Constraint and Opportunity:
Identifying Voluntary Non-Employment

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Contents

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Editorial Note and Acknowledgements

Abstract

This paper is an attempt to assess the extent to which the behaviour of an individual is the result of the constraints that he or she faces – factors beyond individual control - or the result of the exercise of his or her preferences. The study concentrates on participation or non-participation in employment, with non-participation defined broadly to include full-time education, caring or early retirement, as well as unemployment. Following a discussion of potential methodological difficulties, data from the British Household Panel Study are used to construct models of the probability of being in employment, controlling for various constraints. Starting from the position that all non-employment is voluntary, possible constraints are introduced in layers corresponding to the degree to which they are regarded as beyond individual control. The layered approach allows for the fact that opinions vary as to what factors it is appropriate to regard as constraints. Predicted probabilities of being in employment are then compared to each individual's actual state. If the model predicts that he or she has a high probability of being in work, and in fact he or she is not, then there is a prima facie case that she or he is voluntarily out of work. However, since there may be unobserved constraints, the outcome is cross-checked by starting from the opposite position, namely that all non-employment is involuntary, then gradually subtracting those for whom there is evidence of having chosen to be out of work. Only those who are found not to face significant constraints and who state that they do not want work can with confidence be asserted to be voluntarily non-employed. The results suggest that after taking into account as many constraints as possible, one-tenth of the non-employment in our sample is unambiguously voluntary, with a further one-tenth being indeterminate.

Keywords: employment, opportunity, capability, voluntary
JEL number: J64, I39, B40

Introduction

To what extent are individuals' economic or social positions the result of the exercise of their preferences or of the constraints they face? Answering this question is becoming increasingly important, especially in debates over inequality and poverty. Sen, Le Grand, and other economists and political philosophers have argued that, in examining distributional questions, instead of focusing on differences in observed incomes or even on differences in current levels of welfare, it is more appropriate to focus on the choice or opportunity sets that individuals face (Arneson 1989; Cohen 1989; Dworkin 1981; Le Grand 1984, 1991; Roemer 1998; Sen 1984, 1995). At a more applied level, economists prominent in the debate on welfare policy have long argued for an emphasis the significance of the choices and incentive structures that poor people face instead of the more sociological approach of regarding them as subject to inexorable social and economic forces over which they have no control (Mead 1992, Haveman and Bershadker, 1998, Deacon and Mann 1999). In the growing literature on poverty and social exclusion, the question of individual agency – and the possibility of self-exclusion - has become of increasing importance (Atkinson 1998; Barry 1998; Burchardt, Le Grand and Piachaud 1999).

But can this focus on choice or opportunity sets be operationalised in a useful way? Sugden (1998) sets out the conceptual and methodological difficulties, concluding that "perhaps the most we can expect to find are imperfect but workable indices of opportunity" (p.336). In fact, all empirical work in this area faces a fundamental problem. Individuals' observed behaviour is a product of the interaction between the choice or opportunity sets that they face and their preferences. Hence, in simply observing that behaviour, it is impossible to tell whether it is the outcome of preferences or of constraints. How then can we tell in practice whether someone is out of work, or poor, or socially excluded, because of their own choice or because of factors beyond their control?

This paper is an attempt to try to resolve some of these problems. It begins with a brief summary of previous work in the area. It then offers a methodology of its own, and applies it to the work/non-work decision. There is a brief concluding section summarising the principal results and highlighting some remaining issues.

1.   Previous Empirical Approaches

Since Keynes, there has been a vigorous debate within economics about whether involuntary unemployment is theoretically possible. As Hahn (1987) comments, some have argued that it is incompatible with equilibrium, others have argued that it contradicts the hypothesis that agents are rational, and yet others have argued that, while theoretically feasible, it cannot be identified empirically. Here we set aside this important debate for two reasons. Firstly, our focus is on non-employment rather than unemployment (Murphy and Topel 1997 discuss the significance of this distinction), and there can be little doubt that involuntary non-employment, for example due to ill health or disability, is both a theoretical possibility and an actual fact. Secondly, our distinction between voluntary and involuntary is not of the either/or variety. Rather we allow for decisions to be placed on a spectrum between entirely voluntary and totally involuntary, depending on how costly or difficult the decision is to implement. If a jobseeker would be obliged to reduce her reservation wage greatly in order to obtain a job offer, her lack of employment is further towards the involuntary end of the spectrum than someone who can walk into a job of his choosing.

Perhaps the most straightforward empirical approach to distinguishing between enforced and voluntary behaviour is to ask the individuals concerned directly. Mack and Lansley (1985) developed this method in their survey of British households. They asked a series of questions to establish whether households had a number of items (for example, a car, a foreign holiday), and in those cases where an item was lacking, followed it up by checking whether this was through choice or because the item was unaffordable. However, this approach has been criticised for failing to recognise the extent to which preferences may be conditioned by circumstances (Nussbaum 2001). Someone who is struggling to survive financially may find the idea of having a second home so unrealistic that she is inclined to say she does not want one, rather than that she cannot afford it. Moreover there may be constraints on consumption that do not relate to unaffordability, but to location or discrimination (Atkinson 1998).

Nolan and Whelan (1996) also classify households who lack various items generally perceived to be necessary as 'deprived', and they combine this with an income cut-off to identify 'the poor'. Those who are deprived, but have incomes above the threshold, are implicitly assumed

to have a low standard of living through choice.[1] The drawback with this method is that it fails to recognise variations in need (except household size), which affect the ability of a household to convert income into material well-being.

Roemer (1998) proposes an algorithm to enable a social planner to devise policies which reward effort but do not contravene equality of opportunity. He suggests the population should be divided into types, where each type is defined by a vector of characteristics deemed to be beyond individual control (for example, IQ, income level of parents, number of siblings). Within each type, individuals will vary in terms of the amount of effort they are willing to make in order to achieve desirable outcomes. The distribution of effort is itself a characteristic of the type, but an individual's position within the distribution is taken to be a matter of choice. Equality of opportunity, Roemer argues, requires that outcomes across types are equal, but that, within types, outcomes will differ by individuals' positions in the effort distribution.

