

Modelling Occupational Choice: Non-pecuniary Employment Attributes and Endogenous Preferences

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This paper investigates occupational choice through a consideration of the determinants of individual preferences related to non-pecuniary employment attributes. It is argued that tastes concerning such attributes are conditioned in part by-family background, in particular the socio-economic class of individuals' parents. Such an approach represents a questioning of the implicit assumption of conventional labour economics that tastes are exogenous, or unrelated to economic characteristics. This idea is subjected to empirical test through an examination of the job preferences of a large sample of young US males. With important qualifications the major hypotheses of the model are supported. The results cast doubt on the income maximisation framework of mainstream labour theory.

Introduction

Over the last fifteen years labour economists have been preoccupied with the extension and testing of human capital theory. In order to derive refutable empirical hypotheses this model assumes that workers seek to maximise expected discounted lifetime earnings. Such an approach invokes the standard neoclassical assumption of exogenously given and randomly distributed tastes concerning workers' valuation of non-pecuniary job attributes.

One of the most difficult problems of conventional approaches to issues of choice in the labour market is recognised by Blaug, who comments that

The human capital explanation of labor training founders on the failure to provide a testable theory of occupational choice. Nothing is said about the non-pecuniary attractions of alternative occupations.¹

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1. M. Blaug, 'The Empirical Status of Human Capital Theory: A Slightly Jaundiced Survey', *Journal of Economic Literature*, 1976, p. 839.

This is an unsurprising observation of a theory that in effect equates utility maximisation with income maximisation. It would appear that considerable scope exists for an incorporation of economic theory with the issue of preference determination.

This paper investigates the question of occupational choice in the context of endogenous tastes by workers for a particular non-pecuniary job attribute, responsibility in decision making. It begins with an examination of evidence suggesting that socio-economic background is an important determinant of individuals' valuation of this attribute. Empirically refutable hypotheses concerning occupational preference are derived, and these hypotheses are subjected to test with the use of US panel data.

Hierarchy in individuals' needs

At the most general level Maslow postulates a 'needs hierarchy' in which

An individual's needs develop on a sequence from 'lower order' to 'higher order'. The hierarchy consists of five plateaus: (1) basic physiological needs; (2) safety and security needs; (3) social affection needs; (4) esteem needs; and (5) self-realization needs. Only after the lowest level is satisfied does a person become concerned with fulfilling the higher needs, since it is only the unmet needs which motivate him.²

This implies that occupational aspirations depend on the level of needs satisfaction that individuals have experienced. Only individuals who have met their lower order needs would aim for occupations believed to fulfil esteem and self-realisation goals. Substantial support exists for this argument, particularly if it is generalised to encompass notions of economic security.

From extensive interviewing Hyman demonstrates that individuals from poor backgrounds emphasise direct economic considerations such as security, wages or subsidiary economic benefits in the choice of life's work. On the other hand, individuals from high-income backgrounds appear more interested in the congeniality of the career pattern to personality and interests.³ Studies by Bowles,⁴ Bacchus⁵ and Stern⁶ appear to support this conclusion.

It follows that there may be a case for a model postulating systematic differences in the utility functions of groups of decision makers. The traditional micro-economic assumption of exogenous and randomly distributed tastes, or values, requires modification in a world recognising the motivational force of non-economic needs. It would appear to be valuable

2. As reported in B. Carroll, *Job Satisfaction*, Ithaca, 1969, p. 8.

3. See Herbert J. Hyman, 'The Value Systems of Different Classes', in R. Bendix and G. Lipset, *Class Status and Power*, New York, 1963, pp. 492-3.

4. S. Bowles, 'Schooling and Inequality from Generation to Generation', *Journal of Political Economy* 80, Supplement.

5. D. Bacchus, On the Relevance of Non-Pecuniary Benefits of Work: Mostly an Empirical Study, unpublished Yale University paper, May 1976.

