

An Analysis of Sexual Violence – The Relationship between Sex Crimes and Prostitution in South Korea

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By analyzing the survey data of sex offenders in South Korea, this paper aims to explain how prostitution can be linked to sex crimes. The empirical findings show that buying sex is positively associated with committing a sex crime and the experience of paying for sex with a minor exacerbates the severity of sex crimes. These results indicate that one type of risky sexual behaviors – buying sex – can be aggravated to a more serious type of sexual violence, such as rape. However, these findings are drawn in South Korea where prostitution is prohibited, and the same conclusion may not be replicated in places where the risks of buying sex are minimized through the legalization of prostitution. Nonetheless, the complementary relationship between prostitution and sex crimes found in this paper indicates that allowing commercial sex may not be a viable solution to reduce sex crimes.

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INTRODUCTION

Despite the fact that prostitution has long existed in society, sex trade is not typically considered to be a normal economic exchange. Whether or not prostitution should be recognized as a legal transaction of service is a controversial issue in many countries. While some countries legalized prostitution (e.g. Germany, New Zealand and the Netherlands) prostitution remains illegal in many parts of the world. One of the classic arguments posed in favor of the legalization of prostitution is that it could reduce sexual violence. This argument is based on the prediction that sex workers could satisfy the sexual desires of potential sex offenders by providing an alternative to committing sex crimes. Furthermore, it is argued that legalizing prostitution would allow law enforcement resources to be reallocated and used to prevent sex crimes rather than raiding red-light districts. However, this justification for the legalization of prostitution is challenged by counterarguments. Given that prostitution is a typically short-lived sexual exchange that often involves violence against sex workers, the experience of buying sex may lead one to seek more precipitate sexual contact such as rape. Under this assumption, buying sex could be seen as a catalyst for more violent, riskier sexual behaviors in that the relationship between prostitution and sex crimes would be complementary rather than substituting. Hence, this view predicts that the legalization of prostitution exacerbates sex crimes instead of constraining them.

Current literature also provides conflicting empirical evidence on the link between prostitution and sexual violence. For example, Cunningham and Shah (2014) examine the effect of legalization of prostitution in Rhode Island in the United States and find that its legalization reduced sex crimes. Also, Bisschop et al. (2017) suggest

that opening a street prostitution zone has a short-term effect of reducing sexual abuse and rape in Dutch cities. On the other hand, Cho et al. (2013) show in a global study that legalizing prostitution induces more sex trafficking, as increased demand for prostitution cannot be fully satisfied by the voluntary supply of commercial sex. Their finding is supported by Kotsadam and Jakobsson (2013a) who investigate the effects of legal prostitution in European countries and find the positive effect of legalized prostitution on sex trafficking. As seen by the seemingly confounding results of these studies, some suggest a constraining effect of prostitution on rape, while the others highlight a pulling effect on sex trafficking. Their findings do not necessarily negate each other, however, since prostitution may reduce rape while also inducing more sex trafficking. This contradiction implies rather that the inconsistent implications of prostitution suggested by current literature require further investigation in different dimensions. For instance, as the existing studies mainly focus on macro-level evidence obtained by using aggregate data at country or district levels, a micro-analysis that addresses the relationship between individuals' propensity to commit sex crimes and buying sex can provide value-added contributions. Such an approach is particularly necessary because empirical investigation on the effects of prostitution is scarce in literature due to difficulties in accessing data¹, despite active debates on the legalization/prohibition of prostitution that take place in many countries.

In order to contribute a new piece of evidence to the currently inconclusive literature, this paper extends its analysis to examine the effects of prostitution on sex crimes by using the Survey on Sex Criminals (Jeon et al. 2007) collected by the Korean Institute of Criminology. This micro-survey includes questions about individuals' past experiences with commercial sex, sex crimes, and violence, as well as their demographic information and personal values. In South Korea, prostitution is illegal, and the government has exercised strict law enforcement against prostitution since 2004 with the adoption of the Special Law on Sex Trade as a response to growing criticisms on violence and human rights abuses in commercial sex scenes (MOGEF 2014). Considering this course of development, an analysis of the effect of prostitution on sex crimes can provide a relevant implication for policy-makers of the country who are concerned about reducing sexual violence against women.

Using the survey data, the empirical findings of this paper show that buying sex significantly increases the probability that one commits various forms of sex crimes – sexual assaults in general and forced sex with a stranger or a partner. Furthermore, the experience of paying for sex with an underage prostitute exacerbates the severity of sex crimes committed by sex offenders. These findings propose a complementary relationship that prostitution can increase sexual violence. However, this result is possibly driven by an endogenous relationship between the two because the two risky sexual behaviors may share common unobserved characteristics and thus form a simultaneous relationship. Accordingly, the potential endogeneity of the model is accounted for by employing an instrumental variable approach. Using average hotel prices and the enforcement level of brothel control at a city level as external instruments, the results corroborate the main finding of the complementary relationship between prostitution and sex crimes.

In interpreting the results, however, one should be aware of the limitations of the study. First, the survey was conducted with sex offenders because data collected from population-representative samples is not readily available. To the best of my knowledge, there is no population-representative survey about the personal experience of committing a sex crime and buying sex in South Korea because of the sensitive nature of the questions. Thus, the survey used in this study focuses on sex offenders who were available to be inquired in prisons or probation centers. Consequently, the pool of this survey does not reflect the characteristics of the entire male population in South Korea. Second, as prostitution is illegal in South Korea, the findings of this study may not be applied to countries where prostitution is allowed. However, despite its criminalization, prostitution remains rather common in South Korea, where the level of prevalence is comparable to that of countries in which prostitution has

¹Presently, there are several studies that discuss the determinants of prostitution on the demand side: health concerns (Schei and Stigum 2010; Della Giusta, Di Tommaso, Shima, and Strom 2009); risks of being caught under the prohibition of prostitution (Kotsadam and Jakobsson 2013b); clients' reputation and social status (Della Giusta, Di Tommaso and Strom 2009); and social attitudes towards gender equality (Kotsadam and Jakobsson 2011).

been legalized – for instance, Germany (see Section 3.2 for detailed discussions on the prostitution markets in South Korea and Germany). Also, sex buyers are punished at a rather low level of intensity – monetary fines in most cases. Given that buying sex does not necessarily result in severe punishment in South Korea, the illegal standing of prostitution may not significantly affect the decision of whether or not to buy sex.

Having acknowledged the limitations of this study, generalizing its findings requires caution. Nonetheless, seeing as extensive empirical evidence is rare in the literature of this specific field, the findings of this paper add imperfect, but insightful information to shed light on uncertain consequences of prostitution to sexual violence.

CONCEPTUAL FRAMEWORK OF SEXUAL VIOLENCE: SEX CRIMES AND PROSTITUTION

This section discusses theoretical arguments regarding the relationship between prostitution and sex crimes. The experience of buying sex may influence one's decision to commit a sex crime (and vice versa) because both behavioral choices involve trading sexual acts – through a commercial exchange for the former and coercion or violence for the latter. Theoretical predictions propose three different relationships: prostitution is a substitute for sex crimes; prostitution complements sex crimes; and buying sex is a fundamentally different behavior from committing a sex crime.

Substitution Relationship

One may buy sex instead of committing a sex crime if both sexual acts have shared motivations. For instance, if one commits a sex crime because of an unsatisfied sexual desire on the spur of the moment, making prostitution available and affordable might reduce sex crimes.

Assuming a substitution relationship, when does one choose prostitution over a sex crime? The choice between buying sex and committing a sex crime depends on the cost function – i.e. one hires a prostitute if it is less costly than rape. Typically, the decision of choosing one good or service between two substitution options depends on price level. However, because prostitution and sex crimes are both considered risky behaviors, there are additional factors that enter into the cost function. According to Becker (1968), one's decision to commit a crime is determined by gains, the probability of being caught, and the severity of punishment. Therefore, the cost function should include such risk factors for each sexual act. In addition, both prostitution and sex crimes are not only illegal, but also generally considered to be socially undesirable behaviors. Thus, committing these acts involves the costs of social stigma and loss of reputation (see Della Giusta et al. 2009a). Hence, in order for prostitution to substitute sex crimes, the following conditionality of lower costs should be satisfied.

$$C_{\text{prostitution}} (\text{price, risk, reputation}) < C_{\text{sex crime}} (\text{price, risk, reputation})$$

Comparing the costs of prostitution and sex crimes is not straightforward. On the one hand, one has to pay for sex with a prostitute, while the monetary cost of committing a sex crime is almost always zero (disregarding any additional costs, such as purchasing weapons used for physical threats). On the other hand, risk factors such as the probability of arrests and the level of punishments are definitely greater for committing a sex crime. In South Korea, rape is subject to an imprisonment term of three years or longer (Criminal Law Penal Code 297, the Government of Korea 2013), while the punishment for soliciting prostitution is usually a monetary fine between USD 500 and 1,000 (Criminal Law Penal Code 21). Also, legal enforcement of sex crimes is much stricter than enforcement of prostitution. Furthermore, one can safely surmise that the social stigma attached to committing a sex crime is greater than that of buying sex.

On the other hand, the price level of prostitution is hard to obtain because it is operated in black markets. However, a recent study on the prostitution markets in South Korea published by the Ministry of Gender Equality and Family of Korea (MOGEF 2010) provides some estimated price levels through surveys with sex workers and clients. According to this study, the price of commercial sex per transaction is on average 130,000 South Ko-

rean won (about USD 120), but one may find much cheaper offers depending on locations. For example, prostitution that takes places in a motel can cost as little as 29,000 won (USD 26). This minimum price level of buying sex (USD 26) is likely affordable for the majority of potential clients, given South Korea's level of purchasing power (USD 35,485 in 2014, IMF 2015). Considering the higher risks and social stigma imposed on sex crimes, it is unlikely that the price level of hiring a prostitute outweighs the costs of punishments and reputation loss sex offenders would face if they are caught committing a sex crime. By this estimation, the costs of buying sex are likely lower than those of committing a sex crime. This prediction leads to the following hypothesis that prostitution substitutes sex crimes.

H₀. An increase in the frequency of buying sex decreases sex crimes.

