IMPACT OF SEXUAL ACTIVITY ON WAGE: AN EMPIRICAL INVESTIGATION

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Abstract: We test the assumption that the relation between sexual activity and wage is nonlinear, considering that the impact of sex on productivity and therefore on wage occurs during a certain interval of times which one cannot perceive if discrimination is not done. In other words, we must use different dummies to enumerate distinct frequencies. A similar procedure appears in Blanchflower and Oswald (2004) to test the effect of sexual activity on happiness. This is done in column (2) and the results show that this assumption is valid.

Keywords: Productivity. Sexual activity. Wage.

JEL: D01. J3, I1

Resumo: Nós testamos a hipótese de que a relação entre atividade sexual e salário não é linear, considerando que o impacto do sexo sobre a produtividade e em conseqüência sobre o salário ocorre durante certo intervalo de tempo que não se pode perceber se a discriminação não é dada. Em outras palavras, nós precisamos usar diferentes *dummies* para enumerar freqüências distintas. Procedimento similar aparece em

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Blanchflower e Oswald (2004) para teste o efeito da atividade sexual sobre a felicidade.Isto é feito na coluna (2) e os resultados mostram que essa hipótese é válida.

Palavras-chave: Produtividade. Atividade sexual. Salário.

Classificação JEL: D01, J3, I1

1 INTRODUCTION

The willingness to work can be affected by many factors, including the quality of the conjugal relationship (KORENMAN and NEUMARK, 1991). However, the quality of the conjugal relationship is something difficult to measure. To make things simpler, we take the sexual frequency as a measure for a good or bad conjugal relationship. Many studies show that sexual activity and divorce rate have negative relation (EDWARDS and BOOTH, 1994; VEROFF, DOUVAN, and HATCHETT, 1995; WHITE and KEITH, 1990). Blanchflower and Oswald (2004) studied the relation between income, sexual behavior and happiness. The authors reported that the frequency of sexual activity is positively associated to happiness.

According to Lowen (1976, 1977)

> what happens in the body reflects what is happening in the mind because feelings affect the way of thinking and vice versa. However, at a deeper level (unconscious), thoughts and feelings are conditioned by energetic factors.

Donnelly, Burgess, Anderson, and Dillard (2001) show that, in the absence of sex, 100% of the people present symptoms of depression and very low rates of self esteem, which reflected in other areas, such as work. In addition,

everybody experienced unhappiness. The importance of sexual activity for psychical and biological health as a strength capable of maintaining physic and emotional equilibrium in the human being was showed before in many studies (REICH, 1942, 1947, and 1948). Laumann et al (2001) reported the importance of sex and the relation between sexual welfare and happiness. This study found very strong correlation between sexual activity and welfare in many regions of the world.

The central hypothesis behind this research is that sexual activity affects wage through productivity. In this way, this paper presents an empirical investigation based on a sample obtained by interviewing 1.597 adult individuals living in Brasília-DF (Brazil) to estimate an augmented form of wage equation that takes into consideration factors linked to sexual activity in order to verify whether they affect wages.

We show that there is a positive correlation between sexual frequency and wage but the statistical significance of this relationship depends on the interval of times in which the sexual frequency occurs. Outside this interval where the sexual frequency is almost null or very high, sex does not affect wage. The result corroborates our prior concern that sex affects productivity, although it also shows that the relation between wage and sex is increasing but not strictly increasing. In other words, it means that the marginal effect of sexual frequency on wage outside certain limits is zero.

The rest of the paper is arranged as follows: Section 2 introduces the empirical model, describes the database and analyses the variables used in this research. The empirical results are presented in Section 3. Finally, in Section 4 we offer some concluding remarks.