6. D. Stern, 'Education, Wages and Non-Pecuniary Qualities of Work: Some Empirical Findings', Yale University mimeo, November 1975.

to examine occupational choice forces given utility-maximising individuals differentiated by values.

The formation of values related to responsibility

A reasonable assumption is that parents exert an important influence on the decision-making processes of their children. Substantial documentation exists for this view and investigations into the factors determining the length of time individuals remain in the education stream typically emphasise parental attitudes.⁷ In particular, parental values may be crucial inputs to the occupational choice of the child.⁸ Considerable empirical testing has been carried out on the factors related to the formation of values. An examination of this work provides some insights into the forces operating on the occupational choices of individuals, at least in the early stages of the life-cycle.

The most thorough analysis is undertaken by Kohn⁹ in tests carried out using Washington, Turin (Italy) and National US samples. Subjects were asked to rank indicators of values, reflecting at one extreme internal dynamics (or self-realisation), and at the other, conformity to externally defined standards. Holding the separate influence of education, occupation, race and income constant, the pervasive and statistically significant finding is that 'the middle-class variant focuses on the internal processes of self-direction and empathetic understanding, while the working-class variant focuses on conformity to externally defined standards'.¹⁰ Bronfenbrenner,¹¹ Inkeles¹² and Kohn and Schooler¹³ provide evidence consistent with this view. In all cases socio-economic class is importantly related to indices reflecting values suggestive of self-direction, or 'higher order' aspirations.

Kohn and Kohn and Schooler emphasise the importance of education as a causal link in the process. Kohn reasons that

7. For empirical support of this proposition see S. Christensen, J. Melder and B. A. Weisbrod, 'Factors Affecting College Attendance', *Journal of Human Resources*, Spring 1975; J. A. Kahl, 'Educational and Occupational Aspirations of "Common-Man" Boys', *Harvard Educational Review* 23; D. B. Kandel and G. S. Lesser, 'Parental and Peer Influences on Educational Plans of Adolescents', *American Sociological Review*, July 1969; and W. H. Sewell and V. P. Shah, 'Social Class, Parental Encouragement, and Educational Aspirations', *American Journal of Sociology* 73.
8. This view is expressed in both E. Haas, M. Tares and D. Shaw, 'Primary Group Influence on Vocational Choice', *Sociological Quarterly* II, 1961; and N. F. Dufty, 'The Effect of Occupational Experience on the Use of Relatives and Friends as Sources of Information on Occupational Choice', *Journal of Industrial Relations*, September 1971.
9. See M. L. Kohn, *Class and Conformity: A Study in Values*, Dorsey, Homewood, Illinois, 1969.
10. M. L. Kohn, op. cit., p. 21.
11. B. Bronfenbrenner, 'Socialization and Social Class Through Time and Space', in E. E. Maccoby et al. (eds), *Readings in Social Psychology*, Holt, Rinehart and Winston, New York, 1958.
12. A. Inkeles, 'Industrial Man: The Relation of Status to Experience, Perception, and Value', *American Journal of Sociology* 66.
13. M. L. Kohn and C. Schooler, 'Occupational Experience and Psychological Functioning: An Assessment of Reciprocal Effects', *American Sociological Review* 38.

Educational level is pertinent to values and orientation insofar as education provides the intellectual flexibility and breadth of perspective that are essential for self-directed values and orientation; lack of education must seriously interfere with men's ability to be self-directed.¹⁴

An extension of this interpretation of the findings is that parents of lower socio-economic class have not been able to satisfy many of their needs and thus emphasise to their children 'lower order' more than 'higher order' goals. Utility-maximisation behaviour involves the fulfilment of basic economic and security needs for these people more than would be the case for individuals of higher socio-economic class. This latter group would be more likely to place a greater value on 'higher order' aspirations.

