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## Abstract

Internationally, there is no consensus concerning the legal and moral judgment of prostitution. Nevertheless, there is an overwhelming agreement on the need to fight sexual slavery. We analyze how a law – introduced to punish clients of commercial sex services – affects market outcomes. More specifically, we examine how the so-called ‘neo-abolitionism’ or ‘Nordic’ prostitution regime impacts sexual slavery. The theoretical analysis reveals that this effect is ambiguous and crucially depends on the size of the deterrence effect and on local properties of the market demand. In addition, we highlight the conditions under which the composition of clients changes towards more risk-seeking individuals. Policy implications that arise are identified and discussed.

*Keywords:* Prostitution, Regulation, Forced Labor, Sexual Slavery

**JEL Classification:** K42, L51, D42, J3

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## 1. Introduction

Prostitution, i.e., commercial sex, is an important sector of the global economy and also intensively discussed in the public arena. The controversy becomes apparent in the large variety of legislation, ranging from no specific regulation at all to complete criminalization.<sup>1</sup>

However, the way policy regimes are classified is intensely discussed in the literature.<sup>2</sup> One aspect deals with the range of regulatory regimes, which spans the spectrum from a two-fold scale (abolitionism versus prohibitionism) up to a six-fold scale.<sup>3</sup> In a recent contribution, Östergren (2017) proposes a three-fold classification scheme and introduces the following typology: Repressive, restrictive, and integrative regimes.<sup>4</sup> Another aspect is whether the classification should occur on the national or a more regional level. This is because different policy regimes can prevail within countries such as the United States, or even within federal states.<sup>5</sup> Consequently, since one country

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<sup>1</sup>McCarthy et al. (2012), Östergren (2017), as well as Jahnsen and Wagenaar (2018) offer surveys of the legal situation across different countries.

<sup>2</sup>Even the term ‘policy regime’ is under discussion (Östergren, 2017, p. 7). Alternatively, the terms ‘policy models’, ‘policy approaches’, or ‘legal regulatory framework’ are used. Jahnsen and Wagenaar (2018), on the contrary, collect 22 case studies of European countries without even using the framework of a system of policy regimes. The authors rather employ a specific format –a general analytical scheme– for the description, characterization and comparison of prostitution policies.

<sup>3</sup>Danna (2014, p. 17): Prohibitionism, regulationism with health checks and licenses, abolitionism, abolitionism with legal indoor prostitution, neoprohibitionism (the purchase of sexual services is a crime), neoregulationism.

<sup>4</sup>In order to classify a country into one of the three regimes, she proposes to use an assessment protocol based on the 4 *i*’s: Stated intentions, policy instruments, implementation of instruments, and impact on sector and participants.

<sup>5</sup>For instance, within the State of Nevada, prostitution is illegal within the county of

might operate with two or three policy regimes at the same time, it might be necessary to shift the analytical unit from the national to the federal (state) or local level (Östergren, 2017, p. 25).

Despite this obvious heterogeneity with respect to the regulatory regimes, there is a global consensus concerning the proscription and prohibition of forced prostitution for the purpose of exploitation.<sup>6</sup> Forced prostitution is closely linked to trafficking, which is defined by the UN in the *Protocol to Prevent, Suppress and Punish Trafficking in Persons Especially Women and Children (Article 3a)* as:

‘Trafficking in persons’ shall mean the recruitment, transportation, transfer, harbouring or receipt of persons, by means of the threat or use of force or other forms of coercion, of abduction, of fraud, of deception, of the abuse of power or of a position of vulnerability or of the giving or receiving of payments or benefits to achieve the consent of a person having control over another person, for the purpose of exploitation. Exploitation shall include, at a minimum, the exploitation of the prostitution of others or other forms of sexual exploitation, forced labour or services, slavery or practices similar to slavery, servitude or the removal of organs;

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Clark (which contains Las Vegas), but legal brothels operate in 7 out of 16 counties.

<sup>6</sup>O’Connell Davidson (2006) points out that there are definitional problems regarding slavery. We address this issue later in this paper.

(UN, 2000).<sup>7</sup>

Yet, while we can find an international stance against forced prostitution and sexual exploitation, the proper means of achieving this goal are not that clear, especially when it comes to sex market regulations.

The question arises whether there is a link between sexual exploitation and the prostitution regime, and if it exists, in which direction? On the one hand, some argue that the legality of paid sex facilitates trafficking and sexual slavery, because it increases the demand, lowers the slaveholders' costs, and facilitates the matching process (e.g. Jakobsson and Kotsadam (2013) or Cho et al. (2013)). On the other hand, the incentive for victims and clients to cooperate with the police is much lower under prohibitionism (e.g. Bisschop et al. (2017); Cunningham and Shah (2017)). When prostitution becomes an illicit act and thus less visible, the possibilities of control diminish (Scoular, 2010). Moreover, Cho et al. (2013) emphasize that in case consensual commercial sex is decriminalized, there might be a substitution effect, i.e., a shift from forced to legal prostitution.

The empirical research on this issue is ambiguous as well. For instance, while Jakobsson and Kotsadam (2013) as well as Cho et al. (2013) find that harsher prostitution laws reduce trafficking, the New Zealand government's

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<sup>7</sup>Raymond (2002, p. 497) analyses and comments the UN trafficking protocol. She stresses that the definition not only includes the terms 'force' or 'coercion', but also the term 'abuse of victim's vulnerability'. Furthermore, she emphasizes that the consent of a victim is irrelevant (p. 498).

report of the *Prostitution Reform Act 2003* (Fitzharris et al., 2008) contradicts this finding. Hernandez and Rudolph (2015) find no significant relationship at all.

