Bang for Your Buck: STI Risk \textit{and} Pregnancy Risk as Sources of the Price Premium for Unprotected Sex

Constantine Manda

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Road Map

Summary of the Paper
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Pregnancy Risk
  Pregnancy Risk
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Conclusion and Take Aways
Sex workers receive a price premium each time they have unprotected sex.
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Research has inferred that the source of this price premium for unprotected sex is a compensating differential for STI risk.
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I introduce a compensating differential for pregnancy risk as a novel source of the premium for unprotected sex through a simple model that incorporates both STI risk and pregnancy risk.
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Research has inferred that the source of this price premium for unprotected sex is a compensating differential for STI risk.

I introduce a compensating differential for pregnancy risk as a novel source of the premium for unprotected sex through a simple model that incorporates both STI risk and pregnancy risk.

I empirically test for both using a rich panel dataset from Robinson and Yeh(2011) of 19,041 sexual transactions by 192 sex workers in Busia, Kenya collected during 2005 and 2006.
I run sex worker-fixed effects regressions.
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I also use instrumental variables approach to check for robustness of both STI risk and pregnancy risk as sources of the price premium.

I find a price premium for STI risk is USD 2 or 24 percent of average price, while the price premium for pregnancy risk is USD 10 or five times the premium for STI risk.
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I find a price premium for STI risk is USD 2 or 24 percent of average price, while the price premium for pregnancy risk is USD 10 or five times the premium for STI risk.

I also test if clients’ disutility for condoms, another competing theory, is also a source of the price premium for unprotected sex and find that it is not.
Identifying and estimating these sources of the price premium for unprotected sex will allow public health practitioners to tailor public health interventions differentially depending on which one of these sources dominates.
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There is a need to target both sex workers and clients through comprehensive interventions that incorporate sex worker fertility preferences.
Sources of the Price Premium for Unprotected Sex
Sex workers receive a price premium each time they have unprotected sex.
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This price premium has been documented in:

- India (Rao et al. 2005)
- Mexico (Gertler et al. 2005)
- Kenya (Robinson and Yeh 2011)
- Congo (Ntumbanzondo et al. 2006)
- Chicago (Levitt and Venkatesh 2007)
- Ecuador (Arunachalam and Shah 2013)
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- Chicago (Levitt and Venkatesh 2007) and most recently,
- Ecuador (Arunachalam and Shah 2013)
Price Premium
Average Price for Vaginal Sex
by Condom Use

<table>
<thead>
<tr>
<th></th>
<th>Price in Kshs</th>
</tr>
</thead>
<tbody>
<tr>
<td>With A Condom</td>
<td>549.8</td>
</tr>
<tr>
<td>Without a Condom</td>
<td>603.9</td>
</tr>
</tbody>
</table>

Source: Robinson and Yeh (2011)
Sex workers want to avoid getting STIs.
▶ Sex workers want to avoid getting STIs.
▶ STI prevalence increases with price for unprotected sex.
Sex workers want to avoid getting STIs.

STI prevalence increases with price for unprotected sex.

Arunachalam and Shah (2013) use local STI prevalence and find that a 1 percentage point increase in the local disease rate increases the premium for unprotected sex by 33 percent.
Sex workers want to avoid getting STIs.  
STI prevalence increases with price for unprotected sex.  
Arunachalam and Shah (2013) use local STI prevalence and find that a 1 percentage point increase in the local disease rate increases the premium for unprotected sex by 33 percent.  
But they also find a premium for unprotected sex in places where STI prevalence is zero.
Pregnancy Risk
Condoms exclude the possibility of STI infection and pregnancy.
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So, the inference that unprotected sex is transacted at a higher price than protected sex as compensation for increased STI risk is far from robust.
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So, the inference that unprotected sex is transacted at a higher price than protected sex as compensation for increased STI risk is far from robust.

Any empirical test of the compensating differential for STI risk must exclude the possibility of other costs which are also prevented through condom use and which sex workers might potentially wish to avoid, such as pregnancy.
A Simple Model
I introduce a novel source of premium for unprotected sex—a compensating differential for pregnancy risk with a simple model incorporating both STI risk and Pregnancy risk.
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Let \( P_1 \) be the price received by a sex worker for unprotected sex.
I introduce a novel source of premium for unprotected sex—a compensating differential for pregnancy risk with a simple model incorporating both STI risk and Pregnancy risk.

