CESifo WORKING PAPERS

6817
2017

December 2017

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CESifo

Impressum:

CESifo Working Papers
ISSN 2364-1428 (electronic version)
Publisher and distributor: Munich Society for the Promotion of Economic Research - CESifo GmbH
The international platform of Ludwigs-Maximilians University's Center for Economic Studies and the ifo Institute
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Editors: Clemens Fuest, Oliver Falck, Jasmin Gröschl
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CESifo *Working Paper No. 6817*
Category 3: Social Protection

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Abstract

We investigate the prevalence of factors associated with participation in the sex market among men resident in Britain using data from Britain's National Survey of Sexual Attitudes and Lifestyles (Natsal-2, 199-2001,Natsal-3, 2010-2012). The percentage of men asking for paid sex is about 12 per cent in 2010-2012 and it has increased from 10 per cent in 1999-2001. We estimate both the probability of having had sex with a prostitute and the expected number of times men had been together with prostitutes, conditional on participating in the sex market. We find that sex education in school has a negative and significant role in the demand for paid sex. At the time of availability of our data, sex education was compulsory only in council-run schools, but our result suggests that making sex education compulsory in all primary and/or secondary schools may reduce the inclination to have sex with prostitute later in life.

JEL-Codes: C350, D120.

Keywords: demand for sex, participation and number of times with prostitutes, sex education, Britain.

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25 November 2017
This paper uses National Survey of Sexual Attitudes and Lifestyles, 2010-2012 (Natsal-3) and 1999-2001 (Natsal-2). We are indebted to UK Data Archive, University of Essex, Colchester, to make Natsal-2 and 3 freely accessible for research purposes. All results and their interpretation presented in this paper remain the authors' responsibility. We thank Maria Laura Di Tommaso for helpful comments.

1. Introduction

In Britain prostitution is legal, but a number of related activities, including soliciting in a public place, kerb crawling, keeping brothel, pimping and pandering, are outlawed. The Policing and Crime Act 2009 makes it illegal to pay for sex with a prostitute who has been "subjected to force" and this is a *strict liability offence* (clients can be prosecuted even if they didn't know the prostitute was forced). The legal age for solicitation is 18. In spite of the problematic aspects related to prostitution its demand has increased from 1990 to 2010 (White and Johnson, 2014).

In the literature, prostitution is widely studied including topics such as violence, sex tourism, drug abuse, HIV-risk and necessity of regulation (Gerthler and Shah, 2011, Immordino and Russo, 2015). An important branch of the empirical literature on sexual behaviour focuses on sexually transmitted infections: Men paying for sex are considered to be a bridging population of the diffusion of such type of diseases, since their paid partners are often individuals at high risk for what concerns sexually transmitted infections (White et al 2014).

Of interest for our paper are studies of the British sex market. Cameron and Collins (2003) studies male decisions concerning whether or not to buy sex. They used data from a national survey of sexual attitudes and lifestyles in the UK in 1990/1991. Two logit probabilities are estimated; the probability of ever have been together with a prostitute and the probability of have been together with a prostitute during the last 5 years. They find that important determinants for buying sex are health risk and religious denomination. Ward et al (2005) based their analysis on the National probability sample surveys of sexual attitudes and lifestyles (Natsal) of men aged 16-44 resident in Britain. Their data sets are from 1990 and 2000. They find that paying for sex is more frequent among men aged between 25 years and 34 years, who were never or previously married, and who lived in London. They do not find any association with ethnicity, social class, homosexual contact, or injecting drug use. Men who paid for sex are more likely to report 10 or more sexual partners in the previous 5 years; only a minority of their lifetime sexual partners (19.3 per cent), were commercial. They were more likely to meet prostitutes abroad. Drawing on 50 in-depth interviews Sanders (2008) found that the typical male client in the sex market in Britain is an ordinary person searching for intimacy with a woman. However, the sample is small and skewed towards white middle-class men. Jones et al (2015) is based on the British Natsal-3 data set. They report that over the past 20 years, young people refer to school lessons as their main source of information about sex. However in 2010-2012 as much as 68.1 per cent of young men reported not knowing enough when they first felt ready for sexual experience.

Recently there have been a few international studies concerning the impact of sex education programme on the sexual behaviour of young people. Kirby (2011) gives a review of several

international studies assessing the effectiveness of sex education programmes in reducing risky sexual behaviour and number of partners among adolescents and young people. Of special interest for our study is the research reported in Reis et al (2011) who study the significance of sex education in schools and its effects in promoting healthy sexual behaviour among university students in Portugal. The sample included 3278 students. The most notable finding is that students who had sex education in school mentioned more often having had fewer sexual risk behaviors (less occasional partners, less sex associated to alcohol and drugs, less unwanted pregnancies and abortions). A review of the international experiences concerning the impact of sex education in school on sexual behavior is given in Wylie (2010).

To our knowledge there are no papers in the literature that analyse the effects of sex education in school on the demand for paid sex. For this reason we focus here on sex education in British schools and its impact on male's participation in the market for paid sex.