Using the same ideas but a different terminology, Martinetti (1996) argues that the contents of an individual's capability set is determined by a range of personal characteristics together with the social, economic and physical environment. (The capability set is the set of vectors of 'beings' and 'doings', or functionings, the individual is able to achieve). Failure to achieve a given level of functioning may be a matter of choice or the result of constraint. The likelihood that it is the result of constraint can be calculated, Martinetti suggests, by using personal characteristics and contextual variables to predict levels of functioning for the population in general. If an individual's level of functioning is below that predicted by the model, it can be assumed to be a matter of choice rather than constraint.

Unfortunately, neither Roemer nor Martinetti apply their proposed methods to empirical data. However, the developing literature in the United States on so-called 'self-reliant' income exhibits some similarities (Haveman and Bershadker 1998). A self-reliant measure of poverty identifies those people who are incapable of generating sufficient income to meet their basic needs. Haveman and Bershadker model a family's

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[1]   Measurement error and short-term fluctuations in income are also considered as explanations by the authors.

"Net Earnings Capacity" (NEC) as the earnings that would be generated if every adult member worked full-time, adjusted for constraints on working (ill health or disability) and costs of working (primarily child care). Any family whose NEC falls below the official poverty line is deemed unable to be self-reliant, and hence poor in this sense. Families whose NECs are above the poverty line are deemed to be capable of self-reliance; if their actual incomes are below the poverty line, the implication is that this is through choice.

This type of approach assumes that the only relevant characteristic not included in the model is taste; hence any lower-than-predicted level of income or functioning can be attributed to choice. If there are other relevant non-observable characteristics - such as decision-making ability, or hidden additional demand on household resources - true rates of poverty or disadvantage will be underestimated.

2.   Our Approach

Our approach has similarities with, but also significant differences from, that of Haveman and Bershadker. This section outlines some of its basic features, describes the modelling procedures and the data, and discusses some potential methodological problems.

2.1   The Basic Features
The approach has four principal features. First, like Martinetti and Roemer, it begins with the assumption that information about the opportunities open to an individual is necessarily based on the range of things that similar people do. The counterfactual for any one individual is unobservable (what he or she *could* have been doing if he or she was not engaged as presently). However, if someone similar to person A in all relevant respects is doing x, then x is also within person A's opportunity set.

Second, the definition of 'similar in all relevant respects' is a vector of those personal characteristics regarded as beyond individual control, and relevant to the opportunity in question Thus, if age, gender and ethnicity are the only characteristics regarded as beyond an individual's control,

the opportunity set of a white woman aged 34 is given by the range of activities in which white women aged 34 are engaged.[2]

Third, the approach recognises that the extent to which particular factors are under an individual's control is a matter of degree. The educational qualifications an individual possesses are clearly more subject to her influence than her age, but are harder to change than her hairstyle. In the absence of detailed research, the extent to which a factor is within an individual's control may also be a matter of opinion: what are the financial, psychological and time costs of taking adult education classes, for example?

Taken together, these premises indicate that opportunity can best be modelled by comparing the activities of similar individuals, gradually refining the definition of 'similar' by incorporating more characteristics. The starting point is the position that all non-participation (for example in paid work) is voluntary; possible constraints on participation can then be introduced in layers corresponding to the degree to which they are regarded as factors beyond an individual's control. Readers may judge for themselves which layer corresponds most closely to their own position on the spectrum of opinion about the extent to which individuals have control over their characteristics.

The fourth feature of our approach is its recognition of, and treatment of, the problem of unobserved constraints. It is unsatisfactory to assume that any difference from predicted outcomes is a matter of choice, when any model, however sophisticated, cannot capture the effects of constraints not included in the data, such as an individual's ability to make good decisions, nor can it reflect the impact of bad luck. Accordingly, the first analysis presented here, starting from the position that all non-participation is voluntary, is complemented by an analysis starting from the opposite position that all non-participation is involuntary, and then

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[2] All activities undertaken by similar individuals are within the opportunity set of each of those individuals. If there are other activities which none of the individuals undertake, but which they could do if they so wished, they will not be classified as within the opportunity set by the approach proposed here. This is a weakness, but not, we suggest, a problematic one for the application we are exploring, since the groups of similar individuals are large and the activity under consideration – employment - a common one.

subtracting those who can be identified as choosing not to participate. The second analysis is explained more fully section 3.2.

2.2   Order of layers

There are a number of conceptual issues to be resolved in determining the order of the layers. The objective is clear: to order the layers, starting with the factors that are uncontroversially beyond individual control, and ending with factors that are clearly a matter of choice for the individual. One difficulty is the fact that the extent to which a particular factor (for example, place of residence) is under an individual's control may depend on who that individual is. The adult members of a family owning a house with school-age children who live in an area with depressed house prices are more constrained in where they live than a privately-renting recent graduate with no family commitments living in the same area. The difficulty is that we need to use the same order of layers for all individuals. Including interactions between layers in the model does not help because it is the order in which variables are introduced that is at issue. We simply have to take a view on the extent to which a factor is under individual control for *most* people.

The second issue is the treatment of preferences and beliefs. Are these always to be regarded as under an individual's control? Is the preference for smoking of a life-long smoker on a par with the preference of a young person to wear jeans to job interviews? Is the belief that it is your duty to look after an ailing relative under your control to the same extent as the belief that there is no point applying for jobs during the third phase of the moon? It seems clear that we need to distinguish between more and less superficial preferences and beliefs. Beliefs which are subject to strong cultural norms (like those relating to family responsibilities) we classify as being less under an individual's control. Similarly, preferences which are deep-rooted (such as an addiction) or which have so shaped an individual's life that it would require major upheaval to change, are classified as being outside an individual's control to a greater degree.

A third issue is the time dimension: future and past. With respect to the future, it may be that a factor is under an individual's control in the long term but not in the short. For example, through counselling it may be possible to enhance self-confidence; but in the short-term, a severe lack of confidence in oneself can be a serious impediment to employment. We need to discount for the future, so that factors subject only to longer-term

change are regarded as less within an individual's control than more immediately remediable circumstances.

