

Sex Workers and the Cost of Safe Sex

The Compensating Differential for Condom Use in Calcutta

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Prostitution is often called the world's oldest profession, yet economists almost never study it. The practice of safe sex by commercial sex workers is considered central to preventing the transmission of AIDS in developing countries — yet sex workers in Calcutta who regularly use condoms suffer a 79 percent loss in their average earnings per sex act.



Summary findings

The practice of safe sex by commercial sex workers is considered central to preventing the transmission of AIDS in developing countries. Rao, Gupta, and Jana estimate the compensating differential for condom use among sex workers in Calcutta, based on results from a survey conducted in 1993.

If, as suggested by anecdotal evidence, this loss in income is large, it would indicate the existence of strong disincentives for practicing safe sex.

To identify the relationship between condom use and the average price per sex act, they follow an instrumental variable approach, exploiting an intervention program focused on providing information about the AIDS virus and about safe sex practices. The program, instituted in 1992, was not systematically administered.

Using this method, they found that sex workers who always use condoms face a loss of 79 percent in the average earnings per sex act.

This paper — a product of Poverty and Human Resources, Development Research Group — is part of a larger effort in the group to understand the behavior underlying HIV/AIDS transmission. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Patricia Sader, room MC3-556, telephone 202-473-3902, fax 202-522-1153, email address psader@worldbank.org. Policy Research Working Papers are also posted on the Web at www.worldbank.org/research/workingpapers. Vijayendra Rao may be contacted at vrao@worldbank.org. May 2000. (18 pages)

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The Compensating Differential for Condom Use in Calcutta

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1. Introduction

Prostitution is often described as the world's oldest profession yet economists have almost never studied it. The neglect of this important market is particularly glaring in the face of the AIDS epidemic and the consensus that commercially purchased sex is central to the spread of the disease in the developing world (World Bank 1997, Jain et. al., 1994). More than 90 per cent of all adult HIV infections are in developing countries and the vast majority of these cases were contracted from heterosexual sex with an infected partner. To date, AIDS has had the greatest impact in Africa where it is estimated that over 2.5 percent of adults have been infected with the disease. Now, however, the disease is thought to be widespread in South Asia where the first case was reported in 1986. Experts believe that without drastic measures South Asia may suffer effects as devastating as those observed in sub-Saharan Africa.

Promoting the use of condoms and other safe sex practices among sex workers is known to be perhaps the most effective method of preventing the spread of the epidemic in the developing world. In India as in most other developing countries, however, men have a strong preference against using condoms. One indicator of this is that despite many decades of extensive government sponsored "family planning" campaigns promoting their use, condoms have not become a commonly used method of contraception. Recent data from a nationally representative sample show, for instance, that only 7% of married couples use condoms, with female sterilization being the most widely used method of contraception (27 per cent), followed by abstinence and other traditional methods (20 per cent)¹. This inherent resistance to using condoms is compounded by a lack of awareness about HIV/AIDS and safe sex practices in the general population². Consequently sex workers who want to practice safe sex potentially face losing a considerable amount of income by doing so. Anecdotal evidence suggests that sex workers could face at least a fifty percent loss in income by practicing safe sex (Bhave et. al, 1995). There are, however, no direct estimates of the size of this disincentive for safe sex.

If effective policies to combat AIDS are to be devised it is, thus, very important to have some knowledge of the size of the compensating differential faced by sex workers who want to use condoms. If the income loss is large, this suggests that HIV/AIDS interventions among sex workers may need to

¹ International Institute of Population Studies, *National Family and Health Survey (NFHS)*, (1992-93).

² The NFHS also found that only 36 per cent had heard of AIDS in 1993 (NFHS, 1993). A much smaller proportion were likely to have heard of HIV the virus that causes AIDS and therefore of the best methods of preventing it – though these questions were not asked in the NFHS survey. Another survey did ask more detailed questions and found that though 35 per cent had heard of AIDS only 4 per cent were aware of the HIV virus and of measures to prevent its transmission (Gupta and Mitra, 1998). A third survey of people attending an STD clinic in 1993-94, who would be expected to be more aware of STDs than the general population, found that only 14 per cent knew that condoms were effective in preventing HIV transmission (Grover et.al. xx).

find ways of providing compensation for lowered earnings while actively educating clients about the dangers of not using condoms. However, as the client population becomes aware and concerned about the risks of contracting AIDS and thus more receptive to using condoms, this compensating differential should wither away and may even become positive.