Sex education programs are not evenly taught in British schools. In fact some aspects are compulsory and some others depend on school teaching programs. The Education Act 1996 requires that sex education should inform pupils "about sexually transmission infections and HIV and encourage pupils to have due regard to moral considerations and family life" (Sex and Relationship Education (SRE, 2010; networks.nhs.uk, 2011). Consequently, the biological aspects of puberty, reproduction and the spread of viruses and infections must be taught at primary and secondary school age as part of the National Curriculum for Science. Schools are recommended to offer, even if it is not compulsory, the broader subject of Sex and Relationship Education (SRE) as part of Personal, Social and Health Education (PSHE) and Citizenship. In general terms, SRE should help students to learn about the emotional, social and physical aspects of growing up, relationships, sex, human sexuality and sexual health. It seeks to equip children and young people with the information, skills and positive values to have safe, fulfilling relationships, to enjoy their sexuality and to take responsibility for their sexual health and well-being.

The topics included in SRE differ from school to school. Both primary and secondary schools must have an up-to-date policy that describes the content and organization of SRE taught outside the Science Curriculum. Even if a school *decides not* to teach non-compulsory SRE components it must document this choice. Each school's governing body is responsible for developing their school's policy and making sure it is made available to parents who have the right to withdraw their children from SRE taught outside the Science Curriculum.

On 1 March 2017 the government tabled a proposal of amendments, saying that all schools across the system will be bound by the same obligation[3].

In the present study we estimate jointly the probability of buying sex and how many times with a prostitute. Unobserved variables that affect these two choices are most likely correlated, which is the reason for doing a joint estimation. Our main data source is the British survey Natsal-3, with data from 2010-2012. But we also use data from the previous survey, Natsal-2, with data from 1999-2001.

The most notable finding is that learning about sex in school has a significant and sizeable negative marginal effect on the probability of buying sex from a prostitute. If politicians want to reduce prostitution in Britain this result gives support to the proposal in Britain, saying that *all* schools across the system should have compulsory Sex and Relationship Education (SRE) program.

In contrast to the results for Britain cited above, we find that drugs users, and people declaring that they are religious, are more inclined to participate in the sex market than other people. But in line with others we find a strong and significant association between buying sex and being abroad, and also with living in London. Somewhat in line with Sanders (2008) men with medium and medium-high income, which indicates a middle-class background, are more likely than other men to participate in the sex market.

Masturbation seems to be a substitute for how often men buy sex, while unprotected sex is associated with how many times sex is bought. Perhaps to be expected, sex without emotional love is a significant characteristics, both with respect to participation in the sex market and how many times sex is bought.

2. The Econometric Model

In Della Guista et al. (2009a and 2009b) it is assumed that participation in the prostitution market is driven by three sets of variables: income and opportunities, loss of reputation, and moral thresholds. Here, we try to specify an empirical model in accordance with that theoretical model. Let X_{1i} be a vector of observed variables that are assumed to represent the reputation issue and moral

[3] Proposal of amendments on sex education at school, 1 March 2017:

Schools to teach 21st century relationships and sex education, From: Department for Education and The Rt Hon Justine Greening MP. Part of: School and college qualifications and curriculum (available at: https://www.gov.uk/government/news/schools-to-teach-21st-century-relationships-and-sex-education)

School and college qualifications and curriculum Sex education to be compulsory in England's schools. By KatherineSellgren BBC News education reporter (available at: http://www.bbc.com/news/education-39116783).

The national curriculum: https://www.gov.uk/national-curriculum/other-compulsory-subjects

threshold, while X_{2i} be a vector of other observed variables that represent income and opportunities. The subscript *i* denotes the individual. Unknown vectors of coefficients to be estimated attached to X_{1i} and X_{2i} are denoted α and γ, respectively. Furthermore, let ε_i denote an unobserved and normally distributed random variable that also has an impact on whether to have sex with a prostitute or not. We will come back to the probability distribution of ε_i below. We will assume that individual *i* will participate in the sex market if (1) holds:

(1) $X_{2i}\alpha \geq X_{1i}\gamma + \varepsilon_i$

From (1) we thus get that the individual will participate in the sex market if

(2) $X_{2i}\alpha - X_{1i}\gamma \geq \varepsilon_i$

or

$X_{2i}\alpha + X_{1i}\beta \geq \varepsilon_i$

(3) *where*

$\beta = -\gamma$

In the vector X_{2i} we include variables like age and age squared, use of drugs, early start in life with having sex, sex and not necessarily love and relationship, opportunities to having sex abroad, income and living in London. Our justification for this choice of variables is that the older a man is, the higher is the risk that he sooner or later is tempted to try to have sex with a prostitute. Use of drugs, early experience with having sex, and preference for sex, but less interest in establishing a relationship with a woman, accord with conjectures about the characteristics of men who are more inclined than others to buy sex. The justification for income is that paid sex can be costly. London is included, because it is a very big city with a lot of opportunities in the sex market. For the same reason we include sex abroad in this set of variables. We expect all the coefficients in the α-vector to be positive.

