

THE BACHELOR WAGE PENALTY HYPOTHESIS EVIDENCE FROM BRITISH HOUSEHOLD PANEL DATA

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Abstract

An earnings gap has been previously shown between bachelor men and married men. The gap appears higher when estimated using OLS. This gap is examined here by considering simple econometrics and with the use of British Household Panel Survey data. The estimate of the gap found from pooled OLS is higher due to unobserved effects; possibly including individual ability. Thus, married men may have earned more even before marriage. The remaining gap of the Fixed Effect estimation of 3.1% as compared to Pooled OLS explains the productivity hypothesis. Married men might have becoming more productive or they have attributes which suit both to “marriage market” and Labour market. Fixed effects estimation shows the correlation between explanatory variables and unobserved effect reported by Stata to be -0.115, which is very low, and the Hausman test strongly rejects that unobserved effect is not correlated with explanatory variable by X^2 of 367.08 even at P value of 0.000. Hence the fixed effect estimation is better because it allows arbitrary correlation between unobserved effect and explanatory variables. Further, estimates from a binary choice model show men with higher wages have a greater chance to be selected in a “marriage markets” than those with low wages.

Keywords: Earning gap, Fixed Effect, Marriage Market, Pooled OLS, Productivity Hypothesis

INTRODUCTION

Inequality in earning has been discussed for many decades in household and labour economics (Blau and Kahn, 1996). Such inequality has been also seen in marriage and gender where, as labor economists have shown, married women earn less than married men, and there is substantial evidence that explains this differential (Korenman and Neumark, 1991; Beblo, 2008). An Ordinary Least Square (OLS) may show this gap regresses earnings on gender and marriage, and the interaction term becomes larger and significant. One possible explanation is

that the life time cycle for female labor supply reveals periods during which women devote time to domestic production rather than on career development and earning (Stutzer and Frey, 2006).

The more interesting and perhaps striking form of inequality is between married and unmarried men (the bachelor wage penalty). In econometrics analysis, it has been revealed that the raw differential of earning between married and unmarried men is higher. Possibly, it is due to the factors such as education, age, and experience which are all together linked to an individual earning. When men possess these contributor factors for earning, loosely we would expect on average married men to be earning the same as single or never married men (See Ruiz, Go'mez, and Narva'ez, 2010). Logically, men marital's status should have no explanatory power on earning because there is no reason for an employer to pay more to married men. However, married men are in some sense more become attractive in the labor market and henceforth earn more. Why this is so is a longstanding question, and a mixture of answers have been offered. This paper attempt to answer this question in a framework of binary dependent models and panel data estimation methods.

This paper addresses this question in very straightforward ways. It begins by addressing the earning differential gap between married or living together as a couple and single men on a theoretical basis. This is then linked to an empirical explanation using very simple econometrics concepts. The paper differs with many existing studies such as those by Chun and Lee, 2001; Nakosteen et. al, 2004; Nakosteen and Zimmer, 2001; Beblo, 2008 and Pollmann-Schult, 2011 in at least in two ways. Firstly, a simple measure based on pooled OLS is used to derive the conditional differential gap. The differential gap between pooled OLS and the known standard estimation methods of the panel data are used to explore reasons for gap. Secondly, the marital sorting is explained by very simple setting of the known binary choice models.

HUMAN CAPITAL HYPOTHESIS, MARRIAGE & ACQUISITION OF INCOME

The relationship between education, experience and earning has not been much challenged by many researchers, but is complex in nature when featured with marriage (Bowman, 1985). Marriage gives men greater opportunities to specialize in labour market activities when their wives specialize in domestic production (Becker, 1981). Because men historically are regarded as the heads of the household, boys are the first to obtain education and birth rights. This is historically tied to the expectation that men provide bread for living of the family, while the role of a woman is domestically-based production. Consequently, women become inactive in labour market due to inadequate possession of skills and human capital, further propagating the

differential gap of earning between married men and married women (Brenton, 1966; Demos, 1974; Gould, 1974; Bernard, 1982).

The human capital hypothesis tends to explain married men earn more than married women for obvious reasons of human capital accumulations. However, the hypothesis suffers on generality when attempting to explain the earnings of unmarried men, see detailed works such as: Duncan and Holmund (1983), Korenman and Neumark (1999). Their relative disadvantage, argue Nakosteen and Zimmer (1987) seems dominated by marriage selection criterion, in that while there is no enough statistical evidence to suggest a significant relation between wages and marital status, some part of the disadvantage might be related to marital matching, with further earning hypotheses conceptualizing earning in relation to marriage needed.

Marriage is an institution associated to income and the welfare of the household and family. A married or cohabitating couple will find that their incomes rise and their standard of living improves (Ribar, 2004). Culturally, marriage or cohabitation often mean the woman is expected to cleave on her husband and remain supportive in domestic production and rearing of children and other related house-based activities, while men ideally are compelled to be the breadwinners (Becker, 1981; Ehrenreich, 1983; Kenny, 1983). Within such relationships, the man is expected to provide all necessities for his wife and the education of offspring. In developing world, some married men are expected even to improve the welfare of their wives' relatives. From this perspective, marriage may be regarded as business, determining the quality of amenities available to the women, which would primarily rely on the economic soundness of the men. Therefore, Marriage is attractive to a rational man as long as he can balance its obligations and benefits: the maximum marriage utility. This explanation put men throughout ages to diligent labour, acquisition of human capital and henceforth increases earning (Becker, 1981; Kenny, 1983).

