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Sexual Orientation, Disclosure and Earnings

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ABSTRACT

Sexual Orientation, Disclosure and Earnings*

Gay/bisexual workers tend to earn less than other men. Does this occur because of discrimination or because of selection? In this paper we address this question and collect new information on workplace disclosure to separate out discrimination effects from selection effects. Using a large sample of recently graduated men in the Netherlands, we find that gay/bisexual workers earn about 3 to 4 percent less than other men. Our disclosure estimates, however, provide little evidence that the labor market discriminates against gay/bisexual workers. They rather support the selection story, most prominently observed among undisclosed gay/bisexual workers who concentrate in lower paid occupations, and earn about 5 to 9 percent less than other men.

JEL Classification: J15, J24, J71

Keywords: sexual orientation, disclosure, earnings, discrimination, selection

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1 Introduction

Although it is only recent that economists began to focus on the relationship between sexual orientation and earnings, one observation appears to be quite persistent across a small but growing number of empirical studies: gay/bisexual men earn less than other men. Over its cause, however, economists do not agree. Some argue that it is a discrimination effect: employers treat observably similar workers with different orientation differently. Others argue that it is a selection effect: workers with different orientation are unobservably different in their productive skills or tastes.[1]

The disagreement illustrates the difficulty to empirically separate discrimination effects from selection effects. There are -we think- two information problems that complicate the interpretation of sexual orientation estimates. The first problem is that, when it comes to the workers' sexual orientation, researchers are often better informed than employers. If the workers' sexual orientation is known to us researchers but unknown to some employers, part of the estimated sexual orientation effect cannot be attributed to treatment differentials but must come from productivity differences. The second, and perhaps more serious, problem is that, when it comes to the workers' productive skills, employers are usually better informed than researchers. If gay/bisexual and heterosexual workers look similar to researchers but different to employers, the estimated sexual orientation effect may merely reflect productivity differences that are observable to employers but unobservable to researchers.

In this paper, we try to tackle both problems (mainly) by means of collecting new information on the workers' disclosure status. Disclosure information helps us in two ways. First, we distinguish disclosed from undisclosed workers and circumvent the problem that sexual orientation is not always an observable characteristic to employers. And second, we combine disclosure information with a simple discrimination model, and take a first step to uncover the extent of discrimination in sexual orientation estimates. The intuition is as follows. With undisclosed workers, we estimate the relation between sexual orientation and earnings that is driven by productivity differences, and not by employers who discriminate. With disclosed workers, we estimate a similar relationship and attribute the difference in earnings to a combination of employer discrimination and differences in productive traits. If disclosure is exogenous, implying that the productive characteristics do not correlate with disclosure status, the reduced-form estimates enable us to make a distinction between discrimination and selection. If, on the other hand, disclosure is endogenous, we are still able to bound the true impact of a discriminating labor market assuming various economic relationships between the endogenous regressor and unobserved pro-

[1] Among the articles that are supportive of the discrimination hypothesis are Badgett (1995); Klawitter and Flatt (1998); Arabsheibani et al. (2005). Articles that raise doubts about the discrimination hypothesis include Berg and Lien (2002); Blandford (2003); Black et al. (2003); Plug and Berkhout (2004).

ductivity traits.

One of the advantages of this study is that our discrimination tests do not rely on gender. In previous work we saw that lesbian/bisexual women sometimes earn somewhat more than heterosexual women (Berg and Lien 2002; Blandford 2003; Black et al. 2003; Plug and Berkhout 2004). Although this observation challenges the predictions of a discrimination model, it requires a careful interpretation. As Black et al. (2003) argue, the earnings advantages of lesbian workers over other women are not that informative about the nature of discrimination against homosexual male and female workers if heterosexual women are discriminated against as well. With disclosure information, we test for discrimination using only men and thus avoid potential discriminatory practices against heterosexual and lesbian/bisexual women that may affect their differences in pay.

Based on a survey that collects information on Dutch college graduates, including information on the student's sexual orientation and workplace disclosure, we are able to examine the following two issues. First, we estimate the association between sexual orientation and male earnings based on a new sample of Dutch college graduates, and find (consistent with previous) evidence that gay/bisexual men earn less than other men, even in the beginning of a working career. Second, we present new estimates on the effect of workplace disclosure on earnings. We find, much to our own surprise, that the difference in earnings between gay/bisexual and heterosexual men is entirely driven by those gays/bisexuals that work for employers who are unaware about their sexual orientation. When we try to interpret our results, we dismiss discrimination as one of the underlying mechanisms and consider existing selection theories, including the identity model (Akerlof and Kranton 2000) and family specialization model (Becker 1981), as possible alternatives. Our results are most consistent with the notion that among men gay/bisexual workers specialize less in marketable skills.[2]

