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**Spend It Like Beckham?  
Inequality and Redistribution in the UK, 1983-2004**

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## **Abstract**

A main activity of the state is to redistribute resources. Models of the political process generally predict that a rise in inequality will lead to more redistribution. This paper shows that, for the UK in the period 1983-2004, a plausibly exogenous rise in income inequality has not been associated with increased redistribution. We then explore this further using attitudinal data. We show that the demand for redistribution, having shown considerable variation over time, is at an all-time low. We argue that the decline in the demand for redistribution can mostly be accounted for by an increasing belief in the importance of incentives though changes in preferences over the distribution of income have been important in some sub-periods.

Key words: Taxation, Inequality, Redistribution

JEL Classifications: H20, D72

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## **Equation Section 1**

"I warn you that there are going to be howls of anguish from those rich enough to pay over 75% on their last slice of earnings", a gleeful Denis Healey, Labour Party Shadow Chancellor, 1973.

"The justice for me is concentrated on lifting incomes of those that don't have a decent income. It's not my burning ambition to make sure that David Beckham earns less money", Tony Blair, Labour Party Leader, 2001 Election Campaign.

### Introduction

One of the main activities of the state is to redistribute resources. This redistribution can take many forms, being explicit through the tax and welfare system, less direct through the subsidized public provision of certain services (notably education and health) and even indirectly through various government regulations (e.g. the minimum wage).

Economists have, understandably, been interested in the determinants of the variability in the amount of redistribution both across countries and over time. The starting point for this inquiry is most commonly some model of the political process (originating with Romer, 1975, Roberts, 1977, Meltzer and Richard, 1981 – see Persson and Tabellini, 2002, ch. 6, for a more recent overview). These models tend to have the prediction that, *ceteris paribus*, an increase in inequality should bring about an increase in redistribution.

For example, in the model of Meltzer and Richard (1981), where the median voter is decisive, the amount of redistribution is determined by the ratio of mean to median income. It is probably possible to construct models in which this prediction does not hold but it is widely regarded as a 'best guess'<sup>1</sup>. Unfortunately, the prediction that more inequality leads to more redistribution has not fared particularly well empirically (see, for example Perotti (1996), and Moene and Wallerstein (2001, 2003) though Finseraas

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<sup>1</sup> For example, Moene and Wallerstein (2001, 2003) argue that an important distinction should be made between the redistributive and insurance aspects of the welfare states, arguing that more inequality reduces the demand for insurance.

(2006) does claim some support when comparing European countries). One stark example of this ‘paradox of redistribution’ comes from a simple comparison of the United States and Europe where Europe has lower pre-tax inequality and more redistribution (see Alesina, Glaeser and Sacerdote, 2001).

However, as noted by Acemoglu and Robinson (2005), the empirical studies that use cross-country data are not based on a high-quality research design. There are many other differences between countries that muddy the link between income inequality and redistribution. While the existing studies do make serious attempts to control for these confounding factors it is very difficult to do this in a way that is beyond reasonable criticism. Studies of the variability in redistribution have tended to emphasize the importance of factors like racial divisions (e.g. Alesina, Glaeser and Sacerdote, 2001) and the political system (e.g. Austen-Smith, 2000, Iversen and Soskice, 2006). What does not seem to be in the existing literature is a study of how, for a given country, redistribution responds to changes in income inequality. Looking at a country over time has the potential advantage that many factors that might be thought to be relevant to redistribution (e.g. the political system) are held constant so we might hope to get a better estimate of the impact of inequality on redistribution. That is the purpose of this paper where we consider the case of the UK.

The UK is a good country to consider because it has had large rises in pre-tax income inequality that are generally thought to be the result of the exogenous forces of technological change and globalization (Machin, 2003) or changes in the supply of skills (Card and Lemieux, 2001). In particular there has been a large rise in the share of pre-tax income going to those at the top of the income distribution (see Atkinson, 2003, for the

evolution of the income share of the top 1% over 100 years). As discussed above, most models of the political process would predict that the political response to this would take the form of rising redistribution with rising marginal tax rates on the rich. But there is a strong suspicion that this has not happened. For example, the top rate of income tax fell from 83% in the late 1970s to 40% in 1988 since when it has not changed.

The plan of the paper is as follows. In the next section we document some basic facts about the changing distribution of pre- and post-tax income in the UK over the past 30 years. The second section then uses a simple model of the choice of the tax system to argue that the observed outcomes cannot easily be rationalised using a model with unchanging fundamentals (preferences and beliefs) so that something must have changed<sup>2</sup>.

The third, fourth and fifth sections then explore what might have changed using attitudinal data from the British Social Attitudes Survey for the period 1983-2004. We show that the demand for redistribution rose in the period 1983-1995 when income inequality was rising fastest, but the demand for redistribution has fallen since 1995 to its lowest-recorded levels even though there has been no dramatic fall in income inequality over this period. The fourth section shows that political economy models do have some ability to explain the variation in the demand for redistribution – for example, income, views over the desired distribution of income and views about the importance of

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<sup>2</sup> This conclusion is in line with the casual empiricism based on the stated policies towards redistribution of the major political parties as summarized by the quotes at the beginning of the paper. In the 1970s the top marginal rate of income tax was 98% on unearned and 83% on earned income. The Thatcher government reduced the top marginal rate of tax to 40% and Tony Blair has explicitly resisted pressure from some parts of the Labour party to raise it. The Liberal Democrats fought the 2005 general election promising to raise the rate to 50% but their 2006 Conference removed this long-standing pledge. Raising tax rates on the rich is currently off the political agenda, something that seems very curious given the large rise in their share of pre-tax income inequality.

incentives all have significant effects. Finally the fifth section uses Oaxaca decompositions to explain the falling demand for redistribution. We also find that changes in these variables can explain 75% of the fall in the demand for redistribution over the period from the mid 1980s to the mid 2000s with an increasing belief in the importance of incentives being the most important factor.

## 1. Inequality and Redistribution in the UK

In this section we briefly describe the evolution of inequality in both pre- and post-tax income in the UK over the last 30 years. The UK tax and benefit system has a vast number of different programmes that take from one group and give to another – we will not seek to document them all here. Rather we will simply focus on one measure of the overall amount of redistribution taken from the reported figures on the “The effects of taxes and benefits on household income” that has been produced by the Office for National Statistics on a more or less comparable basis since 1971 (and earlier on a less comparable basis) – see Jones (2006) for the most recent version of this analysis. This divides households into deciles and then reports levels of original income and various other measures of income including final income that includes imputed estimates of the value of benefits derived from public services (most importantly, health and education)<sup>3</sup>.

The ONS produces different statistics based on different groupings of households into deciles. For the whole period 1971-2005, there are figures based on ordering households by disposable income i.e. unequivalised and after taxes. This ordering is not

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<sup>3</sup> This is important as, for example, an important aspect of redistribution in the UK is the National Health Service which provides free health care to all. If the share of GDP spent on healthcare rises over time and taxes are raised to pay for it, the UK welfare state will be becoming more redistributive even if the income tax system is not becoming more progressive.

the ideal one for our purpose as we would prefer some measure of equivalised original income. For some years there are also figures for orderings of households on other bases<sup>4</sup>. None of this matters if the tax and benefit system left the ordering of households in terms of income unchanged but there are ways in which it doesn't (e.g. many pensioners have zero original income but are higher up the income distribution in terms of disposable income). But, in practice these difficulties seem to make little difference to an assessment of the trends in redistribution and the results we report here are based on the longest available run of consistent data.

Figure 1 shows the trends in the cumulative shares of original income (i.e. before redistribution) from 1971-2005. One can clearly see the marked decline in the share going to the bottom 80% of households in the period from the late 1970s to the early 1990s since when it has been stable. This obviously implies a rise in the share of original income for the top 20% of households. The fall in the income share for the bottom 80% is in all parts of the distribution, indeed it is largest for those in the middle (where one might expect the median voter to be located) as the income share of the bottom 20% hardly changes. This is the rise in pre-tax income inequality.

Now consider what happens post-tax. Here Figure 2 reports shares in final income after all redistribution through taxes and benefits, both in cash and in kind. The changes here are more muted because the tax and benefit system does redistribute income but the pattern is the same – a rising share in final income of the top 20% with the most marked falls in the middle of the distribution.

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<sup>4</sup> Since 1987 there are tables ordering households by equivalised disposable income and prior to that tables ordering households by (unequivalised) original income.

Although Figures 1 and 2 do show that not all of the rise in pre-tax income inequality has been undone by the tax and benefit system and there has been a rise in post-tax income inequality, it is not quite so simple to say whether redistribution has gone up or down more than would be predicted by the political economy models, as the simple theories do not predict that all rises in wage inequality should be undone by the tax system as long as there are any incentive effects at work. One might point to the fall in the top marginal rate of income tax from 83% to 40% as evidence of declining progressivity at the top of the distribution but very few people paid the 83% rate and the failure to index tax thresholds to average earnings has caused more people to pay the 40% rate than previously (see Adam et al, 2007). Adam et al (2007) also point out that the difference between the pre- and post-tax Gini coefficient has remained very stable and argue that this must mean lower progressivity as the rise in pre-tax wage inequality would otherwise have caused a rise in the Gini gap. Here, we take a different approach – we use a simple theory of the determination of tax rates to attempt to infer whether what we observe is consistent with a constant underlying political process – this is the subject of the next section.

## 2. A Simple Model of the Choice of the Tax System

In this section we describe an approach that allows us to infer whether the observed changes in pre- and post-tax income can be interpreted as the outcome in which only inequality is changing but the ‘fundamentals’ are constant. Our approach has many affinities to the optimal income tax literature that started with Mirrlees (1971) but differs in the details from the standard way of setting up these problems. It is perhaps most

similar to Bourguignon and Spadaro (2005) in its attempt to back out implicit social weights from observed redistribution.

### *Preferences and Labour Supply*

Assume that the individual utility function can be written as:

$$U = \log C - \theta(H) \quad (1)$$

This specification of the utility function imposes the restriction that the uncompensated labour supply elasticity is zero<sup>5</sup>. Assume that the only difference between people is in their pre-tax hourly wage,  $W$ . Denote by  $W(f)$  the hourly wage of someone at position  $f$  in the income distribution – call them an  $f$ -worker.

