

## Who Cares? Attitudes Towards Redistribution and Fiscal Austerity

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# Who Cares? Attitudes Towards Redistribution and Fiscal Austerity

## Abstract

We present new evidence showing that fiscal austerity strengthens support for redistribution, especially for the relatively well-off. Our theoretical model proposes two mechanisms to explain this heterogeneity in support for redistribution: ‘altruism’ and ‘appreciation’. We test our theoretical model’s predictions by matching attitudes reported in the British Social Attitudes Survey with local area-level spending cuts in England over the period 2010 to 2015. We exploit the spatial and temporal variation in spending cuts at the Local Authority level to compute a plausibly exogenous measure of the austerity shock. We find evidence for these two channels.

JEL-Codes: D300, D640, E620, H200, H300, H600.

Keywords: austerity, fiscal consolidation, fiscal policy, redistribution, political attitudes, altruism, appreciation.

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# 1 Introduction

In the aftermath of the Great Recession of 2007-8, countries were experiencing rapidly deteriorating deficits and rising national debts. In response to this, fiscal stimulus was quickly replaced by *fiscal austerity*, a mix of tax hikes and government expenditure cuts, with the aim of consolidating national budget imbalances. In the UK, the first mention of the term *austerity* can be traced back to the speech given by the then UK Conservative Party leader David Cameron to the Party forum in Cheltenham on 26 April 2009.<sup>1</sup> Following the General Election of 2010, David Cameron became Prime Minister forming a coalition Government with the Liberal Democrats based on a platform that included deficit reduction. The Chancellor of the Exchequer during the budget speech to the House of Commons in June 2010 provided a more detailed *austerity* plan; his plan was to eliminate the structural current budget deficit. His ambition was twofold: the objective was to “achieve cyclically-adjusted current balance by the end of the rolling, five-year forecast period” and to reduce the public debt (as a fraction of GDP). More importantly, the plan was to achieve both of its goals through substantial reductions in public expenditure.<sup>2</sup> Figure A.1 – which shows the frequency of Google searches for the words “austerity”, “austerity measures” and “United Kingdom austerity programme” – highlights the degree to which the notion was popularised in the UK following the economic measures implemented by the Coalition Government.

The debate that preceded and followed the adoption of these packages is plagued with controversies. However, the issues raised by austerity go beyond the discussion as to whether, and when, it is an appropriate macroeconomic policy. Large fiscal consolidations may have additional effects on the social and political attitudes and preferences of electorates and their voting behaviour (Alesina et al. 1998). Evidence from cross-country analyses suggests that these consequences are limited (Alesina et al. 2012, Buti et al. 2010), whereas recent papers employing quasi-experimental identification strategies show that austerity may have contributed to political processes as well, such as the Brexit vote in the UK (Fetzer 2018).

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<sup>1</sup>In his speech he said “the age of irresponsibility is giving way to the age of austerity” as reported here <https://conservative-speeches.sayit.mysociety.org/speech/601367>.

<sup>2</sup>This was to be achieved by a combination of public spending reductions and tax increases amounting to £110 billion. The end of the forecast period was 2015–16. The OECD “Restoring Public Finances” report gives a detailed account of the measures.

This paper presents new evidence of the social and political effects of austerity by investigating whether austerity shocks are linked to changes in attitudes towards redistribution in England. One may predict that austerity will reduce support for redistribution as tax rises and spending cuts erode income. However, it is also plausible to argue that austerity shocks may increase support for higher redistribution. The underlying mechanism might be altruistic (Alesina & La Ferrara 2005, Lutten & Valfort 2012), or simply financial as redistribution becomes more appealing to those who lose from austerity (Meltzer & Richard 1981). First, we develop a theoretical framework to model these preferences towards redistribution by explicitly adding mechanisms that are not solely driven by selfish concerns, and we investigate how preferences may differ over the income distribution. Then, we test our theoretical predictions using repeated cross-sections from a geocoded version of the British Social Attitudes Survey for the period 2009-2015, matching these to a plausibly exogenous shock in spending at the Local Authority level.

In the theoretical model, the only source of heterogeneity across individuals is given by income levels. Both high and low income types cast their vote in favour of more or less redistribution between income types, which is then implemented by the government. We remain agnostic as to the specific transfer programs that could be considered here. Both income types are self-interested, yet we also consider more sophisticated preferences. Altruism is included, so that the outcomes of the other type enter the preference structure as well, following Andreoni (1990) and Andreoni & Miller (2002). Moreover, austerity measures often make the income losses of other individuals more salient, which reinforces this channel. Third, and extending the standard model of altruism further, we consider the possibility that individuals increasingly ‘wake up’ to the reality of austerity measures as these become more salient and start biting, whereas, below a certain threshold, austerity remains under the radar. The assumption is that this ‘reality check’ is greater for higher income types, since they are to some degree better protected against austerity and, consequently, are more surprised once the threshold is hit.

The key testable predictions of our model are the following. In the absence of austerity, high-income groups are typically less supportive of redistribution than low-income groups. However, as soon as austerity measures tighten and become salient, attitudes towards redistribution turn positive for the high income group, yet remain neutral for the low

income group. This is the cumulative result of two coinciding mechanisms. The first is a standard altruistic component, and follows directly from our assumptions relating to preferences. As austerity increases and incomes are eroded, the altruistic motive of transferring income to those who are losing out is strengthened. This effect has been previously documented in the redistribution literature, and is shown to be stronger the higher an individual's income is. Other channels reinforcing this altruistic motive in the context of austerity may be concerned with a partial sense of shame. For example, the network of food banks increased from a few thousand before 2009 to one million emergency food parcels distributed by 2013 (Tyler 2021). Food bank collection points can now be found in most UK supermarkets and shopping centres (Loopstra et al. 2018).<sup>3</sup>

The second mechanism, however, is less straightforward. Here, individuals who earn more are in a sense “waking up” to the harsh reality of austerity and would like to mitigate this. We label this mechanism with the term ‘appreciation’ as high-income individuals come to appreciate more of the positive consequences of the welfare system. This may still be due to selfish concerns. For example, cuts in social care will affect long term care, which may impact higher income groups sooner – as they may need to carry the burden of care for their elderly relatives – or later – as they may need to save more for their own care, or even sell their house after retirement. Conversely, the relatively poorer subgroups are not affected by this trend as much, as they are already on the receiving end of redistribution and aware of their position. On the contrary, the austerity measures may even have a negative effect on the lower income groups’ attitudes to redistribution, which can be interpreted as a further erosion of trust in political institutions. We label this possible response by lower-income individuals with the term ‘disillusion’ as opposed to ‘appreciation’. Together with the fall in altruistic support, this explains the neutral response on the low income side, as it cancels out the self-interested positive effect of austerity on redistributive preferences.

We test our theoretical model's predictions by matching attitudes reported in the British Social Attitudes survey with local area-level spending cuts in England over the period 2010 to 2015. We exploit the spatial and temporal variation in spending cuts at the Local Authority level by computing a plausibly exogenous measure of the austerity

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<sup>3</sup>See, also, <https://www.goodhousekeeping.com/uk/consumer-advice/a34573095/food-bank-donations/>; <https://www.trusselltrust.org/get-involved/partner-with-us/strategic-partners/tesco/>.

shock.

Focusing on Local Authorities not only provides spatial variation to aid empirical identification, but it also provides a salient measure of austerity. Local Authorities are in charge of decisions that affect politically sensitive areas such as social care and housing services. Moreover, the austerity packages approved by the Central Government in the UK from 2010 onwards were enacted in effect by a robust and steady decline in funding to Local Authorities (Innes & Tetlow 2015b). We exploit the sharp change in the trend of Local Authority spending that occurred just after the 2009/10 financial year. Per capita spending at the Local Authority level had been growing steadily for over a decade before turning negative after 2009 (see Figure 3). We construct a measure of unexpected cuts at the Local Authority level – the austerity shock – by computing the difference between real spending at the per capita level in a given year and the per capita level of spending in the same authority in the year 2010, the first year after the austerity measures were introduced.<sup>4</sup>

Using an ordered probit approach, we model attitudes toward redistribution on the austerity shock controlling for a very rich set of individual characteristics, time-varying local-authority variables and region fixed effects. This measure of the austerity shock is found, on average, to be associated with more favourable views towards redistribution. In accordance with our theoretical model, we show that more positive attitudes are driven by the relatively high-income households.

Our empirical findings suggest, that, on average and when austerity does not bite, these groups are less supportive of redistribution, as predicted by our theoretical model, and in line with the existing literature. However, as the austerity measures tighten, attitudes towards redistribution become more positive. In other words, austerity changes the attitudes of the relatively richer individuals. These results are robust to an instrumental variable approach. We employ a measure of changes of those grants that were cut by the Central Government and not influenced by local authorities' characteristics as an instrument for local authority spending.

We find some evidence suggesting that the change in attitudes is driven by the mech-

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<sup>4</sup>The year 2009-10 when spending peaked, i.e., the year before austerity measures were introduced, cannot be used in the analysis. This is due to a change in the way the Revenue Expenditure funded by Statute (RECS) was recorded in the Revenue Outturn that leads to an inflation of service spend and makes it inconsistent with subsequent years.

anisms identified in the theoretical model: altruism and ‘appreciation’ (for relatively rich individuals). Consistent with the theoretical model, we find that attitudes towards redistribution of poorer individuals are not affected by austerity. We do not find evidence of disillusion either. When we focus on specific categories of spending shocks, we find that attitudes change significantly following unexpected cuts in social care, which – as discussed above – may be linked to both altruism and appreciation motives. These results are robust to the instrumental variable approach. There is also evidence of changes in attitudes for high-income individuals following sharp cuts in housing benefits, which we take as more indicative of altruism. We do not find any effect from cuts in a residual category that consists of central services such as registry, tax collection and elections, which are unlikely to be associated with redistribution issues and can be regarded as a placebo test serving to validate our interpretation.

To investigate these mechanisms further, we exploit the richness of the British Social Attitudes survey. We identify several questions that we believe may underpin elements of altruism and/or appreciation. This analysis suggests that the main mechanism behind the change in attitudes to redistribution may be appreciation rather than altruism. For example, we find that high-income respondents exposed to more austerity tend to agree with the idea that the creation of the welfare state is one of the proudest achievements of Great Britain, which is in line with renewed appreciation of redistributive policies. However, austerity does not change attitudes for high income groups when it comes to agreeing with spending more for the poor, which would be more in line with altruism. The remainder of the paper is structured as follows. In the next section, we introduce our theoretical model, which links attitudes to redistribution, austerity and income levels. Section 3 describes the British Attitudes Survey data that we match to Local Authority spending. Section 4 provides a background on how Local Authorities were affected by the austerity program implemented between 2010 and 2015 and describes our local austerity shock measure in detail. Section 5 presents our econometric models and tests the predictions of the theoretical model, while Section 6 expands the analysis by introducing an instrumental variable approach that confirms the main results. Section 7 investigates the mechanisms put forward by our theoretical model, namely altruism and appreciation or disillusion, while Appendix E presents the results from additional robustness checks.

Finally, Section 8 concludes.

## 2 The Model

Our stylised model captures the decision-making process of two types of individuals  $i$  with respect to interpersonal redistribution: a rich individual  $i = r$  and a poor individual  $i = p$ , with gross incomes  $Y_r > Y_p$ . The decision variable  $\lambda_i$  denotes the desired level of redistribution in the form of transfers between both income types, so that  $\sum_i \lambda_i = 0$ , implicitly organised by the government.<sup>5</sup> With  $0 < \alpha_i < 1$  denoting the share of gross income,  $Y_i$ , directly or indirectly taken up by austerity measures,  $y_i$  represents income after austerity measures have been deducted from gross income, such that  $y_i = (1 - \alpha_i)Y_i$ . Without loss of generality, we assume that income losses from austerity are equally spread across income groups so that  $\alpha_p = \alpha_r$ , and  $\frac{d\alpha_p}{d\alpha_r} = 1$ . The utility of each individual can then be described as follows

$$U_i = v(y_i - \lambda_i) + \gamma_i a(y_{-i} - \lambda_{-i}) - \delta_i s(y'_i - \lambda_i), \quad (1)$$

with  $v(\cdot)$  and  $a(\cdot)$  increasing and concave functions,  $s(\cdot)$  increasing and convex, and all three having positive third derivatives. Both  $\gamma_i$  and  $\delta_i$  are individual scaling factors with strictly positive support. The standard self-interested motives over disposable income  $(y_i - \lambda_i)$  are captured by  $v(\cdot)$ , whilst  $a(\cdot)$  expresses a preference for altruism as it depends positively on the disposable income  $(y_{-i} - \lambda_{-i})$  of the other income type.<sup>6</sup> Finally, the (extreme) convexity of  $s(\cdot)$  in Eq. (1) should be regarded as capturing income-dependent aversion to austerity over the net share of austerity losses,  $y'_i - \lambda_i$ , with  $y'_i = \alpha_i Y_i$ . Utility is thus directly affected by the size of the austerity measures in place, and this is relative to gross income. The intuition is that, the richer individuals are, the more they will ‘wake up’ to the reality of austerity measures, and even overestimate their impact.<sup>7</sup> This shock-effect can happen for various reasons and will depend on the exact nature of the

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<sup>5</sup>For the sake of generality, we remain agnostic as to the actual redistributive policies introduced by the government. The amount captured by  $\lambda_i$  could, for example, be the result of net fiscal flows between individuals – deducting contributions and taxes from benefits received – summing to zero.

<sup>6</sup>Andreoni (1990) introduced this approach in the context of redistribution and charitable giving. See also Andreoni & Miller (2002). The positive third order derivatives of  $v(\cdot)$  and  $a(\cdot)$  should also be read in this light, as both self-interest and altruism are more pronounced under scarcity.

<sup>7</sup>For simplicity, we start by assuming this is a continuous process. In reality, there is likely to be a threshold level of austerity measures,  $\alpha$ , above which it becomes a focal point for the relatively rich. We extend our model in this direction in what follows, retaining all qualitative results.

measures as well as their salience. The mechanism could be related to an exaggerated fear of losing income in the short, medium or long-term because of the measures.<sup>8</sup> The salience of austerity can be expected to reinforce this channel, with for example the emergence of food banks across the country serving as a strong signal.<sup>9</sup>

Deciding on the desired levels of redistribution, expressed by net transfers  $\lambda_i$ , the optimisation problem of individual  $i$  then becomes

$$\max_{\lambda_i} U_i = v(y_i - \lambda_i) + \gamma_i a(y_{-i} - \lambda_{-i}) - \delta_i s(y'_i - \lambda_i), \quad (2)$$

with  $\sum_i \lambda_i = 0$ , so that we obtain the following first order condition for each individual  $i$

$$\Phi_i \equiv -v'(y_i - \lambda_i) - \gamma_i a'(y_{-i} - \lambda_{-i}) \frac{d\lambda_{-i}}{d\lambda_i} + \delta_i s'(y'_i - \lambda_i) = 0, \quad (3)$$

which implicitly characterises the equilibrium described in Lemma 1 below.

**Lemma 1.** *The Nash equilibrium  $(\lambda_i^*, \lambda_{-i}^*)$  defined by Eq. (3)  $\forall i$  is a unique maximum, with  $\lambda \equiv \lambda_r^* > \lambda_p^* = -\lambda$ .*

Analysing the equilibrium characterised by Lemma 1, and applying the implicit function theorem, we can then investigate the effects of a shift in austerity policies, characterised in Lemma 2.

**Lemma 2.** *In equilibrium, and ceteris paribus, sharper austerity measures cause a shift in attitudes towards redistribution  $\lambda_i$  of individual  $i$ , defined by*

$$\frac{d\lambda_i}{d\alpha_i} = - \left( \frac{v''(y_i - \lambda_i) Y_i - \gamma_i a''(y_{-i} - \lambda_{-i}) Y_{-i} + \delta_i s''(y'_i - \lambda_i) Y_i}{v''(y_i - \lambda_i) + \gamma_i a''(y_{-i} - \lambda_{-i}) - \delta_i s''(y'_i - \lambda_i)} \right). \quad (4)$$

Importantly, what we can deduce from Lemma 2 is that a net-contributing individual  $r$  will respond differently to shocks in austerity measures in equilibrium, as compared to a net-receiving individual  $p$ . We explore this further in the following lemmas.

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<sup>8</sup>One example in our setting could be the introduction of cuts in social care systems, which could stoke the fear of having to sell one's house to finance elderly care. Another example would be the expectation of tax levies on capital (gains) to follow indirect tax increases.

<sup>9</sup>The increase in food banks over the period considered was covered extensively by the national media. See, e.g., <https://www.theguardian.com/society/2015/apr/22/food-bank-users-uk-low-paid-workers-poverty> and <https://www.bbc.co.uk/news/uk-22715458>. For more information about the rise in food bank use over the period, see Tyler (2021).