The paper continues as follows. Section 2 models the relation between sexual orientation and earnings, focuses on the problem that sexual orientation is not generally an observable characteristic, and shows under which conditions we can make a distinction between discrimination and selection effects. Section 3 describes the data on Dutch university graduates, and provides a discussion on

[2] After we sent out our survey –issued in 2004– to collect disclosure information to answer questions about discrimination and sexual orientation, it came to our attention that Comolli (2005) also examined the relationship between gay/bisexual earnings and disclosure. With data on gay/bisexual single workers in four US cities, he finds that disclosed workers earn less (and not more) than undisclosed workers. Our study differs from the work of Comolli in at least two directions. First, his research focuses exclusively on gay/bisexual workers and has little to say about differences in earnings between gay/bisexual and heterosexual male workers. Second, he uses a switching regression model to allow for endogenous disclosure and relies on instrumental variables/exclusion restrictions that are either statistically weak (age at which respondents first wondered they were gay) or unconvincing (the extent to which respondents feel part of the gay community).

our workplace disclosure measure. Section 4 presents the parameter estimates. Section 5 concludes.

2 Empirical Testing for Discrimination

In this Section we explore whether we can empirically test for discrimination against gay/bisexual workers, if sexual orientation is not always observable to employers and we have information on the workers' disclosure status. In our empirical model we concentrate on earnings discrimination and estimate an earnings equation of the form

$$Y_i = \gamma_D H_i + \beta X_i + \epsilon_i, \tag{1}$$

where i indexes the worker, Y is a measure of earnings, H is a measure of sexual orientation that equals 1 for gay/bisexual workers and 0 otherwise, D is a disclosure index that equals 1 for workers whose sexual orientation is known to employers and 0 otherwise, X is a set of other (observed and unobserved) variables assumed to affect earnings, and ϵ is the remaining error assumed to be uncorrelated with Y (and its determinants H and X). We let parameter γ_D vary with disclosure status

$$\gamma_D = \gamma + \delta D, \tag{2}$$

to accommodate that prejudiced employers can only discriminate against gay/bisexual workers with disclosed identity. That is, the effect of sexual orientation on earnings reflects unobserved productivity differences between gay/bisexual and heterosexual workers (γ) and possibly discrimination against sexual orientation ($\delta < 0$). The standard problem of identifying δ empirically, however, is that disclosure is likely to be correlated with unobserved productivity traits.

The empirical strategy we propose to identify δ consists of two parts. The first part tests for discrimination under the assumption of exogenous disclosure. The second and more important part explores the sensitivity of our estimated discrimination effects to productivity assumptions that are less restrictive but (firmly) rooted in economic theory.

Exogenous disclosure

Our least-squares coefficient $\hat{\delta}$ detects discrimination against gay/bisexual workers only if disclosure itself is an exogenous event. In our empirical model exogenous disclosure implies that unobserved productive characteristics do not correlate with disclosure status. To formalize this argument, we let βX_1^1 be a measure of average productivity for gay/bisexual workers whose orientation is observable to employers; βX_1^0 be a measure of the average productivity for gay/bisexual workers whose orientation is not observable to employers; and βX_0 be a measure of the average productivity for heterosexual workers. If we treat

all relevant productivity traits as unobserved, estimate a stripped version of equation (1) and regress Y only on H and HD, we obtain estimates of γ and δ with following properties

$$\hat{\gamma}_{LS} = \beta(X_1^0 - X_0); \quad \hat{\delta}_{LS} = \delta + \beta(X_1^1 - X_1^0). \tag{3}$$

It is easy to see that identification of discrimination against gay/bisexual workers requires that $\beta X_1^1 = \beta X_1^0$. If disclosure is exogenous, we obtain two interesting estimates: one discrimination estimate $\hat{\delta}_{LS}$ that measures the degree of discrimination against gay/bisexual workers, and another selection estimate $\hat{\gamma}_{LS}$ that measures unobserved productivity differences between gay/bisexual and heterosexual men.

Endogenous Disclosure

An important feature, however, is that the disclosure decision is not always exogenous. If gay/bisexual workers choose to be open about their sexual orientation, our method does not work anymore and produces biased discrimination estimates to the extent that disclosed and undisclosed workers differ in their productive traits ($\beta X_1^1 \neq \beta X_1^0$). Our remedy to deal with endogenous disclosure is to relax the assumption of exogenous disclosure, impose various productivity orderings among gay/bisexual and heterosexual workers that are consistent with (conventional) economic theories, and place (lower) bounds on the true degree of discrimination against gay/bisexual workers.[3]