In the vector X_{1i} we include variables that may represent moral threshold characteristics and variables that may be related to loss of reputation and trust if it is discovered that the man has been together with prostitutes. If a man considers himself as religious, we take this as an indicator of high moral. Moreover we consider having a permanent partner, children and having grown up with both parents as characteristics that may make it harder for the man to be together with prostitutes. Finally, we also include whether the man has a leading position at his workplace. Our conjecture is that the loss of reputation, if it is discovered that he is having sex with prostitutes, is higher compared to men with no leading position where they work. We have also included sex education in school. The justification is that this education may prepare pupils for adulthood and enable them to better

take care of themselves and future partners. At the time of our data, sex education was compulsory in council-run England's schools only, but, as said in the Introduction, there is now a proposal, to introduce this education in all schools across the system.

We expect all coefficients in the β – vector to be negative, including the constant.

Given that the man participates in the prostitution market we assume that the number of times he has been together with prostitutes up to the time of the survey, S_i, is given by:

(4) $\left[log\, S_i \mid S_i > 0 \right] = Z_i \lambda + \eta_i$

Here, Z_i is a vector of variables that we assume have an impact on the number of times a man has been together with a prostitute up to the time of the survey. Age and age squared is included in the vector and we expect that the older the man is at the time of the interview the more prostitutes he has been together with, given that he has participated in the sex market. Moreover, we have included whether he has used condoms when having sex with the prostitutes. As in the participation probability we have also included the preference for sex, but less interest in establishing a relationship with a woman. Finally, we have included a variable representing whether he performs masturbation or not; masturbation could either be a complement or a substitute for having sex with a prostitute. Note that this variable and the use of condoms are the only variables not present in the participation equation. The random variable η_i is a normally distributed variable with zero expectation and variance σ^2. The vector λ is a vector of unknown coefficients that we would like to estimate.

If there is a correlation between the random variables affecting participation, ε_i, and the random variable η_i, affecting the number of times with a prostitute, we are facing a selection problem in equation (4). There are good reasons to allow for this correlation and hence to account for the selection. We then have two options, we could either have estimated the participation probability (a probit) and used the estimates to form an Inverse Mills Ratio and included that in (4) to get a conditional expectation which we then could estimate. Or we could estimate the participation probability and the number of times with a prostitute simultaneous in a full maximum likelihood procedure. We have chosen to do the latter.

Let

(5) $\varepsilon_i = \rho \eta_i + \upsilon_i$

Here ρ accounts for the correlation between ε_i and η_i. υ_i is a normally distributed random variable independent of η_i, with zero expectation and variance θ^2. The expected value of ε_i is zero and the variance is given by $var(\varepsilon_i) = \rho^2\sigma^2 + \theta^2$. To this end we denote this variance τ^2.

The probability of participation in the sex market is then given by

$$(6)\quad Pr(S_i > 0) = Pr(\varepsilon_i \le X_{2i}\alpha + X_{1i}\beta) = Pr(\frac{\varepsilon_i}{\tau} \le \frac{X_{2i}\alpha + X_{1i}\beta}{\tau}) = \Phi(\frac{X_{2i}\alpha + X_{1i}\beta}{\tau})$$

where $\Phi(.)$ is the standard normal c.d.f. To estimate the model we have to form the likelihood for the sample we observe, which consists of N_1 that has never participated in the prostitution market, N_2 who has participated and each of them S_i times. Below, L is this joint probability of the sample we observe.

$$(7)\quad L = \prod_{i=1}^{N_1}\left[1 - \Phi(\frac{X_{2i}\alpha + X_{1i}\beta}{\tau})\right]\prod_{i=1}^{N_2}\Phi(\frac{X_{2i}\alpha + X_{1i}\beta}{\tau})\prod_{i=1}^{N_2}\frac{1}{\sigma}\varphi(\frac{log\, S_i - Z_i\gamma}{\sigma})$$

Here $\varphi(.)$ is the p.d.f. in the standard normal distribution. We observe that τ is absorbed in the coefficients α and β, and is thus not identified.

4. Data

In our analysis we use the National Survey of Sexual Attitudes and Lifestyles ('Natsal-2 and Natsal 3), which are randomly drawn sample surveys undertaken during 1999-2001 and 2010–2012, respectively. The surveys are interviews of a representative sample of men and women aged respectively 16-44 and 16-74 living in private households in Britain.[4] Data collection was carried out using computer assisted personal interview (CAPI) techniques along with computer assisted self-interview (CASI) for the more sensitive questions.

The data provide a detailed understanding of patterns and variability of sexual behaviour in Britain. It explores sexual behaviour (paying for sex included) and sexual function and satisfaction over the life-course, health conditions and problems that may affect sexual lifestyles.

[4] Johnson, A., London School of Hygiene and Tropical Medicine. Centre for Sexual and Reproductive Health Research and Nat Cen Social Research, *National Survey of Sexual Attitudes and Lifestyles, 2010-012*. Colchester, Essex: UK Data Archive, September 2015. This work is the result of a collaborative team from five organisations: University College London (UCL); London School of Hygiene & Tropical Medicine (LSHTM); National Centre for Social Research (NatCen); Public Health England (PHE) (formerly the Health Protection Agency); University of Manchester. SN: 7799, http://dx.doi.org/10.5255/UKDA-SN-7799-

We focus on men paying for sex. Selection was constrained to men only since the original data set includes about 1 per cent cases only of women paying for sex, although there is an increase of this demand. We also consider only heterosexual orientation since different sexual orientation is a small percentage of the sample and consequently impossible to consider for consistent estimation.