If the tax-benefit system is such that the tax paid on income  $Y$  is  $T(Y)$ , an  $f$ -worker will choose  $H$  to maximize:

$$U(f) = \max_H \log [W(f)H - T(W(f)H)] - \theta(H) \quad (2)$$

leading to the first-order condition:

$$\frac{W[1-T']}{WH - T(WH)} - \theta'(H) = 0 \quad (3)$$

which can be written as:

$$H\theta'(H) = \frac{[1-T']}{1 - \frac{T(WH)}{WH}} \quad (4)$$

The right-hand side of (4) is 1 minus the marginal tax rate divided by 1 minus the average tax rate, the coefficient of residual income progression (CRIP), a well-known measure of

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<sup>5</sup> The more common assumption in the optimal income tax literature is ‘no income effects’ but the specification here is more appealing for it predicts that, as hourly wages rise, there is no marked secular trend in hours worked whereas ‘no income effects’ predicts an upward trend.

the progressivity of a tax system (see e.g. Musgrave and Musgrave, 1976). It is the percentage increase in post-tax income from a 1% increase in pre-tax income. For future use let us denote the CRIP as  $V$  – it will, in general depend on the tax system, hours of work and earnings but let us denote by  $V(f)$  the CRIP faced by an individual at position  $f$ . (4) gives us:

$$H(f) = \psi(V(f)) \quad (5)$$

Where  $\psi$  is an increasing function so that the CRIP is a sufficient statistic for the level of hours supplied by an individual. Denote by  $\varepsilon(V)$  the elasticity of hours of work with respect to the CRIP. In what follows we will assume that all individuals have non-zero hours of work, something that is appropriate for our focus on the top part of the income distribution. If those at the bottom of the wage distribution do not work, some of the formulae that follow would need modification.

The envelope condition from (2) now implies that:

$$U'(f) = \frac{HW'[1-T]}{WH - T(WH)} = V(f)w'(f) \quad (6)$$

Where lower-case letters denote logs.

### *The Determination of the Tax System*

Now consider how the tax system is determined. We will not model the political process directly – rather we will assume that a person at position  $f$  in the income distribution has some weight  $g(f)$  – what we will call the social weight - on the outcome so that the tax system is chosen to maximize:

$$\Omega = \int g(f)U(f)df \quad (7)$$

If the median voter was decisive only  $g(0.5)$  would be non-zero but models of probabilistic voting (see e.g. Persson and Tabellini, 2002) or social preferences suggest that others will have non-zero influence. Note that the specification used assumes that the weight on the outcome depends only on the position in the distribution and not on either pre- or post-tax income. For future use denote by  $G(f)$  the cumulative density function of the social weights.

The tax system will be chosen to maximize (7) subject to a budget constraint. We will assume, for the moment, that all tax revenue is given back to individuals rather than the more common formulation where the government has a revenue constraint because that is the nature of the data we used in the previous section (where a monetary value is attached to the consumption of public services). So, the budget constraint we use can be written as:

$$\int C(f) df = \int W(f) H(f) df = Y \quad (8)$$

The constraint, first pointed out by Mirrlees (1971), that marginal tax rates can be restricted, without loss of generality, to be less than or equal to 1 here translates into the constraint that  $V(f) \geq 0$ . But, assuming we have an interior solution the following Proposition derives a formula for the marginal tax rate  $m(f)$ :

Proposition 1: Assuming an interior solution, the optimal tax system can be written as:

$$\left[ \frac{m(f)}{1-m(f)} \right] = \frac{w'(f)}{\varepsilon(V(f))} \frac{[G(f)-S_c(f)]}{S_c'(f)} \quad (9)$$

where  $S_c(f)$  is the share of total consumption going to those at position  $f$  or below.

Proof: See Appendix A.

The formula for tax rates derived in (9) has clear affinities to those first derived by Mirrlees (1971) and recently revived by Piketty (1997) and Saez (2001). What is slightly different is that everything is expressed in terms of the tax rate at a given position in the income distribution rather than for a given level of income – this is helpful for our purposes as we are interested in what happens to tax rates for the top of the distribution as their incomes rise. In this set-up as in the rest of the literature, it is impossible to provide explicit closed-form solutions to the optimal tax problem so that the right-hand side of (9) depends on the tax system. But one can readily derive from (9) the standard result that marginal tax rates should be zero at top and bottom as  $G(f) = S_c(f)$  at the two extremes.

One special case where a closed-form expression is available is where there are no disincentive effects on labour supply so that  $\varepsilon=0$ . In this case the optimal distribution of post-tax income has  $S_c(f) = G(f)$  (assuming an interior solution) so that one could think of  $G(f)$  as representing the optimal distribution of consumption. In this case the post-tax distribution of income is completely independent of the pre-tax distribution so one would expect an increase in pre-tax inequality to be completely undone by the tax system. (9) also suggests that marginal tax rates should be lower the more elastic is labour supply.

When there is some disincentive effect one would no longer expect increases in pre-tax inequality to be completely undone by the tax system as one wants those with

higher incomes to work more (as this raises national income) and this requires a decline in the progressivity of the tax system. But (9) can be thought of as saying that marginal tax rates should rise if wage inequality rises as this corresponds to a higher  $w'(f)$  and, for no change in the tax system, a lower  $S_c(f)$  for  $0 < f < 1$ .

We now try to see whether the observed outcomes on the distribution of pre- and post-tax incomes can be rationalized as an outcome of the political process as outlined above with constant ‘fundamentals’ (the social weights and labour supply elasticities).

Re-arranging the expression for the optimal tax rate in (9) leads to:

$$S_c(f) = G(f) - \varepsilon \frac{S_c'(f)}{w'(f)} \left[ \frac{m(f)}{1-m(f)} \right] \quad (10)$$

The terms involving  $S_c(f), w'(f), m(f)$  are all computable from the observed data of the previous section (Appendix B describes the exact way in which we do that). But the ‘fundamentals’  $G(f)$  and  $\varepsilon$  are unknowns. However if (10) is satisfied with constant fundamentals it must be the case that the left-hand side (the share of final income) moves inversely with the term in observables on the right-hand side (we will call this the incentive term).

One would not necessarily expect there to be a negative relationship between the share of final income and the incentive term every year as there is quite likely to be a disequilibrium in any particular year – the first-past-the-post electoral system means that Britain is, in the periods between elections, an elective dictatorship with the government facing review in elections every 5 years. So there is considerable scope in the short-run for a deviation of people’s preferences from the actions of government. But, in the

longer-run one would expect a closer alignment so a negative relationship should be visible over a longer time period.

Figure 3 shows that this has not been the case. This plots the share in final income against the estimated incentive term (based on the estimation procedure described in Appendix B) for the sixth through ninth deciles. For all of them, there is a similar picture – the long-run trend is for a positive relationship between the share of final income and the incentive effect, an indication that the rise in inequality has not been met by an increase in redistribution<sup>6</sup>. The 1980s is the period crucial for this positive correlation (and excluding them makes it disappear). However, this is plausible – pre-tax income inequality rose fastest in the 1980s (see Figure 1) and the Thatcher government did not respond by redistributing more.

The model used here is, of course, very special, reducing all the many dimensions of the tax/benefit system to one. But the analysis does strongly suggest that the fundamentals in the economy have changed. We now turn to more direct evidence for these changes.

### 3. Empirical Evidence on the Demand for Redistribution: Data

To look at evidence on the demand for redistribution we turn to data from the British Social Attitudes Survey (BSAS) and British Election Studies (BES). The BSAS

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<sup>6</sup> Our conclusion here differs from that Kenworthy and Pontusson (2005) who use data from the Luxembourg Income Study to argue using Gini coefficients that increased inequality has been associated with increased redistribution in the UK and other countries. However, if we use ONS data on UK Gini coefficients, one cannot reproduce this finding so it may be an artifact of the data used.

has been conducted every year since 1983, except for the years 1987 and 1992, with the BES being conducted in each election year. The BES has various antecedents that go back into the 1960s though the earliest surveys are not much use for our purposes as the questions asked are rarely asked in more recent years. The BSAS/BES asks questions on a wide range of social and political attitudes though the questions asked vary from year to year and even across sub-samples in the same year. Some questions are asked every year or almost every year, some questions occasionally and some in only one survey. Because we are primarily interested in changes over time, we focus most of our attention on the questions asked reasonably regularly but use the more infrequent questions where they are particularly relevant to our investigations.

The question asked in many years of the BSAS/BES that relates most closely to the role that the government should play in redistribution is the question:

REDISTRIBUTE: “government should redistribute from the better-off to those that are less well-off” (1=strongly disagree, 5 strongly agree)

In what follows we will use the answers to this question as our measure of the demand for redistribution. Although the responses to this question might be expected to give some indication of the demand for redistribution, there are a number of possible interpretations of the answers, not all of which would support its use as a measure of the demand for redistribution. For example, it might be that some respondents think there should be some redistribution so agree with the statement but think that redistribution has gone too far and would like less in the current situation. Perhaps the question one would like to have been asked would be ‘government should *do more* to redistribute from the better-off to those that are less well-off’.

Although we do not have the answers to that specific question for all years, there are occasional questions asked about whether more should be done to redistribute. For example in 1987, 1992, and 1997, a question about the view on the current level of redistribution was asked where respondents were asked to place themselves on an 11-point scale where 1 was the belief that government should make much greater efforts to make people's incomes equal and 11 was the belief that the government should be much less concerned about how equal people's incomes are. This correlates closely with the REDISTRIBUTE variable suggesting that those who think there should be redistribution also think there should be more efforts to redistribute. Table 1 shows the average value of the response to the 'more effort' question for each response to REDISTRIBUTE showing a very strong correlation. In a regression of REDISTRIBUTE on the other question, the t-statistic is 59.

Figure 4 presents the time-series for the mean responses to REDISTRIBUTE. In the late 1970s the demand for redistribution was at its highest, then falling until the mid 1980s. The demand for redistribution then rose until the mid-1990s when it began to fall again. The demand for redistribution is currently at its lowest level even though the level of inequality is at or close to its highest level as we have seen in Figures 1 and 2. We would offer the following narrative to explain this pattern as compared to the actual evolution of inequality documented in the previous section. The economic failures of the 1970s led to disillusion with the policies of the Labour Party (including its egalitarian inclinations) and the election of Margaret Thatcher. The 1980s and early 1990s were a period of starkly rising inequality in both pre- and post-tax incomes. This was the period in which the tax system did not respond to the rise in inequality as we have seen from the

analysis in the previous section. But the redistributive policies of the Thatcher government were never particularly popular and there was rising dissatisfaction with the rise in inequality as evidenced by a rising demand for redistribution. The Conservative government remained in power because its policies in other dimensions were deemed better, notably its management of the economy. But, after a narrow election victory in 1992, and the ejection from the exchange rate mechanism in 1993, the government was extremely unpopular and would have lost an election at any time. So, by the time of the Blair landslide in 1997 it is plausible to think there was a gap between the demand for redistribution and the actual amount in the economy. One might have predicted the Blair government to have been strongly redistributive. But, in fact, little happened<sup>7</sup> – both pre- and post-tax inequality were quite stable in this period. If the demand for redistribution was unchanged this would suggest a continuing unmet demand for redistribution. But Figure 4 shows that the demand for redistribution was falling. It is this fall in the demand for redistribution in recent years in the face of relative stability in the income distribution that will be the main focus of the remaining part of this paper. This fall in the demand for redistribution seems to have occurred at all income levels – Figure 5 shows the trend for different quartiles of equivalised household income – as one would expect, the rich have a lower demand for redistribution in a given year but one can see the decline in the demand for redistribution among all income groups.