Nevertheless, differential gap of earning between married and single men is still questionable on content of discussed 'need hypotheses'. Because in a group of single-unemployed men, in many cases wages is not observed. This group perhaps is due to selection bias of the employers. Certainly, employers would select people to whom they sit on the same table of brotherhood, to whom they have the same root responsibility of caring wives and their children, attended the similar schools and alike (Hill, 1979; Bartlett and Callahan, 1984). Perhaps more striking, employers' homogeneity practicing may be an inspiration to boost unemployed married men an appointment of employment. It is more likely to increase chance of unemployed married men to be employed mostly in promising position of high earning. The

practices favours married men more than single men and so propagate the bachelor wage penalty (Kanter, 1977, 1993).

The productivity theory and differential gap

The bachelor wage penalty can also be explained by productivity theory, which exposes the earning gap between married and unmarried men. As Chun and Lee (2001) have shown using CPS march supplement 1999 data, the average hourly wage of married men is 29.7% higher than that of never married men, and married men appear to have more years of school attendance, with 56% of married men and 50% of never married men having some education. They argue that productivity affected by marriage, strongly depends on degree of specification within marriages, with the potential marriage premium found to be $\gamma = 0.273$ and is significant at 1%. Although they found that men whose wives are household based domestic production and are not in labour market earn 31.4% more than never married men, they argue that the gain actually depends on wives' working hours.

While specialization may make married men productive when wives' labour is based on household domestic production, this encourages men to spend less time on household work. Further, some wives provide substantial assistance to their husband's jobs while at home (Kanter, 1977). In this way, wifely care and help increases the marriage's productivity. This makes productivity hard to measure, at least on the individual basis when a proxy measure is used. Implicitly, this may be a source of the observed bachelor wage penalty.

The idea that specialization explains the bachelor wage penalty is not universal. For example, never married men have been shown to spend about the same amount of time on housework as married men (Hersch and Stratton 2000). In that study, men with working wives spent more time on housework than men whose wives were not in the wage labour force. However, this result was rarely significant at the 0.09 level, suggesting household specialization was not responsible for the bachelor penalty. Furthermore, as Greestein (2000) found using specialization and exchange theory, homemaker wives do more housework than would be expected, and their husbands do less. This specialization or possible exploitation allows husbands to devote more time and energy to market work (Greestein, 2000).

Marital sorting criterion

The marriage selection hypothesis (as oppose to productivity, homogeneity and need arguments) reverses the direction of the explanation for the differential in earnings between married and single men. As Nakosteen and Zimmer (1987, 1997) argue, married men earn more not because they are married, but due to marital matching and earning. While, a higher

wage is an observed variable appreciated in the marriage market. It is also a proxy measure of individual productivity through variables such as education, experience and job training. These variables contribute to higher earning, raking and promotions. For instance, men with such qualities and others such as pleasing characteristics, honestly and loyalty are more likely to be promoted, with higher remuneration (Cornwell and Rupert, 1997). All these characteristics are also valuable in marriage market. Men who possess such characteristics have higher chances to be selected in the marriage market. Moreover, the physical appearance of men has a significant effect on earnings. However, while a pleasing looking man earning more than a plain looking man (See Hemeremesh and Biddle, 1994; Hemeremesh and Parker, 2005), marriage selection based on physical appearance has some drawbacks in empirical work. A man's attractiveness in marriage market is highly dependent upon his observed earnings and as well as on individual traits, so that physical appearance might be esteemed in marriage but is not recorded in most micro data sets (Chun and Lee, 2001). The challenge is that unobservable attributes might be associated with unmeasured earning capabilities, this resulting in bias of coefficient estimates of marital status and in its standard errors in the ordinary least square of wages; bias in the estimators leads to inconsistent and invalid results.

Some studies that have estimated marriage premiums have shown a negative correlation. Evidence from studies differs considerably, for example, Smith (1979), Lam (1988), and Becker (1981), after controlling for age, schooling and experience: there appears to be negative marital sorting, this accounting for the low earning of single men, i.e. the tendency for low income men to remain unmarried. Records of individual earnings before and soon after marriage (Nakosteen and Zimmer 2001) show that there is positive marital sorting. Following their empirical findings, it might mechanically appear that divorce and separation status are due to low wage of the male spouse. This could suggest that divorce and separation increase as wages of male spouse decline. This would be a social impact of low earnings.

However, the positive correlation between marriage and wages is not significantly correlated with marital sorting. Instead, evidence suggests that the wage increase occurs after the change in marital status (see, Kilbourne, England, and Beron, 1994). This argument is consistent with Korenman and Neumark, (1991) who found that men who marry enjoy around an 8 percent wage premium, whereas men who divorce experience about a 2 percent wage decrease. The marital premium is primarily due to productivity dominant effects on marriage. Marriage also sometimes appears independently as an outcome of sound economic status for men (Ginther and Zavodny, 2001). Marriages can also be more random in another way, namely being arranged after an unplanned pregnancy, and in this case marital matching criterion would be waived.

