The Internet, Prostitution, and Rape: Can Taking Prostitution "Indoors" Mitigate Social Harms?

by

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Abstract

BROGIS, MARYSSA The Internet, Prostitution, and Rape: Can Taking Prostitution
"Indoors" Mitigate Social Harms?

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Prostitution is often debated as an illegal activity that causes individual and social harms. This study uses feminist theories on prostitution in conjunction with econometric tools to find if prostitution can actually reduce social harms such as rape. Prostitution is a highly debated subject within feminist literature, as some believe prostitution is considered legitimate work, while others view prostitution as extremely harmful toward women and an act that perpetuates female submission.

This econometric study adds to the feminist debate on prostitution by implementing the internet's role in expanding the indoor market as a potential causal factor in the relationship between prostitution and social harms. This study concludes that there is a clear, negative, and statistically significant relationship between prostitution and rape in America. However, the role that the internet plays in this negative relationship is unclear and calls for further interpretation and research.

Contents

Acknowledgements

List of Tables

Chapter I: Introduction

Prostitution is a subject intensely debated within feminist literature, with some scholars advocating for sex work as legitimate work, and others concerned about the unique harms that prostitution yields. This study will use the feminist theories on prostitution as a foundation to introducing the potential empirical relationship between prostitution and social harms. This study will attempt to work alongside and in the context of these theories on prostitution while adding econometric tools to view the empirical relationship between prostitution and social harms. In this way, this research will use the feminist theories as an introduction to feminist literature on prostitution, move to economic theories on prostitution, and then determine the empirical relationship between prostitution and rape within a feminist context.

1.1 Feminist Theories on Prostitution

The first model that will be discussed is the radical theory of prostitution because this model discusses a topic that serves as the focus of this study: the relationship between prostitution and social harms toward women. The radical feminist theory on prostitution suggests that prostitution devalues women and exists only to promote forms of female inferiority and subordination (Thompson 2000). Under this model, prostitution is believed to perpetuate male domination over women in the forms of sexual violence, assault, etc. The argument of this approach is summarized from Susan Thompson's work (2000) as follows. Male dominance exists due to difference between the "sexes." The term "sexes" is derived from the biological differences of the groups known as "men" and "women." The difference and division of these "sexes" are based upon and perpetuated by a socially constructed hierarchy of the sexes in which men dominate over

women. Therefore, the radical feminist believes that prostitution exists to perpetuate this socially constructed system in which females are inferior to men (Thompson 2000).

Radical feminist Catharine MacKinnon further argues that consent is impossible and sexuality is inauthentic within prostitution because women have no "self" (Freeman 1990). According to MacKinnon, since women are defined through the male perspective, prostitutes: see themselves through the reflection of male desire and thus, cannot own themselves or their sexuality (Freeman 1990). However, Thompson argues in contrast to MacKinnon by stating that "to accept [MacKinnon's argument] is to accept the view that women's position in society has not evolved since the nineteenth and early twentieth centuries" (2000). Additionally, Thompson argues that the radical feminist ideology does not accept that for some women, prostitution is a choice. In turn, Thompson believes that MacKinnon's radical feminist arguments on prostitution deny women a choice to own their sexuality and thus denies women opportunities to define themselves and embrace their individual womanhood.

Establishing the radical feminist model as one of the foundational theories of prostitution is important in the context of this paper because this theory establishes a specific feminist perspective on the relationship between prostitution and social harms. Additionally, it is important to introduce MacKinnon's arguments that sexuality in prostitution is inauthentic because these arguments seem to contrast certain arguments of the liberal feminist (seen later in this section). Additionally, the arguments of the radical feminist could hold weight when discussing the relationship between prostitution and rape. When making conclusions and implications about the empirical relationship between prostitution and rape, it is important to keep in mind that prostitution could be a

form of inauthentic sex according to certain radical feminists such as MacKinnon. In this way, it is important to first establish the context of the liberal feminist in order to view the implications of the empirical relationship between prostitution and rape through a wider lens of perspective.

The next foundational feminist theory on prostitution that will be discussed is the socialist model. This theory is based on Marxist theories of materialism and suggests that prostitution exploits females through a capitalist structure. The capitalist structure of feminism can be seen through the sheer estimated value of certain prostitution markets alone, with Atlanta's sex market being valued around $290 million and Miami at $235 million (Kolodny 2014). Additionally, the socialist feminist takes the Marxist ideology of materialism one step further by considering the sexual division of labor within capitalism and patriarchal society. According to Thompson's interpretation of socialist feminism, prostitution is the combination of capitalism and patriarchy in the sense that: by nature, capitalism places women at a disadvantage to men and patriarchy ensures that women are paid less than men. In this way, women enter prostitution for the potential opportunity to actually be at an economic advantage to men (Thompson 2000).

It is important to establish the socialist feminist theory on prostitution because this theory works within the context of capitalism and the market for prostitution. As this study uses economic models and theories to analyze prostitution and the relationship prostitution has with rape, the socialist theory contextualizes prostitution within a feminist viewpoint in regards to capitalism and the prostitution market. The patriarchal implications for use of the economic model and placing prostitution within a market will later be assessed in more detail within the third chapter of this study.

3

The third model that will be discussed is the liberal feminist theory on prostitution. This theory is based on the idea that a woman has the right to choice and therefore has the right to prostitute herself. In contrast to the radical feminist, the liberal feminist believes that prostitution is a positive step toward independence, rather than a symbol of degradation of women (Thompson 2000). The liberal feminist theory does not question why one goes into prostitution, but rather believes that women have the opportunity to make choices that are in their best interest. The liberal feminist also believes that prostitution can be a sexually liberating experience for women through the idea that women can decide how to use their bodies and with whom. In contrast to the socialist feminist, the liberal feminist would also argue that prostitution can provide economic independence for a woman and that economic need is not the sole reason for entry into prostitution (Thompson 2000).

It is important to establish the liberal feminist theory of prostitution within the context of this paper due to the idea that the liberal feminist places an emphasis on choice. This argument will be important when establishing sex work as work in the second chapter of this study. Unlike the radical and the socialist models of prostitution, the liberal model accepts prostitution as a voluntary labor choice for women that is in her best interest (if the woman prostituting herself deems this job to be in her best interest). In this way, the liberal model will help define sex work as legitimate, voluntary work. Additionally, having this feminist context of prostitution as a voluntary choice will hold weight when discussing the implications of the relationship between prostitution and rape due to the idea that certain feminists view prostitution through a positive lens of independence for women.

These three feminist theories can help organize the debate around prostitution, however, the methodology of these debates leads to qualitative rather than quantitative conclusions. In hopes to move toward additional quantitative conclusions, this paper will bring economic theories such as price, quantity, supply, demand and econometric models including instrumental variable regressions to provide empirical results that can offer a new vision of the feminist theories on prostitution. This study will work alongside of the liberal model and touch on aspects of the social model by discussing sex work as legitimate work. Next, the study will get into the realm of the radical feminist by attempting to analyze the empirical relationship between prostitution and rape. The study will then attempt to add to the feminist literature by taking a modern element, residential internet connections, and suggesting this element as an instrument which affects prostitution and therefore affects rape. From the empirical results, I will come back to the foundational feminist theories in order to draw conclusions and implications for future research.

Chapter II: Literature Review

2.1 Prostitution and Inherent Harms

Before discussing the relationship between prostitution and social harms, the debate surrounding prostitution and inherent harms must be established in order to later appropriately discuss implications of the relationship between prostitution and rape. The nature and type of prostitution work can influence the magnitude of impact that prostitution and the internet have on rape in different ways. Specifically, different types of prostitution, i.e. street based prostitution has greater inherent harms than non-street based prostitution. However, there is controversy in the feminist literature that all prostitution (both on the street and off) entails grave harms which extend beyond the established costs of violence, arrest, and disease and must be taken into account when discussing prostitution (Farley 2005). In this way, if a positive association between the internet and non-street based prostitution (online, indoor prostitution) is found, then the resulting analysis will be useful in two ways: the first being that an increase in non-street based prostitution could lead to less street-based prostitution which is generally seen as dangerous and harmful (see Outdoor vs. Indoor Prostitution section), and the second being a potential increase in all harms toward prostitutes and society if prostitution has inherent, irremovable harms. Therefore, dissecting the debate over inherent harms within prostitution will help analyze the magnitude of any potential effects that prostitution may have in relation to harm against women working as prostitutes and women in general.