Complementary Relationship

A counterargument to the substitution relationship predicts the exact opposite effect of prostitution on sex crimes. It suggests that the experience of buying sex may increase one's propensity to commit a sex crime. Thus, prostitution increases sex crimes, rather than constraining them.

This argument could be plausible if one takes into account the high prevalence of sexual violence and assaults observed in the commercial sex industry (Farley et al. 2004). Through interviews with 854 sex workers in nine countries², Farley and her co-authors found that 71 percent of prostitutes have been physically assaulted and 63 percent of them have experienced rape. This study provides tentative evidence that prostitution shares violent characteristics with sex crimes.

One may argue that such similarities support the role of prostitution as a substitute to sex crimes. However, one can also predict that experiencing one type of violent sexual acts – such as prostitution – enhances one's desire for more violent sexual acts – such as rape. In other words, the experience of buying sex may be a threshold that lends to the accumulation of one's propensity to commit sex crimes (Schei and Stigum 2010).

According to this prediction, there can be two patterns of behavioral development that a sex buyer demonstrates: (i) committing a sex crime in addition to buying sex (diversification of risky sexual behaviors), and (ii) committing a sex crime following prostitution (intensification of risky sexual behaviors). Moreover, the act of buying sex itself may also turn to be a sexual offense if a client rapes a prostitute (combination of prostitution and sex crimes). In any of these cases, prostitution is predicted to increase sex crimes.

In fact, the survey data of sex offenders in South Korea (Jeon et al. 2007) corresponds with these predicted patterns. It shows that almost 40 percent of sex offenders paid for commercial sex in the past year before their imprisonment, while the share of clients of commercial sex is approximately 27 percent of the total male adult population (MOGEF 2014). Moreover, the percentage of sex buyers is greater for sex offenders who used violent means during a rape – 47 percent of those who used physical violence and 54 percent of those who confined victims of rape. These descriptive findings suggest that there could be a complementary linkage between prostitution and sex crimes. Corresponding to the argument, the following hypothesis of a complementary relationship is proposed as an alternative to the substitution hypothesis.

H₀. An increase in the frequency of buying sex increases sex crimes.

No Relationship between Prostitution and Sex Crimes

The two hypotheses above assume that demand for prostitution is closely related to the probability of one committing a sex crime despite the fact that each hypothesis proposes an opposite effect. However, this assumption may not hold if clients of commercial sex are fundamentally different from sex offenders, and/or buying sex has different motivations and reasons from committing a sexual offence. In this case, the demand function of prostitution differs from that of sex crimes, and therefore, the consumption of prostitution services does not affect the

²Canada, Colombia, Germany, Mexico, South Africa, Thailand, Turkey, the United States, and Zambia.

decision of committing a sex crime.

On the one hand, both types of sexual behaviors involve sexual intercourse that does not require a personal relationship with the counterpart (either a prostitute or a victim of sex crime) and often share violent characteristics during the sexual transactions. In this regard, the prediction that there is no relationship between the two acts may not be very convincing at first glance. However, when one looks into the reasons for rape (as stated by sex offenders themselves), a new perspective is born. According to the above-mentioned survey of sex offenders in South Korea, less than 20 percent of the respondents answered that they committed rape in order to satisfy their sexual impulses. In contrast, sexual satisfaction is presumably the primary motivation of buying sex. The rest of the sex offenders gave various other reasons – e.g. anger, love, power, possession, curiosity, alcohol, prevention of another crime, etc. (see Appendix 3). Some of these reasons may overlap with the motivation of buying sex to some extent – e.g., alcohol consumption or curiosity, but some are not – e.g., the prevention of another crime and the cases of love. With these observations, the link between prostitution and sex crimes may not be as strong as previously assumed. Accordingly, a third prediction of no relationship between the two is hypothesized below.

H₀. Prostitution does not have any effect on sex crimes.

DESCRIPTIVE PATTERNS OF SEX CRIMES AND PROSTITUTION IN SOUTH KOREA

Sex Crimes in South Korea

South Korea's sex crime data provides aggregated statistics of sexual violence – including rape and other forms of sexual assaults (UNODC 2015). In 2012, the total number of sexually violent acts reported by police was 19,619 (UNODC 2014). This number indicates that 40 incidences of sex crimes occurred per 100,000 persons. This crime rate places South Korea in the middle of the OECD countries – with a rank of 15th out of 29 available countries in terms of the prevalence of sex crimes (UNODC 2014, see Appendix 4)³.

The statistics collected by the Supreme Prosecutors' Office of Korea (2014) provide more detailed information about sex criminals. Among them, 60.8 percent have a previous criminal record. The unemployment rate of sex criminals is 21.9 percent – much higher than the unemployment rate at the national level (3.1 percent in 2013, KOSTAT 2015). Conversely, the education level of sex criminals is relatively high: 32.9 percent completed high-school education, 17.6 percent are college graduates, and 6.6 percent are currently enrolled in a college – i.e. more than a half of sex criminals have a high school or higher level of education.

The main self-reported motivations for committing a sex crime are: impulsive motives (38.4 percent), curiosity (13.2 percent), and seduction (6 percent). These motives that are presented in the macro-level crime statistics (Supreme Prosecutors' Office of Korea 2014) correspond with the findings of the micro-level survey with 658 sex criminals (Jeon et al. 2007). In the micro survey, the stated primary reason for committing a sex crime is being drunk, followed by sexual desires and curiosity (see Appendix 3). Being drunk in the microdata can partly reflect impulsive motives that are presented as the dominant reason for committing a sex crime in the macro-data above (there is no category of being drunk in the macro-data, and the category of impulsive motives is not included in the microdata).

However, the educational and occupational characteristics of sex offenders in the micro-survey data demonstrate somewhat different patterns from the macro-statistics. Among sex offenders in this micro-survey, only 7.7 percent are college graduates, and another 26 percent completed high school – a much lower level of education compared to the macro-statistics presented above. Furthermore, the unemployment rate of sex offenders in the micro-survey is 11.2 percent – a significantly lower level than that of the macro-statistics, which is 21.9 percent. Apparently, compared to the entire population of sex criminals in South Korea, individuals surveyed are less

³The reported crime prevalence can also be driven by reporting rates. Therefore, a higher crime rate may, at least partially, reflect a higher level of reporting to the police, rather than a higher level of actual prevalence.

educated but have higher employment rates. The average age of sex criminals in the survey is 28.6 years, while information on the average age is unavailable in the macro-statistics.

Prostitution in South Korea

Prostitution is prohibited by law in South Korea. Yet it is commonly seen in many cities, and the prostitution markets are sizable. The aforementioned study estimating the size of the prostitution markets in South Korea (MOGEF 2010) suggests that the revenues of the prostitution industry reached USD 5.5 billion – 0.5 percent of the GDP of South Korea in 2010. The relative size of the prostitution markets in South Korea is similar to that of Germany, where prostitution is legal. In Germany, prostitution earns an estimate of 14.6 billion euro of annual sales revenues that account for 0.55 percent of the GDP (Die Welt 2013). Also, the share of sex buyers in South Korea is considerable. Among men sampled from the population and surveyed by MOGEF (2014), 27 percent answered that they paid for sex in the previous year. Such figures indicate that buying sex is a relatively commonly observed behavior in South Korea, despite its illegal standing.

The share of sex buyers is further higher among sex offenders. 38 percent of surveyed sex offenders paid for sex in the previous year prior to their imprisonment (Jeon et al. 2007). Among them, the share of sex buyers is higher among less-educated individuals. 45 percent of sex offenders with a middle school or lower level of education paid for sex, while only 37 percent of high school graduates and 32 percent of college graduates (or current students) are sex buyers (see Appendix 1). The proportion of prostitution clients is similar between the employed and the unemployed, but does have a small difference – 37 and 33 percent, respectively. Interestingly, married (or partnered) men, among sex offenders, are more often clients of prostitution than singles – 50 and 36 percent, respectively. Sex offenders in their 30s have the greatest tendency to be clients of prostitution, followed by the age group of those in their 20s – 58 and 45.5 percent, respectively. On the other hand, among individuals sampled from the entire male population, the age group of 30-39 forms the largest group of prostitution clients, followed by those in their 40s (MOGEF 2014). It seems that, among non-sex offenders, prostitution clients are older in age (30-40s), while, among sex offenders, younger groups (20-30s) are more likely to hire prostitutes.

EMPIRICAL FRAMEWORK

Baseline Model: Determinants of Sex Crimes

To examine whether the experience of buying sex affects the probability of one committing a sex crime, the following estimation model is formulated.

$$\text{Crime}_i = \beta \text{prostitution}_i + M_i' \gamma + I_i' \tau + X_i' \varpi + u_i \quad (1)$$

The dependent variable is a dummy indicating the type of sex crime person i committed. To construct the dependent variable of sex crimes, three survey questions were used: (i) whether the respondent had forced sex with a stranger, (ii) whether he (in this survey, all respondents were males) had forced sex with his spouse or partner, and (iii) whether he committed sexual harassment against the victim's will (sexual assaults). Note that although all individuals in the sample are sex offenders, the type of sex crime each individual committed differs and therefore the dependent variables have enough variations across observations. Accordingly, the three dependent variables are formed as below.