Our aim is to explain the time-series behaviour of the redistribution variable. Our empirical strategy is to think about the factors likely to be able to explain the attitude towards redistribution using the theoretical framework sketched above, then to see whether these factors can explain the cross-section variation in the demand for

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<sup>7</sup> The redistribution that did take place focused heavily on children and pensioners.

redistribution and then to see whether time-series variation in these variables can explain the trend in the demand for redistribution. If all relevant questions were asked in all years of BSAS this investigation would be very straightforward but unfortunately they are not so it is a bit messier. This explains why, for example, one cannot simply include all variables of potential interest in a single regression and why the sample sizes in the regressions reported below vary from one case to the next.

Using the theoretical framework in the earlier section we might think that the demand for redistribution would be a function of the social weights (the  $g(f)$  function) and views about the importance of incentives ( $\varepsilon$ ). In addition we also consider the role played by perceptions of the level of pre-tax wage inequality and trust in the political process to deliver what voters want. Our explanation for the fall in the demand for redistribution will focus on these factors.

## **Social Weights**

‘Social weights’ here should be interpreted very broadly to mean any factor that affects the  $g(f)$  function, the weight in the social welfare function attached to the utility of people at various points in the income distribution. We would expect this to be affected by the preferences of individuals over outcomes and their weight in the political process.

The simplest economic models assume that individuals only care about the outcomes that affect their current selves so that the current position in the income distribution affects the demand for redistribution – we will capture this by log income relative to the median. Because measures of current income are quite likely to have a lot of noise in them we also include occupation and education as measures of permanent

income. Some other work (e.g. Luttmer, 2001; Vigdor, 2006) has suggested that it is how one is doing relative to people in one's own neighbourhood (and not the national level as our specification assumes) that is most important in influencing views on redistribution – we are not really able to test this view because BSAS only has regional information at the level of 11 broad regions.

But, people's position in the income distribution is not constant. The future position in the income distribution might be unpredictable leading to a demand for social insurance which means weight is put on people at other points in the income distribution other than one's current position. The more important luck is felt to be in determining success or the more risk-averse one is the more redistribution one might expect. Other work (e.g. Fong, 2001; Alesina and La Ferrara, 2005) has shown how the attitude to redistribution is influenced by beliefs about whether success is the result of luck or hard work and Cusack et al (2006) find that the demand for redistribution is related to exposure to labour market risk. Unfortunately BSAS does not contain any question related to this.

Or, the future position in the income distribution might be predictable. The prospect of upward mobility would mean individuals put some weight on outcomes in parts of income distribution where they expect to be in the future (Benabou and Ok, 2001). Alesina and La Ferrara (2005) use predicted income mobility from panel data and find higher future income growth is useful in predicting attitudes to redistribution in the US. We do not take this approach as, in the absence of micro data on actual mobility, the identification strategy depends on excluding some variables that influence income growth from the redistribution equation, which might be questionable. But, in our data we might

expect the young to be less in favour of redistribution than the old with a given level of current income as the young can expect their income to grow in the future.

Or, it may be that people really do care about the utility of others. This might be positively in the sense of altruism or negatively in the sense of status rivalry (see, for example, Corneo and Gruner, 2002). Suppose that each individual has a utility function:

$$\tilde{u}(f) = u(f) + \beta \int_0^1 u(x)\pi(x)dx \quad (11)$$

Where  $u(x)$  is their utility as defined previously and where  $\beta$  measures the weight put on the utility of others.  $\pi(x)$  represents the weight on the utility of someone at position  $x$  – it will be positive if one cares about them but could be negative if one is envious of them.

In this case the social welfare function that is effectively being maximized is:

$$\int_0^1 \tilde{u}(f) \tilde{g}(f) df = \int_0^1 u(f) [\tilde{g}(f) + \beta \pi(f)] df \quad (12)$$

Where  $\tilde{g}(f)$  is the weight in the political process. Using (11) and (12) the effective weights are:

$$G(f) = \frac{\tilde{G}(f) + \beta \Pi(f)}{1 + \beta} \quad (13)$$

More weight will be put on the lower part of the distribution if people are less selfish and more weight on the top part if people are less envious – Alesina, Glaeser and Sacerdote (2001) make this point. It is important to note that the effects of more selfishness and less envy are, in some ways, symmetric in terms of their predictions about what will happen to redistribution. To capture these ideas about social preferences we include variables which measure whether people agree with the statements that

CLASSCONFLICT1 “big business benefits owners at the expense of workers” (1 strongly disagree....5 strongly agree)

CLASSCONFLICT2 “there is one law for the rich and one for the poor” (1 strongly disagree....5 strongly agree)

on the grounds that these seem to reflect views that the pre-tax distribution of income is not legitimate so agreement with these statements might be expected to be associated with a greater demand for redistribution. Because these ideas are associated with the trade union movement we also control for trade union membership, TUNION.

Alesina, Glaeser and Sacerdote (2001) also argue that interpersonal altruism seems linked to race. In the UK, as in many countries, ethnic minorities tend to have lower incomes so are favoured by redistribution. If this is the case we might expect those who express racial prejudice to be more opposed to redistribution. To capture this idea we include the following self-assessed measure of racial prejudice:

RACIALPREJUDICE “Would you describe yourself as: 3: very prejudiced against people of other races, 2: a little prejudiced, 1: not prejudiced at all”

There are also some questions in BSAS/BES that might be interpreted as being directly about preferences over the distribution of income as they do not refer to inequality without making explicit reference to whether the government should do anything about it:

PREFERENCES1 “The gap between rich and poor is 1: too large, 0: about right/too small.”

PREFERENCES2 “Ordinary working people do not get their fair share over the nation’s wealth” (1 strongly disagree....5 strongly agree)

These questions relate to views about the legitimacy and fairness of the income distribution. However, there are a number of possible ways to interpret these responses, not all of which are consistent with their use as a measure of pure preferences. The answers might be about their comparison of the current income distribution with their ideal income distribution in a world with no disincentives or untrustworthy politicians – in this case one might interpret it as being primarily about preferences. Or it could be answered as being about the ideal income distribution in a world with disincentives in which case one might interpret it as being about whether there should be more or less redistribution from the current situation. In the latter case, the variables might not be very different from the dependent variable. In favour of the ‘pure preference’ view it should be said that very large majorities think the gap between rich and poor is too large (see Bromley, 2003, for a more extensive analysis of this variable) making it problematic to interpret this question as being about whether there should be more or less redistribution as there would then seem to be a very large excess demand for redistribution. However because of the ambiguity in the interpretation of these questions we report specifications with and without these variables.

We also include a variable NORELIGION according to whether individuals do not have a religion (Scheve and Stasavage, 2006, provide an argument for why the religious are less in favour of redistribution). Non-christians are too few in number to allow more disaggregation than this.

Finally, one might expect that the weight in the social objective function is influenced by the propensity to vote. It is well-known that turnout in UK general

elections has fallen and if this fall in turn-out is not randomly distributed this can affect the demand for redistribution among voters. In practice this does not seem very important – Figure 6 shows the change in demand for redistribution among voters and non-voters. Voters are marginally less likely to favour redistribution but the trends are very similar. We do not pursue this argument further as we have always found it to have little explanatory power.

Perhaps more tricky is to evaluate the argument that money has been becoming more influential in politics so that we have moved away from ‘one person one vote’ towards ‘one pound one vote’. Those who argue for this tend to suggest that money influences preference through the actions of the media. Unfortunately, BSAS has limited information on media use, the only question regularly asked is whether the respondent reads a newspaper with, in occasional years, questions on the number of hours of TV watched. We found these, admittedly limited, variables to be of little use in explaining attitudes to redistribution so do not pursue this line of enquiry further.

### **Perceptions of Inequality**

The model used in the theoretical section assumed that everyone knows the true distribution of post-tax income. But, in practice there is poor information. In particular, there is evidence that the extent of wage inequality at the top is much greater than perceived – see Hills (2004). This can explain why we see less redistribution than might be expected but in order to explain changes over time one needs the degree of misperception to change.

In 1987 and 1999 (but unfortunately, only those years) respondents are asked about what they think the actual pay is and should be of certain groups of workers – the occupations asked about in both years are skilled factory workers, unskilled factory workers, doctors, chairman of a big corporation and a cabinet minister. There is considerable heterogeneity in the answers to the questions about what actual pay is, revealing considerable misperceptions of the true pay distribution. As measures of perceived actual pay differentials we use the following:

ACTPAYDIFF1 “log of actual pay of unskilled factory worker relative to skilled factory worker”

ACTPAYDIFF2 “log of actual pay of chairman of big corporation relative to skilled factory worker”

ACTPAYDIFF3 “log of actual pay of doctor relative to skilled factory worker”

ACTPAYDIFF4 “log of actual pay of cabinet minister relative to skilled factory worker”

where we use the perceived earnings relative to a skilled factory worker as they have close to average earnings. We also define the variables SHDPAYDIFFx to represent the actual pay differential the respondent believes there should be. As documented by Hills (2004) the responses to these questions do show a demand for redistribution as the desired pay differentials are smaller than the actual (subject to the proviso that doctors are generally thought particularly deserving of high salaries and cabinet ministers less

deserving). But this data also show widespread variation in the perceptions of the actual degree of pay inequality.

## **Incentives**

The elasticity of the labour supply curve is important in determining the optimal degree of redistribution. We often assume people know the ‘right’ model but academic economists debate the size of disincentive effects (see, for example, the contrasting views of Feldstein, 1995, and Gruber and Saez, 2002) so we should not be that surprised if this was mirrored in the electorate. To capture this possibility we use the following questions:

INCENTIVES1 “the welfare state makes people nowadays less willing to look after themselves” (1: strongly disagree,..., 5: strongly agree)

INCENTIVES2 “if welfare benefits weren’t so generous people would learn to stand on their own feet” (1: strongly disagree,...,5: strongly agree)

INCENTIVES3 “Around here most unemployed people could find a job if they really wanted one” (1: strongly disagree,...,5: strongly agree)

These questions are about incentives in the bottom part of the income distribution that may not necessarily be linked to those at the top. There are no directly equivalent questions about incentives in the top part of the distribution but we do experiment with:

INCENTIVES4 “no-one would study for years to become a lawyer or doctor unless they expected to earn a lot more than ordinary workers” (1: strongly disagree,..., 5: strongly agree)

INCENTIVES5 “large differences in income are necessary for Britain’s prosperity” (1: strongly disagree,...,5: strongly agree)

These two last questions are only asked in a handful of years so cannot be used when trying to account for the changing demand for redistribution.

