Patterns of non-employment, and of disadvantage, in a recession

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Non-technical summary

There has been much commentary on the likely consequences of the current recession for the living standards of British households. The UK count of unemployment doubled over a 15 month period between 2008 and 2009. It is likely that the situation will get worse before it gets better.

This short paper aims to contribute to the live debate about the current recession in the United Kingdom by analysing the impact of the recessions of the early 1980s and 1990s on non-employment patterns among people in the main range of working ages. Two complete business cycles are observed, while long-term trends in patterns of non-employment are also taken into account. The implication is that the effects observed in earlier business cycles are likely to be repeated now.

The analysis is based on the General Household Surveys undertaken almost every year between 1974 and 2005, with a total sample of 360,672 adults. Their risks of non-employment can be related both to the year in which they were interviewed, and to other characteristics such as family structure, age, qualifications and so on. Complex interactions between characteristics and annual measures of the health of the labour market can be used to predict what the position in the late 2000s would be, first if there was no recession, and second if there was a recession (eg if the unemployment rate doubled).

Most narratives concentrate on the rate of unemployment as the key indicator – counting only those who are actively seeking work. But the analysis suggests that non-employment rates among other groups (eg mothers or disabled people) are also influenced by cyclical effects. For every 100,000 increase in the number of unemployed people, we can expect a further increase of 27,000 in the number of people reporting that they do not have a job, for other reasons.

It has been suggested that those already facing labour market disadvantage would be most likely to face additional problems if jobs are scarce. That is not the consistent conclusion of the analysis.
- The findings for education and ethnic group tend to support the vicious-circle-of-disadvantage hypothesis: people with poor educational qualifications, and members of minority ethnic groups, are both exceptionally sensitive to a recession.
- The findings for gender, age and disability tend to the opposite, implying that existing disadvantage is stable across business cycles. Women, older people and disabled people have poor underlying job prospects, but are not much affected by a temporary downturn.
- There is no consistent pattern suggesting that people living in already disadvantaged regions are either more or less sensitive to cyclical factors than more prosperous regions.

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Abstract
This short paper aims to contribute to the live debate about the current recession in the United Kingdom by analysing the impact of the recessions of the early 1980s and 1990s on non-employment patterns among people in the main range of working ages. The implication is that the effects observed in earlier business cycles are likely to be repeated now. The paper shows the impact of cyclical factors on overall patterns of non-employment and which social groups are most affected. A key question is whether types of people who are already disadvantaged are especially sensitive to a down-turn.

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1. Aims

The economic downturn following the crisis in the financial services industry has stimulated a spate of commentary on the likely consequences for households and families. Obvious potential economic impacts on unemployment (Stafford and Duffy 2009), poverty (Muriel and Sibieta 2009) and mortgage repossessions (Daily Telegraph 2009) may lead to less obvious adverse personal outcomes, including rises in burglaries (Guardian 2009), divorce (Blekesaune 2008), mental illness (Time 2009) and child abuse (Independent 2008).

This paper focuses on the labour market. The US National Bureau of Economic Research defines a recession as:

> a significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, industrial production and wholesale-retail sales (NBER 2009).

This broad definition is often operationalised statistically to identify a recession as a period of two consecutive quarters of negative economic growth measured by GDP. But the NBER definition stresses a range of potential indicators, and some economists argue for an increase in the rate of unemployment – by more than (say) 1½ or 2 percentage points in 12 months – as the best single indicator (Eslake 2008). Unemployment statistics are both understood by, and potentially threatening to, the general public, and therefore play an important political role. The UK claimant unemployment rate doubled between March 2008 and June 2009, rising by 2.4 percentage points over the 15 months. Since peaks in unemployment typically occur some months after troughs in GDP (see eg Stafford and Duffy 2009), it is likely that the employment situation will get worse before it gets better.

What types of people are likely to find themselves out of work in consequence? Does the lack of demand in the labour market primarily affect people who were disadvantaged already? Or is it 'ordinary people' with average characteristics who find themselves at heightened risk of unemployment? Or does a recession tend to eat away at the privilege of those who had previously been almost certain of carrying on in work?

The existing literature on the relationship between unemployment trends and social disadvantage has been usefully reviewed by Stafford and Duffy (2009). The evidence base is patchy. Much of it looks at trends over a single recession, often analysing data about the downturn before information about the upturn is available. It focuses mainly on unemployment itself (ie people actively looking for a job) as the undesirable outcome, without much attention being paid to the impact of recessions on the number of people out of work for other (reported) reasons. Many studies have focused on one particular disadvantaged group (lone parents, disabled people, ethnic minorities and so on) without direct comparisons between groups, or allowing for the interactions between characteristics.

This short paper aims to contribute to the live debate about the current recession in the United Kingdom by analysing the impact of the recessions of the early 1980s and 1990s on non-employment patterns among people in the main range of working ages (20-59). Two complete business cycles are observed, while long-term trends in patterns of non-employment are also taken into account. Although unemployment rates are used as the measure of the level of demand in the labour market (a predictor variable), overall non-employment probabilities are used as the outcome measure (the dependent variable), including a cyclical rise in the number of people not even looking for work as part of the potential problem. The analysis systematically compares the experiences of different social groups, defined by gender and family structure, age, education, health, ethnicity and region, allowing for and investigating the effects of combinations of these characteristics.

The next section describes the data source – an almost-annual sequence of General Household Surveys over three decades. Section 3 describes the analytical approach, followed, in Section 4, by aggregate findings about the overall effect of a recession on the number of adults not in work. Section 5 show how much more or less sensitive the non-employment rates of particular groups are to cyclical variations. Section 6 discusses the findings, looking for a link between long-term disadvantage and short-term problems.

2. Data: the General Household Survey

The main aim of this paper is to distinguish between long-term and cyclical trends in the non-employment rates of different social groups. It is based almost entirely on a long-running population survey, rather than on published statistics on unemployment and other benefit claims.