The data, given our aim to investigate participation among men in the sex market, have some limits. In fact, they do not give information on prices for paid sex, awareness of reputation losses, amount of freely exchanged sex and other specific personal characteristics.

To understand changes in the behaviour of man asking for paid sex, we use both Natsal-2 and Natsal-3 to generate a pooled cross section. Descriptive statistics of the pooled cross section sample and of each of the two surveys are reported in Appendix A, whereas in the following we focus mostly on Natsal-3 data.

From the original data set including 15162 men we selected age 20-74 since for our purpose age 16-20 include few cases that do not seem important in our study. Data reduces to 5033 observations: 604 Men Paying for Sex (MPS)[5] and 4429 Men Not Paying for Sex (MNPS).

The reported proportion of MPS is 12 per cent of our sample.

Considering MPS across regions we note that the region of London, and the regions of North and South West have higher percentage of demand (see Table 1).

[5] We define as MPS a man who declares to have paid for sex at least once. MNPS otherwise.
From here on we will use the abbreviations MPS and MNPS

Table 1. Descriptive statistics of men asking for paid sex in Britain regions aged 20-74

Region	Mean	Std. Dev.	Total Freq.
North East	0.089	0.286	257
North West (incl.old Mersey region)	0.132	0.339	667
Yorkshire And The Humber	0.108	0.311	435
East Midlands	0.092	0.290	434
West Midlands	0.102	0.303	411
South West	0.111	0.314	424
East	0.108	0.310	558
London	0.167	0.374	502
South East	0.143	0.350	644
Wales	0.091	0.288	275
Scotland	0.131	0.338	426
Total	0.120	0.325	5033

Descriptive statistics of the sample used in the estimation for all observations and for MNPS versus MPS are shown in Table 2.

Table 2. Descriptive statistics: 5033 observations: 604 Men Paying for Sex (MPS) and 4429 Men Not Paying for Sex (MNPS) over age 20-74

		Whole sample			**MNPS[1)]**	**MPS[2)]**	
Variables	Mean	Std. Dev.	Min	Max	Mean		
Paying for sex:							
Ever paid money for het. sex : dummy 1/0	0.12	0.33	0	1	0.00	1.00	
Total number. of het. paid sex partner, life	15.74	73.91	0	3300	13.39	33.00	***
Total number of different women paid money to have sex with	0.67	4.96	0	200	0.00	5.60	***
X_1		**Reputation loss and moral threshold**					
Manager: dummy 1/0	0.24	0.42	0	1	0.23	0.25	
Professional: dummy 1/0	0.25	0.43	0	1	0.25	0.26	
Skilled: dummy 1/0	0.25	0.43	0	1	0.25	0.26	
Elementary occupation: dummy 1/0	0.12	0.32	0	1	0.12	0.10	
Married: dummy 1/0	0.57	0.49	0	1	0.58	0.53	
Cohabiting: dummy 1/0	0.55	0.50	0	1	0.55	0.49	**
Sex education at school: dummy 1/0	0.58	0.49	0	1	0.59	0.49	***
Having any natural child: dummy 1/0	0.52	0.50	0	1	0.52	0.53	
Grew up with two parent: dummy 1/0	0.78	0.41	0	1	0.79	0.75	**
Household size (number of people who live regularly in household (inc. respondent)	2.54	1.33	1	8	2.57	2.32	***
Belong to any religion: dummy 1/0	0.45	0.50	0	1	0.45	0.48	
X_2		**Income and opportunities**					
Age	41.28	15.95	20	74	41	42.6	

Drugs user (if ever injected drugs of any kind): dummy 1/0	0.42		0.49	0	1	0.39	0.59	***
Age first intercourse 13-15: dummy 1/0	0.26		0.44	0	1	0.24	0.34	***
Sex abroad (if any new paid sex partner while outside UK, last five years): dummy 1/0	0.10		0.30	0	1	0.08	0.26	***
Household income (£) (inc benefits, pensions etc.) pre tax per year:								
Income <2,500: dummy 1/0	0.03		0.16	0	1	0.03	0.02	
Income 2,500-4.999: dummy 1/0	0.04		0.19	0	1	0.04	0.04	
Income 5,000-9,999: dummy 1/0	0.07		0.25	0	1	0.07	0.08	
Income 10,000-19,999: dummy 1/0	0.15		0.36	0	1	0.15	0.13	
Income 20,000-29,999: dummy 1/0	0.15		0.36	0	1	0.15	0.15	
Income 30,000-39,999: dummy 1/0	0.13		0.34	0	1	0.13	0.14	
Income40,000-49,999: dummy 1/0	0.10		0.30	0	1	0.10	0.14	***
Income >=50,000: dummy 1/0	0.20		0.40	0	1	0.20	0.20	
Leaving in Great London: dummy 1/0	0.10		0.30	0	1	0.09	0.14	***
Having sex without love: dummy 1/0	0.64		0.48	0	1	0.62	0.77	***
Ever masturbed: dummy 1/0	0.95		0.22	0	1	0.94	0.99	***
Unsafe sex: dummy 1/0	0.07		0.25	0	1	0.06	0.10	***
Greatly HIV/AIDS risk: dummy 1/0	0.27		0.44	0	1	0.25	0.35	***

[1)] MPS (Men Paying for Sex), [2)] MNPS (Men Not Paying for Sex)

For $dummy_i$ the statistics are computed as:
column MNPS: (frequency if dummy i =1)/(total of MNPS);
column MPS: (frequency if dummy i =1)/(total of MPS)

In the following we examine variables related to characteristics and family history of the interviewees. The interviewees pertain to singles or to married/cohabitant family and to a family with up to eight members.