Let $P_1$ be the price received by a sex worker for unprotected sex.

Let $P_2$ be the price received by a sex worker for contracepted sex.
I introduce a novel source of premium for unprotected sex—a compensating differential for pregnancy risk with a simple model incorporating both STI risk and Pregnancy risk.

Let $P_1$ be the price received by a sex worker for unprotected sex.

Let $P_2$ be the price received by a sex worker for contracepted sex.

Let $Q$ be sexual transactions.
I introduce a novel source of premium for unprotected sex—a compensating differential for pregnancy risk with a simple model incorporating both STI risk and Pregnancy risk.

Let \( P_1 \) be the price received by a sex worker for unprotected sex.

Let \( P_2 \) be the price received by a sex worker for contracepted sex.

Let \( Q \) be sexual transactions.

Let \( G \) and \( S \) be the probability of getting pregnant and contracting an STI, respectively (where of course \( 0 \leq G \leq 1 \) and \( 0 \leq S \leq 1 \)).
Let $C_g$ be all the costs of pregnancy.
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Let $C_s$ be all the costs of STI transmission.
Let $C_g$ be all the costs of pregnancy.

Let $C_s$ be all the costs of STI transmission.

If the sex worker chooses to supply unprotected sex, her expected pay off would be:

$$P_1 Q - GC_g - SC_s$$

(1)
Let $C_g$ be all the costs of pregnancy.

Let $C_s$ be all the costs of STI transmission.

If the sex worker chooses to supply unprotected sex, her expected pay off would be:

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On the other hand, if the sex worker chooses to supply contracepted sex, her expected pay off would be:

$$P_2 Q - GC_g - SC_s$$
Let $C_g$ be all the costs of pregnancy.

Let $C_s$ be all the costs of STI transmission.

If the sex worker chooses to supply unprotected sex, her expected pay off would be:

$$P_1 Q - GC_g - SC_s$$  (1)

On the other hand, if the sex worker chooses to supply contracepted sex, her expected pay off would be:

$$P_2 Q - GC_g - SC_s$$  (2)

Where in this case $G$ and $S$ are both zero so that her expected pay off to supplying contracepted sex reduces to:

$$P_2 Q$$  (3)
Her decision rule is thus very simply to supply unprotected sex if and only if (1) is greater than (2), but to simplify, I let \( Q \) equal to 1, so that the sex worker is making this decision each time she engages in transactional sex or:

\[ P_1 - GC_g - SC_s > P_2 \]  

(4)
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$$P_1 - GC_g - SC_s > P_2 \quad (4)$$

I can thus bring $GC_g$ and $SC_s$ to the other side, and get:

$$P_1 > P_2 + GC_g + SC_s \quad (5)$$
This implies that the profit/utility maximizing sex worker will supply unprotected sex in the sex market if and only if:
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- The price received for unprotected sex (i.e. the price premium) exceeds the price received for contracepted sex in the sex market and,
This implies that the profit/utility maximizing sex worker will supply unprotected sex in the sex market if and only if:

- The price received for unprotected sex (i.e. the price premium) exceeds the price received for contracepted sex in the sex market and,
- The sum of the interaction between the probabilities of getting pregnant and getting STIs, and the costs of pregnancy and STI transmission.
Measuring Main Variables
STI Risk
STI Risk

- NoCondom × RiskyClient
STI Risk
- NoCondom × RiskyClient
- Pregnancy Risk
STI Risk

- \( \text{NoCondom} \times \text{RiskyClient} \)

Pregnancy Risk

- \( \text{NoCondom} \times \text{NoBirthControl} \times \text{ProbabilityofPregnancy} \)
STI Risk
- \( \text{NoCondom} \times \text{RiskyClient} \)

Pregnancy Risk
- \( \text{NoCondom} \times \text{NoBirthControl} \times \text{ProbabilityofPregnancy} \)

Clients’ Disutility for Condoms
- **STI Risk**
  - \(\text{NoCondom} \times \text{RiskyClient}\)

- **Pregnancy Risk**
  - \(\text{NoCondom} \times \text{NoBirthControl} \times \text{ProbabilityofPregnancy}\)

- **Clients’ Disutility for Condoms**
  - \(\text{NoCondom} \times \text{Disutility}\)
Probability of Pregnancy
I assume that sex workers, like most women, have a 26 to 32 day menstrual cycle.
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Ideally, the data would have exact information that would allow me to know when a sex worker is on the 1st, 2nd, 3rd, up to her 32nd of her menstrual cycle.
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But it does not.
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Ideally, the data would have exact information that would allow me to know when a sex worker is on the 1st, 2nd, 3rd, up to her 32nd of her menstrual cycle.