The potential relationship between parental values and the occupational decisions of children may be summarised as follows. Given differences in parental attitudes to the desirability of a particular non-pecuniary job component, self-direction or freedom of choice in decision making, it is hypothesised that children reflect such differences in their occupational choices. Utility functions differ systematically between groups with one of the important inputs being the socio-economic background of the decision maker.

This analysis implies that individuals from low socio-economic backgrounds value some indication of responsibility in decision making in their jobs less than do individuals from high socio-economic backgrounds. Thus socio-economic background, in so far as it is related to both the inculcation of values and parental income, influences occupational choice in two ways: directly by the relative emphasis on the non-pecuniary attribute in alternative employments requiring the same educational level, and indirectly by the determination of educational qualification.

An empirical test of the relationships

The hypotheses noted above are testable with the use of the US National Longitudinal Survey of Young Men (NLS) in conjunction with data from the Michigan Income Dynamics Survey.¹⁵ Treating occupations as broadly defined allowed Duncan's Income Dynamics ranking of responsibility in decision making in jobs to be incorporated into the test (see Table 1).¹⁶ This variable is based on the average occupational response of over 1000 respondents, being set equal to 5 if the reported amount of choice was 80 to 100 per cent, down to a minimum of 1 for 0 to 20 per cent.

The use of this proxy as a measure of responsibility in decision making is associated with several problems. First, the variable is likely to vary

14. M. L. Kohn, *op. cit.*, p. 186.

15. Both the National Longitudinal Survey of Young Men and Michigan Income Dynamics are surveys of approximately 5000 individuals conducted about every two years since 1966. They provide a basis for research that is far superior to that found in any other mixed capitalist society.

16. For a fuller description of the ranking, see G. J. Duncan, 'Non-Pecuniary Work Rewards', in J. N. Morgan (ed.), *Five Thousand American Families—Patterns of Economic Progress*, vol. II, University of Michigan, Ann Arbor, 1974.

importantly within, as well as between, occupational categories. However, assuming this measurement error to be randomly distributed, the effect is to bias downwards the size of the regression coefficients. Tests utilising poorly measured variables are strong in this sense since the true relationships are understated.¹⁷ Second, since the choice in work data is used in conjunction with NLS individual observations, the implicit assumption is that the extent of choice perceived by the Income Dynamics sample is similar to that perceived by the NLS group.

The 1971 NLS of Young Men is a large cross-sectional data set with information on an extensive set of economic and demographic variables. Partly because of the low age of the sample (age ranges from 19 to 29 years) the actual occupation of the respondent was not used. Instead, his answer to the question: 'What occupation would you like to be in at age 30?' is taken to be a more valid indication of preferences. The use of this variable instead of current occupation reduces the effect of disequilibrium components typically associated with the employment instability of youth.

Table 1 Choice in work by occupation (RESPON)

<i>Occupation</i>	<i>Choice in work</i>
1. Professional, technical and kindred workers	4.43
2. Managers, officials and proprietors	4.54
3. Clerical and sales workers	4.11
4. Craftsmen, foremen and kindred	3.88
5. Operatives and kindred	3.44
6. Labourers and service workers	3.65
7. Farmers and farm managers	4.85
8. Miscellaneous (armed service, protective)	3.12
<i>Mean</i> 4.01	<i>Standard deviation</i> 0.59