The General Household Survey (GHS) is a continuous multipurpose survey of large random samples of households across Great Britain. The survey has been conducted, using a new sample each time, every year since 1973, with the exception of 1997 and 1999. The latest evidence in the dataset analysed here relates to 2005.[1] In practice the 1973 survey did not have full data on economic activities, and the 1977 and 1978 surveys did not carry the standard question on limiting long-standing illness. These three annual surveys were therefore dropped from the analysis. The database therefore provides 28 annual observations, over a 32 year period.[2]

Structure of the sample being analysed

The analysis in this paper is based on adults aged 20 to 59. Young adults, aged 16 to 19, have not been included because such a high proportion of them are still in full-time education. Men aged 60 to 64 have been omitted because, although still below pensionable age, a high proportion of them have in fact retired – and in this age group, 'early retirement' is sometimes a marker of privilege and sometimes a marker of disadvantage. Where an adult within the age range has a partner under 20 or over 59, the former is included and the latter excluded – but we know whether the excluded partner had a job.

Each of the 28 annual GHSs included in the analysis covers between 10,000 and 16,000 men and women within this age range, with an overall total of 360,672 respondents. Weighting factors have been applied so that each annual survey represents the composition of the relevant year's population by age and sex. These weights are calculated as population size/sample size, so that they can be used as

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[1] Between 2000 and 2004, the annual sample was based on financial years, eg April 2003 to March 2004, but they are labelled here according to the first-named year, eg 2003, for convenience. In 2005, the first three months of the calendar year were allocated to the 2004/05 survey (and labelled here 2004), while a new (and larger) sample was drawn for the remaining months (and labelled here 2005).
[2] ie 1974-2005, excluding '77, '78, '97 and '99.

grossing up factors to estimate the number of people in the population who have been affected.

All the annual surveys asked questions about respondents' economic activity, and about the set of personal characteristics that are known to be associated with people's job prospects. Some of these questions (notably age and sex) were asked and coded identically in every survey, and could easily be compared across the sequence. Others, notably educational qualifications and ethnic group, were asked and/or coded in different ways across the sequence, and an important preparatory task was to ensure that these data were recoded to be as comparable as possible from year to year.

As with all research of this kind, the findings should be treated just as 'estimates', with a margin of error either way associated with sampling considerations, measurement uncertainties and analytical simplifications. It is the broad differences and trends that matter. An appendix provides details of sampling errors in the main analytical model

Definitions of non-employment and of unemployment
People have been defined as 'not in work' if they did not have a job, and were not studying at the time they took part in the survey. The definition is as close as the survey data can get to "NEET" – not in employment, education or training, A job of less than 16 hours per week was counted as not in work, on the grounds that very short hours cannot be considered either a primary activity or a means of earning a living. The 16 hour cut-off is enshrined in current social security and tax-credit legislation, although the formal boundary was at 30 hours at the beginning of the period under review. Full-time education has been classified as 'in work', because it is long-term economic investment, strongly supported by government policy.[3] All references in this paper to 'non-employment ' and synonyms such as 'out of work' refer to this NEET-based definition. In 2005 (the most recent GHS year in the dataset), the non-employment rate ('out of work' as a proportion of all adults in the age range) was 25 per cent, the converse of an overall employment rate of 75 per cent

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[3] The proportion of those defined as 'in work' who were students rose from 1.1 per cent in 1974 to 3.6 per cent in 2003. They were concentrated among those in their twenties. It is possible that scarcity of jobs is one of the factors that encourages young people to stay on in the education system, but that issue is not addressed in this analysis
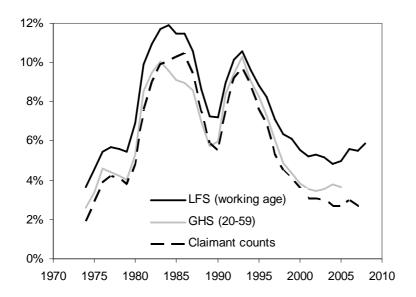
But the words '*un*employed' and '*un*employment' refer more narrowly to people seeking work. In between the unemployed and people in work is a group of those who have no job, but are not looking for one, known as 'economically inactive'. The unemployment rate reported by the GHS in 2005 (the 'ILO definition') was 3.3 per cent.

The best-known measure of unemployment, and the one that can be kept up to date from month to month, is based on a count of the number of people claiming the relevant benefits, mainly the Jobseekers' Allowance and its predecessors Unemployment Benefit and Income Support. Figure A plots changes over the period in three measures of unemployment:

- the figure based on the Labour Force Surveys, using the ILO definition for those of working age in Great Britain – this is the source used for official estimates of long-term trends.
- the GHS based figure, again using the ILO definition, confined to 20-59 year olds in Great Britain
- the claimant count figure, for those of working age across the UK – this is the headline figure used to monitor short term rises and falls in unemployment

The ebbs and flows that are crucial to the analysis in this paper are clearly visible, and the three rather different measures of unemployment track each other with almost uncanny consistency. The main differences are:

- the GHS indicated a peak in unemployment in 1983, and the LFS in 1984, while the claimant count reported a continuing increase through to 1986;
- the LFS figures have been rather higher than the other two versions, especially in the early 1980s and over the most recent period.

The analysis in this paper is based on the GHS measure.

Figure A: Annual unemployment rates, 1974-2008, measured by the Labour Force Survey, by the General Household Survey and by official clamant counts
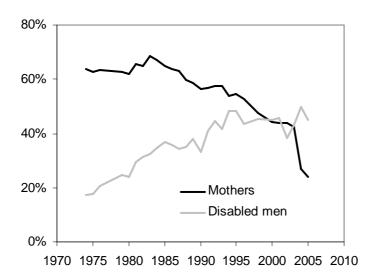

3. Analytical approach

The paper uses logistic regression techniques to estimate the probability that any member of the GHS sample was not in work in any year. That probability will be influenced both by the supply side (the individual's preference for work and the set of skills s/he has to offer), and by the demand side (employers' need for workers). The question to be addressed is how sensitive individuals' non-employment probabilities are to variations in aggregate demand, holding supply-side characteristics constant.