The appropriate treatment of the past depends on the question being asked: in particular, whether we are engaged in a descriptive or a normative exercise. If the objective is the essentially descriptive one of indicating the size of the individual's current opportunity set, the layers should be ordered according to the degree to which factors are under the control of the individual in the here and now.[3] How an individual came to be in the situation is irrelevant, since everything in the past is literally beyond his or her control. So the focus should be on current considerations, such as:

(i)   whether the individual is in a position to make a good decision, for example, whether he or she is in possession of relevant information, knows how to assess that information, and is in reasonable mental health;

(ii)   the range of options open to the individual;

(iii) the extent to which taking each of those options would improve the outcome in question;

(iv)   the cost of taking each of those options, in financial and other terms.

If the objective is the normative task of indicating the degree to which individuals should be held responsible for their situation, then choices and constraints in the past become important. Indeed, in assigning responsibility for the current situation, whether the decision that led to it was made last week or last year is strictly irrelevant. What matters is, firstly, the constraints that operated at the time of the decision, and, secondly, what could now be done to mitigate the situation. However, if one takes the view that personal identity gradually changes over time, or that individuals should be allowed to move on, after a given period, from decisions made in the past (rather like a criminal conviction being spent), then it makes sense to regard people as less responsible for decisions made a long time ago, even if those decisions were entirely free - a sort of backwards discounting. This adds a further criterion to those listed above:

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[3]   The process of describing an individual's opportunity set involves some judgements – for example, about the extent to which a characteristic is within the individual's control – but the purpose of the exercise is not normative.

(v) how long ago the decision was taken which led to the current situation.

Education is a case in point. Clearly one of the determinants of quality of education received is the student's own attitude, which to a certain extent one assumes is under his or her control. However, it is equally clear that many school children and even some college students do not fully appreciate the significance that education is likely to have in shaping their future lives, that options for later improvement are limited, and that the school days of many of the adults in our sample are several decades ago.

The layers used to measure the extent of current opportunity for employment of an individual might be as follows. This formulation takes the current situation as beyond individual control, regardless of how it has come about (i.e. it is applicable to a descriptive rather than a normative exercise). Indications of the sorts of factors that might appear in each layer are given in italics, though it is recognised that these will vary across individuals in different circumstances.

1. Individual has no control over this factor now or in the future. *Sex; ethnicity; other genetic inheritance; age; parental social class; irreversible ill-health and disability; minimum unemployment risk (i.e. the unemployment level in area with lowest unemployment).*

2. Individual has no control over this factor at present, but could at high cost make some changes in the long term with positive though limited impact on outcome. *Decision-making capacity (depends on education and personality: high cost to improving former and limited range of options for changing latter); labour market experience (past experience beyond control but could improve future experience, perhaps subject to investment in education: high financial cost and possible minimal returns); education (past experience beyond control but could make some improvements: high financial cost and possible minimal returns); remaining aspects of ill-health and disability; self-confidence (range of action with low financial cost but possibly high psychological cost, and uncertain returns).*

3. Individual could change this factor in the near future, and action would be effective, but carries high social, psychological or financial costs. *Place of residence; housing tenure (effective action*

possible in most cases but high financial cost in some cases and high psychological/social costs in others); marital status; children and other caring responsibilities (effective action possible but possibly high financial cost and definitely high psychological/social costs).

4.   Individual could readily change this factor. *Preference for other pursuits, such as study, artistic endeavour, travel, or voluntary work.*

Note that greater age of the individual will tend to push the education, labour market experience and health factors towards 'no control', while younger people have greater scope to make changes. For place of residence as a factor, stage of the lifecycle, tenure and geographical location will make a difference; for those in low-value owner-occupied housing or in social housing, especially if they have school-age children, changing their place of residence will be associated with higher costs.

Shifting from a descriptive to a normative focus, in other words from measuring opportunity to assigning responsibility, the significant differences in the order of the layers would be, firstly, a re-ordering of education and labour market experience (when considering current opportunity, labour market experience is regarded as being in the past and hence beyond control; when considering responsibility, the individual is held to have been more capable of making decisions during working life than when the bulk of education took place); and, secondly, the splitting of factors which could be remedied in the long-term by the extent to which past decisions were constrained. In the following analysis, we pursue a descriptive rather than a normative approach, identifying degrees of opportunity rather than degrees of responsibility.

2.3   *Data*
The data used are from the British Household Panel Survey (BHPS). The BHPS was designed as a nationally representative survey of around 10,000 adults, who are re-interviewed each year. We use data on all adults of working age (16 to 59 for women, 16 to 64 for men), interviewed at Wave 8 in 1998/9 - the most recent wave available at the time of writing. The main advantage of this dataset for our purposes is the wide topic coverage, including details of lifetime labour market experience and caring responsibilities alongside standard family and employment variables. The main disadvantage of the dataset is the problem of attrition. While BHPS obtained response rates comparable to most large-scale household surveys at the first wave (at least one interview in 74 per

cent of eligible households), 31 per cent of the original respondents have declined to be interviewed at subsequent waves or been lost to the survey in other ways (including 7 per cent who have died). To address our concern that the remaining sample may no longer be representative, we compared results for a simplified model based on the BHPS Wave 8 sample with results based on the Labour Force Survey for Spring 1999. The results of this comparison were on the whole reassuring; details are given in Appendix 1.

Employment is defined as any paid work, including self-employment, and whether part- or full-time. The non-employment category includes those who are in education or training, early-retired, have caring responsibilities or are sick or disabled as well as the unemployed as traditionally defined. Indicators for most of the factors listed under layers 1 to 4 above were available in the BHPS; details are given in Appendix 2. The two factors for which no indicators could be found were genetic inheritance and decision-making capacity. Sex, ethnicity (four categories), age, education (highest qualification obtained), housing tenure, marital status and children (age of youngest child) are relatively straightforward. Two indicators are used for parental social class: father's and mother's occupation (if any) when the respondent was aged 14. Occupations are coded and grouped into manual, non-manual and other, with the final category including those who were not working, who were not present in the household, or for whom no response was obtained.