Heterosexual behaviour strongly differs between MPS and MNPS: Men who paid for sex were found to have had an average of 33 sexual partners compared to 13.4 partners for men not paying.

Learning about sex is an important aspect of sex behaviour: 59 per cent of MNPS learnt about sex from lessons at school compared to 49 per cent of MPS. Only 5 per cent has an easy parent-child relationship and mostly from mothers. 26 per cent of the interviewees learns mostly about sex from friends of about same age. Only 2 per cent learns from pornographic sources. Data does not say if sex education is given at schools within areas where there are social problems. Data do not provide any consequence on the reaction arisen on the individual that received sex education at school. It would be interesting to know if sex education made them more conscious of their behaviour, or implied risk aversion, or has changed some other personal perceptions.

About 78 per cent of the respondents declare they lived more or less continuously until age 14 with both natural parents, and the mean differs between MNPS and MPS, 79 per cent and 75 per cent, respectively.

It is more frequent to observe MPS in small families than in large families.

Another interesting aspect is about religion: 45 per cent of interviewed declared they belong to a religion.

Analysing age, we observe that demand for paid sex is highest in the group 40-44, while it is low in the group of young 20-14, and after age 65 (Table 3). MNPS tend to be younger than MPS: 41 and 42.6, respectively.

Table 3. Descriptive statistics of MPS at different age group. Fractions.

Man's age at interview, years, grouped	Mean	Std. Dev.	Group Freq.
20-24	0.06	0.242	817
25-29	0.13	0.338	836
30-34	0.13	0.339	614
35-39	0.11	0.310	372
40-44	0.16	0.365	399
45-49	0.15	0.358	392
50-54	0.14	0.346	347
55-59	0.15	0.354	321
60-64	0.15	0.354	363
65-69	0.09	0.287	333
70-74	0.09	0.290	239
Total	**0.12**	**0.325**	**5033**

There is a considerable difference in the drug use: MPS 59 per cent, while MNPS 39 per cent.

Considering age of first heterosexual intercourse (13-15) we observe that among MNPS it is 24 per cent and 34 per cent for the MPS.

Paying for sex remains strongly associated with foreign partners outside the UK.

Data provides dummies related to eight categories of income. The difference is not high between MNPS and MPS, only in the group of income 40,000-49,999 there is a significant difference: MPS have a 4 percent higher income than MNPS.

In Great London, the demand for paying for sex is higher.

As much as 62 per cent of MNPS declares to strongly agree or agree to have sex without love while the percentage of MPS is 77 per cent. Thus sex intercourse seems not to be strongly related to sentimental aspects.

A large percentage (99) of MPS declares ever masturbated compared to 94 per cent of MNPS.

MPS are on average less risk averse than men not paying; they declare they had more unsafe sex last year (10 percent) with respect to men not paying (6 percent).

The self-perception to be at great HIV/AIDS risk is 35 per cent for MPS while 25 per cent for MNPS.

4. Estimate

In Table 4 we report the results of the joint estimate model of the probability of paying for sex and the expected log of demand for paying for sex, given participation in the sex market.

Table 4. Joint estimate of the probability of participating in the sex market and number of times with a prostitute, given participation in the sex market. Selection of men aged 20-74

Variables	Estimates	t-values	Marginal effects
Participation			
X_1	**Reputation loss and moral threshold**		
Constant	-3.7311	-14.6	
Manager	0.0744	0.9	0.0127
Professional administrator	0.1150	1.7	0.0198
Skilled	0.0789	1.2	0.0134
Married	-0.0891	-1.5	-0.0149
Sex education at school	-0.1998	-4.0	-0.0338
Having any child	-0.0230	-0.4	-0.0038
Grew up with two parents	-0.0993	-1.8	-0.0171
Household size	-0.0259	-1.2	-0.0046
Religious	0.1511	3.1	0.0254
X_2	**Income and opportunities**		
Age/10	0.8805	8.2	0.1466
(Age/10) squared	-0.0816	-7.0	-0.0136
Drug user	0.4486	8.3	0.0774
Age first intercourse	0.1437	2.8	0.0248
Sex without love	0.2523	4.7	0.041
Sex abroad	0.8372	12.1	0.1966
Income, medium low	0.0381	0.3	0.0065
Income, high- low	0.1886	1.8	0.0344
Income, medium	0.1167	1.3	0.0204
Income, medium high	0.1121	1.3	0.0195
Income, high, medium	0.2249	2.5	0.0411
Income, high	0.3189	3.4	0.0610
Income, high-high	0.0561	0.6	0.0095
Living in London	0.1920	2.7	0.0348
Z	**Number of times with a prostitute**		
Constant	-2.1113	4.1	
Age/10	0.5637	3.3	0.8184
(Age/10) squared	-0.0460	-2.4	-0.0667
Masturbation	-0.9791	-2.7	-0.0813
Unsafe sex	0.3100	2.5	0.0177
Sex without love	0.3642	3.9	0.0166

Sigma	0.9538	34.8	
No of observation	5033		
Log likelihood	-2517.57		

Note that the expected value of number of times with a prostitute is the following:

(8) $E(S_i) = e^{z_i\gamma + \frac{\sigma^2}{2}}$.

