

Who is watching? The market for prostitution services

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Abstract This paper presents an economic model of prostitution that differs from the existing literature in that it makes no restrictive assumptions regarding the gender, pay, and nature of forgone earning opportunities of prostitutes and clients, and applies the same behavioural hypotheses to both. Our model gives a central role of stigma and reputation effects to both clients and prostitutes. We discuss demand, supply, and equilibrium results, indicating the possible effects of different policies on the industry and its different markets.

Keywords Prostitution · Gender · Reputation

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All of us, with the exception of wealthy and unemployed, take money for the use of our body. Professors, factory workers, lawyers, opera singers, prostitutes, doctors, legislators—we all do things with parts of our bodies, for which we receive a wage in return. Some people get good wages and some do not; some have a relatively high degree of control over their working conditions and some have little control; some have many employment options and some have very few. And some are socially stigmatised and some are not.” (Martha Nussbaum, *Sex and Social Justice*, 1999, p. 276)

1 Introduction

Although prostitution is known as “the oldest profession”, until recently, economists have not been interested in analysing this type of human transaction.

Recent theoretical and empirical contributions have focussed on modelling prices (Cameron et al. 1999; Moffatt and Peters 2004; Edlund and Korn 2002; Cameron 2002), supply determinants (Cameron and Collins 2003), health risk and the effect of condom use on prostitutes’ earnings (Rao et al. 2003; Gertler et al. 2005), and more recently, the evolution of paid sex markets and the ways in which urban spaces favour sexual transactions (Collins 2004).

Edlund and Korn (2002) model prostitution as a highly paid, low-skill female occupation alternative to marriage, explaining high wages in terms of a loss of position in the marriage market. Cameron (2002) provides a more sophisticated explanation for high wages in terms of compensation for social exclusion, risk, front loading in wage profile (informal pension scheme or insurance), boredom and physical effort, distaste, loss of recreational sex pleasure, anti-social and inconvenient hours, possible excess demand and prices used to screen quality, taboos and agent fees. Moffatt and Peters (2004) find that prices are affected by the duration of the transaction, location and age of the prostitute, but that client satisfaction and the price paid are affected by different factors. Stigma enters these models in the form of a barrier faced by prostitutes when wanting to enter other professions, but it is unrelated to the nature of the transaction between the prostitute and the client. Cameron and Collins (2003) model males’ decision to enter the market for prostitution services where the male has the choice to derive utility from one relationship partner and/or one paid sex partner. They distinguish between the motivations of men in relationships (variety, specific acts, frequency, outlet for stress) and single men (“relative search costs of finding willing sexual partners, or partners willing to engage in specific sexual activities in an ad hoc or formal social context, and in a given time period”, Cameron and Collins 2003, p. 274). An econometric study of the characteristics of male demand for street prostitution services, with the aim of assessing the significance of different types of clients’ motivations, is contained in Della Giusta et al. (2007).

The above contributions have shared the assumptions that the object of the prostitution transaction is sex and that prostitution is one of the possible ways in which women (and occasionally men) can supply sex to men. Prostitution is viewed in these papers as a more or less close substitute to other forms of sexual exchange, and being a

man is essential to demanding this service. Biological determinism is used to varying degrees of explicitness and sophistication as the underlying theory of human sexual behaviour, which implies that it is not possible to have a unified economic theory of prostitution independent of the sexual identities of the parties involved.

Garofalo (2002) is the only paper, to our knowledge, that attempts a rigorous gender analysis of prostitution and explains the different prices paid in the different prostitution sub-markets in terms of the power asymmetries between contractual parties¹.

Our model is based on two theoretical assumptions that differ from the previous literature. The first is that demand and supply functions do not depend on gender². The second one is that stigma (the opposite of reputation) plays a fundamental role in determining quantities demanded and supplied.

By assuming that both sex workers and clients could be male or female, the paper acknowledges on the one hand the fact that, although the overwhelming majority of demand is from males³ (for both female and male sex workers' services), there is also a female demand (Aggleton 1998; Sanchez Taylor 2001). Moreover, the assumption allows us to concentrate on modelling the power aspect intrinsic to the relationship⁴. The power aspect pertains to both gender and variables such as class and race that combine in producing the relative social positioning of sex workers and their clients and play a significant role in stigmatisation (Lim 1998; Kempadoo and Doezema 1998; Thorbek and Pattanaik 2002).

