



What is more important for prostitute price? Physical appearance or risky sex behavior?

Hung-Hao Chang^{a,*}, Yungho Weng^{b,1}

^a Department of Agricultural Economics, National Taiwan University, No 1, Roosevelt Rd, Sec 4, Taipei 10617, Taiwan

^b Department of Economics, National Chengchi University, 64, Sec 2, Tz-nan Rd., Wenshan, Taipei 116, Taiwan

ARTICLE INFO

Article history:

Received 15 May 2012

Received in revised form

25 June 2012

Accepted 28 June 2012

Available online 4 July 2012

JEL classification:

J01

J71

I12

Keywords:

Obesity

Risky sex

Prostitute price

Taiwan

ABSTRACT

Using a unique random survey of prostitutes in Taipei city of Taiwan, this study investigates the association between obesity, condom use and prostitutes' price. Results show that overweight prostitutes charge less for their services. However, prostitutes charge more for performing risky sex regardless of the weight status. By further looking at weight and height, we found that the price of prostitutes is only associated with weight.

© 2012 Elsevier B.V. All rights reserved.

1. Introduction

The prostitution industry is vast and operates in almost every corner of the world, either legally or illegally. Unlike other crime statistics, prostitution is market-related, and thus of special interest to economists. However, literature on the economics of prostitution is sparse. In the few existing studies (e.g., Rao et al., 2003; Torre et al., 2010), it is found that prostitutes earn about twice that of general female workers, and the price premium of risky sex is also evident: the prices paid for a prostitute's services are substantially higher when a condom is not used (Rao et al., 2003).

On the other hand, there has been growing interest in physical attractiveness on labor market returns (e.g., Berri et al., 2011, Fletcher, 2009, Hamermesh and Biddle, 1994, Johnston, 2010, Mobius and Rosenblat, 2006 and Robins et al., 2011). These studies concluded that good looks can influence the level of earnings; however, the effects are inconclusive depending on the nature of the job. If physically attractive individuals invest less time in developing their human capital, physical attractiveness may lead

to lower earnings. In contrast, if there is discrimination in the labor market and physical beauty is an advantage, earnings could be positively increased. Although economists have discovered the "beauty premium" in a variety of situations, to the best of our knowledge, little is known about whether physical attractiveness has an impact on the earnings of sex workers. Moreover, there is no literature to do with the interaction between risky sexual behavior and the physical appearance of the prostitutes.

This paper aims to combine two bodies of literature by analyzing the determinants of the price of prostitutes. We pay special attention to the relationship between obesity, risky sexual behavior, and the price of prostitutes using a random survey of 140 street prostitutes in Taipei city of Taiwan.

2. Data and methods

2.1. Data

Our data were collected in the Wanhua district, the most active sex trade area, of Taipei city in Taiwan; social workers conducted face-to-face interviews. Between April and September in 2010, 140 street prostitutes were randomly selected and interviewed.

The price per hour is used for the prostitute's services (US\$/hr). Two measures were used to assess physical appearance. The

* Corresponding author. Tel.: +886 2 33662656; fax: +886 2 23628496.

E-mail addresses: hunghaochang@ntu.edu.tw (H.-H. Chang),

yweng@nccu.edu.tw (Y. Weng).

¹ Tel.: +886 2 29387417.

Table 1
Price distributions by weight status.

Sample (%)	140	25 (18%)	80 (57%)	35 (25%)
	All sample	Underweight	Normal weight	Overweight/Obese
Mean	119	142	128	83
SD	44	42	40	31
Min.	40	80	67	40
Max.	267	267	267	133

Price is measured in US\$/hr (1 US\$ = NT\$30).

first was the body mass index (BMI) calculated on the ratio of weight (in kilogram) to height squared (in meters) of the subject.² The Department of Health in Taiwan gives statistics for adults: BMI ≥ 25 is classified as overweight/obese and BMI ≤ 18 is for underweight. In addition, we use the actual measured weight (in kilograms) and height (in centimeters) as the second measure of physical appearance.

Table 1 shows a sample distribution of the price and body weight. As shown, of the 140 subjects, 18% were underweight and 25% were overweight or obese. The average price paid varies for different weights. The highest average price paid was for the underweight respondents (\$142/hr), and the lowest average price paid was for overweight/obese respondents (\$83/hr).

Our survey also contained some information of the socio-demographic characteristics of the respondents and business-related information. This included work experience and the amount of time the respondents normally worked. Each prostitute was also asked if she agreed not to use condoms if requested to do so by the customers. Accordingly, a binary indicator of condom use is defined to represent risky behavior. All of the definitions of the selected variables and their sample statistics are reported in Table 2.