But it does not.

It does, however, have two variables that allow me to know at least the 1st through to the 5th days of the menstrual cycle, and be able to approximate the probability of pregnancy for each sexual transaction.
The variables are dummies that = 1 if a sex worker reports menstruating the day before; and = 1 if a sex worker reports menstruating the day of the recorded sexual transactions.
So, I can deduce the following:
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- If a sex worker reports not menstruating the day before but reports menstruating the day of the recorded sexual transactions, then she is on the 1st day of her menstrual cycle.
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- If a sex worker reports menstruating the day before but reports not menstruating the day of the recorded sexual transactions, then she is on the 5th day of her menstrual cycle.
- If a sex worker reports menstruating the day before and reports menstruating the day of the recorded sexual transactions, then she is either on the 2nd, 3rd, or 4th day of her menstrual cycle.
More troubling is ...
▶ More troubling is ...

▶ If a sex worker reports not menstruating the day before and also reports not menstruating the day of the recorded sexual transactions, then she is in any one of the days between the 6th and 32nd days of her menstrual cycle.
More troubling is ... 

- If a sex worker reports not menstruating the day before and also reports not menstruating the day of the recorded sexual transactions, then she is in any one of the days between the 6th and 32nd days of her menstrual cycle.
- I cannot know exactly which of these 27 days a sex worker is on during recorded sexual transactions.
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- I cannot know exactly which of these 27 days a sex worker is on during recorded sexual transactions.
- But what I can estimate is the probability that a sex worker is on a day within her fertile window period (The 12 days between days 8 and 19).
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- I cannot know exactly which of these 27 days a sex worker is on during recorded sexual transactions.
- But what I can estimate is the probability that a sex worker is on a day within her fertile window period (The 12 days between days 8 and 19).
- So, I divide 12 by 27 and get 0.44444444444.
After identifying and estimating menstrual days I then assign probabilities of pregnancy from Wilcox et al. (2001) which presents day-specific probabilities of clinical pregnancy.
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- I assign a probability of pregnancy of zero for the 1st day of the menstrual cycle as per Wilcox et al. (2001).
- I assign a probability of pregnancy of 0.004 for the 5th day of the menstrual cycle as per Wilcox et al. (2001).
- I assign the average of the probabilities for days 2 (zero), 3 (0.001), and 4 (0.002) whenever a sex worker reports having menstruated the day before and the day of the recorded sexual transactions.
- I multiply the probability of being on a day within the fertile window (0.44444444444) with the probability of pregnancy for a woman who has sexual intercourse every other day (0.33, from Wilcox et al. 1995) and get 0.14666666666, which I assign to a sexual transaction that occurred with a sex worker who reports not having menstruated the day before or the day of the recorded sexual transaction.
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Specification
\[ P_{irt} = \beta_0 + \beta_1 NC + \beta_2 RL + \beta_3 (NC \times RL) + \sum_{s=1}^{S} \beta^s \gamma^s_{irt} + \sum_{c=1}^{C} \beta^c \omega^c_{irt} + \alpha_i + \tau_t + \epsilon_{irt} \] (1)

\[ P_{irt} = \beta_0 + \beta_1 NC + \beta_2 PP + \beta_3 (PP \times NB) + \beta_4 (NC \times PP \times NB) + \sum_{s=1}^{S} \beta^s \gamma^s_{irt} + \sum_{c=1}^{C} \beta^c \omega^c_{irt} + \alpha_i + \tau_t + \epsilon_{irt} \] (2)

\[ P_{irt} = \beta_0 + \beta_1 NC + \beta_2 RL + \beta_3 (NC \times RL) + \beta_4 PP + \beta_5 (PP \times NB) + \beta_6 (NC \times PP \times NB) + \sum_{s=1}^{S} \beta^s \gamma^s_{irt} + \sum_{c=1}^{C} \beta^c \omega^c_{irt} + \alpha_i + \tau_t + \epsilon_{irt} \] (3)