The explanatory variable of main interest, *prostitution*, indicates how often (per year) the respondent paid for

$$\text{Crime (1 if committed; 0, otherwise)} = \begin{cases} \text{Sexual Assaults} \\ \text{Forced Sex (stranger)} \\ \text{forced Sex (partner)} \end{cases}$$

sex prior to his imprisonment. Two questions from the survey were used to create the prostitution variable: (i) how often the respondent paid to have sex with an adult, and (ii) how often the respondent paid to have sex with a minor (under 20 years old). For each question, the respondents selected one of six options: never, once, twice, three times, four times or more, and not applicable. By using this information about the frequency of paying for sex, two variables (*prostitution of adults* and *prostitution of minors*) are constructed on a five-point scale (from score 0 for ‘never’ to score 4 for ‘four times or more’), respectively. In addition, the two variables were equally weighted to create a third variable, prostitution, which measures the frequency of paying for sex with adults and minors in total on a nine-point scale (from 0 to 8).

$$\text{Prostitution} = \begin{cases} \text{Prostitution (total, scale 0-8)} \\ \text{Prostitution (adults, scale 0-4)} \\ \text{Prostitution (minors, scale 0-4)} \end{cases}$$

The model also includes explanatory variables that reflect misconceptions about rape and prostitution – so-called rape and prostitution myths, respectively (Vector M in Equation 1). Rape myths are cultural beliefs that blame victims of sex crimes for their misfortune and are typically expressed by the following controversial statements: “Women enjoy being raped”, “Victims of rape are promiscuous and/or responsible for their victimization”, and/or “If one resists, one can always escape from being raped” (Grubb and Turner 2012). The acceptance of rape myths tends to be highly correlated with men’s propensity to commit a sex crime (Burt 1980). Prostitution myths prescribe the belief that prostitution decreases sex crimes by providing an alternative way to act on sexual impulses. The prostitution myths variable reflects one’s *view* about commercial sex, while the prostitution variables capture an individual’s actual *act* of buying sex. To measure the degree to which people embrace such myths, two questions from the survey were used. These questions asked respondents to indicate how much they agreed with the following statements: (i) women like men who handle them roughly (for rape myths) and (ii) if there were no prostitution, sex crimes would increase (for prostitution myths). The degrees of the acceptance of rape and prostitution myths are measured on a five-point scale (score 1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, and 5 strongly agree).

Additionally, two variables reflecting self-assessed attitudes are included in the model (Vector I). First, literature suggests that men with low self-esteem are more prone to commit sex crimes because they have fewer opportunities to have sexual contact with women without using violence (Joseph and Black 2012). To evaluate the degree of self-esteem, the question, *to what degree one agrees with the statement, “I am a failure in life”*, from the survey was used. With this information, the variable (*fragile-self*) is created on a five-point scale from score 1 (strongly disagree) to 5 (strongly agree). In addition to low self-esteem, a variable measuring one’s propensity to take risks is also included in Vector I because the costs of committing a sex crime will be lower for risk-loving individuals than risk-averse ones. The risk variable is constructed based on the degree of agreement with the following statement: *“If a task is thrilling and fun, I would do it even if it is dangerous”*. Again, the degree is measured on a five-point scale from strongly disagree (1) to strongly agree (5).

The baseline model also includes demographic factors of sex offenders that would influence one’s sexual behaviors (Vector X): education level, age (at the point of committing a sex crime), marital status, employment status, and childhood experience of being abused by parents (see Appendix 2 for descriptive statistics of demographic characteristics of different types of sex offenders). Detailed information about all variables used in the regression analysis is further presented in Appendix 5.

As the dependent variable has a dummy structure, the model is estimated by using a probit regression method with robust standard errors that are applied to correct for heteroscedasticity. The survey with 658 sex offenders who were either in prison or probation centers in South Korea – collected by the Korean Institute of Criminology – is used for the analysis. Out of the sample of 658 individuals, 480 are available for the estimations due

to missing answers. As noted earlier, the respondents of this survey are sex offenders instead of a sample that represents the general male population. Given that, the survey reflects neither the characteristics of the entire male population in South Korea nor can the results be generalized without caution. However, using the information provided by this survey is still worthwhile given the limited availability of such data. Questions about one's personal experience of buying sex and sex crime are extremely sensitive as they concern privacy, and therefore information on these matters is constrained, particularly in a micro-level survey with individuals. With this in mind, surveys with sex offenders implemented by correction centers and judicial bodies⁴ can provide alternative – probably second best – measurements that make it possible to empirically test for the relationship prostitution and sex crimes. Thus, without attempting to generalize the results, this study aims to find plausible, indicative evidence of the relationship between the two sexual behaviors by using limited but available information.

The Endogeneity of the Model

Equation 1 above is modelled to identify whether the experience of buying sex affects the probability of an individual committing a sex crime. In the baseline model, all available variables that are relevant to explaining sex crimes are included. However, some potentially important determinants of sex crimes are either unobservable – for instance, personality or sexual preferences – or unobserved in this survey – for example, family backgrounds. As these omitted determinants of sex crimes also possibly affect one's choice of buying sex, the causal link between prostitution and sex crimes may not be determined. The problem of endogeneity can be further exacerbated by the simultaneous occurrences of sex crimes and prostitution. The survey data includes variables indicating (i) whether one committed a sexual assault/forced sex in the previous year (dependent variable), and (ii) whether one paid for sex during the same period (explanatory variable of main interest), but without providing further clarification about the chronological order of the two events. If buying sex did not always take place before one committed a sex crime, the direction of causality could be reversed.

To address these issues of endogeneity, an instrumental variable (IV) approach is a viable strategy. Accordingly, the effect of buying sex is estimated by using information obtained through an exogenous excluded instrument. To instrument the endogenous prostitution variable, a variable that is highly correlated to buying sex but does not necessarily have a direct link with sex crimes is required. In this analysis, the average price level of hotels in a city where an inmate resided is selected for this purpose – the data is taken from Statistics Korea 2015⁵. According to the study by the Ministry of Gender Equality and Family of Korea (MOGEF 2010), hotels are one of the four major places where commercial sex takes place (in addition to flats rented for prostitution, brothels, and bars). As clients are expected to pay the costs of renting a hotel room, a higher hotel price is likely to discourage clients from buying sex. Thus, the relationship between hotel price and prostitution is expected to be negative.

To determine whether the selected instrument has high explanatory power over the endogenous prostitution variable, a first stage regression is implemented based on Equation 2 below, with *prostitution* (the frequency of buying sex) as the dependent variable and *hotel price* (the logarithmic average price of hotels in a city where an inmate resided before his arrest) as the main explanatory variable.

$$\text{Prostitution}_i = \psi \text{hotel price}_i + Z_i' \chi + e_i \quad (2)$$

$$H_0: \psi = 0$$

The results are shown in Table 3. The coefficient of *hotel price* is between –0.48 and –2.04, suggesting that a 10 percentage-point (p.p.) increase in hotel price decreases the frequency of buying sex by between 1 (prostitution of adults) and 4.1 p.p. (prostitution of minors). All of the coefficients are statistically significant at a 1 percent

⁴The percent of responses to these surveys is usually high given that offenders are obligated to fill-in survey questionnaires.

⁵As the survey includes no information about the residency of respondents prior to their imprisonment, the location of a prison/probation center is taken as a proxy. The place of their imprisonment is likely highly correlated to the location of residency because most inmates are first placed in a prison nearby their residential areas.

level, thus rejecting the null hypothesis that hotel price has no effect on buying sex.

In addition, the instrument, *hotel price*, must be exogenous to sex crimes. In other words, the hotel price of one's residential area should not have a direct effect on sex crimes, and it explains the probability of one committing a sex crime only via the channel of prostitution. Seemingly, hotel price does not necessarily affect one's decision to commit a sex crime because hotels are not a typical place where forced sex or sexual assaults between strangers would take place. Staying in a hotel together usually implies a certain intimate relationship between two individuals. Also, the primary location of forced sex with a partner is home instead of a hotel (additionally, it is unlikely that one uses a hotel in order to have forced sex with his partner simply because the hotel price is low).

To test for the exogeneity of the instrument, the following two regressions (see Equations 1' and 1'' below) are run one by one. First, the instrument, *hotel price*, is included as an explanatory variable in the structural model together with all other variables (Equation 1'). As *hotel price* should not have a direct effect on sex crimes, the estimated coefficient is expected to be zero, as long as the prostitution variable is also included. When the prostitution variable is excluded from the model (Equation 1''), *hotel price* is then expected to have a significant effect on sex crimes because it would absorb the effect of prostitution.

$$\text{Crime}_i = \beta' \text{prostitution}_i + M_i' \gamma' + I_i' \alpha' + X_i' \omega' + \phi' \text{hotel price}_i + u'_i \quad (1')$$

$$H_0: \phi' = 0$$

$$\text{Crime}_i = M_i' \gamma'' + I_i' \alpha'' + X_i' \omega'' + \phi'' \text{hotel price}_i + u''_i \quad (1'')$$

$$H_0: \phi'' \neq 0$$

Table 3 shows the results of the tests for exogeneity. When the dependent variable is *sexual assaults*, the coefficient of the hotel price variable is insignificant as long as prostitution is controlled for (Column 1). Excluding the prostitution variable from the model, the coefficient of *hotel price* becomes significant at a 1 percent level with an expected negative sign (Column 2). The same result holds when the dependent variable is *forced sex with a partner* (Columns 5 and 6). However, with *forced sex with a stranger* as a dependent variable, the coefficient of *hotel price* remains insignificant even after excluding the prostitution variable (the results are not presented in the table but can be obtained by the author upon request). This suggests that *hotel price* is a weak instrument in this specification. Hence, an alternative instrument is employed to estimate the model of *forced sex with a stranger* (the results using the alternative instrument are shown in Columns 3 and 4).

The alternative instrument (*Brothel Control*) is the degree of the police control of prostitution. Upon the adoption of the Special Law on Sex Trade in 2004 which aimed at reducing prostitution, the Government of South Korea exercised stricter enforcement against prostitution, particularly in places where brothels were concentrated. Therefore, the establishments of brothel complexes were subject to stricter police control that likely discouraged potential clients from buying sex (Kim and Ha 2012). With this observation, the alternative instrument indicates whether a respondent resided in a place where the police enforced stricter regulations against prostitution – the data is taken from MOGEF 2014. As stricter enforcement constrains the supply of prostitution services and increases the risks of being arrested for their clients, this instrument is expected to have a negative effect on the frequency of buying sex.

To test for the explanatory power of the brothel control variable, the first stage regression is modelled as described in Equation 2' below. Table 3 shows that the coefficient of brothel control is between -1.24 and -0.88 , suggesting that exercising stricter control over brothels reduces the purchase of sex services by between 17.6 (prostitution of adults) and 24.8 p.p. (prostitution of minors). All of the coefficients are statistically significant at a 1 percent level.

$$\text{Prostitution}_i = \psi' \text{brothel control}_i + Z_i' \chi' + e'_i \quad (2)'$$

On the other hand, the exogeneity of the instrument, *brothel control*, is more challenging to verify. The instrument may not be exogenous under the following scenarios: (i) if sex criminals intentionally chose to reside in a place with brothel complexes, possibly because such a place provides environments favorable to committing a sex crime, or (ii) stricter enforcement against prostitution also reduces sex crimes, possibly because police exercises stricter control over brothels due to high prevalence of sex crimes. To account for such potential environmental influences, city and province dummies that capture characteristics of residential surroundings are additionally included in this model. By controlling for the city/province variables, one can single out the effect of brothel control from the overall environmental effects. Still, the relationship between brothel control and sex crimes presumed in scenario (ii) may be an issue, even after controlling for the residential effects. However, the direct effect of brothel control on sex crimes may not be great because police control in brothel complexes does not necessarily affect sex crimes that occur in the rest of a city (outside of brothel areas)⁶.