2.2. Statistical analysis

Following the hedonic price model and Rao et al. (2003), the prostitute price is determined by a set of selected characteristics:

$$P_i = P(W_i, X_i) \quad (1)$$

where P_i is the price, W_i is the measure of physical appearance, and X_i is the vector of the determinants of price. In the empirical analysis, four different linear regression models are specified. The baseline model focuses on different weight status (Eq. (2)):

$$P_i = \beta'X_i + \alpha_1 * \text{underweight}_i + \alpha_2 * \text{overweight}_i + \varepsilon_i \quad (2)$$

² Weight and height are physically measured by the interviewers, so they are free of self-report bias.

where *underweight* and *overweight* indicate the underweight and overweight status respectively, and $(\beta, \alpha_1, \alpha_2)$ are the parameters to be estimated. The random error is ε_i .

As a further measure of the price premium of risky sex on the prostitutes' price, Eq. (3) is specified by including the risky sex variable, and several interaction terms between risky sex and weight status into Eq. (2):

$$P_i = \beta'X_i + \gamma_1 * \text{underweight}_i + \gamma_2 * \text{overweight}_i + \gamma_3 * \text{risk}_i + \gamma_4 * \text{underweight}_i * \text{risk}_i + \gamma_5 * \text{overweight}_i * \text{risk}_i + \varepsilon_i. \quad (3)$$

For the second measure of physical appearance, that of actual weight and height, we specified Eqs. (4)–(5):

$$P_i = \beta'X_i + \gamma_1 * \text{weight}_i + \gamma_2 * \text{height}_i + \varepsilon_i \quad (4)$$

$$P_i = \beta'X_i + \gamma_1 * \text{weight}_i + \gamma_2 * \text{height}_i + \gamma_3 * \text{risk}_i + \gamma_4 * \text{weight}_i * \text{risk}_i + \gamma_5 * \text{height}_i * \text{risk}_i + \varepsilon_i. \quad (5)$$

Eqs. (2)–(5) were estimated using the ordinary least square (OLS) method with the robust standard errors.

3. Results and discussions

3.1. Body weight on prostitute price

The estimated results of Eqs. (2) and (3) are presented in Table 3. Results in Model 3A show that overweight is negatively associated with the prostitute price. Prostitutes who are overweight earn less than US\$41.45 per hour compared with respondents who are of normal weight. When risky sexual behavior was considered (Model 3B), the price penalty of overweight prostitutes increased to \$43.54/hr. However, for the same group of prostitutes, the price premium is \$8.18/hr if they are prepared to partake in risky sex. These findings point out that condom use has a strongly negative relationship with the price of sex.

3.2. Height and weight on prostitution price

Table 4 presents the estimated results of Eqs. (4)–(5) which measured the actual weight and height used to assess physical appearance. As shown, weight is negatively associated with the prostitute price. Other things being equal, an additional weight increase per kilogram decreases the prostitute price by \$1.76 per hour. After controlling for risky sex behavior, with every extra kilogram, the prostitute price decreases by \$2.14/hr when condoms are used. However, the price premium is \$1.37/hr if prostitutes are prepared to have unprotected sex (Model 4B). In contrast, actual height is not significantly associated with prostitute price.

Table 2
Sample statistics.

Variable	Definition	Mean	SD
Weight	Weight (kg)	54.6	9.52
Height	Height (cm)	158.79	5.16
Experience1	If less than 1 year (= 1).	0.38	0.49
Experience2	If ≥ 1 and < 3 year (= 1).	0.39	0.49
Experience3	If ≥ 3 year (= 1).	0.24	0.43
Age	Age	42.69	9.25
Primary	If primary education (= 1).	0.20	0.40
Elementary	If finished elementary school (= 1).	0.30	0.46
Junior	If finished junior high school (= 1).	0.26	0.44
Senior	If finished senior high school or higher (= 1).	0.24	0.43
Single	If single or never married (= 1).	0.43	0.50
Divorce	If divorced or widowed (= 1).	0.34	0.48
Married	If married (= 1).	0.23	0.42
Daytime	If worked between 8 am–5 pm (= 1).	0.64	0.48
Evening	If worked between 5 pm–midnight (= 1).	0.24	0.43
Night	If worked between midnight–5 am (= 1).	0.12	0.33
Risky sex	If agreed not to use condom (= 1).	0.10	0.30

Table 3
Estimation of the price equation by weight status.