The second important assumption of our model consists of the incorporation of reputation effects in the behaviour of both clients and prostitutes. The stigma associated with both buying and selling prostitution comes from a moral judgement. Historically, prostitution has been seen as immoral because non-reproductive extramarital sex has been viewed as immoral (Nussbaum 1999; Ryley Scott 1976). In our model, both clients and prostitutes have the potential for reputational losses, which is not affected if they do not engage in prostitution. Buying or selling prostitution implies a stigma effect: reducing actual reputation to a lower level then

¹ Power has been incorporated in economic theory by the seminal work of Hirsch (1977), introducing the idea of positional goods. The idea of positional goods is used with reference to power, prestige, status symbol and power asymmetries among members of a household are also widely used in a cooperative and non-cooperative bargaining model of the family.

² Sex refers to the biological differences between males and females, whereas gender refers to the meaning that a culture gives to such biological difference, constructed on the basis of actual or perceived differences between men and women (Harding 1986; Rubin 1975). Gender relations are, therefore, different in different cultures, and they are not given by nature but socially constructed. Social construction refers to the idea that our identities are shaped through the transmission of values into children from birth in the family, education systems, mass media, etc. These shape our behaviour and values along different dimensions, including class, race, age and gender. Identity is not determined by biology, but by belonging to the social world and relative social positioning, and the power of an actor are likewise socially determined.

³ Sullivan and Simon (1998) find that 17.7% of American males have paid for sex, whereas Cameron and Collins (2003) find that only 4.9% of UK males have done so.

⁴ 'Prostitution allows certain powers of command over one person's body to be exercised by another (O'Connell-Davidson 1998, p.9).

the original potential. We also assume that prostitution is a necessary income-generating activity that is rooted in the lack of alternative earning opportunities.

We first look at the prostitution market when reputational potentials are exogenous, and then we consider the situation when those potentials are considered endogenous. In the endogenous case, it is assumed that if a higher quantity of prostitution is sold or bought in the economy, the stigma effect decreases and the corresponding reputational potentials increase.

We discuss the possible implications of different policies and regulatory regimes on the industry and its different markets. Because income is one of the determinants of demand and supply, and given the current unequal distribution of income among gender in most countries (UNDP 2006), the model predicts the over-representation of men among buyers and women among sellers.

2 Modelling prostitution

We assume that people care about the effects of their actions on their social standing in the community. This assumption has origin in the economic sociology literature on embeddedness and social capital (Granovetter 1985; Bourdieu 1986; Coleman 1988; Putnam 1993; Mansky 2000) that point to two distinct ways in which reputations matter to economic agents. Firstly, because as social beings, they derive utility from a positive evaluation by others in the social groups they belong to (Casson 1991), and secondly, because they are aware of the costs that social sanctions may impose on their material progress (Akerlof 1980; Arnott and Stiglitz 1991). Reputation has, thus, both intrinsic and instrumental value: It is desired per se (provider of utility) and can be used to access other earning opportunities. Stigma is a loss of reputation that can affect pay and working conditions, access to other jobs for prostitutes and can affect clients similarly (depending on the sanctions imposed on them by their community if they are caught). Following Akerlof (1980), we therefore, include reputation in agents' preferences. We allow agents to have a different concern for their reputation depending on their personal characteristics and the specific moment at which they exercise choice. We also allow for the reputation of the individual to be affected by what others do, in this paper, called endogenous norms.

2.1 The demand side, the clients

Let subscript c denote variables related to clients. Let the potential number of clients (as well as the number of prostitutes) be equal to 1. Until otherwise stated, the model below describes the behaviour of a representative agent.

Let

- S_c^0 sex enjoyed without prostitution, "freely exchanged sex"
- S_c amount of prostitution bought
- C_c ordinary consumption
- I_c income beyond subsistence level
- R_c capacity for reputation losses of the client when no prostitution is bought
- w price of prostitution

We assume that the total and exogenous income, I_c , is spent on ordinary consumption and prostitution. Freely exchanged sex is, by definition, free. We, thus, have

$$C_c = I_c - wS_c \tag{1}$$

Reputation is reduced when prostitution is bought in the market. We do not model the probability of being seen as a client; therefore, we assume that when prostitution is bought, it is also observed in the community. To make things simple, we let the clients' realisation for the potential reputation, denoted as r_c , be given by Eq. 2.

$$r_c = R_c - S_c \tag{2}$$

A low R_c means that clients are vulnerable reputationwise when buying prostitution. Therefore, a high status individual (politicians, judges) has a low R_c because he is vulnerable reputationwise. Even a small amount of prostitution bought (small S_c) can ruin his reputation potential.

A high R_c means that clients have little to lose reputationwise; that is, they have a higher capacity for reputation losses. An individual with a low social status may have a high R_c .

A reputation loss can also include the intrinsic feelings of shame and guilt that result from buying sex, especially if the buyer is being unfaithful to a spouse. Thus, we may assume that a married person has a lower reputation capacity (more to lose) than a single person.