Married couples tend to resemble each other in terms of demographic and economic characteristics: attended similar schools and living in same neighborhood, perhaps working in similar offices and jobs (Nakosteen, Westerlund, and Zimmer, 2004). Therefore they are similar at least on an economic dimension, their measured earning correlated even before matching and their earning residual also correlate. This suggests positive marital matching that leads to the bachelor wage penalty.

METHODOLOGY

Data

The main data in this study consists of twelve waves, 1991 to 2002 derived from the official British Household Panel Survey (BHPS). The BHPS is a multi purpose study that follows the same sample of individuals over the period of years and contains meaningful variables in relation to adult women and men; adult members of households are interviewed from a constructed sampling frame. The Panels in BHPS are not balanced, following appearance of individual different number of times throughout interval of 12 years. The panel data become unbalanced due to factors such as deaths of a respondent, attrition, change of inhabitant and the like. Apart from BHPS data, the quarterly UK retail price index was consulted for the years between 1987 and 2003 in order to obtain real wages.

The data summary in Table 1 shows there are total of 28766 observed men on which 73.22% are married or living together and 26.78% fall into categorical of divorced, never married and separated. There are only 1.12% account for separated men, 3.12% divorced and 22.06% for never married sampled men. The average earning of less than 16 years of age is minus 0.344 log points, as it was expected for this group for obvious reasons. On average, married men or living together earn twice higher than non married men.

Descriptive statistics also indicated that the average earning of divorced men is 0.678 and 0.796 for separated men. These estimates are close to the average earning of married man of 0.8 log points, and are much close to an average earning of living together men. While the bachelor penalty earning is still relative bigger compared to the average earning of 0.80 log points more of married man. Never married men earn on average less than half earning of separated and divorced men.

Table 1: Real earning of men between 1991-2001

Marital status	Mean	Std. Dev.	No. of men in given category
Under 16	-0.344	0.320	3
Married	0.800	0.550	17217
Living as couple	0.637	0.493	3846
Widowed	0.153	1.002	126
Divorced	0.678	0.533	894
Separated	0.800	0.523	333
Never married	0.332	0.583	6347
Total sample			28766

Notes: All real wage are presented in natural logarithm

The bachelor wage gap has been considered by a joint sample of married and living together as couples

Model and Estimation Methods

A standard Mincer type human capital earning function is used to estimate wage premiums. In a function, the real wage is assumed to be linearly related with all the covariates, and age is specified as a quadratic term:

$$y_{it} = x_{it}'\beta + a_i + u_{it} \quad [1]$$

Where y_{it} is the real log earning of individual i in each cross section of time t , and x_{it} is a set of covariates includes dummy variables for 12 years: a_i is an unobserved effects or the fixed effect constitutes all unobserved factors that affect earning; this is fixed over time and varies across individuals. With omission of a_i , equation 1 is used to derive the conditional gap of earning of the form:

$$y_{it} = x_{it}'\beta + \gamma d_i + u_{it} \quad \text{for } d_i = \begin{cases} d = 1 \\ d = 0 \end{cases} \quad \text{for married men and single men.} \quad [2]$$

The Conditional differential gap of earning between married men and single men is obtained by

a pooled OLS as: $E(y_{it} / x_{it}) = \hat{\gamma}$. It will always be positive, because for any real values of wages, $y_{di=1} > y_{di=0}$. The estimates of the pooled OLS are the coefficient estimates:

$$\hat{\beta} = T_{xy} / T_{xx} \quad \text{and} \quad \hat{\alpha} = \bar{y} - \hat{\beta} \bar{x}$$

Also Equation 1 can provide the conditional differential gap as obtained in equation 2. However, in order to estimate equation 1 the following assumptions are important to make; an Idiosyncratic error term u_{it} is assumed to be normal distributed with mean zero and constant variance over time and uncorrelated with sets of explanatory variables, β are parameters to be estimated which has sampling distribution generated by the data. While equation 1 can be estimated by using OLS, the estimators will be inconsistent because unobserved error term might be correlated with error term u_{it} . Therefore, equation 1 is differenced in order to remove the fixed effect error. A new differenced equation which does not contain unobserved effect is obtained of the form:

$$\Delta y_{it} = \Delta x_{it} \beta + \Delta v_i \quad 3]$$

Now, this equation can be estimated by OLS through the First Difference (FD) method. In order to estimate it, the following assumptions are important to make; the error term Δv_i has Gauss Markov properties, in addition strictly exogenous assumption of covariate requires Δv_i to be uncorrelated with Δv_{it} , basically $E(x_{it} u_{it}) = 0$ where $t = 1, 2, 3, \dots, 12$; $i = 1, 2, 3, \dots, N$, lastly the homoscedasticity assumption is also required.

Fixed effect estimation (FE)

The composite error term (Idiosyncratic error term) is found by combining the error term and unobserved fixed error of the equation 1. This error term is used to form the wage equation 4 as:

$$Y_{it} = x_{it} \beta + v_{it} \quad t = 1, 2, 3, \dots, 12 \quad \text{and} \quad i = 1, 2, N \quad 4]$$

Equation 4 can be estimated by OLS; however OLS will still provide inconsistent estimators, because the error is composite with unobserved effect. Intuitively, unobserved effect might still be correlated with the set of covariates.