Health and disability are indicated by 'health limits daily activities' and score on the 12-item General Health Questionnaire, the latter usually taken as a measure of mental health. It was not possible to identify causes of current health or disability status, nor the extent to which it was reversible; hence health and disability factors are grouped together in the middle of the range of positions at which they might appear, at layer 2. Caring responsibilities are included using the questions in BHPS on hours spent caring for someone within or outside the household, beyond usual childcare duties. Responses are grouped into four categories: none, under 20 hours, 20-34 hours, and 35 hours or more.

Labour market experience is summarised by the proportion of years since age 16 that the respondent has spent in employment. This variable was constructed from the retrospective employment histories collected from respondents at Wave 2, and subsequent wave on wave information. It is entered into the models conditional on age.

Finally, the most salient feature of place of residence for the analysis was taken to be local unemployment rates. Accordingly, ILO unemployment rates were calculated separately for men and women and matched in from the Labour Force Survey.[4]

2.4   *Methodological problems: endogeneity and omitted variables*

The models we estimate take the form:

$$\Pr(\text{emp} = 1) = \Phi(\beta_0 + \beta_1\{L_1\} + \beta_2\{L_2\} + \beta_3\{L_3\} + \beta_4\{L_4\})$$

where $\Pr(\text{emp}=1)$ is the probability of current employment
          Φ is the cumulative normal distribution
          β_0 to β_4 are regression coefficients
and L_1 to L_4 are sets of explanatory variables corresponding to the layers identified above.

The procedure has two potential problems with respect to the consistency and efficiency of the estimates, with implications for the interpretation of results. The first is the problem of omitted variables, i.e. variables not included in the right-hand side (RHS) but relevant to the determination of the probability of being in employment. If an omitted variable is not systematically related to RHS variables (in other words, if it is exogenous), the coefficients on the RHS variables will not biased, although a smaller proportion of the actual variation in the probability of being in employment will be explained by the model. In addition, some individuals will be mistakenly classified as having a high (or low) probability of employment. This is always a potential problem in empirical modelling, but we hope that we have captured the main types of constraint, albeit crudely in some cases. A check on the classification of individuals into high/low employment probability is provided by the alternative approach to the analysis, described in section 3.2 below.

One exogenous variable omitted from the model deserves particular attention, namely, bad luck. Despite having characteristics generally associated with a high probability of being in employment, an individual

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[4]   BHPS combines local authority districts (LADs) with population less than 120,000 into areas. Rates are weighted averages of ILO unemployment rates at LAD level from Labour Force Survey Local Area Data.

may find themselves out of work through no fault of their own. (For the sake of discussion, assume the market does not clear). Bad (and good) luck are by definition exogenous so the omission does not bias estimates for RHS variables, but it is important to bear in mind when interpreting the results. Some of those who appear to be voluntarily non-employed (high predicted probability of being in work, but not actually in work), are in fact the victims of bad luck. Again, since the classification arising from the regressions in the first approach is cross-checked against the results from the second approach, our overall method is robust in this respect.[5]

A more difficult issue arises where the omitted variable is systematically related to another RHS variable, in other words, where it is endogenous. In this case, RHS coefficients may be biased and the characterisation of the voluntarily and involuntarily non-employed which relies on those coefficients may be misleading. Endogeneity is the second type of problem to which we have drawn attention, and in this context it has two aspects – concern about endogeneity of an omitted variable, and concern about the endogeneity of existing RHS variables.

One omitted variable which is at least partly endogenous is the individual's disposition to work, omitted because it is unobservable. This is likely to be a determinant of both past and present probability of employment, and may also be related to age, education and so on. One response to this type of problem when using panel data is to run a fixed effects regression, which regresses changes in employment for each individual on changes in that individual's characteristics over the period of observation. Disposition to work, assuming it is a fixed characteristic of an individual, is thus 'differenced out'. Unfortunately, much else of interest is also differenced out: in the present case, constraints such as ethnicity, parental social class and education, for example. Ideally, in so far as the disposition to work is itself caused by factors beyond the individual's control, we would like to regard the disposition as a constraint on employment and include it in the RHS, so that only

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[5]   Haveman and Bershadker (1998) adjust predicted earnings by a random draw from the standard error distribution of the earnings equations to preserve the actual variation in earnings, thus allowing for bad luck. This is appropriate since they are concerned with aggregate poverty rates but is not appropriate for classifying individuals as above or below the poverty line, or, as in the present case, as above or below an employment probability threshold.

variation resulting from disposition to work in so far as it is a freely-chosen 'taste' is excluded from the estimate of employment probability. This is in effect achieved by omitting 'disposition to work' itself while including factors which structure disposition to work, but it is at the cost of the coefficients on RHS variables reflecting a combination of their direct impact on probability of employment and their indirect impact through disposition to work.

Concern about the second type of endogeneity can be swiftly addressed. Examining the list of RHS variables, the main candidate is 'proportion of years since age 16 spent in employment', which is likely to be determined by many of the same factors as current employment status. The highest Pearson correlation coefficient between the suspect variable and another RHS variables was 0.39 for men and 0.22 for women, not levels which would normally give cause for concern. Auxiliary regressions of 'proportion of years since age 16 spent in employment' on all the other RHS variables from the main equation had R-squared values of 0.41 for men and 0.23 for women. Using the residuals from these auxiliary regressions in place of the suspect variable in the main regressions did not significantly alter the sign or size of the other coefficients.

3.   Results

This section begins with the results from the basic model. This takes as its starting point that all non-employment, including education, caring activities and early retirement as well as unemployment, is voluntary and then introduces various layers of constraints as indicated in the preceding section. These results are then compared with those which derive from an alternative starting point, namely, that all non-employment is involuntary, and then subtracting those who are identifiably choosing to be out of work.

