

Another theory of prostitution

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Abstract

This paper presents a model of prostitution as an economic activity characterised by stigma, whose supply is based on the availability of other earning opportunities. On the basis of available empirical evidence and findings from other studies, we put forward a rigorous economic analysis of the industry and its different markets making no restrictive assumptions regarding the gender, pay and nature of forgone earning opportunities of the prostitute, and applying the same behavioural hypotheses to prostitutes and clients.

“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]

1. Introduction

Prostitution has many features in common with other activities entailing bodily service. It differs from these activities in many subtle ways but the biggest difference consists in the fact that it is, today, more widely stigmatised. The stigma 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, 1936).

Feminists are deeply divided on the issue of prostitution, and the debate between the “sex-work” and the “abolitionist” lobbies is often heated and bitter. The proponents of sex work are in favour of protective legislation that would improve the working conditions of prostitutes and decrease the social stigma associated with prostitution, which lays at the heart of the violence many prostitutes experience. The abolitionists argue that prostitution is carried out primarily by women and therefore should be seen as part of the perpetuation of the traditional roles of power of men over women, and be abolished. Pateman (1988) explains that what is wrong with prostitution is the perpetuation of a contract where the patriarchal rights of men and women are re-affirmed, and the difference between workers in a capitalist firm and prostitutes is the re-enforcement of a contract that makes the subordination of women (and others) publicly recognised. The debate on prostitution also contrasts the selling of sexual services as opposed to the selling of the self: the basic idea here is that prostitutes sell sexual services, but not the self (Pateman, 1988; O’Connell, 2002).

Economic analysis has so far concentrated on few attempts to model aspects of prostitution, such as the recent paper by Edlund and Korn (2002), which models prostitution as a highly paid, low skill female occupation alternative to marriage, and Garofalo (2002) who explains the different prices paid in the different prostitution markets in terms of the institutional configuration of the exchange, that is on the power asymmetries between contractual parties. More abundant are the empirically based studies such as those by Rao and Lokshin (2001) and Gertler et al. (2003) who

focus on the health risk factor for street prostitutes, Moffatt and Peters (2001), who use the hedonic price method to investigate the pricing of prostitution services, and Cameron et al (1999).

Prostitution is a multi-million trans-national industry mobilising internationally millions of workers, regulated in widely different ways, it is highly fragmented in different markets, in which different types of intermediaries are present (Thorbeck and Pattanaik, 2002; Lim, 1997). Both men (the vast majority) and women demand prostitution services, and interviews with clients suggest that in exchange for their money or gifts they demand ‘control of sex’ rather than just sex (Monto, 1999; Sanchez-Taylor, 2001; O’Connell Davidson, 1998). It is mostly entered for economic reasons, and is done largely but by no means exclusively by women. It is a high risk activity for prostitutes (both violence and health risk), and interviews with prostitutes suggest that the ability to identify and cope with such risks, together with those of maintaining emotional detachment and separation of one’s identity of prostitute from one’s other identities are all skills (Chapkis, 1997; McKeganey and Barnard, 1996). It can therefore be argued with Nussbaum (1999) that prostitution does require skills, but different from the ones we are used to measure.

On the basis of findings from the social scientific and economic literature and available empirical evidence we model prostitution as an economic activity characterised by stigma, making no restrictive assumptions regarding the gender, pay and nature of forgone opportunities of the prostitute, and applying the same behavioural hypotheses to the client. We derive supply and demand functions and determine equilibrium results that allow to describe prostitution as an industry with many different markets, and to simulate the effects of different policies and regulatory regimes. We conclude indicating ways forward in this research.

2. Studies of Prostitution

The social scientific literature on prostitution is vast (recent authoritative monographs on the subject are O’Connell Davidson, 1998, and Lim, 1998) and representative of many different views and concerns. A substantial part of the literature on prostitution consists of studies of prostitution as a crime (and particularly its relationship with other forms of crime), or health and drugs problems connected with prostitution. Street prostitutes’ safety and drug problems are addressed by McKeganey and Barnard (1996) in a UK-based study based on interviews with both prostitutes and clients, which finds most of the street prostitutes interviewed indicating their motivations for entering prostitution as “feeding a drug addiction” or “feeding a family”. This finding is supported also in the first of a three-part series on prostitution (*Dispatches: Sex on the Street; Channel 4 season Prostitution –The Laws Don’t Work*, Channel 4, September 2002), which in its first episode on street prostitutes found that over 90% of them were drug addicts, and that this was their main

motivation for entering prostitution. Maggie O’Kane, who carried out the research work leading to the programme interviewing 110 street prostitutes in 18 towns and cities, also found evidence of the violence to which the estimated 30,000 street prostitutes in the UK are exposed¹.