Despite the importance of the topic, the literature on the economics of prostitution is sparse. Ahlburg and Jensen (1998) in a recent summary of the literature on the commercial sex industry and its implications for HIV/AIDS prevention policies, show that there is a total absence of econometric work. The primary reason for this is the extreme difficulty in gathering reliable data on sex workers since the profession is practiced either illegally or, as in the case of Calcutta - the focus of our paper - on the fringes of legality. While there is a lack of work by economists on sex work, there is a large and growing economics literature on the AIDS epidemic more generally, which has dealt with it from different angles. Some studies have attempted to estimate the macroeconomic impact of the epidemic finding that it is likely to be small (Over 1992), while others have attempted to look broadly at what rational choice analysis can say about the progression of the epidemic (Philipson and Posner, 1995). Kremer (1996) in a theoretical paper examines AIDS transmission in a dynamic model and shows that the prevalence of AIDS would lead people with low levels of sexual activity to be less active. On the other hand it may lead high activity people to become "fatalistic" and thus either reduce their activity only slightly or even increase it. In a mixed population with high and low activity people this creates a positive feedback, by reducing the number of available partners - resulting in higher risks of infection for high activity people and low levels of risk for low activity people.

The micro-econometric literature on AIDS has tended to suggest that epidemiological models of the epidemic may overestimate the speed of its transmission. Ahituv, Hotz and Philipson (1996), for instance, show that condom use increased among individuals in the United States in a manner consistent with the progression of the epidemic - supporting the idea that the epidemic may be self-limiting. In a study of gay men in San Francisco, Dow and Philipson (1996), demonstrate that mating is infection dependent in that infected men are twice as likely as non-infected men to have infected partners which would also tend to slow down the progression of the disease. The econometric literature on AIDS in the developing world is limited and has tended to focus more on assessing its impact rather than on testing behavioral models (World Bank, 1997).

In this paper we use a unique data set of a random sample of commercial sex workers in Calcutta, India surveyed in 1993. They were the focus of a program promoting the health of sex workers and safe sex practices that was initiated in 1992 by the All India Institute of Hygiene and Public Health in collaboration with various other organizations. We exploit the random nature of selection into this

program to identify the relationship between the price of sex work and condom use and thus estimate the compensating differential for safe sex. This instrument allows us to eliminate a serious source of bias common to estimates of compensating wage differentials – biases introduced by simultaneity and unobserved productivity (Garen 1988, Hwang, Reed and Hubbard 1992).

In many ways the market for sex work is simply another labor market. Sex workers in the red light area of Sonagachi in Calcutta who are the focus of this paper are almost always part of a brothel under the ownership of a madam or pimp. They are required to pay fifty per cent of their earnings as rent and “protection” to the person controlling the brothel. The market is quite competitive with over 4,000 sex workers working in 370 brothels servicing about 20,000 clients a day (AIIH&PH, 1997). Calcutta is one of the world's largest cities with an estimated population 13 million of which 31 per cent are migrants. This results in a male dominated sex ratio with 0.83 females for every male in the population that in turn causes the demand for sex work to be consistent and high. Sonagachi is the oldest and best established red-light area in Calcutta and has been in existence at least for 150 years. It is located close to Calcutta University which provides a steady source of clients, and like many other older Calcutta neighborhoods consists of a dense network of narrow, winding streets lined by two and three story buildings. The brothels are supported by a number of restaurants, teashops, bars and other businesses that serve sex workers and their clients in the area.

Sex work is a highly stigmatized activity. Women who enter the profession are rarely able to participate in mainstream social activities and see themselves as “fallen.” In most instances they are cut off from their families, even though some continue to send them remittances. Children of sex workers cannot find spouses from mainstream society and have to marry within the community - which is also indicative of a sex worker’s status as an outcaste. In another survey conducted in Sonagachi in 1992, sex workers were asked the reason why they entered the profession. Table 1 summarizes the responses by income categories of sex workers showing that the majority of sex workers (49 per cent) became sex workers because of acute poverty. This includes situations where destitute parents were compelled by circumstances sell their daughters to pimps or their agents, or where widowed women are forced into it to subsist after the death of their husbands. In an ethnographic study of Sonagachi, Sleightholme and Sinha (1997) suggest that a large number of women enter the profession in order to escape violent husbands, or to support themselves after being abandoned by their husbands. This is substantiated in Table 1 that reports results from an earlier survey of Sonagachi conducted in 1992³. It shows that 1.6 per cent of women entered the profession because of family disputes. Despite the highly stigmatized nature of the

³ We have not been able to obtain these data and are therefore unable to further analyze them.

profession, 8.7 per cent enter it voluntarily. This is because it is a lucrative occupation relative to the rather low earnings potential of other professions open to poorer Indian women.