According to Black et al. (2007) there are two (non-discriminating) economic theories that link labor market outcomes to sexual orientation. The first theory is Becker's family model in which gay/bisexual workers (whether known or unknown to their employer) are less likely to have children, gain less from specialization in market production, and as a consequence accumulate fewer marketable skills (Becker 1981).[4] If we assume that disclosed gay/bisexual workers are indeed less productive than heterosexual workers, our estimate $\hat{\gamma}_{LS} + \hat{\delta}_{LS}$ amplifies the extent of discrimination against gay/bisexual workers. With a negative δ, this means that we interpret $\hat{\gamma}_{LS} + \hat{\delta}_{LS}$ as a lower bound, namely

$$\hat{\gamma}_{LS} + \hat{\delta}_{LS} = \delta + \beta(X_1^1 - X_0) \leq \delta \qquad \text{if} \qquad \beta X_1^1 \leq \beta X_0. \tag{4}$$

The second theory to consider here is the identity model of Akerlof and Kranton (2000). They argue that a worker's utility not only reflects outcomes but also identity, defined by a particular set of behavioral prescriptions. With our

[3] An alternative procedure to identify discrimination effects without assuming exogenous disclosure would be an instrumental variable approach. However, with the data at hand it is impossible for us to come up with an instrument that is credibly valid.

[4] Others have argued that gay/bisexual men are paid less than other men because they have, on average, more feminine traits. If we consider specialization as the result of comparative advantages that are exogenous (innate) and/or endogenous (develop over time), this particular notion does not substantially differ from the one put forward by Becker.

focus on earnings and sexual identity, their model implies that the decision to disclose constitutes a tradeoff between identity-based utility gains and non-discriminatory costs: that is, disclosed workers must conform to behavioral prescriptions that do not pay (well). The observation, for example, that openly gay/bisexual men tend to prefer more feminine (and less rewarding) occupations can be understood as such an identity enhancing mechanism. If Akerlof and Kranton are correct and disclosure is more common among low productive gay/bisexual workers, we observe that

$$\hat{\delta}_{LS} = \delta + \beta(X_1^1 - X_1^0) \leq \delta \qquad \text{if} \qquad \beta X_1^1 \leq \beta X_1^0, \tag{5}$$

where our discrimination estimate $\hat{\delta}_{LS}$, albeit a lower bound, is actually overestimating the impact of a discriminating labor market.[5]

We are aware that the alternative (and less restrictive) assumptions to generate lower bounds may not receive unquestioned acceptance. In our later analysis we will therefore look for some (associative) evidence to validate the suggested relationships between the endogenous regressor and unobserved productivity traits.

3 Data, Sample and Measurement

Our analysis employs data from an annual survey of individuals who completed college education in the Netherlands.[6] The survey is a questionnaire which contains questions on education, work history since graduation and personal characteristics. The survey focuses on recent graduates. That is, individuals who are interviewed graduated in the academic year two years earlier. Yearly around 30,000 questionnaires are sent out and the response rate is about 30 percent. Now the data contain 10 cohorts of graduates in the beginning of their working career, interviewed between 1997 and 2006.

[5] We should emphasize that we derive our particular productivity ordering from interpreting identity theory within a non-discriminating environment. If we would interpret identity theory within the context of a discriminating labor market, meaning that disclosed and undisclosed workers anticipate earnings discrimination, it is possible that disclosed workers end up being more (and not less) productive than undisclosed workers. In this case our discrimination test fails. If we formally introduce anticipation and let the decision threshold to disclose shift with a factor δ, we can show that a negative $\hat{\delta}_{LS}$ is no longer informative about discrimination

$$\hat{\delta}_{LS} = \delta + \beta(X_1^1 - X_1^0) \leq 0 \qquad \text{if} \qquad \beta X_1^1 + \delta \leq \beta X_1^0.$$

The same equation also shows that identity theory within a discriminating environment always predicts a negative $\hat{\delta}_{LS}$. In Section 4 we will use this result to conclude that in our sample the identity mechanism is essentially not observed.

[6] Dutch college education can be divided into two tracks: higher vocational education and university education. Higher vocational education prepares students for specific (categories of) professions, is taught at about 60 special institutes, and its graduates obtain a bachelor degree. University education has a more general, academic character, is provided by 13 universities, and its graduates can obtain bachelor but also master degrees.

In this paper we focus our attention on the latter three cohorts that include information on sexual orientation as well as the degree of openness at the workplace.[7] Of the initial 11,767 male graduates in the 2003/2004, 2004/2005 and 2005/2006 survey, we restrict ourselves to full-time working men (32 and more hours per week) for whom we have complete information on earnings, which reduces our sample to 10,132 observations. We further excluded all workers that were self-employed, worked for temporary employment agencies, earned less than one euro per hour, and for whom data on the various control variables were unavailable. In the end, we are left with a sample of 7,158 male workers, of which 435 are gay (324) or bisexual (111). Descriptive statistics for the most important variables are provided in Table 1.