1. The analysis focuses mainly on whether an individual is not in work, rather whether s/he is unemployed. Clearly the unemployed (looking for a job) are the group of primary concern, given that their current situation is one that they are positively trying to escape. It is often assumed that economically inactive people have chosen not to work and are not of concern. The extent to which these choices are freely made in the long term is open for discussion (Berthoud and Blekesaune 2007). But the important point in the current context is that any *increase* in the non-employment rates of (eg) mothers or disabled people *directly attributable to a cyclical scarcity of job*s is unlikely to have been the outcome of autonomous changes in their preferences, and so should be considered one of the outcomes of a recession.

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2. It is important to take account of *all* the influences on people's job prospects before reaching conclusions about the importance of any *one* of them. A multivariate analysis is proposed, in which gender and family structure, age, education, health, ethnicity and region are all considered as potentially independent predictors of non-employment probabilities. Rather than simply report how many (eg) disabled people do not have a job, the approach offers the opportunity to show how much higher the non-employment rate of disabled people is than that of non-disabled people with otherwise similar characteristics. This net difference – a 'disability employment penalty' (Berthoud 2008) – can be compared with similarly-calculated penalties for mothers, ethnic minority groups and so on (Berthoud and Blekesaune 2007).

3. The analysis compares year by year changes in the labour market advantages or disadvantages experienced by different social groups, with year by year changes in the unemployment rate, used as an indicator of ups and downs in the business cycle. If the non-employment rate of any group remained constant, regardless of booms and busts, then it could be concluded that the group was unaffected by recessions. If their non-employment rate fluctuated widely in a pattern closely synchronised with the national indicator of labour demand, then it could be concluded that the group was highly sensitive to market conditions – and the analysis provides an estimate of the numbers affected. The projects the conclusions about the early 1980s and 1990s to the late 2000s, effectively 'predicting' the detail of what is happening now

4. A constant non-employment rate is not necessarily the appropriate counterfactual baseline against which to compare the outcome of a recession. While the overall proportion of GHS sample members in and out of work remained fairly steady over the long term (once cyclical effects have been ironed out) some of the social groups of interest (eg mothers) have seen a fairly steady improvement in their job expectations, while others (eg disabled people) have seen a fairly steady deterioration (Berthoud 2007). For these groups, what matters is the extent to which their non-employment rate departed from their underlying trend during a recession and recovery.

Figure B plots year by year changes, for one example group whose non-employment rate fell over the period and another whose rate rose. The analytical challenge is to identify the M shaped pattern of response to cyclical variations (see Figure A) superimposed on a steady trend. If the underlying trend was not taken into account, the cyclical effect would be substantially under-estimated when the trend is upwards, and over-estimated when the trend is downwards

Figure B: Illustration of rising and falling trends in annual non-employment rates among specific groups

5. The fifth point is obvious, but needs to be made explicit. The past is the only, but not an ideal, guide to the future. Analysis of the impact of the recessions in the early 1980s and 1990s is intended to illustrate the likely consequences of the recession now in progress. There are all sorts of differences between the three events – in the starting situation, in the causes of the crisis and in the policy responses – which mean that study of the first two cannot be used to predict the pattern of the third with any precision. The analysis should nevertheless offer a good guide to the likely impact of the current downturn on the welfare of individuals.

4. Overall trends in non-employment probabilities

A first step is to establish that cyclical variations in the proportion of potential workers who report that they are unemployed is associated with parallel trends in the proportion of adults who are not in work for other stated reasons. Table 2 does this using a multinomial regression equation, in which each of the alternatives to being in work (16 hours plus) is analysed distinctly. The equation controls for underlying trends by including the sequence of years as a predictor (1974-2005, numbered 0 through 31), and also the square of the numerical sequence. This incorporates an assumption that any long-term rises or falls were continuous, but not necessarily linear.

Since the annual unemployment rate is calculated from the number of people reporting that they were unemployed, it is hardly surprising that the one strongly predicts the other. The important point of the analysis in Table 2 is that all the other alternative outcomes also tended to rise during periods of rising unemployment, and fall during periods of falling unemployment (with the exception of the unimportant "other/not known" category).

Table 2: Multinomial regression equation using annual unemployment rate and annual trend to predict specific labour market activities

		Proportion of all, 2005	Multinomial coefficients		
			Annual unemployment rate	Trend (year)	Trend (year^2)
a)	In work, 16 hours or more	73%	Reference category		
b)	Work, less than 16 hours	5%	**0.021**	**0.022**	**-0.001**
c)	Student	2%	0.018	**0.049**	0.000
d)	Unemployed	3%	**0.152**	**0.032**	**-0.001**
e)	Incapable of work	5%	0.011	**0.096**	**-0.001**
f)	Retired	2%	0.024	**0.166**	**-0.003**
g)	Home or family	8%	**0.038**	**-0.043**	0.000
h)	Other/not known	2%	-0.023	-0.001	**0.001**

Source: GHS 1974-2005, adults aged 20-59. Coefficients in **bold** are significant ($p<0.05$)

The temptation is to use this multinomial approach to predict how sensitive disabled people, older workers and women are to changing market conditions, using the categories "incapable of work", "retired" and "home or family" as indicators of the

three groups' experiences. The difficulty with such a solution is that the choice of label is often subjective, depending partly on what the individual was doing before, and partly on current normative considerations about appropriate social and economic roles. These norms have changed over time, leading to trends in the number of people explaining their non-work in different ways, which do not necessarily match rises or falls in their non-employment probabilities.

Instead, the analysis later in this paper shows how many members of each specific group did not have a job (as defined). Not having a job seems a more objective, and ultimately more important, fact, than the reason given. Moreover the chosen approach allows finer-grain analysis, controlling for more factors, than the categorisation used in Table 2.

