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# Abstinence, Excess, Success?: Alcohol, Cigarettes, Wedlock and Earnings

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## Abstract

*The effects of smoking, drinking and marriage on individuals' earnings are estimated for the UK labour force for 1974, 1984 and 1994. Smokers are found to incur a wage discount; drinkers a wage premium and married individuals a wage premium with a discount for the first child. Such results are interesting given numerous governments' policy interests in the activities of smoking, drinking and the institution of marriage.*

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## 1. Introduction

WHAT are the factors behind an individual's earnings? Every economist knows the role of education and experience, but does it matter how many cigarettes you smoke, how much alcohol you drink, whether you are married or cohabit instead, or how many children you have? This paper delves into these intriguing questions which have not been entirely neglected in the literature which has tended to divide into three, usually unrelated, propositions. Firstly, there is the proposition that cigarette smoking is associated with lower earnings (Levine *et al*, 1997) which is in marked contrast to the rational addiction approach to the demand for cigarettes (Becker *et al*, 1994) which assumes that consumption has no impact on future earnings. Secondly, other researchers have looked at the link between earnings and alcohol consumption, generally coming to the conclusion that moderate drinking may in fact be beneficial to labour market success, (Berger and Leigh 1988). A third body of work has looked for a 'marriage premium' in the sense that there is some labour market return to being married

*per se* over and above benefits from marriage-associated factors. The results of adding a marriage dummy to the usual human capital proxies are documented by (Waldfoegel 1998a), finding that there are returns for men and also for women once the relevant factors are controlled. The present paper is unique in that we examine, for the first time, the joint effect of all three of the factors identified above. Further to this, we consider the stability of these effects over time by using the General Household Survey, from the UK, for 1974, 1984 and 1994. Our earnings functions are estimated separately for men and women. There is a compelling need for this study if we accept the premise that if each of the three cited literatures is individually of validity then each of them must have featured serious mis-specification through omitting the augmentation terms of the other studies.

The broad findings of this paper are as follows. The negative effect of smoking holds up across time (although not significant in 1974) and gender. There appear to be beneficial effects of drinking for both genders although the pattern shifts over time. Clear evidence of labour market returns to marriage, combined with a discount for the first child, are found for both men and women. The structure of the paper is as follows; sections II and III consider the theoretical issues. Section IV reviews the literature in all three areas. Section V looks at the data and section VI looks at the results.

## 2. The rationale for an addictive consumption-earnings link

Apart from standard econometric problems, the literature is beset by the difficulty that

smoking and drinking operate on wages through a number of different avenues which it may be difficult to account for separately. The list of possible causes of association can be briefly summarised as follows:

- (i) pure discrimination: by non-consuming workers against consuming workers which leads employers to prefer non-consumers because of personal prejudice or greater acceptability to customers and fellow workers;
- (ii) risk-shifting: employers may discriminate against smokers because of danger of fires and possible non-cover in insurance and with drinking there is the danger of incompetence leading to damage to equipment or other people;
- (iii) risk preference variation: people who smoke and drink may have greater risk preference than others and hence their mean earnings may be less *ex ante* under identical conditions;
- (iv) lower productivity: due to health damage and/or interrupted work patterns during the course of the day. The effects here may possibly be opposite to this in that a stressed out worker, who can have a cigarette, may experience a surge in productivity. Likewise a relaxing effect of modest social drinking out of work hours might enhance performance. Drinking in work hours is most likely not conducive to output;
- (v) greater absenteeism: this may be due to hangovers or poorer general health;
- (vi) discount rates: in theory smokers and drinkers might be expected to have a higher discount rate than others.
- (vii) health insurance costs: smokers may inflict a higher cost of insurance on employers than non-smokers. Whilst this point may lack empirical verification, it is

one consistently alluded to in the prior research.

Some of the above effects, such as pure discrimination, should vanish when a person quits smoking and drinking. It follows that a quitter might still suffer earnings deficit due to a hysteresis effect: for example, if they developed a poor work record or bad health in the past this would still be detrimental to their earnings prospects. Hence we would expect a quitter to earn less, *ceteris paribus*, than a never smoker but more than one who still smokes.

### 3. The marriage-earnings link

Again there are several routes from the variable to an earnings effect. Marriage may influence the intensity of job search effort, leading to better labour market matching and hence higher wages. Marriage might decrease earnings by lowering the geographical mobility of the worker hence precluding some prospects of internal promotion or external advance. Any such effect may be greater when children are present.

According to Daniel (1995), the main source of a marriage premium for men is the impact of a wife on augmenting their human capital. This may take the form of highly specific investments for which restitution is now sought in divorce cases (see Cohen 1987) such as typing and correcting a college Professor husband's research papers. There are also simple scale benefits in sharing or specialising in household production tasks. Daniel adds also that wifely childcare might 'augment her husband's productivity by allowing him more sleep'. (Daniel 1995, p.116). Some indirect evidence on these effects can be found in Leigh (1995) where divorce has a significant negative effect on absenteeism for men but not for women.