- Where:
  - \( NC \) is No Condom
  - \( RL \) is Risky Client
  - \( PP \) is Probability of Pregnancy
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  - NC is No Condom
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Where:
- NC is No Condom
- RL is Risky Client
- PP is Probability of Pregnancy
Summary of the Paper

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Pregnancy Risk

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Summary Statistics

Results

Robustness

Conclusion and Take Aways

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(2)

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(3)

Where:
- NC is No Condom
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- PP is Probability of Pregnancy
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Bang for Your Buck
Summary Statistics
Sex Workers
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>28.43</td>
<td>(6.98)</td>
</tr>
<tr>
<td><strong>Start Age</strong></td>
<td>18.67</td>
<td>(5.14)</td>
</tr>
<tr>
<td><strong>Years of Education</strong></td>
<td>9.20</td>
<td>(2.69)</td>
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<tr>
<td><strong>Number of Biological Children</strong></td>
<td>2.06</td>
<td>(1.83)</td>
</tr>
<tr>
<td><strong>Never Married</strong></td>
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<td>(0.50)</td>
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<tr>
<td><strong>Cohabitating</strong></td>
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<td>(0.33)</td>
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<tr>
<td><strong>Can Read Kiswahili</strong></td>
<td>0.95</td>
<td>(0.21)</td>
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<td><strong>Can Write Kiswahili</strong></td>
<td>0.88</td>
<td>(0.33)</td>
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<td><strong>Luo</strong></td>
<td>0.51</td>
<td>(0.50)</td>
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<tr>
<td><strong>Luhya</strong></td>
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<td>(0.49)</td>
</tr>
<tr>
<td><strong>HIV Knowledge Test Score (0-1 Scale)</strong></td>
<td>0.94</td>
<td>(0.06)</td>
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<td><strong>Hourly Wage from Sex Work (Ksh)</strong></td>
<td>151.77</td>
<td>(92.24)</td>
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<td><strong>Hourly Wage from Other Work (Ksh)</strong></td>
<td>41.07</td>
<td>(38.54)</td>
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<tr>
<td><strong>Observations</strong></td>
<td>192</td>
<td></td>
</tr>
</tbody>
</table>

*Note: Means are presented with standard deviations in parentheses.*

**Sex Worker Information**

**Client Information**

**Sexual Transactions Information**
Clients
<table>
<thead>
<tr>
<th>Summary Statistics</th>
<th></th>
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<tbody>
<tr>
<td>Disutility for Condoms</td>
<td>0.45</td>
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<td></td>
<td>(0.45)</td>
</tr>
<tr>
<td>Risky Clients</td>
<td>0.46</td>
</tr>
<tr>
<td></td>
<td>(0.46)</td>
</tr>
<tr>
<td>Uncircumcised Clients</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>(0.40)</td>
</tr>
<tr>
<td>Poor Clients</td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td>(0.26)</td>
</tr>
<tr>
<td>Clean Clients</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td>(0.44)</td>
</tr>
<tr>
<td>Handsome Clients</td>
<td>0.54</td>
</tr>
<tr>
<td></td>
<td>(0.46)</td>
</tr>
<tr>
<td>Luhya</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>(0.40)</td>
</tr>
<tr>
<td>Luo</td>
<td>0.24</td>
</tr>
<tr>
<td></td>
<td>(0.39)</td>
</tr>
<tr>
<td>Kikuyu</td>
<td>0.14</td>
</tr>
<tr>
<td></td>
<td>(0.32)</td>
</tr>
<tr>
<td>Somali</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>(0.23)</td>
</tr>
<tr>
<td>Government</td>
<td>0.27</td>
</tr>
<tr>
<td></td>
<td>(0.41)</td>
</tr>
<tr>
<td>Truck Driver</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td>(0.36)</td>
</tr>
<tr>
<td>Boda Boda (Bike Taxi) Driver</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>(0.25)</td>
</tr>
<tr>
<td>Observations</td>
<td>3,656</td>
</tr>
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</table>

Note: Means are presented with standard deviations in parentheses.
Transactions
### Summary Statistics