Note that the definition of non-work used in the analysis is based on categories b, d, e, f, g and h as labelled in the table, so the overall non-work rate was 25% in 2005. (5+3+5+2+8+2). The ILO definition of unemployment rates expresses category d as a percentage of a+b+d. This gives a figure of 3.3% in 2005. Because the bases for the percentages are not the same, a percentage point change in non-employment would refer to more actual people than a percentage point change in unemplyment. This will become clear as examples are given in the following paragraphs.

A first step is to analyse annual non-work rates, using the annual characteristics – current unemployment rate and trend – as the predictor variables. There are three ways of doing this.

- The first column of Table 3 shows the results of an ordinary least squares (OLS) regression in which each year in the sequence is treated as an observation, using the annual unemployment rate and the year-on-year trend as the predictors. It shows that for every rise or fall of 1 percentage point in the unemployment rate, the non-work rate rose or fell by 1.1 a percentage point. This means that if unemployment in 2005 had doubled, from 3.3 per cent to 6.6 percent, the non-work rate would have increased by 3.5 percentage points.
- The second column of Table 3 show the results of a logistic regression equation, predicting the probability of non-employment of each individual in

the sample, again using the annual unemployment rate and the year-on-year trend as the sole predictors.[4] The logistic regression coefficient of 0.051 is not easy to interpret, but it can be calculated that doubling the 2005 unemployment rate from 3.3 to 6.6 per cent would lead to an increase in the non-work rate of 3.6 percentage points.

- The last column of the table shows the results of a similar logistic regression equation, which also controls for the effects of a wide range of other personal characteristics on non-work probabilities. These other effects are recorded in Appendix 1 and may be interesting in their own right; but the important point for the current objective is that controlling for these characteristics suggests a slightly weaker underlying relationship between unemployment and non-work than appeared in the logistic specification without controls – a doubling (3.3 percentage point rise) in the 2005 unemployment rate would lead to a rise of just under 3.3 percentage points in the overall non-employment rate.[5]

Table 3 Three ways of explaining the relationship between annual unemployment rates and annual non-work rates

	Analysis of yearly averages (OLS)	Analysis of individual probabilities (logistic regression)	
		Without controls	With controls
Annual unemployment rate	**0.011**	**0.051**	**0.066**
Trend (per year)	**-0.003**	**-0.009**	0.006
(year squared)	**0.000**	0.000	0.000
(Pseudo) R^2	97%	0.4%	25.5%
N of observations	28	360,672 individuals in 28 clusters	
Effect of increasing unemployment by 3.3%	3.49%	3.59%	3.25%

See Appendix A for full details of the logistic regression equation with controls.
Coefficients in bold type are significant at the 95% confidence level

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[4] All the members of each year's GHS sample have identical values for the annual unemployment rate and the year. Estimates of sampling errors have taken account of the non-independence of these variables at the individual level by treating each year as a cluster.
[5] It is interesting to note that while the raw trend in the non-employment rate is slightly negative in the first two columns of the table (without controls), it is slightly positive in the third column when characteristics are controlled for. This suggests that the reduction in overall non-work rates is more than accounted for by the reduction in the number of people with a high risk of non-employment in any case – eg people with no qualifications, women with children.

The estimate of the effect of doubling the 2005 unemployment rate will be used again and again in the following pages, to illustrate the predicted effects of the recession on particular groups of people. It is calculated by

1. using the logistic regression equation to predict the non-employment probability of each 2005 sample member under 2005 conditions; and

2. adding 3.3 x the relevant coefficient to the prediction formula,[6] and re-predicting the non-employment probabilities in 2005 under the hypothetically revised conditions.

The approach is similar in concept to the calculation of marginal effects, except that the estimate refers to a plausible change in actual conditions rather than to an infinitesimal change. 2005 is used because it is the most recent year available in the data set. Doubling the unemployment rate is assumed because that is what happened (according to the claimant counts) over the 15 month period to June 2009. Remember that the unemployment rate exceeded 10 per cent in the recessions of the early 1980s and early 1990s (see Figure A above) so that the estimates in this paper of what may have already happened may well understate the numbers who are likely to be out of work before the eventual upturn in the economy.

So the best estimate is that a rise of 3.3 in the percentage unemployment rate is matched by a rise of 3.25 in the overall percentage non-work rate. Applying these figures to 2005 conditions implies that:

- Doubling the unemployment rate represents an increase of 812,000 in the number of unemployed people aged 20-59 (defined as looking for work).

- An increase of 3.25 percentage points in the proportion of all adults (in that age range) not working represents a total rise of joblessness attributable to weakened demand of 1,034,000.

- It can be concluded that the number of jobs directly affected by cyclical factors is about 127,000 for every 100,000 individuals recorded as unemployed.

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[6] The formula for predicting probabilities from a logistic regression equation is $1/(1+\exp(-x\beta))$ where $x\beta$ is the sum, for each member of the sample, of the values of the predictor variables times their coefficients.

The rise in unemployment therefore undercounts the total number of people whose jobs are affected by a recession. The difference between the two counts is not massive, and it can be concluded that the number of people not working on grounds of disability, early retirement and motherhood is somewhat, but not exceptionally, sensitive to fluctuations in the number of jobs available.

5. Effects on social groups

The overall effect of fluctuations in labour demand on the number of people out of work is not difficult to estimate and the fact that some 'unemployment' is hidden among people who report other reasons for not having a job is not a new idea (Beatty and Fothergill 2005). But the detailed year by year data provided by the GHS offers an opportunity to analyse the rises and falls in joblessness among different social groups, to show, for example, whether it is men or women, well-qualified or poorly qualified, whose prospects are most sensitive to market conditions. Do disabled people, or members of minority ethnic groups, face additional disadvantage during downturns in the economy, or is their position already so weak that macro-economic changes make no difference?