As in other markets, sex workers are compensated on the basis of their attributes, the services they provide and the demand for those attributes and services. Vaginal sex is the most typical service provided and is practiced in almost all the transactions. Oral and group sex are also prevalent, while anal sex is practically non-existent. While rates are to some extent determined by negotiation, the market is large and competitive and there is a good sense of the "correct" wage or price with differences arising from the sex workers age, physical attributes and her level of education. A sex worker gets to keep about fifty per cent of her earnings, with the rest taken by the madam or pimp.

Methodology

One can think of prices for sex work as being determined by a hedonic function relating the price to a set of characteristics.

$$P=P(X, C) \quad (1)$$

Where P denotes the average rate per act charged by the sex worker, X is a vector of attributes of the sex worker, and C is a variable denoted whether the sex worker practices safe sex, specifically whether her clients always use condoms.

As in any implicit market this function is affected by both demand and supply factors. Estimates of the impact of any characteristic on the price has to be thought of as the result of an equilibrating process. If clients have a strong preference against using condoms (Bhave 1995, Sleightholme & Sinha 1997) and sex workers would like to have condom using clients in order to protect themselves from the AIDS virus, then the theory of equalizing differences (Rosen, 1986) suggests that we should observe a negative relationship between condom use and the average price charged by the sex worker. The actual compensating differential would reflect the point at which the market reaches equilibrium given the attributes, income and preferences of sex workers and clients. Estimating such compensating differentials, however, is not a straightforward exercise and problems of unobserved heterogeneity can cause serious biases in the estimates. Hwang, Reed and Hubbard (1992) point out that unobserved productivity, even if it is not correlated with observed measures of productivity, can cause a large positive bias in estimates of the compensating differential. This is because workers with higher values of the unobserved attribute are more likely to have greater earnings as well as more likely to choose less risky

job attributes, since both are normal goods. Consequently, estimates of the hedonic wage equation will be biased in a direction opposite to the (true) compensating differential. Various approaches have been employed to deal with the problem, including the use of panel data (Duncan and Holmlund, 1983) and instrumental variables (Garen, 1988). While we lack panel data, participation in the safe sex training program provides us with a valuable instrumental variable that is able to correct the bias inherent in OLS estimates of effect of condom use on wages of sex work.

In September, 1992 the All India Institute of Public Health and Hygiene began a program in Sonagachi that attempted to provide basic health care facilities to sex workers and their families in Sonagachi while also educating them about HIV/AIDS and the methods to aid in its prevention. The HIV/AIDS information was communicated in a manner that proved to be both innovative and effective. Initially, a group of twelve sex workers were recruited to become peer educators. They were given intensive training on AIDS and other aspects of health care, provided with green coats to identify them as medical workers, and sent into the community to promote safe sex practices. The primary tool they employed for this purpose was a flip chart that used a series of pictures to explain the nature and progression of the HIV virus, its effect on the human immune system, and how the use of condoms was the most effective method of preventing the disease. They also carried condoms with them to distribute to the sex workers free of cost while demonstrating their proper use. Sex workers who wished to use condoms, subsequent to meeting the peer educator could pick them up for free from nearby locations, thus condoms were available in unlimited supply at zero cost.

The peer educators would contact about 40 to 50 sex workers every day and by the time the survey was conducted in 1993 about 53 per cent of them had been contacted in this manner. It is important to note that those who were contacted were not selected on the basis of their income, age, schooling, or any other characteristic: the peer educators would simply target a set of brothels in an area of Sonagachi and move on to another area the next day⁴. Thus, while the selection was not random in a technical sense, it was also not systematically related to any observed or unobserved attributes relevant to this analysis.