In this paper we shed light on the question of how the legal situation of prostitution affects sexual slavery. The form of regulation at the center of the analysis is the ‘neo-abolitionism’ or ‘Nordic’ prostitution regime (Skilbrei and Holmström, 2011).<sup>8</sup> In this regulatory regime, it is illegal to purchase sexual services. In other words, it is the client who commits a crime, not the prostitute. Hence, the focus is clearly on the demand side of the market. The first country which adapted this new legislation was Sweden in 1999, followed by Norway and Iceland in 2009.<sup>9</sup> Northern Ireland and France joined the group in 2015 and 2016, respectively (Bettio et al., 2017). The last country so far which has made it illegal to pay for sex is the Republic of Ireland in 2017.

This development shows the relevance of the question: Is the criminalization of buying sexual services an appropriate instrument, when the goal is to reduce the quantity of forced prostitution?

To answer this question, this paper introduces a formal economic model

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<sup>8</sup>The term ‘Nordic’ prostitution regime is frequently used in the literature to refer to the regime currently prevailing in Sweden. Östergren (2017, p. 3) criticizes this terminology, because it reduces all the laws that govern prostitution in Sweden to one single law. According to the author, the regime in Denmark is entirely different from the regime in Sweden, which is why the term ‘Nordic’ is misleading.

<sup>9</sup>See Kulick (2003), Waltman (2011) as well as Holmström and Skilbrei (2017) for a detailed discussion of the Swedish case.

where the paid sex market consists of two different types of suppliers providing substitutable sex services:

- First, there are individuals who choose to offer consensual sex for money. We refer to the exchange of voluntary sex services for payment as ‘voluntary prostitution’, ‘free prostitution’, or ‘voluntary sex work’, being aware that this is a controversial term when used in a normative sense.
- Second, there are victims who are forced into prostitution. In this paper, we use the terms ‘forced prostitution’, ‘involuntary prostitution’, and ‘sexual slavery’<sup>10</sup> synonymously. While a clear definition of slavery is not easy to find (see, e.g., O’Connell Davidson (2006)), we follow Rogowski (2013) and refer to “the ownership of another human being and of all of his or her labor” (p. 194). Note that we use the expressions ‘slave holder’ and ‘slave owner’ to refer to the person (or organization) who has control over the individual being forced into prostitution.

Our main finding is that a ban on the purchase of sexual services can have

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<sup>10</sup>We are aware of the fact that there is an intense discussion of whether ‘modern slavery’ exists or not. Slavery is explicitly mentioned in the UN (2000) protocol. However, O’Connell Davidson (2015) is very critical in this respect and severely criticizes the line of argumentation of the abolitionists: “Similarly [as in fairy tales], the figures in new abolitionist stories of ‘modern slavery’ and ‘trafficking’ are stripped of ambivalence.” (O’Connell Davidson, 2015, p. 206). New abolitionism “selectively names certain forms of suffering as ‘modern slavery’, then constructs simple narratives about the roots of these problems in criminality or evil.” (O’Connell Davidson, 2015, p. 208). She concludes with respect to slavery: “Modern slavery’ no longer exists, and none of the phenomena today described as such are the equivalent of transatlantic slavery.” (O’Connell Davidson, 2015, p. 207).

an adverse effect on the extent of involuntary prostitution: A drop in demand c.p. causes prices to decrease, which in turn provokes voluntary prostitutes to exit the market. On the contrary, as a price-setter, the slaveholder's optimal response may be to lower his price in order to 'recover' demand, at least to some extent. This is the case if the deterrence effect is sufficiently small and leads to more sexual slavery even when the overall demand decreases. In an extension, we also highlight the conditions under which the composition of clients changes towards more risk-seeking individuals.

The remainder of this paper is structured as follows. Section 2 gives a short review of the related (theoretical economic) literature. In Section 3, we develop a formal model of the market for paid sex with voluntary and involuntary providers and determine the impact of criminalizing the demand side. The main results are derived. Section 4 concludes with a discussion and some policy implications.

## **2. Related literature**

Although empirical investigations are growing, theoretical economic literature on prostitution is, to our best knowledge, rather scarce. In a seminal contribution, Edlund and Korn (2002) explain the paradox of high compensation for low-skilled work by linking marriage and the labor market: since prostitution is assumed to block access to the marriage market, an individual will only pursue that occupation if the income is sufficiently high to compensate for this kind of opportunity cost. The paper was subject to intense



discussion and has been empirically refuted, see, e.g. Cameron (2002) or Arunachalam and Shah (2008).

Other contributions focus on the role of stigma and reputation (Della Giusta et al., 2009a,b; Della Giusta, 2010; Della Giusta et al., 2017), health risks (Immordino and Russo, 2015), intermediaries like procurers or brothel owners (Farmer and Horowitz, 2013), bargaining power and the well-being of sex workers (Hui, 2017), or migrants' decisions for or against an occupation in the sex market, depending on the extent of relative deprivation and the expected choice of the peer group (Stark and Fan, 2011).