**Lemma 3.** *For the rich, net-contributing individual, the condition for redistributive preferences to respond positively to austerity shocks can be expressed as*

$$\frac{d\lambda_r}{d\alpha_r} > 0 \Leftrightarrow \underbrace{v''(y_r - \lambda_r) Y_r}_{\text{Egoism}(-)} - \underbrace{\gamma_r a''(y_p - \lambda_p) Y_p}_{\text{Altruism}(++)} + \underbrace{\delta_r s''(y'_r - \lambda_r) Y_r}_{\text{Appreciation}(++)} > 0 \quad (5)$$

From Eq. (5), we elicit that the response of the net-contributing individual can be decomposed into three parts. The first part on the left hand side, which we have termed ‘egoism’, is negative. This is intuitive, as a fall in disposable income will make the rich individual less likely to give up part of their income. Second, the middle term in Eq. (5) is positive, and captures a preference for altruism as the income of the poor individual is also hit by austerity. Third, and on the right hand side of Eq. (5), a final positive term captures what we termed ‘appreciation’. Here, the rich individual is afraid of eventually falling on the net-receiving end of redistribution because of austerity, and, hence, starts to appreciate the redistribution inherent to the welfare system they fund. In a sense, they not only ‘wake up’ to the risks of income loss made salient by the austerity shock, but also – simultaneously and increasingly – value the social safety net in place to smooth out such income shocks.<sup>10</sup>

**Lemma 4.** *For the poor, net-receiving individual, the condition for redistributive preferences to respond positively to austerity shocks can be expressed as*

$$\frac{d\lambda_p}{d\alpha_p} > 0 \Leftrightarrow \underbrace{v''(y_p - \lambda_p) Y_p}_{\text{Egoism}(-)} - \underbrace{\gamma_p a''(y_r - \lambda_r) Y_r}_{\text{Altruism}(+)} + \underbrace{\delta_p s''(y'_p - \lambda_p) Y_p}_{\text{Disillusion}(+)} > 0 \quad (6)$$

From Eq. (6), we can see that the response of the net-receiving individual can also be decomposed into three parts. The first part on the left hand side, also termed ‘egoism’, is now even more negative than in Eq. (5). This is again intuitive, as a fall in disposable income will make the poor individual want to receive more transfers out of the redistribution system to compensate for the income losses (and, hence, set  $\lambda_p$  as negative as possible). Second, the middle term in Eq. (6) is less positive than in Eq. (5) as the income of the rich individual is less hit by austerity in absolute terms, so that altruism motives will be

<sup>10</sup>The underlying mechanism runs through the convexity of the third term  $-\delta_i s(y'_i - \lambda_i)$  in the utility function Eq. (1), which can be generalised as a function of our two terms of interest  $s(\alpha_i Y_i, \lambda_i)$ . All results hold in such a general framework, conditional on redistribution and austerity being complements, so that  $\frac{d^2 s(\cdot)}{d\alpha_i d\lambda_i} > 0$ , as well as  $\frac{ds(\cdot)}{d\lambda_i} > 0$  and  $\frac{ds(\cdot)}{d\alpha_i} < 0$ , which is intuitive.

less pronounced. The third term on the right hand side of Eq. (6) is also less positive than in Eq. (5) and, thus, implies a smaller increase in appreciation of the welfare system. This could be because the relatively poor are less inclined to overestimate the effects of austerity as they have less to lose, yet it could also reflect what we will call ‘disillusion’. When austerity measures are intensified, a poorer individual could start to lose faith in the welfare system they already heavily rely on. As trust in political institutions slowly erodes, disillusion with redistribution sets in, and net-receivers will start supporting a ‘smaller’ government doling out smaller transfers.<sup>11</sup>

Comparing Lemma 3 with Lemma 4, and investigating the juxtaposition, yields the following proposition.

**Proposition 1.** *Expanding austerity measures across the board improves attitudes towards redistribution overall. This follows from a positive response for the rich, net-contributing individuals, and a neutral effect on the attitudes of the poor, net-receiving individuals, such that*

$$\frac{d\lambda_r}{d\alpha_r} \gg \frac{d\lambda_p}{d\alpha_p} \frac{d\alpha_p}{d\alpha_r} \approx 0, \quad (7)$$

with  $\frac{d\alpha_p}{d\alpha_r} = 1$  as before.

The intuition behind Proposition 1 is first of all that the egoism of the rich, net-contributing individual is considerably smaller than that of the poor individual. This follows from our concavity assumption on  $v(\cdot)$ , which captures the well-established real world observation that the marginal value of income is smaller the higher up the income distribution.<sup>12</sup> Second, the altruism of the rich individual will be a lot more pronounced than that of the poor individual, for much the same reasons and as expressed by the concavity of  $a(\cdot)$ . This is again intuitive: Since poor individuals are more self-interested, they will care less about the income of richer people, and vice versa for the latter. Third, the disillusion of poorer individuals, and their eroding trust in redistributive policies, will be less pronounced than the appreciation of such policies by the rich. Since the rich have a lot more to lose from austerity measures, the behavioural response of waking up to its potential consequences will be large.

<sup>11</sup>More argument as well as empirical evidence is provided by Rodrik (2018) and Guiso et al. (2017), and by Borck (2007) specifically with respect to redistributive taxation.

<sup>12</sup>The experimental results summarised in Fehr & Schmidt (2006) point in this direction as well. See also Andreoni et al. (2017).

In sum, we thus have a fairly weak negative effect on attitudes in favour of redistribution for the rich in Eq. (5), and two very pronounced positive effects. At the other end of the income distribution, there is a fairly strong selfish response in favour of redistribution in Eq. (6), but this is mitigated by the two negative effects which, as they are less pronounced, will more likely neutralise the first effect rather than make the total sum negative overall. This will be the case under reasonable assumptions regarding the parameter values in Eq. (1), and will depend crucially on the relative importance of each of the preference elements characterised in Lemma 2 and Lemma 3. We specify in Corollary 1:

**Corollary 1.** *The degree to which the shift in attitudes towards redistribution will be different for the rich, net-contributing individual as opposed to the poor, net-receiving individual depends on the relative magnitudes of  $\gamma_i$  and  $\delta_i$ , expressing the relative weight of non-selfish factors.*

Suppose now that the relative importance of altruism and appreciation/disillusion depends positively on the severity of austerity measures. This would be an intuitive extension to the baseline model, as both psychological effects can in a sense be considered secondary to pure self-interest. If, moreover, this positive relationship  $\gamma_i(\alpha_i)$  and  $\delta_i(\alpha_i)$  is staggered around a threshold value for austerity  $\bar{\alpha}$ , we can simply write overall utility expressed by Eq. (1) as follows

$$U_i = v(y_i - \lambda_i) + \mathbb{1}_E \gamma_i a(y_{-i} - \lambda_{-i}) - \mathbb{1}_E \delta_i s(y'_i - \lambda_i), \quad (8)$$

with

$$\mathbb{1}_E(\alpha_i, \bar{\alpha}) = \begin{cases} 1, & \text{if } \alpha_i > \bar{\alpha} \\ 0, & \text{otherwise} \end{cases}. \quad (9)$$

Analysing the equilibrium in this more specific setting, we arrive at Proposition 2.

**Proposition 2.** *If the importance of altruism and disillusion/appreciation depend positively on the level of austerity measures, and if  $\gamma_i(\alpha_i)$  and  $\delta_i(\alpha_i)$  are furthermore staggered around a threshold value for austerity  $\bar{\alpha}$ , then a radical shift in attitudes for the high income type occurs above this threshold: from (extremely) against to in favour of redistribution. Support for redistribution of the lower income type, conversely, tapers off.*

It logically follows from Proposition 2 that, when the threshold is not reached, purely selfish concerns will keep the upper hand, leading to the intuitive outcome where the rich

oppose redistribution, and the poor favour it. This is summarised below.

**Corollary 2.** *If the level of austerity does not pass the threshold value,  $\bar{\alpha}$ , defined in Proposition 2, the low income type will be in favour of redistribution, and the high income type against.*

Lastly, and logically, when only one of both non-selfish mechanisms are at play, predictions are less clear-cut, as captured below.

**Corollary 3.** *If either  $\gamma_i$  or  $\delta_i$  depend on the level of austerity measures  $\alpha_i$ , passing the threshold value,  $\bar{\alpha}$ , can lead to a radical shift in attitudes for the rich, net-contributing individual: from (extremely) against to in favour of more redistribution. The opposite can be true for the poor, net-receiving individual.*

### 3 Attitudes towards redistribution in England

To test the propositions arising from our theoretical model, we have created a unique dataset of local spending and attitudes towards redistribution in England covering the period 2010-2015 by matching geo-coded responses from a special license version of the British Social Attitudes (BSA) survey ([National Centre for Social Research 2018](#)) to a measure of *austerity shock* defined at the Local Authority level. This section provides a detailed description of both the BSA survey data and the ONS data used to compute the local-area level measure of austerity.

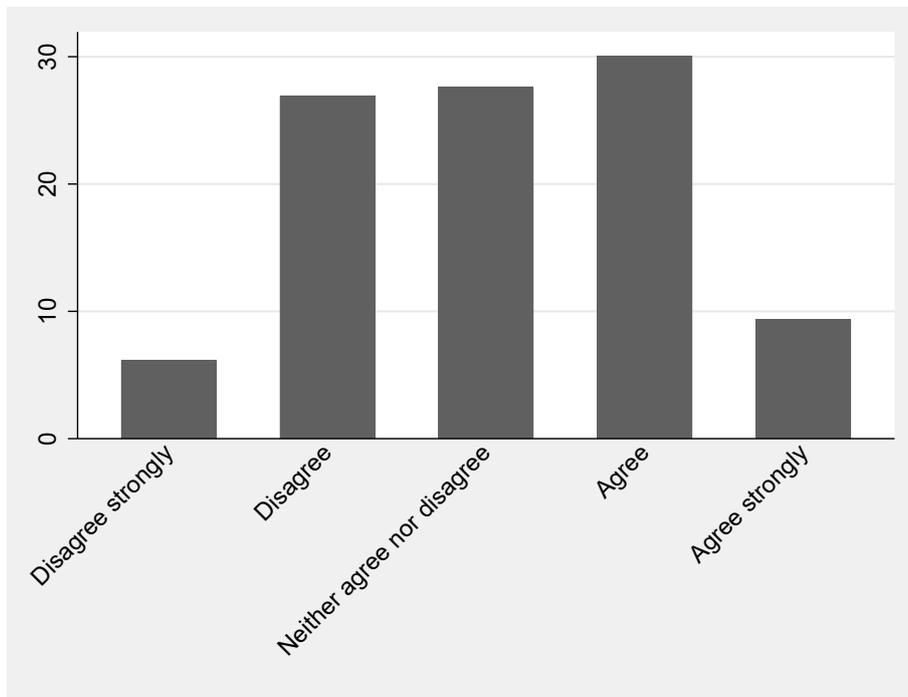
The BSA is a repeated cross-sectional survey aimed at capturing the change in social attitudes in Britain over time. It is conducted every year, on a sample of approximately 3,000 individuals. The survey gathers information on a series of individual characteristics as well as opinions/political attitudes. We pool the waves between the years 2010-2015, which are matched to the austerity shock defined at the Local Authority level. The BSA survey sample includes respondents from all over Great Britain. However, we restrict our sample to the respondents living in England. This is due to the fact that we are investigating the effects of changes in spending at the Local Authority level, and Local Authority structures between the constituent countries of Britain are different. The exact level of geographical disaggregation of the BSA survey dataset available to us is in Unitary authorities, Metropolitan Districts, Counties, inner London, and outer London.

The focus of our analysis lies on the effects of the austerity measures on preferences regarding redistribution. The attitudes of respondents to redistribution are captured by the responses to the following question:

“Should the Government redistribute income from those that are well off to those who are less well off?”.

The question has five possible responses, namely; *Agree strongly*, *Agree*, *Neither agree nor disagree*, *Disagree*, *Disagree strongly*. The categories of the responses are recoded such that *Strongly disagree* is assigned the lowest value of 1 and *Strongly agree* the highest value of 5. Figure 1 shows that about 39% of the individuals in our sample are supportive of redistribution (either *Agree* or *Strongly agree* with the statement), while a slightly smaller percentage (33%) is not supportive. A large portion (28%) of respondents are indifferent (*Neither agree nor disagree* with the statement). It should be noted that those percentages change over time; while 35% of the sample are supportive of redistribution in 2010, that percentage increases to 42% by 2015. During the same period opposition to more redistribution falls from 38% to 28% (see Table A.1 in the Appendix).

Figure 1: Should the Government redistribute income?



Source: British Social Attitudes Survey, England, 2010-2015

### 3.1 Control variables at the individual level

The BSA provides a rich array of respondent characteristics that we exploit in our analysis as controls in different models. Demographic characteristics include age, gender, race, disability status, marital status, the number of children in the household, and the number of adults in the household. Socio-economic characteristics include household income<sup>13</sup>, employment status, education level<sup>14</sup> and socio-economic status. The dataset also includes information on the respondent’s home ownership status (which includes whether they rent a house provided by the Local Authority) and whether the respondent or their spouse claim benefits.

Table 1 reports descriptive statistics for the control variables. Women represent 55% of the sample, and the majority of respondents are white. About 57% of the individuals in the sample live with a partner, either due to marriage or cohabitation. Half of the respondents have low education, while there is an equal proportion of intermediately and highly educated individuals in the sample (both are about 24%). Even though 55% of the sample is employed, 64% of individuals (or their partners) are receiving some type of benefit (including child benefit) or tax credits. Almost 68% of the respondents own their house or hold a mortgage. One third of the sample report that they have a long-standing physical or mental health condition or disability.

## 4 Local spending and austerity in England

The May 2010 UK general election resulted in the formation of a coalition Government between two parties, the Conservative Party and the Liberal Democrats. The Government adopted an austerity program aimed at consolidating the fiscal imbalance of the country with the aim of reducing the structural budget deficit by some 5.7% of national income. Over the next five years, the Coalition Government undertook a series of public spending

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<sup>13</sup>In the BSA survey, household income is only available in income categories. We use the household income variable that splits household income into quartiles as it is the most complete in terms of responses. For example, a variable that splits household income into twenty categories is only available for half of the waves and another household income variable that splits household income into deciles is characterised by a lot of missing information.

<sup>14</sup>Education is calculated based on the age that the individual completed full-time, continuous education. Based on this variable, if the completion age is 16 years or less then the level of education is low, if the completion age is between 17 and 20 years, then the level of education is intermediate, and if the completion age is above 20 years, then the level of education is high. A control is included for individuals who are still in full-time education.

Table 1: Summary statistics for control variables from the British Attitudes Survey

<b>Variable</b>	<b>Mean/Proportion</b>	<b>Number of observations</b>
<b>Gender:</b> Male	45.0%	11,934
<b>Age</b>		
18-24	5.0%	11,934
25-34	13.7%	11,934
35-44	19.1%	11,934
45-54	18.6%	11,934
55-59	8.3%	11,934
60-64	9.4%	11,934
65+	25.9%	11,934
<b>Ethnicity:</b> White	92.8%	11,934
<b>Household income</b>		
Less than £14,999	28.0%	11,934
£15,000- £25,999	23.4%	11,934
£26,000- £43,999	23.1%	11,934
£44,000 or more	25.5%	11,934
<b>House tenure</b>		
Owned/being owned	67.8%	11,934
Rented (Private)	22.2%	11,934
Rented (LA)	10.0%	11,934
<b>Household composition</b>		
Number of children in Household	0.5	11,934
Number of adults in Household	1.8	11,934
<b>Marital status</b>		
Married	47.1%	11,934
Living as married	10.4%	11,934
Separated or divorced	15.4%	11,934
Widowed	9.4%	11,934
Not married	17.8%	11,934
<b>Education</b>		
Still in Education	1.5%	11,934
Low Education	51.0%	11,934
Intermediate Education	23.6%	11,934
High Education	23.9%	11,934
<b>Employment Status</b>		
Employed	54.8%	11,934
Unemployed	4.7%	11,934
Inactive	38.4%	11,934
Still in education/training	2.1%	11,934
<b>Disability status:</b> Disabled	31.1%	11,934
<b>Benefits:</b> Receive benefits	63.5%	11,934
<b>Union Membership:</b> Member	19.0%	11,934
<b>Religion:</b> Religious	51.9%	11,934

cuts at the central and local government level. The agreement included “ring-fencing” the National Health System, the health system that delivers health services in the UK, and education. The responsibility for delivering part of the planned cuts was effectively devolved to Local Authorities by cutting grants paid by the Central Government to Local Authorities.