We will assume that the utility of the client depends on the amount of prostitution bought, freely exchanged sex, consumption of ordinary goods and reputation; that is

$$U_c = U_c(S_c, S_c^0, C_c, r_c). \tag{3}$$

All four marginal utilities are assumed to be positive, which, inter alia, means that the higher the capacity for reputation losses is, the higher the utility. From Eq. 3, we note that prostitution and freely exchanged sex may be substitutes from a client's point of view. This does not preclude the existence of people for whom these are two very distinct types of goods. We will assume that the agent is maximizing utility given the budget constraint. In what follows and to keep things simple, we will assume that the amount of freely exchanged sex, S_c^0 , is given and, thus, is constant. First, we have to find the criteria for buying sex at all. Inserting from Eqs. 1 and 2 in Eq. 3 and maximizing with respect to S_c yields, we get the following condition for participating in the prostitution market:

$$\left[\frac{\partial U_c}{\partial S_c} \middle|_{S_c=0} \right] \geq w + \left[\frac{\partial U_c}{\partial r_c} \middle|_{S_c=0} \right] + \tau_c. \tag{4}$$

The client will participate in the market for prostitution if his willingness to pay for the first unit of prostitution (left hand side in Eq. 4) exceeds the price of prostitution (w), plus the marginal costs of a worsened reputation for consuming it for the first time (the second term on the right hand side in Eq. 4) and a threshold level τ_c that is positive at $S_c=0$ and zero otherwise. We, thus, assume that there is a discontinuity in the utility function such that loss in reputation incurred from consuming the first "unit" of commercial sex is greater than that incurred from consuming subsequent "units". The entry into the market then implies a threshold

crossing; see Cameron (2002). The threshold level may depend on individual characteristics as well as on neighborhood characteristics.

Given that Eq. 4 holds, then the first order condition for consuming prostitution is given by:

$$\frac{\partial U_c}{\partial S_c} = w + \frac{\partial U_c}{\partial r_c} \cdot \frac{\partial U_c}{\partial C_c} \tag{5}$$

Equation 5 states that, at utility maximum, the marginal willingness to pay for prostitution (in terms of consumption of ordinary goods) should be equal to the price of prostitution plus the marginal cost of a worsened reputation (in terms of the consumption of ordinary goods).

To obtain more specific results, we will assume the following functional form of the utility function:

$$U_c = \alpha_0(S_c^0) + \alpha_1 S_c + \alpha_{11} S_c^2 + \alpha_2 C_c + \alpha_3 r_c + \alpha_{33} r_c^2 + \alpha_4 C_c S_c - \tau_c \tag{6}$$

Thus, we postulate utility as quadratic in the consumption of prostitution and reputation and linear in the consumption of ordinary goods, but we allow for an interaction between consumption C_c and commercial sex, S_c . The functional relationship for how freely exchanged sex enters utility is not specified, but we note that from our specification, freely exchanged sex and prostitution are not substitutes. To bring in this substitution is straightforward. The threshold function is such that for $S_c=0, \tau_c>0$ and for $S_c>0, \tau_c=0$. Actually, what we do to keep things simple is that $\left[\frac{\partial \tau_c}{\partial S_c} \Big|_{S_c = 0} \right] = \tau_c$.

From Eqs. 4, 5 and 6, we now get:

$$S_c > 0, \text{ if } a_1 + a_4 I_C \geq w + (a_3 + a_{33} R_C) + \tau_c \tag{7}$$

where

$$\left\{ a_1 = \frac{\alpha_1}{\alpha_2}; a_{11} = \frac{2\alpha_{11}}{\alpha_2}, a_3 = \frac{\alpha_3}{\alpha_2}, a_{33} = \frac{2\alpha_{33}}{\alpha_2}, a_4 = \frac{\alpha_4}{\alpha_2} \right\} \tag{8}$$

Here, a_1, a_3 and a_4 are all positive⁵, and to have a quasi-concave utility function, the following must hold:

$$a_{11} + a_{33} < 0 \tag{9}$$

With $a_{11}<0$, the marginal utility of consuming prostitution is diminishing with consumption given reputation. If $a_{33}<0$, the marginal utility of a higher reputation capacity declines with the size of this capacity. Note, however, that it is not necessary for the quasi-concavity of the utility function that both these two parameters are negative; only the sum of them has to be negative.