## Trust

The model presented above assumes that the tax/benefit system that maximizes the social objective function will be implemented. But, in reality, citizens rely on their elected representatives to implement policies and this principal-agent problem is one in which the politicians are only held to account in occasional elections. In Appendix C we modify the model of the earlier section to include, in a stylized manner, an agency cost in which the government diverts a certain part of the revenue passing through its hands to its own ends that are assumed to be worthless to the general population. As the model sketches, the larger the agency problem the less likely there is to be redistribution because the less money that passes through the government’s hands, the less ability there is to divert resources to their own ends. To capture these ideas we use various measures of trust in government:

TRUST1 “How much do you trust the British government of any party to place the needs of the nation above the interests of their own political party” (4: just about always,..., 1: almost never)

TRUST2 “Generally speaking those we elect as MPs lose touch with people pretty quickly” (1: strongly disagree,...,5: strongly agree)

TRUST3 “Parties are only interested in people’s votes not in their opinions” (1: strongly disagree,...,5: strongly agree)

TRUST4 “People like me have no say in what the government does” (1: strongly disagree,...,5: strongly agree)

TRUST5 “Sometimes politics and government seem so complicated that a person like me cannot really understand what is going on” (1: strongly disagree,...,5: strongly agree)

Another way in which the actual amount of redistribution might differ from the intended amount is through incompetence. To capture these ideas we use the following measures of fraud in the welfare system:

FRAUD1 “Most people on the dole are fiddling in one way or another” (1: strongly disagree,...,5: strongly agree)

FRAUD2 “Large number of people these days falsely claims benefits” (1: strongly disagree,...,5: strongly agree)

Descriptive statistics of all these variables are reported in Table 2 together with means for different time periods to give an idea of trends.

#### 4. Empirical Evidence on the Demand for Redistribution: Pooled Cross-Section Results

We start by reporting results based on pooled cross-sections, and then try to decompose changes over time. Table 3 reports descriptive statistics for the demographic variables

and the results of an equation for the demand for redistribution that only includes demographic variables.

The dependent variable is the response to the question “government should redistribute income from the better-off to those that are less well-off” and takes the value 1-5 with higher values representing a greater demand for redistribution. We simply estimate a linear model because this makes the decompositions that follow easier but nothing crucial depends on this.

In column 2 of Table 3 we see that there is a very strong effect of relative equivalised income on the demand for redistribution, a common finding in the literature. This suggests that economists’ models of the demand for redistribution as first proposed by Romer (1975) and Meltzer and Richard (1981) do contain an element of truth. Current income might contain a lot of noise so it is not surprising that we find an additional effect of occupation with those in higher level occupations favouring less redistribution. But education, conditional on income and occupation, does not have a simple relationship to the demand for redistribution – the demand is highest amongst those with a college degree and then those with no qualification<sup>8</sup>.

But, unsurprisingly, other factors are also significant. Women are less in favour of redistribution than men, the demand for redistribution rises with age , ethnic minorities are more in favour of redistribution than whites, the non-married are more in favour of redistribution than the married with the divorced and separated being particularly in favour of redistribution (perhaps in line with Edlund and Pande, 2002). Those with more children are less in favour of redistribution. There are sizeable regional effects with those

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<sup>8</sup> This ordering is reversed if one excludes income and occupation but it remains the case that those with a degree tend to favour more redistribution than those with lower levels of education

in Scotland, Wales, the north of England and greater London being more in favour of redistribution.

We do not seek to explain all of these correlations – rather we simply use them as background for the variables in which we have more interest. We start by including the sets of variables in groups because one has very few observations if all potentially relevant variables are included at once. In the first column of Table 4 we include variables related to preferences towards redistribution. The coefficients on these variables have the expected sign and are significantly different from zero. Particularly strong are the variables that measure the ‘class conflict’ variables that measure views on the fairness of society – those who think big business is bad and who think there is one law for the rich and one for the poor are much more likely to be in favour of redistribution. Those who are racially prejudiced and the religious are less in favour of redistribution while trade union members are more. The second column then includes the direct measures of the preferences for redistribution. These variables have the expected sign and are significant but the size and significance of the coefficients on the other variables is unaffected.

The next set of results then include variables designed to measure misperceptions. In the third column of Table 4 we include the perceptions about actual pay differentials. Individually these are not very significant but one can reject the hypothesis that they are jointly equal to zero. The significance of these variables improves if one controls for desired pay differentials (suggesting, perhaps in line with the predictions of cognitive dissonance that people do not perceive what they do not like) – the results are reported in the fourth column. The fifth column then only retains the pay differentials relating to

unskilled workers, chairmen of corporations and ministers. The coefficients on what pay differentials should be correlated with the demand for redistribution in the way one would expect. The results here suggest that, controlling, for preferences on desired pay differentials, one is more likely to be in favour of redistribution if one perceives a great deal of inequality. As Hills (2004) has documented, people tend to under-estimate the size of pay differentials so this has the potential to explain a weak demand for redistribution. However, to explain a falling demand for redistribution, one would have to argue that misperceptions have worsened over time. The fact that these questions were only asked in 1987 and 1999 makes it hard to consider whether this has happened but the means reported in Table 2 suggest that perhaps perceptions of inequality at the top have risen.

Table 5 includes the variables related to incentives. In the first column all of the questions about the incentives associated with the welfare state are included. Agreeing that the welfare state makes people less willing to look after themselves, that the unemployed could get a job if they really wanted one, that if welfare benefits weren't so generous they would learn to stand on their own two feet are all associated with demanding less redistribution. As discussed earlier these variables are about the incentives effects at the bottom of the distribution not the top, but the second column shows that the variables relating to incentives at the top are also correlated with the demand for redistribution. The third column includes all of the incentive variables. Unfortunately, the variables relating to incentives at the top are only available for a few years so cannot be used in the decomposition reported below.

In Table 6 we include the variables related to trust in government and belief that the system operates fairly. Belief that large numbers of people falsely claim benefits and that most people on the dole are fiddling are strongly associated with lower demands for redistribution. The variables related to trust in government are much weaker, generally of the ‘wrong’ sign and individually do not appear significant. But as the third column shows, this is partly a collinearity problem – exclusion of some variables makes the remaining ones significant though with the opposite sign from that predicted. However, the overall effect remains small.

We have included sets of variables one at a time. But, if one selects the most significant variables and includes them in a pooled regression one gets results like those presented in Table 7. The variables that were significant individually remain significant – the effects of the class conflict variables are particularly large. These results suggest that the predictions of a simple theory about the variation in the demand for redistribution are in line with the empirical evidence. But, we are more interested in whether we can explain the fall in the demand for redistribution using changes in these variables. Our attempt to do that is the subject of the next section.

##### 5. Empirical Evidence on the Demand for Redistribution: Changes Over Time

Our aim in this section is to try to provide an account of the change in the demand for redistribution over time. Because not all of the relevant questions are asked in each year of the BSAS, our approach is limited, to a considerable degree, by the availability of data. We take three sample periods, early (1986 and 1987), middle (1994 and 1996) and late (2003 and 2004). The choice of years might appear a little arbitrary but are chosen in

part to reflect the availability of data (e.g. the key question on the demand for redistribution is not asked in 1995 or the latest available year, 2004). Our chosen periods do reflect a period in the 1980s when the demand for redistribution was low, a period in the 1990s when it was at its peak and a period of still lower demand in the 2000s.

Our empirical approach is to estimate separate equations for the demand for redistribution in each of these periods and then to use Oaxaca decompositions to decompose the observed change in the demand for redistribution into a part that is due to changing coefficients and a part that is due to changing characteristics. The latter component can then be further decomposed into a part due to each type of variable. Our chosen specification for this exercise includes all the demographics and then the variables CLASSCONFLICT1, CLASSCONFLICT2, RACIALPREJUDICE, INCENTIVES2-3 and FRAUD2. This choice of variables to include is partly determined by those that were especially significant in the results reported in the previous section but also by the availability of questions in enough years. For example, the variables relating to government trust are not available in enough years to be useful, but were not generally found to be very significant.

The estimates of the redistribution equation for the 3 periods are reported in Table A1 and the Oaxaca decompositions in Table 8. We report results when evaluating the change in characteristics at both sets of coefficients – though the choice of year for the coefficients typically makes little difference. The first point is that the effect of demographics is normally very small and not always in the direction of a falling demand for redistribution. For example, the share of graduates is rising strongly, and graduates tend to be more pro-redistribution.

But the other included variables can explain much of both the rise in the demand for redistribution from the mid 1980s to the mid 1990s and the subsequent fall, though the important factors vary from one sub-period to another. First, let us consider the whole period from the mid 1980s to the 2000s. Here one can explain approximately 75% of the fall in the demand for redistribution and it is the variables related to incentives that are most important in that. Changing preferences and declining trust in the system are much less important.

But, the decomposition for the 2 sub-samples is a bit different. In the first sub-period, from 1986/7 to 1994/6 there is a rise in the demand for redistribution with something like two-thirds being explainable. The most important factor here were the changes in the ‘class conflict’ variables – there was, for example, little change in attitudes about incentives. This change is perhaps not surprising given the large rise in pre-tax income inequality in this period. But in the second sub-period, from 1994/6 to 2003/4 things are very different. There is now a very large collapse in the demand for redistribution with, again, something like two-thirds being explainable. Now, it is the attitudes about incentives that are changing the most but the class conflict variables move in the direction of reducing the demand for redistribution, ending up, more or less, where they had been in the 1980s. This change in attitudes is perhaps remarkable because, although attitudes ended up in a similar place, income inequality did not – it was much higher in 2003/4 than in 1986/7. But, considering the period as a whole it appears that this rise in income inequality has not made people more hostile to the rich and their belief in the power of incentives has increased.

There is one other issue that deserves some discussion. One of the demographic variables included in these regressions is age. Others have argued that cohort effects are important that, for example, those who came of age in the Thatcher era have very different preferences from the hippies of the sixties generation (see, for example, Bromley, 2003). There is a well-known insurmountable collinearity problem that year of birth=year-age so one cannot hope to separately disentangle age from cohort and time effects. Perhaps more worryingly for the investigation here, the way in which one chooses to model the demand for redistribution will affect the Oaxaca decomposition. To see this, consider the following simple example. Suppose there are no cohort effects, only age effects and the relationship between the demand for redistribution and age is linear and stable over time. Represent it by:

$$y_{it} = \beta_0 + \beta_1 a_{it} + \varepsilon_{it} \quad (14)$$

Then all of any observed change in redistribution can only be due to changes in the age distribution – the Oaxaca decomposition will tell us the contribution of changing coefficients is zero. But, now suppose we model the demand for redistribution as a function of year of birth,  $b_{it}$ . (14) now becomes:

$$y_{it} = (\beta_0 + \beta_1 t) - \beta_1 b_{it} + \varepsilon_{it} \quad (15)$$

The average year of birth must be increasing over time so that the intercept in the redistribution equation will appear to be changing. The Oaxaca decomposition will give a different answer about the contribution of characteristics and coefficients to the changing demand for redistribution.

There is no solution to this problem as one can never separately identify age and cohort and year effects. But we do not believe it a serious problem. We have done our

decomposition with year of birth instead of age in the demographic variables and our results are very similar. The reason for this is that views on redistribution are not strongly correlated with age (see Alt, Preston and Sibeta, 2007, for a similar conclusion).

