results		Marginal effects		Estimation results		Marginal effects		
	Coefficient	t-student	Coefficient	t-student	Coefficient	t-student	Coefficient	t-student	
		Delta method	Bootstrap			Delta method	Bootstrap		
Family situation									
Married	0.152	5.69	5.40	0.76 pp	5.03	0.274	7.65	7.41	1.19 pp
Number of children	-0.004	-0.32	-0.31	-0.02 pp	-0.32	0.066	5.04	4.77	0.27 pp
At least 2 children ≤ 5 years old						-0.077	-2.68	-2.73	-0.30 pp
Never Married x Children						0.102	2.25	2.14	0.36 pp
Unskilled						0.125	3.62	3.62	0.48 pp
Highly skilled						0.025	0.57	0.56	0.09 pp
Craftsman, merchant, entrepreneur, self-employed						0.136	3.28	3.40	0.48 pp
Real estate capital									
Home owner	0.803	2.65	2.69	0.36 pp	2.79				
Homebuyer	0.182	6.89	6.73	0.80 pp	6.99				
Unskilled	0.028	0.95	0.94	0.13 pp	0.94				
Highly skilled	-0.140	-3.71	-3.73	-0.70 pp	-3.44				
Craftsman, merchant, entrepreneur, self-employed	-0.588	-10.79	-9.89	-0.04 pp	-6.67				
Situation of the partner									
Unemployed	-0.410	-4.67	-4.63	-2.66 pp	-3.38				
Employed	-0.993	-14.04	-13.78	-2.73 pp	-20.85				
Paris metropolitan area	0.028	0.85	0.90	0.13 pp	0.92	-0.122	-3.91	-3.77	-0.49 pp
Location									-3.52

Table 10 (continued)

Variables	Participation equation			Employment equation						
	Estimation results		Marginal effects	Estimation results		Marginal effects				
	Coefficient	t-student	Coefficient	t-student	Coefficient	t-student				
	Delta method	Bootstrap	Bootstrap	Delta method	Bootstrap	Bootstrap				
Rural commune	-0.056	-2.23	-2.14	-0.26 pp	-2.10	0.006	0.23	0.24	0.02 pp	0.24
Region with low unemployment rate	-0.019	-0.44	-0.42	-0.09 pp	-0.41	0.117	2.44	2.49	0.40 pp	2.75
Region with high unemployment rate	-0.126	-4.91	-4.95	-0.62 pp	-4.66	-0.008	-0.28	-0.29	-0.02 pp	-0.29
Unemployed	-1.505	-37.79	-38.07	-22.3 pp	-20.45	-2.560	-40.15	-38.30	-58.8 pp	-25.38
Situation the previous year										
Intercept	3.007	34.01	32.83			2.178	36.92	36.41		
<i>Residual correlation (ρ)</i>						-0.834	18.74	-16.89		

In other words, all things being equal, the young male homosexuals are more exposed to unemployment than their heterosexual counterparts. But after forty years old, there is no higher risk of unemployment for gays than for heterosexual men.

How can we interpret such findings? The greatest exposure of gays to unemployment can be put in relation with a higher turnover on the labor market for gays (13.4 %) compared to heterosexual men (6.2 %). This gap in terms of turnover rate can originate in two sources:

- Differences in life styles between heterosexual and homosexual populations, that have an impact on the labor supply: higher mobility, the fact that the partner has an identical probability to be unemployed, lower probability to have children *etc.*
- Discriminatory practices on the labor market.

If one focuses on the latter explanation, the gap in turnover rate can be the outcome of the following factors: (i) within firms, if gays face a glass ceiling and have less frequent promotions, they must use external mobility (job-to-job flows) instead of internal mobility to boost their career, (ii) if the sexual orientation of employees can be progressively learned by potentially discriminating employers, gay workers have a strong incentive to change job more frequently than heterosexual workers. One sees that possible discriminatory practices may involve higher turnover rate and mobility for gay employees.

How to put these explanations in line with the differences by age observed above in unemployment and participation rates? A possible story could be the following: if discriminatory practices are heterogeneously distributed in the workplace, the process to find the *good job* is probably more difficult and time consuming for the gay workers than for their heterosexual counterparts.

Table 11 below reports the unemployment and turnover rates for the different age groups considered here. For heterosexual men the unemployment rate is pretty similar for young (2.3 %) and old (2.5 %) workers and their turnover rates decrease with age (8.9 % vs. 4.2 %).

In comparison both the unemployment rate (9.9 % for young workers vs. 6.6 % for older workers) and the turnover rate (16.5 % vs. 6.1 %) are much higher for gay workers than for heterosexuals. In addition these rates exhibit strong contrast between young and old workers. The third column of Table 11 displays the contrast between gays and heterosexual men for young and old workers. The gaps observed for young workers in terms of unemployment and turnover rates exceed largely the ones observed for old workers.