<table>
<thead>
<tr>
<th>Description</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price for Sexual Transaction (Ksh)</td>
<td>509.51</td>
<td>(286.41)</td>
</tr>
<tr>
<td>Unprotected Vaginal Sex</td>
<td>0.08</td>
<td>(0.14)</td>
</tr>
<tr>
<td>STI</td>
<td>0.03</td>
<td>(0.07)</td>
</tr>
<tr>
<td>STI Risk</td>
<td>0.03</td>
<td>(0.10)</td>
</tr>
<tr>
<td>Birth Control</td>
<td>0.60</td>
<td>(0.49)</td>
</tr>
<tr>
<td>Probability of Pregnancy</td>
<td>0.13</td>
<td>(0.05)</td>
</tr>
<tr>
<td>Pregnancy Risk</td>
<td>0.003</td>
<td>(0.02)</td>
</tr>
<tr>
<td>Observations</td>
<td>192</td>
<td></td>
</tr>
</tbody>
</table>

Note: Means are presented with standard deviations in parentheses. Please also note that pregnancy risk and probability of pregnancy are calculated at the transaction level.
Results
STI Risk
Average Price for Vaginal Sex by STI Risk

Source: Robinson and Yeh (2011)
### STI Risk as a Source of the Price Premium for Unprotected Sex

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ksh</td>
<td>Ksh</td>
<td>Ksh</td>
<td>Ksh</td>
</tr>
<tr>
<td>No Condom</td>
<td></td>
<td></td>
<td>-4.263</td>
<td>1.325</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(31.17)</td>
<td>(30.12)</td>
</tr>
<tr>
<td>Risky Client</td>
<td></td>
<td>-10.95</td>
<td>-3.104</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(26.02)</td>
<td>(27.16)</td>
<td></td>
</tr>
<tr>
<td>No Condom*Risky Client</td>
<td>128.9*</td>
<td>142.7**</td>
<td>138.5*</td>
<td>143.4*</td>
</tr>
<tr>
<td></td>
<td>(72.20)</td>
<td>(68.87)</td>
<td>(74.98)</td>
<td>(77.80)</td>
</tr>
<tr>
<td>Sex Worker Controls</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Client Controls</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Time Dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Fixed Effects</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Constant</td>
<td>574.8***</td>
<td>609.8***</td>
<td>578.0***</td>
<td>609.8***</td>
</tr>
<tr>
<td></td>
<td>(75.16)</td>
<td>(78.59)</td>
<td>(75.98)</td>
<td>(79.02)</td>
</tr>
<tr>
<td>Kshs€</td>
<td>588.1</td>
<td>590</td>
<td>588.1</td>
<td>590</td>
</tr>
<tr>
<td>Sexual Transactions</td>
<td>2506</td>
<td>2378</td>
<td>2506</td>
<td>2378</td>
</tr>
<tr>
<td>R-Squared</td>
<td>0.00915</td>
<td>0.0203</td>
<td>0.00926</td>
<td>0.0203</td>
</tr>
<tr>
<td>F Statistic</td>
<td>1.593</td>
<td>4.534</td>
<td>1.523</td>
<td>4.258</td>
</tr>
</tbody>
</table>

Notes:
- a. Standard errors clustered at the sex worker level in parentheses.
- b. *** 1% level of confidence.
- c. ** 5% level of confidence.
- d. * 10% level of confidence.
- e. Mean of Ksh.
Pregnancy Risk
Average Price for Vaginal Sex
by Menstrual Days

<table>
<thead>
<tr>
<th>Day Type</th>
<th>Price in Kshs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Day</td>
<td>552.7</td>
</tr>
<tr>
<td>2nd, 3rd, or 4th Day</td>
<td>700.0</td>
</tr>
<tr>
<td>5th Day</td>
<td>950.0</td>
</tr>
<tr>
<td>6th to 32nd Day</td>
<td>595.1</td>
</tr>
</tbody>
</table>