Our findings suggest that it is the changing views about the workings of the economy, both in terms of the importance of incentives and the justness of the pre-tax distribution of resources (as measured by the class conflict variables), that can explain the fall in the demand for redistribution. Of course, one should not think of this as a deep causal explanation – these preferences should themselves be seen as endogenous and it is an impossible task to track changes in attitudes back to some clearly exogenous fundamentals. Because of this problem, the next section sketches some ways in which these preferences might be endogenous.

## 6. The Endogeneity of Preferences and Beliefs

In this paper we have shown how, over the past 25 years, pre-tax income inequality has risen and the demand for redistribution has fallen. These changes might be independent of each other but there is also the possibility that they are connected. Such connections might run in both directions. For example, Benabou and Tirole (2006) and Alesina and Angeletos (2004) have constructed ingenious models in which the level of inequality influences beliefs. These models can have multiple equilibria in which inequality and redistribution are negatively correlated. Alternatively, it may be that a rise in inequality puts the rich at more risk of redistribution while giving them more resources to fight it. Hence it may be that the rise in inequality caused the rich to invest more in moulding the attitudes of voters in ways that are more tolerant of inequality.

But it is also possible that the causality runs from beliefs to pre-tax income inequality. This might be because pre-tax inequality is influenced by some aspects of government policy e.g. the minimum wage or high-quality publicly funded education though these are not the factors most often mentioned in accounts of the evolution of UK wage inequality. But it might also be because the decline of class conflictual attitudes and the rising belief in the importance of incentives leads to rising relative pay for managers within firms i.e. to widening pre-tax income inequality.

There is no way that we can hope to disentangle these interconnections and decide which are the important ones with the data available to us. But our data does suggest that preferences and attitudes can change quite markedly over short periods of time so that models that always treat these fundamentals as changing rather slowly may be rather inaccurate and that a very important part of politics may be the battle for the hearts and minds of voters.

## 7. Conclusions

In this paper we have shown how the rise in pre-tax income inequality in the UK has not led to more redistribution. The main reason for this would appear to be that the demand for redistribution is falling and is currently at its lowest recorded level. We have shown that theories of the demand for redistribution do have explanatory power – e.g. the rich are less in favour of redistribution, and those who believe incentives are important favour less redistribution. Furthermore these attitudes can change quite rapidly over time. Using decomposition, we have argued that the main change in attitudes that can account for the falling demand for redistribution in the UK is a greater belief in the importance of

incentives as proxied by attitudes about the disincentives to work associated with the welfare state. Quite why attitudes have changed in this way is an interesting question and could, conceivably be linked with the rise in wage inequality, but we are not able to offer an answer to this question.

**Table 1: The correlation between measures of the demand for redistribution**

<i>REDISTRIBUTE</i>	<i>Mean Value of Redistribution scale</i>	<i>Number of observations (Total number 3313)</i>
1	7.98	274
2	6.73	918
3	5.28	664
4	3.7	982
5	2.37	475

Notes: REDISTRIBUTE stands for the statement “government should redistribute from the better-off to those that are less well-off”, with answers from 1 to 5, where 1 corresponds to “strongly disagree” and 5 to “strongly agree”. Redistribution scale runs from 1 to 11 with 1 corresponding to the view that “the government should make much greater efforts to make people’s incomes equal” and 11 to the view that “the government should be much less concerned about how equal people’s incomes are”.

**Table 2: Descriptive Statistics for Attitudinal Variables**

<i>Variables</i>	<i>Average-1980s</i>	<i>Average-1990s</i>	<i>Average-2000s</i>	<i>Average-All Years</i>
REDISTRIBUTE: Government should redistribute income from better-off to those that are less well-off	3.2	3.24	3.08	3.2
CLASSCONFLICT1: Big business benefit owners at the expense of workers	3.37	3.51	3.5	3.48
CLASSCONFLICT2: There is one law for the rich and one for the poor	3.63	3.75	3.6	3.68
RACIALPREJUDICE	1.4	1.34	1.3	1.36
PREFERENCES1: Gap between rich and poor	0.79	0.84	0.81	0.81
PREFERENCES2: Ordinary working people do not get their fair share over the nation's wealth	3.61	3.67	3.6	3.63
NORELIGION	0.32	0.38	0.42	0.38
TRADE UNION MEMBER	0.25	0.19	0.18	0.2
ACTPAYDIFF1. Log of actual pay of unskilled worker relative to skilled worker	-0.48	-0.41	n/a	-0.45
ACTPAYDIFF2 Log of actual pay of chairman of big corporation worker relative to skilled worker	1.89	2.24	n/a	2.03
ACTPAYDIFF3. Log of actual pay of a doctor relative to skilled worker	0.73	0.88	n/a	0.79
ACTPATDIFF4. Log of actual pay of cabinet minister relative to skilled worker	1.24	1.42	n/a	1.31
SHDPAYDIFF1. Log of preferable pay of unskilled worker relative to skilled worker	-0.41	-0.36	n/a	-0.39
SHDPAYDIFF2. Log of preferable pay of chairman of big corporation relative to skilled worker	1.22	1.4	n/a	1.29
SHDPAYDIFF3. Log of preferable pay of doctor relative to skilled worker	0.67	0.77	n/a	0.68
SHDPAYDIFF4. Log of preferable pay of cabinet minister relative to skilled worker	0.8	0.91	n/a	0.84
INCENTIVES1: Welfare state makes people less willing to look after themselves	3.06	3.19	3.34	3.16
INCENTIVES2: If benefits weren't so generous people would learn to stand on their own feet	2.9	2.84	3.15	2.95
INCENTIVES3: Unemployed people could find a job if want to	2.71	2.86	3.63	3.05
INCENTIVES4: No-one would study to become a lawyer or doctor unless they expect to earn a lot more than ordinary workers	3.71	3.61	3.61	3.64
INCENTIVES5: Large differences in income are necessary for Britain's prosperity	2.75	2.55	2.78	2.72
TRUST1: How much trust gov to place nation's needs above that of their own party	2.38	2.14	1.95	2.13
TRUST2: MPs lose touch with people quickly	3.72	3.82	3.85	3.82
TRUST3: Parties are interested in people's votes not their opinions	3.5	3.72	3.86	3.73
TRUST4: People like me have no say in what gov does	3.46	3.46	3.6	3.52
TRUST5: Gov and politics are so complicated	3.61	3.47	3.47	3.48
FRAUD1: People on the dole fiddle	2.92	3.01	3.16	3.05
FRAUD2: Many people falsely claim benefits	4.05	4.27	4.34	4.23

Notes: Higher values are associated with (stronger) support of relevant statements/questions. In particular, RACIALPREJUDICE is coded as 1: no prejudiced, 3: very prejudiced, PREFERENCES1 as 1: too large, 0: about right/too small and TRUST1 as 1: almost never, 4: just about always. NORELIGION and TRADE UNION MEMBER are binary coded as 1 if yes and 0 if no. All other variables except ACTPAYDIFF1-4 and SHDPAYDIFF1-4 are coded as 1: strongly disagree, 5: strongly agree.

**Table 3: Descriptive Statistics for Demographic variables and Results from a regression of REDISTRIBUTE on demographics**

<i>Demographic Variables</i>	<i>Mean</i>	<i>Regression results</i>
Log relative household income	0.029 (0.67)	-0.300 (0.012)**
Intermediate non manual	0.17 (0.37)	0.184 (0.020)**
Junior non manual	0.19 (0.39)	0.142 (0.020)**
Skilled manual	0.19 (0.39)	0.266 (0.020)**
Semi-skilled manual	0.17 (0.37)	0.316 (0.022)**
Unskilled manual	0.05 (0.023)	0.392 (0.030)**
Other occupation	0.002 (0.047)	-0.307 (0.122)*
Degree	0.12 (0.33)	0.250 (0.024)**
Higher education below degree	0.14 (0.35)	-0.137 (0.021)**
A levels or equivalent	0.11 (0.32)	-0.173 (0.022)**
O levels or equivalent	0.19 (0.39)	-0.172 (0.019)**
CSE or equivalent	0.09 (0.29)	-0.106 (0.022)**
Foreign/other qualification	0.01 (0.1)	-0.120 (0.054)*
Employed	0.56 (0.49)	0.012 (0.029)
Other status	0.39 (0.48)	-0.017 (0.030)
Male	0.45 (0.49)	0.139 (0.013)**
Age	47.6 (17.03)	0.015 (0.002)**
Age <sup>2</sup>	2562.63 (1746.1)	-0.0001 (0.00002)**
Black	0.014 (0.11)	0.112 (0.049)*
Asian	0.016 (0.12)	0.173 (0.046)**
Mixed/other race	0.007 (0.08)	0.131 (0.069)
Living as married	0.067 (0.25)	0.102 (0.025)**
Separated	0.11 (0.31)	0.234 (0.019)**
Widowed	0.1 (0.3)	0.181 (0.023)**
Single	0.16 (0.37)	0.201 (0.019)**
No. of children	0.09 (0.2)	-0.036 (0.007)**
Scotland	0.064 (0.24)	0.248 (0.023)**
North East England	0.099 (0.2)	0.158 (0.027)**

North West England	0.064 (0.24)	0.161 (0.023)**
York & Humber	0.09 (0.28)	0.111 (0.023)
West Midlands	0.092 (0.28)	0.085 (0.023)**
East Midlands	0.077 (0.26)	0.039 (0.025)
Eastern England	0.045 (0.2)	0.057 (0.030)
South West England	0.09 (0.29)	0.078 (0.023)**
London	0.098 (0.29)	0.141 (0.023)**
Wales	0.05 (0.22)	0.185 (0.029)**
Year dummies		Yes
No. of observations	34341	34341
R <sup>2</sup>		0.09

The dependent variable in the regression reported in the second column is the REDISTRIBUTE variable.  
 Standard errors in parentheses, \* significant at 5% level; \*\* significant at 1% level

**Table 4: Regressions explaining redistribution with preferences and perceptions variables**

Independent Variables	(1)	(2)	(3)	(4)	(5)
<i>Preferences</i>					
Big business benefits owners at the expense of workers	0.389 (0.008)**	0.248 (0.012)**			
One law for rich and one for poor	0.248 (0.008)**	0.141 (0.011)**			
Union member	0.051 (0.018)**	0.045 (0.023)*			
Racial prejudiced	-0.140 (0.013)**	-0.131 (0.016)**			
No religion	0.052 (0.015)**	0.052 (0.019)**			
Gap between rich and poor too large		0.225 (0.024)**			
Ordinary working people do not get their fair share over the nation's wealth		0.317 (0.013)**			
<i>Misperceptions</i>					
Log of <b>actual</b> pay of unskilled worker relative to skilled worker		-0.144 (0.105)	-0.630 (0.124)**	-0.62 (0.11)**	
Log of <b>actual</b> pay of chairman of big corporation worker relative to skilled worker		-0.007 (0.039)	0.173 (0.046)**	0.18 (0.04)**	
Log of <b>actual</b> pay of a doctor relative to skilled worker		-0.080 (0.081)	0.046 (0.106)		
Log of <b>actual</b> pay of cabinet minister relative to skilled worker		0.149 (0.054)**	0.171 (0.062)**	0.20 (0.05)**	
Log of <b>desired</b> pay of unskilled worker relative to skilled worker			0.808 (0.126)**	0.77 (0.10)**	
Log of <b>desired</b> pay of chairman of big corporation relative to skilled worker			-0.353 (0.056)**	-0.42 (0.05)**	
Log of <b>desired</b> pay of doctor relative to skilled worker			-0.122 (0.107)		
Log of <b>desired</b> pay of cabinet minister relative to skilled worker			-0.090 (0.068)	-0.11 (0.06)	
Demographic variables	Yes	yes	yes	yes	Yes
Year dummies	Yes	yes	yes	yes	Yes
No. of observations	19046	10606	1448	1386	1409
R <sup>2</sup>	0.32	0.38	0.10	0.17	0.17