Local Authorities in the UK are much more reliant on central grants and transfers compared to other OECD countries given that they have very limited power to raise revenue and no faculty to borrow. While cuts happened in Scotland and Northern Ireland as well, we focus on England as the systems and cuts are slightly different across the constituent countries in the UK. Local government expenditure comprises about one quarter of total government expenditure and is mostly administered by Local Authorities. Local Authorities are elected by their residents and are in charge of delivering important services for their constituents, including social care and housing services, local public transport, waste collection and disposal. This local dimension of austerity makes austerity itself more salient to individuals.

Constructing a measure of local austerity is challenging. The first challenge relates to identifying a definition of “spending” that is comparable over time. We have built our dataset following a series of reports published by the Institute for Fiscal Studies including (Innes & Tetlow 2015a) and Innes & Tetlow (2015b). The most relevant indicator of how Local Authorities support people in each area is the net service spending, i.e., the amount of expenditure on publicly-funded services. To keep the measure comparable over time, services such as education, public health, police, and fire and rescue need to be excluded as responsibilities have changed during the period considered.<sup>15</sup>

This implies that our measure of local authority spending includes information on the following six categories:

- Highways, roads and transport;
- Social Care for children and adults;

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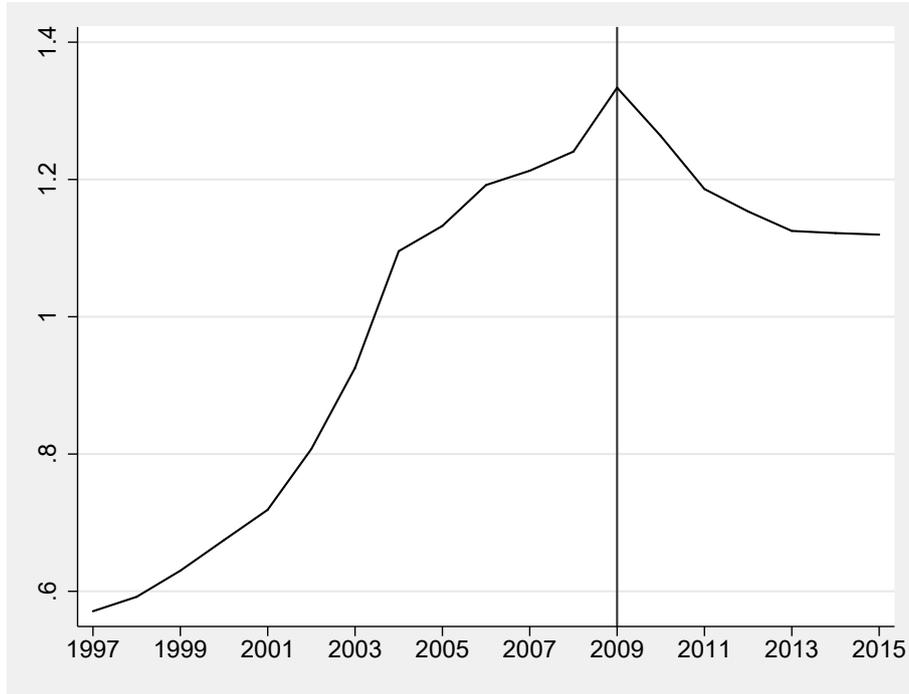
<sup>15</sup>To be precise, some local services are not under the control of Local Authorities, e.g., Police services, Fire and Rescue services, and National Parks and their geographies do not fully overlap with Local Authorities (Innes & Tetlow 2015a). Regarding education, after 2010, the Government allowed schools to apply for “Academy status”. Schools that became academies were no longer dependent on the Local Authorities in which they reside for their financial support. Hence, changes in Local Authority spending on education inevitably capture these transitions as well. We also exclude public health spending as Local authorities did not have any provision responsibilities before 2013.

- Housing (services and benefits);
- Cultural and environmental services;
- Planning and Development; and
- Central and Other Services.

Table C.1 in the Appendix provides some examples of what these services deliver.

To give an idea of the importance of the reductions in local government spending in these services over the period 2010-2015, we have collected data from the National Archives. We show the total spending per capita across all English Local Authorities between 1997 and 2015 in Figure 3. The decline in Local Authority spending from 2010/11 onwards is in stark contrast with the previous trend. Until 2010-11, spending per capita was increasing in real terms every year. We exploit this change to construct a measure of the austerity shock and estimate the causal effect of local-area austerity on redistribution preferences, as detailed in Section 4.1 below. Our econometric analysis is restricted to the period 2010-2015 because data were not disaggregated by Local Authority before 2008 and there are issues with comparability over time between 2009 and 2010 on-wards. Furthermore, the dataset includes only the sub-sample of Local Authorities that match the geographic location of the BSA observations at any given year.

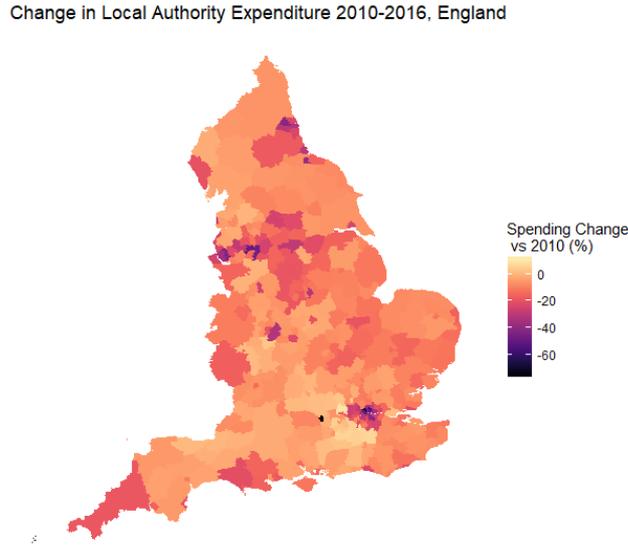
Figure 2: Aggregate Local Authority real spending per capita in England, 1997-2015



Note: Authors' own calculation from ONS data.

The geographical variation in spending cuts can be seen in Figure 3, where the percentage change in spending per capita in England between 2010-11 and 2015-16 is plotted on a map of England. The darker colours indicate larger cuts. These differences provide the geographical variation in cuts that we exploit in the econometric analysis to estimate the effects of austerity on redistribution preferences. In the same figure, we can also see that the rate of austerity cuts was higher in the North of England and in coastal areas than in the South of England.

Figure 3: Percent changes in spending across Local Authority over 2010-2015



Note: Authors' own calculation from ONS data

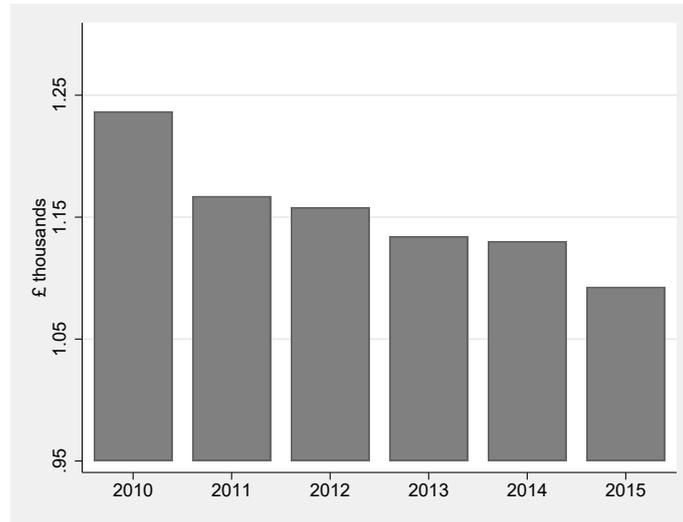
The administration of local government in England is quite complex and comprises single-tier and two-tier councils elected by their residents.<sup>16</sup> We match the BSA data with the lower tier areas and inner and outer London. When these lower tier areas are also part of larger regional authorities, which also have service provision responsibilities (for example, combined authorities), we use population weights to calculate the approximate proportion of the larger area spending that corresponds to those smaller areas. We calculate all spending in real terms and per capita for our analysis. In terms of geographical variation, our final merged dataset includes spending information for 119 localities in England.

Figure 4 illustrates the average spending per capita by year, and its composition across the six spending categories (defined above) over the 119 Local Authorities included in our final dataset. The decline in spending is steady and noticeable. In 2010, Local Authorities were spending about £1,237 per person, on average, across all the categories. The amount decreased to £1,093 in 2015, a 12% reduction. Panel (b) illustrates that although the decline is general across all categories, it has been relatively less pronounced for social care and housing, which make up about 70% of the local spending. Between 2010 and

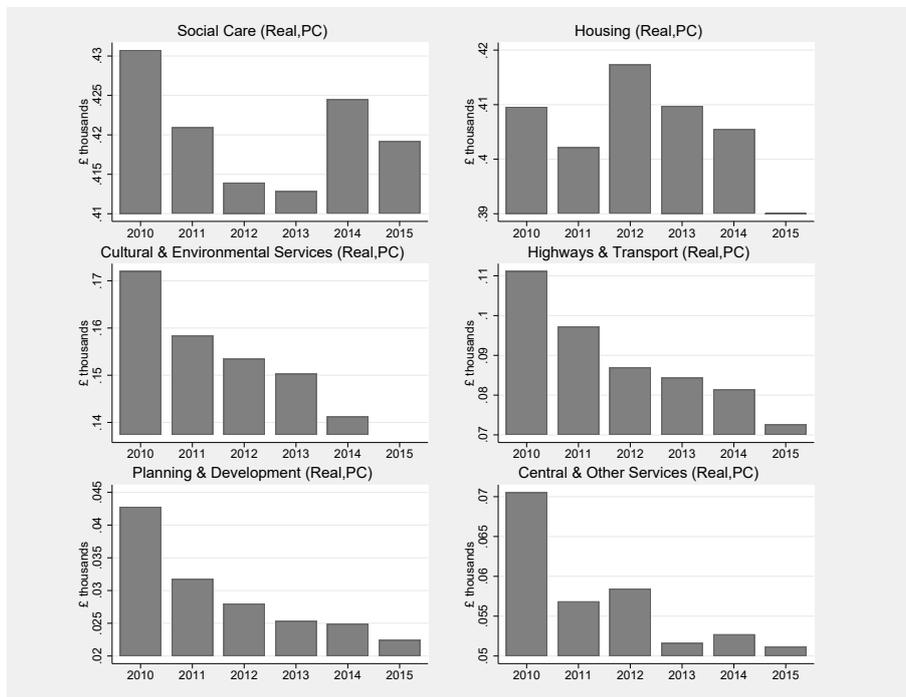
<sup>16</sup>Appendix C provides more information about the administration of the local government in England.

2015, spending on social care and housing went down by about 3% and 5%, respectively, while it declined by about 35% for transport, by 48% for planning and development, by 20% for environment and cultural services and by 27% for central and other services.

Figure 4: Average local authority spending per capita, 2010-2015



(a) Average spending per capita



(b) Average spending per capita across categories

Note: Authors' own calculations from ONS data, including the areas where BSA respondents reside.

Roughly three-fifths of Local Authority spending is financed through central government grants while the remaining two-fifths comes from revenue raised with local taxes on commercial and residential properties ([Department for Communities and Local Government 2014](#)). The Central Government provides a series of grants to Local Authorities. These grants can be split into two main categories: a grant that provides general funding (the so-called “formula grant”) and specific grants for particular services ([Department for Communities and Local Government 2014](#)).

The “formula grant” comprises two grants: the business rates revenue grant and the revenue support grant. Business rates, otherwise known as non-domestic rates, are collected taxes on the properties of local businesses. In the past, all the revenue from these taxes would have been collected by the Central Government who would then redistribute them to Local Authorities as a grant, given the specific needs of each Local Authority. After 2013, Local Authorities were allowed to keep approximately 50% of their non-domestic rates revenue in the form of the rate retention scheme grant and the rest of the non-domestic rates revenues were redistributed to Local Authorities through the revenue support grant and other grants ([Local Government Association 2015](#)). This new scheme was introduced, as it was believed that this would give an incentive to Local Authorities to support local businesses more.

The council tax revenue collected by Local Authorities, covers about one quarter of Local Authority spending. Local Authorities have the right to increase council tax every year, up to a specific amount. Any increase higher than this has to be decided by a local referendum. Soon after the Central Government started cutting expenditure, it offered a council freeze grant to Local Authorities if they did not increase their council tax for that year. At the beginning, this grant was so high that all Local Authorities accepted it and decided not to increase their rates. Every subsequent year, the amount of the grant offered was lower, which led to fewer and fewer Local Authorities accepting it and, therefore, increased their council tax rates instead ([Ministry of Housing, Communities and Local Government 2014](#)).

#### **4.1 The austerity shock**

Our empirical strategy exploits the geographical variation in spending cuts to construct a measure of unexpected austerity at the local area level – the austerity shock. In order

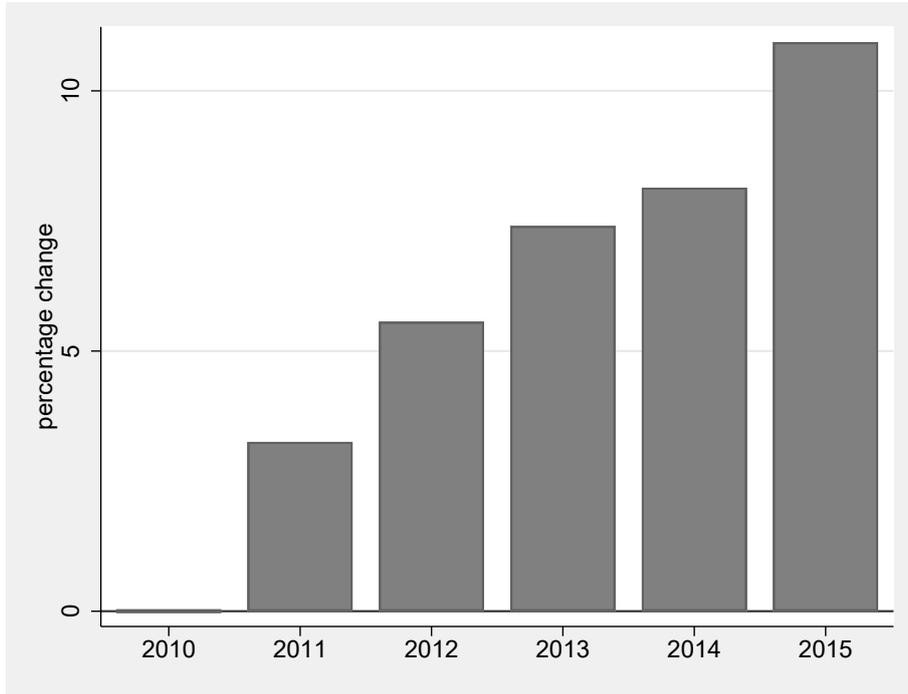
to compute the *austerity shock*, we subtract the amount of local spending in any given year from the outset of the austerity policy (year 2010), which is, therefore, used as counterfactual spending. This means that we assume that individuals would expect their Local Authorities to spend *at least* as much as they did in 2010 in real terms, i.e., before the austerity cuts came into place. This can be seen as a conservative approach to measuring the shock as local spending was increasing in real terms up to that point.

Specifically, the *austerity shock* is computed as Eq. (14):

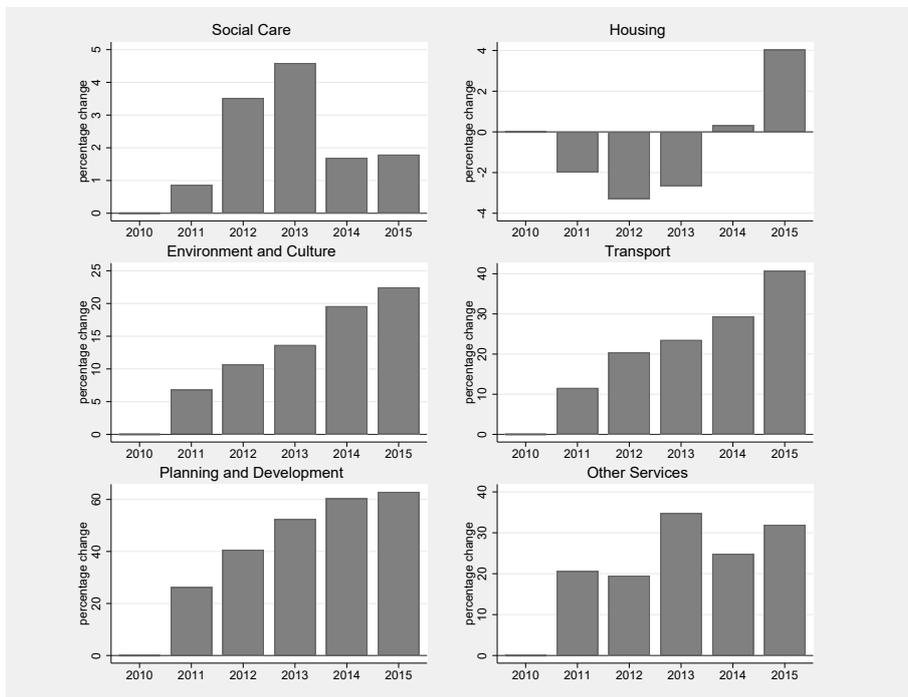
$$austerity_{g,t} = -(\ln(\text{Spending per capita})_{g,t} - \ln(\text{Spending per capita})_{g,t=2010-11}), \quad (10)$$

where  $g$  indicates the Local Authority, and  $t$  the current year. We calculate the spending per capita for every locality in order to capture distortions in spending due to changes in population size. In terms of the time dimension, we match the Local Authority spending from the financial year (April  $year_t$  to March  $year_{t+1}$ ) to the BSA survey wave of  $year_t$ . We set *austerity* to be equal to the negative difference in spending so that, as the value of the variable increases, the level of austerity increases, i.e., the greater the value, the greater the local spending shock. We also compute this for each category of spending.