Potentially, there is a negative gross association with marriage for women due to factors associated with marriage, such as the home production orientation that follows from a

Becker (1991) model. In support of this, time budget studies consistently show a male reluctance to take on a considerable range of traditionally 'female' tasks. There may be additional negative effects from employer discrimination especially when children are present (Goldin, 1990). Evidently, a marriage discount for women should reduce when the presence of children is controlled for, however whether or not it turns into a premium depends on the decision-making structure within families (Grossbard-Shechtman 1984). The evidence in Waldfogel (1998b) suggests that once the associative effects of marriage are controlled for there is indeed a net labour market return, to the marital state, for women.

Since marriage appears to bring gains to both the male and female partners one is led to wonder whether this is, to some extent, due to a positive sorting process, viz. those with other unmeasured wage-enhancing characteristics tend to marry each other. For some empirical evidence on this see Cameron (1985). The implications of Becker's original work on the economics of the family (Becker 1973, 1974) is *opposite* to this as there is assortative mating whereby women are channelled away from the paid labour market (comparatively speaking) and thus should *ceteris paribus* encounter a marital discount due to these intra-familial unobservables. As with the case of addictive consumption, the question of whether there are hysteresis effects arises. Some of the gains to marriage will be reversible particularly where a male-dominated household is dissolved. In contrast to this, estimated female returns might turn out to be greater, *ceteris paribus*, for those who are divorced as they might be, *ex post*, revealing past labour market investments made as a hedge against divorce risk as suggested in Greene and Quester (1982), who also provide some supportive empirical evidence.

#### 4. The literature: results and problems

Using a standard Mincerian earnings function, for hourly earnings, the most recent

researchers have come to the conclusion that smoking lowers the hourly wage rate by an estimated 4-7 per cent (Levine et al, 1997). The first study, by Berger and Leigh (1989) using the 1973 Quality of Employment Survey, found no connection between smoking and earnings. The main disadvantage of their paper is the small sample size which is corrected in Levine *et al* (1997), who use samples from the NLSY National Longitudinal Survey of Youth (2817 in 1984 and 3228 in 1991). Their earnings function uses a dummy for whether the individual is a daily smoker as their index of smoking status. A fairly parsimonious specification is used with only race and sex dummies added to the human capital, family background and experience variables. Most studies follow this kind of specification although generally with region dummies added. One problem with the econometric work, on the smoking-earnings link, is that it lumps ex-smokers together with those who have never smoked. In this paper, we take account of these differences. In Levine *et al* (1997), some calculations were made for the effect of quitting on earnings. Broadly, their findings are that the quitter earns more, *ceteris paribus*, than the current smoker but less than the never smoker. Their study is limited to a particular cohort of Americans which somewhat limits the range of evidence on the effect of quitting on smoking as there will have been little scope for the negative effects to build up before quitting, due to the ceiling on the age of the sample.

Turning now to the drinking papers, Berger and Leigh (1988) use the 1972-3 Quality of Employment Survey, i.e. the same sample as their 1989 smoking paper, which contains only 1496 observations. Drinking is measured by the number of occasions of how often per week liquor, beer or wine are consumed. This is not a particularly good measure of drinking especially as people from some cultural backgrounds drink infrequently but in large [or 'bingeing'] amounts. Berger and Leigh find

that modest, by their definition, drinkers amongst women earn 7.8 per cent more than non-drinkers with the corresponding figure for men being 20.9 per cent.

Heien (1996) conducted a more extensive study of the link between alcohol consumption and earnings. The data sets used for this study were the NHSA (National Household Survey on Alcohol) for the years 1979 and 1984 and the 1972-73 Quality of Employment Survey. The number of observations in each survey were 1521, 3828 and 1373 respectively. Drinking was measured as total number-of-drinks per month. This measure was created by looking at the weekly number of drinks intervals that an individual had placed themselves in. For example 5-7 drinks per week. This study used only a shift dummy for gender. In terms of the results, a statistically significant inverted U-shaped quadratic relationship was found between earnings and alcohol consumption in all samples.

French and Zarkin (1995) took a less than parsimonious route when selecting their sample. For reasons not clearly explained, they choose a random sample of workers from four organisations. The full sample contains 1050 observations. It is not clear how they ensured the sample was random or representative in each firm, nor is it clear if the firms were representative of a general population of firms. Some attempts are made to describe whether the firm operates nationally or locally and the type of occupations represented by each firm's workers. Two measures of drinking were used: 'daily' and 'heavy' during the past twelve months. A daily drinker was defined as an individual who drank on 20 or more days in the last 30. A heavy drinker was defined as an individual who drank five or more drinks per occasion on five or more days of the last 30. Again an inverted U-shaped relationship between drinking and earnings was found with peak earnings around 1.69 - 2.4 drinks per day. Again, gender differentials were permitted only by the use of

a simple shift dummy.