While theoretically contentious, statistical evidence supports the exclusion criteria of the brothel control variable (see Columns 3 and 4 in Table 3). When prostitution is controlled for (Column 3), the coefficient of *brothel control* is insignificant. However, excluding the prostitution variable, the coefficient becomes significant at a 5 percent level with an expected negative sign (Column 4).

Using the two instruments, IV probit estimations are conducted: instrumenting hotel price for the models of sexual assaults and forced sex with a partner; and brothel control for forced sex with a stranger. The second stage regression takes the form in Equation 3 below, where *prostitution_hat* indicates the predicted value of prostitution estimated in the first stage.

$$\text{Crime}_i = \beta_{iv}' \text{prostitution_hat}_i + M_i' \gamma_{iv} + I_i' \tau_{iv} + X_i' \omega_{iv} + u_i \quad (3)$$

Extension of the Model

In this section, two additional tests are conducted in order to obtain robust evidence on the relationship between prostitution and sex crimes. First, the determinants of buying sex are investigated and compared with those of committing a sex crime. This comparison enables us to identify whether there are common determinants between the two sexual behaviors. If the two share commonality to a large extent, one may argue that sex offenders buy sex for the same reasons that they commit sex crimes (and vice versa), and therefore the two sexual acts can be substituted for each other. Accordingly, the model that consists of potential determinants of buying sex is formed below (Equations 4 and 4') to examine this question.

$$\text{Prostitution}_i = M_i' \theta + I_i' \rho + X_i' \kappa + \varepsilon_i \quad (4)$$

$$\text{Prostitution}_i = \lambda \text{crime}_i + M_i' \theta' + I_i' \rho' + X_i' \kappa' + \varepsilon'_i \quad (4')$$

As *prostitution* is a count variable scoring from 0 to 8, a negative binomial method with robust standard errors is applied to estimate the model. Vector *M* includes prostitution and rape myths, Vector *I* self-assessed attitudes (risk-taking and low self-esteem), and Vector *X* one's demographic and childhood information. In addition, the experience of committing a sex crime in the past is further controlled for in Equation 4' in order to capture any simultaneous effect running from committing a sex crime to buying sex. To make the order of the events right, I constructed the crime variable in Equation 4' by using information about sex crimes committed in the past that are not related to the current imprisonment – i.e. the crime variable in Equation 4' is different from the crime

⁶Comparing the two choices of instruments – *hotel price* and *brothel control*, the latter with higher explanatory power is preferred in the model of *forced sex with a stranger*. This is because a weak correlation between the instrument (*z*) and the endogenous variable (*x*) increases the bias of an estimator, if the exogeneity of an instrument is not strictly observed: i.e. $\text{plim } \hat{\beta}_{iv} = \beta + [\text{Corr}(z'u)/\text{Corr}(z'x)] * \sigma_u/\sigma_x$, if $\text{Corr}(z'u) \neq 0$. Note that the instrument of *hotel price* is employed in the other models that have *sexual assaults* and *forced sex with a partner* as dependent variables because this instrument provides high explanatory power and is also more likely to be exogenous in the respective models.

variables used as dependent variables in Equations 1 and 3. With this information, sex crimes (*crime*) occurred prior to buying sex (*prostitution*) in this model.

Second, whether the experience of buying sex increases one's propensity towards more violent sexual behaviors is further examined by identifying the relationship between prostitution and the severity of sex crimes. If buying sex intensifies one's propensity for sadistic, violent sexual acts, accumulating the frequency of buying sex may result in escalating the violence level of one's sexual behaviors – such as committing a more severe form of sex offenses. This aspect is examined by using information about specific forms of rape that sex offenders committed. To do so, three severe types of rape are selected for the analysis: acquaintance rape, raping minors (under 20 years old), and raping with sadistic means (such as confinement). The model of severe forms of sex crimes is formulated below accordingly.

$$\text{Severe}_i = \beta_1 \text{prostitution}_i + M_i' \gamma_1 + I_i' \gamma_1 + X_i' \omega_1 + S_i' \mu_1 + v_i \quad (5)$$

The dependent variable, *Severe*, is a dummy variable consisting of the aforementioned three severe forms of sex crimes, respectively. Given that the dependent variable has a dummy structure, a probit estimation method with robust standard errors is applied.

The explanatory variable of main interest is *prostitution*. The set of the control variables used in Equation 1 are again included in this model – rape and prostitution myths (M), self-assessed attitudes (I), and demographic and childhood information (X). Additionally, Equation 5 includes new variables that describe situations involved in the occurrence of the specific sex crime in question (Vector S). The information about situations is available for these specific types of sex crimes only (therefore such variables could not be included in Equation 1). Variables in Vector S comprise: offenders' self-stated reasons for rape – desires, power, or anger, following the classification of Groth (1979); substance use (offender's alcohol consumption); victim's vulnerability (victim's age and alcohol consumption); and the degree of the victim's resistance (verbal and physical)⁷.

RESULTS

Does Prostitution Increase/Constrain Sex Crimes?

The central question of this paper is whether the experience of buying sex increases or decreases the probability of one committing a sex crime. Table 1 shows the baseline results that are estimated based on Equation 1 in Section 4. The coefficient of prostitution is positive and statistically significant at 1-5 percent levels in all specifications – with an exception of Column 3. It implies that if a sex offender had visited prostitutes more often in the past year, he was more likely to commit a sex crime. This effect holds for all types of sex crimes in question (sexual assaults, forced sex with a stranger, and forced sex with a partner), as well as for all age groups of prostitutes (adults and minors). The only exception is that more frequently visiting a prostitute who is under 20 years old does not increase the probability of committing sexual assaults (Column 3). However, the experience of paying for sex with an underage prostitute increases the probability of committing forced sex (Columns 6 and 9). Specifically, a one-standard deviation increase in the frequency of buying sex increases the probability of one committing sexual assaults by 2.2-4.4 p.p., forced sex with a stranger by 3.6-9.4 p.p., and forced sex with a partner by 2.5-4.7 p.p.

In addition to the effect of prostitution, there is some evidence that more strongly agreeing with rape myths increases the probability of committing forced sex with a partner. A one-standard deviation increase in the acceptance level of rape myths increases the probability of committing this type of sex crimes by about 2 p.p. (Column 8). However, prostitution myth variables are widely irrelevant to explaining sex crimes. This is possibly due to high multi-collinearity between prostitution myths and the actual behavior of buying sex. Risk-loving

⁷For the relevance of such circumstances to the occurrence of sex crimes, see Grubb and Turner (2012), Zimmerman and Benson (2007), and Angelone et al. (2014).

Table 1. Sex crimes and prostitution, probit analysis, marginal effects (2007, South Korea)

DV	Sexual Assaults			Forced Sex (strangers)			Forced Sex (partners)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Prostitution (total)	0.02 (0.01)**			0.06 (0.01)***			0.03 (0.006)***		
Prostitution (adults)		0.03 (0.01)**			0.06 (0.01)***			0.03 (0.007)***	
Prostitution (minors)			0.06 (0.04)			0.10 (0.04)***			0.07 (0.02)***
Prostitution Myths	0.02 (0.02)	0.02 (0.02)	0.03 (0.02)	−0.0004 (0.01)	0.002 (0.01)	0.02 (0.02)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Rape Myths	−0.002 (0.02)	0.01 (0.02)	−0.01 (0.02)	−0.007 (0.01)	0.003 (0.01)	−0.01 (0.02)	0.01 (0.01)	0.023 (0.012)*	0.01 (0.01)
Risk-taking	0.01 (0.02)	−0.002 (0.02)	0.01 (0.02)	0.01 (0.01)	0.01 (0.01)	0.025 (0.014)*	0.01 (0.01)	0.01 (0.01)	0.02 (0.01)*
Fragile-self	0.03 (0.02)*	0.04 (0.02)**	0.03 (0.02)*	0.003 (0.01)	0.006 (0.01)	−0.007 (0.014)	0.001 (0.01)	0.003 (0.01)	−0.002 (0.01)
Age	0.02 (0.01)**	0.02 (0.01)**	0.02 (0.01)***	0.007 (0.008)	0.008 (0.009)	0.025 (0.009)***	0.003 (0.005)	0.006 (0.005)	0.01 (0.005)*
Age ²	−0.0002 (0.0001)*	−0.0002 (0.0001)**	−0.0003 (0.0001)**	−0.0001 (0.0001)	−0.0002 (0.0001)	−0.0004 (0.0001)***	−0.00004 (0.0001)	−0.0001 (0.0001)	−0.0001 (0.00008)*
Singlehood	0.07 (0.04)*	0.05 (0.04)	0.06 (0.04)	−0.05 (0.04)	−0.05 (0.05)	−0.06 (0.05)	−0.02 (0.03)	−0.02 (0.03)	−0.03 (0.03)
Middle School or Below	0.08 (0.08)	0.09 (0.09)	0.10 (0.08)	0.05 (0.07)	0.04 (0.07)	0.12 (0.08)	0.06 (0.06)	0.06 (0.06)	0.09 (0.07)
Some High School	0.03 (0.07)	0.05 (0.08)	0.05 (0.08)	0.07 (0.07)	0.07 (0.07)	0.12 (0.08)	0.08 (0.06)	0.09 (0.07)	0.12 (0.08)
High School Graduate	0.08 (0.08)	0.09 (0.08)	0.11 (0.08)	0.01 (0.06)	−0.01 (0.06)	0.06 (0.07)	0.05 (0.05)	0.05 (0.06)	0.09 (0.07)
Some College	0.19 (0.11)*	0.21 (0.12)*	0.05 (0.08)*	0.04 (0.08)	0.04 (0.08)	0.05 (0.09)	0.05 (0.08)	0.06 (0.08)	0.05 (0.09)
Unemployed	0.02 (0.06)	0.03 (0.06)	0.01 (0.06)	−0.03 (0.04)	−0.03 (0.04)	−0.03 (0.04)	0.02 (0.04)	0.04 (0.05)	0.02 (0.04)
Abused by Parents	−0.004 (0.02)	0.002 (0.02)	0.005 (0.02)	0.01 (0.02)	0.02 (0.02)	0.03 (0.02)	0.02 (0.014)	0.02 (0.02)	0.025 (0.015)*
Observations	469	478	472	470	474	474	467	473	471
(pseudo)R ²	0.09	0.09	0.08	0.21	0.20	0.09	0.16	0.16	0.12
Log likelihood	−185.56	−196.77	−188.57	−145.67	−152.31	−167.93	−112.95	−123.01	−118.47