2.2 Outdoor vs. Indoor Prostitution

Outdoor prostitution is the most iconic image of prostitution that Americans visualize today. Outdoor, also known as street-based prostitution is statistically and

inherently dangerous due to the nature of work and practices involved with outdoor prostitution. While there is a great difference between the conditions of some prostitutes in relation to other street prostitutes, there is a general basis that outdoor prostitution has inherent harms greater than indoor prostitution. This consensus is based on the facts that outdoor prostitution involves practices such as an irregular base of clients (meeting for the first time on the street), high rates of drug use, seldom use of condoms, and high rates of abuse, violence, and sexual assault (Weitzer 2007).

Indoor prostitution is usually associated with "higher class" prostitution, such as escort services, call girls, working in brothels, etc. This type of prostitution has less inherent harms to women than street prostitution due to the nature of work. Women working in indoor prostitution face a lower risk of arrest than women working on the street who solicit themselves publicly (Delap 2014). Additionally, women working in indoor prostitution generally work with a familiar base of low-risk clients and have time to research or get information on new clients, as compared to outdoor workers who usually meet their clients at the time of transaction. Indoor prostitutes use less drugs and experience lower rates of violence than outdoor workers. Many indoor workers also claim that they entered the indoor market by choice and have high-levels of self-esteem (Weitzer 2007).

While many argue that indoor prostitution is significantly less harmful to women than outdoor, other authors argue that indoor prostitution is just as harmful as outdoor prostitutes due to similar psychological effects and trauma that prostitutes face during and after their work in prostitution. Additionally, the relative invisibility of indoor prostitution (in comparison to outdoor) could create more danger for prostitutes (Farley

7

2005). This theory complicates the previous argument that the internet could reduce harms to women by increasing indoor prostitution. In the context of Farley, any increase in prostitution would increase overall harms to women working in any type of prostitution, indoor or outdoor. Therefore, finding a correlation between the internet and indoor prostitution could actually increase overall harms toward prostitutes. Additionally, finding a negative correlation between prostitution and rape could provide interesting moral trade-offs, as the internet may increase prostitution and which in turn could decrease rape. Thus, harms toward prostitutes may be heightened, yet social harms may be lessened due to decreased rates of rape.

2.3 Spillovers and Negative Externalities

Not only does the prostitution market have harms which directly affect women working as prostitutes, but this market also has many spillover effects which pose a negative externality on individuals who do not participate in this market in the form of social harms. The first and most obvious externality of the market is sexually transmitted disease. Sexually transmitted disease is seen as a potential spillover of the prostitution market in the following way: if a prostitution consumer obtains a sexually transmitted disease from participating in the prostitution market and then has sex with another individual outside of the market, that outside individual is at a higher risk for obtaining a sexually transmitted disease even though the individual did not participate in the prostitution market himself. This idea is not to say that prostitution increases or perpetuates the amount of sexually transmitted diseases, but instead to introduce the idea that those participating in the prostitution market could transmit the diseases to those outside the market, thus, creating a negative externality.

The main spillover effect and focus of this paper is rape. Rape is considered a potential spillover effect from the prostitution market because prostitution could have an effect on males on the verge of raping, thus affecting individuals outside of the prostitution market. Many debates exist on the subject, yet one idea is that if an individual is unable to form a consensual sexual relationship with a partner, then he will look for an alternative method for sex, making rape and prostitution substitutes for an individual in this situation (Posner 1992). Therefore, this theory shows a negative relationship between prostitution and rape, supporting the idea that prostitution could create a positive externality by reducing social harms. This theory is not attempting to justify rape or claim that this relationship holds in every environment, but rather suggests one theory that could explain a negative relationship between prostitution and rape.

Many feminists argue against the idea of prostitution and rape as substitutes in the sense that the argument is based on the foundation that male sexual urge is something that needs to be alleviated, or worse, that male sexual urge is used to justify male sexual dominance over women. Additionally, many feminists argue that prostitution provides a normalized, unseen form of male domination that perpetuates harms toward women rather than reduce them. In modern American society, commercialized sex, especially high class/ indoor prostitution, has been glamorized to the point where male sexual privilege has been imbedded and made invisible within this system. Therefore, this glamorization skews the public vision by placing female financial autonomy and choice at the forefront, disguising the fact that women's sexual desires can be and are often made worthless in this system. Therefore, some feminists find that the invisibility of male sexual dominance is extremely dangerous in this system because dominance has been

normalized to become unrecognizable (Coy 2012). In this way, prostitution can perpetuate American norms of male sexual dominance which continue into society and can continue to harm women in forms such as rape and other non-consensual sexual violence. Therefore, this feminist perspective (aligning with radical feminist theory) essentially argues that the prostitution market can create and perpetuate negative externalities towards all women and actually increase certain social harms.

2.4 Sex Work as Legitimate Work

Before determining the empirical relationship between prostitution and rape, prostitution must first be contextualized within the feminist debate of sex work as work. While some scholars view prostitution as legitimate work, others are concerned about the specific harms that prostitution yields, as previously noted in the "Prostitution and Inherent Harms" section of this study. Additionally, many feminists argue that prostitution has horrific and irremovable associated harms such as serious and lasting mental damage (Farley and Barkan 1998) underage prostitution/ exploitation of adolescence (Kotrla 2010), human trafficking/indebted servitude through sex (Raymond et al 2010), etc. By referencing this literature that discusses these issues in depth, this study notes that these issues and debates are established in the feminist community and should be discussed prominently. By arguing that sex work is legitimate work, this paper does not attempt to avoid these issues, but rather to view other aspects of prostitution in regards to the relationship between prostitution and social harms. From this point on, this study will only refer to prostitution in terms of the exchange of sexual services from adult, female prostitutes for monetary payments from clients. For simplicity purposes, this study will also assume the prostitute is a female and the client is a male. However, it

should be noted that many of the issues established in this paper can be applied to male prostitution as well.

In the following paragraphs, I will attempt to build on previous literature to legitimize sex work so that prostitution can be properly analyzed in conjunction with social harms, economic theory, and the foundational theories on prostitution introduced in the previous section. This section will align with the views of the liberal feminist in the sense that prostitution will be centralized as voluntary, legitimate labor. This section will also make the argument that sex work is actual work in order to establish that this is a legitimate labor force which can later be placed within an economic context.

Sex work is defined as a low-skill, high wage job and requires a specialized skill set. When the term low-skill is used in this context it is in regards to formal education required for the job. Sex work requires physical labor and stamina, and wages which are contingent upon the prostitute's physical labor and stamina characteristics (Jeffrey and MacDonald 2006; Law 2011). Additionally, many service sector job skills such as interpersonal skills are required. Similar to the interactions that a waitress would have with his/her customer, a prostitute must also be kind, professional, accommodating, polite, able to cater to a variety of customers, and treat each customer as an individual. These are interpersonal skills that are continually built on the job, as the prostitute builds a network of clients and these are skills which can be easily translated outside of the sex industry (Law 2011).

Not only do prostitutes need basic soft skills, (confidence, ability to communicate effectively, catering to clients, etc.) but they also need industry specific skills. Sex workers are required to have a wide basis of sex industry knowledge, including fetishes,

creating a pleasing erotic atmosphere while keeping control of the situation at hand, knowing red flags for potential assault during the situation, and presenting herself as an erotic, enticing individual, rather than simply a provider of sex for compensation. Additionally, in the case of fetishes and fantasy role play, the prostitute must also have proficient acting and social skills to keep her client engaged. In this way, the prostitute must have a specialized set of skills which allow her to keep herself physically safe and in control while also creating an atmosphere of sexual pleasure, fantasy, and even the illusion of romance or the girlfriend experience in specific cases (Parent et al 2013).