Zarkin *et al* (1998) tried to replicate the results of French and Zarkin (1995) using a nationally based survey, the 1991 and 1992 National Household Surveys on Drug Abuse. The sample sizes for men were 3015 (1991) and 2933 (1992), whilst for women they were 3176 (1991) and 2991 (1992). In contrast to French and Zarkin (1995), a more sophisticated measure of drinking was used. Instead of a daily and heavy measure, Zarkin *et al* (1998) created 7 categories of drinking ranging from light drinking per month to heavy drinking per month. The results of their estimates suggests that male drinkers earned 7 per cent more than men who did not drink and that this relationship was constant across a wide range of drinking levels. The returns to drinking for women were found to be statistically insignificant.

Categorisation is a problem with the meaning of definitions for drinking variables as there is no clear definition of 'light', 'modest' or 'heavy' drinking in terms of their effects on labour market performance. Such terms are usually defined with respect to medical expertise or social/moral judgements: for example in Europe there is a definition of heavy drinking based on units of alcohol whereby beer, wine and spirits are converted into a common denominator. The line of demarcation differs markedly between men and women due to their differing physiological capacities to absorb alcohol without damage. Studies of the alcohol-earnings link will tend not to contain outright alcoholics due to the nature of the samples and the fact that they are more likely to be out of the labour market. Hence it is a little bit unclear what is actually being measured and the alcohol definitions may in fact proxy some other unmeasured attributes such as motivation or facets of personality.

There has been little work on the specific channels through which smoking and drinking might influence earnings although there are a few papers on their impact on absenteeism.

Leigh (1995), using samples of 4186 women and 4253 men from the 1986 Panel Study of Income Dynamics estimates a Tobit model of absence rates, finding 232 per cent reductions in absenteeism rates for female smokers and 42 per cent reductions in absenteeism rates for male smokers. Controlling for personal characteristics associated with smoking reduces this to a modest effect of smoking for men but a negligible effect for women.

Until recently, investigation of the marriage premium has also been restricted to U.S. data. Daniel (1995) reports findings from the National Longitudinal Study of Youth for those aged 14-21 in 1979. The marriage premium for white men is about 6 per cent whilst that for black men is about 4.5 per cent. Black women earn a marriage premium of about 3 per cent. White women experience a discount but this is due to the effect of children. When these are accounted for, there is a small positive effect of marriage that appears after a few years of marriage. There is strong evidence that children reduce the returns for white males but the evidence for black males is weaker. Waldfogel (1998a) presents more results from the same data source using the 1980 and 1991 samples with black and Hispanic dummies rather than full parameter shifts being allowed. This paper includes non-working individuals by using their last recorded wage rate and including a not-currently-working dummy. The family variables are marital status dummies and one and two-or-more children dummies. The net effects of being married are significantly positive for males and females and are about 11-12 per cent for the former and about 4 per cent for the latter. The point estimates are highly similar across the two years.

The premium for women is wiped out by the impact of having one child and turned into a substantial discount when there are two or more children. The equivalent effects for men are somewhat inconsistent; in 1980 the children dummies are positive whilst in 1991 they

are negative.

### **5. Data and variables**

The data are taken from the General Household Survey, in the UK, for 1974, 84 and 94. Unlike most of the American studies, this is a series of all age samples rather than a limited age span birth cohort. Our sample selection is restricted to those who have worked in the last year in a full-time (more than thirty hours per week) job. Definitions of variables are given in table 1. Smoking and drinking data are collected by self-assessment with respondents asked to self-report or categorise their consumption of cigarettes and alcohol. This may well lead to bias. For example, the percentage of male or female heavy drinkers in 94 and 84 is always less than 1 per cent. However, in 1984 70 per cent of the males believed that they were moderate drinkers, a figure which fell to 43 per cent in the 1994 sample. Similarly, in 1984 60 per cent of females categorised themselves as moderate drinkers, falling to 30.8 per cent in 1994. In terms of smoking, in 1974 50 per cent of males were smokers, as were 45 per cent of females. However, by 1994 only 26 per cent of males were smokers and likewise only 25 per cent of females were smokers. Whilst it might be expected that smoking and drinking go together, correlations between reported levels of smoking and drinking for either males or females in 1984 and 1994 never exceeded 0.08.

Whilst it is a boon to be able to use such a span of data, particularly in view of the limited nature of most earlier studies, the 1974 data are unfortunately limited. They do not contain any variables for drinking, cohabitation or ethnicity. Further, the cohabitation variable is only available for 1994. Whilst these deficiencies limit the comparability and comprehensiveness of the results, we decided to persist with the use of all three waves. As far as possible we try to follow the literature in terms of the model

specification and variable definitions. The experience variables are proxies derived from the age-left-education variable and current age, rather than the true level of experience. The drinking dummy is defined from self-assessments of the level of alcohol consumption.

### 6. Estimation and results

The predictions from the literature are fairly self-evident. The smoking dummy should have a negative coefficient. The quit-smoking coefficient should be negative, but smaller than that for smoking, if there are hysteresis effects of smoking from some of the causes listed above. The expectation of the drinking coefficients is of some positive effect although this is largely derived from perusal of the extant literature rather than any strong economic-theoretical basis. The marital status coefficients are expected to be positive and greater for men than for women. The children coefficients are expected to be negative and broadly stronger in effect for women than for men. As the incentive to invest in a partner's career is less in the cohabitative state we would expect it to bring positive returns which are less than those to marriage. As indicated the divorce situation is complex but broadly one expects a male return less than that to marriage but a female return which may exceed that to marriage. A self reported measure of health is also included and we expect individuals who have been ill during the last year to have significantly less earnings than someone who has been well. If smoking and drinking proxy for health, then the inclusion of this measure of health should reduce the size and significance of the associated drinking and smoking coefficients.