Prior to this contact with the peer educators, even if the sex workers had heard of AIDS most did not have any detailed knowledge of the disease or a sense of how safe sex practices could prevent its transmission. Thus flip charts represented the first time that most the sex workers were receiving accurate and complete information on AIDS. Since the flip charts were not administered in a systematic manner

⁴ The brothels are not located in a systematic pattern. Each street in Sonagachi has a mix of "high-class" and "low-class" establishments that sometimes co-exist within the same building.

and were effective tools in encouraging safe sex while providing sex workers with access to free condoms, they can be potentially used to identify the compensating differential for condom use.

We can posit the existence of an equation determining whether a sex worker always uses condoms:

$$C=C(X, S) \quad (2)$$

where C is a binary variable denoting condom use, X is the vector of sex worker characteristics, and S is a dummy indicating if the sex worker has seen the flip chart. We will estimate (2) and (1) simultaneously using instrumental variables to get unbiased and consistent estimates of the impact of condom use on income. In particular, it helps deal with an important type of unobserved heterogeneity in this market - the sex worker's physical attractiveness which will bias the estimate of the impact of condom use on income if condom use is not instrumented. Physical attractiveness is perhaps the most important attribute in determining earnings from sex work and is also very difficult to measure. Since it is not measured, estimates of the impact of condom use on sex worker wages can be seriously biased because sex workers who are relatively attractive and consequently have a high demand for their services may also be more willing to "purchase" safe sex by using condoms. However, their earnings would remain high relative to the rest of the population. This would cause condom use to show a positive correlation with the average rate per act, which is a problem similar to the bias caused by unobserved productivity on estimates of compensating differentials in other labor markets (Hwang, Reed and Hubbard, 1992). While any such unobserved heterogeneity is a potential problem in OLS estimates of prices, so long as the excluded variable - contact with a peer educator - is not correlated with the source of unobserved heterogeneity, condom use can be instrumented to correct for the bias.

As explained above the data for this analysis are from a random sample of 612 sex workers in Sonagachi from a survey conducted in 1993. The sex workers were surveyed by a team social workers under the supervision of the All India Institute of Hygiene and Public Health (AIHH&PH). AIHH&PH had a presence in Sonagachi for more than a year at the time of the survey and were therefore able to establish an excellent rapport with the sex workers and thus elicit accurate responses⁵. While the survey instrument was primarily focussed on medical evaluations, a number of socio-economic questions were also asked. It should be noted that there are two main limitations in the survey from the perspective of estimating compensating differentials. Clients were not surveyed, which prevents us from saying anything about the demand side of the market, and questions on prices were not based upon different

⁵ See the AIHH&PH report (1997) for more details.

types of service but on the average price charged per act. Therefore, while we know the average price charged by a sex worker we do not have direct information about how this changed if the sex worker used condoms or varied the type of service offered.

For the vector \mathbf{X} denoting sex worker characteristics we will include her education - divided into three categories for primary school (4th), middle school (7th) and high school and above (10th). We will also include the sex workers age in years, her tenure in the profession in months, whether she was married before coming into the profession, the number of children she has, and whether she has had a tubal ligation⁶. For the condom use variable C we will use a binary classification asking if she always uses condoms or not, and S which is excluded from the price equation is also a binary variable denoting whether the sex worker has seen the flip chart. Thus, we will estimate the impact of always using condoms on a sex worker's average wage per act.

Results

The sex workers in Sonagachi are reputed to be the most prosperous in Calcutta but Figure 1, which provides a diagram of the kernel density estimate of the average rate per act, shows that they are a highly heterogeneous group with a wide variation in their earnings. The median price charged is forty rupees, but the average price charged by a sex worker range from a minimum of Rs.15 to a maximum of Rs. 600 per act⁷. Ninety per cent of the sex workers charge less than Rs.100, and 25 per cent charge less than 30 rupees. This heterogeneity is also reflected in sex worker characteristics that have been summarized in Table 2. The average age is 23 with sex workers ranging in age from fourteen to fifty. About 21 per cent of them have had some schooling and they have spent an average in sex work with 19 being the average age of entry into the profession. On average a sex worker has 0.6 children with about 20 per cent of them having been married before entering the profession. The female sterilization rate is about ten per cent, and about 42 per cent of them were medically treated in previous month. Finally, note that 47 per cent of the sex workers always use condoms and 54 per cent have been targeted by the peer educators and have seen the flip chart.