The dependent variable in the regression reported in the second column is the REDISTRIBUTE variable.  
Standard errors in parentheses, \* significant at 5% level; \*\* significant at 1% level

**Table 5: Regressions explaining redistribution with incentive variables**

Independent Variables	(1)	(2)	(3)
<i>Incentives</i>			
Welfare state makes people less willing to look after themselves	-0.091 (0.009)**		-0.044 (0.049)
If benefits weren't so generous people would learn to stand on their own feet	-0.095 (0.009)**		-0.131 (0.052)**
Unemployed people could find a job if want to	-0.077 (0.009)**		-0.021 (0.051)
Large differences in income are necessary for Britain's prosperity		-0.238 (0.020)**	-0.254 (0.044)**
No one would study for years to become a lawyer or doctor unless they expected to earn a lot more than ordinary workers		0.067 (0.020)**	-0.055 (0.044)
Demographic variables	yes	yes	yes
Year dummies	yes	yes	yes
No. of observations	18809	3012	654
R <sup>2</sup>	0.12	0.12	0.17

The dependent variable in the regression reported in the second column is the REDISTRIBUTE variable.  
Standard errors in parentheses, \* significant at 5% level; \*\* significant at 1% level

**Table 6: Regressions explaining redistribution with trust and fraud variables**

Independent Variables	(1)	(2)	(3)
<i>Trust</i>			
How much trust gov to place nation's needs above that of their own party	-0.031 (0.022)	-0.022 (0.020)	
MPs lose touch with people quickly	0.006 (0.020)	0.007 (0.018)	
Parties are interested in people's votes not their opinions	0.025 (0.020)	0.027 (0.018)	0.037 (0.014)**
People like me have no say in what gov does	0.003 (0.015)		
Gov and politics are so complicated	0.009 (0.015)		
<i>Fraud</i>			
People on the dole fiddle	-0.104 (0.015)**	-0.088 (0.014)**	-0.084 (0.014)**
Many people falsely claim benefits	-0.14 (0.017)**	-0.141 (0.016)**	-0.137 (0.015)**
Demographic variables	yes	yes	Yes
Year dummies	yes	yes	Yes
No. of observations	5285	6021	6807
R <sup>2</sup>	0.10	0.10	0.10

The dependent variable in the regression reported in the second column is the REDISTRIBUTE variable. Standard errors in parentheses, \* significant at 5% level; \*\* significant at 1% level

**Table 7: Pooled regressions explaining redistribution with selected variables**

Independent Variables	(1)	(2)
<i>Preferences</i>		
Big business benefit owners at the expense of workers	0.429 (0.020)**	0.423 (0.014)**
One law for rich and one for poor	0.217 (0.019)**	0.231 (0.014)**
Union member	0.018 (0.043)	
Racial prejudiced	-0.125 (0.034)**	-0.096 (0.023)**
No religion	0.025 (0.036)	
<i>Incentives</i>		
Welfare state makes people less willing to look after themselves	-0.064 (0.019)**	-0.065 (0.014)**
If benefits weren't so generous people would learn to stand on their own feet	-0.039 (0.021)	-0.041 (0.014)*
Unemployed people could find a job if want to	-0.053 (0.020)**	-0.059 (0.014)**
<i>Trust</i>		
Parties are interested in people's votes not their opinions	-0.016 (0.018)	
<i>Fraud</i>		
People on the dole fiddle	-0.036 (0.021)	
Many people falsely claim benefits	-0.048 (0.018)*	-0.055 (0.013)**
Demographic variables	Yes	Yes
Year dummies	Yes	Yes
No. of observations	3047	5802
R <sup>2</sup>	0.34	0.36

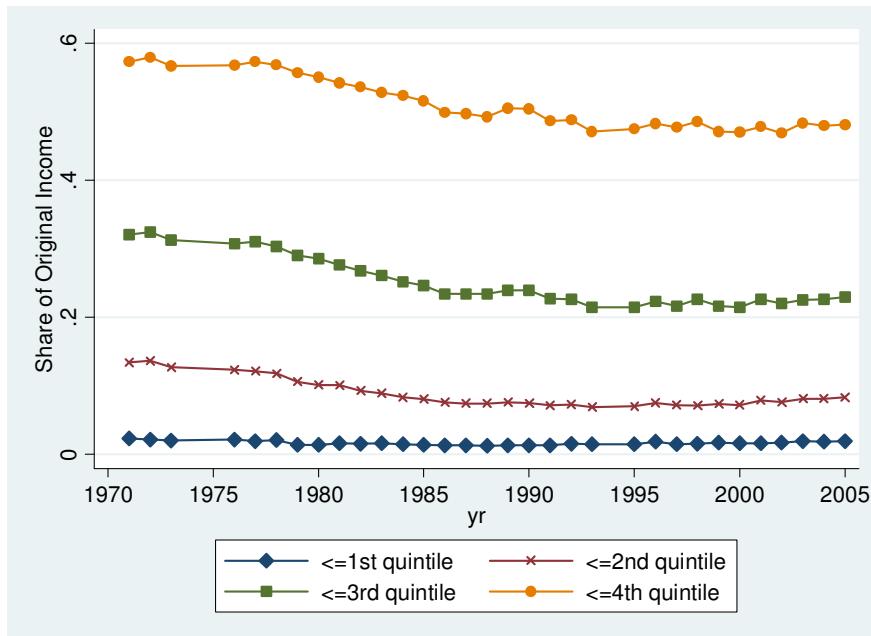
The dependent variable in the regression reported in the second column is the REDISTRIBUTE variable.  
Standard errors in parentheses, \* significant at 5% level; \*\* significant at 1% level

**Table 8: Oaxaca decomposition of changes in the demand for redistribution over time**

	1986/87-2003/04		1986/87-1994/96		1994/96-2003/04	
	1986/87 estimated coefficients	2003/04 estimated coefficients	1986/87 estimated coefficients	1994/96 estimated coefficients	1994/96 estimated coefficients	2003/04 estimated coefficients
<b>Total Difference</b>	-0.166	-0.166	0.156	0.156	-0.323	-0.323
<b>Unexplained</b>	-0.054	-0.043	0.065	0.041	-0.143	-0.11
<b>Explained</b>	-0.112	-0.123	0.091	0.115	-0.18	-0.213
<b>Contributions in explained difference</b>						
<i>Demographics</i>	-0.013	0.016	-0.018	-0.011	0.029	0.022
<i>Preferences</i>	-0.005	-0.0001	0.105	0.125	-0.11	-0.093
Big business benefit owners at the expense of workers	0.033	0.028	0.087	0.108	-0.066	-0.044
One law for rich and one for poor	-0.05	-0.046	0.012	0.01	-0.052	-0.057
Racial prejudiced	0.011	0.017	0.005	0.007	0.007	0.009
<i>Incentives</i>	-0.079	-0.108	0.008	0.007	-0.083	-0.12
If benefits weren't so generous people would learn to stand on their own feet	-0.034	-0.06	0.004	0.001	-0.017	-0.068
Unemployed people could find a job if want to	-0.045	-0.047	0.004	0.005	-0.066	-0.052
<i>Fraud</i>	-0.013	-0.03	-0.003	-0.005	-0.014	-0.022
Many people falsely claim benefits	-0.013	-0.03	-0.003	-0.005	-0.014	-0.022

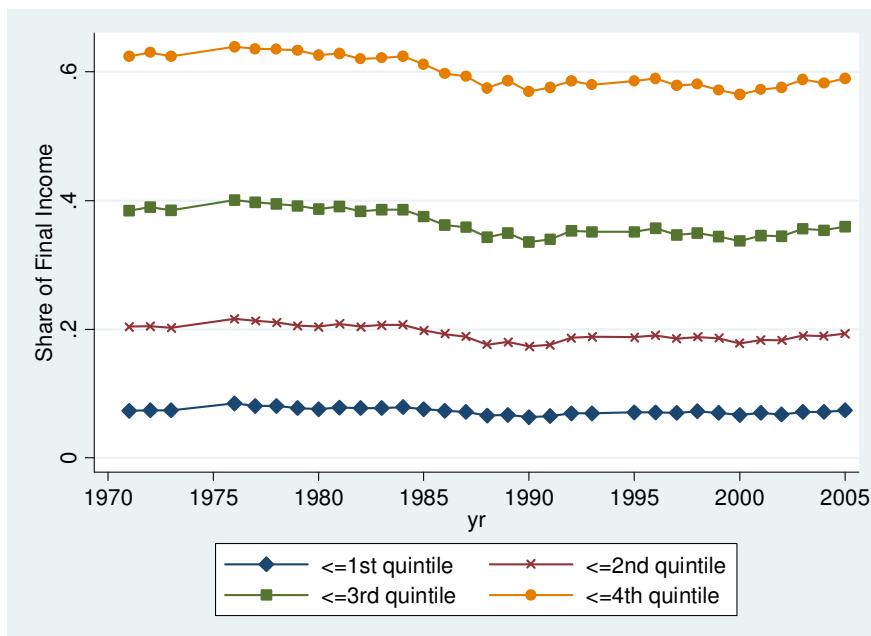
Notes: Contribution of individual demographic variables not reported in the interests of space. These details are available from the authors on request.