Motivations for entering prostitution are often found to differ in other “higher” segments of the industry, such as those found by Chapkis’ (1997) study of sex workers in parlours, escort agencies, and call girls, for whom there appeared to have been more choice exercised both in entering the business, and in controlling the conditions of their work and the way they felt about it. Evidence of the different working conditions in different parts of the industry was also found in the second episode of the Channel 4 programme that presented the stories of workers in different kinds of prostitution (mainly parlour-based). Sex workers described their working conditions as safer (in as far as the relationship with clients and pimps is concerned), and some of the workers were lobbying for de-criminalisation or legalisation, following the experiences of countries with a more open attitude towards prostitution which give legal protection to the workers (Australia and the Netherlands). The motivations of clients (who were all males and appeared to be representatives of all sectors of society) were also addressed in the third part of the series. These appeared to convey the impression that a connection existed between the effort and costs associated with finding a sexual partner who would readily satisfy their sexual preferences, and the straightforward and readily accessible option of prostitution. Such characteristics and motivations of clients are analysed in the collection of studies edited by Thorbek and Pattanaik (2002), which documents the increase in prostitution across borders. A sort of “psychological” profile of male sex tourists is drawn on the basis of their own descriptions of themselves and accounts of their experiences, which suggests that many of them are finding relationships with others very difficult (either because they don’t have the time or the skills required to meet people) and choose sex tourism as an “easier” alternative, which does not imply any responsibility. As for the views they hold of prostitutes, it appears that both sexism and racism mix in determining a very marked distancing, which allows clients to practically ignore and show no interest in the lives and working motivations of the prostitutes whose services they buy.

Torbek and Pattanaik (2002) also connect prostitution to international migration (increased number of men going abroad as sex tourists, military or UN, and increased number of women, but also men and children migrating from poorer countries to become prostitutes for male demand), looking at the patterns and characteristics of women’s migration and trying to describe the complex reality of trafficking (which varies between extremes of slavery and organised migration of

¹ “Nearly three quarters of the women interviewed said they had been attacked by clients in the previous 12 months. Just under two thirds had been raped or seriously beaten, sometimes at gunpoint. Three quarters of the women don’t report attacks because they don’t think the police will care” (O’Kane, 2002).

prostitutes who choose to travel themselves). Case studies are also presented in which prostitutes in tourist places describe their activity as a business and themselves as entrepreneurs. Women clients are also engaging in sex tourism, as documented both in Thorbek and Pattanaik, and in Sanchez Taylor (2001). The latter in particular offers a more in-depth analysis of North American and Northern European women buying prostitution services of young men in the Caribbean, in what they themselves describe as ‘romance holidays’. Responses to her interviews suggest that, on the one hand, the women clients are mostly reluctant to define what they engage in as prostitution, and on the other that their ideas about the young men whose service they buy are deeply rooted in racist ideas about black men and black men’s sexuality. The theme of inequality appears to be at the core of the relationship: prejudices that allow the stigmatisation of another prostitute as fundamentally “different” and inferior to oneself appear again and again in customers accounts.

Finally, all the studies mentioned address the relationship between prostitutes and pimps and the role of pimping, and several detailed studies exist that concentrate on the very specific nature of pimping as a criminal activity or a form of exploitation (Tiggey *et al*, 2000).

3. Economics and prostitution

Reynolds’ (1986) constitutes perhaps the most famous contribution on prostitution by an economist. The book contains an excellent review of studies on prostitution carried out in the US over the previous two decades across the social sciences (sociology, anthropology, geography and political science), addressing issues such as why and how people become prostitutes, the relationship between pimps and prostitutes, the role of prostitution in society and how prostitutes see themselves, the relationships between prostitution and drug use, and the political aspects of prostitution. The economic literature existing at the time of her study is classified in two strands: studies that deal with supply and demand of prostitution showing how it is similar to other markets, and studies in the economics of crime that analyse the costs and benefits of a prohibition on prostitution. The focus of Reynolds’ study is actually location: it is a geographical analysis of prostitution markets in the US, addressing the question of why street prostitutes are to be found in certain street corners and not in others. She models environments for prostitution under the assumptions of maximisation under constraint and discusses how actors in prostitution markets react to incentives and dis-incentives coming from the legal structure in the type of prostitution they engage in and the location of their activity. She then fits the models with data collected in 1982-83 for different US locations, in order to assess the impact of different regulatory regimes for the activity. The conclusions reached by the study are that prostitution will always exist, even if it is

prohibited by law, that limits can be drawn on the types of prostitution existing in each community, and that policies prohibiting prostitution altogether should be changed for the good of society.

Scattered work by economists has been done on various aspects of the prostitution business. Recent studies include Rao and Lokshin (2001), who focus on the health risk factor and using a data set of 608 sex workers in Calcutta in 1993 interviewed by a team of social workers under the supervision of the All India Institute of Hygiene and Public Health, found that the differential for condom use can mean a loss of up to 44% of their earnings for sex-workers. Gertler et al. (2003) also explicitly address the nature of the market for unprotected commercial sex in Mexico and find similar result.

Another recent study on prices is by Moffatt and Peters (2001), who using clients' data apply the hedonic price method to investigate the way in which prices of prostitutes' services are determined. Prices are found to be affected by duration of the transaction, location, and age of the prostitute, and the factors that affect client satisfaction are found to not affect the price paid. The latter is regarded by Moffatt and Peters as a puzzling finding, although we would argue that this is actually not a contradictory finding, once a more sophisticated approach to defining demand and supply of prostitution is formulated, capable of taking into account not just price/quantity considerations.