Averaging a wage equation 4 and subtract from its origin model can be a right solution to remove an unobserved effect. This removes variation within while only time variation is allowed.

A new equation which is the time-demeaned on y is obtained of the form: $y_{it}^{td} = \beta x_{it}^{td} + u_{it}^{td}$. It is now estimated by Fixed Effect (FE) method and the corresponding parameter estimates are

given as; $\hat{\beta}_w = W_{xy} / W_{xx}$ and $a_i = \bar{y}_i - \hat{\beta}_w \bar{x}_i$.

Apart from previous assumptions 1 to 3, this equation needs addition assumption,
 $E(u_{it} / x_{it}, a_i) = 0$ for $t = 1, 2, 3, \dots, 12$

Random effect estimation (RE)

A new wage equation 4a) is obtained after averaging equation 4 and weighted instead,

$$y_{it} - \lambda \bar{y}_i = (1 - \lambda)\beta_0 + \beta(x_{it} - \bar{x}_{it}) + \varepsilon_{it} - \lambda \bar{\varepsilon}_i \tag{4a}$$

This equation needs additional assumption apart from assumptions 1 to 4, ie $Cov(x_{it}, a_i) = 0$. From equation 4a) the covariance of the same individual is obtained as;
 $Cov(v_{it}, v_{is}) = \sigma_\varepsilon^2 / \sigma_u^2 + \sigma_\varepsilon^2$. Once wage equation 4a) is estimated, it can be used along with equation 4 to produce Hausman test. The Hausman’s test is basically the difference between estimates in equations 4 and 4a. This test is based on the following hypotheses: $H_0 : a_i$ are not correlated with vectors of covariates and $H_a : a_i$ are correlated with vectors of covariates. Its test statistic under H_0 is given as;

$$[\hat{\beta}_w - \hat{\beta}_g]^T [\text{var}(\hat{\beta}_w) - \text{var}(\hat{\beta}_g)]^{-1} [\hat{\beta}_w - \hat{\beta}_g] \sim \chi^2(k) \tag{4b}$$

Probit and Logit model

A Linear Probability Model (LPM) is considered to estimate the odd of men to be selected into marriage as:

$$Mast_i = z^T \beta + \delta_1 \ln(lwp) + \xi \quad Mast_i = \begin{cases} 1 & \text{if partner} = \text{Married} \\ 0 & \text{if partner} = \text{Bachelor} \end{cases} \tag{5}$$

This model includes all set of covariates expect marital status, these covariates are assumed to be linear in population and so on the sample. The model is estimated by OLS in the place of the dichotomous dependent variable. The robust standard errors of the form:

$\text{var}(\hat{\varphi}_j) = \sum_{i=1}^T \hat{r}_{ij}^2 \hat{u}_i^2 / SSR_j^2$ are used instead of the usual standard errors because the variance of the dummy partner will always be non constant. The robust standard error has an advantage because the standard heteroskedasticity tests are exempted in place non constant variance as in our case, for details exposition (see, Wooldridge, 2006). Once

heteroskedasticity-robust standard errors are obtained, it is simple to construct a heteroskedasticity-robust t statistic. This t-statistic has been used in this paper for the case of Pooled OLS and PLM estimations found in table 2 & 3.

Whilst heteroskedasticity is now not causing so severe problem. The bound of [0,1] in variable partner in the LHS of equation 5] is not guaranteed. This bound can be achieved when an appropriate choice function is a cumulative density function. This leads to the desired specifications of probit and logit models. Now, since these models are non-linear, the maximum likelihood is used to estimate the parameters in the models. It maximizes the likelihood function of both models to obtain:

$$((y_i - \Omega(x_{it}\varphi)) / \Omega(x_{it}\varphi)(1 - \varphi(x_{xit})))x_{it} = 0 \quad 6]$$

In case of logit model, the Ω is the logistic function of the form: $\Omega(x_{it}\varphi) = \exp(x_{it}\varphi) / (1 + \exp(x_{it}\varphi))$ for [0, 1]. For the probit model, Ω is the standard

normal cumulative distribution function (cdf) expressed as: $\Omega(x_{it}\varphi) = \Phi(x_{it}\varphi) = \int_{-\infty}^{\varphi} \phi(v)dv$, where

$\phi(x_{it}\varphi)$ is the standard normal density of the form $(2\pi)^{-1/2} \exp(-x_{it}\varphi^2 / 2)$. The marginal effects to both models are used to interpret the coefficients estimates. These marginal effects are the one which are presented in table 3, for both logit and probit.

ANALYSIS & FINDINGS

The bachelor wage penalty

There appears a positive raw differential of earning between married and non married men of 0.385 log-points as indicated in table 1. This positive raw differential will always be observed in this given sample. A simple plot on figures 1 and 2 is used to explain why this is so. It shows the rectangular bars of the single men, which always stands shorter than that of the married men for the whole period of 12 years. This suggests that on average, married men earn more than single men. Similar result of the wage differential gap has been obtained over time consistently, although the gap is declining slightly since late 1960 to the last two decades (Blackburn and Korenman, 1994).