**Figure 1**  
**The Shares of Original Income by Cumulative Quintile**



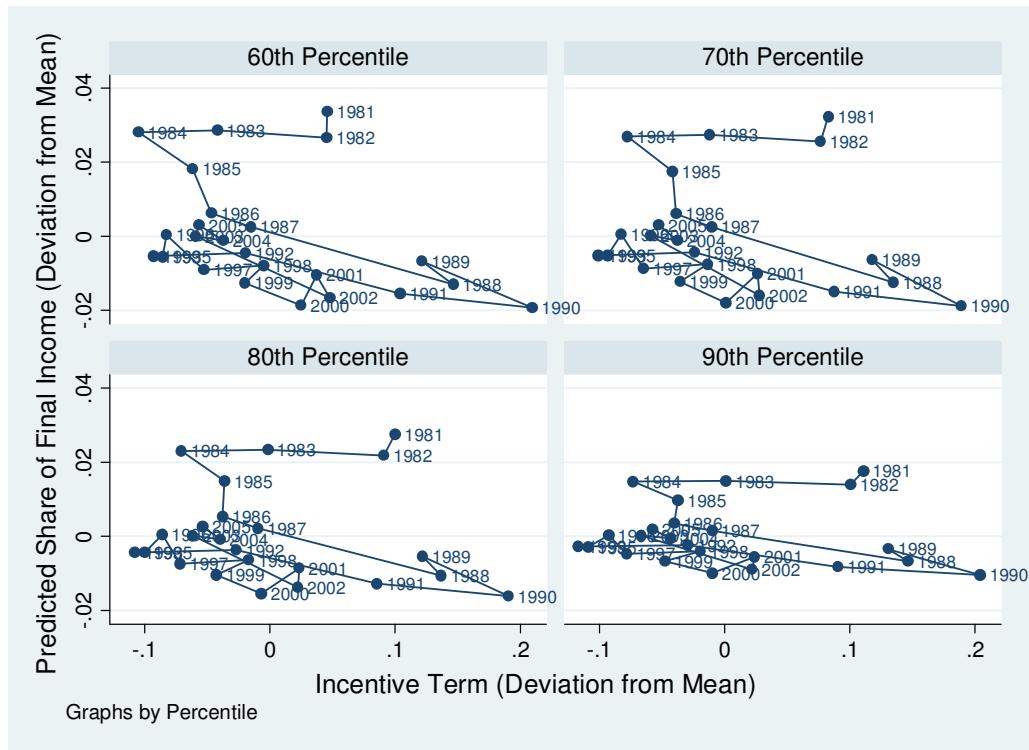
Source: ONS data in Jones (2006) and equivalent for earlier years.

**Figure 2**  
**The Shares of Final Income by Cumulative Quintile**



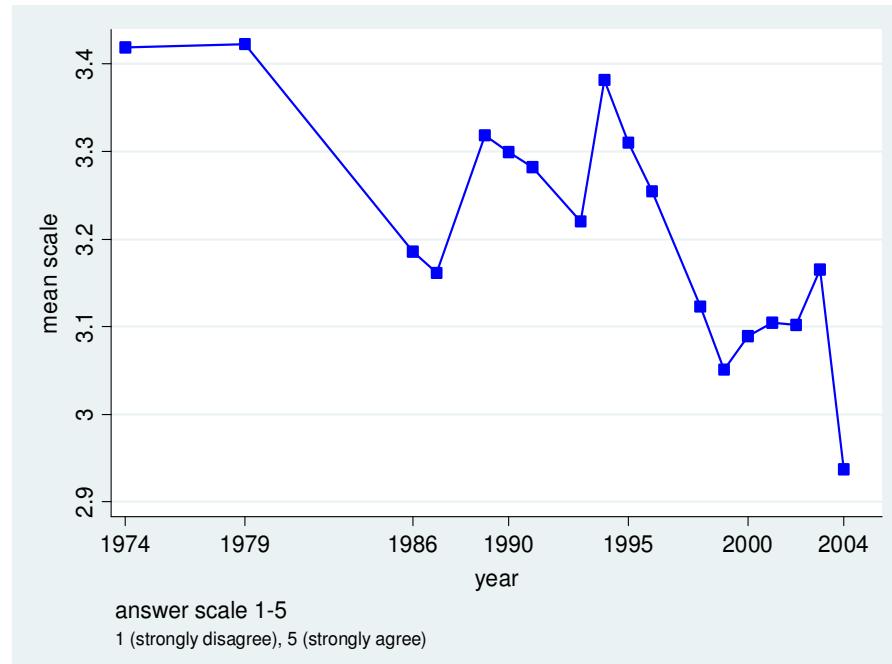
Source: ONS data in Jones (2006) and equivalent for earlier years.

**Figure 3**  
**The Relationship Between Shares of Final Income and the Incentive Term**



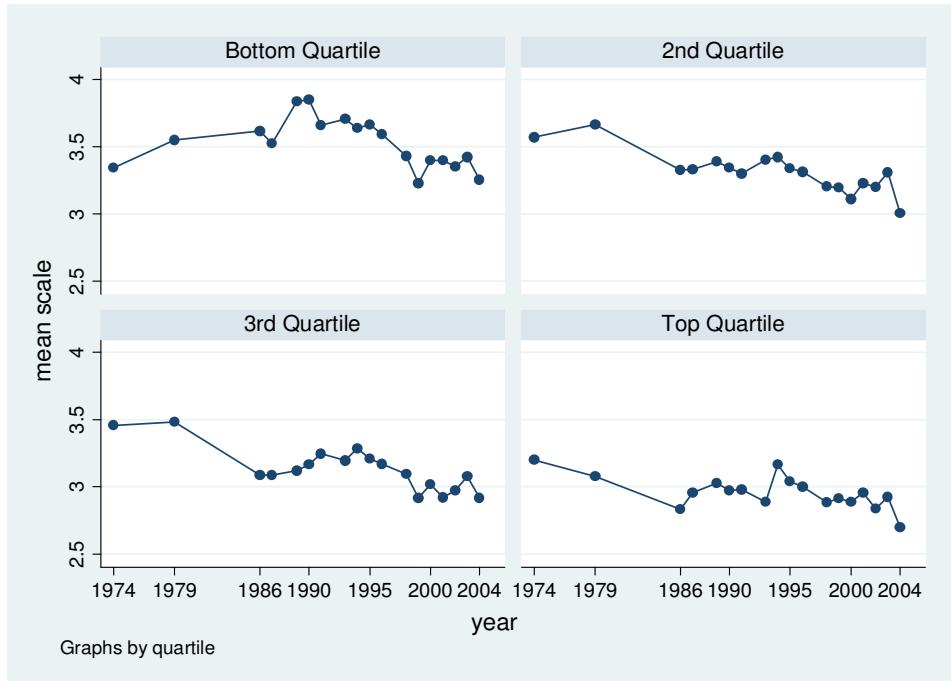
Notes: These are computed using the formula in (10) and using the methods described in Appendix B.

**Figure 4**  
**The Changing Demand for Redistribution**



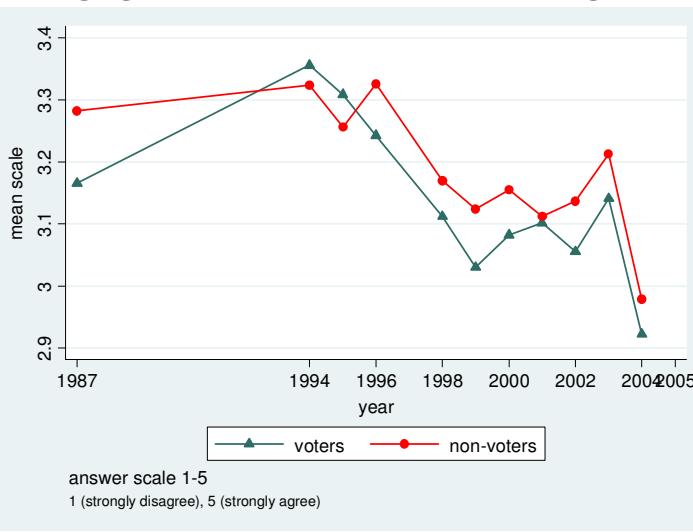
Notes: this is the mean value of REDISTRIBUTE (“government should redistribute income from the better-off to those that are less well-off”)

**Figure 5**  
**The Changing Demand for Redistribution  
 by quartile of equivalised household income**



Notes: this is the mean value of REDISTRIBUTE (“government should redistribute income from the better-off to those that are less well-off”)

**Figure 6**  
**The Changing Demand for Redistribution among Voters and Non-Voters**



Notes: this is the mean value of REDISTRIBUTE (“government should redistribute income from the better-off to those that are less well-off”) for those who reported voting in the previous general election and those who did not.

**Table A1: Regression results for early, middle and late sample periods**

<b>Independent Variables</b>	<b>1986-87</b>	<b>1994-96</b>	<b>2003-2004</b>
<i>Demographics</i>			
Log relative household income	-0.119 (0.078)	-0.140 (0.047)**	-0.168 (0.049)**
Intermediate non manual	-0.015 (0.119)	0.032 (0.076)	-0.062 (0.079)
Junior non manual	-0.017 (0.118)	0.100 (0.075)	-0.111 (0.093)
Skilled manual	-0.026 (0.114)	0.092 (0.077)	-0.049 (0.089)
Semi-skilled manual	0.153 (0.126)	0.165 (0.083)*	-0.100 (0.097)
Unskilled manual	0.115 (0.173)	0.137 (0.108)	-0.125 (0.147)
Other occupation	-0.135 (0.416)	-0.003 (0.439)	-0.868 (0.652)
Degree	0.215 (0.152)	0.114 (0.097)	-0.000 (0.100)
Higher education below degree	-0.050 (0.117)	0.062 (0.082)	-0.097 (0.096)
A levels or equivalent	-0.114 (0.128)	-0.036 (0.084)	-0.129 (0.094)
O levels or equivalent	-0.178 (0.099)	-0.000 (0.072)	-0.017 (0.081)
CSE or equivalent	-0.037 (0.122)	0.063 (0.095)	-0.007 (0.092)
Foreign/other qualification	-0.435 (0.382)	-0.174 (0.224)	-0.087 (0.231)
Employed	-0.023 (0.174)	0.182 (0.105)	0.148 (0.153)
Other status	-0.035 (0.180)	0.118 (0.106)	0.101 (0.154)
Male	0.050 (0.082)	0.052 (0.052)	0.123 (0.056)*
Age	-0.021 (0.015)	0.000 (0.009)	-0.000 (0.010)
Age <sup>2</sup>	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Black	-0.066 (0.506)	0.598 (0.169)**	0.087 (0.215)
Asian	0.085 (0.338)	-0.120 (0.172)	0.211 (0.188)
Mixed/other race	-1.976 (1.005)*	0.108 (0.237)	0.397 (0.280)
Living as married	-0.238 (0.195)	0.107 (0.099)	0.118 (0.098)
Separated	0.068 (0.141)	0.121 (0.071)	0.095 (0.074)
Widowed	0.044 (0.151)	0.025 (0.093)	-0.069 (0.101)
Single	0.055 (0.128)	0.054 (0.077)	0.109 (0.080)
No. of children	-0.026 (0.041)	0.000 (0.028)	0.007 (0.032)
Scotland	0.147 (0.131)	0.096 (0.093)	0.034 (0.095)
North East England	0.085 (0.152)	0.178 (0.104)	-0.119 (0.121)