Measurement of Sexual Orientation and Workplace Disclosure

In the empirical literature on the economics on sexual orientation three sexual orientation measures are currently in use: measures based on (past) sexual experiences; measures based on partnership; and self-reported orientation measures. These measures do not fully overlap and may capture different aspects of sexual orientation. A series of recent papers in economics (Badgett 1995; Black et al. 2003; Plug and Berkhout 2004; Comolli 2005; Carpenter 2005 2007) relate these different aspects to the extent of workplace disclosure and argue that some measures of sexual orientation are more informative to employers (and fellow workers) than others. Within a labor market setting, for example, sexual orientation measures based on partnership are more relevant than measures based on past sexual behavior, simply because it is much easier for employers to obtain information on the gender of the employee's partner, than on whom an employee spent his time in bed with. A variable that measures the extent of workplace disclosure would resolve part of the discussion, but is rarely collected in large systematic data sets.

Not in our data. Regarding sexual orientation, the former college graduates are asked whether they are sexually attracted to men, women or both. Together with the graduates' gender we identify sexual orientation. Regarding workplace disclosure, we ask all identified gay/bisexual graduates that work at the time of data collection whether their employers/fellow-workers know their sexual orientation, and whether they themselves are open about their sexuality at work. This enables us to construct two disclosure indicators. One measures disclosure directly: employers/collegues just know the sexual orientation of their employees/fellow-workers. The other one measures disclosure indirectly: employers/collegues might know the sexual orientation from the open gay/bisexual lifestyle employees/fellow-workers lead (at work). In our data, we find that the nondisclosure shares among gay/bisexual workers at the beginning

[7] Only in our 2003/2004, 2004/2005 and 2005/2006 survey data we collect information on the extent of workplace disclosure.

of their working are substantial. Depending on the definition of workplace disclosure, about 40 to 60 percent of all the gay/bisexual workers in our sample work for employers who are ignorant about their sexual identity.

Note that sexual orientation question as well as the openness questions are part of a special section at the end of the questionnaire that concentrated on general individual and household characteristics. The fact that we infer information on sexual identity and disclosure at the end of the survey, after all other information is gathered, is an additional strength of our data. By doing so, we circumvent potential selectivity in response behavior, when respondents belonging to a sexual minority group would have taken the opportunity to emphasize or even exaggerate problems encountered in relation to their sexual orientation.

4 Results

Table 2 presents least squares estimates of the relationship between the (log of) hourly earnings and various measures of sexual orientation on samples of working heterosexual, homosexual and bisexual men, using varying sets of control variables.

Because much of the empirical literature on the economics on sexual orientation has concentrated on estimating the effect of sexual orientation on earnings, we begin to discuss the estimated effects of sexual orientation on the earnings of all men. In panel A column (i) we regress earnings on a sexual orientation dummy as the single right-hand-side variable and find that gay/bisexual workers receive 4 percent less in hourly pay than heterosexual workers. In columns (ii) and (iii) we add several other covariates. We find that the inclusion of age, ethnicity, region, school characteristics, and job characteristics (including 15 occupation indicators) has little effect. The earnings penalty for being gay/bisexual continues to be statistically significant, negative but small varying between 3 and 4 percent. Our findings are, as such, comparable to those obtained in previous studies: gay/bisexual men earn (somewhat) less than other men (Badgett 1995; Berg and Lien 2002; Blandford 2003; Black et al. 2003; Plug and Berkhout 2004; Comolli 2005; Carpenter 2005 2007).

Having empirically established that gay/bisexual men earn less than other men, we next investigate to which extent the penalty for being gay/bisexual can be explained (best) by discrimination theory, identity theory and/or specialization theory.

Discrimination

To better understand whether this sexual orientation effect is a discrimination effect (or a selection effect for that matter), we must recognize that any discrimination interpretation of the observed earnings penalty depends on the employers' ability to distinguish their employees' sexual orientation. Equations

(1) and (2) are designed to address this issue. If we treat the decision to disclose as exogenous, the negative association between sexual orientation and wages, as reported above, has important implications for disclosure and sexual orientation effects. If, for example, the negative correlation is entirely driven by discriminating employers, we expect the disclosure effect to be negative and the sexual orientation effect to be zero ($\hat{\delta}_{LS} < 0;\ \hat{\gamma}_{LS} = 0$). If the negative association just picks up selection effects reflecting a negative relationship between gay/bisexual workers and their unobserved earnings skills, we expect the disclosure effect to be zero and sexual orientation effect to be negative ($\hat{\delta}_{LS} = 0;\ \hat{\gamma}_{LS} < 0$). And if the penalty captures both discrimination and selection effects, the earnings effects of disclosure and sexual orientation must be negative ($\hat{\delta}_{LS} < 0;\ \hat{\gamma}_{LS} < 0$).