3.1   Layers of constraints on employment opportunity
Four probit regressions were run for men, and four for women, each time allowing for an additional layer of constraints on the individual's opportunity for employment. Details of the regressions are given in Appendix 2. The models were used to predict the probability of being in employment for each sample member, and the predicted probabilities compared to actual employment status. Four categories were created, as follows:

"High, No work":   High predicted probability of being in
                    employment, but not actually in employment

"Low, No work":   Low predicted probability of being in
                    employment, and not actually in employment

"High, In work":   High predicted probability of being in
                    employment, and actually in employment

"Low, In work":   Low predicted probability of being in
                    employment, but actually in employment

Hence the "Low, No work" and "High, In work" categories are those
where behaviour is in line with prediction, while those in the "High, No
work" category may be voluntarily non-employed, and "Low, In work"
are in employment against the odds. High probability was defined as
mean probability or above for the relevant gender in the sample, and low
probability as less than the mean. Table 1 shows the proportions of men
and women in each category.

Table 1: Categories of predicted and actual employment, by layer

MEN   *Row percentages*

Layer	High, No work	Low, No work	High, In work	Low, In work	All
1 (fixed)	7	13	58	22	100
1-2 (+ health)	5	15	62	18	100
1-3 (+ labour market experience + education)	4	16	68	13	100
1-4 (+ local + family)	4	16	68	13	100

WOMEN   *Row percentages*

Layer	High, No work	Low, No work	High, In work	Low, In work	All
1 (fixed)	16	16	48	20	100
1-2 (+ health)	15	17	50	18	100
1-3 (+ labour market experience + education)	10	22	52	16	100
1-4 (+ local + family)	8	24	53	15	100

Source: authors' calculations using BHPS Wave 8

So for example, at Layer 1, 7 per cent of men were not working but had high predicted probability of working (the "High, No work" category), but by Layer 4, just 4 per cent of men fell into this category. Put another way, if the only factors regarded as beyond an individual's control are his or her age, gender, ethnicity and parental social class, then the results suggest that 35 per cent of all men not in work in the sample (7 percentage points out of 20 per cent not in work) were out of work through choice. However, if not only these factors but also an individual's health, education, labour market experience, education, area of residence and family were also regarded as factors beyond his control, then just 20 per cent were voluntarily out of work.

In general, as additional factors are added, the proportion in the "High, No work" category falls, and there is a corresponding rise in the size of the "Low, No work" category. This is to be expected: the effect of recognising more constraints on employment opportunities is to reduce the number of people who are predicted to be able to work.

A higher proportion of women than men are categorised as "High, No work", although the decline in the proportion in that category from layer 1 through to layer 4 is similar for the two genders. If only age, gender, ethnicity and parental social class are considered as constraints, then the proportion who are out of work through choice is 50 per cent. If not only these factors but also a woman's health, education, labour market experience, area of residence and family are regarded as beyond individual control, the proportion drops to 25 per cent.

The comparison with men suggests either that women are more likely to be voluntarily non-employed, or that the model reflects the constraints on female employment less well. We return to this distinction later in the paper.

Among individuals not currently employed, we can compare the characteristics of those with low and high predicted probabilities of working. Since the probabilities depend on how many layers are included in the model, Table 2 compares two extremes: the categorisation resulting from layer 1, and that resulting from all four layers together.

At Layer 1 - which controls only for age, ethnicity and parental social class – the majority of men in the "High, No work" category regard themselves as unemployed or long-term sick/disabled. Compared to

those classified as "Low, No work", they have lower household incomes, are more likely to be disabled, are less well-qualified and are less likely to be owner-occupiers. In other words, among the non-employed, those in "High, No work" appear to be a more disadvantaged group than those in "Low, No work".

Table 2: Characteristics of the non-employed, comparing those with low and high predicted probabilities of working

MEN

	Layer 1		Layers 1-4	
	High, No work	**Low, No work**	**High, No work**	**Low, No work**
% who say they are:				
unemployed	37	15	37	20
retired	7	33	33	21
looking after family	13	2	7	5
student	6	28	10	22
sick/disabled	37	21	12	30
Mean household income (£ per month)	1,321	1,925	1,836	1,684
Mean age (years)	40.1	44.0	42.9	42.6
% disabled	43	30	5	41
Mean proportion of years in work since age 16	0.60	0.55	0.79	0.52
% no qualifications	31	25	11	31
% never married	28	42	20	40
% owner occupiers	51	67	82	57
Mean local unemployment rate	7.2	7.5	6.3	7.6
Base (unweighted)	*144*	*283*	*77*	*350*

WOMEN

	Layer 1		Layers 1-4	
	High, No work	Low, No work	High, No work	Low, No work
% who say they are:				
unemployed	6	10	13	6
retired	2	10	8	5
looking after family	75	37	49	58
student	5	29	21	15
sick/disabled	13	15	8	16
Mean household income (£ per month)	1,916	1,805	2,308	1,706
Mean age (years)	38.1	37.0	38.0	37.4
% disabled	21	24	6	28
Mean proportion of years since age 16 in work	0.47	0.39	0.71	0.33
% no qualifications	21	29	9	31
% never married	8	38	24	23
% owner occupiers	60	64	79	56
Mean local unemployment rate	5.4	5.8	5.5	5.7
Base (unweighted)	*384*	*380*	*197*	*567*

Source: authors' calculations using BHPS Wave 8

By layer 4, when allowance has been made for other constraints, most of the long-term sick/disabled have moved over into the "Low, No work" category, while the retired have gained in relative significance in the "High, No work" category. (Since the whole sample is below state pension age, this represents early retirement). The socio-demographic profile of the "High, No work" group has also been transformed: they are now better off than the "Low, No work" group, much less likely to be disabled, have spent a higher proportion of their working life in employment, are better qualified and much more likely to be owner-occupiers, and live in an area of relatively low unemployment. In short, they are a group who appear to have plenty of choices.[6]

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[6]   It is possible that some are involved in undeclared paid work, but this would account for only a small proportion.