Source: Robinson and Yeh (2011)
## Summary of the Paper

### Sources of the Price Premium for Unprotected Sex

#### Pregnancy Risk

**Specifications**

**Summary Statistics**

<table>
<thead>
<tr>
<th>Predicted Price in Kshs</th>
<th>1st Day</th>
<th>2nd, 3rd, or 4th Day</th>
<th>5th Day</th>
<th>6th to 32nd Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Birth Control</td>
<td>563.9</td>
<td>549.7</td>
<td>572.6</td>
<td>564.4</td>
</tr>
<tr>
<td>Without Birth Control</td>
<td>618.2</td>
<td>673.5</td>
<td>644.6</td>
<td>639.1</td>
</tr>
</tbody>
</table>

*Source: Robinson and Yeh (2011)*

---

### Robustness

**STI Risk**

**Pregnancy Risk**

**STI Risk and Pregnancy Risk**

---

### Conclusion and Take Aways

**Bang for Your Buck**
## Results

### STI Risk and Pregnancy Risk

<table>
<thead>
<tr>
<th>Model</th>
<th>No Condom</th>
<th>Probability of Pregnancy</th>
<th>Probability of Pregnancy*No Birth Control</th>
<th>No Condom<em>Probability of Pregnancy</em>No Birth Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Ksh 32.02</td>
<td>Ksh (37.66)</td>
<td>Ksh 319.2</td>
<td>Ksh 714.6*</td>
</tr>
<tr>
<td>(2)</td>
<td>Ksh 4.063</td>
<td>Ksh (26.32)</td>
<td>Ksh (267.4)</td>
<td>Ksh (447.3)</td>
</tr>
<tr>
<td>(3)</td>
<td>Ksh 319.2</td>
<td>Ksh (267.4)</td>
<td>Ksh 499.6</td>
<td>Ksh 716.0**</td>
</tr>
<tr>
<td>(4)</td>
<td>Ksh 4.063</td>
<td>Ksh (26.32)</td>
<td>Ksh 499.6</td>
<td>Ksh 716.0**</td>
</tr>
</tbody>
</table>

### Sex Worker Controls
- No: No condom, probability of pregnancy, and no birth control
- Yes: Yes condom, probability of pregnancy, and birth control

### Client Controls
- No: No condom, probability of pregnancy, and no birth control
- Yes: Yes condom, probability of pregnancy, and birth control

### Time Dummies
- Yes: Time dummies included

### Fixed Effects
- Yes: Fixed effects included

### Constant
- Ksh 536.5***
- (53.38)

### Kshs
- Mean of Ksh.

### Sexual Transactions
- 6361

### R-Squared
- 0.00282

### F Statistic
- 1.301

### Notes:
- a. Standard errors clustered at the sex worker level in parentheses.
- b. *** 1% level of confidence.
- c. ** 5% level of confidence.
- d. * 10% level of confidence.
- e. Mean of Ksh.
## STI Risk and Pregnancy Risk as Sources of the Price Premium for Unprotected Sex

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STI Risk</strong></td>
<td>Ksh</td>
<td>Ksh</td>
<td>Ksh</td>
<td>Ksh</td>
</tr>
<tr>
<td>No Condom</td>
<td>-33.22</td>
<td>-31.02</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>(36.87)</td>
<td>(42.79)</td>
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</tr>
<tr>
<td>Risky Client</td>
<td>-19.55</td>
<td>-15.35</td>
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<tr>
<td></td>
<td>(25.89)</td>
<td>(27.04)</td>
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</tr>
<tr>
<td>No Condom*Risky Client</td>
<td>76.31</td>
<td>71.70</td>
<td>101.8</td>
<td>92.41</td>
</tr>
<tr>
<td></td>
<td>(73.70)</td>
<td>(69.77)</td>
<td>(82.20)</td>
<td>(86.08)</td>
</tr>
<tr>
<td>Probability of Pregnancy</td>
<td>650.0**</td>
<td>649.4**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(292.9)</td>
<td>(267.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Probability of Pregnancy*No Birth Control</td>
<td>-1071.9**</td>
<td>-961.3*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(478.6)</td>
<td>(507.6)</td>
<td></td>
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</tr>
<tr>
<td>No Condom<em>Probability of Pregnancy</em>No Birth Control</td>
<td>593.7</td>
<td>667.7</td>
<td>801.5*</td>
<td>860.9</td>
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<tr>
<td></td>
<td>(399.8)</td>
<td>(438.4)</td>
<td>(479.8)</td>
<td>(565.7)</td>
</tr>
<tr>
<td><strong>Sex Worker Controls</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Condom</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Risky Client</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>No Condom*Risky Client</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Probability of Pregnancy</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Probability of Pregnancy*No Birth Control</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Constant</strong></td>
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<td>533.3***</td>
<td>476.5***</td>
<td>501.6***</td>
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<td></td>
<td>(91.37)</td>
<td>(153.5)</td>
<td>(100.1)</td>
<td>(153.2)</td>
</tr>
<tr>
<td><strong>Kshs</strong></td>
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<td>591.7</td>
<td>589.1</td>
<td>591.7</td>
</tr>
<tr>
<td>Sexual Transactions</td>
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<td>2133</td>
<td>2246</td>
<td>2133</td>
</tr>
<tr>
<td>R-Squared</td>
<td>0.0123</td>
<td>0.0233</td>
<td>0.0152</td>
<td>0.0258</td>
</tr>
<tr>
<td>F Statistic</td>
<td>2.514</td>
<td>4.062</td>
<td>2.881</td>
<td>4.614</td>
</tr>
</tbody>
</table>