The marginal effects related to expected total times with a prostitute are based on this formula.

We start with commenting on the estimates of the probability of having sex with a prostitute. The estimates of coefficients related to the "threshold" variables, the X_{1i} vector, meets our a priori expectations, with two exceptions: First, the coefficients attached to the professional status, represented by the four dummies described in Section 3 (the reference case is *elementary occupation*) are not significant and they all have a positive sign. That is contrary to our expectation, since men with a professional status may have more to lose if it becomes known that they have had sex with a prostitute. Second, to belong to a religion has a significant and *positive* effect on the probability of having sex with a prostitute.

Marriage may prevent individuals for having sex with prostitutes. This hypothesis is partly confirmed by the negative estimate, but it is not significant.

The sign of the coefficient related to have any child is negative but not significant. We got the same results if we replaced it with the number of children.

Living until age of 16 in traditional families with the presence of both parents has a negative impact on participation in the sex market, but the coefficient is not completely significant. We get the same result for using the size of the household; the coefficient is negative, but not significant.

Sex education at school; the coefficient is negative and significant. Judged by the marginal effect it is an important variable preventing men for having sex with prostitute.

Turning to the estimates of the coefficients attached to the variables in the X_{2i} vector we observe from Table 4 that as the age increases up to the age of around 54, there is an increase in the probability of having participated in the sex market.

Men with a high income, given the professional status, may be more vulnerable socially if observed with prostitutes. On the other hand to buy sex could be expensive and hence higher income may have a positive impact on participation in the sex market, in particular if sex takes place indoor in hotels and apartments. Our estimates partly confirm that expectation and show that only for those with an income around 30,000-50,000 pounds per year the coefficients are positive and significant. Men with these incomes are typically middle-class men.

Drug abusers are represented by the dummy *drug use*, which equals 1 if ever injected any kind of drugs and equal 0 otherwise. Drug abuse is widespread and abusers have a stronger inclination to have sex with a prostitute; the coefficient is positive and highly significant.

The participation in the sex market is positive and significant among men asking for sex without love, i.e. without any obligation or sentimental value.

The demand for paid sex, while outside UK last 5 years, is positive, significant and the marginal effect is really sizeable. To be abroad may give more opportunities to find prostitutes and less possibilities to be observed being with a prostitute. The latter means that this variable could also belong to the X_1-vector.

The variable age at first heterosexual intercourse is represented by a dummy, which is equal to 1 if the individual had a sexual intercourse between the age of 13 and 15, and equal to 0 if older. The coefficient is positive and significant, confirming that those who started early with having sex are also more likely to enter the commercial sex market as an adult.

In the estimate of the expected number of times with prostitutes all of the variables have a significant impact. Age is significant and implies that the expected number of times with a prostitute increases up to the age 61-62. The estimates show that masturbation (ever or not) has a negative and significant impact, which indicates that masturbation is a substitute for having sex with a prostitute. Like in the participation probability, the impact of sex without love on the expected number of times with a prostitute is positive and significant. A worrying result is that the expected number of times with a prostitute is higher among those who are not using condoms than among those who do. Given the observed variables, unobserved heterogeneity matters as captured by the estimate of sigma.

As mentioned above having had sex education in school is one of the most important variables preventing men from having sex with a prostitute. In Table 5 we show an estimate of the probability of having had sex education in school (Probit) when our observed adult men were school pupils. The father's occupation is observed when the sons were 14 years old.

If the man, when he was at school, attended a school with only boys in the class, the probability of having had sex education is lower compared to if he went to schools with both gender in class. With regards to father's occupation, sons of managers and administrators had higher chance to go to schools where sex education took place than sons of fathers with other and not so well paid jobs.

Table 5. Estimates of the probability of having had sex education in school.

Variable	Estimates	t-values
Constant	0.640	9.75
Attended single sex class	-0.808	-10.84
Boarding School	0.066	0.49
Father's occupation when the boy was 14 years:		
Farm workers	-0.545	-2.70
Skilled manufacturing	-0.294	-3.48
Unskilled-manufacturing	-0.352	-3.99
Manager, administrator	0.210	1.99
Salesman	-0.126	-0.72
Other work	-0.211	-2.01
Number of observations	5330	
Log likelihood	-3348.715	

In order to use more information about the demand for paid sex we pooled the two last available National Survey of Sexual Attitudes and Lifestyles (Natsal-2 and Natsal-3).