Note: Robust standard errors are in parentheses. * p<.10, ** p<.05, *** p<.01. *College graduate* is omitted as a reference category of the education variables.

attitudes have a positive effect on forced sex that is marginally significant. A one-standard deviation increase in risk-taking attitudes increases the probability of committing forced sex by between 2 (with a partner) and 2.5 p.p. (with a stranger). This result corresponds with the cost function of sex crimes that risk-loving attitudes reduce the costs of committing a crime (see Section 2.1.). A lower level of self-esteem (*fragile-self*) results in a higher probability of committing sexual assaults. A one-standard deviation increase in fragility increases the probability of committing sexual assaults by 3.1-4.1 p.p. This supports the argument that sex crimes are an outcome of frustration, the lack of self-confidence, and inferiority (Joseph and Black 2012).

Among demographic and personal characteristics, the age of sex offenders affects the probability of one committing sexual assaults. The coefficients of *age* and *age*² are respectively positive and negative with statistical significance at a conventional level (Columns 1-3). Generally speaking, the probability of committing sexual assaults increases until one reaches 50 years old, and decreases afterwards. However, when buying sex from a minor is included as an explanatory variable, the probability increases only until 33 years of age (Column 3). Seemingly, buying sex of minors absorbs some of the older age effects. In contrast, the education of sex offenders is unimportant to explaining their deviant sexual behaviors. Omitting *college graduates* as a reference category, the coefficients of most education variables are insignificant, except the 'some college' category (either college drop-out or currently enrolled in a college) that has a positive effect on sexual assaults at a 10 percent level. Being abused by parents during one's childhood does not explain sexual assaults and forced sex with a stranger, but parental abuse increases the probability of forcing sex with a partner by 2.5 p.p., showing that the experience of being abused by family results in abusing another family member later in one's life.

The findings show that the experience of buying sex has substantial explanatory power over the probability of one committing a sex crime. This can also be seen by comparing R^2 of the models with and without the prostitution variable. For the model of sexual assaults, R^2 increases from 0.07 to 0.09 by adding the prostitution variable. For forced sex with a stranger, it increases from 0.07 to 0.21, and for forced sex with a partner from 0.09 to 0.16. This means that prostitution accounts for 2-14 percent of the total variations in the probability of committing a sex crime⁸.

The probit analysis of the baseline model is, however, subject to endogeneity because unobserved individual characteristics and simultaneity between the two sexual acts. Hence, an instrumental variable is employed and the model is estimated by a two-stage probit instrumental variable method, as described in Section 4.2.

Table 2 presents the results of the IV estimations. The positive and significant coefficients of prostitution remain unchanged in most specifications. However, for forced sex with a partner, the IV results reveal that the effect of prostitution is mainly driven by prostitution of adults (see Columns 7-9). Overall, the effects of prostitution become larger in the IV estimations, compared to the baseline results in Table 1. The size of the coefficient increases largest for sexual assaults, from 0.02 to 0.16. For forced sex with a stranger, it increases from 0.06 to 0.10, and for forced sex with a partner, from 0.03 to 0.12⁹. Such large IV estimators indicate that the economic significance of the effects of prostitution are substantial. Specifically, a one-standard deviation increase in the frequency of buying sex increases the probability of one committing sexual assaults by 19.8-30.6 p.p., forced sex with a stranger by 15.6-36.4 p.p., and forced sex with a partner by 17.6 p.p.

On the other hand, coefficients of several control variables lose their significance, which is likely due to multicollinearity caused by using the predicted values of prostitution in the first stage. However, the positive effects of low self-esteem and age effects remain consistent to some extent in the model of *sexual assaults*.

⁸This can also be evident through a residual analysis; prostitution explains 2-15 percent of the residual variations. This share is computed based on the following formula: $(R^2 \text{ including prostitution} - R^2 \text{ excluding prostitution}) / (1 - R^2 \text{ excluding prostitution})$ (See Alesina et al. 2013 for this approach).

⁹The endogeneity of the model results in the underestimation of the effect of prostitution, presumably because some unobserved determinants of sex crimes are negatively correlated with the experience of buying sex.

Table 2. Sex crimes and prostitution, instrumental variable approach, marginal effects (2007, South Korea)

DV	Second Stage, probit regression								
	Sexual Assaults			Forced Sex (strangers)			Forced Sex (partners)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Prostitution (total)	0.16 (0.03)***			0.10 (0.036)***			0.08 (0.07)		
Prostitution (adults)		0.135 (0.05)***			0.11 (0.03)***			0.12 (0.06)**	
Prostitution (minors)			0.85 (0.19)***			1.01 (0.16)***			0.29 (0.34)
Prostitution Myths	−0.03 (0.02)	−0.01 (0.02)	0.01 (0.02)	−0.013 (0.016)	−0.01 (0.02)	−0.001 (0.02)	−0.002 (0.02)	−0.02 (0.02)	0.02 (0.01)
Rape Myths	−0.01 (0.01)	0.002 (0.02)	−0.05 (0.02)**	−0.007 (0.014)	0.003 (0.01)	−0.06 (0.02)***	0.01 (0.02)	0.02 (0.02)	−0.002 (0.02)
Risk-taking	−0.01 (0.01)	−0.01 (0.01)	0.02 (0.02)	0.009 (0.014)	0.002 (0.01)	0.03 (0.02)	0.01 (0.01)	0.001 (0.02)	0.02 (0.02)
Fragile-self	0.03 (0.013)**	0.04 (0.01)***	0.02 (0.02)	0.009 (0.014)	0.011 (0.013)	0.005 (0.02)	0.01 (0.01)	0.01 (0.01)	−0.002 (0.01)
Age	−0.02 (0.01)*	−0.01 (0.02)	0.003 (0.01)	−0.005 (0.013)	−0.006 (0.012)	−0.004 (0.02)	−0.01 (0.02)	−0.01 (0.02)	0.007 (0.01)
Age ²	0.0003 (0.00017)*	0.0002 (0.0002)	−0.0001 (0.0002)	0.0004 (0.0002)	0.00005 (0.0002)	0.00002 (0.0002)	0.0001 (0.0002)	0.0002 (0.0003)	−0.0001 (0.0001)
Singlehood	0.07 (0.04)*	0.05 (0.04)	−0.002 (0.05)	−0.03 (0.04)	−0.03 (0.04)	−0.074 (0.05)	−0.01 (0.04)	−0.001 (0.04)	−0.04 (0.04)
Middle School or Below	−0.03 (0.06)	−0.02 (0.08)	0.12 (0.07)*	0.01 (0.06)	−0.01 (0.06)	0.11 (0.07)	0.03 (0.08)	0.003 (0.08)	0.10 (0.07)
Some High School	−0.04 (0.06)	−0.03 (0.07)	0.11 (0.07)	0.03 (0.06)	0.01 (0.06)	0.13 (0.07)*	0.06 (0.07)	0.03 (0.08)	0.11 (0.07)*
High School Graduate	−0.01 (0.06)	0.01 (0.08)	0.18 (0.07)***	−0.01 (0.06)	−0.04 (0.06)	0.16 (0.07)**	0.04 (0.07)	0.002 (0.07)	0.11 (0.08)
Some College	0.08 (0.06)	0.11 (0.08)	0.15 (0.08)*	0.03 (0.06)	0.02 (0.06)	0.08 (0.08)	0.05 (0.07)	0.04 (0.07)	0.06 (0.08)
Unemployed	0.02 (0.04)	0.02 (0.05)	0.01 (0.06)	−0.02 (0.05)	−0.02 (0.05)	0.01 (0.06)	0.03 (0.04)	0.04 (0.04)	0.02 (0.04)
Abused by Parents	−0.04 (0.02)*	−0.02 (0.02)	−0.02 (0.02)	−0.001 (0.02)	0.003 (0.02)	−0.01 (0.03)	0.01 (0.03)	−0.002 (0.03)	0.02 (0.02)
Observation	469	478	472	470	474	474	467	473	471
Log likelihood	−1,004.56	−1,005.59	−350.98	−961.09	−952.50	−326.67	−929.80	−928.32	−280.28
Wald Chi2	282.04***	123.67***	344.27***	57.35***	81.67***	879.04***	42.74***	118.01***	40.79***

Note: Robust standard errors are in parentheses. * p<.10, ** p<.05, *** p<.01. *College graduate* is omitted as a reference category of the education variables. The endogenous variables that are instrumented are *prostitution (total)*, *prostitution (adults)*, and *prostitution (minors)*. The excluded instruments are hotel price for Columns 1-3 and 7-9, and *brothel control* for Columns 4-6.