Provided $a_{33}<0$, we observe from Eq. 7 that the higher the reputation capacity R_c is, the lower is the marginal cost from the reputation effects of consuming prostitution and the more likely it is that prostitution is consumed. The lower

⁵ Note that a_1, a_3 and a_4 could depend on observed as well as unobserved individual characteristics such that a high status individual may have a higher a_3 than a lower status individual.

threshold level, τ_c , the less serious is the threshold crossing problem and the more likely it is that the individual will enter the market. We also observe that the higher the income I_c is and the lower the price w is, the higher is the chance that the individual will enter the market.

Given that S_c is positive, the demand for prostitution is given by:

$$a_1 + a_{11}S_c + a_4I_c - 2a_4wS_c = w + a_3 + a_{33}r_c . \tag{10}$$

From Eq. 10, we can derive the demand for prostitution as a function of the price of prostitution and reputation capacity. However, to describe the demand curve, it is more convenient to consider the price w as a function of the amount of prostitution bought, S_c . We, thus, get

$$w = \frac{(a_1 - a_3) - a_{33}R_c + a_4I_c + (a_{11} + a_{33})S_c}{1 + 2a_4S_c} . \tag{11}$$

The derivative of this demand function is given by

$$\left\{ \begin{array}{l} \frac{\partial w}{\partial S_c} = \frac{a_{11} + a_{33} - 2a_4w - \tau_c}{1 + 2a_4S_c} ; S_c = 0 \\ \frac{\partial w}{\partial S_c} = \frac{a_{11} + a_{33} - 2a_4w}{1 + 2a_4S_c} ; S_c > 0 \end{array} \right. \tag{11'}$$

From Eq. 11', the demand for prostitution is a downward sloping function of price provided that the utility function is strictly quasi-concave, that is, $(a_{11} + a_{33}) < 0$. The demand function has jump upwards at $S_c=0$. It is straightforward to show that the demand function is convex, that is, curved towards the origin. To have a positive demand, it is required that $(a_1 - a_3 - a_{33}R_c + a_4I_c) > 0$.

The demand curve is shifted upwards when the capacity for reputation losses as well as the income is shifted upwards. We also note that when the demand curve is shifted upwards, the more utility the agent derives from having sex (a_1 , higher) and/or the lower the utility loss is through reputation losses (a_3 , lower). The demand curve is shown in Fig. 1.

2.2 The supply side

Subscripts p denote the variables related to prostitutes. The amount of prostitution sold reduces both leisure and reputation for prostitutes. To make things simple, we measure reputation and leisure in the same units as prostitution sold. Let H_p denote the hours available for work in prostitution above those worked elsewhere. Therefore, if H_p is high, prostitutes have few other options than selling prostitution; if it is low, prostitutes have many other options. To capture the labor supply effects without a detailed modelling of labor supply in ordinary jobs, we assume that H_p depends on income I_p in ordinary jobs. The higher this income is, the higher is labor supplied in ordinary jobs and the less attractive it is to work as a prostitute. Leisure, denoted as L_p , thus, depend on income in ordinary jobs, that is, $L_p = H_p(I_p) - S_p$, where the derivative of H_p is negative. Prostitutes derive utility from the consumption of goods and services, C_p , which is financed by the total income $I_p + wS_p$. wS_p is the income from selling prostitution. Let R_p denote the reputation

capacity of the prostitute. A high R_p means that prostitutes have little to lose reputationwise when selling prostitution, and a low R_p means the opposite.

The actual reputation is denoted as $r_p = R_p - S_p$.

The utility is given by

$$U_p = U_p(L_p, C_p, r_p). \tag{12}$$

The utility function as well as the availability of ordinary jobs and reputation capacity may vary across individuals. All three marginal utilities are assumed to be positive. Again, we have to start with the condition for participating at all as a prostitute. Assuming that the agent is maximizing utility with respect to offering prostitution services, we get the following participation criteria:

$$S_p > 0 \text{ if } \left[\frac{\partial U_p}{\partial L_p} \middle|_{S_p=0} \right] \leq w - \left[\frac{\partial U_p}{\partial r_p} \middle|_{S_p=0} \right] - \tau_p. \tag{13}$$

Thus, an individual will start to sell prostitution if the price for selling the first amount of prostitution (w) minus the costs of a worsened reputation for doing so (the second term to the right in Eq. 13) and minus the threshold level related to the entry (τ_p), as in the case of the clients, measured in same units as w , exceeds the shadow price of leisure evaluated at zero prostitution sold. Given that the individual