2.5 Prostitution and Rape

Now that the feminist literature has been established as a foundation and sex work has been contextualized as legitimate work, this study will begin to apply economic literature to prostitution. As stated previously, this study will focus on the relationship between prostitution and rape. I predict that an increase in prostitution will lead to a decrease in rape based upon a possible theory that individuals unable to form consensual relationships could engage in prostitution. In the article "Decriminalizing Indoor Prostitution: Implications for Sexual Violence and Public Health," Cunningham and Shah support this hypothesis by finding a negative relationship between prostitution (as a result of an unexpected decriminalization of indoor prostitution in Rhode Island in 2003) and rates of rape and gonorrhea during the 2003-2009 time period. In my own study, I will substitute decriminalization with the Internet in the sense that both decriminalization and the Internet reduce transaction costs associated with stigma and risk of arrest, which in turn could increase indoor prostitution. Although reduction of transaction costs differ between decriminalization and the internet in the sense that the Internet provides more

private transactions while decriminalization provides less risk of arrest, both the Internet and decriminalization are vehicles for decreased transaction costs and increased supply of indoor prostitution.

2.6 The Internet and the Market for Sex

I expect to find that with increased internet access, there will be an increased supply of indoor prostitution. These expectations are based upon the argument that increased internet access will lead to an increased supply of online, indoor prostitution because the internet eases the ability of prostitutes to solicit semi-privately, easily, and comfortably from their computer rather than word of mouth advertisement which is usually most often done on the street. Just as the Internet has augmented the market for most tradable goods through opportunities to advertise and sell online, the prostitution market has the opportunity to benefit from the Internet in a similar way. Comparable to a seller's personal site on Ebay or Craigslist, a prostitute can solicit on sites such as TheEroticReview.com to build her reputation and client base. In this way the Internet makes advertisement easier for sex workers relative to word of mouth advertisement seen in the street based outdoor sex market. As argued by Cunningham and Kendall (2011), the increased use of Internet for solicitation purposes could then lead to a displacement effect of the outdoor market, and it will be more likely for sex workers to engage in lower-risk behaviors due to the nature of the indoor sex market.

While increased Internet usage and availability has led to increased supply of sex workers, the Internet has also augmented the demand for prostitution based on the idea that searching for a prostitute online is easier and more secretive than seeking a prostitute on the street. Searching for prostitution services online is thought to be easier and more

convenient due to the fact that internet searches can be done from home and literature

supports that people are comfortable searching for "sensitive" information online (Conti

and Sobiesk 2007, Kreuter et al 2009). Additionally, searching for prostitution services

online could augment the demand for this market, thus causing an outward shift in

supply.

Additional support for the idea of a positive association between secrecy and

consumption in the "taboo" sexual market is seen in Winai Wongsurawat's article

"Pornography and Social Ills: Evidence from the Early 1990s." In this study,

Wongsurawat finds a positive association between abundance of P.O. boxes and

subscriptions to Penthouse magazine due to decreased social costs associated with the

anonymous aspect of P.O. boxes. Although this study uses P.O. boxes and pornographic

magazines, the study can still serve to support the positive relationship between increased

secrecy (represented by the Internet in the context of my own study) and consumption of

sexual services (represented as prostitution in the context of my own study).

2.7 Pornography and Rape

Although I hypothesize that prostitution and rape have a negative relationship,

one could argue that the internet does not lead those who cannot form a consensual

sexual relationship to prostitution, but rather to pornography. Conflicting opinions on the

relationship between pornography and rape are abundant in the literature. Some literature

argues that pornography increases predispositions to rape and lowers internal inhibitions

not to rape (Russell 1988). Additionally, some authors find that soft-core, commonly

used pornography has no relationship with rape, but hard-core and violent pornography

does (Boeringer 1994). However, other authors find no statistically significant correlation

between rape and pornography, suggesting that men's attitudes toward women and rape are a result societal problems, not sexually explicit videos (Davies 1997; Kimmel and Linders 1996; Ferguson and Hartley 2009). Additionally, many feminists confront the idea of pornography leading to increased male sexual violence through the argument that pornography is purely fantasy. In this way, society is believed to twist these fantasies into intent, rather than view them as fictional or in the realm of fantasy (Kipnis 1996).

While many authors suggest that there is a positive correlation between rape and pornography or no relationship at all, some have found statistically significant negative relationships between pornography and rape. Wongsurat (2006) uses instrumental variables associated with anonymity (P.O. Boxes) and finds a negative empirical relationship between pornography and rape. In a similar manner, Kendall (2007) uses the arrival of the Internet as a variable representing anonymity and finds a negative correlation with rape, but not other crimes. This literature serves a significant purpose in this paper, as both authors suggest rape and pornography to have a substitutive relationship. Therefore, it is possible that pornography and prostitution could have competing substitutive effects on rape.

Chapter III: Theory on the Market for Indoor Prostitution

Based on the literature introduced in this paper thus far, prostitution is seen as a complex and highly debated topic. Before moving into the economic theory, it will be stated again that not all prostitution is voluntary or just. However, in this section, I will discuss the market for prostitution, within the context of prostitution being defined as legitimate (based on previously stated reasons in "Sex Work as Work" section) and voluntary (based on the liberal feminist model's definitions of autonomy) work. This section will use economic theory as a foundation for discussing the prostitution market, more specifically, the online, indoor prostitution market.

In the prostitution market, there is a supply curve of prostitutes ready to sell their services for a specified price and a demand curve of customers willing to buy services at a specified price. Before the economic model can build upon the liberal feminist model, the very foundations of the economic model of supply and demand must first be discussed with a feminist context in mind. The economic model objectifies female sexuality to be a tradable good and quantifies exploitative harms to women as transaction costs. Additionally, the supply/demand framework is based on male sexual dominance and privilege in the sense that women are only supplying male sexual needs. Although the foundations of this model can be problematic within a feminist framework, the economic model realistically presents the modern American market for prostitution. By using this model for theoretical purposes, this paper does not attempt to justify male sexual privilege and dominance, but rather show a realistic model for this market, as prostitution is essentially built upon the exchange of alleviating male sexual need for money. Therefore, by basing the prostitution market upon economic models, it is not to

justify male dominance, but rather to make this study of prostitution more realistic and feasible in the context of modern society.

3.1 Costs for the Prostitute

The prostitution market has associated transaction costs mainly associated with risk of arrest and social stigma of being involved in illegal or "taboo" transactions that are similar to many other illegal markets. Based on economic foundations, one can safely assume that a prostitute or a client would enter the prostitution market if the benefit exceeds the cost. In this case, the benefit would consist of wages and any additional utility gained from transactional sex (sense of self-worth from making income, social aspects of the job, etc.) The elements of cost for an individual prostitute are quantified in this way:

$$C_i^P = `w_i + u_i + q_vV + q_aA + q_dD$$

In this case, w_i represents the wage in other employment, u_i represents any disutility associated with engaging in commercial sex, q_vV, q_aA, and q_dD represent the costs and probabilities of violence, arrest, and disease respectively.

The element of cost that is specific to the prostitute is violence. Indoor sex workers are vulnerable to violence from the police and customers in the forms of robbery, assault, sexual assault, and even death in some instances (Weitzer 2007). The risk of violence, known as q_v in this model, is also increased because indoor sex work almost always is done strictly between two people in a private location. The variable q_v could also be problematic as violence can be interpreted in many ways. For example, some feminists consider the simple entrance into prostitution and the act of selling one's body to be considered violent due to non-physical harm in the forms of post-traumatic stress

(Farley and Barkan 1998). Additionally, Parent et al (2013) argue that violence is not an intrinsic part of this industry, but rather perpetuated through the social, legal, and labor context in which the work is situated. Therefore, q_v has ambiguous magnitude effects on cost as q_v most likely has a strong relationship with arrests as well. In this way, recognizing the legal and social barriers that prostitutes face is essential for analyzing the role that the variable $q_v V$ holds in the individual prostitute's cost equation.

Stigmatization is an additional element included in the prostitute's individual costs in the disutility element of the equation. Due to the illicit nature of prostitution work, those who choose to participate in the prostitution market face social stigmatization in many forms. Prostitutes are regarded as immoral, promiscuous, addicted to drugs, sexually diseased, dishonest, disreputable, trapped in the industry, pushed into the profession by desperation, etc. (Parent et al 2013). Additionally, due to social constructions and norms, knowing that a woman once worked as prostitute could significantly lower her chances of forming "normal" social groups, finding a romantic partner, obtaining full-time work, obtaining work or volunteer opportunities with children, etc. In this way, working as a prostitute, even for a short period of time, significantly increases a prostitute's opportunity cost, which could lead to a substitution effect for w_i, or earning wages by other forms of employment.