The papers most closely related are Collins and Judge (2008) and Lee and Persson (2015). Collins and Judge (2008) restrict their analysis to the client's demand for sex services and found that the client will substitute licensed for unlicensed (which means more risky and socially less desired) sex services if the relative price, the risk, or the time costs of the former diminishes. This might be seen as an argument for a more liberal form of legislation. In a further contribution, Collins and Judge (2010) focus on the spill-over effects of harsher policing on the amount of prostitution in neighboring regions. Given the (strong) assumption that the price of paid sex remains constant, the demand will shift from the more policed to the less policed sector.

Lee and Persson (2015) use a modified Edlund / Korn model including trafficking to analyze different regulatory regimes. Their results strongly depend on paradoxical price reactions due to the interaction between the marriage market and the market for commercial sex.

The present paper adds to the existing literature by paying special attention to the supply of forced labor. More precisely, the model proposed in the next section is based on the idea that the slave owner holds significant market power and that slavery grants the employer “much lower marginal labor costs at the price of a higher fixed cost, namely that of buying the slave and maintaining the whole apparatus of compulsion and control” (Rogowski, 2013, p. 194). There are some seminal contributions on slavery and forced labor (Bergstrom, 1971; Barzel, 1977; Lagerlöf, 2009; Acemoglu and Wolitzky, 2011; Dari-Mattiacci, 2013). Other papers that deal with slavery or forced labor are Rogers and Swinnerton (2008), who set up a model including exploitative child labor, and Wheaton et al. (2010) as well as Akee et al. (2014), who analyze certain features of the human trafficking business.

### 3. A formal model

In this section, we set up the basic analytical framework, starting with the demand side of the market. Here, the client’s net utility is given by

$$U_C = u_i - p - E, \tag{1}$$

where  $p$  is the price for a (standardized) sex service and its direct utility  $u_i$  varies across the population according to a (non-degenerate) distribution  $F(u)$  with continuous density  $f(u)$ . This allows for different moral sentiments, such as feelings of shame and guilt caused by a violation of social norms. The last term of (1) simply accounts for the expected value of being

caught and punished. In the basic setting without regulation, the expected punishment is set to  $E = 0$ .<sup>11</sup> The individual will demand prostitution services if

$$u_i \geq p + E, \tag{2}$$

which simply means that the benefit of buying has to outweigh its expected costs or, to put it another way, that the expected net utility is nonnegative.

In the next step, condition (2) is used to derive the total demand  $D$  in the sex market given that the population size is normalized to one:

$$D(p, E) := 1 - F(p + E). \tag{3}$$

Surely demand decreases in the monetary and (expected) legal costs of the sexual service. The reduction of the client's demand in response to an increased risk of being punished is empirically supported, for instance by Kotsadam and Jakobsson (2014).

Next, we turn to the supply side of the market. An important feature of the model is that the supply is dualistic, i.e., voluntary and involuntary sex services are treated as complete substitutes. To begin with, the net utility of a free prostitute is given by

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<sup>11</sup>See Cameron (2002, Ch.10) for a more detailed form of the utility function.

$$U_F = p - \theta_i, \tag{4}$$

where  $\theta_i$ , the disutility of prostitution, varies across the population according to a (non-degenerate) distribution  $G(\theta)$  with continuous density  $g(\theta)$ . The reservation wage of sex workers is  $w$ .<sup>12</sup> Note that the index  $F$  is an abbreviation for ‘free’ prostitutes.

Hence, the participation condition of an individual to offer sex for money of his or her<sup>13</sup> own free will is given by

$$p - \theta_i \geq w. \tag{5}$$

Thus, the supply of free sex sellers is simply

$$S_F := G(p - w). \tag{6}$$

As mentioned before, there is a second type of supply besides consensual sex work, namely, individuals forced to prostitute themselves (‘sexual slavery’). In line with Rogowski (2013), we assume fixed costs  $C$  for the

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<sup>12</sup>A uniform wage is assumed for simplicity. It might, however, reflect the empirical observation that prostitution is “the most lucrative side income available to these low-skilled women” (Edin and Lein (1997), cited in (Edlund and Korn, 2002, p. 188)). D’Ippoliti and Botti (2017) analyze the pull and push factors that influence transsexual and transgendered people to supply sex services. The prospective income was identified as an important pull factor.

<sup>13</sup>There is no need to be specific here. However, it should be noted that the vast majority of human beings involved in prostitution (Cameron and Collins (2003), UN (2013)) and sexual slavery (UN, 2009) are female. See Dennis (2008) for a reflection on male prostitution.

slaveholder, such as the costs of trafficking and the formation of a control system, but no variable costs: Supervising one slave is extremely costly, but supervising the next ten does not cause notable additional costs when the appropriate structure has been installed already.

Moreover, since organized illegal activities generally require some kind of ‘enforcers’, it is plausible to assume that the principal has the resources to repel potential rivals.<sup>14</sup> Thus, with enormous economies of scale and barriers to entry, there are strong economic reasons to expect the slave owner to act as a natural (local) monopolist, at least within a certain area.<sup>15</sup> We therefore assume the sex market to consist of one dominant price leader (the slaveholder) and a competitive fringe of small price-taking suppliers (the free prostitutes).<sup>16</sup>

Hence, the slave-owner’s expected profit is simply determined by

$$\Pi = pn - C, \tag{7}$$

where  $n$  denotes the number of involuntary prostitutes. Since the slaveholder

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<sup>14</sup>Indeed, there is a strong link between sex slavery / trafficking and organized crime, see, e.g. Jakobsson and Kotsadam (2013) or Shannon (2012).