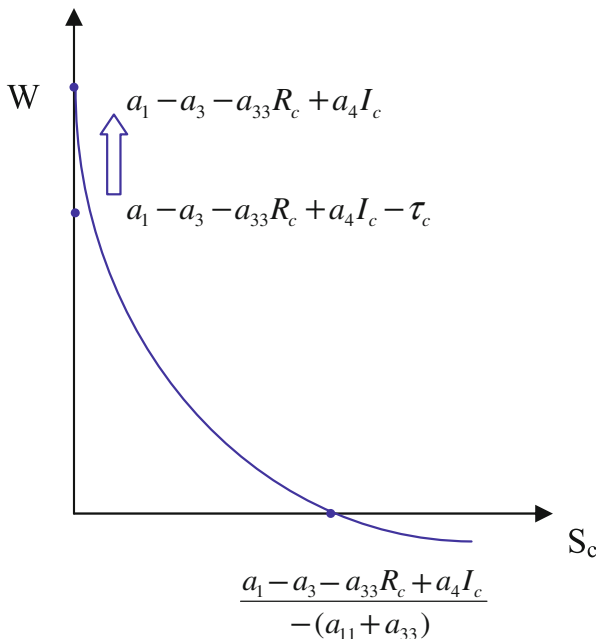


Fig. 1 Demand

participates as a seller, the optimal amount of prostitution sold is determined by the following condition (together with the hours and budget constraints):

$$\frac{\frac{\partial U_p}{\partial L_p}}{\frac{\partial U}{\partial C_p}} = w - \frac{\frac{\partial U_p}{\partial r_p}}{\frac{\partial U}{\partial C_p}}. \tag{14}$$

Thus, at optimum, the shadow price of leisure (the term to the right in Eq. 14) equals the marginal net gain of supplying labour through the sale of prostitution. This marginal net gain equals the price of prostitution obtained in the market minus the shadow price of reputation.

Again, to proceed with more specific results, we will assume that the utility function of the prostitute can be specified as⁶

$$U_p = \beta_1(H_p(I_p) - S_p) + \beta_{11}(H_p(I_p) - S_p)^2 + \beta_2(I_p + wS_p) + \beta_3(R_p - S_p) + \beta_{33}(R_p - S_p)^2 - \tau_p. \tag{15}$$

Let

$$\left\{ b_1 = \frac{\beta_1}{\beta_2}; b_{11} = \frac{2\beta_{11}}{\beta_2}; b_3 = \frac{\beta_3}{\beta_2}; b_{33} = \frac{2\beta_{33}}{\beta_2} \right\}. \tag{16}$$

A necessary condition for the utility function to be quasi-concave is that $b_{11} + b_{33} < 0$. Again, a sufficient condition for this is to assume that both the marginal utility of leisure is diminishing in the leisure enjoyed and the marginal utility of the reputation is declining in the level of reputation. Each of them will be negative. This will be assumed here. The mathematical property of τ_p is similar to τ_c above.

We now have

$$S_p > 0, \text{ if } b_1 + b_{11}H_p(I_p) \leq w - (b_3 + b_{33}R_p) - \tau_p. \tag{17}$$

We observe that the higher the price w of prostitution is and the lower the income in an ordinary job I_p is, the more likely it is that an individual will supply prostitution. Moreover, the more it takes to ruin one’s own reputation (the larger R_p), the more likely it is that prostitution will be sold. The less serious the threshold crossing problem is, the more likely it is that the individual will start working as a prostitute.

Given that $S_p > 0$, then the optimal amount of prostitution can be derived from the following supply function:

$$w = b_1 + b_{11}H_p(I_p) + b_3 + b_{33}R_p - (b_{11} + b_{33})S_p. \tag{18}$$

The supply curve is an upward sloping linear curve, and it is given in Fig. 2.

If the capacity for reputation losses R_p increases, the supply curve is shifted downwards. This means that at a given price of prostitution, the prostitute is willing to supply more. A higher value for R_p means that more prostitution can be sold without destroying ones’ own reputation. The same type of shift will occur if I_p gets lower (H_p gets higher), which means that if a person has fewer other working

⁶ β_1, β_2 and β_3 are all positive. They may depend on individual characteristics.

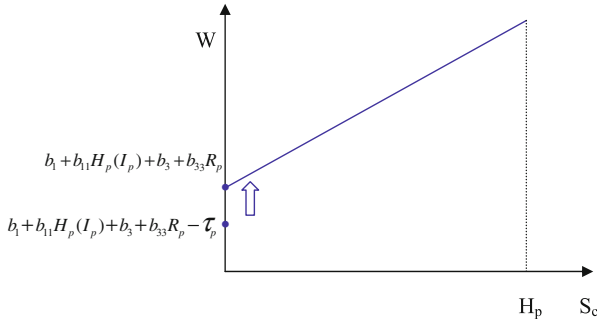


Fig. 2 Supply

possibilities than prostitution, they will be willing to offer more prostitution given the price and the characteristics of the individuals.