The estimating equation is the basic Mincerian human capital function which involves regressing log earnings on a set of human capital variables plus additional dummies for region, smoking, drinking and marital situation. The full derivation of the function

can be found in Addison and Siebert (1979, pp.159-163). It is assumed that an individual starts with a given earnings capacity which can be augmented by investments in years of schooling and post-school investment. It is assumed that the fraction of earnings capacity invested over the working life follows a linearly declining path. This gives rise to a quadratic term in years of work experience. As with all such studies we are constrained by the questions asked in the source material. There are problems of bias which might be raised: for example: possible simultaneity between the focus variables of this paper (smoking, drinking) and earnings through an income effect dictating the need for something other than a simple OLS approach. One response to this is to point out that there is very little evidence of any income responsiveness of addictive substances to income (see for example the literature review of smoking by Cameron (1998)). Further, use of an instrumental variable approach will not bring any gains where it proves impossible to find suitable instruments; indeed perseverance in such circumstances tends to bring unstable and implausible results overall (see for example Levine *et al*, 1997).

The results are shown in tables 2 and 3. The first set of results features only a constant and two smoking dummies to show the gross effects of smoking and quitting. The second set adds the light, moderate, and heavy self-assessments-of-drinking dummies. We then add the full set of conventional earnings function variables plus six family variables for marital status and number of children. Finally, we add a measure of health and explore the discount rates amongst smokers and drinkers with interactions between experience and both drinking and smoking. The results are very encouraging for the existing work on these separate literatures. Fairly standard results are found for the education, training and experience variables. A fair degree of support is found for all the propositions advanced therein

and some interesting additions arise.

The simple regressions for smoking and drinking give only gross effects of smoking which prove to be statistically significant. For 1984 and 1994 these are as expected being negative, although the 1974 results are anomalously positive. For 1974, smoking shows gross gains but the net effects, according to the full specification, are zero. The net effect of being an ex-smoker turns out to be significantly positive, in 1974, for males but insignificant for females.

We turn now to the 1984 and 1994 results. The gross negative smoking effects for men and women are extremely large and are not reduced by adding the drinking dummies. However, adding the human capital and family variables reduces them to magnitudes comparable with the U.S. studies. The quit-smoking dummies tend to be positive and significant in the first two sets of results but the full specification reduces them to insignificance suggesting that there are no hysteresis effects of smoking once human capital and family covariation with smoking is controlled for.

The male and female results show a rising rate of return to drinking in 1984 but this vanishes in the 1994 data. In 1994, women have an inverted U-relation where the peak is for moderate drinking whilst for men there is a loss for light drinking but no other effects. These results are a little messy but the broad conclusion is that those who rate themselves as moderate to heavy drinkers do not suffer earnings loss and may, in fact, gain.

The effects for marriage are very strong indeed, suggesting that marriage effects in previous studies are not mis-attributions to covariant smoking and drinking effects. For men, the net effect is in the range 21.8-28.9 per cent, which is above the typical values for the USA studies, and any offsetting effects of children are small and weak with there being, on the contrary, a significant positive return to the second child in 1984. The results for divorce

indicate a strong gain over being unmarried, but are less than the marriage effects, being about 12 per cent, which makes sense in terms of labour market analysis.

For women, there are large, although much smaller, net gains to marriage but only in 1984 and 1994 (8.4-10.3 per cent). The negative effect of the presence of children overwhelmingly offsets this confirming the work of Waldfogel (1998b). The divorced-marriage connection is different for women. In 1984 the returns for divorced women are quite close to those for the still married. In 1994, the relationship is reversed where the divorced woman earns a greater rate of return than the still married. This was predicted above on the basis of the work of Greene and Quester (1982) but it may also be indicative of reverse causation in that the Becker inspired research on the determinants of divorce indicates that male wages have a negative effect on this whilst female wages have a positive effect.

The cohabitation results are most interesting as both genders show a significant gain over the single state. For both, the returns are less than the returns to fully formalised marriage but are still substantial (16.7 per cent for men and about 8 per cent for women).

When a measure of health is added to the model a negative effect is found for bad health for men only in 1984 and for women only in 1994. In each of these specifications there is a small reduction in the smoking coefficient which would tend to indicate that smoking to some extent does proxy for ill health.

In the final specifications, interactions between experience and both heavy drinking and smoking are included in order to test the hypothesis that the earnings discounts to smoking and drinking relate to lower discount rates amongst these individuals. If true, we should expect a lower earnings - experience profile and these additional interaction terms will help to identify this. In terms of the empirical results, supporting evidence is only found for

women who smoke. In addition, for women the smoking coefficient also becomes insignificant. Suggesting that for women the earnings discount from smoking may actually relate to lower discount rates.