<sup>15</sup>Note that Skaperdas (2001, p. 186) argues in the same manner regarding the provision of ‘protection’ by organized crime groups. In a more general sense, Abadinsky (2012, p. 4) lists the striving for hegemony or monopoly as one of four basic characteristics of organized crime groups, “maintained by violence, by the threat of violence, or by corrupt relationships with law enforcement officials”. This assumption differs significantly from Lee and Persson (2015), who presume the traffickers to act as price takers under perfect competition with constant marginal costs only.

<sup>16</sup>See, for instance, Lipczynski et al. (2005, p. 142f).

clearly has an incentive to choose  $n$  as large as possible, for a given price  $p$  the number of sexual slaves simply meets the residual demand  $D - S_F$ :

$$\begin{aligned} n &= D - S_F \\ &= 1 - F(p + E) - G(p - w). \end{aligned} \tag{8}$$

Figure 1 illustrates the market for sexual services. As (6) indicates that the supply curve has a positive slope and that the first free prostitute (with  $\theta_i = 0$ ) enters the market at  $p = w$ , this is where the spread between the total and residual demand originates. Furthermore, without sexual slavery, the total demand is completely served by the fringe at price  $\bar{p}$  defined by  $D(\bar{p}) = S_F(\bar{p})$ .

In addition, Figure 1 illustrates the slave owner's maximization problem, which is to set the price that guarantees the highest possible profit. Hence, noting that (7) implies hyperbolic isoprofit curves for different levels of  $\Pi$ , the slaveholder's optimal price  $p^*$  is found where the highest attainable isoprofit curve  $\Pi^*$  is tangent to the residual demand.

Without further restrictions, there are four potential scenarios, which depend on the parameters  $C$  and  $w$  and on the properties of  $F(u)$  and  $G(\theta)$ :

- (i) For  $p^*n < C$  and  $1 - F(w + E) > 0$ , there is no sexual slavery in the market and the demand is completely served by voluntary providers at price  $\bar{p}$ ;

- (ii) For  $p^*n \geq C$  and  $p^* < w$ , no one is willing to offer sexual services voluntarily and the demand is completely served by sexual slavery;
- (iii) For  $p^*n \geq C$  and  $p^* \geq w$ , the supply side consists of both free and forced prostitutes;
- (iv) For  $p^*n < C$  and  $1 - F(w + E) = 0$ , there is no prostitution at all.

Since the problem at hand is to determine the effect of punishing clients on a market for paid sex that has both voluntary and involuntary providers, we assume condition (iii) to hold in the initial equilibrium and next turn to the formal analysis.

Using (7) and (8), the first-order condition of (7) with respect to  $p$  is<sup>17</sup>

$$\Omega := p \cdot (-F'(p + E) - G'(p - w)) + n = 0. \quad (9)$$

This condition reflects the following trade-off:

- A marginal increase of the price level ( $p$ ) raises the revenue per forced prostitute ( $n$ ).
- Yet, an increase of the price level would also increase the number of free prostitutes, since  $\partial G/\partial p > 0$ . Hence, the residual demand and the slaveholder's profits decrease.

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<sup>17</sup>Note that in the event of zero marginal costs, profit maximization is the same as revenue maximization.

- As a second dampening effect on demand, a marginal increase of  $p$  lowers the overall demand ( $-\partial F/\partial p < 0$ ). This effect also influences profits negatively.

Given that the second-order condition is satisfied, the optimal price  $p^*(E, w)$  is found where this trade-off is balanced. Based on this optimal price  $p^*(E, w)$ , the optimal quantity of sex slaves ( $n^*$ ) is determined by

$$n^* = 1 - F(p^*(E, w) + E) - G(p^*(E, w) - w), \quad (10)$$

Then, for  $p^*$  and  $n^*$  as defined above, the total number of prostitutes in the market is  $N = n^* + S_F(p^*)$ , see Figure 1.

### 3.1. A ban is imposed

What happens when the buying of sexual services is penalized, i.e.,  $E > 0$ ? Does the desired decline in the amount of forced prostitution, given by (10), take place?

**Proposition 1.** *The deterrence effect c.p. decreases total demand and therefore causes a reduction of free and forced prostitution in the first place. However, if the slaveholder's ex post incentive to lower the price in order to recover clients is sufficiently strong, the law ends up producing an unintended increase in sexual slavery.*

*Proof.* From (10) it follows that



$$\begin{aligned} \frac{dn^*}{dE} &= -\frac{\partial p^*}{\partial E} [F'(p^* + E) + G'(p^* - w)] - F'(p^* + E) \\ &\stackrel{(9)}{=} -\frac{\partial p^*}{\partial E} \frac{n^*}{p} - F'(p^* + E), \end{aligned} \quad (11)$$

so a necessary condition for  $\frac{dn^*}{dE} > 0$  is  $\frac{\partial p^*}{\partial E} < 0$ . Using (9) and the implicit function theorem, one obtains

$$\text{sign} \left[ \frac{\partial p^*}{\partial E} \right] = \text{sign} \left[ \frac{\partial \Omega}{\partial E} \right] = \text{sign} [-pF''(p + E) - F'(p + E)], \quad (12)$$