Table 3. Sex crimes and prostitution, reduced form regression, marginal effects (2007, South Korea)

DV	First Stage, negative binomial regression					
	Prostitution (total)		Prostitution (adults)		Prostitution (minors)	
Hotel Price (IV)	−0.57 (0.18)***		−0.48 (0.17)***		−2.04 (0.76)***	
Control variables	Yes		Yes		Yes	
Wald-chi (14)	195.03***		199.61***		110.14***	
Brothel Control (IV)	−0.89 (0.25)***		−0.88 (0.25)***		−1.24 (0.60)**	
Control variables	Yes		Yes		Yes	
Wald-chi (19)	6,071.71***		7,530.18***		1,940.68***	
DV	Test for the Exclusion Criteria, probit analysis					
	Sexual Assaults		Forced Sex (strangers)		Forced Sex (partners)	
	(1)	(2)	(3)	(4)	(5)	(6)
Prostitution (total)	0.02 (0.01)**		0.06 (0.01)***		0.03 (0.01)***	
Hotel Price (IV)	−0.05 (0.05)	−0.13 (0.04)***			−0.02 (0.02)	−0.05 (0.03)*
Brothel Control (IV)			−0.04 (0.04)	−0.11 (0.05)**		
Prostitution Myths	0.02 (0.02)	0.03 (0.02)	−0.002 (0.01)	0.014 (0.015)	0.008 (0.011)	0.015 (0.012)
Rape Myths	−0.005 (0.02)	0.004 (0.02)	−0.004 (0.013)	0.004 (0.017)	0.013 (0.009)	0.023 (0.013)*
Risk-taking	0.01 (0.01)	−0.003 (0.02)	0.01 (0.01)	0.02 (0.014)	0.01 (0.009)	0.013 (0.01)
Fragile-self	0.02 (0.015)*	0.027 (0.015)*	0.001 (0.01)	−0.01 (0.014)	0.0003 (0.01)	−0.004 (0.01)
Age	0.016 (0.008)**	0.019 (0.01)**	0.005 (0.01)	0.023 (0.01)**	0.003 (0.005)	0.016 (0.006)***
Age ²	−0.0002 (0.0001)*	−0.0002 (0.00013)*	−0.0001 (0.0001)	−0.00037 (0.00014)**	−0.00004 (0.00007)	−0.00022 (0.0001)**
Singlehood	0.06 (0.04)	0.04 (0.04)	−0.06 (0.05)	−0.07 (0.05)	−0.02 (0.03)	−0.02 (0.03)
Middle school/below	0.07 (0.08)	0.08 (0.09)	0.04 (0.07)	0.074 (0.076)	0.06 (0.06)	0.07 (0.07)
Some high school	0.03 (0.07)	0.06 (0.08)	0.06 (0.07)	0.085 (0.074)	0.08 (0.06)	0.11 (0.08)
High school graduate	0.09 (0.08)	0.12 (0.09)	0.002 (0.06)	0.008 (0.062)	0.05 (0.05)	0.05 (0.06)
Some college	0.19 (0.11)*	0.20 (0.12)*	0.03 (0.07)	0.022 (0.076)	0.05 (0.08)	0.05 (0.08)
Unemployed	−0.001 (0.05)	−0.01 (0.05)	−0.02 (0.04)	−0.035 (0.04)	0.02 (0.04)	0.03 (0.04)
Abused by parents	−0.003 (0.02)	0.02 (0.02)	0.01 (0.02)	0.036 (0.019)*	0.02 (0.01)	0.026 (0.016)*
Observation	469	486	470	478	467	477
(Pseudo) R ²	0.10	0.10	0.22	0.09	0.16	0.10

Note: Robust standard errors are in parentheses. * p<.10, ** p<.05, *** p<.01. *College graduate* is omitted as a reference category of the education variables.

Common Determinants of Committing Sex Crimes and Buying Sex

To further elaborate on the relationship between sex crimes and prostitution, common determinants of the two sexual behaviors are investigated in this section. The determinants of sex crimes were already discussed in Section 5.1 based on the results presented in Table 1. The determinants of prostitution are estimated based on Equations 4 and 4', and Table 4 shows the results. The findings indicate that the past experience of committing a sex crime explains the frequency of buying sex. Committing sexual assaults increases the probability of buying sex by 3.4-11.2 p.p., forced sex with a stranger by 11.3-32.6 p.p., and forced sex with a partner by 9.3-36.6 p.p. This result hints at simultaneity between prostitution and sex crimes – together with the findings presented in Section 5.1. This simultaneous relationship motivates a prediction that one sexual act increases an individual's propensity for the other one.

Table 4 further shows that supporting prostitution myths increases the frequency of buying sex – particularly with adult prostitutes. This is different from no effect of such myths on sex crimes in Table 1. Interestingly, low

Table 4. Determinants of prostitution, negative binomial regression (2007, South Korea)

	Prostitution (total)				Prostitution (adults)				Prostitution (minors)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Sexual Assaults		0.31 (0.17)*				0.36 (0.16)**				0.56 (0.51)		
Force Sex (strangers)			1.02 (0.14)***				1.01 (0.14)***				1.63 (0.59)***	
Forced Sex (partners)				0.84 (0.19)***				0.80 (0.17)***				1.83 (0.60)***
Prostitution Myths	0.30 (0.08)***	0.30 (0.08)***	0.28 (0.08)***	0.27 (0.08)***	0.31 (0.08)***	0.31 (0.08)***	0.28 (0.08)***	0.27 (0.08)***	0.19 (0.21)	0.14 (0.20)	0.09 (0.19)	0.08 (0.19)
Rape Myths	0.10 (0.09)	0.09 (0.09)	0.10 (0.08)	0.06 (0.08)	0.06 (0.08)	0.05 (0.08)	0.06 (0.08)	0.02 (0.08)	0.84 (0.25)***	0.80 (0.25)***	0.64 (0.19)***	0.61 (0.19)***
Risk-taking	0.19 (0.07)***	0.19 (0.07)***	0.17 (0.07)**	0.18 (0.07)**	0.21 (0.07)***	0.21 (0.07)***	0.19 (0.07)***	0.20 (0.07)***	-0.12 (0.24)	-0.07 (0.24)	-0.24 (0.29)	-0.22 (0.28)
Fragile-self	-0.15 (0.07)**	-0.15 (0.07)**	-0.15 (0.07)**	-0.15 (0.07)**	-0.14 (0.07)**	-0.15 (0.07)**	-0.15 (0.07)**	-0.15 (0.07)**	0.18 (0.19)	0.16 (0.18)	0.09 (0.21)	0.15 (0.20)
Age (rapist)	0.38 (0.06)***	0.37 (0.06)***	0.35 (0.06)***	0.37 (0.06)***	0.38 (0.06)***	0.37 (0.07)***	0.35 (0.06)***	0.37 (0.07)***	0.44 (0.11)***	0.42 (0.11)***	0.38 (0.14)***	0.39 (0.15)***
Age ² (rapist)	-0.005 (0.001)***	-0.005 (0.001)***	-0.005 (0.001)***	-0.005 (0.001)***	-0.005 (0.001)***	-0.005 (0.001)***	-0.005 (0.001)***	-0.005 (0.001)***	-0.006 (0.002)***	-0.006 (0.002)***	-0.005 (0.002)***	-0.006 (0.002)***
Singlehood	-0.23 (0.21)	-0.26 (0.21)	-0.16 (0.20)	-0.18 (0.20)	-0.20 (0.18)	-0.22 (0.18)	-0.14 (0.19)	-0.16 (0.19)	-0.10 (0.95)	-0.12 (0.94)	-0.26 (0.79)	-0.22 (0.75)
Middle School	0.56 (0.29)*	0.55 (0.28)**	0.48 (0.28)*	0.60 (0.27)**	0.63 (0.29)**	0.61 (0.28)**	0.53 (0.30)*	0.65 (0.29)**	-0.23 (0.63)	-0.31 (0.63)	-0.26 (0.76)	-0.20 (0.71)
Some High School	0.49 (0.30)	0.49 (0.30)*	0.40 (0.30)	0.44 (0.29)	0.59 (0.30)**	0.58 (0.30)*	0.47 (0.32)	0.51 (0.30)*	0.08 (0.94)	0.04 (0.93)	-0.26 (0.94)	-0.24 (0.91)
High School Graduate	0.36 (0.28)	0.36 (0.27)	0.32 (0.27)	0.38 (0.27)	0.47 (0.28)*	0.46 (0.27)*	0.42 (0.29)	0.48 (0.28)*	-1.52 (0.87)*	-1.50 (0.90)*	-1.59 (0.98)*	-1.63 (0.93)*
Some College	-0.12 (0.36)	-0.18 (0.36)	-0.16 (0.35)	-0.08 (0.36)	-0.06 (0.35)	-0.17 (0.35)	-0.15 (0.36)	-0.06 (0.37)	0.71 (1.05)	0.78 (1.10)	0.56 (1.07)	0.52 (1.19)
Unemployed	-0.16 (0.27)	-0.14 (0.27)	-0.11 (0.26)	-0.16 (0.24)	-0.25 (0.23)	-0.23 (0.23)	-0.16 (0.25)	-0.23 (0.23)	0.69 (0.88)	0.70 (0.88)	0.74 (0.88)	0.63 (0.83)
Abused by Parents	0.28 (0.10)***	0.26 (0.10)**	0.24 (0.10)**	0.24 (0.10)**	0.24 (0.10)**	0.22 (0.10)**	0.20 (0.10)*	0.21 (0.10)**	0.50 (0.32)	0.53 (0.33)	0.29 (0.27)	0.28 (0.28)
Observations	471	462	470	467	480	478	474	473	475	472	474	471
Wald chi2	173.56***	170.73***	239.72***	178.96***	178.05***	175.18***	242.24***	183.48***	129.70***	166.57***	198.46***	232.81***
Log likel.	-573.73	-570.82	-557.87	-561.50	-578.71	-575.19	-553.33	-561.63	-80.02	-79.45	-76.81	-73.76

Note: Robust standard errors are in parentheses. * p<.10, ** p<.05, *** p<.01. *College graduate* is omitted as a reference category of the education variables.

self-esteem constrains one from buying sex (prostitution of adults), while such fragility increases the probability of committing sexual assaults. When comparing the determinants of prostitution and sex crimes presented in Tables 1 and 4, respectively, the only common effect found between the two is the positive effect of risk-taking attitudes. However, while this effect is robust in explaining prostitution in total and prostitution of adults (Table 4), it is significant only in two specifications out of nine when explaining sex crimes (Table 1).

In addition, age effect is somewhat different between prostitution and sex crimes. The frequency of buying sex increases until one reaches his mid/late-thirties (between 35 and 38), and declines afterwards (Table 4). The positive effect of age remains longer for sex crimes – until one becomes 50 years old in general (Table 1). Having abusive parents also has a different effect on prostitution and sex crimes. The experience of being abused by parents increases the frequency of buying sex to a large extent, but it has a limited effect on sex crimes: increasing the probability of forcing sex with a partner only and no effect on the other two types of sex crimes.