The change in profile of the "High, No work" group is of course a direct consequence of taking into account more constraints on employment opportunities. Their characteristics are the inverse of those included in the model which tend to reduce employment chances, precisely because they are the group whose actual status differs from their predicted status. Despite having characteristics that are generally associated with higher probability of employment, they are not in work. The comparison between the "High, No work" group defined at Layer 1, and the same group defined after Layer 4, emphasises the fact that where fewer constraints are accounted for, a greater proportion of the group have characteristics generally associated with disadvantage.

The proportion of "High, No work" men who regard themselves as unemployed remains large through the addition of layers (though by Layer 4 the proportion represents a smaller number of individuals). This is surprising, given that unemployment is usually considered to be an involuntary state. It indicates either that self-definition of unemployment differs from a definition based on the idea of lack of opportunity for any employment, or that the model does not sufficiently account for constraints on finding work. With respect to this last point, controlling for labour demand by including the local unemployment rate is inevitably crude. It does not reflect the demand for the individual's particular skills, and in some cases it is an average over an area much larger than the labour market in which the individual in fact operates. Moreover, the model calculates *differences* in the chances of employment between individuals living in different areas, and does not reflect the underlying quantity of unemployment. Even in areas of low unemployment, there are necessarily some out of work, and the characteristics of these individuals may be no different from some of those in work.

The majority of women who are not working classify themselves as looking after the home or family. This group remains dominant even after introducing controls for marital status and age of youngest child. In general, changes in the profile of the "High, No work" group of women, as further constraints are introduced to the model, are in a similar direction to changes for men. Initially, members of the "High, No work" group have similar characteristics to the "Low, No work" group. But by Layer 4, they occupy a much more privileged position: richer, less disabled, better labour market experience, higher qualifications, higher rates of home ownership and lower local unemployment rates.

Similar comparisons can be made among those who are in employment, between those with high predicted probability of working (the "High, In work" group) and those with low predicted probability ("Low, In work": working against the odds). To summarise, by Layer 4, we find the "Low, In work" group are more likely to be self-employed, to have lower household incomes, to be age 16-29 or age 55-64, disabled, have no educational qualifications, be unmarried, with less labour market experience and living in an area of relatively high unemployment. A similar profile applies to women (with the exception of self-employment).

3.2 Identifying voluntary non-employment

So far, the approach has been to start from the position that all those not in employment are voluntarily out of work and then introduce identifiable constraints in stages. By Layer 4, 20 per cent of non-employed men and 25 per cent of non-employed women remain classified as voluntarily non-employed. An alternative is to start from the opposite position – that all individuals out of work are constrained to be so – and then to subtract those who are identifiably choosing to be out of work. If both methods were perfect, the outcomes would be the same: the same individuals would be classified as voluntarily non-employed. Of course, there is not sufficient information fully to meet the requirements of either method, but the two analyses can provide a mutual check.

Starting then with all men out of work, we can firstly subtract the 22 per cent who are in full-time education or training. This is assumed to be voluntary. Next we can examine those who say they do not want a job[7]. This statement needs to be treated with caution, since some respondents who say they do not want a job may be discouraged job-seekers, or face other constraints on working - their expressed wish may be conditioned by the circumstances in which they find themselves. Among those who say they do not want a job, we exclude those who have full-time caring responsibilities (35 hours a week or more), who are disabled, or are

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[7]   Respondents who are not in employment are asked, 'Have you looked for any kind of paid work in the last 4 weeks?', and if they answer 'no', they are subsequently asked, 'Although you are not looking for paid work at the moment, would you like to have a regular paid job even if only for a few hours a week?'.

mentally ill.[8] This brings us to 39 per cent of all men out of work who are either in full-time education or training, or who 'freely' do not want a job.

The proportion of men out of work classified as voluntarily non-employed by the final layer of the first analysis was 20 per cent – about half the 39 per cent arrived at by starting from the opposite position. But is the first group a sub-set of the second? Table 3 cross-tabulates the two sets of results, for men and for women.

Table 3: Two classifications of non-employed individuals

MEN *Cell percentages*

| | | Starting position: all non-employment is voluntary | |
		High, No work	Low, No work
Starting position: all non-employment is involuntary	Don't want work	8	31
	Do want work	9	52

WOMEN *Cell percentages*

| | | Starting position: all non-employment is voluntary | |
		High, No work	Low, No work
Starting position: all non-employment is involuntary	Don't want work	13	29
	Do want work	11	47

Source: authors' calculations using BHPS Wave 8

Three-fifths of all non-employed men are categorised consistently by the two analyses (the leading diagonal). Half can with confidence be asserted to be involuntarily out of work: they face constraints in working and have no identifiable voluntary reason for not working. (Fewer than one in ten (8 per cent) appear to not face substantial constraints in working

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[8]   Disability indicated by positive response to 'Does your health limit your daily activities, compared to others of your own age?', and mental illness indicated by scoring 2 or more on the General Health Questionnaire. See Appendix 2 for details.

and either say they do not wish to work or are in full-time education or training: they are voluntarily non-employed.

The off-diagonal cases are also of interest. In the top right-hand corner are those who face constraints in working, but do not want work anyway (31 per cent). Their opportunities are limited, but it is not a limitation they regret at present. Discouraged jobseekers would be included in this group.

Those in the bottom left-hand corner (9 per cent) fall between the stools of our two analyses: they are not in employment, they do not appear to face substantial constraints on their opportunities, yet they claim to want work. There are three possible explanations. Firstly, they may face hidden constraints on working, not controlled for in Layers 1 to 4. Secondly, they may have over-stated their desire to work. Thirdly, they may be the victims of bad luck: the first analysis is based on relative probabilities of working, and there will be some who – despite characteristics giving high predicted probability of employment – are genuinely unable to find a job.

The proportion of women in each of the four categories is similar to the proportion of men, despite the fact that the underlying regressions were fitted separately and attitudes towards work might be thought to differ by gender.