provided the second-order condition is satisfied.<sup>18</sup>

Equation (12) implies that  $p^*$  decreases in  $E$  if the deterrence effect is sufficiently high (second term) or if lowering the price in terms of ‘customer recovery’ is more profitable to the slaveholder after the regulation than before (first term); this is the case when  $F$  is convex, at least around  $p^*$ . Thus, the necessary condition for  $\frac{dn^*}{dE} > 0$  can be specified as

$$F'(p + E) > -pF''(p + E) := \underline{\phi}. \quad (13)$$

Provided (13) is fulfilled, it follows from (11) that the new law leads to

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<sup>18</sup>Note that the second-order condition  $\frac{\partial^2 \Omega}{\partial p^2}$  includes the first and second derivatives of  $G(p - w)$ , which means that the magnitude of  $\frac{dn^*}{dE}$  also hinges on the supply of free prostitutes.

an extension of slavery if, and only if,

$$F'(p^* + E) < -\frac{\partial p^*}{\partial E} [F'(p^* + E) + G'(p^* - w)] := \bar{\phi}, \quad (14)$$

which is a sufficient condition for  $\frac{dn^*}{dE} > 0$ . Consequently, for  $F'' < 0$ , forced prostitution increases in  $E$  if  $\underline{\phi} < F' < \bar{\phi}$ .

Moreover, (6) gives the fringe's reaction to the new law:

$$\frac{\partial G(p^* - w)}{\partial E} = G'(p^* - w) \frac{\partial p^*}{\partial E}. \quad (15)$$

Hence, if we assume that (13) and (14) hold, the extent of voluntary prostitution clearly diminishes.<sup>19</sup>

□

This analysis shows that the criminalization of buying sexual services increases sexual slavery under certain conditions. First, the equilibrium market price has to decrease in  $E$ . This is the case if the deterrence effect is sufficient strong or if the cumulative distribution function  $F(u)$  is (locally) convex around  $p^*$ , so that the slaveholder's incentive to lower the price in order to recover clients increases.<sup>20</sup> As a consequence, free prostitutes leave the market. Second, the magnitude of this effect must outweigh the lost

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<sup>19</sup>This result may be associated with the substitution effect mentioned in Cho et al. (2013).

<sup>20</sup>For instance, if  $u_i \sim \mathcal{N}(\mu, \sigma^2)$ , it follows that  $F''(u_i) = -\frac{u_i - \mu}{\sigma^2} f(u_i)$  and  $F$  is convex for  $u_i < \mu$ . As it is reasonable to assume that those clients with low values of  $u$  leave the market first, we have reason to expect the price to fall.

demand due to the deterrence effect, as it is clear from (3) that the new law reduces the total quantity of prostitution. Figure 2 illustrates the case where the prosecution of clients leads to more sexual slavery.<sup>21</sup>

### 3.2. Some more observations on the voluntary supply of sexual services

While Proposition 1 already established the ambiguity of a ban on the purchase of sexual services, some more conclusions can be drawn from the present market structure.

For instance, consider the voluntary prostitutes' **reservation wage**  $w$ . As (6) directly shows, free individuals will leave the market if  $w$  increases. In addition, given (10), the marginal effect of an increase in  $w$  on the optimal number of forced prostitutes is determined by

$$\frac{\partial n^*}{\partial w} = -\frac{\partial p^*}{\partial w} \frac{n^*}{p} + G'(p - w), \quad (16)$$

where

$$\text{sign} \left[ \frac{\partial p^*}{\partial w} \right] = \text{sign} \left[ \frac{\partial \Omega}{\partial w} \right] = \text{sign} [pG''(p - w) + G'(p - w)], \quad (17)$$

which is ambiguous as well. First, some free prostitutes will leave the market

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<sup>21</sup>Lee and Persson (2015) derive a similar, although simpler, result: the criminalization of buying commercial sex decreases the total amount of prostitution but increases trafficking. As the law provokes men's relative valuation of 'reproductive sex' to rise, the 'price of marriage' increases. Therefore, in equilibrium, this goes along with a higher price for commercial sex, which in turn gives rise to an expansion in the trafficked supply. Without the link to the marriage market, this paradoxical price reaction in the market for commercial sex obviously would not occur.

when their outside option improves. Hence, the residual demand of the slaveholder grows and thus the impact of a marginal increase of  $p$  on  $\Pi$ . This is why the second term of (17) is positive. Second, raising the market price clearly counteracts the exit of competitors (free prostitutes). More precisely, if  $G$  is concave, the supply of sex workers reacts more sensitively to changes in  $p$  than before the increase of the reservation wage, which is an incentive for the slaveholder to lower  $p$ . This result is summarized in Proposition 2.

**Proposition 2.** *If  $\frac{\partial p^*}{\partial w} \leq 0$ , the amount of sexual slavery is increasing in  $w$ . Otherwise, the overall effect is not clear, but it might be more profitable for the slaveholder to hold fewer slaves, i.e.,  $n^*$  decreases.*

Note that (6) indicates that the supply of free prostitutes consists of individuals with low values of  $\theta_i$ . It therefore seems more plausible to expect  $G'' > 0$  to hold, implying that  $p$  is increasing in  $w$ , and, consequently, that the sign of  $\frac{\partial n^*}{\partial w}$  is ambiguous.<sup>22</sup> Figure 3 illustrates the right-shift of  $S_F$  caused by the reservation wage growth. Accordingly, the new residual demand curve  $D - S_F$  exhibits a kink more to the right. The isoprofit curve in Figure 3 is such that the new equilibrium is characterized by a higher market price and more sexual slavery, but as Proposition 2 states, this is not necessarily the case.