Figure 5: Local austerity shock, 2010-2015



(a) Total effect of austerity shock



(b) Austerity shock across categories

Note: Authors' own calculation from ONS data

Figure 5 serves to illustrate the increasing level of austerity in England as captured by our austerity shock. The austerity shock is growing year on year, and it is positive every year for every category with the exception of housing. Table 2 reports the summary statistics of the overall austerity shock over the period 2010-2015, as well as disaggregated by spending category.

Table 2: Summary statistics of spending, austerity and local-area level variables

	Mean	St Dev	Min	Max
Austerity shock	6.1	6.4	-8.2	35.7
Austerity shock - Transport	22.0	21.9	-49.0	144.7
Austerity shock - Social care	2.1	8.4	-28.5	46.0
Austerity shock - Housing	-0.3	5.0	-18.0	19.9
Austerity shock - Culture and environment	12.7	12.0	-26.2	72.3
Austerity shock - Planning and development	41.4	43.7	-88.6	310.5
Austerity shock - Other expenses	22.5	54.5	-143.7	565.3
Employment rate	72.3	4.9	54.2	84.2
Migration rate	11.8	9.5	2.1	40.0

Note: Authors' own calculation from ONS data.

## 4.2 Local-area level control variables

To control for potential confounders at the local level, some specifications include employment and migration rates, which are taken from the ONS regional statistics tables. The latter is based on the estimated number of non-foreign born divided by the estimated population at each locality. The last two rows of Table 2 provide the descriptive statistics for these variables. Every specification also includes indicators of NUTS1 regions, i.e. the nine government office regions, which are the administrative units in the Nomenclature of Territorial Units for Statistics (NUTS), a geocode standard used by the European statistics agency, Eurostat, for referencing the subdivisions countries for statistical purposes.

## 5 Main Results

We start our econometric analysis by documenting the general effect of the austerity shock on attitudes towards redistribution using ordered probit models of the following form:

$$y_{it}^* = \alpha A_{gt} + \mathbf{x}_{it}'\beta + \mathbf{M}_{gt}'\gamma + \delta + t + \epsilon_{it}, \quad \epsilon_i \sim N(0, 1), \quad \forall i = 1, \dots, N \quad (11)$$

where  $y_{it}^*$  is a continuous latent variable capturing these attitudes and is assumed to be linearly dependent on a vector of independent variables and an error term  $\epsilon_{it}$ , which follows a Normal distribution. Individuals are denoted by  $i$ , different waves by  $t$  (recall these are repeated cross-sections), and the sample size is  $N$ . The austerity shock is captured by the variable  $A$ , which varies across Local Authorities  $g$  and over time  $t$ . The vector  $\mathbf{x}$  includes a series of demographic and individual specific variables: gender; age; race; disability; the number of children and the number of adults in the household; marital status; education level; employment status, household income; benefit claims; house ownership; union membership; and religiosity. The vector  $\mathbf{M}$  includes the share of migrants in each Local Authority  $g$  at time  $t$ , and the employment rate at the Local Authority  $g$  at time  $t$ . Finally, year controls ( $t$ ) and a set of NUTS1 region fixed effects ( $\delta$ ) are included in every regression specification. Standard errors are clustered at the Local Authority level. This baseline model will be augmented with interactions between austerity and income to test the predictions of our theoretical model.

Table 3 reports the (average) marginal probability effects, i.e. the change in the probability of reporting a given response (*Strongly Agree, Agree, ...*) associated with the austerity shock.<sup>17</sup> Our initial analysis shows that the austerity shock changes attitudes. Consistent with our theoretical model in Section 2, individuals tend to become more supportive of redistribution after their area has been hit by austerity. For instance, the first row of Table 3 reports marginal effects of the model with year and region fixed effects, which show that a 1 percentage point increase in the austerity shock is associated with an increase in the probability of responding either ‘agree’ and ‘strongly agree’ by 0.19 and 0.15, respectively. This result is robust to the inclusion of local-area level characteristics and individual-level characteristics (see the second row). As expected, the estimated marginal effects become smaller after the introduction of personal characteristics and Local Authority characteristics, while being still statistically significant at the 5% level. On average, the probability of responding ‘Agree’ or ‘Strongly Agree’ with more redistribution increases by 0.08 and 0.06, respectively, as the austerity shock increases by 1 percentage

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<sup>17</sup>The full set of estimates is reported in the Appendix (Table D.1) and is in line with the literature and prior expectations. Male, older individuals, non-white, people with a reported disability, non-married, and highly educated individuals are more supportive of redistribution. Individuals who do not claim benefits are less supportive compared to people who claim. As we will discuss in more detail in the remainder of the paper, the baseline model shows that higher earners and people who own their home are less supportive of redistribution, on average.

point (see the third row or Table 3). The inclusion of the household income category controls does not influence the size of the coefficient in accordance with expectations, but the marginal effect is less precisely estimated (see the fourth row of Table 3, which is the full model in equation 11).

We take this as indicative of potential heterogeneous effects. Our theoretical model is explicit about differential effects across the income distribution as it predicts that changes in attitudes following austerity vary across different groups. We empirically test for these heterogeneous effects across the income distribution by estimating two separate types of interaction models. First, we add interaction terms between the austerity shock and each income category to our model, so the ordered probit model denoted in equation 11 can be re-written as:

$$y_{it}^* = \alpha A_{gt} \times I_{it} + \mathbf{x}_{it}'\boldsymbol{\beta} + \mathbf{M}_{gt}'\boldsymbol{\gamma} + \delta + t + \epsilon_{it}, \quad \epsilon_i \sim N(0, 1), \quad \forall i = 1, \dots, N \quad (12)$$

where,  $I_{it}$  denotes the household income category of individual  $i$  at time  $t$ .

Further, and to test our theoretical model in more detail, we create indicators that capture different levels of austerity, from ‘low’ to ‘high’, using intervals defined by percentiles of austerity by year, and interact these austerity level indicators with the household income controls. For each year and for each local authority, we split the austerity shock into quintiles, i.e., we include five indicators of austerity in the regression models. For example, there is an 80th percentile for austerity shock in 2011, 2012, etc., which represents the value below which 80% of the observations may be found in 2010, 2011, etc.. Austerity above this value would represent a very high level of spending cuts, while, in contrast, a value below the 20th percentile would constitute a low level of austerity. This empirical strategy enables us to test whether there is a substantial difference in attitudes for high income groups who experienced different levels of austerity, as predicted by our theoretical model. The ordered probit model in equation 12 is amended as follows:

$$y_{it}^* = \alpha G_{gt} \times I_{it} + \mathbf{x}_{it}'\boldsymbol{\beta} + \mathbf{M}_{gt}'\boldsymbol{\gamma} + \delta + t + \epsilon_{it}, \quad \epsilon_i \sim N(0, 1), \quad \forall i = 1, \dots, N \quad (13)$$

where,  $G_{gt}$  denotes indicators for the austerity level that captures increasing levels of

austerity based on the percentiles, as described above.

Table 3: Attitudes towards redistribution and austerity

	(1) Strongly disagree	(2) Disagree	(3) Neither	(4) Agree	(5) Strongly agree
Baseline model	-0.107*** (0.029)	-0.213*** (0.057)	-0.020*** (0.007)	0.192*** (0.052)	0.147*** (0.040)
+LA characteristics	-0.067** (0.027)	-0.133** (0.053)	-0.012** (0.006)	0.120** (0.048)	0.092** (0.037)
+Individual characteristics	-0.051** (0.026)	-0.101** (0.051)	-0.009* (0.005)	0.092** (0.046)	0.070** (0.035)
+Household characteristics	-0.045* (0.026)	-0.090* (0.052)	-0.008 (0.005)	0.081* (0.047)	0.062* (0.036)
Observations	11,934	11,934	11,934	11,934	11,934

Notes: This table reports average marginal effects of austerity on attitudes towards redistribution estimated from ordered probit specifications. Each column represents the response outcome to the attitudes question, while each row investigates how the marginal effects vary when changing the set of controls across specifications. The baseline model controls for year and Government Office Region fixed effects. These variables are included in all subsequent regressions. The second row adds Local Authority (LA) characteristics, i.e. the employment rate and migrant share at Local Authority level. The individual characteristics added in row 3 include gender, age, race, disability, number of children, number of adults, marital status, benefit claims, house tenure, education, employment status, union membership, and religiosity. Household income controls are included in row 4. Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 4 is divided into three panels. Panel A (labelled “Baseline model”) shows the marginal probability effects of belonging to one of the top three income categories computed after estimating the fully specified model in equation Eq. (11). Specifically, Panel A shows the “baseline” attitudes to redistribution model for different income groups (with respect to the lowest income category), with everything else – including austerity – held constant. We report these baseline results here so that attitudes towards redistribution when austerity is held constant can be compared more easily with the results from the models with the interaction terms, which show how attitudes towards redistribution vary when austerity measures tighten. These results show that, everything else equal, individuals in the highest income category (£44,000+) are less likely to support redistributive policies, compared to individuals in the lowest income category (with household earnings less than £14,000). The estimated effects are similar in models that do not include the austerity shock. This first panel replicates the result generally found in the literature: relatively rich people are, on average, less supportive of redistribution. The estimated average marginal effects show that the probability of responding agree or strongly agree

with more redistribution is lower for those earning more than £44,000, than for those earning less than £14,000, by 0.085 and 0.06, respectively.

Table 4: Austerity and attitudes towards redistribution across income groups

	(1) Strongly disagree	(2) Disagree	(3) Neither	(4) Agree	(5) Strongly agree
PANEL A Baseline model					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.012*** (0.003)	0.030*** (0.007)	0.007*** (0.002)	-0.025*** (0.006)	-0.023*** (0.006)
£26,000- £43,999	0.024*** (0.004)	0.055*** (0.008)	0.009*** (0.002)	-0.048*** (0.007)	-0.040*** (0.007)
More than £44,000	0.047*** (0.006)	0.093*** (0.010)	0.007*** (0.002)	-0.085*** (0.010)	-0.062*** (0.007)
PANEL B Interaction model: ( <i>Austerity</i> ) $\times$ ( <i>Income Groups</i> )					
Less than £14,000	-0.006 (0.029)	-0.016 (0.081)	-0.005 (0.023)	0.013 (0.065)	0.014 (0.068)
£15,000- £25,999	-0.029 (0.037)	-0.066 (0.084)	-0.010 (0.013)	0.058 (0.074)	0.047 (0.060)
£26,000- £43,999	-0.014 (0.044)	-0.027 (0.084)	-0.001 (0.004)	0.025 (0.079)	0.017 (0.053)
More than £44,000	-0.171*** (0.053)	-0.244*** (0.077)	0.034** (0.014)	0.249*** (0.078)	0.131*** (0.042)
PANEL C Interaction model: ( <i>Austerity Percentiles</i> ) $\times$ ( <i>Income Groups</i> )					
80th-100th VS <20th percentile - less than £14,999	-0.002 (0.006)	-0.005 (0.016)	-0.001 (0.004)	0.004 (0.013)	0.004 (0.013)
80th-100th VS <20th percentile - £15,000 - £25,999	-0.002 (0.006)	-0.004 (0.015)	-0.001 (0.002)	0.003 (0.013)	0.003 (0.011)
80th-100th VS <20th percentile - £26,000 - £43,999	0.003 (0.008)	0.006 (0.016)	0.000 (0.000)	-0.006 (0.015)	-0.004 (0.009)
80th-100th VS <20th percentile - £44,000 or more	-0.033*** (0.010)	-0.051*** (0.016)	0.005** (0.002)	0.051*** (0.016)	0.028*** (0.009)
Observations	11,934	11,934	11,934	11,934	11,934

Notes: This table reports average marginal effects of austerity on attitudes towards redistribution estimated from ordered probit regressions. Panel A reports the estimated marginal effects for income controls computed from the fully specified model in equation Eq. (11) (Table 3, row 4). Panel B reports the estimated marginal effects of the interaction terms from the ordered probit models that include interactions between the austerity shock and each income group control. Panel C presents the difference between the change of predicted probabilities in places where austerity is high versus places where austerity is low (80th percentile versus 20th percentile for austerity) for different income groups. Every regression model includes the following set of controls: year and Government Office Region fixed effects; Local Authority (LA) characteristics such as the employment rate and the migrant share at the Local Authority level; Individual characteristics such as gender, age, race, disability, number of children, number of adults, marital status, benefit claims, education, employment status, union membership, and religiosity. Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

The bottom part of Table 4 tests the predictions from our theoretical model and reports average marginal effects from the two *separate* interaction models, described in equations 12 and 13, respectively. Panel B shows average marginal probability effects estimated from an ordered probit regression of attitudes towards redistribution on the

austerity shock, where the austerity shock is interacted with each household income category. These can be interpreted as the (average) probability change of reporting one of the categories (Strongly Agree, Agree, etc.) as the austerity shock increases by 1 percentage point. When using marginal effects, the change in attitudes is predicted when austerity increases by a very small magnitude (1 percentage point). Panel C reports the results from the second interaction model, equation 13, that uses austerity percentiles and thus tests whether attitudes vary when austerity changes are much larger than 1 percentage point. In particular, Panel C focuses on how large the difference is between the probability of a response (such as ‘Strongly Agree’) if one experienced relatively high levels of austerity (80th percentile) versus low levels (20th percentile) for each income group. According to our theoretical model, we should expect those in high income households to be more likely to be in favour of redistribution when comparing high versus low austerity levels, and the difference to be statistically significant.

In line with Proposition 2, our findings indeed suggest that higher income individuals are, on average, more likely to support redistribution compared to lower income individuals when austerity hits. The results in Panel B show that being in the high income bracket is associated with an increase in the probability of agreeing (strongly agreeing) with more redistribution by 0.25 (0.13) as the austerity shock increases by 1 percentage point. Both marginal effects are statistically significant at the 1% level. On the other hand, such changes in austerity levels do not seem to affect the redistribution preferences of individuals in households where income is less than £14,000. The average probability change is small and statistically insignificant. Therefore, the increasing support for redistribution as a response to the increase in austerity is predominantly driven by the high income group. This is indicative of a shift in attitudes. However, marginal effects are only able to capture small changes in austerity levels. The analysis in Panel C enables us to contrast the effects of substantially diverging degrees of austerity (such as the 80th percentile versus the 20th percentile). Again, we can see that a change in the probability of agreeing with more redistribution is only apparent for the high income individuals. No such change is found for low income individuals.

## 6 Instrumental variable approach

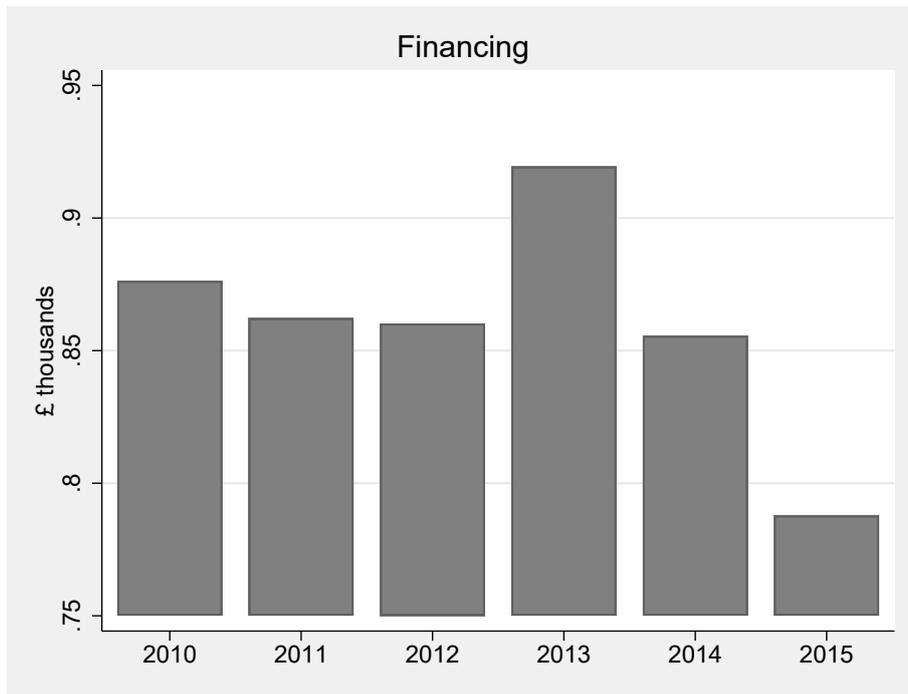
In this section, we propose an instrumental variable for local spending based on specific grant cuts by the central government. As discussed above, local authority spending is financed partly through central government grants and partly through revenue raised with local taxes, sales, fees and other charges.