Table 4 presents results from a probit regression of the determinants of condom use. Firstly, note that controlling for all the \mathbf{X} variables, sex workers who have encountered a peer educator are about 12 per cent more likely to always use condoms. Sex workers who have been to the AIIPH&H clinic for medical treatment are about 7 per cent more likely to use condoms, though this is not significant at the 5

⁶ Note that since physical attractiveness is not likely to be correlated with education and therefore its omission is not likely to bias the education effects.

⁷ There are 4 outlying average rates that exceed 210 rupees that are omitted from the analysis.

per cent level. Condom use is also higher among younger sex workers and, to an extent, among the better educated since sex workers with a middle school education are 16 per cent more likely to use condoms than uneducated sex workers. Neither female sterilization nor number of children significantly affects condom use suggesting that condoms are not used as contraceptives.

Table 3 present OLS estimates of the log of the average rate per act. The first regression estimates a structural equation with condom use included as a right-hand side variable. The OLS results show that condom use has a positive but non-significant coefficient. The second regression estimates a reduced form log rate equation which excludes the condom use variable but includes the flip chart dummy. This regression shows that sex workers who have seen the flip chart have wages that are 18 per cent lower than those who have not seen the flip chart. Since sex workers were exposed to the flip chart in a relatively random manner, this indicates that exposure to the flip chart caused a change in behavior that resulted in lower wages. Since, the flip chart also increased condom use the mechanism driving this loss in income may be that sex workers who were better informed about HIV/AIDS preferred to use condoms even at the expense of a loss in income.

The second regression in Table 4 estimates the structural equation for the log rate with the instrumented condom use variable. Here we see that the condom use, which is significant at the 5 per cent level, reduces the average rate per act by about 79 per cent. While this suggests a very large compensating differential it is not all that unrealistic considering the 50 per cent loss income indicated by anecdotal evidence from sex workers in Bombay (Bhave et. al, 1995). Even if the estimate is biased downward it does clearly indicate that sex workers can face large losses in income by using condoms and this should be taken into consideration by any intervention that tries to introduce safe sex practices into sex worker communities.

The other variables have predictable but interesting effects on rates. Unlike other labor markets, age is negatively related to income with every year of age reducing the average wage earned by 2.5 per cent⁸. Note, however, that experience does not have a significant effect suggesting that the job-specific skills are not very important⁹. It is interesting to note that sex workers have large and significant returns to schooling. Sex workers with primary schooling do not make significantly more than uneducated sex workers, but those who have completed middle and high school make about 50 per cent more. This may be because clients and sex workers sort assortatively with more educated clients preferring better educated sex workers and paying more for their services. Also note that sex workers who were married before entering the profession make about 25 per cent less. This suggests a selection effect. Married

⁸ Age did not have any quadratic effects in these data and therefore only the linear specification is reported.

⁹While experience does not affect earnings, it may matter more in coping with the harsh realities of life in the red light area.

women are among those who have forced into prostitution by circumstances, while unmarried women were more likely to have been induced into joining the profession because of their ability to command a high price in the market.

To summarize the main findings in this paper, we have attempted to estimate the compensating differential for condom use for a sample of sex workers in Calcutta from 1993. An intervention program was instituted in 1992 which brought sex workers into contact with peer educators who instructed them about AIDS and safe sex practices, and was administered in a non-systematic manner. By 1993 fifty three per cent of the sex workers had come into contact with a peer educator. This is used to instrument a sex workers probability of always using condoms and thus identify the impact of condom use on earnings. We find that condom use can result in a 79 per cent loss in the average price per act. In order to institute effective interventions among sex workers it is crucial that this fact be taken into consideration.

The policy implications of this finding are quite important. If the economic disincentives to practice safe sex are as large as estimated here, HIV-AIDS interventions in populations where AIDS awareness is will face serious problems in promoting safe sex among sex workers – particularly in the initial years. Thus, any interventions should focus on simultaneously promoting safe sex practices among potential clients as well as sex workers. Some thought may also be given to the fact that sex workers may suffer large economic losses during the initial years of the intervention. This could be circumvented either by direct compensation or by a large scale program which results in a quick increase in condom use so that competition between sex workers does not drive down the price of safe sex. There are a number of open questions that remain. Does the disincentive for safe sex disappear as the intervention program matures? Do earnings of sex workers, in fact, increase as they are perceived as being “safer.” These questions will be addresses in future work.