Finally, it was also decided to test the hypothesis that the smoking discount could result from labour market inactivity. This could be due to ill health, employer discrimination or even longer search periods by smokers as compared to non smokers. A logit model of unemployment was estimated using the main variables from the earnings function and the results are presented in table 4. Clearly, smoking is a strong and positive predictor of unemployment for both men and women. Similarly, the evidence from the 1994 data set suggests that drinkers, whether they be light, moderate or heavy, are all more likely to be unemployed. Taken together, these results would suggest that smoking and drinking are important determinants of an individual's likelihood of being employed. Whether this result stems from discrimination and poorer search we are unable to say.

The results are summarised as follows (leaving out the 1974 anomalies for clarity). There is a broad negative effect of smoking which survives the expanded specification of this paper. The weight of this paper is against a smoking hysteresis effect. The smoking discount is partially offset by the inclusion of ill health and may for women be additionally explained by a lower discount rate. Furthermore there is evidence to suggest that smoking positively predicts unemployment and thus the discount to smoking may stem from labour market inactivity. On balance, drinking alcohol tends to have no or a beneficial effect. The marriage premium is large, greater for men than women and has a tendency to be offset, for women, by a children discount but this is not the case for men. Marriage appears to leave behind traces of its human capital augmentation as the divorced

earn more than the never married. Further, there are substantial returns, albeit less than to marriage, for cohabitation suggesting that such human capital augmentation goes on even in the presence of incomplete markets for obtaining an exit share.

### **7. Conclusion**

In Anglo-American culture smoking and drinking have now become stigmatised activities whilst marriage has been promoted consistently by governments as beneficial. Campaigning against smoking and drinking has focused on the health effects, and that for the family on moral and social (externality) effects. This paper brings together, for the first time, the joint effects of these policy targets on earnings. The findings are quite striking. All the established effects of marital status, drinking and smoking, from previous literature, are still manifest. The gains to being married are very high, not only are they greatly in excess of the gains to cohabiting or having previously been married but they are also much larger than in comparable U.S. studies. In one case the return to marriage is approaching 30 per cent. Such a dramatic result coupled with smoking and drinking effects fairly close to American estimates leads us ineluctably to end with the old academic cliché that more work needs to be done.



**Table 1: Variable Names and Definitions**

<i>Variable Name</i>	<i>Definition</i>
OLEVEL	Compulsory education. Dummy variable, 1 = attained 'ordinary level' qualification as highest
ALEVEL	Post compulsory education. Dummy variable, 1 = attained 'advanced level' qualification as highest
DEGREE	Higher education. Dummy variable, 1 = attained university degree as highest qualification.
TRADEXAM	Trade qualification. Dummy variable, 1 = attained trade qualification
EXP	Employment experience measured as current age less age when left full time education
EXPSQ	Employment experience squared
PRESMOKE	Ex smoker. Dummy variable, 1 = previous smoker
SMOKE	Smoker. Dummy variable, 1 = current smoker
LIGHT	1= light drinker
MOD	1= moderate drinker
HEAVY	1= heavy drinker
WHITE	White or non-white. Dummy variable, 1 = white
WHTCOLL	White collar or blue collar. Dummy variable, 1 = white collar
TENURE	1= in current job >2 years
MARRIED	Marital status, 1 = married
DIVORCED	1= divorced
COHAB	1= cohabiting
CHLD1	1= one child present
CHLD2	1= two children present
CHLD3	1= three or more children present
HEALTH	1= health during last 12 months has been poor
EXPSMK	EXP*SMOKER
EXPSQSMK	EXPSQ*SMOKER
EXPDRK	EXP*HEAVY
EXPSQDRK	EXPSQ*HEAVY