This comparative analysis hints that the observed determinants of prostitution are widely different from those of sex crimes. However, there might be some common unobserved characteristics that affect both prostitution and sex crimes in the same way. Thus, residual tests are conducted to identify potentially shared effects of unexplained factors. Table 5 shows, however, that unobserved factors influence sex crimes and prostitution differently. Residual effects are positive to sex crimes (Columns 1-3), but negative to prostitution (Columns 4-6). With such differences – both observed and unobserved, one sexual act may not easily substitute the other.

Does Prostitution Exacerbate the Severity of Sex Crimes?

So far, the empirical findings propose that the experience of buying sex increases the probability of one committing a sex crime. This relationship is further examined in this section by identifying whether prostitution exacerbates the severity of sex crimes. If the experience of buying sex intensifies one's propensity for more violent sexual acts, prostitution may not only increase the frequency of committing sex crimes, but also exacerbate the degree of violence in sex crimes. To test this argument empirically, three severe forms of rape are selected: acquaintance rape, raping underage victims, and using more sadistic means (e.g. confinement) for rape.

Table 6 shows the results based on Equation 5 above. In general, the experience of buying sex does not necessarily aggravate the severity of rape. However, paying for sex with an underage prostitute increases the probabilities of one committing all three severe types of rape (see Columns 3, 6, and 9). Specifically, a one-standard deviation increase in the frequency of buying sex with a minor increases the probabilities of committing acquaintance rape, raping a minor, and using sadistic means by 6.1, 5.4, and 1.4 p.p., respectively. A possible interpretation of this result is that buying sex with a minor is a rape-like behavior, and thus such an act is more easily accelerated to more severe sex crimes. In contrast, buying sex with an adult has a constraining effect on raping underage victims (Column 5). This negative relationship, however, does not necessarily suggest a substitution effect between prostitution and sex crimes, given the positive relationship between paying for sex with a minor and raping a minor. It may rather indicate that raping a minor has a completely different utility function from that of hiring adult prostitutes.

The results further suggest various self-stated reasons for committing different types of severe sex crimes. Power and anger are important determinants of raping acquaintances, while it is sexual desires for raping minors. This finding supports the argument that rape is not only a function of sexual impulses, but also that of

Table 5. Effects of unobserved heterogeneity, residual analysis (2007, South Korea)

DV	Sexual Assaults	Forced Sex (strangers)	Forced Sex (partners)	Prostitution (total)	Prostitution (adults)	Prostitution (minors)
Residuals	0.72	1.34	1.48	-0.07	-0.05	-0.006
Observations	469	470	467	462	471	465

Note: residuals are estimated through the regressions presented in Columns 1, 4, and 7 in Table 2, and Columns 2, 6, and 10 in Table 4, respectively.

Table 6. Prostitution and the severity of sex crimes, probit analysis, marginal effects (2007, South Korea)

DV	Acquaintance Rape			Rape of Minors			Sadistic Means		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Prostitution (total)	0.03 (0.02)			−0.04 (0.02)**			0.009 (0.005)		
Prostitution (adults)		0.01 (0.02)			−0.06 (0.02)***			0.008 (0.006)	
Prostitution (minors)			0.17 (0.07)**			0.15 (0.06)**			0.04 (0.02)*
Prostitution Myths	−0.001 (0.027)	−0.01 (0.02)	0.002 (0.02)	−0.05 (0.03)*	−0.05 (0.03)*	−0.06 (0.03)**	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Rape Myths	0.01 (0.028)	0.02 (0.03)	0.003 (0.03)	0.05 (0.03)	0.04 (0.03)	0.03 (0.03)	−0.01 (0.01)	−0.004 (0.01)	−0.01 (0.01)
Risk-taking	−0.01 (0.03)	−0.004 (0.03)	−0.005 (0.03)	−0.04 (0.03)	−0.03 (0.03)	−0.04 (0.03)	0.004 (0.01)	0.002 (0.01)	0.004 (0.008)
Fragile-self	0.01 (0.03)	−0.001 (0.03)	0.005 (0.03)	0.05 (0.03)	0.04 (0.03)	0.06 (0.03)*	−0.01 (0.01)	−0.01 (0.01)	−0.016 (0.01)
Reason: power	0.50 (0.09)***	0.47 (0.09)***	0.51 (0.08)***	−0.16 (0.12)	−0.11 (0.12)	−0.18 (0.12)	−0.02 (0.03)	−0.03 (0.02)	−0.02 (0.02)
Reason: anger	0.38 (0.13)***	0.39 (0.13)***	0.34 (0.13)***	−0.07 (0.13)	−0.08 (0.13)	−0.07 (0.13)	0.07 (0.07)	0.07 (0.07)	0.05 (0.06)
Reason: desire	0.01 (0.06)	0.04 (0.06)	0.01 (0.06)	0.21 (0.07)***	0.20 (0.07)***	0.21 (0.07)***	0.03 (0.02)	0.03 (0.02)	0.02 (0.02)
Alcohol: rapist	0.06 (0.04)*	0.07 (0.04)*	0.065 (0.037)*	0.05 (0.04)	0.04 (0.04)	0.06 (0.04)	0.002 (0.01)	0.002 (0.01)	−5.44e-06 (0.01)
Alcohol: victim	0.003 (0.003)	0.01 (0.03)	0.004 (0.03)	−0.10 (0.04)***	−0.11 (0.04)***	−0.10 (0.04)***	−0.01 (0.01)	−0.004 (0.01)	−0.01 (0.01)
Resistance: verbal	0.07 (0.06)	0.06 (0.06)	0.07 (0.06)	−0.13 (0.06)**	−0.14 (0.06)**	−0.13 (0.06)**	0.05 (0.03)**	0.054 (0.026)**	0.05 (0.03)**
Resistance: physical	0.12 (0.07)	0.10 (0.07)	0.12 (0.07)*	−0.13 (0.08)*	−0.13 (0.08)*	−0.13 (0.08)*	0.01 (0.03)	0.01 (0.03)	0.01 (0.03)
Victim's Age: 12 or younger	−0.07 (0.24)	−0.08 (0.24)	−0.10 (0.24)				0.98 (0.01)***	0.98 (0.01)***	0.97 (0.02)***
Victim's Age: 13-19	0.05 (0.25)	0.02 (0.25)	0.02 (0.25)				0.86 (0.08)***	0.87 (0.08)***	0.83 (0.09)***
Victim's Age: 20-29	−0.20 (0.22)	−0.21 (0.22)	−0.21 (0.23)				0.95 (0.04)***	0.95 (0.04)***	0.94 (0.04)***
Victim's Age: 30-39	−0.28 (0.13)**	−0.29 (0.13)**	−0.29 (0.14)**				0.99 (0.004)***	0.99 (0.005)***	0.99 (0.01)***
Victim's Age: 40-49	−0.17 (0.19)	−0.17 (0.19)	−0.18 (0.19)				0.98 (0.01)***	0.98 (0.01)***	0.98 (0.01)***
Age of rapist	−0.034 (0.018)*	−0.03 (0.02)	−0.034 (0.018)*	−0.14 (0.02)***	−0.14 (0.02)***	−0.15 (0.02)***	0.012 (0.007)*	0.013 (0.007)*	0.012 (0.007)*
Age ² of rapist	0.001 (0.0003)**	0.0006 (0.0003)*	0.0007 (0.0003)**	0.002 (0.0003)***	0.002 (0.0003)***	0.002 (0.0003)***	−0.0002 (0.0001)*	−0.0002 (0.0001)*	−0.0002 (0.0001)*
Singlehood	0.02 (0.07)	0.01 (0.07)	0.004 (0.07)	0.05 (0.08)	0.06 (0.08)	0.06 (0.08)	0.01 (0.02)	0.01 (0.02)	−0.001 (0.03)
Middle School or Below	−0.18 (0.09)**	−0.16 (0.09)*	−0.17 (0.10)*	−0.05 (0.10)	−0.04 (0.10)	−0.07 (0.10)	0.04 (0.05)	0.03 (0.05)	0.05 (0.05)
Some High School	−0.17 (0.09)*	−0.15 (0.09)*	−0.16 (0.09)	−0.02 (0.10)	0.01 (0.10)	−0.04 (0.10)	0.01 (0.04)	0.01 (0.04)	0.03 (0.04)
High School Graduate	−0.23 (0.08)***	−0.21 (0.08)**	−0.21 (0.08)**	−0.14 (0.10)	−0.12 (0.10)	−0.14 (0.10)	−0.04 (0.02)*	−0.04 (0.02)*	−0.03 (0.02)
Some College	−0.20 (0.09)**	−0.18 (0.09)**	−0.20 (0.09)**	−0.22 (0.10)**	−0.22 (0.10)**	−0.22 (0.10)**	0.02 (0.05)	0.03 (0.05)	0.02 (0.04)
Unemployed	−0.18 (0.07)**	−0.14 (0.07)*	−0.19 (0.07)***	−0.24 (0.08)***	−0.24 (0.07)***	−0.23 (0.08)***	0.03 (0.04)	0.02 (0.04)	0.02 (0.03)
Abused by Parents	0.01 (0.04)	0.01 (0.04)	0.02 (0.04)	0.01 (0.04)	−0.0001 (0.04)	−0.01 (0.04)	0.024 (0.01)**	0.024 (0.01)**	0.03 (0.01)***
Observations	430	439	433	443	452	446	405	410	407
(pseudo)R ²	0.15	0.14	0.16	0.31	0.32	0.31	0.20	0.20	0.22
Wald chi2	80.99***	76.12***	82.78***	131.64***	135.91***	138.66***	265.06***	265.86***	282.79***
Log likelihood	−240.41	−248.10	−239.97	−208.90	−210.38	−210.37	−97.04	−99.73	−97.14

Note: Robust standard errors are in parentheses. * p<.10, ** p<.05, *** p<.01. *50 or older* is omitted as a reference category of the victim's age variables; and *college graduate* is omitted as a reference category of the (offender's) education variables.

dominance and power (see Appendix 3). The importance of domination in explaining rape provides additional evidence against the claim that prostitution can constrain sex crimes by satisfying the sexual desires of potential offenders.