In panel B we estimate the model we discussed in Section 2 and regress earnings on a sexual orientation and disclosure dummy using our direct measure of workplace (non)disclosure. Rather surprisingly, we find that none of the implications suggested above matches with our sexual orientation and disclosure estimates. Instead of a negative or zero disclosure coefficient, we find a positive $\hat{\delta}_{LS}$ in every specification. The sexual orientation coefficient $\hat{\gamma}_{LS}$ is always negative. In column (i), for example, our estimates show that gay/bisexual workers earn on average 9 percent less than other men, and that among gay/bisexual workers those with disclosed identity earn on average 8 percent more. With several other covariates added results fall but not by much. It is interesting to note that the estimated coefficients $\hat{\gamma}_{LS}$ and $\hat{\delta}_{LS}$ are similar in size but opposite in sign: together they are always statistically insignificant and very close to 0. This suggests that disclosed workers who are gay/bisexual earn as much as heterosexual workers, and that the earnings penalty for being gay/bisexual, as reported in Panel A, is primarily driven by those gay/bisexual workers who did not disclose their sexual orientation to their employers (or fellow employees for that matter). In panel C we estimate the same equation but switch to indirect disclosure measures. With disclosure indicators based on the degree of openness at work, our findings reported in the third panel do not substantially change. The estimates again show that, among all men, only gay/bisexual workers that are not open and perhaps purposely conceal their sexual identity earn significantly less. Independent of the specification used, the penalty for not being open $\hat{\gamma}_{LS}$ moves around the 5 percent.[8]

If disclosure is exogenous, it is clear that our results cannot rationalize the negative association between sexual orientation and wages. In particular, our findings indicate that gay/bisexual workers experience positive, rather than neg-

[8] In the empirical literature on sexual orientation and earnings it is common to pool gay and bisexual workers. In this paper we follow this procedure. If we would re-estimate our specifications on samples of gay and heterosexual workers, we get estimates that are very similar in sign, magnitude and significance level. According to the specification, as estimated in Table 2 column (iii), the point estimates, in case we exclude all bisexual workers from our sample, are found to be -0.030 [0.010]; -0.071 [0.20] and 0.054 [0.023]; -0.043 [0.014] and 0.26 [0.20] in Panels A, B and C, respectively (with standard errors between brackets).

ative, discrimination with a premium that varies between 3 to 8 percent. These unconventional numbers, however, should not be taken too literally (yet), and call into question whether the decision to disclose is truly exogenous, an issue to which we shall turn next to.

Identity

Since we do not believe that positive discrimination serves as a credible explanation for our findings, we conclude that the exogenous disclosure assumption is violated, and that our discrimination estimates as discussed above are biased. In particular, the bias we observe suggests that among gay/bisexual workers disclosed workers are abler workers, and therefore earn higher wages, even in a labor market that discriminates.

At first sight, identity theory seems to be an appropriate alternative: it does not assume that the decision to disclose is completely orthogonal to observed and unobserved productivity traits, and it allows for disclosed workers to be (somewhat) more productive than undisclosed workers (see footnote 5). However, identity theory fails to predict the disclosure premium we observe in every specification. The implication of this observation is immediate: we rule out the identity model as one of the underlying mechanisms.

Specialization

The household specialization model predicts that gay/bisexual workers end up earning less then other male workers in a non-discriminating labor market. As such, we observe that these predictions apply to undisclosed workers. All the reported sexual orientation estimates $\hat{\gamma}_{LS}$ are negative and inform us that gay/bisexual workers, who are not discriminated against because employers are unaware about their sexual orientation, earn significantly less than heterosexual workers. The specialization model, however, appears less evident for disclosed workers. In fact, our observation that disclosed workers earn as much as heterosexual workers is not informative about potential skill differences between gay/bisexual and heterosexual workers. If prejudiced employers know their workers' orientation and discriminate, these estimates imply that disclosed gay/bisexual workers have more marketable skills than heterosexual workers, and not less as the specialization theory predicts.