North West England	0.087 (0.129)	0.068 (0.085)	0.174 (0.101)
York & Humber	0.072 (0.130)	0.141 (0.094)	-0.027 (0.099)
West Midlands	0.056 (0.137)	-0.065 (0.087)	0.061 (0.099)
East Midlands	0.063 (0.137)	0.022 (0.094)	0.049 (0.100)
Eastern England	-0.217 (0.169)	-0.146 (0.120)	-0.106 (0.130)
South West England	0.050 (0.132)	0.040 (0.084)	-0.024 (0.102)
London	0.187 (0.139)	0.038 (0.086)	0.041 (0.103)
Wales	-0.186 (0.161)	0.115 (0.120)	0.092 (0.123)
<hr/>			
<i>Preferences</i>			
Big business benefit owners at the expense of workers	0.388 (0.036)**	0.483 (0.027)**	0.326 (0.032)**
One law for rich and one for poor	0.255 (0.036)**	0.210 (0.025)**	0.231 (0.030)**
Racial prejudiced	-0.079 (0.057)	-0.106 (0.043)*	-0.124 (0.049)*
<hr/>			
<i>Incentives</i>			
Unemployed people could find a job if want to	-0.060 (0.035)	-0.082 (0.025)**	-0.064 (0.032)*
If benefits weren't so generous people would learn to stand on their own feet	-0.077 (0.034)*	-0.033 (0.026)	-0.134 (0.029)**
<i>Fraud</i>			
Many people falsely claim benefits	-0.034 (0.032)	-0.053 (0.024)*	-0.080 (0.031)**
Observations	980	1523	1378
R-squared	0.37	0.39	0.29

Standard errors in parentheses, \* significant at 5% level; \*\* significant at 1% level

## Appendix A: Proof of Proposition 1

Using (6) one can write (7) as:

$$\Omega = \int g(f)U(f)df = U(1) - \int G(f)U'(f)df = U(1) - \int G(f)w'(f)V(f)df \quad (16)$$

Now,  $U(1)$  can be thought of as being determined by the budget constraint that:

$$\int C(f)df = \int W(f)H(f)df = Y \quad (17)$$

Using (1) and (6) this budget constraint can be written as:

$$e^{U(1)} \int e^{-\int_f^1 w'(x)V(x)dx} e^{\theta(H(f))} df = Y \quad (18)$$

Or, taking logs:

$$U(1) = \log \int W(f)H(f)df - \log \int e^{-\int_f^1 w'(x)V(x)dx} e^{\theta(H(f))} df \quad (19)$$

Putting this into (16) gives an expression for the objective function that is written solely in terms of  $V(f)$  (or  $H(f)$ ) which is a function of  $V(f)$ . Taking the derivative with respect to  $V(f)$  leads to the first-order condition:

$$\frac{\partial \Omega}{\partial V(f)} = \frac{W(f)H(f)}{Y} \frac{1}{H(f)} \frac{\partial H(f)}{\partial V(f)} - \theta'(H(f)) \frac{\partial H(f)}{\partial V(f)} \frac{C(f)}{Y} + w'(f) \frac{\int_0^f C(x)dx}{Y} - G(f)w'(f) \quad (20)$$

Using (4) this can be simplified to the following:

$$\frac{\partial \Omega}{\partial V(f)} = \varepsilon(V(f)) \left[ \frac{s_Y(f)}{V(f)} - s_C(f) \right] + w'(f) [S_C(f) - G(f)] \quad (21)$$

Where  $\varepsilon(V(f))$  is the elasticity of labour supply with respect to  $V(f)$ ,  $s_Y(f)$  is the ‘share’ of an individual at position  $f$  in total income,  $s_C(f)$  is the ‘share’ of an individual at position  $f$  in total post-tax income (i.e. consumption), and  $S_C(f)$  is the cumulative share of individuals up to position  $f$  in total consumption. This, in turn, can be further simplified by noting that  $s_C(f)/s_Y(f)$  is 1 minus the average tax rate so that (21) can be written as:

$$\frac{\partial \Omega}{\partial V(f)} = \varepsilon(V(f)) S_C'(f) \left[ \frac{m(f)}{1-m(f)} \right] + w'(f) [S_C(f) - G(f)] \quad (22)$$

Where  $m(f)$  is the marginal tax rate faced by a person at position  $f$  in the income distribution and we have used the fact that  $V(f)$  is 1 minus the marginal tax rate divided by 1 minus the average tax rate. Re-arranging and assuming an interior solution proves the result.

## Appendix B: Estimating the Preference Equation

Our main focus of interest will be on the top deciles. A good approximation to the cumulative shares of both pre- and post-tax income in this data is the following:

$$\log S_i(f) = -\alpha_i(1-f), \quad i = Y, C \quad (23)$$

This is equivalent to the approximation of an exponential distribution with a higher value of  $\alpha$  corresponding to more inequality at the top. If we estimate this equation for the top 5 deciles for each year from 1971-2005 the R2 is never below 0.99 so this is a good approximation. The estimated values are plotted in Figure XX. For pre-tax inequality one sees a rise from the early 1970s to the early 1990s since when there is not much change although a hint of a downward trend. For post-tax income the 1970s were a period in which post-tax inequality did not change much but there was then a sharp rise in the 1980s but since the 1990s there has not been much of a change.

From (23) we have that:

$$S_C'(f) = \alpha_C S_C(f) \quad (24)$$

Now we will also have that the 1 minus the marginal rate of taxation will be given by:

$$1-m(f) = \frac{S_C''(f)}{S_Y''(f)} = \frac{\alpha_C^2}{\alpha_Y^2} \frac{S_C(f)}{S_Y(f)} \quad (25)$$

This also implies that the coefficient of residual income progression will be given by:

$$V(f) = \frac{S_C''(f)}{S_Y''(f)} \frac{S_Y'(f)}{S_C'(f)} = \frac{\alpha_C}{\alpha_Y} \quad (26)$$

So is constant. This then implies, from (5) that hours of work will be constant in this part of the distribution so that:

$$w'(f) = \frac{S_Y''(f)}{S_Y'(f)} = \alpha_Y \quad (27)$$

If we put this information into (10) we have that:

$$G(f) = e^{-\alpha_C(1-f)} - \alpha_C e^{-\alpha_C(1-f)} \frac{\varepsilon}{\alpha_Y} \left[ \frac{\alpha_Y^2 e^{-\alpha_Y(1-f)} - \alpha_C^2 e^{-\alpha_C(1-f)}}{\alpha_C^2 e^{-\alpha_C(1-f)}} \right] \quad (28)$$

Because everything on the right-hand side of (28) is observable part from the labour supply elasticity one can use (28) to derive

One can re-arrange this to give:

$$e^{-\alpha_C(1-f)} = G(f) + \varepsilon \alpha_C e^{-\alpha_C(1-f)} \frac{1}{\alpha_Y} \left[ \frac{\alpha_Y^2 e^{-\alpha_Y(1-f)} - \alpha_C^2 e^{-\alpha_C(1-f)}}{\alpha_C^2 e^{-\alpha_C(1-f)}} \right] \quad (29)$$

## Appendix C

### A Model of the Tax System with an Agency Cost

In this section we sketch how the presence of an agency cost will tend to reduce tax rates. We do not construct an elaborate model of the principal-agent relationship between citizen and elected representative. Rather we assume that a fraction of total tax revenue that passes through the government's hands on the way from one set of citizens to another is 'lost' which can be thought of as either through incompetence or venality with the social value of the recipients of this in the latter case being assumed to be zero. If the position in the income distribution where is denoted by  $f^*$  then the budget constraint (8) for the government becomes:

$$\int_0^{f^*} [C(f) - W(f)H(f)] df = (1-\gamma) \int_{f^*}^1 [W(f)H(f) - C(f)] df \quad (30)$$

which can be re-arranged to give:

$$\tilde{C} = \int_0^{f^*} C(f) df + (1-\gamma) \int_{f^*}^1 C(f) df = \int_0^{f^*} W(f)H(f) df + (1-\gamma) \int_{f^*}^1 W(f)H(f) df = \tilde{Y} \quad (31)$$

Using (1) and (6) this budget constraint can be written as:

$$U(1) = \log \left[ \int_0^{f^*} W(f)H(f) df + (1-\gamma) \int_{f^*}^1 W(f)H(f) df \right] - \log \left[ \int_0^{f^*} e^{-\int_f^1 w'(x)V(x)dx} e^{\theta(H(f))} df + (1-\gamma) \int_{f^*}^1 e^{-\int_f^1 w'(x)V(x)dx} e^{\theta(H(f))} df \right] - \log [f^* + (1-\gamma)(1-f^*)] \quad (32)$$

Putting this into (16) gives an expression for the objective function that is written solely in terms of  $V(f)$  (or  $H(f)$  which is a function of  $V(f)$ ). Taking the derivative with respect to  $V(f)$  leads to the first-order condition for someone in the top part of the income distribution i.e. for whom  $f > f^*$  leads to:

$$\begin{aligned} \frac{\partial \Omega}{\partial V(f)} &= \frac{(1-\gamma)W(f)H(f)}{\tilde{Y}} \frac{1}{H(f)} \frac{\partial H(f)}{\partial V(f)} + (1-\gamma)\theta'(H(f)) \frac{\partial H(f)}{\partial V(f)} \frac{C(f)}{\tilde{Y}} \\ &\quad + w'(f) \frac{\int_0^{f^*} C(x) dx (1-\gamma) \int_{f^*}^f C(x) dx}{\tilde{Y}} - G(f)w'(f) \end{aligned} \quad (33)$$

Using (4) this can be simplified to the following:

$$\frac{\partial \Omega}{\partial V(f)} = (1-\gamma)\varepsilon(V(f)) \frac{C}{\tilde{C}} \left[ \frac{s_Y(f)}{V(f)} \cdot \frac{Y}{C} - s_C(f) \right] + w'(f) \left[ \frac{C}{\tilde{C}} [(1-\gamma)S_C(f) + \gamma S_C^*(f)] - G(f) \right] \quad (34)$$

Where the notation is the same as before and  $S_C^*(f)$  is the cumulative share of individuals up to position  $f^*$  in total consumption. This, in turn, can be further simplified by noting that  $s_C(f)/s_Y(f)$  is 1 minus the average tax rate so that (21) can be written as:

$$\frac{\partial \Omega}{\partial V(f)} = (1-\gamma)\varepsilon(V(f)) \frac{C}{\tilde{C}} S_C'(f) \left[ \frac{m(f)}{1-m(f)} \right] + w'(f) \left[ \frac{C}{\tilde{C}} [(1-\gamma)S_C(f) + \gamma S_C^*(f)] - G(f) \right] \quad (35)$$

Where  $m(f)$  is the marginal tax rate faced by a person at position  $f$  in the income distribution. Now using (31) we also have that:

$$\frac{\tilde{C}}{C} = (1-\gamma) + \gamma S_c^*(f) \quad (36)$$

Substituting this into (35) and assuming we have an interior solution we have that:

$$\left[ \frac{m(f)}{1-m(f)} \right] = \frac{w'(f)}{\varepsilon(V(f))} \left[ G(f) - S_c(f) - \frac{\gamma}{1-\gamma} S_c^*(f) [1-G(f)] \right] \quad (37)$$

The final term is a measure of the agency cost and the larger it is, the lower the optimal marginal tax rate. A comparison with the formula for the optimal tax rate in Proposition 1 shows an extra negative term on the right-hand side.

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