The austerity measures introduced by the central government were implemented as cuts to grants provided to local authorities, which acted as an exogenous shock to the local authorities' ability to spend. However, the final spending cut levels varied vastly between local authorities ([Innes & Tetlow 2015b](#)). Given the cuts in financing from the central government, local authorities made decisions over whether to: use or build up their reserves; increase (or not) fees, charges, and taxes; and ultimately whether to decrease (or not) service or non-service spending. Local authorities are most likely to have made their spending decisions based on: the level of local needs; the level of grants provided by the central government; their capacity to raise income through taxes, sales, fees and other charges; and their reserve levels. It can be argued, however, that their final spending decisions were also affected by public opinion. [Hills \(2002\)](#) in his work on social security policies and public attitudes found that often in the UK, opinion surveys and focus groups seem to play a leading role in shaping policies. Our model assumes that the austerity shock is exogenous and not determined by individual sentiment towards cuts. However, if local authorities perceive that discontentment rises in their area due to increasing austerity cuts, it is plausible that they might adjust their spending decisions - to the extent that this is feasible - in order to mediate the effects of the central government cuts on services. This would imply that the estimated austerity shock coefficient is biased downwards.

Unfortunately there is no BSA survey question that would allow us to measure the "anti-cuts sentiment" in the area. Thus, to correct for this potential omitted variable bias, we employ an instrumental variable approach. We instrument spending by using a measure of spending power that captures the capacity for spending based on the grants provided from the central government to the local authorities. We argue that cuts to those grants are exogenous to any spending decisions local authorities might make, while they have a decisive effect on the local authorities' spending ability and, thus, final service spending.

The central government grants that we include in this instrumental variable analysis are the following: a) grants that are directed to supporting the services that are included in our austerity measure (social care, housing, environment and culture, transport, planning and development, and central and other services); b) grants that provide general funding (the so-called “formula grant”), which is not directed to a specific service; and c) grants that are ring-fenced for housing benefits provision. We have excluded a very small grant that is allocated to “other services” as it might have been used for services that have been discontinued over time. We also exclude the so-called Council Tax Freeze Grant that compensates for withholding an increase in the Council Tax rates and, thus, its provision is dependent on the local authority’s preference to increase the council tax. In Figure 6 below, we can see how the sum of grants provided from the central government to the local authorities has changed over time.

Figure 6: Average financing per capita over 2010-2015



Note: Authors’ own calculation from ONS data. This graph includes the central government grants for specific services, the “formula grant”, and ring-fenced grants for housing benefits. The values are in real terms and per capita and only cover local authorities that are included in our sample.

We derive a measure of grant cuts, which is calculated in the same way as the austerity shock:

$$\text{Grant-cuts}_{g,t} = (\ln(\text{Real grants per capita})_{g,t} - \ln(\text{Real grants per capita})_{g,t=2010-11}), \quad (14)$$

where  $g$  indicates the Local Authority, and  $t$  the current year. The endogeneity potentially arises in the austerity variable due to the omission of individual anti-cuts sentiment. To tackle the potential bias of the endogenous variable,  $A_g$ , in Equations 11 and 12, we use an instrumental variable approach. The first stage estimates how austerity in local authority  $g$  depends on a series of parameters including the decline in central government grants, which is the instrumental variable. The second stage uses the fitted values of austerity from the first stage to estimate its unbiased effect on redistribution preferences. The first stage equation is as follows:

$$A_g = \gamma_g G_g + \mathbf{z}'_g \boldsymbol{\theta}_g + \eta_g, \quad \eta_g \sim N(0, 1), \quad \forall g = 1, \dots, M \quad (15)$$

where  $G_g$  denotes the grant-cuts in local authority  $g$ ,  $\mathbf{z}_g$  are other controls variables, and  $\eta_g$  is the error term.

Table 5 shows the attitudes towards redistribution as austerity increases and after correcting for the likely bias of the service spending change, using as an instrumental variable, the exogenous change in the provision of central government grants. The rest of the specification is similar to that presented in Table 3 above. After correcting for the downward bias, we see that the unbiased effect size is larger than previously estimated.

Similarly, Table 6 shows the attitudes towards redistribution by income group as austerity increases, using the instrumental variables approach. In all other specifications, Table 6 is similar to Table 4 above. Panel A of Table 6 shows the preference for redistribution by income group, everything else equal is almost identical to Table 4. Once we focus on the preference for redistribution as austerity increases in the area (Panel B, Table 6), we see that the size of the unbiased effect is greater than previously estimated, given the direction of the bias.

Table 5: Attitudes towards redistribution and austerity with IV

	(1) Strongly disagree	(2) Disagree	(3) Neither	(4) Agree	(5) Strongly agree
Baseline model	-0.288*** (0.104)	-0.558*** (0.190)	-0.051** (0.020)	0.503*** (0.174)	0.394*** (0.137)
+LA characteristics	-0.257** (0.117)	-0.499** (0.217)	-0.046** (0.022)	0.450** (0.198)	0.352** (0.155)
+Individual characteristics	-0.249** (0.115)	-0.483** (0.214)	-0.043** (0.021)	0.436** (0.195)	0.339** (0.152)
+Household characteristics	-0.237** (0.112)	-0.461** (0.209)	-0.042** (0.020)	0.416** (0.191)	0.324** (0.148)
Observations	11,934	11,934	11,934	11,934	11,934

Notes: This table reports average marginal effects of austerity on attitudes towards redistribution estimated from ordered probit specifications with the instrumental variables approach. Each column represents the response outcome to the attitudes question, while each row investigates how the marginal effects vary when changing the set of controls across specifications. The baseline model controls for year and Government Office Region fixed effects. These variables are included in all subsequent regressions. The second row adds Local Authority (LA) characteristics, i.e. the employment rate and migrant share at Local Authority level. The individual characteristics added in row 3 include gender, age, race, disability, number of children, number of adults, marital status, benefit claims, house tenure, education, employment status, union membership, and religiosity. Household income controls are included in row 4. Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table 6: Austerity and attitudes towards redistribution across income groups with IV

	(1) Strongly disagree	(2) Disagree	(3) Neither	(4) Agree	(5) Strongly agree
PANEL A Baseline model					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.012*** (0.003)	0.029*** (0.007)	0.006*** (0.002)	-0.025*** (0.006)	-0.023*** (0.006)
£26,000- £43,999	0.024*** (0.004)	0.054*** (0.008)	0.009*** (0.002)	-0.046*** (0.007)	-0.040*** (0.007)
More than £44,000	0.047*** (0.006)	0.091*** (0.011)	0.007*** (0.002)	-0.083*** (0.010)	-0.062*** (0.007)
PANEL B Interaction model: ( <i>Austerity</i> ) $\times$ ( <i>Income Groups</i> )					
<i>(Austerity) <math>\times</math> (Income Groups)</i>					
Less than £14,000	-0.141 (0.092)	-0.383 (0.236)	-0.108* (0.061)	0.307 (0.194)	0.325* (0.195)
£15,000- £25,999	-0.194* (0.104)	-0.435* (0.222)	-0.066** (0.034)	0.380* (0.197)	0.315* (0.161)
£26,000- £43,999	-0.205* (0.114)	-0.390* (0.212)	-0.017 (0.015)	0.363* (0.198)	0.249* (0.139)
More than £44,000	-0.407*** (0.156)	-0.570*** (0.217)	0.078** (0.033)	0.583*** (0.221)	0.315** (0.128)
Observations	11,934	11,934	11,934	11,934	11,934

Notes: This table reports average marginal effects of austerity on attitudes towards redistribution estimated from ordered probit regressions with the instrumental variables approach. Panel A reports the estimated marginal effects for income controls computed from the fully specified model in Equation Eq. (11) (Table 3, row 4). Panel B reports the estimated marginal effects of the interaction terms from the ordered probit models that include interactions between the austerity shock and each income group control. Every regression model includes the following set of controls: year and Government Office Region fixed effects; Local Authority (LA) characteristics such as the employment rate and the migrant share at the Local Authority level; Individual characteristics such as gender, age, race, disability, number of children, number of adults, marital status, benefit claims, education, employment status, union membership, and religiosity. Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

## 7 Mechanisms

According to our theoretical framework, for high income individuals, the shift in attitudes is driven by altruistic motives and the realisation of the adverse impacts of austerity on low income individuals and, more indirectly, on themselves. We refer to these two mechanisms as altruism and appreciation, respectively. The effects of austerity may become more apparent and salient in the immediate environment of high income individuals as the austerity measures are intensified. For example, food banks have been increasing in number across England around the time of the austerity measures and collection points for food banks are to be found in many public places, shopping centres and supermarkets (Loopstra et al. 2018). Cuts in specific spending, such as social care, may also indirectly affect the well-being of high income individuals in different ways. For instance, they may realise that they may not be able to rely on public services for the care of their elderly relatives or for their own care in the future.

In what follows, we empirically explore the existence of these two mechanisms by investigating the relationship between attitudes towards redistribution and unexpected spending cuts (i.e. shocks) on categories of expenditure that are more likely to be linked with altruism and appreciation. These spending categories are social care and housing. In addition, we have identified other attitudinal questions in the BSA survey that may be linked to the concepts of altruism and/or appreciation. We begin by estimating ordered probit models of attitudes towards redistribution on austerity shocks as captured by expenditure on social care and housing (see Panel *b* of Figure 5).

The findings in Table 7 show how the shock in social care expenditure changes the probability of supporting redistribution across the income groups. As with the previous table, the first panel of Table 7, labelled “Baseline model”, reports the average marginal effects of income estimated from regressions of attitudes towards redistribution on the social care austerity shock and the other controls listed in Eq. (11). The bottom panels of Table 7 provide evidence in support of the mechanisms put forward. As unexpected social care expenditure cuts intensify, high income individuals are more likely to support redistribution. In other words, high income individuals ‘wake up’ to the effect of the cuts in social care expenditure and realise that redistribution may be beneficial. To some extent, these results can be taken as evidence in support of the altruism channel as well,

Table 7: Social care spending shock and attitudes towards redistribution across income groups

	(1) Strongly disagree	(2) Disagree	(3) Neither	(4) Agree	(5) Strongly agree
PANEL A Baseline model					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.012*** (0.003)	0.030*** (0.007)	0.007*** (0.002)	-0.025*** (0.006)	-0.023*** (0.006)
£26,000- £43,999	0.024*** (0.004)	0.055*** (0.008)	0.009*** (0.002)	-0.048*** (0.007)	-0.040*** (0.007)
More than £44,000	0.047*** (0.006)	0.094*** (0.010)	0.007*** (0.002)	-0.085*** (0.010)	-0.062*** (0.007)
PANEL B Interaction model: ( <i>Austerity</i> ) $\times$ ( <i>Income Groups</i> )					
Less than £14,000	0.019 (0.018)	0.052 (0.049)	0.015 (0.015)	-0.042 (0.039)	-0.044 (0.042)
£15,000- £25,999	-0.002 (0.027)	-0.004 (0.061)	-0.001 (0.009)	0.003 (0.053)	0.003 (0.043)
£26,000- £43,999	-0.024 (0.031)	-0.047 (0.059)	-0.002 (0.003)	0.044 (0.055)	0.030 (0.038)
More than £44,000	-0.107*** (0.035)	-0.153*** (0.054)	0.021*** (0.007)	0.156*** (0.054)	0.082*** (0.031)
PANEL C Baseline model with IV					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.012*** (0.003)	0.030*** (0.007)	0.007*** (0.002)	-0.025*** (0.006)	-0.024*** (0.005)
£26,000- £43,999	0.025*** (0.004)	0.055*** (0.008)	0.009*** (0.002)	-0.048*** (0.007)	-0.041*** (0.006)
More than £44,000	0.048*** (0.006)	0.092*** (0.010)	0.007*** (0.002)	-0.084*** (0.010)	-0.063*** (0.007)
PANEL D Interaction model with IV: ( <i>Austerity</i> ) $\times$ ( <i>Income Groups</i> )					
<i>(Austerity) <math>\times</math> (Income Groups)</i>					
Less than £14,000	-0.083 (0.060)	-0.226 (0.156)	-0.065 (0.042)	0.181 (0.126)	0.194 (0.132)
£15,000- £25,999	-0.127* (0.072)	-0.284* (0.151)	-0.043* (0.023)	0.248* (0.133)	0.206* (0.112)
£26,000- £43,999	-0.171** (0.081)	-0.319** (0.144)	-0.013 (0.010)	0.298** (0.135)	0.205** (0.097)
More than £44,000	-0.287*** (0.099)	-0.399*** (0.135)	0.056*** (0.020)	0.409*** (0.137)	0.221*** (0.083)
Observations	11,934	11,934	11,934	11,934	11,934

Notes: This table reports average marginal effects of austerity on attitudes towards redistribution estimated from ordered probit regressions. Panel A reports estimated marginal effects for income category controls computed after running the fully specified model in Equation Eq. (11) (Table 3, row 4). Panel B reports the marginal effects of the interaction terms from estimating ordered probit models that also include interactions between the austerity shock and each income group dummy variable. Panels C and D are equivalent to Panels A and B respectively, estimated via the instrumental variables approach. All regressions include the following set of controls: year and Government Office Region fixed effects; Local Authority (LA) characteristics such as the employment rate and migrant share at Local Authority level; Individual characteristics such as gender, age, race, disability, number of children, number of adults, marital status, benefit claims, education, employment status, union membership, and religiosity. Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 8: Housing spending shock and attitudes towards redistribution across income groups

	(1) Strongly disagree	(2) Disagree	(3) Neither	(4) Agree	(5) Strongly agree
PANEL A Baseline model					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.012*** (0.003)	0.030*** (0.007)	0.007*** (0.002)	-0.025*** (0.006)	-0.023*** (0.006)
£26,000- £43,999	0.024*** (0.004)	0.055*** (0.008)	0.009*** (0.002)	-0.048*** (0.007)	-0.040*** (0.007)
More than £44,000	0.047*** (0.006)	0.093*** (0.010)	0.007*** (0.002)	-0.085*** (0.010)	-0.062*** (0.007)
PANEL B Interaction model: ( <i>Austerity</i> ) x ( <i>Income Groups</i> )					
Less than £14,000	-0.004 (0.033)	-0.010 (0.091)	-0.003 (0.026)	0.008 (0.073)	0.008 (0.077)
£15,000- £25,999	-0.077 (0.053)	-0.174 (0.119)	-0.027 (0.019)	0.153 (0.104)	0.125 (0.087)
£26,000- £43,999	-0.055 (0.064)	-0.105 (0.121)	-0.005 (0.006)	0.098 (0.113)	0.066 (0.077)
More than £44,000	-0.118* (0.068)	-0.169* (0.095)	0.024 (0.017)	0.173* (0.098)	0.089* (0.050)
PANEL C Baseline model with IV					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.014*** (0.004)	0.025** (0.012)	0.005 (0.004)	-0.020* (0.011)	-0.023*** (0.006)
£26,000- £43,999	0.026*** (0.005)	0.044** (0.022)	0.006 (0.005)	-0.037* (0.020)	-0.040*** (0.007)
More than £44,000	0.050*** (0.007)	0.075** (0.036)	0.005 (0.005)	-0.067** (0.034)	-0.063*** (0.007)
PANEL D Interaction model with IV: ( <i>Austerity</i> ) x ( <i>Income Groups</i> )					
<i>(Austerity) x (Income Groups)</i>					
Less than £14,000	-0.850 (1.246)	-1.732 (1.476)	-0.424* (0.227)	1.313 (1.003)	1.693 (1.943)
£15,000- £25,999	-1.101 (1.421)	-1.838 (1.310)	-0.232*** (0.089)	1.554 (1.029)	1.618 (1.779)
£26,000- £43,999	-1.204 (1.501)	-1.752 (1.260)	-0.060 (0.044)	1.604 (1.109)	1.412 (1.666)
More than £44,000	-1.507 (1.735)	-1.666 (1.113)	0.229 (0.146)	1.736 (1.208)	1.208 (1.507)
Observations	11,934	11,934	11,934	11,934	11,934

Notes: This table reports average marginal effects of austerity on attitudes towards redistribution estimated from ordered probit regressions. Panel A reports estimated marginal effects for income category controls computed after running the fully specified model in Equation Eq. (11) (Table 3, row 4). Panel B reports the marginal effects of the interaction terms from estimating ordered probit models that also include interactions between the austerity shock and each income group dummy variable. Panels C and D are equivalent to Panels A and B respectively, estimated via the instrumental variables approach. All regressions include the following set of controls: year and Government Office Region fixed effects; Local Authority (LA) characteristics such as the employment rate and migrant share at Local Authority level; Individual characteristics such as gender, age, race, disability, number of children, number of adults, marital status, benefit claims, education, employment status, union membership, and religiosity. Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

as cuts in social care affect poor people disproportionately. Panels C and D show the average marginal effects computed after the IV model, which confirm the main results.