As a second approach, we therefore consider alternative predictions that follow from a specialization model. As Becker (1981) explains, gay/bisexual couples are less likely to have children, and because of that they may invest less in their human capital and have a less extensive division of work. To explore the possible role of human capital and labor supply differences between gay/bisexual and heterosexual workers, we regress various human capital and division of work outcomes on our set of sexual orientation measures and the usual controls, including age, ethnicity, and region. If we look at educational

differences between (disclosed) gay/bisexual and heterosexual workers, the evidence is mixed. In Table 3 we find some evidence against specialization in columns (i) and (v), where our results indicate that, as students, gay/bisexual workers received somewhat higher GPA scores in high school and college than most other male workers. Evidence in favor of specialization, however, can be found in columns (ii), (iii) and (vi) where we observe that the same gay/bisexual workers have invested more in their feminine traits, displayed by greater verbal ability and lower mathematical ability, and were more likely to graduate in typically female (and less rewarding) fields of study.[9] If we look at labor supply patterns, evidence in favor of specialization is much stronger. Compared to heterosexual male workers, our estimates show that (disclosed) gay/bisexual workers work fewer hours, have partners that work more hours, and they report to work much less in case they would live in families with children.[10]

If we consider the men in our sample –college graduates, young and predominantly childless– it is not a priori clear why the observed school and labor outcomes of gay/bisexual workers provide some (weak) support for the theory of household specialization. Perhaps this means that skill differences between between gay/bisexual and heterosexual men are innate. Or perhaps this means that skill differences originate from differences in expectations, where gay/bisexual men anticipate not to live in traditional households with children and because of that make different school and work choices. Understanding the sources of specialization is important, but is too difficult to treat with available data.

Synthesis

Our disclosure and sexual orientation estimates have two (rather pessimistic) implications for the discrimination tests we set out in Section 2. First, our findings suggest that disclosed and undisclosed workers are different, and that because of these differences the method we propose fails in separating discrimination effects from selection effects: our discrimination estimates as discussed above are biased. Second, the bias we observe suggests that among gay/bisexual workers disclosed workers are abler workers, and therefore earn higher wages, even in a labor market that discriminates. Since this observation goes against the predictions of the identity model (in which workers with disclosed identity are willing to work for lower pay), we cannot use the difference between the disclosure and nondisclosure estimates to bound the impact of a discriminating labor market. Thus two of the three discrimination tests we propose do not work.

[9] When we include the share of men within each field of study (calculated at a three-digit-level) as an additional control in our earnings regressions, we find that the estimated return to male dominated fields of study equals 0.025 [0.012] (with standard errors shown in brackets). Note that the inclusion of male share as an additional control variable had no mediating effect on the nondisclosure penalty.

[10] In the Netherlands it is not uncommon for gay couples to adopt children.

On a brighter note, the remaining discrimination test that rests on specialization theory can still detect (the absence of) labor market discrimination. The argument is as follows. Since disclosed gay/bisexual workers earn as much as heterosexual workers, we know that discrimination theory and specialization theory are mutually exclusive, at least in our sample. This means that only one of them can be true. The data weakly favors specialization theory over discrimination theory, even though our discrimination estimates themselves are biased and therefore not conclusive. But if Becker got it right and the disclosed workers in our sample show a mild tendency to behave as family specializers, which they do, we must conclude that the labor market does not discriminate against sexual orientation, at least not against young working college gay/bisexual graduates in the Netherlands which is known to be one of the more tolerant countries towards sexual minorities.

5 Concluding Remarks

In 1995 Badgett mentioned that a variable measuring the extent of workplace disclosure of gay identity would be more appropriate to include in the wage equation, since disclosure is necessary for workplace discrimination to occur. One decade later, we follow up on her suggestion, collect new information on workplace disclosure, and develop a simple (and possibly valuable) strategy to assess the role of discrimination in sexual orientation estimates.

In our strategy the exogeneity of the disclosure decision plays a key role. If disclosure is exogenous, implying that the productive characteristics do not correlate with disclosure status, we show that information on disclosure is useful in separating discrimination effects from selection effects. Our data, however, reject exogenous disclosure. Would this identification assumption hold, our results indicate that gay/bisexual workers experience positive discrimination. Since we do not believe that employers treat gay/bisexual workers favorably, we conclude that disclosed workers earn significantly more than undisclosed workers because of differences in productive traits.

If we replace the exogenous disclosure assumption with productivity assumptions that are less restrictive, we show that information on disclosure can still be useful in bounding discrimination effects. We derive bounding assumptions from existing theories of specialization and identity. Our data appears to be most consistent with Becker's specialization model in which gay/bisexual workers are less likely to specialize in market production, and as a consequence accumulate fewer marketable skills. If we accept that gay/bisexual workers tend to act as if they are family specializers, then the proper interpretation of our results is that labor market discrimination cannot be held responsible for the observed differences in earnings between gay/bisexual and heterosexual workers.

Of course, an important question is what is the external validity of our analysis. As we have discussed throughout, the results we find are specific to a

group of young working college graduates in the Netherlands. Our observation of absent discrimination against gay/bisexual workers may, for example, not be relevant for older generations in the labor market. If gay/bisexual workers experience losses in earnings because they more frequently end up in dead-end jobs or face glass ceilings, it is likely that discrimination estimates based on starters miss these effects. In addition, our results are specific to the Netherlands and may not hold in other societies either. It is not clear, though, that this is a limitation of our study. Since the Netherlands is one of the more tolerant countries towards sexual minorities, we actually believe that studying earnings effects in this particular country adds a potential value to this study.