3.3   *Exploring discrepancies between the two analyses*
The group who have high predicted probability of employment, but are not in work despite saying that they want to work, are of interest because they are classified differently by the two analyses (bottom left of the table). Hidden constraints, misrepresentation of preferences, and bad luck were three explanations put forward in the previous section. It is in the nature of these explanations that they are hard to distinguish. However comparing the characteristics of this group with those who are voluntarily non-employed (and have high predicted probability of working: top left), may indicate whether there are hidden constraints. For example, if the mean predicted probability of working is lower for the 'involuntary' group, or if their household incomes are significantly lower, this would suggest their opportunities are genuinely limited. Similarly, comparing the job-search activities of the involuntarily non-employed who have high predicted probability of employment (bottom left), with the job-search activities of the involuntarily non-employed who have low

predicted probability of employment (bottom right), might provide corroborative evidence for their stated preferences for work.

In Table 4, the differences in predicted probability of working are not significant. But for both men and women, the average household income of those who express a desire to work is lower than the average income of those who do not wish to do so.

To probe the expressed preference for work, the third row of Table 4 examines job search behaviour. Over twice the proportion of men, and of women, have looked for work in the last four weeks in the high-employment-probability group as in the low-probability group, despite the fact that both groups express a desire to work. There is no indication here that the former's expressed preference is over-stated.

Table 4: Characteristics of 'High, No work but do want work' compared to other groups

MEN

	High, No work but do want work	High, No work and don't want work	Low, No work but do want work
Mean predicted probability of employment	0.92	0.91	-
Household income last month (£)	1,455	2,327*	-
Looked for work in last 4 weeks (%)	66	-	26*

WOMEN

	High, No work but do want work	High, No work and don't want work	Low, No work but do want work
Mean predicted probability of employment	0.80	0.81	-
Household income last month (£)	2,005	2,484*	-
Looked for work in last 4 weeks (%)	39	-	17*

* Difference between this value and corresponding value for 'High, No work but do want work' is significant at 5% level.
Source: authors' calculations using BHPS Wave 8

4.   Conclusion

All attempts to operationalise the concept of opportunity are confronted by its inherent unobservability, since what someone could have done but is not doing is always a counterfactual. The suggestion has been made that a reference group of similar individuals can be used to provide the counterfactual, but empirical applications based on this idea have run into two further difficulties, firstly, over the definition of "similar" individuals, and secondly, the issue of unobserved constraints.

The approach we have pursued in this paper makes the first of these problems explicit, by differentiating between normative and descriptive exercises and showing how the opportunities deemed to be open to individuals narrows as the reference group becomes more tightly defined (and the range of factors taken to be beyond individual control expands). The results indicate that measurement of opportunity is highly sensitive to the assumptions made about the range of factors that are beyond individual control. Thus if gender, age, ethnicity and parental social class are considered to be the only relevant factors beyond control, 35 per cent of non-employed men and 50 per cent of non-employed women are classified as not taking up opportunities for employment which are within their grasp.[9] However, once health, labour market experience, education, characteristics of the locality and family circumstances are taken into account, those percentages fall to 20 and 25 per cent respectively.

Our approach mitigates the second problem identified above – that of unobserved constraints – by complementing the first, layered, analysis with a second analysis which starts from the position that all non-employment is involuntary and gradually introduces reasons for voluntary non-participation. Further data would be needed to discriminate between rival explanations for the 1 in 10 of non-employed men, and similar proportion of non-employment women, who are voluntarily out of work according to the fullest version of the first analysis but are classified as involuntary by the second analysis – the main candidates being bad luck, over-stated desire to work, or hidden

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[9]   The non-employed population includes, for example, those in education, those with caring responsibilities and those who have taken early retirement as well as the unemployed.

constraints. But three-fifths of the non-employed are classified consistently by the two analyses, the majority of whom have limited opportunities for employment. Just 1 in 10 of non-employed men, and a similar proportion of non-employed women can be unambiguously classified as voluntarily out of work.

Given the emphasis in recent welfare economics, political philosophy and social policy on the importance of the concept of opportunity, the need to find a way of deciding whether an observed outcome is the result of constraint or preference has become pressing. This paper has proposed a new methodological approach to that issue, one that allows judgements about the extent to which factors are a constraint to vary and yet has the capacity to produce empirical results. We hope it provides a foundation on which further developments can be built.

Appendix 1: Validation of BHPS model

Concerns about the effects of attrition on the representativeness of the BHPS sample led us to compare results from the BHPS (Wave 8, 1998/9) and the Quarterly Labour Force Survey (Spring 1999). The Quarterly Labour Force Survey has a much larger sample (N=85,672), and the sample is refreshed on a five-quarter cycle.

Compared to the LFS, BHPS appears to slightly over-estimate the proportion of men in paid work. This difference is increased by restriction to the analysis sample (which requires information to have been supplied at Wave 1 on parental social class, as well as full information at Wave 8). For women, estimates in the two surveys are very close.

Percentage of adults aged 16-59/64 in employment

	BHPS unweighted, whole sample	BHPS Cross-sectionally weighted, Analysis sample	LFS unweighted, whole sample
Men	79	81	77
Base	*3,708*	*2,794*	*42,484*
Women	67	69	68
Base	*3,551*	*2,993*	*43,188*

Comparable models of being in paid work were constructed using the two datasets (separately for men and women). Explanatory variables were as follows:

Age and age squared
Ethnicity (four groups: White; Black Caribbean/African/Other, Indian/Bangladeshi/Pakistani, Chinese/Other)
Disability ('health limits daily activities' in BHPS; Disability Discrimination Act definition in LFS)
Highest educational qualification (six groups)
Marital status (Married/cohabiting; Divorced/separated/ widowed; Never married)
Age of youngest child in household (four age groups and 'none')

Region (19 government regions)
Housing tenure (Owner occupier; Social renting; Private renting/other)

There are some differences between these basic models and those used in the body of the paper, due to lack of comparable data in LFS. The main differences are: the omission of labour market experience, caring responsibilities, and mental health; and the use of region rather than local authority area unemployment rate.