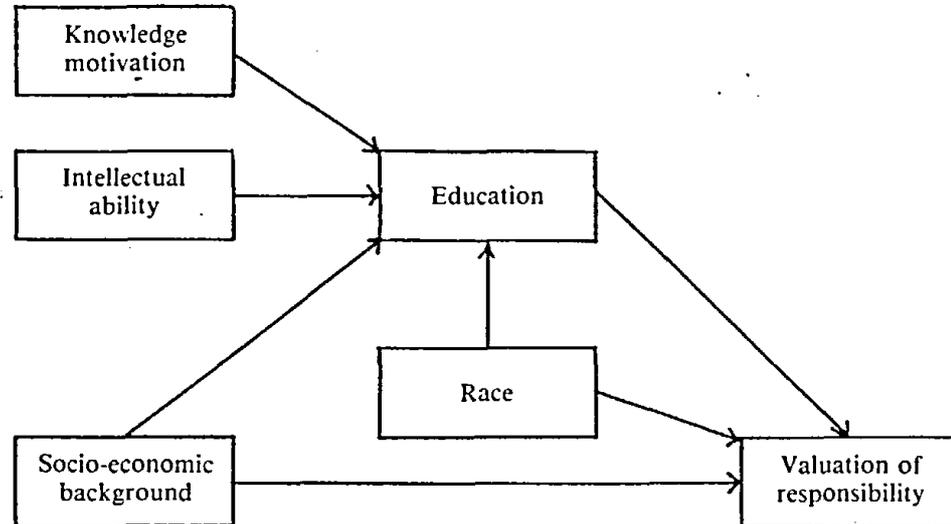
The model was tested by setting the occupational group desired by the individual equal to the responsibility index associated with it and reported in Table 1. The other variables used were: SB, an index of the individual's socio-economic background;¹⁸ EDUC, the number of years of schooling of the individual (only persons who had completed their education were included in the sample); BLACK, a race dummy variable (0 = white, 1 = black) as a control for race-related factors determining occupational and educational choice; and control variables for other factors determining

17. For a formal proof, see E. Hanushek and J. Jackson, *Statistical Methods for Social Scientists*, Academic Press, New York, 1977, p. 287.

18. The index of socio-economic background (SB) comprised five elements: (1) father's educational attainment; (2) mother's educational attainment; (3) occupational status of the father (or head of household) when the respondent was 14 years old; (4) educational attainment of the respondent's oldest sibling and (5) availability of reading material in the home when the respondent was 14. Ref.: *NLS Young Men Codebook*, US Department of Labor, 1970. Appendix 6.

educational choice (IQ, an intellectual ability proxy;¹⁹ KWW, a knowledge motivation proxy;²⁰ and SIB, the number of siblings of the individual).

The causal model may be summarised diagrammatically as follows:



Econometrically, the model is:

$$\text{RESPON} = \alpha_0 + \alpha_1\text{EDUC} + \alpha_2\text{SB} + \alpha_3\text{BLACK} + \epsilon_0 \quad (1)$$

$$\text{EDUC} = \beta_0 + \beta_1\text{SB} + \beta_2\text{IQ} + \beta_3\text{BLACK} + \beta_4\text{SIB} + \beta_5\text{KWW} + \epsilon_1 \quad (2)$$

where α_0, β_0 are constants and ϵ_0, ϵ_1 are error terms assumed to be independent and randomly distributed. The predictions of the model are:

$$\alpha_1, \alpha_2, \beta_1, \beta_2, \beta_5 > 0$$

$$\beta_4 < 0$$

$$\alpha_3, \beta_3 \geq 0$$

Table 2 sets out the means and standard deviations of the variables.

The correct functional form of the model is not obvious, so different specifications were utilised in the estimations. Little variation in coefficient significance or size was found, and Table 3 presents the results for the simultaneous equations regression with all variables in logarithmic form.

19. IQ scores were obtained from respondents' high schools. Because of the diversity of different tests applied, the scores underwent a normalisation process at Ohio State University.

20. The NLS summarises the three components of the KWW test:

The first . . . involves occupational identification. Respondents were asked to select one of three statements that best describes the duties of each of ten occupations—hospital orderly, machinist, acetylene welder, stationary engineer, statistical clerk, fork lift operator, economist, medical illustrator, draftsman, and social worker. The second component involves the typical educational attainment of men in each of these same occupations. Third, respondents were asked, for each of eight pairs of occupations, which one provides the highest average annual earnings.

Ref.: *NLS Young Men Codebook*. US Department of Labor. 1970. 1:120.