The main logistic regression equation covering all groups and the whole period is set out in Appendix A. Including (say) education and the annual unemployment rate in the same model tells us that people with no qualifications are generally less likely to have a job than graduates in all years, and that the overall non-employment rate fluctuates with the business cycle for people of all educational backgrounds. But this does not differentiate between the effects of the business cycle on those with low and high qualifications. The analysis needs to estimate the pattern of changes over time for each social group.

This has been done by adding a set of interaction terms to the equation, which provide estimates of the effects of both underlying trends and cyclical variations in demand, on each of the original predictor variables. The detailed results are in Appendix A, together with a summary of the Stata commands used to generate the estimates. The model takes account of the direct effects on non-work probabilities of 30 characteristics, and also allows for 30 distinct trends, and 30 distinct cyclical patterns.

Models with large numbers of interaction terms are too complex to be interpreted directly. The trick is to repeat the approach already used to summarise the overall cyclical effect.

- The current non-work probability of each member of the 2005 sample is predicted, taking account of all characteristics and their interactions
- A hypothetical non-employment probability is then calculated for each 2005 sample member, assuming a 3.3 percentage point increase in the unemployment rate, and applying that to all the interactions between characteristics and unemployment rates.
- This provides, for every sample member, an estimate of their increased risk of non-employment. Variations in this increased risk can be analysed across the key characteristics of interest.
- Reported effects are averaged across adults in the 2005 sample

That is done in the following paragraphs, for the following characteristics in order: gender/family structure, age, disability, educational qualifications, ethnic group and region.

Gender and family structure
Preliminary analysis suggested that the most efficient way of describing variations in non-employment patterns was to compare all men (excluding the small number of lone fathers), women without dependent children living with them, and mothers (plus lone fathers). This three way distinction provides the basis for Table 4, illustrated by Figure C.

By 2005, the estimated non-employment rate among men (as defined) had risen to nearly 15 per cent as the result of long-term trends. Among parents (mostly mothers, as defined), it had fallen to about 38 per cent, while childless women were in between at 27 per cent. But a rise of 3.3 per cent in the unemployment rate is expected to have substantially more impact on men (4.0 percentage points) than on parents (3.1 points), with childless women least affected (1.6 points).

Table 4 Logistic regression predictions of the relationship between annual unemployment rates and overall non-work probabilities, by gender and family structure.

	Men (except lone fathers)	Women (except mothers)	Parents (mothers + lone fathers)
Percent predicted not to be working in 2005	14.7%	27.0%	37.8%
Predicted if unemployment doubled	18.7%	28.6%	41.0%
Predicted increase, percentage points	4.0%	1.6%	3.1%
Number not working in 2005 (thousands)	2,196	2,335	3,111
Predicted increase (thousands)	603	135	258
Proportionate increase	27%	6%	8%

The second half of Table 4 presents the percentages in terms of the number of people affected. Two million 'men' would have been out of work for one reason or another in 2005 anyway. They would be joined by more than a further half million if unemployment had doubled. Larger numbers of 'women' and 'parents' who would not have been working in any case, are relatively unaffected by a potential recession. The number of men out of work would increase by more than a quarter; the number of childless women by little more than one in twenty.

Figure C Predicted changes in number of non-employed people in 2005 conditions, by gender and family structure

Note: see text for definition of. categories

Table 5 Logistic regression predictions of the relationship between annual unemployment rates and non-work probabilities, by other social characteristics.

	Percent predicted not to be working in 2005	Predicted increase		
		Percentage points	Thousands	proportionate
Age				
20-24	22.4%	5.7%	215	26%
25-29	22.9%	4.8%	189	21%
30-34	24.2%	4.1%	167	17%
35-39	23.1%	3.3%	140	14%
40-44	19.4%	2.6%	113	13%
45-49	19.9%	2.1%	81	10%
50-54	26.5%	1.7%	62	7%
55-59	36.3%	1.3%	53	4%
Disability				
Not disabled	19.2%	3.3%	890	17%
Limiting long-standing illness	53.5%	2.1%	99	4%
Education				
No qualifications	46.1%	4.0%	176	9%
Lower	30.8%	4.6%	137	15%
O level/GCSE	25.7%	2.7%	198	11%
A level	18.7%	2.2%	106	12%
Higher/degree	16.5%	2.5%	243	15%
Ethnic group				
White	23.2%	2.9%	815	12%
Caribbean	27.7%	5.2%	24	19%
Indian	28.3%	4.2%	36	15%
Pakistani Bangladeshi	47.0%	6.9%	44	15%
Other	35.0%	5.2%	70	15%
Region				
Scotland	22.2%	2.0%	55	9%
North East	27.0%	1.5%	20	6%
North West	24.5%	3.4%	101	14%
Yorks and Humber	25.5%	3.0%	109	12%
East Midlands	24.7%	3.8%	96	15%
West Midlands	25.8%	5.1%	144	20%
Wales	26.1%	2.3%	36	9%
Eastern	22.3%	3.2%	102	14%
London	26.8%	3.8%	144	14%
South East	23.2%	2.7%	122	12%
South West	21.9%	2.1%	58	10%

Age

Table 5 reports estimates for a series of other population groups, calculated in the same way as, though presented in less detail than, the results by gender and family structure in Table 4. Analysis by age shows that the overall proportion not working in baseline 2005 conditions tended to be higher in the 50s, and especially the late 50s,

compared with younger age groups. But it is clearly people at the beginning of the age-sequence analysed who are most susceptible to the potential impact of a recession. The non-employment rate among 20-24 years olds would soar by a quarter, while the rate for 55-59 years olds would rise by only one in twenty five.