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TABLE 1–Summary Statistics for Some Selected Variables

	Hetero males ($N = 6,723$)		G/B males ($N = 435$)		Disclosed G/B males ($N = 267$)		Undisclosed G/B males ($N = 168$)	
Labor market outcomes:								
hourly wages	9.837	*2.411*	9.506	*2.599*	9.814	*2.630*	8.982	*1.822*
Labor supply outcomes:								
hours worked	38.840	*2.939*	38.242	*2.909*	38.221	*2.995*	38.277	*2.765*
hours worked partner	27.986	*14.93*	33.522	*12.82*	34.981	*12.20*	27.643	*13.72*
stated hours worked, in hypothetical family with partner and child	33.245	*5.677*	30.358	*6.122*	30.051	*6.253*	30.940	*5.854*
Individual characteristics:								
age	26.689	*3.072*	26.433	*2.901*	26.521	*3.280*	26.283	*2.102*
ethnicity	0.057		0.072		0.035		0.137	
north	0.073		0.054		0.046		0.068	
east	0.186		0.221		0.180		0.291	
south	0.225		0.241		0.263		0.202	
west	0.515		0.484		0.511		0.439	
Disclosure characteristics:								
known to employer/collegues			0.631		1.000		0.000	
open lifestyle			0.411		0.601		0.086	
Various human capital outcomes:								
GPA (high-school)[a]	6.966	*0.600*	7.040	*0.619*	7.034	*0.614*	7.049	*0.629*
math grades (high-school)[b]	6.516	*1.202*	6.393	*1.226*	6.376	*1.244*	6.422	*1.199*
language grades (high-school)[c]	6.834	*0.693*	6.957	*0.749*	6.975	*0.714*	6.925	*0.806*
MA	0.437		0.445		0.477		0.390	
GPA (college)	7.127	*0.539*	7.238	*0.571*	7.249	*0.564*	7.221	*0.586*
gender share in college	0.620	*0.235*	0.493	*0.253*	0.477	*0.253*	0.520	*0.251*
years of parents' schooling	11.698	*2.747*	11.634	*2.574*	11.896	*2.598*	11.186	*2.479*

[a] In high school and college grades range from 1 (worst) to 10 (best).

[b] In high school students may matriculate in two types of math, where type B math is considerably more advanced than type A math. The better students enroll in math B and often (40 percent) take math A on the side. Of those who do, the math A grade is on average 1 points higher than the math B grade. We therefore measure math grade as the maximum of the students math B grade and math A grade minus 1.

[c] In high school all students matriculate in Dutch and English. To measure language grade we take averages.

TABLE 2–Least Squares Estimates of Sexual Orientation Effects on Hourly Earnings

	(i)		(ii)		(iii)	
A. Sexual Orientation Effects on Earnings.						
G/B ($\hat{\gamma}_D$)	–0.036	*0.011****	–0.029	*0.009****	–0.035	*0.009****
B. Sexual Orientation Effects on Earnings for (Un)Disclosed Workers (using Direct Disclosure).						
G/B ($\hat{\gamma}$)	–0.087	*0.017****	–0.065	*0.015****	–0.071	*0.014****
G/B known to employer/collegues ($\hat{\delta}$)	0.080	*0.022****	0.058	*0.019****	0.057	*0.018****
$\hat{\delta}+\hat{\gamma}$	–0.006	*0.013*	–0.007	*0.012*	–0.014	*0.011*
C. Sexual Orientation Effects on Earnings for (Un)Disclosed Workers (using Indirect Disclosure).						
G/B ($\hat{\gamma}$)	–0.055	*0.014****	–0.045	*0.012****	–0.048	*0.012****
G/B open lifestyle ($\hat{\delta}$)	0.045	*0.021***	0.040	*0.018***	0.030	*0.017**
$\hat{\delta}+\hat{\gamma}$	–0.009	*0.016*	–0.005	*0.014*	–0.018	*0.013*
Controls:						
Individual, human-capital, region	—		×		×	
Occupation, industry, job characteristics	—		—		×	

Note.— Standard errors in italics; ***significant at 1% level; **significant at 5% level; *significant at 10% level; All regressions include controls for survey year.