Not only do women working as prostitutes face stigmatization from judgmental stereotypes, female prostitutes also face additional marginalization from what is known as "whore stigma." This stigma is attached to women who appear to be unvirtuous, essentially dividing women into the pure and impure (Pheterson 1993). Therefore, the

stigma associated specifically with women in prostitution significantly increases a

prostitute's disutility, u_i, and can generate a large impact on her costs.

3.2 Does the Benefit Exceed the Cost?

Although the costs and benefits of the prostitute have been defined in an

economic context, feminists often argue that a female's decision to enter prostitution is

one of desperation rather than voluntary choice. Within the context of this study, the

decision to enter prostitution will be viewed as voluntary choice, as prostitutes select their

labor industry under a constrained range of options, usually including current household

income, educational background, previous labor experience, and other job opportunities

(Parent et al 2013). Prostitution provides relatively high wages to women that may not

have the credentials to perform high-skilled, high pay service sector jobs. For example,

women working in the indoor prostitution sector make substantially high wages, in some

cases up to $1000 an hour (Cunningham and Shah 2014). This idea is not to say that

prostitutes base their decision to enter prostitution on wages, but rather to show that

prostitutes can find their relatively high wages to be a benefit or a sense of self-worth.

3.3 Costs of the Client

Similar to a prostitute's decision to enter the market, consumers of prostitution

services are expected to participate in the prostitution market if the benefits exceed the

costs. The associated elements of cost for an individual client are quantified as follows:

$$C_i^C = y + u_i + q_eE + q_aA + q_dD$$

In this context, y represents the availability of sexual alternatives (domestic sex, porn,

potentially rape, etc.), u_i represents the net utility of commercial sex (utility minus

disutility), q_eE, q_aA, and q_dD represent the client's individual probability and cost of extortion, arrest, and disease respectively.

Both the prostitute and client have arrest as an included element in their individual costs. Although arrest is included in both cost equations, the probability, or q_a is very different in the prostitute's costs as compared to the client's costs. Prostitutes face a much higher q_a due the fact that they have a lack of legal protection. Customers may threaten to call police if they do not receive a service they want, regardless of the initial conditions and agreements set between the prostitute and the customer (Parent et al 2013). In this case, clients have an advantage because police action usually only entails whoever is left at the scene of the "crime," most usually a brothel. Therefore, the prostitute stays while the client can quickly flee and escape arrest. This act results in a lower q_a for clients and a heightened q_a for prostitutes. However, the customer can quickly flee the scene and escape from arrest, even though he is just as involved in the "crime" as the prostitute.

Not only does this legal context affect the element of arrest in the cost equation, but the legal context also affects the element of disease in both the prostitute's and the client's costs. Since the client holds the upper hand in this legal context, the client has the ability to force a prostitute into unwanted and dangerous sexual territory, such as sex without a condom. This act can then lead to increased risk of disease, q_d, for both the prostitute and the customer. In this case, the elements q_aA, and q_dD are highly related to one another, showing how understanding the social and legal contexts are necessary when analyzing the role that violence and disease play in both the prostitute's and customer's individual costs.

3.4 Applying Costs to the Model

Since the elements of cost for the individual prostitute and customer have been established, these costs can motivate the supply and demand for prostitution as seen below. In this model P represents the price of transaction, Q represents the quantity of transactions, and S measures the respective supply of prostitutes soliciting themselves in the indoor prostitution market.
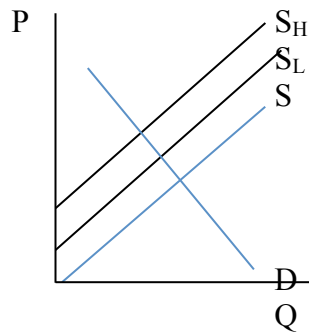
In this case, supply is based upon S_0 which one assumes is any reason a person would not want to enter the prostitution market (stigma, illegality, etc.), and P_C which represents probability of getting caught. In the model S_H represents supply in cities which have strict prostitution laws/a high probability of getting caught. The curve S_L represents cities that have lenient prostitution laws/less probability of getting caught. As seen from this model, the market moves out of equilibrium in a manner similar to that of many other black markets with an increase in price and a decrease in quantity. Therefore, consumer surplus and producer surplus are decreased by the amount of dead weight loss in the market.

Increased internet use is expected to lower transaction costs by lowering the probability, or all q's, of the elements in the cost equation due to privacy and ease of searching for sensitive materials via internet. Increased internet use could also affect the y

term, or availability of potential alternatives, in the cost equation for customers through channels such as porn and online dating. In this context, the S_H and S_L curves are expected to shift down, as the internet is expected to decrease the probability of each element of cost by the same amount. However, the magnitude of the internet's effect on the probability of each element will be different for each supply curve, as the internet will cause a greater effect for the S_H curve and a smaller impact on the S_L curve. Therefore, the internet is expected to bring these curves to a state which is closer to equilibrium, increasing both consumer and producer surplus: a benefit for both the prostitute and the customer.

Chapter IV: Discussion of the Data

This study will view the relationship between prostitution and rape at the state and city level. The prostitution data was obtained directly from Scott Cunningham with the raw data being pulled from The Erotic Review (TER), an international sex review website. This website is believed to be a comparable measure of the indoor sex market because this site is by far the largest website offering customer reviews on sex workers, restricts prostitute information to those paying a fee or submitting more than two reviews (reviews are checked by TER staff before information access in granted), and the site allows those who have not reviewed many other workers to be discounted by other users (Cunningham and Kendall 2011). TER data is aggregated to the city and state level from the years 1998-2013 and measures 40 U.S. cities and 28 U.S. states.

For this study, the supply of indoor prostitutes listing on TER on the city level was aggregated by collapsing unique records of reviews per prostitute, per city, per year. From there, the supply data was further aggregated into a count of TER prostitutes per city. On the state level, the data was aggregated in the same way as city level; however, prostitution listings from states were included in addition to cities. Both the city and state level TER data is measured in three ways throughout the empirical analysis. The first is the actual measurement of TER prostitute counts used to present levels. The second measurement is rates, which uses TER prostitute supply/population of city or state to show TER supply per resident. The third specification or measurement of TER supply uses the natural log. Changes in the natural log indicate growth rates of TER prostitution supply over time.

Although the TER data is one of the best measures available for studying the online, indoor, prostitution market, the TER data is a noisy measure of the supply of indoor prostitution. TER data clearly does not depict the full prostitution market, as TER is only a small snapshot of a sector of the indoor market. In the early years of TER measurement the online sex market grows in relation to other forms, such as Craig's List and other large online review sites. However, Craig's List limited "adult services" in 2008 and eventually eliminated this category in 2010 (Leonard 2010). Therefore, after the year 2008, TER could have less measurement error and hold more weight in the supply of online, indoor, prostitutes. Additionally, the natural log of TER supply seems to be a very noisy measure of TER supply growth, especially in the early years of measurement. In the early years of the TER data (1998-2003) there was exponential growth, as TER as a website was building from the ground up. In this way, there seems to be larger growth in the early years, even though there are significantly fewer prostitutes on TER in the early years. Therefore, the log of TER supply provides a noisy measurement of the growth of indoor prostitution.

The data on crime is based upon U.S. FBI Uniform Crime Reporting Statistics and ranges from 1998-2013 on the city-level. Within this data set, statistics on population, murder, rape, robbery, aggravated assault, burglary, larceny/theft, motor vehicle theft, and arson are included. For the purposes of this study, I will focus on rape, defined by the Uniform Crime Reporting Program (UCR) as "the carnal knowledge of a female forcibly and against her will" (Legacy Definition until 2012) and later as "penetration, no matter how slight, of the vagina or anus with any body part or object, or oral penetration by a sex organ of another person, without the consent of the victim"

(Revised Definition starting 2013). Like the TER data, the rape data will be measured in levels, rates, and natural logs. An important limitation of the crime data is that rape is found to be grotesquely underreported, by as much as 80% in some cases (Kruttschnitt et al 2014). Therefore, the potential magnitude of the effect of the prostitution and the internet on rape could be masked by this limitation in the data.