In general, there might well be other causes for a right-shift of  $S_F$ . For

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<sup>22</sup>This applies, for example, to  $\theta_i \sim \mathcal{N}(\mu, \sigma^2)$ .

instance, any additional costs which affect only free prostitutes will influence their participation constraint (5) and hence can be analyzed in the same way as an increase in the reservation wage ( $w$ ). As a consequence, it becomes clear that any additional regulation that only affects the free prostitutes involves the very same effects as an increase in their reservation wage.<sup>23</sup>

If, for example, soliciting is criminalized as well, we could add a cost term to the right side of (4). This would have the same effect as increasing  $w$ : For a given price  $p$ , a certain amount of free prostitutes to whom (5) no longer applies would leave the market. Other examples are regulatory obligations or forms of stigmatization: While regulatory obligations, such as licensing procedures or regular health control screenings, would involve direct costs, discrimination or stigmatization, e.g. associated with the criminalization of prostitution, would change the distribution of  $\theta$ .

### 3.3. *Clients with heterogeneous risk attitudes*

In the foregoing sections, the clients were heterogeneous with respect to their direct utility derived from the sexual service they purchase. In this extension, we allow clients to also differ in their attitude towards risk. More precisely, we introduce a new parameter  $\alpha$  which captures the costs of risk when buying sex is being prosecuted. The idea is that some individuals

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<sup>23</sup>This statement holds for regulations which are either addressed to free prostitutes only or regulations addressed to the whole supply side but only obeyed by the free prostitutes. In case forced prostitutes and/or the slaveholders do not stick to the rules, they do not affect their cost function. Therefore, this kind of regulation would only influence the decision making process of free prostitutes.

		<i>Utility</i>	
		$u_l$	$u_h$
<i>Risk costs</i>	$\alpha_l$	$A$	$C$
	$\alpha_h$	$B$	$D$

Table 1: Types of clients with respect to utility and risk costs.

are less prone to take risks, which is equivalent to a higher level of  $\alpha$ . On contrary, we assume an individual with a high level of  $\alpha$  to be a ‘risk taker’. Consequently, the net utility defined in (1) changes to

$$U_c = u_i - p - \alpha_j E \tag{1'}$$

Our aim is to examine how the composition of the clients changes as a response to prosecution. Note that the price is taken as given, i.e. the analysis is restricted to the demand side. Furthermore, for reasons of simplicity, we use a discrete version of our model to make our point clear. Following Barigozzi and Turati (2012), we consider four types of potential clients, who differ in the two dimensions  $u_i \in \{u_l, u_h\}$  and  $\alpha_j \in \{\alpha_l, \alpha_h\}$ . Table 1 presents these four types:  $A = (u_l, \alpha_l)$ ,  $B = (u_l, \alpha_h)$ ,  $C = (u_h, \alpha_l)$ ,  $D = (u_h, \alpha_h)$ .

In the second step, we establish the critical values of  $E$  that make each type indifferent between buying and not buying. These are  $\tilde{E}_{l,l} = \frac{u_l - p}{\alpha_l}$ ,  $\tilde{E}_{l,h} = \frac{u_l - p}{\alpha_h}$ ,  $\tilde{E}_{h,l} = \frac{u_h - p}{\alpha_l}$ , and  $\tilde{E}_{h,h} = \frac{u_h - p}{\alpha_h}$ .

Now starting with a situation without prosecution ( $E = 0$ ) and all potential clients being active in the market (which requires  $u_l > p$ ), we can determine how an increase of  $E$  c.p. affects the average risk tolerance and

the average utility on the demand side. The results are summarized in Proposition 3.

**Proposition 3.** *If  $\Delta u := u_h - u_l$  is sufficiently low and  $\Delta\alpha := \alpha_h - \alpha_l$  is large enough so that  $\Psi > 0$ , the average risk costs of the clients is non-increasing in  $E$ , while the average utility follows no clear trend.*

*Proof.* In case the level of  $E$  increases, it is straightforward to see that type  $B$  is the first to leave the market, while type  $C$  is the last. Then, to ensure that type  $D$  follows  $B$  and  $A$  follows  $D$ ,  $\Psi := (u_l - p)\alpha_h - (u_h - p)\alpha_l > 0$  must hold.

□

Figure 4 shows the average utility and the average risk costs depending on  $E$ , for  $\Psi > 0$ . When the intensity of prosecution reaches the critical values, the composition of the clients changes. The less risk tolerant types are the first to leave the market, while the ‘risk takers’ remain, which manifests in a drop of the average risk costs from  $\frac{1}{2}(\alpha_h + \alpha_l)$  to  $\frac{1}{3}\alpha_h + \frac{2}{3}\alpha_l$  to  $\alpha_l$ . For  $\Psi < 0$ , the average risk costs follows no clear trend when  $E$  increases.