2 EMPIRICAL INVESTIGATION

In order to test the influence of sex on wages we use here the mincerian or wage equation augmented by variables linked to sexual activity such as

$$Lnw_i = \beta_0 + \beta_1 X_i + \beta_3 W_i + \beta_4 Z_i + \varepsilon_i \qquad (1)$$

The dependent variable is measured in terms of the monthly wage log received by the employee. The reason that the wages appear to be transformed in log in the wage equation is due to the fact that wage equation[4] is a result of the solution of an optimum choice problem of the agent in relation to the impact of the educational level on its discounted future income (GRILICHES, 1977). The data for explicative variables can be disaggregated into three categories: human capital (X_i), individual attributes (W_i) and the third group refers to variables associated to sex (Z_i). Finally, ε represents the random term.

The variables linked to human capital define the factors that are inherently linked to productivity or that in a general way appear in literature as contributing to explain the wage equation like schooling, experience and experience squared (CARD, 2001). We also include in this group which kind of function the individual is responsible for. In other words, this variable displays the level of responsibility the employee has in the firm.

The group of individual characteristics is conceptually related to discrimination. Such factors are represented by sex, marital status, if the individual has children, if the individual works for the private or public sector, etc. All of these variables are used in any study to estimate the wage equation (CARD,

[4] In economic literature wage or mincerian equation is generally used to estimate returns to schooling, which is represented by the schooling coefficient.

2001). The dummy for sex seeks to verify if gender has some effect on the wage. It is common to find a positive sign for male. A number of studies point the existence of penalty wage for women (PHELPS, 1972). The subject of discrimination in relation to sex is not as obvious as one may imagine at first. Lazer and Rosen (1990) show that discrimination against women in the case of high salaries is due to the fact that women have their careers interrupted because they are responsible for the future education of their children. Thus employers possessing limited information about the workers' potential, use sex to predict the employee's future behavior. Finally, the dummy for children also appears in several articles referring to this subject.

The third category defines the variables related to individual sexual life, where the sexual frequency is the most important. Other questions such as "do you have sex before leaving home" and "do you miss sex" also appear in the questionnaire. One point that should be stressed is that marital status can also affect the productivity through sex. Firstly, married individuals have sex more easily available than non-married ones because time and effort lost in looking for sex is lower. Secondly, many studies have showed that married individuals are more productive than non-married ones (LOH, 1996; KORENMAN and NEUMARK, 1991). In this context marriage can be considered as a proxy to non-measured productivity (HILL, 1979). Married men earn substantially more than single men with education, experience, and other similar productive attributes.

The database was obtained by interviewing 1.597 adult individuals living in Brasília (Capital of Brazil). The interviews were held in the month of October 2001. In the sample, only individuals who work in the formal private sector of the economy are included. The interviewers were master students from the Economic department of Catholic University of

Brasília. They had specific training in order to perform this kind of research. The average time of each interview was about fifteen minutes. The sample was selected to take into account all the diversity existing among citizens of Brasília. Thus, they were selected from several districts of the city. In order to avoid problems of endogeneity in the regression our database includes only individuals that do not need to pay for sex. Table 1 presents the definition of the variables adopted in this study.

Table 1: Definition of variables

Variables	Description
I Productivity	
Wage (W)	Monthly wage (workload: 40 hrs. weekly)
Below Middle School	Dummy variable, which assumes value equals to 1 if the individual did not conclude middle school (less than 8 years of studies), and assumes value equal to 0, otherwise.
Middle School	Dummy variable, which assumes value equal to 1 if the individual concluded middle school (8 years of studies), and 0, otherwise.
High School	Dummy variable, which assumes value equal 1 if the individual concluded high school (11 years of study), and 0 otherwise.
Graduated	Dummy variable, which assumes value equal 1 if the individual concluded graduated studies (16 years of study), and 0 otherwise.
Experience (EXP)	Years of formal work experience
Superior	Dummy variable, which assumes value equal 1 if the individual work in some occupation that requires graduate degree, and 0 otherwise
Intermediary	Dummy variable, which assumes value equal 1 if the individual work in some occupation that requires only high school, and 0 otherwise

Inferior	Dummy variable, which assumes value equal 1 if the individual work in some occupation that requires only or less than high school, and assumes value equal to 0 otherwise
Fulltime	Assume value 1 if the individual works fulltime, 0 otherwise

II Individual Characteristics

Married	Marital status married or in stable relationship=1 and 0 otherwise
Children	Assumes value 1 if the individual has children and 0 otherwise
Sex	Assumes value 1 if male and 0 otherwise
Private	Assumes value 1 if individual works in the private sector is and 0, otherwise

III Variables Linked to Sexual Activity

Frequency	Frequency which the individual makes sex during a week
Before Leave Home	Dummy variable, which assumes value 1 if the individual makes sex before going to work and 0 otherwise.
Not Enough	Dummy which assumes value 1 whether the individual miss sex and 0 otherwise.