Notes:
- a. Standard errors clustered at the sex worker level in parentheses.
- b. *** 1% level of confidence.
- c. ** 5% level of confidence.
- d. * 10% level of confidence.
- e. Mean of Ksh.
Robustness
I also run an IV with a dummy variable that equals one whenever a sex worker does not report any menstruation as instrument for pregnancy risk.
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Although the coefficient on pregnancy risk (2204.5) from this IV approach is not statistically significant at the 10 percent level, it is however substantially large in Ksh.
I also run an IV with a dummy variable that equals one whenever a sex worker does not report any menstruation as instrument for pregnancy risk.

Although the coefficient on pregnancy risk (2204.5) from this IV approach is not statistically significant at the 10 percent level, it is however substantially large in Ksh.

The IV approach also allows me to test for the endogeneity of my pregnancy risk variable.
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The IV approach also allows me to test for the endogeneity of my pregnancy risk variable.

Null hypothesis: Pregnancy risk is exogenous
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Although the coefficient on pregnancy risk (2204.5) from this IV approach is not statistically significant at the 10 percent level, it is however substantially large in Ksh.

The IV approach also allows me to test for the endogeneity of my pregnancy risk variable.

- Null hypothesis: Pregnancy risk is exogenous
- P-values are 0.47 and so we fail to reject the null hypothesis.
I also run an IV with a dummy variable that equals one whenever a sex worker does not report any menstruation as instrument for pregnancy risk.

Although the coefficient on pregnancy risk (2204.5) from this IV approach is not statistically significant at the 10 percent level, it is however substantially large in Ksh.

The IV approach also allows me to test for the endogeneity of my pregnancy risk variable.

- Null hypothesis: Pregnancy risk is exogenous
- P-values are 0.47 and so we fail to reject the null hypothesis.

HIV test score positively predicts birth control adoption.
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The IV approach also allows me to test for the endogeneity of my pregnancy risk variable.

- Null hypothesis: Pregnancy risk is exogenous
- P-values are 0.47 and so we fail to reject the null hypothesis.

HIV test score positively predicts birth control adoption.

Sex workers are pregnancy risk averse.
Conclusion and Take Aways
A compensating differential for STI risk is a source of the price premium for unprotected sex.
A compensating differential for STI risk is a source of the price premium for unprotected sex.

So is a compensating differential for pregnancy risk.
▶ A compensating differential for STI risk is a source of the price premium for unprotected sex.
▶ So is a compensating differential for pregnancy risk.
▶ The relationship between pregnancy risk, however needs to be explored with better data.
A compensating differential for STI risk is a source of the price premium for unprotected sex.

So is a compensating differential for pregnancy risk.

The relationship between pregnancy risk, however, needs to be explored with better data.

Public policy should incorporate fertility preferences in trying to eliminate this price premium.
A compensating differential for STI risk is a source of the price premium for unprotected sex.

So is a compensating differential for pregnancy risk.

The relationship between pregnancy risk, however needs to be explored with better data.

Public policy should incorporate fertility preferences in trying to eliminate this price premium.

Eliminating or reducing the price premium for unprotected sex will reduce sex workers’ incentives, both at the intensive and extensive margins, to supply unprotected sex.
Ahsanteni Sana

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constantinemanda@gmail.com