Because education is treated endogenously, the estimation technique is a two-equation structural model. The coefficients should be interpreted as elasticities.

This result provides empirical support for the hypothesis that education and socio-economic background are determinants of individuals' valuation of responsibility in decision making. Both variables are positively related to the freedom of choice associated with the occupation desired of the individual (at the 5 per cent significance level or better). Treating education as endogenously determined in the model revealed that socio-economic background, intellectual ability and a knowledge motivational variable are significant positive determinants of schooling. Table 4 presents interpretative estimates of coefficient sizes, calculated at the mean as the percentage change in the dependent variables resulting from one standard deviation changes in the independent variables.

Table 2 Statistical characteristics of the variables

<i>Variable</i>	<i>Mean</i>	<i>Standard deviation</i>	<i>Minimum</i>	<i>Maximum</i>
SB	104.17	19.33	43	158
EDUC	12.79	2.49	6	18
BLACK	0.17	—	0	1
IQ	99.36	15.29	51	148
KWW	35.87	7.48	10	56
SIB	2.95	2.24	0	13

Number of observations = 1344

Table 3 Results of simultaneous equations estimation

<i>Dependent variables</i>	<i>Independent variables</i>						
(i) log RESPON	CON-						
	STANT	log EDUC	log SB	log IQ	BLACK	log SIB	log KWW
	0.956	0.297	0.033		0.009		
	(14.31)	(5.98)	(1.98)		(1.13)		
(ii) log EDUC	0.471		0.121	0.263	0.034	0.037	0.214
	(1.50)		(2.52)	(4.18)	(0.43)	(0.19)	(5.15)

T-statistics in parentheses

Number of observations = 1344

Table 4 The percentage change in the dependent variables from standard deviation changes in the independent variables

<i>Dependent variables</i>	<i>Independent variables</i>			
	EDUC	SB	IQ	KWW
RESPON	5.80	0.61		
EDUC		2.25	4.05	5.04

The effect of SB on the responsibility associated with the occupation desired is not particularly large. It implies that a change from the minimum to the maximum SB score is associated with preferring an occupation of about 0.31 higher on the choice in work index. This is equivalent to choosing the 'Farmers and farm managers' occupation instead of the 'Managers, officials and proprietors' occupation. The calculation is derived with the use of the following formula:

$$\frac{\frac{\Delta \text{RESPON}}{\text{RESPON}}}{\frac{\Delta \text{SB}}{\text{SB}}} = \text{Direct effect of SB} + \text{Indirect effect of SB}$$

$$= [\alpha_2 + \beta_1 \cdot \alpha_1]$$

$$\therefore \frac{\Delta \text{RESPON}}{\text{RESPON}} = [\alpha_2 + \beta_1 \cdot \alpha_1] \cdot \frac{\Delta \text{SB}}{\text{SB}}$$

$$= [\alpha_2 + \beta_1 \cdot \alpha_1] \cdot \frac{\Delta \text{SB}}{\text{SB}} \cdot \text{RESPON}$$

Evaluating at the means, and noting that $\Delta \text{SB} = 158 - 43 = 115$,

$$\Delta \text{RESPON} = [\alpha_2 + \beta_1 \cdot \alpha_1] \cdot \frac{115}{104.17} \cdot 4.01$$

$$= [0.033 + 0.121 \cdot 0.297] \cdot 4.427$$

$$= 0.305$$

Education appears to be more important: a change from the minimum to the maximum years of schooling results in preferring an occupation of about 1.17 higher on the choice in work index. This is equivalent to choosing the 'Managers, officials and proprietors' occupation over the 'Operatives and kindred' classification. The calculation is derived with the use of the following formula:

$$\frac{\frac{\Delta \text{RESPON}}{\text{RESPON}}}{\frac{\Delta \text{EDUC}}{\text{EDUC}}} = \alpha_1$$

$$\therefore \frac{\Delta \text{RESPON}}{\text{RESPON}} = \alpha_1 \cdot \frac{\Delta \text{EDUC}}{\text{EDUC}}$$

$$\Delta \text{RESPON} = \alpha_1 \cdot \frac{\Delta \text{EDUC}}{\text{EDUC}} \cdot \text{RESPON}$$