Coefficients on the explanatory variables were of the same sign in the BHPS and LFS models in all cases, except for two of the educational qualification categories for men (BHPS showed positive association between higher vocational qualifications and employment, and between 'other' qualifications and employment, compared to degree or equivalent; LFS showed negative association). All the LFS results were statistically significant at the five per cent level (with the exception of some regions for women), while some of the BHPS results were not. This is likely to be due to the difference in sample size. Coefficients also varied in size between the two models. In particular, larger differences were found between ethnic groups, and between different levels of educational qualification, in the LFS.

The models were used to calculate the difference between predicted probability of employment and actual employment, categorised as in the body of the paper. As the table below indicates, the proportions of individuals in each category were similar across the BHPS and LFS.

Relationship between predicted and actual employment status

Percentage in each category

		BHPS	LFS
Men	High, No work	4	5
	Low, No work	16	18
	High, In work	62	60
	Low, In work	17	18
Women	High, No work	9	10
	Low, No work	23	22
	High, In work	48	51
	Low, In work	19	18

Overall, the comparison between BHPS Wave 8 and LFS Spring 1999 suggests that estimates of the proportions of different groups in the population are reasonably close in the two surveys, while estimates of the size of coefficients in multivariate analysis differ more widely. The main results in this paper do not rely on the size of coefficients.

Appendix 2: Probit regressions on whether in paid work

Men (N=2,798)	Layer 1 dF/dx	Layers 1-2 dF/dx	Layers 1-3 dF/dx	Layers 1-4 dF/dx
Age	+0.06**	+0.06**	+0.03**	+0.03**
Age squared	-0.0007**	-0.0007**	-0.0004**	-0.0004**
Ethnic group: *White*	omitted	omitted	omitted	omitted
Black	+0.04	+0.03	+0.05	+0.07**
Asian	-0.03	-0.07	+0.00	-0.00
Chinese/Other	-0.19**	-0.21**	-0.08	-0.07
Father's social class:				
Non-manual	omitted	omitted	omitted	omitted
Manual	-0.03	-0.02	-0.01	-0.00
Other	-0.06**	-0.05**	+0.03	+0.02
Mother's social class:				
Non-manual	omitted	omitted	omitted	omitted
Manual	+0.04**	+0.05**	+0.05**	+0.04**
Other	+0.03*	+0.02	+0.05**	+0.05**
ADL limited(a)		-0.44**	-0.33**	-0.29**
GHQ score(b)		-0.03**	-0.03**	-0.03**
Proportion of years since age 16 in employment				
('pemp16')			+0.60**	+0.55**
'pemp16' * age			-0.004**	-0.004**
Highest educational qualification:				
Degree			omitted	omitted
Vocational higher			-0.06**	-0.04*
'A' level or eqiuv			-0.15**	-0.12**
'O' level or equiv			-0.12**	-0.08**
Other			-0.07**	-0.03
None			-0.16**	-0.09**
Male ILO u/e rate in local authority area(c)				-0.004**
Housing tenure:				
Owner-occupier				omitted
Private tenant				-0.05**
Social tenant				-0.10**
Marital status:				
Currently married/cohab				omitted
Previously married				-0.05*
Never married				-0.11**
Age of youngest child:				
0-2				-0.07**
3-4				-0.04
5-10				-0.11**
11-15				-0.04*
None				omitted
Hours caring per week:				
None				omitted
Under 20				-0.00
20-34				-0.19**
35+				-0.33**
Pseudo R-squared	0.15	0.26	0.39	0.42

Women (N=3,009)	Layer 1 dF/dx	Layers 1-2 dF/dx	Layers 1-3 dF/dx	Layers 1-4 dF/dx
Age	+0.04**	+0.04**	+0.03**	+0.04**
Age squared	-0.0006**	-0.0006**	-0.0004**	-0.0007**
Ethnic group: _White_	omitted	omitted	omitted	omitted
Black	-0.08	-0.08	+0.00	-0.01
Asian	-0.16**	-0.08	+0.07	+0.08
Chinese/Other	+0.06	+0.05	+0.12	+0.11
Father's social class:				
Non-manual	omitted	omitted	omitted	omitted
Manual	-0.03	-0.02	+0.03	+0.03
Other	-0.10**	-0.09**	+0.01	+0.01
Mother's social class:				
Non-manual	omitted	omitted	omitted	omitted
Manual	-0.02	+0.02	-0.01	+0.03
Other	-0.05**	-0.05**	+0.00	+0.01
ADL limited(a)		-0.29**	-0.21**	-0.23**
GHQ score(b)		-0.03**	-0.04**	-0.03**
Proportion of years since age 16 in employment ('pemp16')			+0.50**	+0.53**
'pemp16' * age			+0.007**	+0.006**
Highest educational qualification: _Degree_			omitted	omitted
Vocational higher			-0.11**	-0.09**
'A' level or eqiuv			-0.18**	-0.17**
'O' level or equiv			-0.20**	-0.15**
Other			-0.33**	-0.28**
None			-0.28**	-0.24**
Female ILO u/e rate in local authority area(c)				-0.002
Housing tenure:				
Owner-occupier				omitted
Private tenant				+0.02
Social tenant				-0.01
Marital status:				
Currently married/cohab				omitted
Previously married				-0.02
Never married				-0.12**
Age of youngest child:				
0-2				-0.45**
3-4				-0.36**
5-10				-0.17**
11-15				-0.01
None				omitted
Hours caring per week:				
None				omitted
Under 20				-0.02
20-34				-0.21**
35+				-0.31**
Pseudo R-squared	0.04	0.07	0.23	0.29

Notes:

(a)   Positive response to: "Does your health limit your daily activities, compared to someone of your own age?"

(b)   General Health Questionnaire, administered as part of self-completion booklet. Responses to 12 questions on anxiety, ease of sleeping, concentration, feelings of self-worth, etc, cumulated into a score of 0 to 12. Standardly used as a measure of mental illness, higher scores indicating greater likelihood of illness.

(c)   BHPS combines local authority districts (LADs) with population less than 120,000 into areas. Rates are weighted averages of ILO unemployment rates at LAD level from Labour Force Survey Local Area Data.

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