3 EMPIRICAL RESULTS

Table 2 presents the econometric results of the wage equation (1) estimated by OLS. Columns (1) and (2) refer to the unrestricted models that include both males and females. Columns (3)-(6) show the results of the restricted models in order to analyze the regressions for males and females separately.

Table 2:Econometric Results

Human Capital	Irres-tricted (1)	Irres-tricted (2)	Restricted Males (3)	Restricted Females (4)	Restricted Males (5)	Restricted Females (6)
	Coeff. P-Value	Coeff. P-Value	Coeff. P-Value	Coeff. P-Value	Coeff. P-Value	Coeff. P-Value
CONSTANT	5.005 (0.000)	5.7386 (0.000)	4.8312 (0.000)	5.4898 (0.000)	4.5632 (0.000)	4.5966 (0.000)
HIGH SCHOOL	0.5279 (0.000)	0.5029 (0.000)	0.4063 (0.000)	0.4042 (0.000)	0.4058 (0.000)	0.4245 (0.000)
GRADUATED	0.7834 (0.000)	0.7709 (0.000)	0.7256 (0.000)	0.8806 (0.000)	0.7122 (0.000)	0.8321 (0.000)
EXPERIENCE	0.0416 (0.000)	0.0563 (0.000)	0.0503 (0.000)	0.0706 (0.000)	0.0543 (0.000)	0.0200 (0.000)
EXP2	-0.0002 (0.000)	-0.0004 (0.000)	-0.0004 (0.000)	-0.0007 (0.000)	-0.0004 (0.000)	-0.0008 (0.000)
FULLTIME	0.3774 (0.000)	0.3458 (0.000)	0.5628 (0.000)	0.2543 (0.000)	0.5752 (0.000)	0.4099 (0.000)
SUPERIOR	0.5063 (0.000)	0.5291 (0.000)	0.5085 (0.000)	0.3840 (0.000)	0.5459 (0.000)	0.3723 (0.000)
PRIVATE	0.2783 (0.000)	0.2331 (0.000)	0.2282 (0.001)	0.3245 (0.001)	0.2516 (0.002)	0.4132 (0.002)
Individual Attributes						
SEX	0.1221 (0.000)	0.1136 (0.000)	-	-	-	-
CHILDREN	0.0567 (0.493)	0.0587 (0.306)	0.0276 (0.762)	-0.1032 (0.1661)	0.0344 (0.642)	-0.0756 (0.366)
MARRIED	0.1289 (0.000)	0.8403 (0.025)	0.1977 (0.005)	0.0753 (0.279)	0.1982 (0.005)	0.11223 (0.150)
Sexual Activit						
FREQUENCY	0.0054 (0.508))	-	-	-	-	-
SEX-0-1 TIMES	-	0.0452 (0.503)	0.1615 (0.252)	0.1534 (0.139)	-	-
SEX-2 TIMES	-	0.0976 (0.119)	0.0029 (0.981)	0.2834 (0.002)	-	-
SEX-3 TIMES	-	0.1838 (0.001)	0.1185 (0.003)	0.2224 (0.005)	-	-
SEX-4 TIMES	-	0.1754 (0.009)	0.2719 (0.001)	0.0082 (0.009)	-	-