The two data set have some differences: Natsal-2 refers to age 16-44 while Natsal-3 refers to 16-74. Further, Natsal-2 does not report any information about income, while Natsal-3 does. Some demands of the questionnaire are not similar in the two surveys. To get the pooled cross section we made some variables homogeneous, and we use education level as a proxy of income. We also reduced our analysis to men aged 20-44. The pooled cross section give us also the opportunity to observe a larger number of men who paid for having sex (i.e. 849).

In the following Table 6 we report the estimate of the probability of participation in the sex market of the pooled cross section and, separately, for the two surveys. Summary statistics for Natsal-2 and pooled data set are given in Appendix A.

Table 6. Probability of participating in the sex market on the pooled cross section data on wave 1999-2001, and on wave 2010-2012, over age 20-44

	Pooled cross section			**wave 1999-2001**			**wave 2010-2012**		
Variables	Estimates	t	Marginal effect	Estimates	t	Marginal effect	Estimates	t	Marginal effect
Constant	-5.196	-10.120		-4.708	-6.940		-5.85	-7.21	
$\mathbf{X_1}$	**Reputation loss and moral threshold**			**Reputation loss and moral threshold**			**Reputation loss and moral threshold**		
Manager	-0.013	-0.210	-0.002	-0.121	-1.450	-0.020	0.14	1.32	0.023
Professional	-0.125	-1.340	-0.020	-0.168	-1.350	-0.026	-0.04	-0.26	-0.006
Administrative	0.067	0.930	0.012	0.044	0.470	0.008	0.10	0.89	0.017
Skilled	-0.003	-0.040	0.000	-0.100	-1.260	-0.017	0.13	1.33	0.022
Married	-0.070	-1.440	-0.012	-0.050	-0.790	-0.009	-0.09	-1.16	-0.014
Sex education at school	-0.200	-3.720	-0.031	-0.203	-2.690	-0.032	-0.20	-2.61	-0.031
Having any child	-0.142	-2.760	-0.024	-0.239	-3.490	-0.041	-0.03	-0.40	-0.005
Grew up with two parents	-0.078	-1.600	-0.013	-0.038	-0.570	-0.007	-0.11	-1.57	-0.019
Belong to a religion	0.142	3.370	0.024	0.122	2.240	0.021	0.17	2.52	0.028
$\mathbf{X_2}$	**Income and opportunities**			**Income and opportunities**			**Income and opportunities**		
Age/10	1.654	5.280	0.278	1.392	3.360	0.239	2.03	4.11	0.323
(Age/10) squared	-0.201	-4.220	-0.034	-0.159	-2.530	-0.027	-0.26	-3.45	-0.042
Heavy smoker	0.140	2.530	0.025	0.120	1.760	0.022	0.20	2.01	0.034
High alcohol use	0.230	2.780	0.044	0.202	1.430	0.039	0.25	2.42	0.046
Drug injection	0.557	4.240	0.129	0.515	2.530	0.119	0.55	3.15	0.121
Age first intercourse 13_15	0.208	4.500	0.037	0.218	3.580	0.040	0.18	2.56	0.031
Sex abroad	0.747	14.800	0.171	0.632	9.680	0.140	0.92	11.35	0.216
Degree	0.008	0.100	0.001	0.156	1.520	0.028	-0.26	-2.02	-0.039
A-level	0.145	1.800	0.026	0.275	2.650	0.053	-0.08	-0.62	-0.012
O-level	0.077	1.160	0.013	0.158	1.870	0.027	-0.10	-0.87	-0.015
Unsafe sex	0.233	3.260	0.045	0.343	3.760	0.071	0.06	0.55	0.011
Masturbation	0.556	4.630	0.067	0.446	3.210	0.059	0.85	3.38	0.078
Living in London	0.281	5.530	0.053	0.288	4.790	0.054	0.23	2.35	0.042
Wave_2010-2012 (dummy)	0.130	2.920	0.022						
Number of observations	7295			4249			3046		
LR chi2(22)	542.69			299.70			276.00		
Prob > chi2	0.00			0.00			0.00		
Pseudo R2	0.104			0.098			0.1273		
Log Likelihood	-2345.258			-1385.386			-946.30819		

Estimates confirm that the probability of demand for paid sex increased from 2000 to 2010. Estimates also (partially) confirm results found in the analysis reported in Table 4 above. In particular, having had sex education in school has a negative and significant impact on buying sex both in pooled cross section and in each wave. In the expanded set of covariates included in the X_2

vector we observe that men with a risky life-profile (sex without condoms, use of drugs, heavy smoking and high consumption of alcohol) are more inclined to buy sexual services from prostitutes than other men.

4. Conclusion

We have used data from Britain's third National Survey of Sexual Attitudes and Lifestyles (Natsal 2 and Natsal-3) with a sample of men aged 20 -74, living in private households in Britain, in an analysis of their demand for sexual services from prostitutes. In the most recent sample from 2010, about 12 per cent of British men have paid for sex at least once.

This paper build on a model that jointly estimates the probability of paying for sex and the expected number of times having sex with a prostitute, given participation in the sex market.

We find positive, significant and strong marginal effects of having sex abroad or living in London.