Figure 1: Real Earning of Men (a), 1991-2002

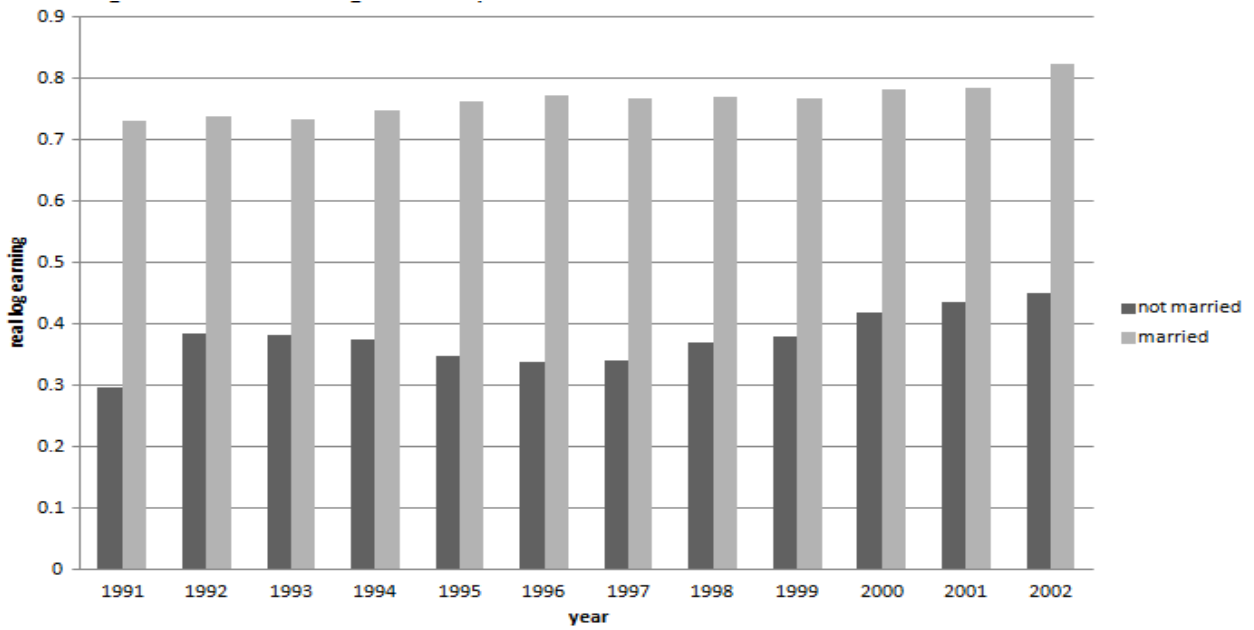
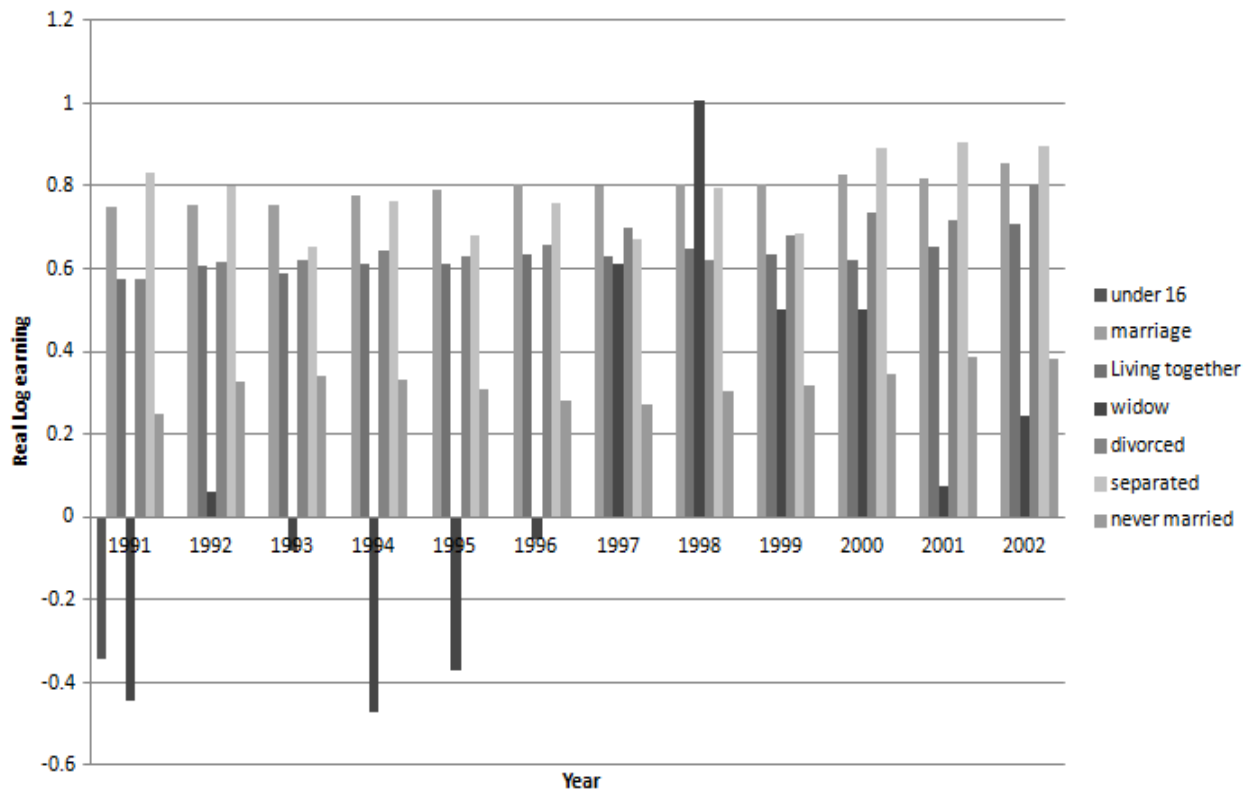