Variable	Model 3A		Model 3B	
	Coefficient	SE	Coefficient	SE
Underweight	5.55	7.63	10.19	8.12
Underweight * Risky sex			−38.93	25.59
Overweight	−41.45***	6.83	−43.54***	7.29
Overweight * Risky sex			8.18**	4.15
Risky sex	3.50	9.67	8.70	14.50
Single	−3.38	7.49	−3.50	7.46
Divorced	−3.61	7.55	−3.41	7.52
Age	−1.45***	0.35	−1.60***	0.36
Elementary	−16.57**	8.46	−19.25**	8.58
Junior	−13.45	9.12	−17.82*	9.39
Senior	12.49	9.40	7.60	9.75
Experience2	−17.80***	6.46	−17.13***	6.50
Experience3	−11.93	7.59	−12.92*	7.65
Evening	7.54	6.81	7.37	6.78
Night	19.92**	8.83	17.84**	8.88
Constant	203.46***	20.26	212.89***	20.93
<i>Statistical test</i> ^a				
H_0 : Underweight = Underweight * Risky sex = 0			F value = 1.45 (p -value = 0.238)	
H_0 : Overweight = Overweight * Risky sex = 0			F value = 19.50 (p -value < 0.001)	
Adjusted R^2			0.45	

* Indicates the significance at 10% level.

** Indicates the significance at 5% level.

*** Indicates the significance at 1% level.

^a Statistical test was based on the coefficients in Model 3B.

Table 4
Estimation of the price equation by height and weight.

Variable	Model 4A		Model 4B	
	Coefficient	SE	Coefficient	SE
Weight	−1.76**	0.33	−2.14**	0.38
Weight * Risky sex			1.37*	0.73
Height	0.40	0.62	0.65	0.66
Height * Risky sex			−1.09	1.93
Risky sex	6.60	10.33	100.28	295.86
Single	−4.10	7.78	−5.00	7.76
Divorced	−4.94	7.89	−6.25	7.93
Age	−1.35***	0.36	−1.44***	0.36
Elementary	−10.39	8.78	−12.68	8.85
Junior	−8.28	9.48	−10.47	9.50
Senior	18.11*	9.84	14.14	10.01
Experience2	−18.13***	6.72	−17.02**	6.71
Experience3	−12.81	7.96	−12.97*	7.91
Evening	12.96*	7.04	13.39*	7.01
Night	20.74**	9.16	21.04**	9.13
Constant	217.39**	97.10	1.37*	0.73
<i>Statistical test</i> ^a				
H_0 : Height = Height * Risky sex = 0			F value = 0.52 (p -value = 0.596)	
H_0 : Weight = Weight * Risky sex = 0			F value = 16.49 (p -value < 0.001)	
Adjusted R^2			0.41	

* Indicates the significance at 10% level.

** Indicates the significance at 5% level.

*** Indicates the significance at 1% level.

^a Statistical test was based on the coefficients in Model 4B.

4. Conclusions

This study combines the literature of physical attractiveness in the labor market with an analysis of prostitution. By using a survey of 140 prostitutes in Taipei city of Taiwan, we investigated the association between obesity, risky sex, and prostitutes' price. The results show that being overweight is negatively associated with the prostitutes' price, but a premium price for risky sex was also found. By further looking at actual weight and height, it was found that the price penalty was significantly associated with weight, but not with height.

Our findings need to be treated with caution. Our analysis may suffer from endogeneity bias because condom use and prostitute price may be correlated due to some unobserved common factors. To deal with the problem of endogeneity, in the preliminary analysis we estimated an instrumental variable model using the criminal records and arrested history of prostitutes as the instruments to correct for the potential endogeneity bias of condom use. However, the results point to weak instruments. A lack of detailed information about the household member and geographic heterogeneity is an impediment for us to finding useful instruments. Moreover, no information on the customers was

included in this survey so an insight into customers' demands could not be further addressed.

Acknowledgments

An earlier version of this paper was presented at the annual conference of the Western Economic Association International at San Diego, CA, USA in June 2011. The authors appreciate the comments from conference participants, as well as the anonymous reviewers and the journal editor.

References

- Berri, D., Simmons, R., Van Gilder, J., O'Neill, L., 2011. What does it mean to find the face of the franchise? Physical attractiveness and the evaluation of athletic performance. *Economics Letters* 111, 200–202.
- Fletcher, J., 2009. Beauty vs. brain: early labor market outcomes of high school graduates. *Economics Letters* 105, 321–325.
- Hamermesh, D., Biddle, J., 1994. Beauty and the labor market. *American Economic Review* 84, 1174–1194.
- Johnston, D., 2010. Physical appearance and wages: do blondes have more fun? *Economics Letters* 108, 10–12.
- Mobius, M., Rosenblat, T., 2006. Why beauty matters? *American Economic Review* 96, 222–235.
- Rao, V., Gupta, I., Lokshin, M., Jana, S., 2003. Sex workers and the cost of safe sex: the compensating differential for condom use among Calcutta prostitutes. *Journal of Development Economics* 71, 585–603.
- Robins, P., Homer, J., French, M., 2011. Beauty and the labor market: accounting for the additional effects of personality and grooming. *Labour* 25, 228–251.
- Torre, A., Havenner, A., Adams, K., Ng, J., 2010. Premium sex: factors influencing the negotiated price of unprotected sex by female sex workers in Mexico. *Journal of Applied Economics* 13, 67–90.