Disability

There has been much discussion of the possibility that the rapid rise in the number of disabled people claiming out-of-work benefits over the 1980s and early 1990s was caused by the industrial restructuring and fiscal retrenchment associated with the Thatcher administration (Beatty and Fothergill 2005). A more detailed analysis of trends in the non-employment rates of disabled people (using the same GHS dataset) is in progress – preliminary findings suggest that disabled people are highly sensitive to *geographical* variations in the health of the labour market, but not very sensitive to variations *over time* (Berthoud forthcoming)

The General Household Survey does not carry detailed questions on the nature and severity of people's impairments, such as would be required to define 'disability' with any precision. Instead, it identifies sample members who report a limiting long-standing illness – a question which has been shown to exaggerate estimates of the number of disabled people in the working age population, and underestimate the extent of their labour market disadvantage (Berthoud 2007).

If disabled people (ie those reporting a limiting long-standing illness) followed a similar trajectory in the current downturn as they did in the 1983 and 1993 recessions, they would experience a 2.1 percentage point rise in their non-employment rate – rather lower than that faced by non-disabled people. The rise would be only a small proportionate increase, compared with the very high rate of non-employment already faced by disabled people

Education

Educational qualifications have a strong influence of people's chances of having a job, as well as on the type of work and level of earnings they can expect. Nearly half of the shrinking group of people with no qualifications are estimated to have been out of work in 2005 conditions, even before the hypothesised recession. But only one

sixth of the growing group of graduates, and others with higher educational qualifications, would have been out of work in baseline 2005 conditions.

The third panel of Table 5 shows that under-qualified potential workers have been exceptionally sensitive to previous recessions, and are predicted to suffer a substantial increase in non-employment during the current period; while well-qualified individuals are much better protected against the vagaries of the labour market.

Unlike the analyses by gender/family, age and disability, the analysis by education suggests that those already disadvantaged will be most at risk of further disadvantage. One consequence is that the proportionate increase, recorded in the final column of the table, is fairly constant across qualification categories

Ethnic group

It has long been observed that the unemployment rates of ethnic minorities are 'hypercyclical' (Smith 1977, Jones 1993), rising faster than white unemployment rates during recessions, but falling faster during periods of economic growth. This means that an assessment of minority non-employment rates is sensitive to the period in the cycle that is under consideration.

The current analysis estimates overall non-employment rates (not just unemployment), and differentiates between the main minority groups. A complication is that the composition of the minority population has changed over the decades being analysed, following migration, so the projection of 1980s and 1990s experience to the 2000s is less reliable.

Nevertheless, the conclusions are largely consistent with previous studies. Pakistanis and Bangladeshis, already among the most disadvantaged groups in the country, are also shown to be highly sensitive to a potential recession, with an estimated increase in non-employment of nearly 7 percentage points. All the minorities, though less disadvantaged in normal times, also exhibit the hypercyclical pattern.

Region

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The non-employment rate in the base conditions of 2005 ranged between just under 22 per cent in the South West, and 27 per cent in the North East. It is well known that unemployment rates vary between regions, but Figure D shows that long-term prosperous and disadvantaged regions have fluctuated over the business cycle in parallel with each other. Table 5 shows that doubling the 2005 unemployment rate is estimated to increase the proportion of people out of work by between 1½ percentage points in the North East, and just over 5 percentage points in the West Midlands

Figure D Variations in raw unemployment and overall non-employment rates across the business cycle, in regions of low, middle and high underlying unemployment
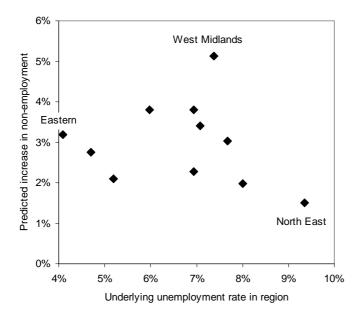

Note: Underlying unemployment is calculated as the mean unemployment rate in each region, over the whole 32 year period. Low rates are in Eastern, South East, South West and East Midlands (< 6%); mid rates are in London, Wales and North West (6-6.9%); high rates in West Midlands, Yorkshire/ Humberside, Scotland and North East (>=7%).

Table 5 listed the regions in an order roughly from north to south. There is no obvious north/south divide in the sensitivity of labour markets to cyclical effects. An alternative perspective is offered in Figure E, which plots the estimated increase in non-employment in each region, against the region's underlying unemployment rate (calculated as its mean unemployment rate across the 32 year period). Again, there is no obvious relationship between the underlying health of a regional economy and its response to a downturn.

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Figure E Predicted increase in non-employment associated with a recession: regions plotted against their underlying unemployment rate

Conclusions

Rises and falls in job opportunities are so directly linked to cyclical patterns of growth and decline in national output that some experts propose trends in unemployment statistics as the key measure of the health of a national economy. The claimant count doubled in just over a over a year, from 2.4 per cent in March 2008 to 4.8 per cent in June 2009. Given that the rate peaked at more than 10 per cent in 1983 and again in 1993, a further substantial increase in joblessness may take place before the tide turns.

This paper uses survey data covering a thirty-year period, analysing the experience of past two recessions to predict the probable impact of the current downturn on individuals. Of course no two circuits of the economic cycle are identical, but the past is the only, if imperfect, guide to the future. The analysis is designed to show, first, whether the reduction in the number of people in work is confined to, or larger than, the number reporting themselves to be unemployed (ie available for and actively looking for work); and, second, what kinds of people (men or women, young or old, and so on) are likely to be affected. The analysis is based on a multivariate logistic regression equation which takes account both of changes in the characteristics of the population, and (crucially) of longer-term trends in the non-employment risks of particular groups. An analysis of the whole 32 year period covered by the GHS is

used to 'predict' the outcome of a hypothetical recession occurring in 2005 (the latest year in the data sequence). The inference is that this is what is happening now, in 2009. The hypothesised macro-economic event is a doubling of the national unemployment rate, from 3.3 to 6.6 percent. If the current recession turns out to be deeper than that, all the outcomes will be worse than those predicted here – but the pattern of variations should be similar.