A good example of the latter is Garofalo's work, based on a rigorous study of the Italian case and based on Bowles' and Gintis' theory of contested exchange and on the theory of positional goods as formulated by Pagano (1999). She explains the different prices paid in the different prostitution sub-markets in terms of the institutional configuration of the exchange, that is on the power asymmetries between contractual parties (Garofalo, 2002). On the basis of a thorough argument based on the functioning of the patriarchal system in reproducing gender asymmetries, Garofalo stresses the fundamental role of prostitution in the construction of the gender identity of the client as male². This is the only work, to our knowledge, that attempts a rigorous gender analysis of female prostitution, as well as an economic one.

The most famous recent work by economists on prostitution is however Edlund and Korn (2002), which provides the first theory of prostitution in economics to be accepted by a major journal. Their starting points are the following: prostitution in their model is low skills, labour intensive, female, and well paid. The key to this puzzle is found in the observation that a woman can be either a wife or a prostitute but not both: "If marriage is a source of income for women, then the prostitute has to be compensated for forgone marriage market opportunities". Prostitution is

² A point that we will take and expand, in light of the reviewed evidence, to consider prostitution as part of more general structures of reproduction of social inequality (gender, race, class).

defined as “The act of rendering, from the client’s point of view, non-reproductive sex against payment. A prostitute sells non-reproductive sex , while a wife sells reproductive sex” The price of prostitution in their model is equal to the price of sex within marriage and the female wage, so that in equilibrium: the price of commercial sex equals the price for sex within marriage (or the income the man needs to pay to the woman to marry her) plus the female wage rate. The demand for prostitution depends on the price of commercial sex, price of sex within marriage, male income, and on the proportion of married and un-married men. In their model the married men demand of prostitution is less than the unmarried men demand. Their main reason for this is that married men have less disposable income to spend on prostitution. The paper has much merit, the greatest perhaps being that of opening the debate in a discipline that has so far largely stirred away from such a controversial issue. The assumptions made are however not easily verifiable. The categorisation of prostitution as a female only occupation is incorrect, the idea that the supply of prostitution is fixed, i.e. exogenous, seems in stark contrast with the evidence on the population movements between Europe, Northern Africa, South-Asia (Thorbeck and Pattanaik, 2002, Rodriguez et al., 2001), and what the authors present as their starting puzzle, that prostitution provides high wages for low skills is in our view based on a fundamental mis-understanding of the skills involved.

4. Stylised facts

In light of the surveyed literature and currently available data (which is abundant but very scattered and of difficult comparability), prostitution can be described as a multi-million industry mobilising internationally millions of workers, regulated in widely different ways.

A. Supply. As regards supply, this is an activity mostly entered for economic reasons, which appears to be a job done largely but not exclusively by women (Aggleton 1998, Sanchez Taylor, 2001). Supply and working conditions depend partly on the availability of other livelihood opportunities (not just other jobs and their pay, but also the working conditions) and partly on social stigma.

B. Skills. Criminalisation and social stigma make this a high-risk activity for prostitutes (violence and health risk). Evidence suggests that the ability to maintain emotional detachment and separate one’s identity of prostitute from one’ other identities (Chapkis, 1999; McKeganey and Barnard, 1999) are skills, and skills are required (and developed on the job) to defend themselves and cope with risks, given the occurrence of violence against prostitutes is widespread and often little protection is offered by institutions. As argued by Nussbaum (1999, p. 284), prostitution does require skills, but different from the ones we are used to measuring.

C. Demand. Both men (the vast majority) and women demand prostitution services. What emerges from interviews with clients is that they demand ‘control of sex’ for money, rather than, as conventionally believed, ‘sex’ for money. Studies that contain interviews with clients also suggest that the demand is underpinned by ideas of control and subjugation supported by patriarchy and racism, which provide an entitlement to use prostitutes by stigmatising them as inferior (see also Garofalo’s clients’ motivations regarding the construction of masculine identity). As it is often the case in matters of inequality, these same systems (patriarchy, racism, classism) provide mechanisms for a partial subversion of the stigmatisation, so that both prostitutes and clients describe themselves as in control of the relationship (Chapkis 1997; McKeganey and Barnard, 1996).

D. Market fragmentation and intermediaries. It is also a highly fragmented industry divided in different sub-markets, and characterised by the presence of different types of intermediaries, which play a particularly important role, ranging from more to less exploitative (examples of trafficking and nuances of it at one end self managed prostitutes, including trade unions at the other), and appear to differ in the different sub-markets (see Channel 4 programme, Tiggey et al. 2000, Sharpe 1998, Garofalo, 2002).

5. Modelling the role of stigma in the market for sex: a reputation model of prostitution.

To model prostitution taking into account social stigma, we develop a model (along the lines of Della Giusta, 1999, developed to analyse social capital and market access), which explicitly includes reputation in agents’ preferences. We model stigma as a loss of reputation that can be incurred by both clients and prostitutes, and we then link reputations with income differentials (see section 5.7 below). Although the model is based on maximisation under constraint of a utility function for representative agents, whose behaviour is rational, we make a different behavioural assumption in that individuals are social beings and therefore aware of the presence of reputation effects in all their interactions. This affects their choices as much as do economic outcomes. Their utility is therefore defined on consumption (which will in turn be a function of their income and other characteristics) and on reputation. Reputation has both intrinsic and instrumental value: it is desired per-se (provider of utility) and can be used to access other earning opportunities. This differs from other attempts to include reputation as a determinant of agents’ behaviour (see for example Cameron, 2003) in that we make an explicit link between reputations and earning opportunities.