Plus regional dummies not shown in tables 2, 3 and 4

Table 2: Earnings Functions For Men: 1974, 1984 and 1994

Year	74	84	84	84	74	84	84	84	94	84	84	94
Constant	-0.2284 (0.0132)**	2.8813 (0.0246)*	2.0004 (0.0136)**	2.3517 (0.0355)**	1.9896 (0.0279)**	-1.0375 (0.0308)**	0.8614 (0.0691)**	0.8556 (0.0571)**	1.4260 (0.0755)**	0.8541 (0.0572)**	1.6334 (0.0739)**	0.8541 (0.0572)**
SMOKER	0.0838 (0.0166)**	-0.3191 (0.0356)*	-0.1561 (0.0227)**	-0.3502 (0.0351)**	-0.1569 (0.0227)**	0.0091 (0.0142)	-0.1367 (0.0256)**	-0.0638 (0.0192)**	-0.1192 (0.0277)**	-0.0817 (0.0192)**	-0.0902 (0.0649)	-0.0817 (0.0192)**
PRESMOKE	0.2188 (0.0206)**	0.1422 (0.0389)*	0.0458 (0.0231)**	0.1041 (0.0383)**	0.0420 (0.0231)*	0.0620 (0.0179)**	4.44E-03 (0.0283)	-0.00003 (0.0198)	0.0020 (0.0303)	0.0012 (0.0197)	0.0331 (0.0312)	0.0012 (0.0197)
LIGHT				0.4082 (0.0419)**	-0.0253 (0.0286)		0.1739 (0.0297)**	-0.0566 (0.0247)**	0.2243 (0.0551)**	-0.0696 (0.0246)**	0.0624 (0.0436)*	-0.0696 (0.0246)**
MOD				0.4853 (0.0382)**	0.0541 (0.0294)*		0.2245 (0.028)**	0.0128 (0.0244)	0.2456 (0.0495)**	0.0100 (0.0243)	0.1740 (0.0361)**	0.0100 (0.0243)
HEAVY				0.6036 (0.0647)**	-0.1491 (0.1136)		0.3097 (0.046)**	-0.0150 (0.0932)	0.3996 (0.0648)**	-0.0118 (0.0942)	0.5184 (0.5173)	-0.0118 (0.0942)
MARRIED						0.2342 (0.0177)**	0.2886 (0.0313)**	0.2182 (0.0239)**	0.3349 (0.0343)**	0.2208 (0.0238)**	0.3479 (0.0345)**	0.2208 (0.0238)**
DIVORCED						0.1275 (0.0447)**	0.0902 (0.0688)	0.1133 (0.046)**	0.1625 (0.0811)**	0.1191 (0.0457)**	0.1890 (0.0817)**	0.1191 (0.0457)**
COMAB								0.1666 (0.0305)**		0.1700 (0.0306)**		0.1700 (0.0306)**
CHLD1						-0.0212 (0.0164)	-0.0121 (0.0307)	-0.0288 (0.0221)	-0.0388 (0.0317)	-0.0308 (0.0221)	-0.0524 (0.0318)*	-0.0308 (0.0221)
CHLD2						-0.02736 (0.0175)	0.0714 (0.0319)**	0.0021 (0.0237)	0.0189 (0.0330)	0.0052 (0.0236)	-0.0035 (0.0331)	0.0052 (0.0236)
CHLDS						-0.098734 (0.0242)	0.0267 (0.0534)	-0.0107 (0.0379)	0.0771 (0.0517)	-0.0073 (0.0375)	0.0416 (0.0618)	-0.0073 (0.0375)
WHITE							-0.0575 (0.05)	0.1236 (0.0384)**	0.0711 (0.1267)	0.1393 (0.0393)**	0.0763 (0.1261)	0.1393 (0.0393)**
WHTCOLL						0.1976 (0.0139)**	1.0456 (0.0238)**	0.2287 (0.0172)**	-0.9938 (0.0259)**	0.2225 (0.0171)**	1.0050 (0.0261)**	0.2225 (0.0171)**

OLEVEL	0.1418	0.1659	0.0903	0.1578	0.0972	0.1574	0.0865
	(0.0183)***	(0.0256)***	(0.0182)***	(0.0328)	***	(0.0182)	***
ALEVEL	0.3180	0.3566	0.0850	0.4130	0.0952	0.3913	0.0942
	(0.0661)***	(0.0355)***	(0.048)***	(0.1856)	**	(0.0446)	**
DEGREE	0.4173	0.7891	0.3590	0.8894	0.3559	0.8824	0.3536
	(0.0398)***	(0.0393)***	(0.028)***	(0.0807)	***	(0.0277)	***
TRADEXAM	0.1481	0.0344	0.0823	0.1968	0.0787	0.2097	0.0798
	(0.0151)***	(0.0299)	(0.016)***	(0.0333)	***	(0.0158)	***
TENURE	0.0098	0.3883	0.1980	0.3483	0.2002	0.3783	0.1989
	(0.0187)	(0.0318)***	(0.02)***	(0.0353)	***	(0.0189)	***
EXP	0.0951	0.0427	0.0403	0.0505	0.0397	0.0563	0.0394
	(0.0019)***	(0.0034)***	(0.003)***	(0.0038)	***	(0.0026)	***
EXPSC	-0.0010	-0.0008	-0.0008	-0.0009	-0.0007	-0.0010	-0.0007
	(0.00003)***	(0.0001)***	(0.0001)***	(0.0001)	***	(0.0001)	***
HEALTH				-0.1914	-0.0616	-0.2031	-0.0526
				(0.0578)	***	(0.0681)	***
EXPSMK							
EXPSQSMK							
EXPDRK							
EXPSQDRK							
R2	0.0154	0.0318	0.0202	0.0671	0.0254	0.2981	0.2981
Adj. R2	0.0151	0.0314	0.0196	0.0660	0.0240	0.2957	0.2957
F	55.1626***	75.3993**	34.3648***	65.8994***	17.3719***	122.9408***	192.4354***
n	7078	4592	3319	4592	3319	7078	4592

\*\*\* Sgn. 1% lev. \*\* Sgn 5% lev. \* Sgn 10% lev.