Similarly, unexpected local cuts in housing benefits affect attitudes for those in the top income category, who shift their preferences in favour of redistribution as cuts increase (Table 8). We can take this as evidence in support of altruism. However, this mechanism is weaker as the IV model does not reveal statistically significant changes in attitudes for high income groups (see Panel D of Table 8).

For completeness, we estimate the effects of cuts for the other spending categories on redistribution preferences in Appendix D. The mechanism linking cuts in those spending categories and the redistribution preferences might be less apparent. However, some evidence supporting the appreciation channel may be found when focusing on austerity shocks in environmental and cultural services that arguably might be more salient for high income groups (see Table D.2). It is plausible to argue that these services might be of particular importance for these groups and that a cut in these services may reveal effects of austerity that have not been previously considered. Note, however, that the evidence of a shift in attitudes is only confirmed when using the austerity shock variable instead of the IV approach. There is not much evidence of strong shifts in attitudes towards redistribution when exploring unexpected cuts in expenditure on transport (Table D.3), which may be expected as this category lumps together public transport expenditure (more likely to be of importance for low income groups) and highway maintenance and enhancement (which may be more salient for high income groups). There is also some indication that the redistribution preferences of middle-income households are strengthened as spending on planning and development is reduced (Table D.4). However, the results from the IV approach are suggestive of appreciation as attitudes towards redistribution shift for rich people.

Finally, it might be argued that expenditure on services such as registry and tax collection may not be salient from a redistribution perspective. Specifically, we would not expect attitudes towards redistribution to change when expenditures in this administrative area are cut unexpectedly. This accords with the findings presented in Table D.5. Attitudes towards redistribution across income groups are not affected by shocks in expenditure on central services. Such analysis can be regarded as a type of placebo test and validation of

our theoretical model and empirical strategy.

We now move towards exploring the potential for these mechanisms by looking at additional attitudinal questions from the BSA survey. To preview our results, we find stronger support for the appreciation mechanism than the altruistic mechanism. Following Corollary 3, this then implies that respondents put a higher weight on appreciation than on altruism in Eq. (1).

First, we explore whether austerity affects the degree to which high income individuals agree that *“the creation of the Welfare State is one of the proudest achievements of Great Britain”* and we regard this as supporting appreciation. Panel A of Table 9 typically shows that higher income groups do not agree with this statement, in line with Corollary 2. Again, and following Corollary 3, high income individuals shift their attitudes and are more likely to support this statement as the austerity shock hits. These results are robust to the IV approach (see Panels C and D).

Another statement that plausibly captures the presence of appreciation among richer households is *“Ordinary working people do not get their fair share of the Nation’s wealth”*. This statement asks the respondent’s opinion on the existence of injustice related to government spending and wages. To the extent that individuals from richer households consider themselves as ordinary working people, their response to this statement arguably captures their appreciation of redistribution. Table 10, Panel A, shows that people in richer households are less likely to agree with this statement compared to people in poorer households. However, in accordance with the predictions of our theoretical model, as austerity increases people in richer households are more likely to agree with this statement (Panels B and D, Table 10).

We further explore the presence of altruism. Table 11 reports estimates of ordered probit regressions of the categorical responses to the statement: *“There is one law for the rich and one for the poor”*. According to our theoretical priors, we expect high income individuals to express more agreement with this statement if exposed to an austerity shock. As in the previous case, the baseline model of attitudes across income groups (controlling for the austerity shock and other characteristics) is presented in Panel A (and in Panel C for the IV model), and the findings suggest that high income individuals are, on average, less altruistic. As shown in Panels B and D, as austerity increases, individuals in richer

households are more likely to support this statement.

Even though the question above indicates that more well-off individuals believe there is some unfairness stemming from an individual's financial position, it does not clearly indicate whether they would be willing to practically support those who are less well-off. To further understand if pure altruistic motives drive the increased support for redistribution by more well-off individuals, we explore their responses to two more questions. The first question is "*Should the Government spend more money on welfare benefits for the poor?*" and the second statement is "*Cutting welfare benefits would damage too many peoples' lives*". As richer individuals are less likely to claim welfare support but are more likely to fund it, we believe that these questions are more likely to capture the altruistic motives of more affluent individuals. The findings presented in Panels A and C in Tables 12 and 13 show that individuals in households with higher earnings are less likely to support more spending on welfare benefits for the poor or to agree that cutting benefits would be too detrimental, compared to individuals in less affluent households. As austerity increases, we see no change in these stances for relatively well-off individuals, for both statements (see Panels B and C). This suggests that the change in redistribution preferences of richer individuals is more likely to be driven by appreciation rather than pure altruism.

We further explore the robustness of our main results by using indicators other than household income to capture different levels of the financial affluence of the respondents. Specifically, we use individual earnings and housing tenure instead of household income as an indicator for the financial standing of the respondent, whilst still controlling for household income. We also test the possibility that there is a delay in the reaction of the redistribution preferences of individuals to the austerity shock by using the previous year's cuts in spending in the local authority as the austerity shock. The results of these robustness checks can be found in Appendix E.

Table 9: The creation of the Welfare State is one of the GB's proudest achievements (by income groups)

	(1) Strongly disagree	(2) Disagree	(3) Neither	(4) Agree	(5) Strongly agree
PANEL A Baseline model					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.006*** (0.002)	0.012*** (0.004)	0.016*** (0.005)	-0.010*** (0.004)	-0.024*** (0.008)
£26,000- £43,999	0.006*** (0.002)	0.012*** (0.004)	0.015*** (0.005)	-0.010*** (0.003)	-0.023*** (0.008)
More than £44,000	0.006** (0.002)	0.012** (0.005)	0.015** (0.006)	-0.010** (0.004)	-0.024** (0.010)
PANEL B Interaction model: ( <i>Austerity</i> ) x ( <i>Income Groups</i> )					
Less than £14,000	0.003 (0.018)	0.007 (0.038)	0.010 (0.053)	-0.005 (0.029)	-0.015 (0.080)
£15,000- £25,999	-0.039 (0.024)	-0.074 (0.046)	-0.088 (0.054)	0.066 (0.040)	0.135 (0.084)
£26,000- £43,999	0.022 (0.025)	0.043 (0.049)	0.052 (0.058)	-0.038 (0.043)	-0.080 (0.089)
More than £44,000	-0.046** (0.023)	-0.089** (0.043)	-0.108** (0.053)	0.079** (0.038)	0.165** (0.080)
PANEL C Baseline model with IV					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.006*** (0.002)	0.012*** (0.004)	0.016*** (0.005)	-0.010*** (0.004)	-0.024*** (0.008)
£26,000- £43,999	0.006*** (0.002)	0.011*** (0.004)	0.015*** (0.006)	-0.009*** (0.003)	-0.023*** (0.008)
More than £44,000	0.006** (0.002)	0.012** (0.005)	0.015** (0.006)	-0.010** (0.004)	-0.023** (0.010)
PANEL D Interaction model with IV: ( <i>Austerity</i> ) x ( <i>Income Groups</i> )					
<i>(Austerity) x (Income Groups)</i>					
Less than £14,000	-0.031 (0.039)	-0.066 (0.082)	-0.092 (0.113)	0.049 (0.062)	0.140 (0.172)
£15,000- £25,999	-0.079* (0.044)	-0.151* (0.082)	-0.181* (0.096)	0.134* (0.072)	0.278* (0.150)
£26,000- £43,999	-0.017 (0.042)	-0.034 (0.082)	-0.041 (0.099)	0.030 (0.072)	0.062 (0.151)
More than £44,000	-0.085* (0.045)	-0.164* (0.087)	-0.199* (0.105)	0.143* (0.075)	0.305* (0.162)
Observations	11,226	11,226	11,226	11,226	11,226

Notes: This table reports average marginal effects of austerity on attitudes towards redistribution estimated from ordered probit regressions. Panel A reports estimated marginal effects for income category controls computed after running the fully specified model in equation Eq. (11) (Table 3, row 4). Panel B reports the marginal effects of the interaction terms from estimating ordered probit models that also include interactions between the austerity shock and each income group dummy variable. Panels C and D are equivalent to Panels A and B respectively, estimated via the instrumental variables approach. All regressions include the following set of controls: year and Government Office Region fixed effects; Local Authority (LA) characteristics such as the employment rate and migrant share at Local Authority level; Individual characteristics such as gender, age, race, disability, number of children, number of adults, marital status, benefit claims, education, employment status, union membership, and religiosity. Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 10: Ordinary working people do not get their fair share of the nation's wealth (by income groups)

	(1) Strongly disagree	(2) Disagree	(3) Neither	(4) Agree	(5) Strongly agree
PANEL A Baseline model					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.001*** (0.001)	0.013*** (0.005)	0.015*** (0.005)	-0.011*** (0.004)	-0.019*** (0.007)
£26,000- £43,999	0.004*** (0.001)	0.034*** (0.006)	0.035*** (0.006)	-0.030*** (0.005)	-0.043*** (0.008)
More than £44,000	0.012*** (0.002)	0.083*** (0.008)	0.068*** (0.006)	-0.081*** (0.008)	-0.083*** (0.008)
PANEL B Interaction model: ( <i>Austerity</i> ) x ( <i>Income Groups</i> )					
Less than £14,000	-0.001 (0.004)	-0.011 (0.037)	-0.013 (0.044)	0.008 (0.028)	0.016 (0.056)
£15,000- £25,999	-0.006 (0.005)	-0.054 (0.039)	-0.057 (0.040)	0.047 (0.033)	0.071 (0.050)
£26,000- £43,999	-0.012 (0.007)	-0.085* (0.050)	-0.073* (0.043)	0.083* (0.049)	0.087* (0.052)
More than £44,000	-0.044*** (0.011)	-0.224*** (0.055)	-0.116*** (0.030)	0.239*** (0.059)	0.146*** (0.036)
PANEL C Baseline model with IV					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.002*** (0.001)	0.013*** (0.005)	0.014*** (0.005)	-0.011*** (0.004)	-0.018*** (0.007)
£26,000- £43,999	0.004*** (0.001)	0.034*** (0.006)	0.034*** (0.006)	-0.030*** (0.005)	-0.042*** (0.008)
More than £44,000	0.012*** (0.002)	0.082*** (0.009)	0.066*** (0.006)	-0.079*** (0.009)	-0.082*** (0.008)
PANEL D Interaction model with IV: ( <i>Austerity</i> ) x ( <i>Income Groups</i> )					
<i>(Austerity) x (Income Groups)</i>					
Less than £14,000	-0.020 (0.014)	-0.187 (0.127)	-0.222 (0.150)	0.143 (0.099)	0.286 (0.192)
£15,000- £25,999	-0.033** (0.017)	-0.279** (0.135)	-0.289** (0.140)	0.240** (0.117)	0.360** (0.175)
£26,000- £43,999	-0.046** (0.022)	-0.327** (0.145)	-0.278** (0.123)	0.316** (0.141)	0.335** (0.149)
More than £44,000	-0.116*** (0.040)	-0.583*** (0.189)	-0.300*** (0.105)	0.615*** (0.199)	0.384*** (0.133)
Observations	11,227	11,227	11,227	11,227	11,227

Notes: This table reports average marginal effects of austerity on attitudes towards redistribution estimated from ordered probit regressions. Panel A reports estimated marginal effects for income category controls computed after running the fully specified model in equation Eq. (11) (Table 3, row 4). Panel B reports the marginal effects of the interaction terms from estimating ordered probit models that also include interactions between the austerity shock and each income group dummy variable. Panels C and D are equivalent to Panels A and B respectively, estimated via the instrumental variables approach. All regressions include the following set of controls: year and Government Office Region fixed effects; Local Authority (LA) characteristics such as the employment rate and migrant share at Local Authority level; Individual characteristics such as gender, age, race, disability, number of children, number of adults, marital status, benefit claims, education, employment status, union membership, and religiosity. Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 11: There is one law for the rich and one for the poor (by income groups)

	(1) Strongly disagree	(2) Disagree	(3) Neither	(4) Agree	(5) Strongly agree
PANEL A Baseline model					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.004*** (0.001)	0.018*** (0.005)	0.013*** (0.004)	-0.006*** (0.002)	-0.029*** (0.009)
£26,000- £43,999	0.010*** (0.002)	0.043*** (0.007)	0.029*** (0.005)	-0.018*** (0.003)	-0.064*** (0.010)
More than £44,000	0.025*** (0.002)	0.091*** (0.008)	0.051*** (0.005)	-0.050*** (0.005)	-0.117*** (0.011)
PANEL B Interaction model: ( <i>Austerity</i> ) x ( <i>Income Groups</i> )					
Less than £14,000	-0.004 (0.007)	-0.020 (0.038)	-0.016 (0.031)	0.005 (0.009)	0.035 (0.067)
£15,000- £25,999	-0.012 (0.012)	-0.055 (0.052)	-0.038 (0.036)	0.022 (0.021)	0.084 (0.078)
£26,000- £43,999	-0.025 (0.017)	-0.093 (0.061)	-0.052 (0.034)	0.052 (0.034)	0.118 (0.077)
More than £44,000	-0.077*** (0.022)	-0.212*** (0.057)	-0.072*** (0.020)	0.161*** (0.044)	0.201*** (0.054)
PANEL C Baseline model with IV					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.004*** (0.001)	0.018*** (0.005)	0.013*** (0.004)	-0.006*** (0.002)	-0.029*** (0.009)
£26,000- £43,999	0.010*** (0.002)	0.043*** (0.007)	0.029*** (0.005)	-0.018*** (0.003)	-0.064*** (0.010)
More than £44,000	0.025*** (0.002)	0.090*** (0.008)	0.050*** (0.005)	-0.049*** (0.005)	-0.116*** (0.011)
PANEL D Interaction model with IV: ( <i>Austerity</i> ) x ( <i>Income Groups</i> )					
<i>(Austerity) x (Income Groups)</i>					
Less than £14,000	-0.037 (0.029)	-0.185 (0.142)	-0.149 (0.115)	0.045 (0.038)	0.326 (0.250)
£15,000- £25,999	-0.053 (0.043)	-0.235 (0.185)	-0.163 (0.129)	0.093 (0.075)	0.358 (0.282)
£26,000- £43,999	-0.078* (0.047)	-0.289* (0.167)	-0.162* (0.093)	0.161* (0.097)	0.368* (0.211)
More than £44,000	-0.182** (0.072)	-0.494** (0.192)	-0.169** (0.070)	0.374** (0.145)	0.471** (0.189)
Observations	11,219	11,219	11,219	11,219	11,219

Notes: This table reports average marginal effects of austerity on attitudes towards redistribution estimated from ordered probit regressions. Panel A reports estimated marginal effects for income category controls computed after running the fully specified model in equation Eq. (11) (Table 3, row 4). Panel B reports the marginal effects of the interaction terms from estimating ordered probit models that also include interactions between the austerity shock and each income group dummy variable. Panels C and D are equivalent to Panels A and B respectively, estimated via the instrumental variables approach. All regressions include the following set of controls: year and Government Office Region fixed effects; Local Authority (LA) characteristics such as the employment rate and migrant share at Local Authority level; Individual characteristics such as gender, age, race, disability, number of children, number of adults, marital status, benefit claims, education, employment status, union membership, and religiosity. Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 12: Should the Government spend more money on welfare benefits for the poor? (by income groups)