At an aggregate level, the analysis confirmed that the reduction of the number of people in work would be larger than the increase in the number of unemployed. Bear in mind that macro-economic trends impact on a continuous process by which men and women leave work and find new jobs. An increase of 100,000 in the unemployment count does not mean that exactly that number of people were made redundant. It is the net outcome of a rise in the rate at which people leave work, and/or a fall in the rate at which they start new jobs. Other non-workers, besides the unemployed, participate in these outflows and inflows, so that scarcity of jobs might (for example) encourage a disabled person to give up work a little earlier than he might otherwise have done, or discourage a mother from finding a job until a little later than she might otherwise have done. The scale of this rise in the number of 'discouraged workers' during a recession is not as great as might perhaps have been feared – an increase of 127,000 in the total number of people not in employment, for every 100,000 who say they are unemployed.
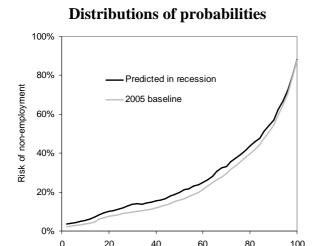
The General Household Survey data provide a unique opportunity to identify the social characteristics of those most and least affected by a recession. For adults aged 20-59 taken as a whole, the increase in the non-employment rate, predicted if the strictly measured unemployment rate doubled, was 3.25 percentage points. For the sub-groups identified in Tables 4 and 5, this effect fell as low as 1.3 percentage points (55-59 year olds) and as high as 6.9 percentage points (Pakistanis and Bangladeshis). The groups most affected are men, younger adults, not disabled, with poor educational records, members of ethnic minorities, living in the West Midlands. Those least affected, conversely, are women without children, in older age groups, disabled, with good qualifications, whites, living in the North East of England.

It is far from easy to generalise from these observed patterns. It has been suggested that those already facing labour market disadvantage would be most likely to face additional problems if jobs are scarce. That is not the consistent conclusion of the analysis.

- The findings for education and ethnic group tend to support the vicious-circle-of-disadvantage hypothesis.
- The findings for gender, age and disability tend to the opposite, implying that existing disadvantage is stable across business cycles. This is particularly surprising for disabled people, whose deteriorating job prospects over the decades have often been blamed on the experience of earlier recessions.
- There is no consistent pattern suggesting that already disadvantaged regions are either more or less sensitive to cyclical factors than more prosperous regions

The output from the logistic regression equations can be used to address the relationship between baseline prospects and cyclical sensitivity more directly. The analysis predicts the non-employment probability of every member of the (2005) GHS sample, based on his or her characteristics; and the change in that predicted probability associated with a hypothesised recession. Those with low baseline probabilities of being out of work (positioned on the left of the graphs in Figure F) tend to be men, young, not disabled, with degrees, white, living in the South West. Those with poor prospects, a high baseline probability of non-employment, are depicted on the right of the graphs – they tend to be mothers, older, disabled, with no qualifications, members of minority groups, living in the North East. The graph in the left hand panel illustrates the baseline distribution of non-work probabilities, and also the predicted outcome of a recession. It can be seen that the increase in non-work risk is broadly spread across the distribution of initial probabilities, rather than bunched mainly at one end or the other.
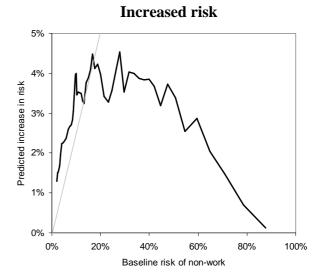
Figure F: Relationships between baseline non-employment probabilities and the increased risk associated with a recession

Distributions of probabilities

Increased risk

Note: Both graphs are based on dividing the distribution of baseline risks into 50 equal groups, each covering 2 per cent of the total. The left hand graph plots these according to their number in the sequence; the right hand graph plots them at their mean baseline risk.

The right hand panel re-presents the data from the left hand panel, this time plotting the average increase in non-work probabilities directly against the baseline probability. The pattern can be summarised in three stages:

- Among adults with a fairly low risk of being out of work – up to about 20 per cent – a recession can be expected to increase that (low) risk by about one fifth. That is 1 percentage point for people with a 5 per cent starting risk, rising to 4 percentage points for those with a starting risk of 20 per cent. (The pattern is illustrated by the sloping straight line.) About 6 out of 10 adults are in this range with a steady *proportionate* increase in their risk.

- Across the middle of the range of initial disadvantage, between about 20 per cent and 50 per cent, the further increase in risk is steady at about 4 percentage points. About 3 out of 10 adults are in this already-disadvantaged range, facing a steady *absolute* increase in their risk,

- The most disadvantaged people are relatively unaffected by a recession. More than half of them are out of work in any case. About 1 in 10 adults are in this position of extreme disadvantage, who could hardly be further affected by temporary labour market fluctuations.

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Appendix A: Details of main logistic regression equation

Table A1 presents the details of a logistic regression equation predicting adults' probability of not working (at least 16 hour per week, using the definition explained on page 3). The main coefficients show that, as expected, some types of people are systematically more or less likely to have a job than other types of people.

- Men and women without a partner have lower job expectations than men with a partner
- Over the period as a whole, women with a partner were even less likely to have a job than single people (though this disadvantage has decreased over the years).
- The younger a mother's, or lone father's, youngest child, the less likely s/he was to be employed.
- The individual's own age had no effect on job chances up to 45; but expectations declined steadily from 45 onwards.
- Disabled people (LLI) were less likely to have a job.
- The better someone's educational qualification, the more likely they were to be in employment.
- Members or minority ethnic groups were often at a disadvantage. Pakistani and Bangladeshi women were exceptionally unlikely to have a job. In contrast, Caribbean women were more likely to have a job than white women with otherwise similar characteristics.
- People living in some regions have less chance of being in work than in other regions, all other characteristics held constant.

While these findings are of interest in their own right, showing which social groups are most and least disadvantaged, the task on this occasion is to show how the non-employment rates of each group changed from year to year, controlling for long-term trends in order to focus on short term variations in the national unemployment rate. The logistic regression equation therefore included terms interacting all the 'social group' variables with both year on year trends and the annual unemployment rate. The coefficients on the these interaction terms are shown on the right of the table.