#### 4. Discussion and policy implications

The formal analysis has revealed that the answer to the question whether the regulation causes more or less forced prostitution is ambiguous. The regulation would work in the right direction if only the direct effect, the deterrence of clients, is being considered. However, if the slaveholder’s strategic

behavior is also taken into account, the overall result is less clear. In case there are incentives to lower the price in order to recover clients and to repel the competitive fringe of free prostitutes, it takes a strict enforcement when implementing the new law to guarantee a reduction in sexual enslavement.<sup>24</sup>

Hence, there are serious doubts about the ‘Nordic’ prostitution regime being the first best solution to the problem of forced prostitution in the market for sexual services.

First, it is unlikely to expect rising prices after its implementation. For example, Scoular (2010, p. 20) reports a drop in prices caused by the decline in demand in Sweden, which gives reason to anticipate the effects described in Proposition 1: Voluntary prostitution diminishes and might be replaced by forced prostitution. Moreover, it is to be feared that the remaining prostitutes might have to take more risks and suffer from worse working conditions (ibid., Di Tommaso et al. (2009)). Hence, we cannot rule out that the good intentions with respect to the introduction of the regulation produces an unintended evil. In this respect, we support the importance of Östergren’s 4i’s assessment protocol, which highlights the necessity to study the intentions, instruments, implementation, and the impact simultaneously (Östergren, 2017).

Second, it seems unlikely that the government will commit the resources

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<sup>24</sup>Of course, if  $E$  is sufficiently high to induce  $p^*n < C$ , sexual slavery is wiped out. Note that the conclusion, whereupon a weak deterrence effect with  $\underline{\phi} < F' < \bar{\phi}$  encourages slavery while a crackdown clearly reduces it, resembles the “fine enough or don’t fine at all” result of Lin and Yang (2006).



needed to provoke this collapse of the demand for commercial sex. Instead, ‘gesture politics,’ such as shifting prostitution from more to less visible locations (see, e.g., Scoular (2010, p. 13)) might occur, which may increase sexual slavery, as the formal analysis shows. Besides, an environment in which the demand for sexual services is criminalized narrows a sex worker’s ability to screen clients and to negotiate the terms of the sex work transactions, a point made in contributions such as Krüsi et al. (2014) and Sanders (2004). In a more general sense, the field studies by Cunningham and Shah (2017) as well as Bisschop et al. (2017) document that the (local) decriminalization of prostitution reduces the level of sexual violence and mitigates the spread of sexually transmitted diseases.

Third, our model indicates that the composition of clients might change towards more risk-seeking individuals. What consequences can be expected from this shift? In general, risk seeking is identified by Gottfredson and Hirschi (1990) as one of the key elements of self control, which in turn serves as an important predictor for antisocial or criminal behavior. In addition, there is reason to expect the deterrence effect of probabilistic sanctions to be rather small for the risk-taking type (e.g. Friehe and Schildberg-Hörisch (2017)). In reference to markets for sexual services, a higher proportion of risk-seeking clients should affect the extent of violence against prostitutes and health risks caused by unsafe practices. Hence, this effect on the composition of the clients should be seriously taken into account by law makers.

As a policy implication, we therefore recommend avoiding regulatory mea-

sures that trigger a fall in prices or lead to a deterioration in the working conditions of prostitutes. Instead, the analysis indicates that it is more promising to focus on the slaveholder's fixed costs  $C$ : As the profit function (7) shows, sexual slavery is profitable only if  $C$  does not exceed the revenue. In other words, a policy that focuses on the costs of slavery may force the slave owners to leave the market or, as the case may be, lower the market entry incentive, without harming the free providers of sexual services.

There are several ways to increase the costs of sexual slavery. First, stricter law enforcement towards traffickers would have a direct impact on their expenses. For example, a slave's price will increase as trafficking becomes more complicated. Second, victim protection programs and similar initiatives would encourage victims to escape and therefore significantly increase the costs of control.<sup>25</sup> Finally, preventative measures, such as awareness campaigns, might help to impede sexual slavery in the first place.

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<sup>25</sup>See also Rogowski (2013) and Akee et al. (2014).

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Figures

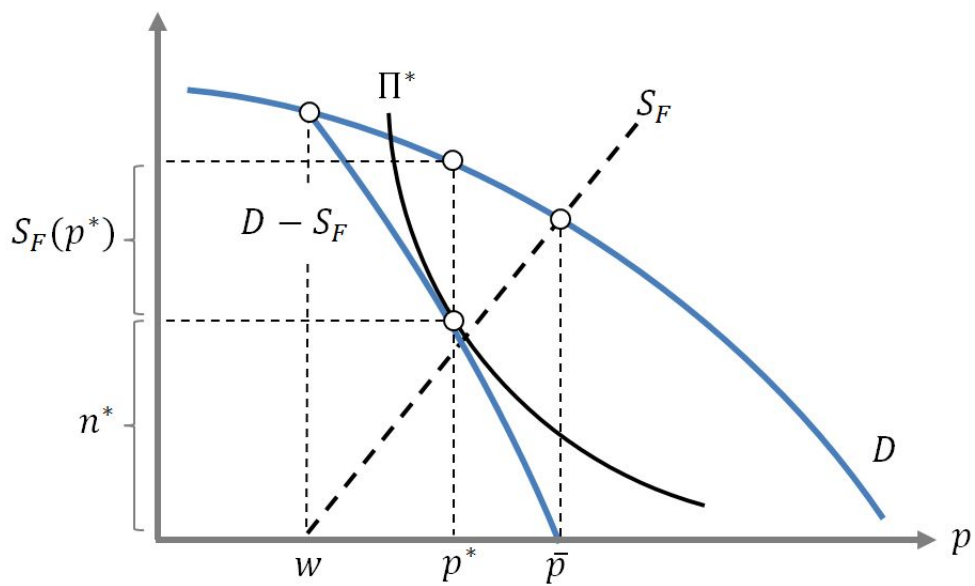


Figure 1: The market for sexual services.