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Table 1
Reasons for Entering Sex Work by Average Rate Category – (Prices in 1993 Rupees)
 (Source: AIH&PH, *A Dream, A Pledge, A Fulfillment: Five Year Stint at Sonagachi 1992-1997*,
 Calcutta, 1997)

Reasons	>Rs.110	Rs. 55 – Rs.110	<Rs.55	All Categories
% Acute poverty	39.5	60.8	38.8	49.1
% Voluntarily joined	9.9	4.8	13.1	8.7
% Family dispute	21.0	19.1	25.0	21.6
% Tricked into joining	23.5	10.0	18.8	15.6
% Traditional Sex Workers	6.2	4.3	4.4	4.7
% Kidnapped	0.0	0.1	0.0	0.4
Total in category	81 (100 %)	207 (100%)	160 (100%)	448 (100%)

Table 2
Descriptive Statistics

<u>Variable</u>	<u>Mean</u>	<u>Std.Dev.</u>
Average Rate Per Act – 1993 Rupees	49.936	32.457
Age	23.273	5.576
Months in Sonagachi	47.235	
Primary School (4 th Grade)	0.031	
Completed Middle School (7 th Grade)	0.123	
Completed High School (10 th Grade)	0.054	
Married Before coming to Sonagachi	0.192	
Number of Children	0.631	0.860
Sterilized	0.102	
Medically Treated Last Month	0.424	
Seen Flip Chart	0.535	
Always Uses Condoms	0.473	