Figure 1: Real Earning of Men (b), 1991-2002



On the other hand, the conditional gap of earning of 0.163 as indicated in table 2 appears to be relative low than that of the raw differential. This is because the pooled OLS has been controlled by other additional covariates and categorical variables. The pooled OLS here is based on robust standard errors, because the usual standard errors might understate the true standard errors due to serial correlation. It turns out that even in cross section; married men earn more than single men. This finding is in line with other previous work of the bachelor wage penalty (e.g., Antonovics and Town, 2004). Moreover, the estimation methods in the table 2 showed the same sign for all coefficients estimates, with only discrepancy to the year dummies. Also a fixed effect method when an unobserved effect is removed, a return for marriage falls to 3.1% and is statistically significant. It controlled for an unobserved effect that tends to increase the wage premiums and consequently increases the selection probability of marriage. It is now seen that the conditional gap of earning obtained from the pooled OLS as compared to the fixed effect method is large due to unobserved effect, which might be individual ability. Arguably, a comparison shows that married men earned more even before marriage. This comparison with a large part of unobserved effect found from the pooled OLS may also explain the productivity hypothesis. Presumably, the remains part of the fixed effect of 3.1% account for the productivity. It shows that either married men becomes more productive due specialization or they have attributes which suit to the job promotions and raking, and hence earned higher (Ribar, 2004). Further results in the table 2 indicated that age is positive and significant for all the estimation methods, and its square estimate is negative and consistence. Moreover, the correlation between explanatory variables and unobserved effect reported by Stata is 0.115 based on the fixed effect estimation method. This correlation is very low, and the Hausman's test strongly reject that unobserved effect is not correlated with explanatory variable by Chi-square of 367.08 even at P value of 0.000. Therefore, a fixed effect method is better because it allowed correlation between unobserved effect and explanatory variables arbitrarily. Apart from fixed effect, the First difference also shows better estimations due to fact that all the variables are significant at zero p value with few exceptional.

The results in table 2 are now interpreted with only a fixed effects method because the Hausman's test has already shown that fixed effect method is superior. In a table, first degree is significant. However, its significant might have been arising due relatively small sample of qualified first degree holders. A first degree holder earns 1.7% more than with no education when other variables are controlled. Other important variable such as age square is also statistically significant. This variable shows the maximum age threshold above which wages will start to decline.

Table 2: Real wages estimations for the years, 1991 -2002

	Between	Pooled OLS	Random Effects	Fixed Effects	FD
Partner	0.19 (0.016)	0.163 (0.007) *(0.007)	0.068 (0.008)	0.031 (0.009)	0.002 (0.010)
Manual	0.181 (0.015)	0.176 (0.006) *(0.007)	0.059 (0.007)	0.015 (0.008)	NA
Age	0.115 (0.003)	0.114 (0.002) *(0.002)	0.125 (0.002)	0.108 (0.007)	0.107 (0.008)
Agesq	-0.001 (0.000)	-0.001 (0.000) *(0.000)	-0.002 (0.000)	-0.002 (0.000)	-0.001 (0.000)
qual2	-0.034 (0.036)	-0.051 (0.017) *(0.020)	-0.008 (0.025)	0.017 (0.035)	0.031 (0.054)
qual3	-0.225 (0.033)	-0.245 (0.016) *(0.019)	-0.231 (0.024)	-0.139 (0.038)	-0.001 (0.062)
qual4	-0.304 (0.035)	-0.334 (0.017) *(0.020)	-0.316 (0.025)	-0.209 (0.040)	-0.053 (0.065)
qual5	-0.355 (0.039)	-0.375 (0.018) *(0.021)	-0.370 (0.028)	-0.241 (0.045)	-0.101 (0.069)
qual6	-0.494 (0.037)	-0.513 (0.017) *(0.021)	-0.470 (0.027)	-0.219 (0.044)	-0.094 0.069
_cons	-1.277 0.067	-1.301 (0.033) *(0.041)	-1.620 (0.043)	-1.167 (0.228)	
Sigma	-a		0.430		0.543
Sigma	-a		0.027		0.265
Theta			0.725		0.808

Notes: Log wage (real) is dependent variable in all estimation methods,

* Robust standard errors,

Figures in brackets are the standard errors.

FD: First Difference Estimation,

Reference category for education is qual1=higher degree, dummies for education are from higher degree=qual1 to no education qualification=qual6.

Dummies for years are excluded from the table.