TABLE 3–Estimating the Effect of Sexual Orientation on Various Human Capital and Labor Supply Outcomes of Men

	(i) GPA (high-school)	(ii) Mathematics Grades (high-school)	(iii) Language Grades (high-school)	(iv) BA/MA (college)	(v) GPA (college)	(vi) Gender Share Field of Study (college)
	(N=6,948)	(N=6,576)	(N=6,756)	(N=7,158)	(N=7,080)	(N=7,158)
A. Sexual Orientation Effects on Human Capital Outcomes.						
G/B ($\hat{\gamma}_D$)	0.074	−0.127	0.126	0.025	0.114	−0.130
	*0.029***	*0.061***	*0.034****	*0.022*	*0.025****	*0.011****
B. Sexual Orientation Effects on Human Capital Outcomes for (Un)Disclosed Workers (using Direct Disclosure).						
G/B ($\hat{\gamma}$)	0.091	−0.087	0.099	−0.010	0.102	−0.104
	*0.047**	*0.099*	*0.055**	*0.036*	*0.041***	*0.018****
G/B known to employer/collegues ($\hat{\delta}$)[a]	−0.027	−0.063	0.042	0.055	0.019	−0.041
	0.058	*0.122*	*0.068*	*0.044*	*0.052*	*0.022**
$\hat{\delta}+\hat{\gamma}$[b]	0.064	−0.150	0.142	0.045	0.121	−0.145
	*0.036**	*0.076***	*0.042****	*0.027*	*0.032****	*0.013****
C. Sexual Orientation Effects on Human Capital Outcomes for (Un)Disclosed Workers (using Indirect Disclosure).						
G/B ($\hat{\gamma}$)	0.124	0.024	0.134	0.034	0.178	−0.119
	*0.037****	*0.079*	*0.055****	*0.029*	*0.033****	*0.014****
G/B open lifestyle ($\hat{\delta}$)[a]	−0.124	−0.354	−0.020	−0.024	−0.158	−0.026
	*0.057****	*0.119****	*0.067*	*0.044*	*0.051****	*0.022*
$\hat{\delta}+\hat{\gamma}$[b]	0.001	−0.329	0.114	0.010	0.019	−0.145
	0.045	*0.092****	*0.053***	*0.034*	*0.040*	*0.017****

Note.— Standard errors in italics; ***significant at 1% level; **significant at 5% level; *significant at 10% level. All regressions include additional controls for the worker's the child's age, ethnicity, region of residence, and survey year.

[a] This parameter measures the differences in outcomes between disclosed and undisclosed workers.

[b] The sum of the parameters δ and γ measures the differences in outcomes between gay/bisexual workers with disclosed identity and heterosexual workers.

TABLE 3 CONT'D–Estimating the Effect of Sexual Orientation on Various Human Capital and Labor Supply Outcomes of Men

	(vii) Parent's Years of Schooling	(viii) Hours Worked (realized)	(ix) Partners' Hours Worked (realized)	(x) Hours Worked in Hypothetical Case of Family with Children (stated)
	(N=7,153)	(N=7,158)	(N=3,231)	(N=4,485)
A. Sexual Orientation Effects on Labor Supply Outcomes.				
G/B ($\hat{\gamma}_D$)	−0.038	−0.612	5.241	−2.927
	0.128	*0.139****	*1.151****	*0.347****
B. Sexual Orientation Effects on Labor Supply Outcomes for (Un)Disclosed Workers (using Direct Disclosure).				
G/B ($\hat{\gamma}$)	−0.424	−0.555	0.174	−2.385
	*0.207***	*0.223***	*2.529*	*0.581****
G/B known to employer/collegues ($\hat{\delta}$)[a]	0.610	−0.090	6.331	−0.823
	*0.207***	*0.278*	*2.814***	*0.709*
$\hat{\delta}+\hat{\gamma}$[b]	0.186	−0.645	6.504	−3.209
	0.159	*0.172****	*1.279****	*0.424****
C. Sexual Orientation Effects on Labor Supply Outcomes for (Un)Disclosed Workers (using Indirect Disclosure).				
G/B ($\hat{\gamma}$)	−0.090	−0.571	4.742	−2.331
	0.165	*0.178****	*1.539****	*0.451****
G/B open lifestyle ($\hat{\delta}$)[a]	0.124	−0.099	1.101	−1.401
	0.252	*0.272*	*2.254*	*0.680***
$\hat{\delta}+\hat{\gamma}$[b]	0.034	−0.669	5.844	−3.732
	0.196	*0.212****	*1.685****	*0.523****

Note.— Standard errors in italics; ***significant at 1% level; **significant at 5% level; *significant at 10% level. All regressions include additional controls for the worker's the child's age, ethnicity, region of residence, and survey year.

[a] This parameter measures the differences in outcomes between disclosed and undisclosed workers.

[b] The sum of the parameters δ and γ measures the differences in outcomes between gay/bisexual workers with disclosed identity and heterosexual workers.