Risky behaviour (unsafe sex, drug use, heavy smoking and high consumption of alcohol) is found to be positively and significantly related to demand for paid sex. We also found positive and significant effect of '*belonging to any religion*'. This seems to render a misleading consideration believing that the individual moral values is a restraint on participation in the sex market.

A notable result is that sex education in school has a significant negative effect on having sex with prostitutes. The policy implication emerging from this finding suggests the diffusion of sex education in all primary and high schools, in accordance with the government amendment proposed on 1 March 2017.

Compliance with Ethical Standards:

Funding: This study was funded by The Ragnar Frisch Centre of Economic Research, Oslo, Norway

Conflict of Interest: Steinar Strøm has received research grants from The Ragnar Frisch Centre of Economic Research, Oslo, Norway. Marilena Locatelli has received research grants from The Ragnar Frisch Centre of Economic Research, Oslo, Norway. The authors declare that they have no conflict of interest.

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Appendix A. Summary Statistics of Natsal-2 and the pooled data.

	Pooled cross section				wave 1999-2001				wave 2010-2012			
Variables	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
Paying for sex:												
Ever paid money for het. sex : dummy 1/0	0.116	0.320	0	1	0.117	0.322	0	1	0.115	0.319	0	1
Total number. of het. paid sex partner, life	14.133	32.518	0	1000	14.624	37.337	0	1000	13.447	24.236	0	400
Total number of different women paid money to have sex with	0.442	2.971	0	150	0.434	3.095	0	150	0.453	2.790	0	100
X1	**Reputation loss and moral threshold**											
Manager: dummy 1/0	0.288	0.453	0	1	0.305	0.460	0	1	0.265	0.441	0	1
Professional: dummy 1/0	0.094	0.292	0	1	0.082	0.274	0	1	0.111	0.314	0	1
Administrative: dummy 1/0	0.136	0.343	0	1	0.131	0.337	0	1	0.144	0.351	0	1
Skilled: dummy 1/0	0.266	0.442	0	1	0.270	0.444	0	1	0.260	0.439	0	1
Elementary occupation: dummy 1/0	0.163	0.369	0	1	0.169	0.375	0	1	0.154	0.361	0	1
Married: dummy 1/0	0.511	0.500	0	1	0.531	0.499	0	1	0.482	0.500	0	1
Sex education at school: dummy 1/0	0.229	0.420	0	1	0.191	0.393	0	1	0.282	0.450	0	1
Having any natural child: dummy 1/0	0.428	0.495	0	1	0.464	0.499	0	1	0.378	0.485	0	1
Grew up with two parent: dummy 1/0	0.772	0.420	0	1	0.802	0.399	0	1	0.730	0.444	0	1
Hosehold size (number of people who live regularly in household (inc. respondent)	2.819	1.428	1	12	2.827	1.459	1	12	2.807	1.385	1	8
Belong to any religion: dummy 1/0	0.409	0.492	0	1	0.430	0.495	0	1	0.379	0.485	0	1
X2	**Education and opportunities**											
Age	31.380	6.986	20	44	32.515	6.828	20	44	29.797	6.897	20	44
Non-smoker: dummy 1/0	0.629	0.483	0	1	0.608	0.488	0	1	0.658	0.474	0	1
Light smoker: dummy 1/0	0.215	0.411	0	1	0.201	0.400	0	1	0.235	0.424	0	1
Heavy smoker: dummy 1/0	0.155	0.362	0	1	0.190	0.392	0	1	0.107	0.309	0	1
High alcoholic consumption: dummy 1/0	0.051	0.221	0	1	0.028	0.166	0	1	0.083	0.276	0	1
Drugs user (if ever injected drugs of any kind): dummy 1/0	0.017	0.128	0	1	0.012	0.111	0	1	0.023	0.149	0	1
Age first intercourse 13-15: dummy 1/0	0.271	0.445	0	1	0.258	0.438	0	1	0.290	0.454	0	1
Sex abroad (if any new paid sex partner while outside UK, last five years): dummy 1/0	0.154	0.361	0	1	0.161	0.368	0	1	0.144	0.351	0	1
Degree level qualification: dummy 1/0	0.283	0.451	0	1	0.270	0.444	0	1	0.301	0.459	0	1
A-levels: dummy 1/1	0.166	0.372	0	1	0.145	0.352	0	1	0.197	0.398	0	1
O-level: dummy 1/2	0.418	0.493	0	1	0.430	0.495	0	1	0.401	0.490	0	1
None	0.132	0.339	0	1	0.155	0.362	0	1	0.100	0.300	0	1
Leaving in Great London: dummy 1/0	0.203	0.403	0	1	0.270	0.444	0	1	0.111	0.314	0	1
Ever masturbed: dummy 1/0	0.945	0.229	0	1	0.936	0.245	0	1	0.957	0.203	0	1
Unsafe sex: dummy 1/0	0.069	0.253	0	1	0.068	0.252	0	1	0.069	0.254	0	1
Greatly HIV/AIDS risk: dummy 1/0	0.047	0.212	0	1	0.049	0.216	0	1	0.044	0.206	0	1
Wave2010: dummy 1/0	0.418	0.493	0	1								
Number of observations	7295				4249				3046			