The Internet usage data is from the Federal Communications Commission for the years 2000-2013 at the state level. This data measures the number of high speed line connections over 200 kilobits per second (kbps) in at least one direction. Only the residential connections are used in this measure due to the intuition that individuals are more likely to solicit prostitutes on their personal, residential internet network rather than a business or governmental internet network. The residential connection data is measured in rates, levels, and natural logs in the same manner as TER and crime data.

Prostitution law data has also been utilized in the instrumental variable regression used later in this study. The prostitution laws are measured through potential maximum jail time and maximum fines. The maximum jail time represents the longest jail sentence a prostitute could receive if arrested. The maximum fine represents the highest fine a prostitute could have to pay if arrested. These measures of prostitution laws were found republished on ProCon.org and updated as of 2009. The maximum fine and maximum time variables are measured in levels, rates, and natural logs when interacted with the internet as well.

4.1 Descriptive Statistics

Although internet data could not be found at the city level, the city level prostitution and crime data was still utilized because this data could be more robust. The

city level data has a greater amount of observations than the state level data. Additionally, there were more city specific listings in TER than state specific listings. The city level data could also be a more accurate depiction than state data due to the fact that commercial sex markets tend to be centered around metropolitan areas, rather than rural areas which are also accounted for in state level data.

Table 1 shows the descriptive statistics for the city level prostitution data and city level crime data and only includes the major variables used in Regression Equation 1 which will be introduced in the empirical discussion section of the study. The first variable, TER Supply Rate, represents the number of prostitutes listed on TER divided by population across cities over time. This variable has a mean value of about 4, indicating that on average there are about 4 prostitutes listing on TER per 10,000 residents. The minimum value of .008 prostitutes per 10,000 residents comes from San Diego in 1998. The maximum value of 39 prostitutes listing on TER per 10,000 residents results from Atlanta in 2013. Overall, the maximum and minimum values for TER Supply Rate show that TER prostitution supply is increasing over time.

The next variable, violent crime rate represents the number of violent crimes divided by population across cities over time. The mean value on this variable indicates that on average there are about 114 violent crimes per 10,000 residents. The minimum value of 14 violent crimes per 10,000 people comes from Los Angeles in 2012. The maximum value of 1,135 violent crimes per 10,000 people results from Atlanta in 2002.

The last variable, rape rate, represents the number of rapes divided by city population. The mean value depicts that there are about 5 rapes per 10,000 people on

average. The minimum value of 4 rapes per every 100,000 people results from Los Angeles in 2012. The maximum rate of 13 rapes per 10,000 people results from Cleveland in 2003. Overall, these maximum and minimum values indicate trends that rape other violent crimes are decreasing on average over time.

Table 2 shows the descriptive statistics of the main variables used in the state level regressions. The first variable, TER supply rate, measures the number of prostitutes listing on TER per state population. Therefore, the mean value of 3.253 represents that there are about 3 prostitutes soliciting on TER per 10,000 residents. The minimum value of .001 prostitutes per 10,000 residents results from Texas in 1999. The maximum result of .0029 prostitutes per 10,000 residents results from the District of Columbia in 2012. Since the District of Columbia represents a region rather than a true state, the state with the maximum prostitution supply is Nevada in 2012.

The variable rape rate has a mean value of about 3.25, depicting that on average, there are about 3 rapes per every 10,000 residents. The minimum rate of one rape per 10,000 residents is recorded in New Jersey in the year 2010. The maximum rate of 5 rapes per every ten thousand residents occurs in New Mexico in 2008.

The residential connection rate variable represents the amount of residential high speed internet lines divided by population. On average, there are 1666 lines 10,000 residents. The minimum residential connection rate of 38 lines per 10,000 residents comes from Indiana in 2000 and the maximum rate of 3210 lines per 10,000 residents comes from District of Columbia in 2012.

The variables max_time and max_fine are introduced in Table 2 to represent the various state legal contexts in which prostitution occurs. These variables are interacted with the internet measure in later regressions in order to show how residential internet access may have a different effect in certain legal contexts. As stated in the economic theory earlier in this study, the expected result is that internet access will have a larger effect in harsher legal environments relative to more lenient legal environments.

The max_time variable represents the most severe jail sentence a prostitute could get when arrested. The mean sentence of about 426 days indicates that on average, the most severe punishment a prostitute could get is a 426 day sentencing if arrested. The minimum rate of 30 days is for Hawaii and the maximum rate of 1825 days, or about 5 years, is for Pennsylvania. This vast difference in maximum sentencing indicates that Hawaii is a rather low risk state in regards to soliciting prostitution services, while Pennsylvania is very high risk.

The max_fine variable represents the most severe fine a prostitute could have to pay if arrested. The mean fine measures $3750, implying that on average a prostitute could face a rather severe fine of about a $4000 when arrested. The minimum fine of $500 exists in Hawaii and the maximum fine of $25000 exists in Illinois. Therefore, Hawaii is solidified as a low risk state and Illinois can be seen as a high risk state.

Chapter V: Empirical Discussion and Results

5.1 Is there an Empirical Relationship between Prostitution and Rape?

This study will use multiple regressions to establish the relationship between the Internet, online indoor prostitution, and rape. The first equation is a basic OLS Regression with fixed effects showing the effects of TER prostitution supply on rape. This equation is depicted as follows:

Regression Equation 1:

$$\text{rape}_{rt} = \beta_1 \text{TER\_pros\_supply}_{rt} + \alpha_r + \varepsilon_{rt}$$

In this equation, the variable rape represents the dependent variable measuring the number of rapes across a certain region over time. The variable $\text{TER\_pros\_supply}_{rt}$ represents the amount of prostitutes listed on The Erotic Review. The variable α_r is a region fixed effect. The region fixed effect variable is used to control for all time invariant omitted variables specific to a given region. For example, this variable controls for aspects of a place such as culture, religion, etc. that could affect prostitution and/or rape rates for that given area. The variable ε_{rt} simply is the error term used to absorb any additional variance not picked up by the other variables in the regression.

Regression Equation 2:

$$\text{rape}_{rt} = \beta_1 \text{TER\_pros\_supply}_{rt} + \alpha_r + \alpha_t + \varepsilon_{rt}$$

A criticism of Regression Equation 1 is that both rape and TER prostitution supply measures could vary systematically during the time period under investigation. This raises the question of whether the correlation between rape and TER prostitution supply is spurious, i.e. driven by time variation in the variables. Therefore, I will attempt to correct for this by adding time fixed effects and a time trend to control for systematic

changes in TER prostitution supply and rape over time. The time fixed effect in

Regression Equation 2 is represented through the variable α_t and is used to control for

any national shocks or trends that could affect prostitution and/or rape in a uniform

manner by allowing each year to have its own effect in the regression. For example, this

fixed effect could be helpful if the decision by Craigslist to remove erotic services in

2010 caused a sharp increase in TER prostitute listings. This time fixed effect could also

control for any other non-linear effects, such as the 2008 recession.

Regression Equation 3:

$$\text{rape}_{rt} = \beta_1 \text{TER\_pros\_supply}_{rt} + \beta_2 \text{year} + \alpha_r + \varepsilon_{rt}$$

Regression Equation 3 uses an added variable, year, which controls for a linear

time trend in the data by including the years of an observation as a regressor. This time

trend is used to indicate a one-time variable which absorbs any variation caused by

national time trends.

Table 3 shows the outcomes from Regression Equations 1, 2, and 3 on the city

level (see Appendix). This table has 9 specifications representing 3 different measures of

prostitution (and consequently rape) along with time trends and fixed effects.

Specifications 1, 4, and 7 are the results of Regression Equation 1; specifications 2, 5,

and 8 are the results of Regression Equation 2; specifications 3, 6, and 9 are the results of

Regression Equation 3.