Stigma coincides with loss of reputation, which can affect pay and working conditions and access to other jobs for prostitutes, and can affect clients similarly. We also allow for agents to have

a different concern for their reputation depending on their personal characteristics and the specific moment at which they exercise choice, so that, for example, someone with a high reputation may have little regard for it and act accordingly.

We model determinants of supply and demand, following as closely as possible our list of stylised facts, and find the equilibrium quantity and price for commercial sex. We also produce a classification of different sub-markets in the prostitution industry, in terms of clients' reputation and their relative preference for it, and prostitutes' employment alternatives, their reputation and their relative preference for it. We do not model intermediation or risk in the present paper.

Clients' utility depends on the amount of commercial sex bought, on the consumption of ordinary goods, and reputation. Prostitutes' utility depends on leisure (time spent not working in prostitution or other jobs), consumption of ordinary goods, and reputation. We maximise clients' utility with respect to a budget and a reputation constraint, and obtain the marginal willingness to pay for commercial sex in terms of consumption of other goods and reputation loss. Analogously, for prostitutes we obtain the shadow price of leisure time in terms of the net gain of supplying commercial sex (which also includes reputation loss). Note that in our model everybody can be either prostitute or client, depending on their economic circumstances and available alternatives: some may not bear the stigma and would rather starve than sell sex, some would never purchase.

We assign a specific functional form to utility, which allows us to model different agents by introducing relative preferences for consumption, reputation, and consumption of commercial sex and leisure. We thus derive demand and supply functions through which we obtain the market equilibrium, which through variation of the parameters can be applied to describe different sub-markets in the prostitution industry.

5.1 The demand side, the clients

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

Let:

S_c^0 = sex enjoyed without buying sex, "freely exchanged sex"

S_c = amount of commercial sex bought

C_c = ordinary consumption

I_c = income beyond subsistence level

R_c = reputation of the client when no commercial sex is bought

w = price of commercial sex

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

$$(1) \quad C_c = I_c - wS_c$$

Moreover reputation is reduced from the maximum R_c when commercial sex is bought in the market, and here we assume that when commercial sex is bought it is also observed in the community, so that a high R_c means that clients have much to lose reputation-wise when having commercial sex. To make things simple we let the clients reputation, denoted r_c , be given by

$$(2) \quad r_c = R_c - S_c$$

We will assume that

$$(3) \quad R_c = t(I_c - I_p)$$

where I_p is the non-wage income of the prostitutes, which is hypothesised to be lower than the total income of the clients. The justification for this specification is that reputation is a positional good, which depends on what power clients have in relation to prostitutes. Here power is instrumented by how much richer the clients are relative to prostitutes when no sex is sold; t is a fixed parameter.

The utility of the client depends on amount of commercial sex bought, consumption of ordinary goods and reputation, that is

$$(4) \quad U_c = U_c(S_c + S^0, C_c, r_c)$$

From (4) we note that for expository reasons we assume that sex bought and freely exchanged sex are perfect 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, but rather assumes that agents who purchase sex have the same attitude to purchased and freely exchanged sex³. 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 a constant.

First, we have to find the criteria for buying sex at all. Inserting from (1) and (2) in (4) and maximizing with respect to S_c yields the following condition for participating in the commercial sex market:

³ For an empirical analysis of clients' attitude to sex see (Della Giusta, Di Tommaso and Stroem, 2004).

$$(5) \quad \left[\frac{\frac{\partial U_c}{\partial S_c}}{\frac{\partial U_c}{\partial C_c}} \Big|_{S_c = 0} \right] \geq w + \left[\frac{\frac{\partial r_c}{\partial U_c}}{\frac{\partial U_c}{\partial C_c}} \Big|_{S_c = 0} \right]$$

Thus, the client will participate in the market for commercial sex if their willingness to pay for one extra amount of sex (given that they initially only enjoy freely exchanged sex) exceeds the price of commercial sex, plus the marginal costs of a worsened reputation for buying for the first time.

Given that (5) holds, then the first order condition for buying sex is given by:

$$(6) \quad \frac{\frac{\partial U_c}{\partial S_c}}{\frac{\partial U_c}{\partial C_c}} = w + \frac{\frac{\partial r_c}{\partial U_c}}{\frac{\partial U_c}{\partial C_c}}$$

Eq. (4) states that at utility maximum the marginal willingness to pay for commercial sex (in terms of consumption of ordinary goods) should be equal to the price of commercial sex plus the marginal cost of a worsened reputation due to purchases of commercial sex.