Table 4: Hausman's Test

Fixed	Random B	b-B	Sqrt (SE)	Chi-Sq	
Partner	0.031	0.068	0.037	0.004	71.433
Manual	0.015	0.059	0.044	10.004	47.773
Age	0.108	0.125	0.016	0.007	5.415
Agesq	0.001	0.001	0.000	0.000	0.318
qua12	0.017	0.008	0.025	0.024	1.045
qua13	0.139	0.231	0.092	0.029	10.191
qua14	-0.209	0.315	0.107	0.031	11.764
qua15	0.241	0.370	0.129	0.035	13.643
qua16	0.218	0.470	0.251	0.035	51.082
Chi-Square (19) = 367.08			Prob >Chi-Square = 0.0000		

Notes: Null hypothesis of the test:

No correlation between unobserved errors term and explanatory variables

The last column is t-square: an individual based test,

Test is performed using all dummy years

Reference category for education is qual1=higher degree,

dummies for education are from higher degree=qual1 to no education qualification=qual6

The marital sorting criterion

An investigation of the probability of selection of men into marriage is made. This probability depends on earning as discussed in previous sections. The linear probability model in table 3 shows that all the coefficient estimates are statistically significant, except for the dummy years which are excluded from a table. It also indicated that an increase of one log points of earnings results to an increase of 11% chance of men to marry, when holding other variables constant. This means that an observed higher earning of married men is a result of marital sorting and it is not because of marriage tied. Similar results have been obtained in other previous works(see, Nakosteen, Westerlund and Zimmer, 2004).

While wage is statistically significant, the results should be handled with care. It has higher t-value because the sample of non married mean is 3 times smaller than that of married men. Wages of both non married and married men are taken together here. Possibly this lowered the standard errors which increased the t-value. Moreover, all levels of education in the LPM have positive probabilities of men to be 'married'. More interesting, the positive value of education is in line with the both human capital hypothesis and marital sorting creation. Since education is an important variable in the popular Mincer- type human capital equation and, wage is proxy for the measure of productivity. Man with such variable will become more productive and at the sometime increases his earnings. This means that, an individual with some education simultaneously increases earning and chance to be sorted from the marriage market.

Similarly, age is statistically significant based on t-value, its coefficient for age square is negative and even highly statistically significant. This portrays the maximum age upon which the probability of men to be sorted for marriage starts to decline. Such threshold age is also linked with a decline of an individual earning when the earning equation is estimated, see figure 3. Other results from LPM showed that when an individual change from less paid job to a higher paid job, there is an increase of about 5.5% more chances of men to be married. This coefficient estimate is also statistically significant. Although its probability increase is very low, it is a consistent estimate. For the case of probit and logit model, all the coefficients estimates are statistically significant except the dummies for years which are not reported here. For a probit model, changing from less paid job to a higher paid job, increases a chance of 15.5% more of man to be sorted from the marriage market; this estimate is just statistically significant. In a case of probit model, this change increases a chance of 15.2% more.

Furthermore, there are 13% and 12.8% chances of a man to be 'married' for the estimations of probit and logit respectively, when there are an increase of one log point of earning. All these estimates are statistically significant. These chances are higher and consistency with our earlier discussions. Therefore there is a positive marital sorting between marriage and wage premium. These results are in line with other similar studies found in the works such as: Nakosteen and Zimmer (1987, 1997, 2001). In Germany similar results are also observed on which married men receive on average 13 percent higher wages than single men and 4.5 percent higher wages than cohabiting men (Beblo, 2008). That is to say, married men have higher wages because they have a more favourable mixture of characteristics, even before marriage. Intuitively, men with a higher wage potential are more likely to be selected into married.

While, it has been shown that married men earn more is not because they are married. Rather, they have attributes which favour them both in labour market and marriage market. In this case, we would have expected low earning for the divorced men and separated men. This phenomenon is not observed in our sample as indicated in table 1 and figure 2. In fact, there might be some other explanations which may not necessarily be wages that puts men into divorced or separated cases. Once controlling for such explanations, we would have been confident enough to precede interpretation into that direction. This is beyond the scope of this paper.