In the regression output depicted in Table 3, there is a clear, negative and

statistically significant relationship between TER prostitution supply and rape on the city

level. The first specification, measuring levels, indicates that on average, an increase of 1

TER prostitute listing is associated with a decrease of about .09 rapes. The second and third specifications tell a similar story, with added time effects and slightly different coefficients than the first specification. The prostitution measure is negative and significant at the 1% level in all three specifications, showing a significant relationship between increased TER prostitution supply and decreased rape.

Specification 4 shows that when the TER prostitution supply rate increases by 1, there is an associated decrease in the rape rate by about .084. Specifications 5 and 6, also measuring rates, tell a similar story with the same level of significance (1%).

Specifications 7, 8, and 9, measuring natural logs, have been restricted to all years over 2003. The natural log is restricted because the growth of TER prostitute listings in the early years (before 2003) is believed to be a noisy measure of indoor online prostitution growth (see data section for variable TER prostitution supply). With this being said, specification 7 indicates that on average, a one percent increase of TER prostitution supply is associated with a .015 percent decrease in amounts of rape. This variable is not significant and specifications 8 and 9 tell a different story of a positive and significant relationship between prostitution and rape. Due to the fact that the natural log is a noisy measurement of online prostitution growth, specifications 7, 8, and 9 should be taken lightly in comparison to specifications 1-6 which tell a consistent and significant story.

Table 4 also indicates a negative and generally statistically significant relationship between TER prostitution supply and rape on the state level. Specification 1 implies that an increase of one TER prostitute listing is associated with a decrease of about .4 rapes

on average. Specifications 2 and 3 tell a similar story of a negative relationship between TER prostitution listings and rape when period fixed effects and a linear time trend are added.

Specifications 4, 5, and 6 also show a negative and statistically significant relationship between TER prostitute listings and rape. Specification 4 implies that an increase in the TER prostitution rate by 1 is associated with a .065 decrease in the rape rate on average. However, when time fixed effects are added in specification 5, the coefficient on TER prostitution supply rate drops significantly, indicating that an increase in the TER prostitution rate by 1 is associated with a .027 decrease in the prostitution rate. Specification 6 tells a similar story as specification 5, with a coefficient around -.023 and significance at the 1% level.

Specifications 7, 8, and 9 do not tell the story of a strong, significant, negative relationship between TER prostitution supply and rape. However, specifications 7-9 do depict a weak overall negative association between TER prostitution supply and rape. Specification 7 shows that on average, a 1% increase in the TER prostitution supply is associated with a .05% decrease in rapes. This specification is significant at the 1% level, however, does not include time effects, making the result less robust. Specifications 8 and 9 include time fixed effects and a time trend, making the findings more robust, however, these specifications are less significant and reveal a very different finding than specifications 1-7. For these reasons and noisy measurement limitations mentioned in the data section, the natural log findings in this table are also questionable. Specifications 1-7 are seen to have the most robustness for this regression. Therefore, at the overall state level there is a finding of a negative and statistically significant relationship between

prostitution and rape.

5.2 Do Prostitution Arrests Influence the Indoor Prostitution Supply?

The following regression, shown in Table 5 is used to determine if prostitution arrests play a strong role in affecting the supply of indoor prostitution. Finding this relationship is necessary to help clarify what shifts are happening to the indoor prostitution market. As I will attempt to identify how the internet shifts the prostitution supply, which in turn affects rape, determining the relationship between the indoor and outdoor markets becomes important. Regression equation 4 is used to determine if prostitution arrests affect the indoor supply of prostitution, i.e. if arrest rates push prostitutes to solicit online and increase the supply of the indoor market. The regression depicting this relationship is shown below:

Regression Equation 4:
$$\text{TER\_pros\_supply}_{rt} = \beta_1 \text{pros\_arrest}_{rt-1} + \alpha_r + \alpha_t + \varepsilon_{rt}$$

In this regression, TER pros supply represents the supply of TER prostitution listings across states over time. The variables α_r, α_t, and ε_{rt} represent the region and time fixed effects and error term as used earlier in Regression Equation 2. The variable pros_arrest, representing prostitution arrests, has a time lag by one year. For example, prostitution arrests from 2009 would affect TER prostitution supply for 2010. The time lag was used for this regression to avoid issues of reverse causality. If TER prostitution supply and prostitution arrest were from the same year, one could argue that TER prostitution supply could actually be affecting prostitution arrests. With the time lag on prostitution arrests,

the regression attempts to only view the effects that prostitution arrests have on the TER prostitution supply for the following year.

Table 5 reveals no significant findings regarding the relationship between prostitution arrests and TER prostitution supply. Both specifications 1 and 2 reveal negative and insignificant correlations between prostitution arrests and TER prostitution supply. Specification 3 indicates a positive and insignificant relationship between prostitution arrests and TER prostitution supply. Therefore, this table does not have robust enough results to make implications about the expected shifting of outdoor markets to indoors.

5.3 Moving from Correlation to Causality: Using the Internet and Legal Environments as Instruments

As seen from regression equations 1, 2, and 3, the basic OLS regression shows foundational significant relationships between prostitution and rape. However, these results are subject to two criticisms. First, the OLS regressions can establish correlation, but not causation. The second criticism is that TER is a noisy measure for indoor prostitute supply as noted earlier. Due to this measurement error, the TER prostitution supply variable will tend to bias coefficient estimates toward zero. Therefore, internet access and legal environments will be implemented as instruments, as to mitigate some of the measurement error of TER prostitution supply and help determine shifts in the indoor prostitution market.

Residential Internet access is believed to be a good instrument due to its strength and validity. Residential Internet connections are likely to be correlated with TER prostitution supply because individuals need to use the internet in order to solicit on TER

(due to the fact that TER is an online website) and are likely to use their residential connection to do so. Residential Internet connections are also likely to be a valid instrument because the internet is believed to affect rape only through its effect on TER prostitution supply. Although some scholars argue that porn is a channel of the internet which affects rape, these ideas have been contested in the literature review by many authors. Therefore, while residential internet access may have some weaknesses, the instrument is overall believed to be a strong and valid instrument.

Additional instruments that will be used are prostitution laws. This instrument is used to avoid issues of reverse causality, as these laws are assumed to affect all of the instruments, but not rape. The prostitution laws are quantified by state through the maximum jail time and the maximum fine a prostitute could get when arrested. Prostitution laws are believed to be a very strong instrument due to the fact that legal environments of prostitution should affect a prostitute's choice to solicit on TER. Prostitution laws are also believed to be a valid instrument, as prostitution laws seem to only have the potential to affect rape through TER prostitution supply. When these prostitution laws are interacted with a measure of Internet access, this coefficient should provide an indication of the significance of the online prostitution supply on rape exclusively. Additionally, the internet expansion is expected to affect the online prostitution market differently, due to differing legal environments.

An instrumental variable (IV) regression will be used, in order to determine the relationship between increased indoor online prostitution and decreased rape. When determining the relationship between TER prostitution supply and rape in the IV regression, prostitution will be seen as a function which includes the internet. This

function of prostitution can help determine the role that the internet plays in relation to prostitution and thus, the effects on rape. This IV regression is depicted below in a set of two equations, representing the first and second stage of the regression. In the equations below, prostitution is first determined in relation to residential internet connections and the interactive term, which identifies the exogenous component of online prostitution that is related to internet access and the legal environment for prostitution. This relationship is then substituted into the pros variable measuring a proxy for the indoor prostitution supply in the second equation.

Regression Equation 5:

$$\text{TER\_pros\_supply}_{rt} = \beta_1 \text{residential\_connections}_{rt} + \beta_2 \text{int\_maxtime}_{rt} + \beta_3 \text{int\_maxfine}_{rt} + \alpha_r + \alpha_t + \varepsilon_{rt}$$

$$\text{rape}_{rt} = \beta_1 \text{pros}_{rt} + \alpha_r + \alpha_t + \varepsilon_{rt}$$

The variable TER_pros_supply measures the amount of TER prostitution listings across states over time, while residential_connections represents the number of high-speed residential internet lines across states over time. The next variable, int_maxtime represents the interaction between the residential connections and prostitution laws regarding jail time. The variable int_maxtime is another interaction term between residential connections and prostitution laws regarding fines.