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

$$(7) \quad U_c = \alpha_1 \ln(S_c + S^0) + \alpha_2 C_c + \alpha_3 \ln r_c$$

where $\alpha_i > 0 \forall i$

Thus, we postulate utility as a log-linear function in sex (freely exchanged plus commercial) and reputation and linear in consumption of ordinary goods. From (5), (6) and (7) we now get

$$(8) \quad S_c > 0, \text{ if } \frac{a_1}{S^0} \geq w + \frac{1 - a_1}{R_c} = w + \frac{1 - a_1}{t(I_c - I_p)}$$

Given that $S_c > 0$, then

$$(9) \quad \frac{a_1}{S_c + S^0} = w + \frac{1 - a_1}{R_c - S_c}$$

where

$$(10) \quad \left\{ a_1 = \frac{\alpha_1}{\alpha_2}; 1 - a_1 = \frac{\alpha_3}{\alpha_2}, 0 \leq a_1 \leq 1 \right\}$$

Note that $S_c < R_c$.

The second order condition requires that

$$(11) \quad \frac{-a_1}{S_c^2} - \frac{1 - a_1}{(R_c - S_c)^2} < 0,$$

which clearly is fulfilled given the admissible region for a_1 .

If $a_1=1$, then reputation does not matter, and if $a_1=0$ it is only reputation that matters. If a_1 is high, the client is randy, less concerned about reputation; if a_1 is low, the client is not randy, or more concerned about reputation.

Obviously if $a_1=0$, then $S_c=0$ and no commercial sex is bought in the market. To focus on the more interesting cases, we assume that $0 < a_1 \leq 1$.

From (8) we observe the following

- the more sex is exchanged freely, i.e. the higher S_c^0 is, the less likely it is that sex will be bought in the market,
- the more reputation matters, i.e. the lower a_1 is the less like it is that the individual will participate in the sex market,
- the higher the price of commercial sex is, the less likely it is that the agent will take part in the commercial sex market,
- the larger the income differential is, i.e. the larger the difference I_c-I_p , the more likely it is that sex will be bought.

Given that the sex is bought in the market, then from (9) we can find the demand for commercial sex as a function of the price of commercial sex and maximum reputation. However to describe the demand curve it is more convenient to consider the price w as a function of the amount of commercial sex bought, S_c . We thus get

$$(12) \quad w = \frac{a_1}{S_c + S^0} - \frac{(1 - a_1)}{R_c - S_c}$$

We notice that if $a_1=1$, the case when reduced reputation has no impact on utility, $w = \frac{1}{S_c + S^0}$, which is the standard “text-book” case with a downward sloping demand curve, and with the curve approaching the horizontal axis when S_c goes to infinity and to a_1/S_c^0 when S_c goes to zero. We observe that if S_c^0 increases the demand curve for commercial sex is shifted downwards. When reputation matters, we observe from eq. (12) that the demand curve is shifted downwards relative to the demand curve when reputation does not matter. The higher the maximum reputation is, the closer the demand curve gets to the standard one. The interpretation of this is that the higher R_c is, the more commercial sex can be bought without destroying ones’ own reputation.

From (12) we easily get that the demand curve is always downward sloping. The upper part of the demand curve is a convex function, with the demand curve approaching a_1/S_c^0 when S_c goes to zero, and the lower part is a concave function that approaches R_c when S goes to R_c . The value of S_c at which the curve switches from a convex to a concave function is given by

$$(13) \quad \tilde{S} = \frac{a}{1+a} R_c - S^0 < R_c$$

where

$$(14) \quad a = \left[\frac{a_1}{1-a_1} \right]^{1/3}$$

The demand curve is given in Figure 1.

[Figure 1 here]

5.2 The supply side.

Subscripts p denotes variables related to prostitutes. The amount of commercial sex sold reduces both leisure and reputation among prostitutes. To make things simple we measure reputation and leisure in the same units as commercial sex sold. Let H_p denote hours available for work in prostitution above those worked elsewhere. So if H_p is high, prostitutes have few other options than selling commercial sex; if it is low, prostitutes have many other options than selling commercial sex. Thus leisure, denoted L_p , equals $L_p = H_p - S_p$. Prostitutes derive utility from consumption of goods and services, C_p , which is financed by total income $I_p + wS_p$. I_p is an exogenous income, while wS_p is the income from selling commercial sex. Let R_p denote the maximum reputation the prostitute can enjoy when no commercial sex is sold, so that a high R_p means that prostitutes have very little to lose reputation-wise when selling commercial sex and a low R_p means the opposite.