	(1) Strongly disagree	(2) Disagree	(3) Neither	(4) Agree	(5) Strongly agree
PANEL A Baseline model					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.014*** (0.003)	0.040*** (0.008)	0.002** (0.001)	-0.039*** (0.008)	-0.017*** (0.004)
£26,000- £43,999	0.021*** (0.003)	0.057*** (0.009)	0.001 (0.001)	-0.056*** (0.008)	-0.023*** (0.004)
More than £44,000	0.032*** (0.006)	0.080*** (0.015)	-0.002 (0.002)	-0.079*** (0.015)	-0.030*** (0.005)
PANEL B Interaction model: (Austerity) x (Income Groups)					
<i>(Austerity) x (Income Groups)</i>					
Less than £14,000	0.011 (0.022)	0.036 (0.073)	0.005 (0.011)	-0.035 (0.070)	-0.017 (0.035)
£15,000- £25,999	0.051 (0.040)	0.131 (0.103)	-0.003 (0.004)	-0.130 (0.102)	-0.049 (0.039)
£26,000- £43,999	0.048 (0.042)	0.110 (0.097)	-0.011 (0.010)	-0.109 (0.097)	-0.037 (0.032)
More than £44,000	-0.075 (0.050)	-0.144 (0.097)	0.029 (0.019)	0.147 (0.099)	0.044 (0.031)
PANEL C Baseline model with IV					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.014*** (0.003)	0.040*** (0.008)	0.003** (0.001)	-0.039*** (0.008)	-0.017*** (0.004)
£26,000- £43,999	0.020*** (0.003)	0.056*** (0.009)	0.002 (0.001)	-0.055*** (0.009)	-0.023*** (0.004)
More than £44,000	0.031*** (0.006)	0.080*** (0.016)	-0.001 (0.002)	-0.079*** (0.015)	-0.031*** (0.005)
PANEL D Interaction model with IV: (Austerity) x (Income Groups)					
<i>(Austerity) x (Income Groups)</i>					
Less than £14,000	-0.035 (0.081)	-0.118 (0.265)	-0.018 (0.038)	0.114 (0.256)	0.057 (0.128)
£15,000- £25,999	-0.009 (0.118)	-0.023 (0.306)	0.000 (0.005)	0.023 (0.302)	0.009 (0.116)
£26,000- £43,999	-0.018 (0.116)	-0.042 (0.268)	0.004 (0.024)	0.042 (0.268)	0.014 (0.093)
More than £44,000	-0.147 (0.141)	-0.288 (0.277)	0.053 (0.046)	0.292 (0.282)	0.090 (0.091)
Observations	11,934	11,934	11,934	11,934	11,934

Notes: This table reports average marginal effects of austerity on attitudes towards redistribution estimated from ordered probit regressions. Panel A reports estimated marginal effects for income category controls computed after running the fully specified model in equation Eq. (11) (Table 3, row 4). Panel B reports the marginal effects of the interaction terms from estimating ordered probit models that also include interactions between the austerity shock and each income group dummy variable. Panels C and D are equivalent to Panels A and B respectively, estimated via the instrumental variables approach. All regressions include the following set of controls: year and Government Office Region fixed effects; Local Authority (LA) characteristics such as the employment rate and migrant share at Local Authority level; Individual characteristics such as gender, age, race, disability, number of children, number of adults, marital status, benefit claims, education, employment status, union membership, and religiosity. Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 13: Cutting welfare benefits would damage too many peoples' lives (by income groups)

	(1) Strongly disagree	(2) Disagree	(3) Neither	(4) Agree	(5) Strongly agree
PANEL A Baseline model					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.006*** (0.001)	0.032*** (0.006)	0.017*** (0.003)	-0.031*** (0.006)	-0.024*** (0.005)
£26,000- £43,999	0.013*** (0.002)	0.063*** (0.008)	0.027*** (0.004)	-0.061*** (0.008)	-0.042*** (0.005)
More than £44,000	0.017*** (0.002)	0.076*** (0.008)	0.030*** (0.004)	-0.074*** (0.008)	-0.049*** (0.005)
PANEL B Interaction model: (Austerity) x (Income Groups)					
<i>(Austerity) x (Income Groups)</i>					
Less than £14,000	-0.006 (0.012)	-0.034 (0.072)	-0.021 (0.044)	0.031 (0.066)	0.029 (0.061)
£15,000- £25,999	-0.026 (0.021)	-0.123 (0.095)	-0.051 (0.040)	0.119 (0.093)	0.081 (0.064)
£26,000- £43,999	-0.015 (0.026)	-0.058 (0.101)	-0.015 (0.027)	0.057 (0.100)	0.031 (0.054)
More than £44,000	-0.015 (0.020)	-0.055 (0.072)	-0.011 (0.015)	0.054 (0.071)	0.026 (0.035)
PANEL C Baseline model with IV					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.006*** (0.001)	0.032*** (0.006)	0.017*** (0.003)	-0.031*** (0.006)	-0.024*** (0.005)
£26,000- £43,999	0.013*** (0.002)	0.063*** (0.008)	0.027*** (0.004)	-0.060*** (0.008)	-0.042*** (0.005)
More than £44,000	0.017*** (0.002)	0.076*** (0.008)	0.030*** (0.004)	-0.074*** (0.008)	-0.049*** (0.005)
PANEL D Interaction model with IV: (Austerity) x (Income Groups)					
<i>(Austerity) x (Income Groups)</i>					
Less than £14,000	0.011 (0.024)	0.063 (0.144)	0.039 (0.089)	-0.059 (0.133)	-0.054 (0.123)
£15,000- £25,999	-0.004 (0.042)	-0.018 (0.201)	-0.008 (0.085)	0.017 (0.195)	0.012 (0.133)
£26,000- £43,999	0.013 (0.046)	0.052 (0.183)	0.014 (0.049)	-0.051 (0.181)	-0.027 (0.096)
More than £44,000	0.015 (0.043)	0.054 (0.158)	0.011 (0.031)	-0.054 (0.157)	-0.026 (0.076)
Observations	11,934	11,934	11,934	11,934	11,934

Notes: This table reports average marginal effects of austerity on attitudes towards redistribution estimated from ordered probit regressions. Panel A reports estimated marginal effects for income category controls computed after running the fully specified model in equation Eq. (11) (Table 3, row 4). Panel B reports the marginal effects of the interaction terms from estimating ordered probit models that also include interactions between the austerity shock and each income group dummy variable. Panels C and D are equivalent to Panels A and B respectively, estimated via the instrumental variables approach. All regressions include the following set of controls: year and Government Office Region fixed effects; Local Authority (LA) characteristics such as the employment rate and migrant share at Local Authority level; Individual characteristics such as gender, age, race, disability, number of children, number of adults, marital status, benefit claims, education, employment status, union membership, and religiosity. Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

## 8 Conclusion

This paper presents new evidence on the social and political effects of fiscal consolidation. We investigate whether a shock in local spending is associated with changes in attitudes towards redistribution in England over the period 2010-2015, coinciding with the UK austerity plan imposed by the UK Coalition Government.

We find that a plausibly unexpected measure of the austerity shock is, on average, associated with more favourable views towards redistribution. In accordance with our theoretical model, we find that more positive attitudes are driven by individuals from high income households. However, in the absence of austerity, high income groups are less supportive of redistribution, which is in line with the existing literature. These results are robust to an instrumental variable approach where spending cuts are instrumented by cuts in central government grants that are exogenous to local-area attitudes. In other words, austerity changes the attitudes towards redistribution for those who are less likely to be on the receiving end of redistribution. Our theoretical model points to two mechanisms that may be driving these results, namely altruistic preferences and appreciation of the welfare state.

We investigate these mechanisms in two ways. First, we explore whether our results are driven by cuts in specific categories of spending. We find that the high income group changes their preferences in favour of redistribution as a response to cuts in housing benefits, which may suggest altruism. We also find that the relatively rich in our sample favour redistribution when cuts in social care spending increase, which may reveal appreciation towards the welfare system. Looking at additional attitudinal questions from the British Social Attitudes Survey, we find stronger support for the appreciation mechanism than the altruistic mechanism.

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**URL:** <https://commonslibrary.parliament.uk/research-briefings/cbp-8585/>

## A Figures and tables

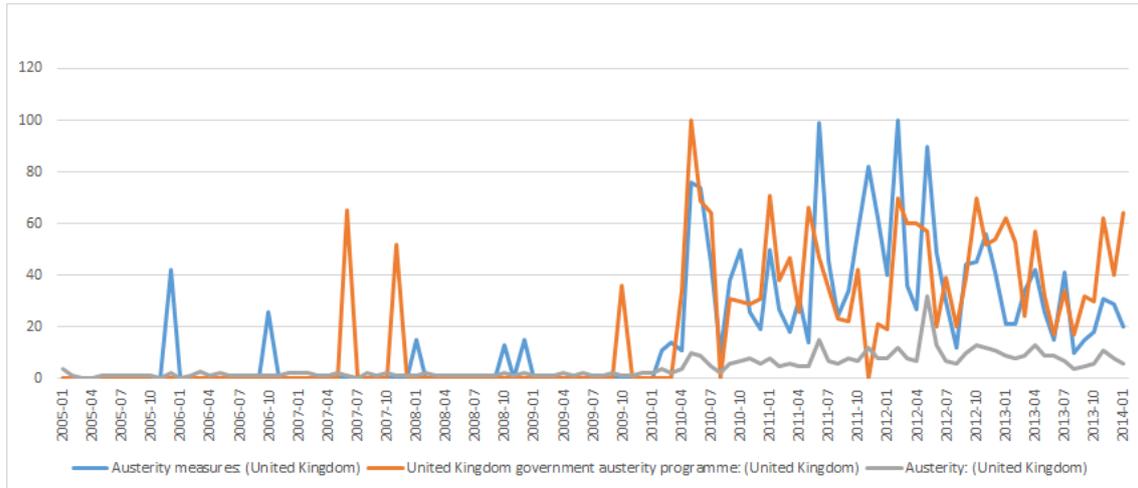


Figure A.1: Google searches for “Austerity” in the UK.

Table A.1: Should the government redistribute income?

	2010	2011	2012	2013	2014	2015
Disagree strongly	7	6	6	6	7	5
Disagree	31	29	26	26	27	23
Neither agree nor disagree	28	29	26	26	27	29
Agree	26	29	30	32	30	32
Agree strongly	9	7	11	10	9	10

Notes: Source: British Social Attitudes Survey, England, 2010-2015

## B Proofs

**Proof of Lemma 1.** Solving the optimisation expressed by Eq. (1), subject to  $\sum_i \lambda_i = 0$ , each individual  $i$  chooses  $\lambda_i$  taking  $\lambda_{-i}$  of the other type as given, which yields the following first order condition for each type

$$-v'(y_i - \lambda_i) - \gamma_i a'(y_{-i} - \lambda_{-i}) \frac{d\lambda_{-i}}{d\lambda_i} + \delta_i s'(y'_i - \lambda_i) = 0, \quad (16)$$

characterising a maximum as the second derivative of Eq. (16) is clearly negative,

$$v''(y_i - \lambda_i) + \gamma_i a''(y_{-i} - \lambda_{-i}) \left( \frac{d\lambda_{-i}}{d\lambda_i} \right)^2 - \delta_i s''(y'_i - \lambda_i) < 0, \quad (17)$$

with  $v''(\cdot) \wedge a''(\cdot) < 0$  and  $s'' > 0$ . The Nash equilibrium must then satisfy

$$-v'(y_i - \lambda_i) - \gamma_i a'(y_{-i} - \lambda_{-i}) \frac{d\lambda_{-i}}{d\lambda_i} + \delta_i s'(y'_i - \lambda_i) = -v'(y_{-i} - \lambda_{-i}) - \gamma_{-i} a'(y_i - \lambda_i) \frac{d\lambda_i}{d\lambda_{-i}} + \delta_{-i} s'(y'_{-i} - \lambda_{-i}). \quad (18)$$

Reordering and rewriting Eq. (18), where  $\frac{d\lambda_{-i}}{d\lambda_i} = \frac{d\lambda_i}{d\lambda_{-i}} = -1$  follows from  $\lambda_i = -\lambda_{-i}$ , we then obtain

$$v'(y_i - \lambda_i) + \gamma_{-i} a'(y_i - \lambda_i) + \delta_{-i} s'(y'_{-i} - \lambda_{-i}) = v'(y_{-i} - \lambda_{-i}) + \gamma_i a'(y_{-i} - \lambda_{-i}) + \delta_i s'(y'_i - \lambda_i), \quad (19)$$

which, given our assumptions on functional form, and the fact that  $Y_r > Y_p$ , can only hold if and only if  $\lambda \equiv \lambda_r > \lambda_p = -\lambda$ , defining the Nash equilibrium  $(\lambda_r^*, \lambda_p^*)$ . Rewriting Eq. (18), and setting  $\lambda \equiv \lambda_i = -\lambda_{-i}$ , then yields

$$\Phi_i(\lambda) \equiv -v'(y_i - \lambda) + \gamma_i a'(y_{-i} + \lambda) + \delta_i s'(y'_i - \lambda) = -v'(y_{-i} + \lambda) + \gamma_{-i} a'(y_i - \lambda) + \delta_{-i} s'(y'_{-i} + \lambda) \equiv \Phi_{-i}(\lambda), \quad (20)$$

which shows that the Nash equilibrium is unique, since  $\frac{d\Phi_i(\lambda)}{d\lambda} < 0$ ,  $\frac{d\Phi_{-i}(\lambda)}{d\lambda} > 0$ , and  $\Phi_i(0) > \Phi_{-i}(0)$  under reasonable parameter assumptions.  $\square$

**Proof of Lemma 2.** Applying the implicit function theorem to the equilibrium characterised by Eq. (3) for each individual  $i$ , we obtain

$$\frac{d\lambda_i}{d\alpha_i} = -\frac{\frac{d\Phi_i}{d\alpha_i}}{\frac{d\Phi_i}{d\lambda_i}} = -\left( \frac{-v''(y_i - \lambda_i)(-Y_i) - \gamma_i a''(y_{-i} - \lambda_{-i}) \frac{d\lambda_{-i}}{d\lambda_i} \left( -\frac{d\alpha_{-i}}{d\alpha_i} Y_{-i} \right) + \delta_i s''(y'_i - \lambda_i) Y_i}{v''(y_i - \lambda_i) + \gamma_i a''(y_{-i} - \lambda_{-i}) \left( \frac{d\lambda_{-i}}{d\lambda_i} \right)^2 - \delta_i s''(y'_i - \lambda_i)} \right). \quad (21)$$

Then, making the simplifying assumption that austerity measures affect rich and poor in the same way, so that  $\frac{d\alpha_{-i}}{d\alpha_i} = \frac{d\alpha_i}{d\alpha_{-i}} = 1$ , and solving the optimisation by setting  $\lambda \equiv \lambda_i = -\lambda_{-i} > 0$ , we obtain Eq. (4).  $\square$

**Proof of Lemma 3.** Since the denominator of Eq. (4) is negative as shown under Lemma 1, it follows that the sign of  $\frac{d\lambda_r}{d\alpha_r}$  is defined by the numerator of Eq. (4), which is expressed by Eq. (5).  $\square$

**Proof of Lemma 4.** Since the denominator of Eq. (4) is negative as shown under Lemma 1, it follows that the sign of  $\frac{d\lambda_r}{d\alpha_r}$  is defined by the numerator of Eq. (4), which is expressed by Eq. (6).  $\square$

**Proof of Proposition 1.** From our assumptions on functional forms, with  $v(\cdot)$  as well as  $a(\cdot)$  concave and  $s(\cdot)$  convex, we know that the first term of Eq. (5) in Lemma 3 is negative, whilst the two following terms will be positive in equilibrium, and ceteris paribus. Moreover, since third derivatives are positive, and  $Y_r > Y_p$ , the second and third terms will be more pronounced than the first. Similarly, the first term of Eq. (6) in Lemma 4 is negative, yet the sign will be more pronounced as  $v'''(\cdot) > 0$  and  $Y_r > Y_p$ . The two other terms are still positive, but here the effect is less pronounced since  $a'''(\cdot) > 0$ ,  $s'''(\cdot) > 0$  and  $Y_r > Y_p$ . Given that  $\frac{d\alpha_p}{d\alpha_r} = 1$ , it then follows not only that  $\frac{d\lambda_r}{d\alpha_r} \gg \frac{d\lambda_p}{d\alpha_p}$  for reasonable parameter values, but also that  $\frac{d\lambda_p}{d\alpha_r} \approx 0$ .  $\square$

**Proof of Corollary 1.** This follows naturally from Proposition 1, Lemma 3 and Lemma 4. As the second and third term gain in relative weight in Eq. (5) and Eq. (6) as  $\gamma_i$  or  $\delta_i$  increase, the channels of altruism and appreciation come out reinforced.  $\square$

**Proof of Proposition 2.** This results directly from Proposition 1. As  $\alpha$  increases beyond the threshold, the relative weight of the second and third term in Eq. (5) and Eq. (6) jumps in binary fashion from 0 to  $\gamma_i$  or  $\delta_i$ , so that any marginal increase beyond the threshold value  $\bar{\alpha}$  sets in motion the more complex workings of Proposition 1 and the mechanisms described there.  $\square$

**Proof of Corollary 2.** This is a logical counterpart of Proposition 2. If the threshold value  $\bar{\alpha}$  is not reached, the only active term in Eq. (5) and Eq. (6) is the first one, which

captures purely self-interested preferences. Since  $Y_r > Y_p$ , this implies that, on the margin, richer individuals will be less in favour of redistribution than the poor.  $\square$

***Proof of Corollary 3.*** This follows from Proposition 2 and, similar to Corollary 1, makes the outcome conditional on the relative weights of the second and third term in Eq. (5) and Eq. (6), but now in a binary fashion: the increase (around the threshold) can only be from 0 to  $\gamma_i$  or  $\delta_i$ .  $\square$

## C Local Authorities in England

Local Authorities in England are directly elected by their residents and are organised in single-tier and two-tier councils. The two-tier councils consist of an upper-tier area and a lower-tier area. The upper-tier areas are geographically larger than the lower-tier ones, and overlap with more than one lower-tier area. The Local Authorities have a series of services they provide to their residents. In the case of single-tier authorities, the authority is responsible with administering these services, while in the case of two-tier councils the responsibility is in many cases shared between them ([Department for Communities and Local Government 2014](#)).