We will now turn to the market equilibrium when both clients and prostitutes participate in the market. To begin with, we simplify matters and ignore heterogeneity, but in Section 3, we will discuss the implications for the model of going beyond the representative agents.

2.3 Market equilibrium

At market equilibrium the price of prostitution as seen from the demand side has to be equal to the price of prostitution as seen from the supply side. The amount of prostitution sold has to be the same, here denoted as S^* .

From Eqs. 11 and 18, we then get

$$S^* = f(H_p(I_p), R_p, R_c), \tag{19}$$

where f is a function increasing in H_p , that is, decreasing in I_p , increasing in R_p and R_c . A closed-form solution for the equilibrium of sex sold is a little messy but straightforward. The equilibrium wage w^* then follows from either Eq. 11 or 18. In Fig. 3, we show the equilibrium and we note that there is a unique equilibrium.

Table 1 describes the impact of changes in the key parameters on the equilibrium price and quantity of prostitution.

Column 2 shows that more prostitution is sold at a higher price when the reputation capacity of clients increases and/or when clients are able to cover to a great extent their consumption of prostitution.

Column 3 suggests that if it becomes more difficult to have one’s reputation ruined by being found out as a prostitute, then more prostitution will be sold at a low price. This is consistent with the evidence of some temporary immigrant prostitutes in Europe who

Table 1 Changes in S^* and w from increases in $\{R_c, R_p, I_p\}$

Change	R_c	R_p	I_p
S^*	+	+	-
W	+	-	+

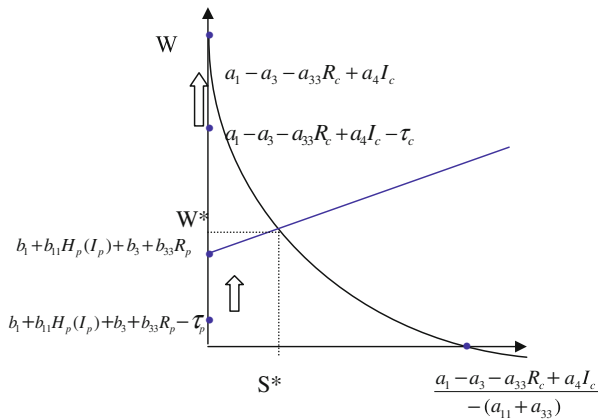


Fig. 3 Equilibrium

aim to work in prostitution only for a limited amount of time to accumulate savings and then return to their country (see Thorbek and Pattanaik 2002; Corso and Trifirò 2003).

Column 4 states that the higher the income is in an ordinary job (H_p , lower), the less prostitution is sold at a higher price.

Note that the price of prostitution at equilibrium may reflect compensation in terms of reputation losses among clients as well as prostitutes; thus, our analysis has much in common with Cameron (2002).

3 The market for prostitution when norms are endogenous

In the preceding sections, we assumed that the reputation variables were exogenously given and considered only demand and supply for representative agents on both sides of the market. Here, we will relax the first assumption. Because of this, we also have to consider demand, supply and equilibrium for the population as a whole. We will not, however, introduce any heterogeneity in the model, which of course has to be done in empirical specifications. To simplify the exposition, we let the total number of clients and prostitutes be the same and equal to N , and without loss of generality, we set $N=1$.

According to Akerlof’s (1980) theory of social custom, the fact that people may tend to generally believe or disregard any social code and the existence of a range of social codes together may imply that multiple equilibria exist, each corresponding to a different social code. In our context, prostitution is stigmatised in different degrees in different societies, and changing social attitudes towards it can, therefore, be expected to produce different market equilibria.

The reputation function in Akerlof depends on the individual’s obedience of the code and the proportion of the population who believe in that code. Similarly, in our model, we assume that the larger the market for prostitution, the more it will take for a single agent to ruin his or her own reputation supplying or consuming prostitution services. We, therefore, assume that reputation depends on the number of clients and prostitutes, respectively. Thus, the larger the proportion of the population that is

engaged in prostitution, the less stigmatisation and, therefore, the higher reputation capacities, i.e. that it takes more to ruin ones' reputation. In our representative agent framework, we then have

$$R_c = NS_c = S_c \text{ and} \tag{20}$$

$$R_p = NS_p = S_p. \tag{21}$$

When the agents make their choice, we do not assume that they take Eqs. 20 and 21 into account. The impact of individual sexual behaviour on the norms in the society has the character of being externalities.

From Eqs. 11 and 20, we now get the following demand curve provided that S_c is strictly positive:

$$w = \frac{(a_1 - a_3) + a_4I_c + a_{11}S_c}{1 + 2a_4S_c} \tag{22}$$

From Eqs. 11 and 22, after some straightforward math, we note that the downward sloping demand curve for sex now has been twisted around. It starts lower on the w -axis⁷ and the slope is numerically lower (see Fig. 4).