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

The utility is given by

$$(15) \quad U_p = U_p(L_p, C_p, r_p)$$

Again, we have to start with the condition for participating at all as a seller of sex. Assuming that the agent is maximizing utility with respect to sex sold, we get the following participation criteria:

$$(16) \quad S_p > 0 \text{ if } \left[\frac{\frac{\partial U_p}{\partial L_p}}{\frac{\partial U_p}{\partial C_p}} \Big|_{S_p=0} \right] \leq w - \left[\frac{\frac{\partial U_p}{\partial r_p}}{\frac{\partial U_p}{\partial C_p}} \Big|_{S_p} \right]$$

Thus, an individual will start to sell sex in the market if the price for selling the first amount of sex, minus the costs of a worsened reputation for doing so, exceeds the shadow price of leisure evaluated at zero sex sold. Given that the individual participate as a seller, the optimal amount of sex sold is determined by the following condition (together with the budget constraints):

$$(17) \quad \frac{\frac{\partial U_p}{\partial L_p}}{\frac{\partial U_p}{\partial C_p}} = w - \frac{\frac{\partial U_p}{\partial r_p}}{\frac{\partial U_p}{\partial C_p}}$$

Thus, at optimum the shadow price leisure (the term to the right in (17)) equals the marginal net gain of supplying labour through the sale of commercial sex. This marginal net gain equals the price of commercial sex 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 as

$$(18) \quad U_p = \beta_1 \ln(H_p - S_p) + \beta_2(I_p + wS_p) + \beta_3 \ln(R_p - S_p),$$

where $\{\beta_1, \beta_2, \beta_3\} > 0$

Setting

$$b_1 = \frac{\beta_1}{\beta_2}; b_3 = 1 - b_1 = \frac{\beta_3}{\beta_2}; 0 \leq b_1 \leq 1,$$

we get from (16), (17) and (18):

$$(19) \quad S_p > 0, \text{ if } w \geq \frac{b_1}{H_p} + \frac{1-b_1}{R_p}$$

We clearly see that

- the higher the price if selling sex is, the more likely is that an individual will take part in the sale of sex,
- the more other working alternatives the individual has, i.e. the lower H_p is, the less likely it is that the individual will take part in the sex industry,
- the more reputation matters, i.e. the smaller b_1 is, the less likely it is that the individual will sell sex,
- the less it takes to ruin the reputation, i.e. the smaller R_p is, the less likely it is that sex will be sold.

Given that $S_p > 0$, then the optimal amount of sex sold follow from the following supply function:

$$(20) \quad w = \frac{b_1}{H_p - S_p} + \frac{1 - b_1}{R_p - S_p}.$$

The second order condition is fulfilled given the permissible values for b_1 .

So if b_1 is high, prostitutes are less concerned about reputation; and if b_1 is low, prostitutes are more concerned about reputation. We observe that if reputation does not matter, i.e. if $b_1=1$, then we have the standard textbook case with an upward sloping labour supply curve, starting at $\frac{1}{H_p}$ for $S_p=0$ and goes to infinity when S_p approaches H_p .

Next we observe that if leisure does not matter, i.e. if $b_1=0$, we also get an upward sloping supply curve, which starts at $\frac{1}{R_p}$ for $S_p=0$ and goes to infinity when S_p approaches R_p . However even if the prostitute does not derive any utility from leisure, there is an upper time-bound on how much labour he or she can supply. Thus also in this case the labour supply curve goes to infinity when S_p approaches H_p , provided $H_p \leq R_p$.

In the case when $0 < b_1 < 1$, the supply curve is a weighted average of the supply curve when reputation does not matter and the supply curve when leisure does not matter. The weights are b_1 and $(1-b_1)$. In Figure 2 we show the labour supply curves, given that maximum leisure is the binding constraint.

[Figure 2 here]

If the maximum reputation capacity, R_p , increases, the supply curve is shifted downwards, which means that at given price of commercial sex, w , the prostitute is willing to supply more commercial sex. Again, as in the case of clients, a higher value for R_p means that more commercial sex can be sold without destroying ones' own reputation.

We will now turn to market equilibrium, when both clients and prostitutes participate in the market.

5.3 Market equilibrium

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

From (12) and (20) we then get

$$(21) \quad \frac{a_1}{S^* + S^0} - \frac{1 - a_1}{R_c - S^*} = \frac{b_1}{H_p - S^*} + \frac{1 - b_1}{R_p - S^*}$$

Thus the equilibrium amount of commercial sex sold and bought in the market S^* is a function of the exogenous parameters, i.e. $S^* = f(a_1, b_1, R_c, R_p, H_p, S_C^0)$

Table 1. Changes in S^* and w from increases in a_1, b_1, R_c, R_p, H_p , and S_C^0

| Change in | Increase in | | | | | |
|-----------|-------------|----------------------------------|-------|-------|-------|---------|
| | a_1 | b_1 | R_c | R_p | H_p | S_C^0 |
| S^* | + | $-(H_p < R_p)$ $+(H_p > R_p)$ | + | + | + | - |
| w | + | $+(H_p < R_p)$ $-(H_p > R_p)$ | + | - | - | - |

The table allows to examine the impact of changes in the key parameters on the equilibrium price and quantity of commercial sex.

Thus, column 2 indicates that the more the clients are concerned about having paid commercial sex and the less they are concerned about their reputation (corresponding to an increase in a_1), the more sex is bought and sold in the market and the higher is the price of paid commercial sex.

Column 3 indicates that the more the prostitutes are concerned about leisure at the expense of reputation (b_1 increases), the less commercial sex is sold at a higher price, if there are opportunities to work elsewhere (H is the binding constraint). If there are not (H is high), then the more commercial sex is sold for a low price.

Column 4 shows that a lot of commercial sex is sold at a high price to clients with a high reputation capacity, i.e. less vulnerable clients, or clients who are able to cover to a great extent their sex activities, and (combining with column 2) this is more true the less they care about their reputation.