The Stata commands producing the model were in the following form,[7] where A to Z represent the predictor variables ranging from 'Lone man' to South West; 'year' is the numerical year in the sequence (1974=0), 'year2' is its square and 'ueyear' is the national average unemployment rate in each year.

```
foreach a in A-Z{
        gen I`a'year=`a'*year
        }
foreach a in A-Z{
        gen I`a'year2=`a'*year2
        }
foreach a in A-Z{
        gen I`a'ue=`a'*ueyear
        }

logit  nonwork  A-Z  year  IAyear-IZyear  year2  IAyear2-IZyear2 ueyear IAue-IZue
```

---

[7] These are not the commands actually used, but rewritten to make the method as clear as possible to the reader.

Post-estimation commands were used to estimate, first, each sample member's current probability of being out of work

    predict prednw

and then each sample member's counterfactual probability of being out of work if the annual unemployment rate was increased by 3.3 per cent

    predict XB, xb
    gen counterpred = 1/(1+exp(-(XB +.033*(_b[ueyear] + A*_b[IAue] + ...+ Z*_b[IZue]))))

The effect of a hypothesised recession is then the difference between the counterfactual prediction and the actual prediction. All the analysis in the paper reports the effect in 2005, although in principle the same output could be applied to other years in the sequence.

The results of the analysis are shown in Table A1 on the next page. The equation was based on 360,672 observations, clustered in 28 annual surveys, weighted as described on pages 2 and 3. The ratios of coefficients to their standard errors are indicated by the z statistic, and coefficients significant at the 95 per cent confidence limit are highlighted in bold type. The pseudo R^2 (a measure of the accuracy with which the equation was able to predict individual non-work probabilities) was 25.4%.

Table A1: Logistic regression equation predicting non-employment probabilities

	Mean (in 2005)	Main coefficient		Interactions with . . . . year		year squared		unemployment rate	
		B	z	B	z	B	z	B	z
Family structure									
Lone man	12%	**0.704**	11.2	-0.005	-0.3	0.000	-0.3	-0.006	-0.4
Man with partner (base)	38%								
Lone woman	15%	**1.721**	28.8	**-0.033**	-2.0	0.000	-0.3	**-0.064**	-4.1
Woman with partner	35%	**2.970**	37.2	**-0.049**	-3.5	0.000	0.1	**-0.084**	-5.7
Age of children*	-3	**-0.185**	-29.8	0.000	0.0	**0.000**	2.6	0.001	1.3
Has a working partner	53%	**-0.695**	-8.5	**-0.063**	-3.6	**0.002**	2.8	0.019	1.1
Age (spline)									
Per year, 20-45	37.6	**0.010**	2.5	**0.002**	3.2	**0.000**	-3.9	**-0.003**	-3.4
Per year, 45-59	2.7	**0.102**	27.8	0.001	1.9	0.000	-1.8	**-0.004**	-4.5
Disablity									
None (base)	85%								
Limiting long-standing illness	15%	**1.118**	15.3	0.024	1.8	0.000	-0.4	**-0.036**	-2.4
Education									
No qualifications	14%	**0.145**	2.5	**0.037**	3.3	-0.001	-1.8	0.019	1.7
Less than O level/GCSE	9%	-0.082	-1.6	0.010	1.0	0.000	-0.6	**0.027**	2.7
GCSE (base)	23%								
A level	15%	**-0.145**	-2.4	0.004	0.3	0.000	-0.5	-0.013	-1.1
Higher	30%	**-0.442**	-7.7	-0.017	-1.8	0.000	1.5	0.010	1.0
Not known	8%	**0.571**	4.7	-0.030	-1.5	0.000	0.4	-0.007	-0.4
Ethnic group									
White (base)	90%								
Caribbean man	1%	0.138	0.9	0.037	1.3	-0.001	-0.6	0.012	0.4
Caribbean woman	1%	**-1.136**	-10.4						
Indian	3%	0.290	1.4	-0.028	-0.8	0.001	1.1	-0.009	-0.2
Pakistani/Bangladeshi man	1%	0.424	1.7						
Pakistani/Bangladeshi woman	1%	**1.218**	5.3	0.029	0.8	-0.001	-0.6	0.010	0.2
Other minority group	4%	-0.102	-0.5	0.023	0.8	0.000	0.1	-0.002	-0.1
Region									
Scotland	9%	-0.061	-1.1	**0.052**	6.0	**-0.002**	-5.4	-0.017	-1.6
North East	4%	**0.166**	3.8	**0.053**	3.6	**-0.002**	-3.5	-0.028	-1.9
North West	9%	0.010	0.2	0.015	1.3	-0.001	-1.4	0.004	0.3
Yorks & Humber	11%	**-0.116**	-2.2	**0.026**	2.9	**-0.001**	-2.4	0.000	0.0
East Midlands	8%	**-0.177**	-3.0	0.008	0.6	0.000	-0.4	0.016	1.0
West Midlands	9%	**-0.193**	-2.6	-0.010	-0.6	0.000	0.8	**0.036**	2.4
Wales	5%	**0.212**	3.8	0.020	1.7	**-0.001**	-2.2	-0.011	-0.9
Eastern	10%	-0.006	-0.1	0.000	0.0	0.000	-0.2	0.005	0.4
London	12%	**-0.230**	-4.0	0.014	1.3	0.000	-0.2	0.002	0.2
South East (base)	14%								
South West	9%	0.095	1.3	0.021	1.4	-0.001	-1.7	-0.011	-0.8
Trend									
Year	31	-0.045	-1.5						
Year squared	961	**0.003**	3.4						
Unemployment rate									
This year	0.033	**0.215**	7.0						
Constant		**-4.262**	-29.2						

* Someone whose youngest child was aged 0 was scored -18; whose youngest child was 18, was scored 0.
Women with no children scored 0. Men were scored 0 unless they were lone parent