SEX-5 TIMES	-	0.1907 (0.021)	0.2680 (0.003)	0.0357 (0.209)	-	-
SEX-6 TIMES	-	0.1288 (0.307)	0.4370 (0.022)	0.4378 (0.623)	-	-
SEX-MORE THAN 7 TIMES	-	0.0469 (0.656)	-0.1429 (0.354)	0.1804 (0.733)	-	-
BEFORE LEAVE HOME	-	-	-	-	0.1108 (0.128)	-0.0234 (0.759)
NOT ENOUGH	-	-	-	-	0.2596 (0.005)	-0.1405 (0.068)
VIF	1.657	1.521	1.684	1.511	1.765	1.761
R2 ADJ	0.4354	0.4405	0.5268	0.4432	0.5121	0.4489
OBS	1.255	1.255	761	494	761	494

In Table 2 it is possible to observe the robustness of the model. In relation to the specification of the model, some points deserve to be emphasized. Estimation by OLS also allows us to identify whether there is multicolinearity in the model with the use of the Variance Inflation Factor (VIF) instrument that calculates the impact upon the variance of the variable resulting from the correlations among the other regressors. The literature states that there is evidence of multicolinearity when the value that indicates the highest VIF is greater than 5 (Judge et al., 1982). In accordance with the results of all regressions nothing seems to indicate the existence of the multicollinearity in the regressions.

According to the results obtained some comments can be done. Firstly, concerning the variables associated to human capital and individual attributes such results are in accordance with the literature, indicating for instance that wage correlates positively to schooling and experience (CARD, 2001). The results also show that wage correlates negatively with EXP2 (as seen in the literature) because one more year of experience augments the wage, but in a relationship minor than one. The result for SEX is also in accordance with previous research on

wage equation which shows that females receive penalties in the labor market. In column (1) we observe that people who are married have a premium. This can be seen by the positive coefficient of this variable. Notwithstanding, when we checked the statistical significance of this variable in columns (3) and (4) we found that only married males receive a premium in the labor market. Finally, we observe that the variable CHILDREN does not present statistical significance for any regression.

In the last paragraph we show the results of estimated coefficients concerning the attributes linked to human capital and individual characteristics. However, our main concern in this research is to verify whether sexual activity affects wages. This is done by verifying the impact of sex on productivity. In order to check this hypothesis we perform distinct specification for wage equation augmented by variables associated to the individual's sexual life. The main variable used to study the relationship between sexual activity and wages in this study is the one that measures sexual frequency, the times that the individual has sex during the period of one week. The results can be seen in Table 2.

In column (1) we note that the frequency variable is not significant. This result can lead us to believe that sex does not affect wage definitively. But we also test the assumption that the relation between sexual activity is nonlinear, considering that the impact of sex on productivity and therefore on wage occurs during a certain interval of times which one cannot perceive if discrimination is not done. In other words, we must use different dummies to enumerate distinct frequencies. A similar procedure appears in Blanchflower and Oswald (2004) to test the effect of sexual activity on happiness. This is done in column (2) and the results show that this assumption is valid.

When the sexual frequency is ordered we note that there is an interval in which this variable presents statistical significance. This interval takes place between the level in

which the sexual activity is null or very low and the level in which the activity is, in our judgment, very high. For the unrestricted model the interval where sexual activity is significant comprehends a frequency from two to five times a week. In our opinion this achievement reflects the fact that the relation between sexual activity and productivity is determined by a non-decreasing relation where there is a limit which the impact of a unit more of sex does produce effect on productivity and therefore on wage.

We perform the same regression in columns (3) and (4) discriminating for gender. According to the results the males require more sex to be productive. The minimum and the maximum where the frequency appears with significance are both superior for the males. This is in accordance with what appears in the literature regarding the fact that males have a higher rate of sexual activity than females (Stafford and Kline, 2004). Finally, in columns (5) and (6) we insert other variables linked to sexual behavior presented in the database. The variable "before leave home" does not present statistical significant. Concerning the variable "not enough" the results are not conclusive in presenting distinct signs for males and females.

4 CONCLUDING REMARKS

For the unrestricted model the interval where sexual activity is significant comprehends a frequency from two to five times a week. In our opinion this achievement reflects the fact that the relation between sexual activity and productivity is determined by a non-decreasing relation in which there is a limit which the impact of one unit more of sex does produce an effect on productivity and therefore on wage.

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