In addition, substance use has mixed effects. It is the alcohol consumption of rapists that increases the probability of raping an acquaintance, but a victim's alcohol consumption does not worsen the severity of sex crimes. Instead, alcohol consumption of minors even decreases their probability of being raped. These findings on substance use contradict one of the rape myths that alcohol consumption of victims is responsible for their victimization. Also, the effect of a victim's resistance varies depending on the type of rape. It constrains the rape of minors but exacerbates the usage of sadistic means. This finding challenges the widely spread rape myth that victims can always escape from being raped by resisting (Gerger et al. 2007).

Overall, the analysis in this section provides an indecisive conclusion on whether the experience of buying sex intensifies the severity of sex crimes. However, there is an indication that paying for sex with an underage prostitute has a positive relationship with the exacerbation of sex crimes, which is likely due to their shared nature to target more vulnerable counterparts.

CONCLUSION

In this paper, I sought to find micro-evidence on the relationship between prostitution and sex crimes by using a micro-survey data from South Korea. The results of this paper suggest that the experience of buying sex increases the probability of one committing a sex crime, and paying for sex with a minor further exacerbates the severity of sex crimes. This empirical evidence indicates that one type of risky sexual behaviors – buying sex – intensifies one's propensity towards more violent, riskier sexual behaviors, such as rape, which supports the theoretical prediction of the complementary relationship between prostitution and sex crimes.

This finding signals to policy-makers that allowing prostitution may not be the best solution to reduce sex crimes, but instead worsen the problem. While shedding light on negative externalities of prostitution, however, this study does not necessarily propose the prohibition of prostitution as a policy choice. Such restrictions may not always be effective and the criminalization of prostitution could also exacerbate the violent aspects of commercial sex if it is operated underground. The findings of this paper instead address necessities for a cautious approach to prostitution by providing counterevidence to the presumed positive externalities of legalized prostitution that the advocates of the legalization propose.

As mentioned above, the scope of this study is limited to an analysis of sex offenders due to data availability. Thus, the findings should be corroborated with an extended population-representative sample when data is available. By doing so, future studies can enrich the currently inconclusive literature in the fields of prostitution and sex crime research with more robust empirical evidence.

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Appendix 1. Sex buyers and non-buyers among sex offenders, by education, marital status, and age, percent (Survey with 658 sex criminals in South Korea, Jeon et al. 2007)

	Prostitution (adults)		Prostitution (minors)	
	Buyers	Non-buyers	Buyers	Non-buyers
Total	38.29 (242/632)	61.71 (390/632)	5.80 (36/621)	94.20 (585/621)
Education: college	32.30 (36/115)	68.70 (79/115)	5.36 (6/112)	94.64 (106/112)
Education: high school	36.84 (119/323)	63.16 (204/323)	3.13 (10/319)	96.87 (309/319)
Education: below high school	44.76 (85/190)	55.26 (105/190)	10.70 (20/187)	89.30 (167/187)
Unemployed	32.69 (17/52)	67.31 (35/52)	5.88 (3/51)	94.12 (48/51)
Employed	37.12 (170/458)	62.88 (288/458)	3.55 (16/451)	96.45 (435/451)
Single	35.70 (176/493)	64.30 (317/493)	5.93 (29/489)	94.07 (460/489)
Married/Partnered	50.00 (63/126)	50.00 (63/126)	5.83 (7/120)	94.17 (113/120)
Age: 10s	12.64 (23/182)	87.36 (159/182)	1.10 (2/182)	98.90 (180/182)
Age: 20s	45.45 (75/165)	54.55 (90/165)	3.68 (6/163)	96.32 (157)
Age: 30s	58.18 (96/165)	41.82 (69/165)	10.69 (17/159)	89.31 (142/159)
Age: 40s	41.67 (35/84)	58.33 (49/84)	6.17 (5/81)	93.83 (76/81)
Age: 50+	36.11 (13/36)	63.89 (23/36)	16.67 (6/36)	83.33 (30/36)

* Parentheses: the number of respondents of the respective demographic group who are sex buyers or non-buyers / the total number of respondents of the respective demographic group.

Appendix 2. Sex offenders, by education, marital status, and age, percent (Survey with 658 sex criminals in South Korea, Jeon et al. 2007)

	Sexual Assaults	Forced Sex (strangers)	Forced Sex (partners)	Rape of Minors	Acquaintance Rape	Sadistic Means
Education: college	18.26 (21/115)	9.82 (11/112)	7.21 (8/111)	31.82 (35/110)	32.38 (34/105)	9.62 (15/153)
Education: high school	16.82 (55/327)	14.81 (48/324)	10.63 (34/320)	43.87 (143/326)	35.33 (112/317)	8.81 (26/295)
Education: below high school	19.60 (39/199)	14.52 (27/186)	13.16 (25/190)	45.79 (87/190)	40.11 (75/187)	9.13 (41/449)
Unemployed	16.98 (9/53)	9.80 (5/51)	11.76 (6/51)	39.22 (20/51)	26.00 (13/50)	12.50 (6/48)
Employed	16.67 (78/468)	13.82 (63/456)	8.99 (41/456)	44.84 (204/455)	38.34 (171/446)	8.57 (36/420)
Single	17.86 (90/504)	12.83 (63/491)	9.84 (48/488)	45.44 (224/493)	35.95 (174/484)	9.13 (41/449)
Married/Partnered	19.53 (25/128)	19.67 (24/122)	16.13 (20/124)	29.27 (36/123)	38.46 (45/117)	10.71 (12/112)
Age: 10s	7.73 (14/181)	7.14 (13/182)	3.85 (7/182)	82.42 (150/182)	43.50 (77/177)	6.47 (11/170)
Age: 20s	20.00 (34/170)	17.47 (29/166)	12.88 (21/163)	18.07 (30/166)	17.90 (29/162)	12.50 (19/152)
Age: 30s	22.81 (39/171)	18.52 (30/162)	14.20 (23/162)	23.53 (30/170)	31.74 (53/167)	10.49 (15/143)
Age: 40s	25.53 (20/85)	13.75 (11/80)	12.35 (10/81)	42.17 (35/83)	62.16 (46/74)	9.21 (7/76)
Age: 50+	22.22 (8/36)	11.11 (4/36)	18.92 (7/37)	42.86 (12/28)	56.25 (18/32)	3.03 (1/33)

*Parentheses: the number of respondents of the respective demographic group who committed the respective sexual offence / the total number of respondents of the respective demographic group.

Appendix 3. Reasons for Committing Rape (Survey with 658 sex criminals in South Korea, Jeon et al. 2007)

	Number	Percent
To satisfy sexual desires (<i>desire</i>)	126	19.1
To possess the victim (<i>power</i>)	13	2.0
Love (<i>power</i>)	21	3.2
Anger, retaliation (<i>anger</i>)	24	3.6
Curiosity (<i>desire</i>)	96	14.6
To prevent the reporting of another crime	29	4.4
Alcohol consumption (being drunk)	249	37.8
Drug use	2	0.3
Spur of the moment (<i>anger</i>)	18	2.7
Because of the accomplice	10	1.5
Victim consented	7	1.1
Did not commit rape	6	0.9
Other reasons	39	5.9
No answer	18	2.7
Total	658	100

Appendix 4. Crime Rates of Police-recorded Sexual Offences, national level (per 100,000 persons, OECD countries, 2012)

Ranking	Country	Crime Rates of Rape and Sexual Assaults
1	Sweden	182.5
2	United Kingdom (England and Wales)	81.6
3	Switzerland	81.1
4	Australia	80.2
5	New Zealand	76
6	Canada	75.6
7	Finland	64.9
8	Belgium	61.7
9	Germany	55.3
10	Luxembourg*	55
11	Netherlands	54.7
12	Norway	52.6
13	Ireland	46.3
14	France	41.9
15	Republic of Korea (South Korea)	40
16	Austria	37.6
17	Mexico	30.1
18	Portugal	20.1
19	Spain	19.3
20	Czech Republic	18.6
21	Hungary	13.3
22	Slovenia	12.8
23	Croatia	11.9
24	Italy	7.7
25	Turkey	7.5
26	Greece	7.4
27	Poland	7.3
28	Japan	6.7
29	Slovakia	2.6

*Note: the data of Luxembourg comes from 2011 – the most recent available year for the country.

Appendix 5. Descriptive statistics

Variables	Observations	Mean	Std. Dev.	Minimum	Maximum
Sexual Assaults	469	0.16	0.36	0	1
Forced Sex (strangers)	468	0.13	0.34	0	1
Forced Sex (partners)	465	0.08	0.28	0	1
Acquaintance Rape	448	0.38	0.48	0	1
Rape of Minors	460	0.45	0.48	0	1
Sadistic Means	428	0.09	0.28	0	1
Prostitution (total)	469	1.00	1.56	0	8
Prostitution (adults)	469	0.94	1.47	0	4
Prostitution (minors)	469	0.06	0.36	0	4
Prostitution Myths	469	3.79	1.05	1	5
Rape Myths	469	2.43	0.89	1	5
Risk-taking	469	2.31	1.00	1	5
Fragile-self	469	2.29	1.03	1	5
Age of Rapist	469	27.99	10.70	12	68
Singlehood	469	0.83	0.38	0	1
Unemployed	469	0.10	0.30	0	1
Abused by Parents	469	1.56	0.71	1	4
Reason: power	469	0.05	0.22	0	1
Reason: anger	469	0.04	0.19	0	1
Reason: desires	469	0.35	0.48	0	1
Alcohol: rapist	466	1.16	0.87	0	2
Alcohol: victim	460	0.72	0.83	0	2
Resistance: verbal	450	0.31	0.46	0	1
Resistance: physical	450	0.18	0.38	0	1
Hotel Price (Korean Won)	469	27,119	11,993	10,322	51,736
Brothel Control	469	0.65	0.48	0	1

Variables	Observations	Frequency	Percent	Cum.
Middle school or below	469	122	26.01	26.01
High School	469	250	53.30	79.31
College or above	469	98	20.89	100
Victims' age: 1-19	460	206	44.78	44.78
Victims' age: 20-29	460	171	37.17	81.96
Victims' age: 30-39	460	43	9.35	91.30
Victims' age: 40-49	460	35	7.61	98.91
Victims' age: 50+	460	5	1.09	100