Table 11 Unemployment rate and turnover rate by age

Unemployment rate/Turnover rate	Gays (1)	Heterosexuals (2)	Gap (1)–(2)
< 40 years old	9.9 %/16.5%	2.3 %/8.9 %	+7.6 %/+7.6 %
≥ 40 years old	6.6 %/6.1 %	2.5 %/4.2 %	+4.1 %/+1.9 %

All things being equal – and focusing on an explanation based on discriminatory practices on the labor market – the early years of the working life appears to be more difficult for gay workers than for heterosexual men. Gays spend probably more time than their heterosexual counterparts to find the *good job* and are more exposed to the unemployment risk.

Conclusion

This paper is one of the first attempts to assess, in a unified econometric framework, the existence and the extent of a participation-gap and an unemployment-gap based on sexual orientation. We used a bivariate probit selection model where the labor supply and the employment equation have been jointly estimated.

The study yields several results. First, gay workers and especially young gay workers face a higher unemployment risk than their heterosexual counterparts even after having controlled for many individual characteristics. All things being equal, their labor supply is also significantly lower than that of heterosexual men.

Secondarily, entering the labor market for gay men is more difficult than it is for other people. They face a higher search cost to find the *good job*, in addition to a wage penalty subsequently incurred. Moreover, to the extent that all gays are not identified as such by their employers, our results probably underestimate the unemployment rate penalty undergone by uncloseted gay workers.

The results obtained are consistent with what could have been expected from the previous studies about sexual orientation, hiring and unemployment. In particular, the lower probability of being employed for gay people than for heterosexuals is confirmed. We cannot exclude that this gap is driven by discrimination against gay people; however it is formally impossible to rule out the possibility to explain such a gap by differences between the individual preferences of gays and heterosexuals.

This point is important when one thinks of this, from a policy perspective. For policy design, not only one needs to be able to identify whether or not the employment gap is due to discrimination practices, but - one step further - if one faces taste-based discrimination or statistical discrimination. If taste-based discrimination accounts for the bigger part of the employment rate gap between gay and heterosexual workers, antidiscrimination legislation is perhaps the only available response (see Drydakis (2014)).

The difficulty to capture the precise nature of the employment gap between gays and heterosexuals, which is inherent to the method used in this article, should probably lead to future research focusing on the precise identification of the origin of the difference in employment rates between homosexual and heterosexual people.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Appendix: Variables used in the Selection and Wage Equations

Table 12 List of variables used. The underlined characteristics correspond to the base case

Variables		Selection equation	Wage equation	
Individual characteristics	Sexual orientation	Gay vs. <u>Heterosexual</u>	✓	
	Age	<30 vs. <u>30–34</u> vs. 35–39 vs. 40–44 vs. 45–49 vs. ≥ 50	✓	
	Birth place	<u>France</u> vs. Western countries (excl. France) vs. African countries vs. other countries	✓	
	Degrees	No degree vs. <u>A-Level or Professional degree</u> vs. College vs. Master's, PhD	✓	
	Family situation	Age x No degree: Yes vs. <u>No</u>		✓
		Number of children		✓
		Married vs. <u>Unmarried</u>	✓	✓
		At least 2 children ≤ 5 years old: Yes vs. <u>No</u>		✓
	Age of the partner	Never Married x Children: Yes vs. <u>No</u>		✓
		<30 vs. <u>30–34</u> vs. 35–39 vs. 40–44 vs. 45–49 vs. ≥ 50	✓	
	Social capital <i>Qualification of the father</i>	Craftsman, merchant, entrepreneur, self-employed vs. Middle or top managers vs. <u>Technicians, associate professionals</u> vs. Unskilled employee or worker		✓
	Real estate capital	Homebuyer, Home owner vs. <u>Leaseholder</u>	✓	
	Partner income <i>Qualifications of the partner</i>	Craftsman, merchant, entrepreneur, self-employed vs. Middle or top managers vs. <u>Technicians, associate professionals</u>	✓	
	Situation of the partner on the labor market	<u>Inactive</u> vs. Unemployed vs. Employed	✓	
	Location	Rural commune vs. <u>Urban commune (excl. Paris)</u> vs. Paris metropolitan area	✓	✓
		Region with low vs. <u>middle</u> vs. high unemployment rate	✓	✓
	One year ago on the labor market	<u>Employed</u> vs. Unemployed	✓	✓

Our main sample being constituted of fourteen stacked Employment Surveys (1996–2009), time dummy variables – one for each year – have also been systematically introduced into the equations, to remove a possible effect of the business cycle

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