Table 3: Marriage Selection: Probabilities Estimates, 1991 – 2002

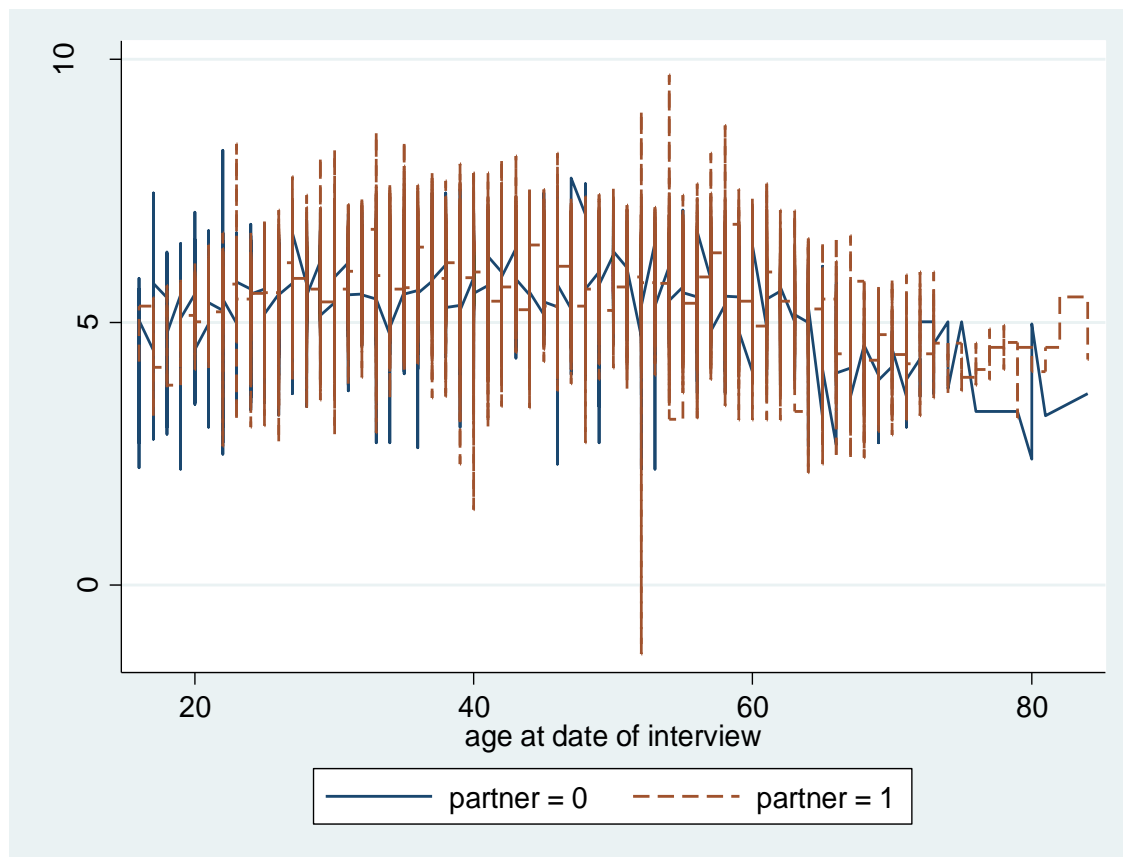
	LPM	Probit	Logit
Real log wage	0.110 (0.005) *(0.005)	0.131 (0.006)	0.128 (0.006)
Age	0.062 (0.001) *(0.001)	0.054 (0.002)	0.051 (0.002)
Agesq	-0.001 (0.000) *(0.000)	-0.001 (0.000)	-0.001 (0.000)
Manual	0.019 (0.005) *(0.005)	0.016 (0.006)	0.015 (0.006)
qual2	0.011 (0.014) *(0.014)	0.011 (0.016)	0.013 (0.016)
qual3	0.069 (0.013) *(0.013)	0.081 (0.015)	0.079 (0.015)
qual4	0.092 (0.014) *(0.014)	0.098 (0.013)	0.093 (0.013)
qual5	0.091 (0.015) *(0.015)	0.095 (0.014)	0.089 (0.013)
qual6	0.072 (0.015) *(0.015)	0.077 (0.015)	0.073 (0.014)
_cons	-0.802 (0.028) *(0.029)		-

Notes: Partner is used as a dependent variables in all the models, dummy years are used in all models but are excluded in the table ,

* robust standard errors and Figures in brackets are the standard errors,

Reference category for education is qual1=higher degree, dummies for education are from higher degree=qual1 to no education qualification=qual6

Figure 3: The Earning of Married and None Married Men, 1991 to 2002



CONCLUSION AND RECOMMENDATIONS

It has been shown that there is gap of earning between married men and single men. This gap might have been attributed by productivity argument, shown by small wage premium obtained on the fixed effect estimation as compared to the Pooled OLS. The gap appears as the remaining value for fixed effect which might be that married men are highly appreciated in both labour and marriage market. In other words, when unobserved effect is swept out, men might have earned more even before marriage. Moreover, the study finds that fixed effect estimation is more appropriate method. Its critical assumption of allowing correlation between unobserved effect and explanatory variables is fulfilled here. Conversely, while the first difference estimation is significant, there is low variation in the variable. Henceforth, it becomes inefficient estimation criterion.

Furthermore, the estimates of marital sorting are consistent with previous studies and that men with higher earning have higher chances to be selected into marriage when linear probability model is used for estimations. This is also true in a case of both Probit and Logit models. While it has been found here that reasons such as marital sorting and productivity arguments both explain the bachelor wage penalty hypothesis. Such expositions can be supplemented with data for the working hours of individuals, or the transition of wages before and after marriage and even to the divorced case.

Whilst the British Department of Work and Pension is committed to provide services which promote equality without any discrimination on grounds of gender, gender identity, marital status etc. It has been observed that married men have higher chances to be recruited and or promoted for jobs than single men. Therefore, there is still a need to conduct complex analysis on men's marital status and recruitment instead of limiting analysis on men's marital status-wage differentials. This will aid on development of the balanced and coherent men-recruitment and job promotions policies.

Moreover, in some cases, women working in Britain still earn almost less than men, although they carry out the same work or work of equal value (Blackaby et.al, 2005). This wage differential between men and women can be translated into the positive marital sorting found in this study. It may entail positive marital sorting, because the observed earning of women is less than that of men with same employment opportunity. Therefore, British Equal Pay and the Equality Act, 2010 should be more transparency in pay systems that allow companies to pay female employees the same as their male colleagues.

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