From Eqs. 18 and 21, we get

$$w = b_1 + b_{11}H_p(I_p) + b_3 - b_{11}S_p. \tag{23}$$

Again, by comparing Eqs. 18 and 23, we observe that the supply curve now starts higher up on the w -axis⁸, and the slope is lower.

Let S^{**} denote the equilibrium level of aggregate sex sold in the market. From Eqs. 22 and 23, we get

$$S^{**} = g(I_c, H_p(I_p)). \tag{24}$$

Provided that prostitutes and clients have entered the market, we observe that at equilibrium, the amount of sex sold depends on the income of the clients and the income in ordinary jobs for the prostitutes. It can easily be shown that, at equilibrium, the amount of sex sold S^{**} and the price of buying sex w^{**} is increasing with the income of the client, whereas the amount of sex sold is decreasing with the income in ordinary jobs of the prostitutes, and the price is increasing with this income. Thus, in countries with an uneven income distribution where the clients typically are rich and the possible prostitutes are poor, we should expect more sex sold at lower prices compared to societies where the income and job opportunities are more evenly distributed. In these latter countries, relatively less sex is sold and prices are higher. Given the taste for prostitution, one should, hence, expect that there are commercial interests tied to import possible prostitutes to rich countries. Other things equal, this result also points to a policy measure against

⁷ The demand curve starts at $w=a_1-a_3+a_4I_c$, which is below $a_1-a_3+a_4I_c-a_{33}R_c$ because a_{33} is negative.

⁸ The supply curve starts at $w=b_1+b_{11}H_p+b_3$, which is higher than $b_1+b_{11}H_p+b_3+b_{33}R_p$ because b_{33} is negative.

prostitution: By improving on the quality and the availability of ordinary job opportunities, one should expect a decline in the amount of sex sold.

The equilibrium when reputation capacity is endogenous, together with the equilibrium when the capacities are treated as exogenous, is given in Fig. 4. Comparing the different types of equilibria, we note that the impact on the price of prostitution services as well as the amount of sex sold is ambiguous. Figure 4 illustrates some possible outcomes.

We can distinguish between four different equilibria:

1. The reputation capacities are exogenous. The interpretation is that the actions of the agents are not able to change moral standards. They are absolute and given. In this case, an amount of prostitution sold is S_A and the price is w_A . This equilibrium may serve as the benchmark case (point A in Fig. 4).
2. The clients' reputation capacity increases with how much sex is sold. Reputations of the prostitutes' are not affected by the amount of sex sold. More prostitution is sold and the price is higher than in the benchmark case (point B in Fig. 4).
3. The prostitutes' reputation capacity is affected by what the prostitutes do, but this is not the case for clients. Less prostitution is sold at a higher price compared to the benchmark case (point C in Fig. 4).
4. Both the clients' and the prostitutes' reputation capacities are affected by what these two parties do. Less amount of prostitution is sold at a higher price as in the benchmark case (point D in Fig. 4).

The main reason for the two latter results is that the shadow price of leisure gets higher at equilibrium and the prostitutes demand a higher price to be willing to sell prostitution services.

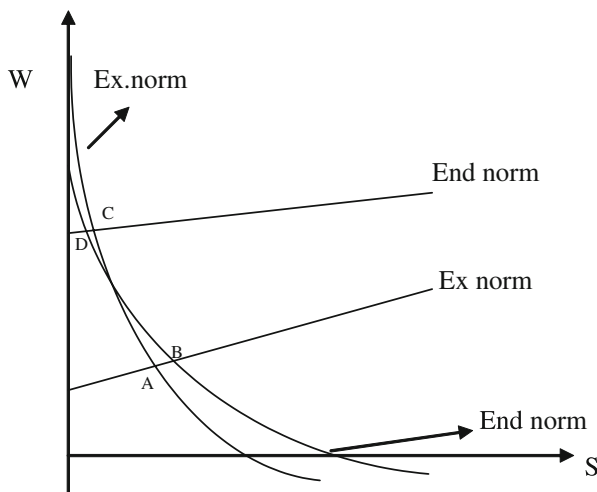


Fig. 4 Equilibrium with endogenous and exogenous norms

4 Different markets and policies

The model allows simulating the effect of different policies for prostitution. For example, policies that recognise prostitution as a job and reduce the stigma associated with it will have the effect of increasing the marginal net gain of supplying prostitution and increase the marginal willingness to pay for prostitution. This should, in a closed economy, have the effect of increasing the price of prostitution and, given the same availability of alternative earning opportunities and if there are constant intermediation margins, also increase the quantity supplied. However, in an open economy, there always is immigration of illegal workers and out-migration of clients (sex tourism) that would help keep prices low.