Table 3: Earnings Functions Women: 1974, 1984 and 1984

Year	74	84	94	84	74	84	94	84	94	84	94	
Constant	-0.7496 (0.0178)**	2.4726 (0.0289)**	1.728 (0.016)**	2.1634 (0.0391)**	1.6919 (0.0351)**	-1.2492 (0.0535)**	0.746 (0.1011)**	0.8191 (0.0637)**	0.9140 (0.1092)**	0.9456 (0.0651)**	0.9794 (0.1092)**	0.9508 (0.0655)**
SMOKER	0.0682 (0.0255)**	-0.2764 (0.0472)**	-0.133 (0.027)**	-0.3483 (0.0465)**	-0.1442 (0.027)**	0.014 (0.0229)	-0.1176 (0.0366)**	-0.0569 (0.0238)**	-0.1053 (0.0423)**	-0.0420 (0.0249)**	-0.0277 (0.0663)**	-0.0347 (0.0563)**
PRESMOKE	0.2178 (0.0448)**	0.1971 (0.066)**	0.0418 (0.031)	0.118 (0.0647)**	0.0336 (0.0313)	0.0492 (0.0398)	0.0698 (0.0505)	0.0026 (0.0269)	0.0804 (0.0579)	0.0037 (0.0263)	0.1162 (0.0583)**	0.0053 (0.0283)**
LIGHT				0.4020 (0.0503)**	0.0026 (0.0372)		0.1367 (0.0394)**	0.0329 (0.0319)	0.2150 (0.0739)	0.0177 (0.0336)	0.0701 (0.0853)	0.0183 (0.0335)
MOD				0.5479 (0.0537)**	0.1058 (0.0388)**		0.2055 (0.0428)**	0.0927 (0.0335)**	0.2681 (0.0699)**	0.0885 (0.0352)**	0.2334 (0.0599)**	0.0890 (0.0352)**
HEAVY				0.7953 (0.1085)**	-0.2393 (0.3062)		0.2951 (0.0849)**	-0.1201 (0.2595)	0.3014 (0.1193)	-0.0920 (0.2628)	0.2238 (0.1157)**	1.5321 (3.1068)
MARRIED						-0.0277 (0.0256)	0.1031 (0.0401)**	0.0840 (0.0253)**	0.1611 (0.0495)**	0.1348 (0.0259)**	0.1662 (0.0458)**	0.1268 (0.0260)**
DIVORCED						0.0183 (0.0526)	0.0674 (0.0746)	0.151 (0.0418)**	0.0924 (0.0916)**	0.2132 (0.0438)**	0.2503 (0.0923)**	0.1971 (0.0440)**
COHAB								0.0798 (0.0324)**		0.1152 (0.0332)**		0.1080 (0.0332)**
CHLD1						-0.2557 (0.0294)**	-0.2207 (0.0472)**	-0.0612 (0.027)**	-0.1954 (0.0511)**	-0.0394 (0.0283)	-0.2171 (0.0511)**	-0.0418 (0.0283)
CHLD2						-0.2757 (0.0388)**	-0.2206 (0.0627)**	-0.0322 (0.035)	-0.3002 (0.0650)**	0.0168 (0.0370)	-0.3266 (0.0651)**	0.0087 (0.0370)
CHLD3						-0.3286 (0.0536)**	-0.2383 (0.1403)**	-0.1362 (0.0716)**	-0.3458 (0.1336)**	-0.1118 (0.0787)**	-0.4350 (0.1335)**	-0.1156 (0.0785)**
WHITE								0.0135 (0.0761)	0.5220 (0.1753)**	0.0131 (0.0424)	0.5289 (0.1761)**	0.0154 (0.0423)**
WHTCOLL						0.223 (0.0244)**	0.9842 (0.0382)**	0.2788 (0.027)**	-0.6751 (0.0513)**	0.2829 (0.0284)**	0.6851 (0.0515)**	0.2826 (0.0283)**

OLEVEL	0.1182 (0.0312)***	0.1131 (0.0457)**	0.1491 (0.0213)***	0.2782 (0.0544)***	0.1345 (0.0223)***	0.2487 (0.0546)***	0.1405 (0.0224)***
ALEVEL	0.3289 (0.1629)**	0.4053 (0.0618)**	0.165 (0.0544)***	0.4012 (0.4090)	0.1258 (0.0572)**	0.4758 (0.4107)**	0.1383 (0.0571)**
DEGREE	0.6494 (0.0777)***	0.8891 (0.0857)**	0.4221 (0.0391)***	0.7744 (0.1215)	0.3855 (0.0404)***	0.7877 (0.1219)***	0.3863 (0.0403)***
TRADEXAM	0.0587 (0.0308)*	0.0284 (0.0391)	-0.0355 (0.02)*	0.0324 (0.0754)	-0.0318 (0.0208)	0.3602 (0.0758)***	-0.0333 (0.0209)
TENURE	0.0842 (0.0299)***	0.5356 (0.0428)**	0.2304 (0.0231)***	0.4997 (0.0510)	0.2862 (0.0239)***	0.5140 (0.0510)***	0.2512 (0.0239)***
EXP	0.0506 (0.0032)***	0.0373 (0.0053)**	0.0305 (0.0031)***	0.0463 (0.0082)	0.0067 (0.0014)***	0.0589 (0.0070)***	0.0082 (0.0015)***
EXPSQ	-0.0009 (0.0001)***	-0.0008 (0.0001)**	-0.0007 (0.0001)***	-0.0008 (0.0001)	-0.0001 (0.0000)***	-0.0011 (0.0002)***	-0.0001 (0.0000)***
HEALTH				-0.1099 (0.0844)	-0.1200 (0.0453)***	-0.1035 (0.0847)	-0.1184 (0.0452)***
EXPSMK						-0.0196 (0.0107)*	-0.0227 (0.0062)***
EXPSQSMK						0.0005 (0.0002)*	0.0006 (0.0001)***
EXPORK						-0.0024 (0.0686)	-0.1123 (0.3421)
EXPSQDRK						0.0020 (0.0015)	0.0016 (0.0081)
R2	0.0083	0.0233	0.0145	0.0765	0.0235	0.0765	0.3148
Adj. R2	0.0076	0.0225	0.0136	0.0745	0.0213	0.0745	0.3078
F	12.8171***	28.6395***	15.901***	39.7287***	10.3748***	39.7287***	32.2753***
n	3025	2404	2148	2404	2148	2404	2148