Figure 1

Kernel Density of Real Rate Per Act

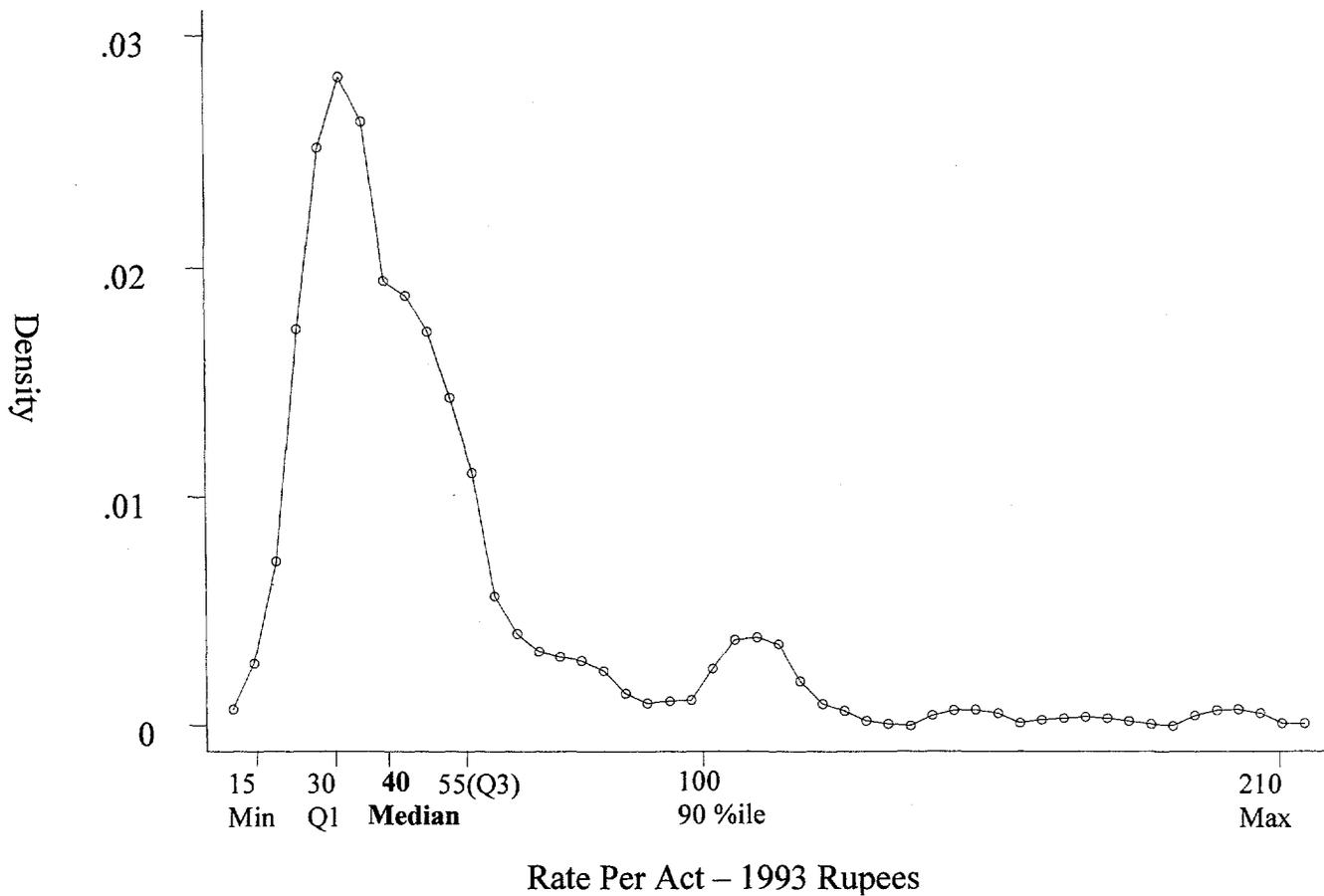


Table 3

(Standard Errors are Heteroskedasticity Corrected)

Variable (N=608)	Log Average Rate Per Act - Structural OLS		Log Average Rate Per Act - Reduced Form OLS		Log Average Rate Per Act - IV	
	<i>Coefficient</i>	<i> t </i>	<i>Coefficient</i>	<i> t </i>	<i>Coefficient</i>	<i> t </i>
Age	-0.0094	2.2	-0.0103	2.5	-0.0251	2.1
Years in Profession	0.0003	0.7	0.0006	1.4	0.0014	1.4
High School (10+)	0.3198	3.9	0.3218	4.0	0.4717	2.2
Middle School (7 th Grade)	0.3029	4.5	0.2894	4.1	0.5346	3.6
Primary School (4 th Grade)	0.0217	0.2	0.0671	0.7	0.1963	0.8
Married	-0.1904	5.0	-0.1183	2.9	-0.2458	2.5
Number of Children	0.0299	1.1	0.0156	0.6	0.0436	0.8
Sterilized	-0.0413	0.6	-0.0138	0.2	-0.1649	1.2
Medically Treated Last Month	-0.0555	1.4	-0.0603	1.6	-0.0498	0.5
Seen Flip Chart	---	--	-0.1799	4.0	---	--
Condom Always Used	0.0520	1.3	---	--	---	--
Condom Always Used - IV	---	--	---	--	-1.5845	2.1
Constant	3.9338	43.7	4.0569	45.9	4.9483	9.9

Table 4

(Standard Errors are Heteroskedasticity Corrected)

Variable (N=608)	Seen Flip Chart (Probit)		Condoms Always Used (Probit)	
	<i>Partial Derivative</i>	z	<i>Partial Derivative</i>	z
Age	-0.0030	0.1	-0.0097	1.8
Years in Profession	0.0016	3.0	0.0006	1.2
High School (10+)	-0.0441	0.4	0.1132	1.2
Middle School (7 th Grade)	-0.1147	1.7	0.1560	2.5
Primary School (4 th Grade)	0.3273	2.2	0.0876	0.7
Married	0.5549	7.9	-0.0895	1.6
Number of Children	-0.1015	3.3	0.0175	0.6
Sterilized	0.2109	2.8	-0.0970	1.3
Medically Treated Last Month	-0.0499	1.2	0.0740	1.8
Seen Flip Chart	---	---	0.1122	2.5

Table 6: Marginal rate of return to education for women in India

Author	Year	Region	Rate of return
Kingdon	1996 ¹	Urban Uttar Pradesh	4.9
Tilak	1990	Andhra Pradesh	3.6
Duraisamy	1988	Rural Tamil Nadu	0.8

Source: Kingdon (1996).

Notes: ¹ Specification with parental background.

Table 7: Returns to education by level

Level of education	Kingdon	Unni
	(Urban Uttar Pradesh)	(Urban Tamil Nadu)
Primary	-3.2	0.0
Junior	13.4	11.5
Secondary	20.8	20.0
Higher	14.0	27.0

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