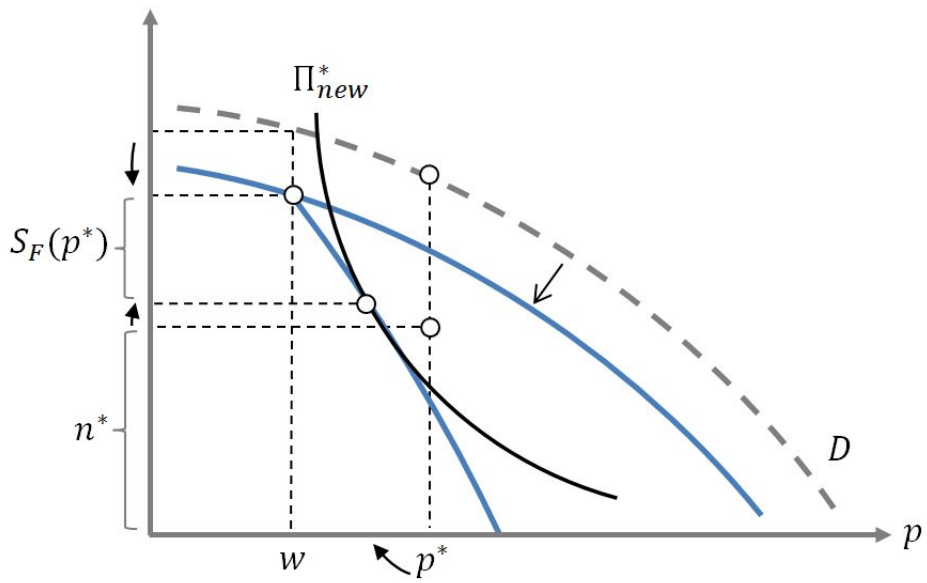


Figure 2: Punishing the clients leads to more sexual slavery.

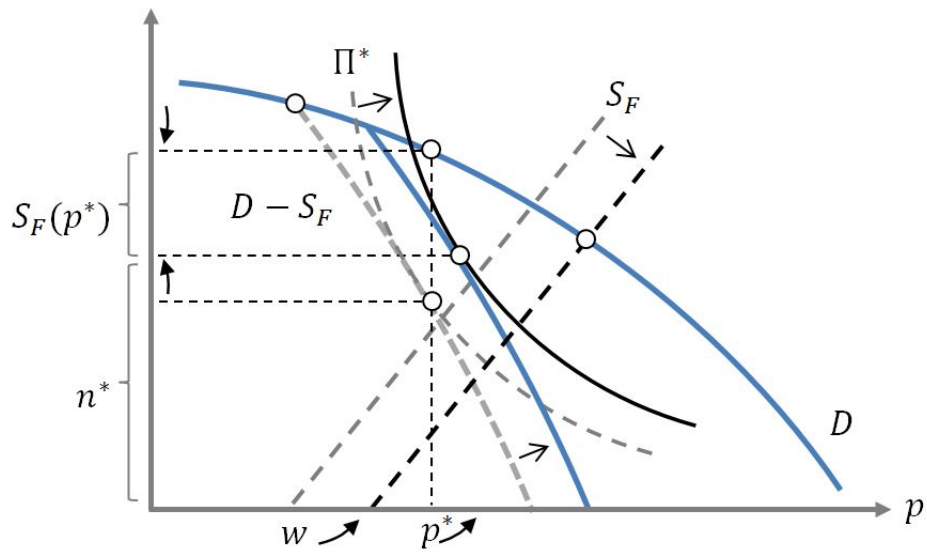


Figure 3: New market equilibrium caused by an increase in the free prostitutes' reservation wage  $w$ .

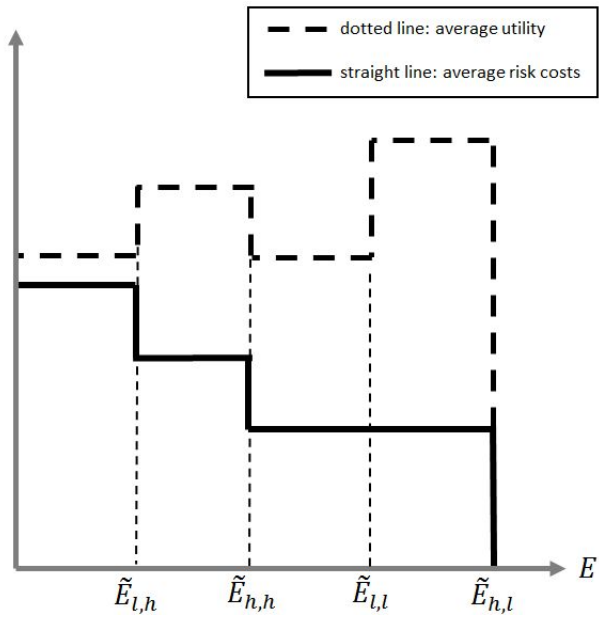


Figure 4: Demand side: Average utility and average risk costs.