Another example is that of policies that increase the stigma of being clients that have been used in the case of street prostitution where the latter is illegal in the expectation that this would reduce supply in this market. According to our framework, this reduces the marginal willingness to pay for prostitution and may reduce the quantity of prostitution sold as well as the equilibrium price. But clients may try to reduce the risk of being caught rather than reducing their demand.

A third example is given by policies that increase alternative earning opportunities for prostitutes. The effect of these policies will be felt on that part of prostitution that is supplied for lack of earning alternatives. Our model then implies that less prostitution is sold at a higher price.

Clearly, the effect of policies greatly depends on the particular segment of the industry that is being addressed, and our model allows the description of up to 32 different markets within the prostitution industry, depending on clients' reputation and their concern for it and the prostitutes' employment alternatives, their reputation and their concern for it.

Taking the demand side first, recall that a high a_1 means that the client is less concerned about reputation and a low a_1 means the opposite. Moreover, a high R_c means that clients have little to lose reputationwise when having paid for prostitution, and a low R_c the opposite. Then let $F_c(i,j)$ mean a combination of $i=H,L$ and $j=H,L$, for example $(a_1, \text{high}; R_c, \text{low})$. Then, there are four combinations:

$$\{F_c(H,H), F_c(H,L), F_c(L,H), F_c(L,L)\}. \quad (25)$$

For example, $F_c(H,L)$ may be a careless judge who has much to lose if caught purchasing prostitution.

Now, consider the supply side. For prostitutes, recall that a high b_1 means a relative preference for more leisure and less concern for reputation, and a low b_1 the opposite. Also, a high R_p means that prostitutes have little to lose reputationwise when selling prostitution and a low R_p the opposite. Furthermore, a high H_p indicates that prostitutes have few other options than selling prostitution, and a low H_p indicates many other options than selling prostitution. Again, let $F_p(k,r,s)$ mean a combination of $\{k,r,s\}=H,L$ for example $(b_1, \text{high}; H_p, \text{low}; R_p, \text{low})$ so that all together there are eight different cases for prostitutes. For example, a student who prefers leisure and who is not concerned about their reputation, but has a lot of other

options other than selling prostitution and little to lose reputationwise by selling prostitution far from their environment will have $F_p(H,L,H)$.

Matching the cases generates 32 different possibilities that can potentially describe 32 different markets, or particular cases. A careless judge purchasing prostitution services from a student would be the combination $F_c(H,L)$ and $F_p(H,L,H)$. The price of prostitution will be high and the amount sold will be low compared to the reference case of $F_c(H,H)$ and $F_p(L,H,H)$, which could describe average status clients not concerned about their reputation purchasing street prostitution, where street prostitutes typically have few other jobs available and do not enjoy very high social status. This standard market relative to the others will have the lowest price and the highest amount of prostitution sold.

5 Conclusions

The prostitution industry is fundamentally characterised by stigma and our model shows that it is possible to endogenise this key feature to describe demand and supply conditions and determine different market equilibria on the basis of which policy implications can be discussed. We have made no restrictive assumptions regarding pay and the nature of forgone opportunities for the prostitute, and concentrating on income, reputation, and personal attitude variables, we have determined the price and quantities of equilibrium for the different submarkets and, more importantly, produced a framework in which the effect of policy can be simulated. We have also hypothesised a threshold both for the clients and the prostitute, which has to be crossed to demand and supply the first unit of prostitution.

Despite the lack of a gendered demand and supply, our model predicts the current over-representation of women among suppliers and men among demanders. This follows directly from the inclusion of income in the utility function of clients and prostitutes. The model predicts that the higher the income of the prostitute in ordinary jobs, the lower the hours available for working in prostitution and, therefore, the less prostitution is sold at a higher price. Given that in all the countries in the world (see UNDP 2006), the income earned by women is less than the income earned by men (even in countries with low gender inequality, Norway for instance, the wage gap is around 20%), our model predicts the current situation where women supply and men demand. But it allows also for the opposite situation where rich Western women demand prostitution services from men in developing countries. In other words, assuming a genderless model of prostitution allows us to stress the importance of income inequality to justify the current gendered distribution among demanders and suppliers without the need for biological determinism.

Our analysis sheds light on many issues that have so far remained formally unconnected in economic analysis, and given the present reviews of prostitution policies taking place across several countries, hopefully will attract more economists to produce work that can be usefully applied to policy formulation.

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