Table 6 shows the first stage of Regression Equation 5, measuring the relationship between residential connections, interactive law terms, and TER prostitution supply. This table uses the same standard 3 specifications of this paper: levels, rates, and natural logs. The first two specifications imply a positive and statistically significant relationship (1% level) between residential connections and TER prostitution supply. This implies that the

internet has a strong relationship with TER prostitution listings. Additionally, the term interacting the internet with maximum fines, has a positive relationship with prostitution that is significant at the 1% level. This expected, positive relationship shows that the internet affects prostitution positively and differentially based on the legal environment. However, the term which uses the interaction between the internet and maximum time has a negative relationship with prostitution, telling the opposite story of the term interacting the internet with maximum fines. It is ambiguous why these two interactive terms tell opposite stories; therefore the results of the interaction term may not be robust.

Table 7 presents the regression results from Regression Equation 5, the second stage of the IV regression. In this equation, the pros variable measures the predicted amount of online prostitution by using the internet and legal environments as instruments. This regression was run with three specifications, in the same manner as the previous regressions: measuring levels, rates, and then natural logs. Table 7 shows an unclear story regarding the relationship between the internet, indoor prostitution, and rape. Specification 1, measuring levels, implies that an increase in 1 prostitute using the interaction of residential connections and prostitution laws is associated with a .85 decrease in rapes. This specification shows a negative and statistically significant relationship. Specification 2 and 3 show contrasting relationships between TER prostitution supply and rape, yet, neither specification is significant. Therefore, Table 7 shows a negative relationship between online indoor prostitution and rape using the instrumental regression with residential connections and prostitution laws as instruments. However, only one specification is significant, showing that this negative relationship may not be robust.

5.4 Robustness Checks using Violent Crimes

In order to make the relationship between the internet, indoor online prostitution, and rape more robust, controls for violent crime are added. One could argue that prostitution itself does not have a significant relationship with rape because there could be other common elements affecting violent crime, thus, said unknown common elements also affect rape. The following regression equation uses murder as an additional control representing a form of violent crime in order to control for these common elements.

Regression Equation 6:

$$\text{rape}_{rt} = \beta_1 \text{pros}_{rt} + \beta_2 \text{murder}_{rt} + \alpha_r + \alpha_t + \varepsilon_{rt}$$

In this regression equation the variables rape and pros have consistent meaning as in the previous equations. The new variable in this equation, murder, represents a total count of murder across states over time. Table 8 uses the 3 specifications used previously in this paper: levels, rates, and natural logs.

Specification 1 presents an expected, negative and statistically significant relationship between prostitution supply (measured through internet and legal environments) and rape. Additionally, in this specification there is no significant relationship between murder and rape, indicating that any common elements affecting crime is controlled for and does not affect TER prostitution supply. While specification 2 shows no significance and specification 3 shows the opposite story of the first specification, murder is still not statistically significant in any of the specifications. Therefore, table 8 has been effective in making the relationship between TER prostitute listings and rape more robust by controlling for elements affecting violent crime.

Chapter VI: Conclusions

Overall one can determine that the empirical results imply a negative and significant relationship between TER prostitution supply and rape. This finding is consistent with my hypothesis that a negative relationship between prostitution and rape exists. This finding is consistent with the findings from Cunningham and Shah (2014), a study which finds that the decriminalization of prostitution in Rhode Island between is associated with a 31% decrease in state wide rape between the years 2004 and 2009. My study confirms and expands these findings by using data from 28 states rather than Rhode Island individually.

My findings indicate a negative relationship between TER prostitution supply and rape. As seen in Table 3 and Table 4, an increase of 1 TER prostitute listing is associated with a decrease of .06 rapes on the city level and decrease of .04 rapes on the state level. Table 5 indicates that this study cannot provide significant results indicating the relationship between prostitution arrests and TER prostitution supply, and thus is not able to discuss conclusions about shifting of outdoor and indoor markets. Table 6 indicates that residential internet connections have a positive correlation with TER prostitution supply and the legal environment also has a positive impact on TER prostitution supply in certain specifications. Table 7 indicates that an additional 1 online indoor prostitute is associated with a decrease in .8 rapes when residential internet connection and legal environments are used as instruments. Table 8 shows that when an additional control is used (murder) the relationship between online indoor prostitution and rape remains significant and negative.

The results of the OLS and IV regressions indicate very different magnitudes for the impact of TER prostitution supply on rape. The IV regression indicates that TER prostitute listings and rape have almost a 1:1 relationship. The OLS regression indicates a much smaller magnitude, with about a 1:.04 relationship. As stated when discussing the validity of instruments, the internet could affect rape in channels other than TER prostitution supply. Therefore, the IV regression could be an overestimate. Additionally, TER prostitution supply is seen to be a noisy measure of the indoor, online prostitution supply. Therefore, this measurement error could bias the coefficients in the OLS equation closer to 0, creating underestimation of the impact of TER prostitution supply on rape. Consequently, the IV and the OLS regressions represent a spectrum of potential impact that online indoor prostitution (measured through TER supply or internet and legal environments) could have on rape, but does not pinpoint a specific number measuring the magnitude of effect.

These results are subject to many limitations. Due to the illegal nature of prostitution, the indoor prostitution supply data has many limitations. The measure used in this study clearly does not represent the actual entire indoor prostitution market, rather a small percentage taken from a large online review site. In this way, the prostitutes that solicit online either independently or on a site that is not The Erotic Review are not included in this data set. Additionally, the data set was generously given by Scott Cunningham, and I did not have the proper resources to collect more data to enhance this data set. An additional challenge with this study was using mostly state level rather than city level analysis. The prostitution data had to be aggregated into the state level, as the residential internet connection data could only be found on the state level. Therefore, the prostitution

data for some states may not have full representation. An additional limitation stated in the beginning of the empirical section is the difficulty with the natural log data. Due to the rapid growth of The Erotic Review, and consequently the measurement of the supply of indoor prostitution used, the years for natural logs had to be restricted. In this way, the small time period used for natural logs (2004-2013) is also a limitation within this study.

Although this study does have many limitations, the conclusions still lead to many implications. The finding of a relationship between increased TER prostitution supply and decreased rape shows that feminists and economists should view prostitution in a different light. Rather than viewing prostitution and rape as two separate entities, these findings call for the two topics to be analyzed in relation to one another. Therefore, the debate around prostitution should not be formed without considering that taking prostitution indoors could mitigate social harms. Additionally, these findings support others which conclude that prostitution has the opportunity to reduce social harms, rather than perpetuate them. Therefore, indoor prostitution has the potential to be seen in a more positive light within the debate. This idea is not to: negate the known harms of individual prostitutes entirely or make the claim that this relationship always exists, but rather to show that there is a relationship between rape and social harms that needs to be further discussed and researched.

The negative relationship between prostitution and rape can also add to the debate in feminist literature on prostitution by providing empirical results that lie alongside the foundational feminist theories discussed in the introduction of this study. The empirical relationship found between prostitution and rape can shed a new light on the radical feminist theory, which states that prostitution perpetuates forms of female subordination

and thus can lead to increased sexual violence, assault, rape, etc. By no means do the findings of this paper intend to state that all women should become prostitutes in order to eradicate rape or that the radical feminist theories are proven wrong by the empirical findings of this study. As seen in the first sections of this paper, prostitution and rape are both extremely complex and highly debated subjects. An empirical finding solidifying a relationship between prostitution and rape rather pushes for individuals to view the two subjects in conjunction. The findings of this paper cannot make claims that prostitution intervenes in perpetuating all forms of female subordination. However, the findings do provide results that imply an empirically negative relationship between prostitution and rape. As seen throughout this study, the results are subject to many limitations. Therefore, the findings cannot necessarily support or contest the radical feminist theory, but rather further confirm that there is a relationship between prostitution and rape that should be discussed in depth.

Additionally, the empirical findings of this paper are not necessarily groundbreaking or relevant in affecting the socialist or liberal feminist theories on prostitution. However, as noted in the introduction, the socialist and liberal feminist theories can still root the empirical findings within a feminist context. As the results find a relationship between increased prostitution and decreased rape, within the context of the liberal feminist, prostitution can be seen as a positive step for women. In this case, the interpretation of the empirical results would be different than if the interpretation was contextualized within the socialist theory in the sense that prostitution could be seen as the conjunction of capitalism and patriarchy exploiting women. In this way, the empirical results do not

necessarily support or contest the socialist and liberalist theories of prostitution, but rather the theories change the context in which the empirical results are interpreted.