Evaluated at the means, and noting that $\Delta \text{EDUC} = 18 - 6 = 12$,

$$\Delta \text{RESPON} = 0.297 \cdot \frac{12}{12.79} \cdot 4.01$$

$$= 1.117$$

Qualifications to the findings

The possibility of relationships between RESPON and a host of other (unmeasured) variables opens the results to criticism of biases. The SB coefficient is suspect if factors exist such that individuals from high socio-economic backgrounds are more 'able' to aspire to higher paying occupations, once their education is completed. Several possibilities come to mind: nepotism, increased awareness of opportunities, and greater mobility. The results presented are more credible if it is believed that employment opportunities do not vary systematically between socio-economic class groups.

Further, it is possible that the ranking of occupations according to individuals' perception of freedom of choice in decision making is consistent with occupational rankings that might exist for other job-related characteristics such as prestige, security or wages. This represents a problem in interpretation of the general model only in so far as these characteristics reflect lower order needs. This is probably true for security and wages, and not the case for prestige. Unfortunately there is no information on the existence or otherwise of these correlations.

A final caveat is that if employers of high-responsibility occupations believe that individuals with more education are better able to make independent decisions, the positive relationship between responsibility and education overstates the component of choice attributable to *employee* preference. A proportion of the sample may have nominated their desired occupation from the subset of occupations they believe their education qualifies them for.²¹ While these possibilities pose interesting questions in themselves, the absence of information precludes an examination of the underlying relationships.

These qualifications are not trivial. However, it would be conjectural at this stage to deny that the statistical associations revealed offer support for the postulated hypotheses. Nevertheless, the reported results should be interpreted with these caveats in mind.

Conclusion

It has been argued in this paper that neoclassical micro-economics, with its emphasis on the assumption that individuals maximise material consumption or income, has little to say about occupational choice. If jobs differ in non-pecuniary rewards preferred by some groups more than others, a case may be made for treating preferences endogenously. One particular non-pecuniary attribute, the freedom to make decisions on the job, has been considered in terms of its attractiveness to individuals differing in both socio-economic background and education.

Support has been found for the hypothesis that systematic relationships exist between job preferences and the socio-economic characteristics of individuals. The results are consistent with a perception of workers attempting to fulfil needs based on a material and psychological hierarchy.

21. The inclusion of education as an explanatory variable in the model reduces the strength of this criticism.

In this sense they provide a questioning of the simple income-maximising model of human capital theory.

The empirical test is subject to important qualifications, however. The occupational categories employed are very broad, and several restrictive assumptions were necessary given a lack of wage and other data. The results only provide tentative support for the stated hypotheses.

Modelling non-pecuniary aspects of employment is an important and neglected area of labour economics. Unfortunately, the methodological foundation of such investigations is in its infancy. Further work examining trade-offs between job attributes in the context of differences in individual preferences appears highly desirable.

APOLOGY

In Owen Covick's article in the March 1981 issue, 'Productivity-gearred Wages Policies: Some Problems Arising from the Recent Growth in Self-employment', two equations appeared without their brackets. Equation (3) and the one above it on page 5 should have read

$$\left(\frac{c}{x}\right)_B = \left(\frac{c}{x}\right)_i$$

and

$$\left(\frac{W}{Y} \cdot \frac{N_E H_E}{N_W H_W}\right)_B = \left(\frac{W}{Y} \cdot \frac{N_E H_E}{N_W H_W}\right)_i \quad (3)$$

We apologise to the author and to readers for any confusion caused by this oversight.

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