Column 5 suggests that if it is difficult to have one's reputation ruined by being found out as a prostitute, then a lot of commercial sex will be sold at a low price. This matches the evidence of temporary immigrant prostitutes in Europe who aim to work in prostitution only for a limited amount of time to accumulate savings and then return to their country (see Thorbeke and Pattanaik, 2002; Corso and Trifirò, 2003).

Column 6 simply states that the fewer the alternative earning opportunities (H_p high), the more commercial sex is sold at a lower price.

Column 7 says that the more sex the clients have at home, the less sex they buy and the price for commercial sex will also be lower.

The equilibrium wage w^* follows from either (12) or (20). In Figure 3 we show the equilibrium for the case that $H_p < R_c < R_p$.

[Figure 3 here]

5.4 Reputation as a positional good: the market for paid sex 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 and not only for representative agent. We will not, however, introduce any heterogeneity in the model, which of course has to be done in empirical specifications. To simplify exposition we let the total number of clients and prostitutes be the same and equal to N .

Let

$$(22) \quad \{X_c = NS_c \text{ and } X_p = NS_p\}.$$

To let norms related to reputation be dependent on what the agents do, we will assume that the more sex is bought and sold in the market, the more it will take for one single agent to ruin his or her reputation. We assume that reputation is a positional good and depends on the degree of income disparity between clients and prostitutes:

$$(23) \quad R_c = t(NS_c)(I_c - I_p), \text{ with } t(\cdot) \text{ being an increasing function of income differentials.}$$

$$(24) \quad R_p = NS_p$$

When the agents make their choice, we do not assume that they take (23) and (24) into account. The impact of individual sexual behaviour on the norms in the society has the character of being externalities. To simplify matters we have assumed that $t(X_c)=t_1X_c$, where $t_1>0$.

From (12) and (23) we now get

$$(25) \quad w = \left[\frac{a_1}{1 + \frac{NS^0}{X_c}} - \frac{(1-a_1)}{t_1N(I_c - I_p) - 1} \right] \frac{N}{X_c}$$

We now observe that the demand curve now will be a monotonously downward sloping convex curve, provided that NS_c^0 is sufficiently small compared to X_c . We observe that if NS_c^0 is sufficiently large, the market for paid sex will disappear. Moreover we also observe that when a_1 is sufficiently small the market for paid sex will disappear. If a_1 is small, i.e. close to zero, reputation matters a lot for the individual clients.

From (20) and (24) we get:

$$(26) \quad w = \frac{N}{N-1} \left[\frac{b_1(N-1)}{H_pN - X_p} + \frac{1-b_1}{X_p} \right]$$

The supply curve is downward sloping for small X_p and upward sloping for large X_p ; more precisely, if \tilde{X}_p is the minimum of the supply curve:

$$(27) \quad \begin{cases} \frac{\partial w}{\partial X_p} < 0 \text{ for } X_p < \tilde{X}_p \\ \frac{\partial w}{\partial X_p} > 0 \text{ for } X_p > \tilde{X}_p \end{cases}$$

where \tilde{X}_p is defined by

$$(28) \quad \frac{b_1(N-1)}{(H_pN - \tilde{X}_p)^2} = \frac{1-b_1}{\tilde{X}_p^2}$$

When X_p approaches H_pN , then w goes to infinity. The supply curve with endogenous norms change considerably compared to when the norms were exogenous. The new supply curve is given in Figure 4 below.

[Figure 4 here]

Let X^* denote the equilibrium level of aggregate sex sold in the market. From (25) and (26) we get

$$(29) \quad X^* \left[\frac{a_1}{X^* + NS^0} - \frac{b_1}{H_p N - X^*} \right] = \frac{1 - a_1}{t_1(I_c - I_p) - 1} + \frac{1 - b_1}{N - 1}$$

More than one equilibrium level is possible once reputation becomes endogenous. And the comparative statics corresponding to Table 1 will now yield ambiguous results, depending on the size of X^* relative to NS_C^0 and to $H_p N$.

[Figure 5 here]

6. Markets and policies

The modelling of reputation and stigma reflects the issues emerging in the literature and evidence on prostitution, where inequality appears as a fundamental driving force generating supply and demand. A first general implication of modelling reputation as a positional good is that a more equal society, without immigration, would see prostitutes paid better and a lower demand than a more unequal one.

More specifically, 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 commercial sex, and increase the marginal willingness to pay for commercial sex. This should, in a closed economy, have the effect of increasing the price of commercial sex and, given the same availability of alternative earning opportunities and if there are constant intermediation margins, also increase the supply. However, in an open economy there always is immigration of illegal workers and out-migration of clients (sex tourism), which would help keeping prices low.

Another example is that of policies that increase the stigma of being clients, which 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 commercial sex and not the quantity of commercial sex demanded, and will therefore imply that clients will try to reduce the risk of being caught or negotiate lower prices, 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 which is supplied for lack of earning alternatives, and with simulations it can be established which of three possible effects will dominate: a reduction in supply and a permanent increase in price of commercial sex, or

an increase in supply due to the increased price which will ultimately lower it again to the initial level, or finally a permanent reduction in supply due to an increased concern for reputation on the part of those who have been able to exit the market.