As seen from the empirical results, the internet plays an ambiguous role in shifting the indoor prostitution market, thus, affecting rape. Although the relationship between increased residential internet access and indoor prostitution is not extremely strong, there are certain specifications showing a strong positive correlation between the internet and indoor prostitution. This finding implies that the internet has an empirically positive relationship with the supply of indoor prostitution, but is not an extremely strong relationship. This finding is consistent with my hypothesis that the internet plays a significant role in prostitution, but the finding is not as strong as my hypothesis implies, due to the fact that this relationship was only found within certain specifications.

When the variable interacting prostitution laws with residential connections is added, there is a positive relationship found in certain specifications. This result implies that the internet has can shift the online indoor prostitution market differentially, based on legal environment. Therefore, the findings from the interactive term in certain specifications strengthen the overall positive relationship between the internet and indoor prostitution by showing that the internet encourages growth of the safer indoor market. Additionally, Regression Equation 4 indicates that within certain specifications the indoor market is growing as prostitution arrests are declining. By finding that the internet does have a force on the growth of indoor prostitution, this result is a positive for women in the sense that the internet helps move women into a safer sector of prostitution, relative to outdoor.

Although my overall statistical results are not extremely robust, my findings do provide valuable and much needed insight in regards to the relationship between the internet, indoor prostitution, and rape. The significant findings from this paper have implications which call for not only more discussion, but discussion of prostitution in an updated and modern light. Prostitution can no longer be considered by itself, or an issue for only feminists to discuss. Prostitution is a subject which must be discussed in conjunction with modern elements and by scholars with diverse backgrounds. As seen from this paper, more interdepartmental studies of this topic will only enhance the current debate and lead to progress in regards to women working as prostitutes and the prostitution market in general.

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Appendix

Table 1: City Level Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
TER Supply Rate (per 10,000)	3.798	5.748	.00829	39.887
Violent Crime Rate (per 10,000)	114.15	90.345	14.158	1135.515
Rape Rate (per 10,000)	4.994	2.408	.418	13.79

Table 2: State Level Descriptive Statistics

Variable	Mean	Std. Dev	Min	Max
TER Supply Rate (prostitution supply/ population, per 10,000)	0.866	3.113	0.00150	29.131
Rape Rate (rape/ population, per 10,000)	3.25	0.955	1.115	5.634
Residential Connection Rate (per 10,000)	1666.668	915.939	38.183	3210.385
Maximum Jail Sentence (days)	426.6667	386.8272	30	1825
Maximum Fine (dollars)	3750	5607.994	500	25000

Table 3: Basic OLS Relationship between TER Prostitute Supply and Rape at the City Level

VARIABLES	(1) rape	(2) rape	(3) Rape	(4) rape_rate	(5) rape_rate	(6) rape_rate	(7) lnrape	(8) lnrape	(9) lnrape
TER_pros_supply	-0.0880***	-0.0693***	-0.0601***						
	(-6.962)	(-4.152)	(-3.553)						
TER_pros_supply_rate				-0.0838***	-0.0366**	-0.0260*			
				(-7.199)	(-2.533)	(-1.750)			
lnTER_pros_supply							-0.0156	0.126***	0.0712**
							(-0.885)	(4.235)	(2.349)
Constant	361.9***	316.0***	6,254**	0.000506***	0.000524***	0.0193***	5.529***	5.066***	59.40***
	(71.81)	(5.162)	(2.623)	(75.19)	(4.608)	(6.131)	(61.84)	(40.25)	(3.853)
Observations	552	552	552	550	550	550	385	385	385
R-squared	0.087	0.186	0.097	0.092	0.245	0.152	0.002	0.199	0.037
Number of city1	40	40	40	40	40	40	40	40	40
Region FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	No	No	Yes	No	No	Yes	Yes
Time Trend	No	No	Yes	No	No	Yes	No	No	Yes

lnpros_supply restricted (2004-2013)
t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Basic OLS Relationship between TER Prostitute Supply and Rape at the State Level

VARIABLES	(1) rape	(2) rape	(3) rape	(4) Raperate	(5) raperate	(6) raperate	(7) lnrape	(8) lnrape	(9) lnrape
TER_pros	-0.409***	-0.466***	-0.453***						
	(-13.53)	(-10.76)	(-10.67)						
TER_prosrate				-0.0606***	-0.0265***	-0.0274***			
				(-6.768)	(-3.454)	(-3.501)			
TERlnpros							-0.0480***	0.0298*	0.0291**
							(-6.058)	(1.944)	(2.038)
Constant	2,839***	2,467***	-9,927	0.000327***	0.000367***	0.0103**	7.820***	7.466***	50.10***
	(166.5)	(9.918)	(-1.135)	(171.1)	(12.91)	(13.28)	(176.6)	(101.1)	(7.454)
Observations	381	381	381	381	381	381	252	252	252
R-squared	0.342	0.423	0.346	0.115	0.445	0.398	0.141	0.280	0.271
Number of state1	28	28	28	28	28	28	28	28	28
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	No	Yes	No	No	Yes	No	No	Yes	No
Time Trend	No	No	Yes	No	No	Yes	No	No	Yes

Lnpros restricted (2004-2013)

t-statistics in parentheses

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

Table 5: OLS Regression Viewing Effects of Prostitution Arrests on TER Prostitution Supply

VARIABLES	(1) TERpros	(2) TERprosrate	(3) TERlnpros
L.pros_arrest	-0.0194		
	(-1.381)		
L.pros_arrest_rate		-0.00746	
		(-0.889)	
L.lnprosarrest			0.0460
			(1.245)
Constant	230.2***	1.96e-05***	4.376***
	(4.087)	(4.009)	(17.32)
Observations	269	269	215
R-squared	0.487	0.566	0.761
Number of state1	27	27	27
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

lnpros_arrest restricted (2004-2013)
L. refers to time lag added to independent variables
t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6: OLS Regression Establishing Internet Access as Instrument

VARIABLES	(1) TERpros	(2) TERprosrate	(3) TERlnpros
residential_connections	0.000343***		
	(10.51)		
int_maxfine	1.13e-08***		
	(2.949)		
int_maxtime	-3.26e-07***		
	(-3.761)		
res_int_rate		0.00447***	
		(4.347)	
int_maxfine_rate		-6.38e-09	
		(-0.179)	
int_maxtime_rate		-1.05e-06	
		(-1.420)	
o.lnresint			-
o.lnint_maxfine			-
lnint_maxtime			1.560***
			(4.124)
Constant	17.74	-6.79e-05	-25.07***
	(0.349)	(-1.434)	(-3.472)
Observations	310	288	223
R-squared	0.706	0.189	0.775
Number of state1	23	23	23
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

(Due to mathematical nature, lnresint and ln_maxfine omitted due to multicolinearity issues)
lnpros restricted
t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7: Second Stage IV Regression Using Internet Access as Instrument

VARIABLES	(1) rape	(2) Raperate	(3) lnrape
pros	-0.852***		
	(-9.911)		
prosrate		-0.0103	
		(-0.390)	
lnpros			0.0826
			(1.628)
Constant	2,684***	0.000354***	7.209***
	(50.95)	(62.83)	(30.11)
Observations	288	288	201
Number of state1	23	23	23
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

lnpros_supply restricted

z-statistics in parentheses

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

Table 8: IV Regression with Violent Crime Control

VARIABLES	(1) rape	(2) raperate	(3) lnrape
pros	-0.864***		
	(-7.611)		
murder	-0.141		
	(-0.409)		
prosrate		0.0231	
		(0.348)	
murder_rate		0.476	
		(0.860)	
lnpros			0.233***
			(2.980)
lnmurder			0.0338
			(0.586)
Constant	2,749***	0.000321***	6.605***
	(16.15)	(8.329)	(16.22)
Observations	288	288	267
Number of state1	23	23	23
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

lnpros restricted
z-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1