\*\*\* Sgn. 1% lev. \*\* Sgn 5% lev. \* Sgn 10% lev.

Table 4:

## Logit model for Unemployment

Variable	Female		Male	
	84	94	84	94
SMOKER	0.7042 (0.1294) ***	0.9965 (0.1358) ***	0.9955 (0.0995) ***	1.1223 (0.1038) ***
EXSMOKER	0.5733 (0.1841) **	0.2544 (0.1803)	0.2237 (0.1352) *	0.0101 (0.1313)
LIGHT	-0.092 (0.1714)	1.1175 (0.1993) ***	0.0376 (0.1267)	1.0845 (0.1485) ***
MOD	-0.1343 (0.1968)	0.9139 (0.2304) ***	-0.1846 (0.1333)	0.8544 (0.1599) ***
HEAVY	-1.7539 (0.7401) **	0.7354 (0.3815) **	-0.2636 (0.2136)	0.8748 (0.1999) ***
MARRIED	-0.4696 (0.1547) ***	-0.7650 (0.1474) ***	-0.7757 (0.1146) ***	-0.6608 (0.1083) ***
DIVORCED	0.5624 (0.2640) **	-0.0107 (0.2284)	-0.4583 (0.2571) *	0.0783 (0.1925)
COHAB		-1.2842 (0.2743) ***		-0.089 (0.1595)
CHLD1	0.0749 (0.1443)	0.4430 (0.1435) ***	-0.0646 (0.1148)	0.0053 (0.1209)
CHLD2	-0.1152 (0.1709)	0.0922 (0.1857)	-0.0123 (0.1278)	-0.2966 (0.1380) **
CHLD3	-0.2187 (0.3138)	-0.1169 (0.3154)	0.4877 (0.1708) ***	0.3171 (0.1620) **
WHITE	-0.8397 (0.2115) ***	-0.8749 (0.2031) ***	-0.7979 (0.1537) ***	-0.826 (0.1491) ***
WHTCOLL	-0.7288 (0.1236) ***	1.6646 (0.1435) ***	-0.9178 (0.1054) ***	-0.0735 (0.1054)
OLEVEL	-0.3288 (0.1507) **	0.2413 (0.1397) *	-0.7061 (0.1313) ***	0.305 (0.1110) ***
ALEVEL	-0.3645 (0.2366)	0.4774 (0.3078)	-0.7232 (0.1754) ***	0.0302 (0.2421)
DEGREE	-0.8647 (0.3330) ***	0.2366 (0.2537)	-0.3725 (0.2181) *	-0.1974 (0.2107)
TRADEXAM	-0.0602 (0.5355)	0.0019 (0.1334)	-0.221 (0.1580)	0.1171 (0.0961)
EXP	-0.076 (0.0189) ***	-0.0035 (0.0039)	-0.0472 (0.0120) ***	0.0158 (0.0057) ***
EXPSQ	0.0006 (0.0004)	-0.0001 (0.0001) *	0.0008 (0.0002)	-0.0002 (0.0001)
Constant	-0.4408 (0.2980)	-4.0095 (0.3214) ***	-0.547 (0.2226)	-2.6976 (0.2099) ***
n	4617	9734	6728	10523
chi squared	286.8351 ***	496.3057 ***	572.2213 ***	493.4235 ***

\*\*\* Sgn. 1% lev. \*\* Sgn 5% lev. \* Sgn 10% lev.

## Endnotes

1. University of Bradford. We would like to thank the anonymous referees for many constructive and illuminating comments which have greatly improved this paper.

2. The variance of earnings for non smokers is always greater than that of smokers in all our data sets for both men and women, except for females in 1994. Thus suggesting that risk preferences are not the underlying reason for an earnings discount amongst smokers.

3. The coefficient on a dummy in a log dependent variable equation is a biased estimate of the percentage differences. See Kennedy (1981).

4. It can be argued, as indeed it could throughout this paper and with all of the literature, that the returns may be due to unmeasured associated personality factors rather than the factor to which the return is being attributed.

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