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 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 randy, less concerned about reputation and a low a_1 means the opposite. Moreover, a high R_c means that clients have to much lose reputation wise when having paid commercial sex, 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 high, R_c low). Then there are four combinations:

$$(27) \quad \{F_c(H,H), F_c(H,L), F_c(L,H), F_c(L,L)\}$$

For example, $F_c(H,H)$, may be a randy judge, who has much to lose if caught purchasing commercial sex.

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 much to lose reputation wise when selling commercial sex and a low R_p the opposite. Furthermore, a high H_p indicates that prostitutes have few other options than selling commercial sex, and a low H_p indicates many other options than selling commercial sex. Again, let $F_p(k,r,s)$ mean a combination of $\{k,r,s\}=H,L$ for example (b_1 high, H_p low, R_p low), so that all together there are 8 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 commercial sex, and little to lose reputation-wise by selling commercial sex far from their environment will have $F_p(H,L,L)$.

Matching the cases generates 32 different possibilities, which can potentially describe 32 different markets, or particular cases. A randy judge having paid commercial sex with a student would be the combination $F_c(H,H)$ and $F_p(H,L,L)$. The price of paid commercial sex will be high and the amount sold will be little compared to the reference case of $F_c(H,L)$ and $F_p(L,H,L)$, which could describe clients not concerned about their reputation who have paid commercial sex with street prostitutes, who typically have few other jobs available and are concerned about their reputation but the latter is not very high as they are poorer. This standard market relative to the others will have the lowest price and the highest amount of commercial sex sold (as can be seen in table 1).

7. Empirical work and conclusions

Empirical work is obviously needed to estimate our model and its applicability for policy simulations, particularly collecting information regarding both clients and prostitutes, and addressing not just their income differentials and opportunities for alternative work for prostitutes, but also variables capable of addressing stigma and stigma perception. For example, measures of violence against sex workers as against other workers could proxy the stigma attached to prostitution; the visibility of sex workers could proxy the reputation effect to clients; and similarly the extent to which sex workers lead a “double-life” (i.e. hide the fact that they sell sex) could proxy stigma perception by sex workers.

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. We have made no restrictive assumptions regarding gender, pay, and nature of forgone opportunities for the prostitute, and concentrating on income, reputation, and personal attitude variables we have determined price and quantities of equilibrium for different submarkets and more importantly produced a framework in which the effect of policy can be simulated. We believe 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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Figures

Figure 1: Demand

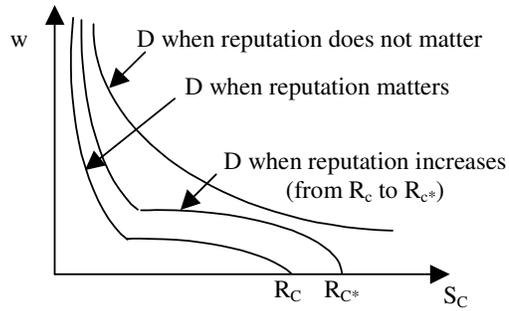


Figure 2: Supply

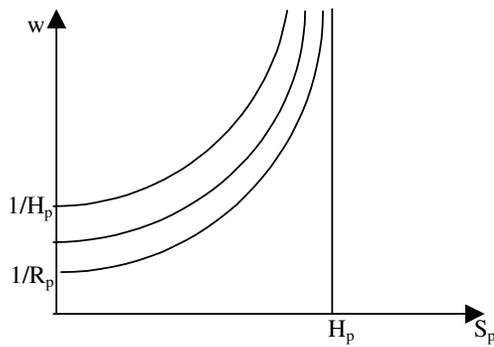


Figure 3: Equilibrium in the market for commercial sex

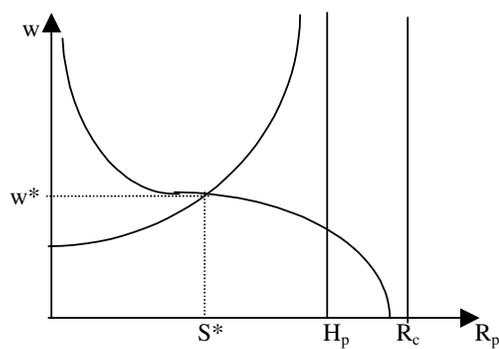


Figure 4: Supply when reputation is endogenous

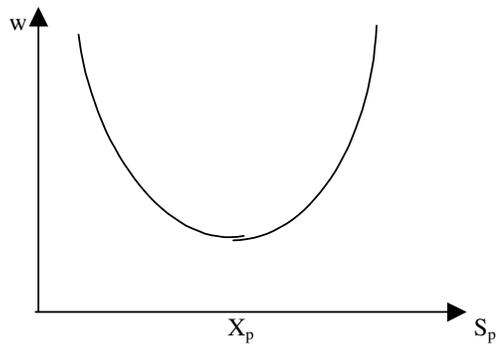


Figure 5: Market equilibrium when reputation is endogenous