The Local Authorities can take the following forms; Metropolitan Districts, London Boroughs, Unitary Authorities, Shire Counties, Shire Districts, and Single Purpose Authorities. The Single Purpose Authorities include the Fire and Rescue Authorities, Transport Authorities, Waste Authorities, Police and Crime Commissioner, and National Parks Authorities ([Department for Communities and Local Government 2015](#)). The Unitary Authorities, the Metropolitan Districts, the London Boroughs and the City of London, and the Isles of Scilly are all single-tier councils. Two-tier councils are the Shire Counties (upper-tier) and the Shire Districts (lower-tier) ([Ministry of Housing, Communities and Local Government 2016](#)). Finally, there are some Combined Authorities which are legal bodies formed to allow two or more councils to cooperate and decide together on matters that affect all of them ([Shared Intelligence 2016](#)).

In our analysis we exclude the Fire and Rescue Authorities, Police and Crime Commissioner Authorities, and National Parks Authorities as they are financed from the Central Government and the Local Authorities have no decisive power over their finances ([Innes & Tetlow 2015a](#)). There is an overlap between the Combined Authorities, the Transport Authorities, the Waste Authorities, and the Greater London Authority with the Unitary Authorities, the Metropolitan Districts, the Shire Districts, and the London Boroughs. In the following table we show the smaller areas that the larger ones cover:

<b>Larger Areas</b>	<b>Smaller Areas</b>
Combined Authority	Unitary Authorities Metropolitan Districts Shire Districts
Transport Authority	Metropolitan Districts
Waste Authority	Metropolitan Districts London Boroughs
Greater London Authority	London Boroughs
Shire Counties	Shire District

We match the BSA data with the lower tier areas and London. In order to calculate the spending over those areas, we use population weights to calculate the approximate proportion of the larger area spending that corresponds to the smaller areas they overlap with. We calculate all spending in real terms and per capita for our analysis.

Table C.1: Examples of Services delivered by local government - England

Major service	Examples of what is delivered
Highways, Roads and Transport	Highways – construction and maintenance of non-trunk roads and bridges Street lighting Traffic management and road safety; new line parking services Public transport – concessionary fares; support to operators; co-ordination Airports; harbours and toll facilities
Social Care for Children and Adults	Children’s and families’ services – support; welfare; fostering; adoption Youth justice – secure accommodation; youth offender teams Services for older people – nursing; home; residential and day care; meals Services for people with a physical disability; sensory impairment; learning disabilities or mental health needs Asylum seekers Supported employment
Housing	Council housing (Housing Revenue Account) Housing strategy and advice; housing renewal. Housing benefits and welfare Homelessness
Cultural and environmental services	Culture and heritage – archives; museums and galleries; public entertainment Recreation and sport – sports development; indoor and outdoor sports and recreation facilities Open spaces – national and community parks; countryside; allotments Tourism – marketing and development; visitor information Libraries and information services Cemetery; cremation and mortuary services Community safety; consumer protection; coast protection; trading standards Environmental health – food safety; pollution & pest control; housing standards; public conveniences; licensing Agricultural and fisheries services Waste collection and disposal; street cleansing
Planning and development	Building and development control Planning policy – including conservation and listed buildings Environmental initiatives Economic and community development
Central and other services	Local tax collection Registration of births; deaths and marriages Elections – including registration of electors Emergency planning Local land charges Democratic representation Corporate management

<sup>1</sup> This is table 1.2a, page 18 from [Department for Communities and Local Government \(2014\)](#).

## D Auxiliary Regressions

Table D.1: Individual level control variables on redistribution preferences

	(1) Strongly disagree	(2) Disagree	(3) Neither	(4) Agree	(5) Strongly agree
Male (ref. cat: Female)	-0.016*** (0.002)	-0.033*** (0.005)	-0.003*** (0.001)	0.029*** (0.004)	0.023*** (0.004)
<i>Age Groups (ref. cat: 18-24)</i>					
Age Group: 25-34	-0.018** (0.009)	-0.026** (0.012)	0.003 (0.002)	0.026** (0.012)	0.015** (0.007)
Age Group: 35-44	-0.034*** (0.008)	-0.054*** (0.012)	0.002 (0.002)	0.053*** (0.012)	0.033*** (0.007)
Age Group: 45-54	-0.041*** (0.008)	-0.069*** (0.011)	0.000 (0.003)	0.066*** (0.011)	0.044*** (0.007)
Age Group: 55-59	-0.046*** (0.009)	-0.081*** (0.012)	-0.002 (0.003)	0.076*** (0.012)	0.053*** (0.008)
Age Group: 60-64	-0.044*** (0.008)	-0.076*** (0.012)	-0.001 (0.003)	0.072*** (0.012)	0.049*** (0.008)
Age Group: 65+	-0.034*** (0.009)	-0.055*** (0.014)	0.002 (0.002)	0.054*** (0.014)	0.034*** (0.008)
White (ref. cat: Non-white)	0.011** (0.005)	0.023** (0.011)	0.003 (0.002)	-0.020** (0.010)	-0.017* (0.009)
With Disability (ref. cat: No disability)	-0.012*** (0.002)	-0.025*** (0.005)	-0.003*** (0.001)	0.023*** (0.004)	0.018*** (0.003)
Number of children in household	-0.000 (0.002)	-0.001 (0.003)	-0.000 (0.000)	0.001 (0.003)	0.001 (0.002)
Number of adults in household	-0.008*** (0.002)	-0.016*** (0.004)	-0.001*** (0.000)	0.015*** (0.004)	0.011*** (0.003)
<i>Marital Status (ref. cat: Married)</i>					
Cohabiting	-0.012*** (0.004)	-0.023*** (0.008)	-0.002* (0.001)	0.021*** (0.007)	0.016*** (0.006)
Separated or divorced	-0.013*** (0.004)	-0.025*** (0.008)	-0.002** (0.001)	0.023*** (0.007)	0.017*** (0.005)
Widowed	-0.006 (0.005)	-0.011 (0.009)	-0.001 (0.001)	0.010 (0.008)	0.007 (0.006)
Not married	-0.014*** (0.004)	-0.028*** (0.009)	-0.003** (0.001)	0.025*** (0.008)	0.020*** (0.006)
Claims benefits (ref. cat: No benefit claims)	-0.008*** (0.003)	-0.016*** (0.006)	-0.001** (0.001)	0.015*** (0.005)	0.011*** (0.004)
<i>House Tenure (ref. cat: Rented)</i>					
Owned/being bought	0.019*** (0.004)	0.041*** (0.008)	0.005*** (0.001)	-0.037*** (0.007)	-0.029*** (0.006)
Social housing/Squatting	-0.005 (0.003)	-0.013 (0.009)	-0.003 (0.002)	0.011 (0.007)	0.010 (0.007)
<i>Education (ref. cat: Low education )</i>					
Still in education	-0.020* (0.012)	-0.042 (0.029)	-0.007 (0.007)	0.037 (0.023)	0.032 (0.024)
Intermediate education	0.001 (0.003)	0.002 (0.006)	0.000 (0.000)	-0.002 (0.005)	-0.002 (0.004)
High education	-0.013*** (0.003)	-0.027*** (0.006)	-0.003*** (0.001)	0.024*** (0.005)	0.020*** (0.005)
<i>Employment Status (ref. cat: Employed)</i>					
Unemployed	-0.012** (0.005)	-0.025** (0.011)	-0.003* (0.002)	0.022** (0.010)	0.018** (0.009)
Inactive	-0.004 (0.003)	-0.007 (0.007)	-0.001 (0.001)	0.006 (0.006)	0.005 (0.005)
Still in education/training	-0.004 (0.013)	-0.007 (0.027)	-0.001 (0.003)	0.007 (0.024)	0.005 (0.019)
Union Member (ref. cat: Not a Union member)	-0.021*** (0.003)	-0.045*** (0.006)	-0.007*** (0.002)	0.039*** (0.005)	0.033*** (0.005)
Religious (ref. cat: Not religious)	0.008*** (0.003)	0.017*** (0.005)	0.002** (0.001)	-0.015*** (0.005)	-0.012*** (0.004)
Observations	11,934	11,934	11,934	11,934	11,934

Notes: This table reports average marginal effects of the individual level controls for (Table 3, row 4). Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table D.2: Environmental and cultural services spending shock and attitudes towards redistribution across income groups

	(1) Strongly disagree	(2) Disagree	(3) Neither	(4) Agree	(5) Strongly agree
PANEL A Baseline model					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.012*** (0.003)	0.030*** (0.007)	0.007*** (0.002)	-0.025*** (0.006)	-0.023*** (0.006)
£26,000- £43,999	0.024*** (0.004)	0.055*** (0.008)	0.009*** (0.002)	-0.048*** (0.007)	-0.040*** (0.007)
More than £44,000	0.047*** (0.006)	0.093*** (0.010)	0.007*** (0.002)	-0.085*** (0.010)	-0.062*** (0.007)
PANEL B Interaction model: ( <i>Austerity</i> ) x ( <i>Income Groups</i> )					
Less than £14,000	0.013 (0.015)	0.037 (0.041)	0.011 (0.012)	-0.030 (0.032)	-0.031 (0.035)
£15,000- £25,999	-0.011 (0.019)	-0.025 (0.044)	-0.004 (0.007)	0.022 (0.039)	0.018 (0.032)
£26,000- £43,999	0.030 (0.023)	0.058 (0.044)	0.003 (0.002)	-0.054 (0.041)	-0.037 (0.027)
More than £44,000	-0.053** (0.026)	-0.076** (0.035)	0.011* (0.006)	0.078** (0.037)	0.040** (0.018)
PANEL C Baseline model with IV					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.013*** (0.004)	0.024** (0.011)	0.004 (0.003)	-0.019** (0.010)	-0.022*** (0.006)
£26,000- £43,999	0.025*** (0.004)	0.042** (0.019)	0.006 (0.004)	-0.035** (0.017)	-0.038*** (0.008)
More than £44,000	0.050*** (0.007)	0.075*** (0.029)	0.004 (0.004)	-0.067** (0.027)	-0.062*** (0.007)
PANEL D Interaction model with IV: ( <i>Austerity</i> ) x ( <i>Income Groups</i> )					
<i>(Austerity) x (Income Groups)</i>					
Less than £14,000	-0.370 (0.441)	-0.751 (0.526)	-0.182** (0.079)	0.573 (0.373)	0.729 (0.672)
£15,000- £25,999	-0.471 (0.493)	-0.792* (0.473)	-0.101*** (0.036)	0.671* (0.382)	0.692 (0.614)
£26,000- £43,999	-0.479 (0.512)	-0.717 (0.477)	-0.030 (0.024)	0.655 (0.423)	0.571 (0.580)
More than £44,000	-0.687 (0.617)	-0.749* (0.384)	0.109* (0.065)	0.783* (0.429)	0.545 (0.515)
Observations	11,934	11,934	11,934	11,934	11,934

Notes: This table reports average marginal effects of austerity on attitudes towards redistribution estimated from ordered probit regressions. Panel A reports estimated marginal effects for income category controls computed after running the fully specified model in equation Eq. (11) (Table 3, row 4). Panel B reports the marginal effects of the interaction terms from estimating ordered probit models that also include interactions between the austerity shock and each income group dummy variable. Panels C and D are equivalent to Panels A and B respectively, estimated via the instrumental variables approach. All regressions include the following set of controls: year and Government Office Region fixed effects; Local Authority (LA) characteristics such as the employment rate and migrant share at Local Authority level; Individual characteristics such as gender, age, race, disability, number of children, number of adults, marital status, benefit claims, education, employment status, union membership, and religiosity. Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table D.3: Transport spending shock and attitudes towards redistribution across income groups

	(1) Strongly disagree	(2) Disagree	(3) Neither	(4) Agree	(5) Strongly agree
PANEL A Baseline model					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.012*** (0.003)	0.030*** (0.007)	0.007*** (0.002)	-0.025*** (0.006)	-0.023*** (0.006)
£26,000- £43,999	0.024*** (0.004)	0.055*** (0.008)	0.009*** (0.002)	-0.048*** (0.007)	-0.040*** (0.007)
More than £44,000	0.047*** (0.006)	0.093*** (0.010)	0.007*** (0.002)	-0.085*** (0.010)	-0.062*** (0.007)
PANEL B Interaction model: ( <i>Austerity</i> ) x ( <i>Income Groups</i> )					
Less than £14,000	0.001 (0.008)	0.003 (0.022)	0.001 (0.006)	-0.002 (0.018)	-0.002 (0.019)
£15,000- £25,999	-0.002 (0.012)	-0.004 (0.027)	-0.001 (0.004)	0.004 (0.024)	0.003 (0.019)
£26,000- £43,999	0.026* (0.015)	0.049* (0.028)	0.002 (0.002)	-0.046* (0.027)	-0.031* (0.018)
More than £44,000	-0.023 (0.016)	-0.033 (0.022)	0.005 (0.004)	0.034 (0.023)	0.017 (0.012)
PANEL C Baseline model with IV					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.013*** (0.003)	0.030*** (0.007)	0.006*** (0.002)	-0.025*** (0.006)	-0.025*** (0.005)
£26,000- £43,999	0.025*** (0.004)	0.053*** (0.009)	0.009*** (0.002)	-0.046*** (0.008)	-0.041*** (0.006)
More than £44,000	0.049*** (0.006)	0.091*** (0.012)	0.007*** (0.002)	-0.082*** (0.011)	-0.064*** (0.007)
PANEL D Interaction model with IV: ( <i>Austerity</i> ) x ( <i>Income Groups</i> )					
<i>(Austerity) x (Income Groups)</i>					
Less than £14,000	-0.086* (0.051)	-0.221** (0.110)	-0.062** (0.028)	0.174** (0.086)	0.196* (0.102)
£15,000- £25,999	-0.110* (0.059)	-0.230** (0.105)	-0.033** (0.015)	0.200** (0.091)	0.174** (0.087)
£26,000- £43,999	-0.098 (0.066)	-0.179 (0.110)	-0.008 (0.007)	0.166 (0.101)	0.119 (0.080)
More than £44,000	-0.181** (0.083)	-0.237** (0.097)	0.035** (0.015)	0.245** (0.101)	0.138** (0.068)
Observations	11,934	11,934	11,934	11,934	11,934

Notes: This table reports average marginal effects of austerity on attitudes towards redistribution estimated from ordered probit regressions. Panel A reports estimated marginal effects for income category controls computed after running the fully specified model in equation Eq. (11) (Table 3, row 4). Panel B reports the marginal effects of the interaction terms from estimating ordered probit models that also include interactions between the austerity shock and each income group dummy variable. Panels C and D are equivalent to Panels A and B respectively, estimated via the instrumental variables approach. All regressions include the following set of controls: year and Government Office Region fixed effects; Local Authority (LA) characteristics such as the employment rate and migrant share at Local Authority level; Individual characteristics such as gender, age, race, disability, number of children, number of adults, marital status, benefit claims, education, employment status, union membership, and religiosity. Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table D.4: Planning and development spending shock and attitudes towards redistribution across income groups

	(1) Strongly disagree	(2) Disagree	(3) Neither	(4) Agree	(5) Strongly agree
PANEL A Baseline model					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.012*** (0.003)	0.030*** (0.007)	0.007*** (0.002)	-0.025*** (0.006)	-0.023*** (0.006)
£26,000- £43,999	0.024*** (0.004)	0.055*** (0.008)	0.009*** (0.002)	-0.048*** (0.007)	-0.040*** (0.007)
More than £44,000	0.047*** (0.006)	0.093*** (0.010)	0.007*** (0.002)	-0.085*** (0.010)	-0.062*** (0.007)
PANEL B Interaction model: ( <i>Austerity</i> ) x ( <i>Income Groups</i> )					
Less than £14,000	-0.003 (0.005)	-0.009 (0.013)	-0.003 (0.004)	0.007 (0.010)	0.008 (0.011)
£15,000- £25,999	-0.013*** (0.005)	-0.029*** (0.011)	-0.004*** (0.002)	0.026*** (0.009)	0.021*** (0.008)
£26,000- £43,999	-0.007 (0.006)	-0.014 (0.012)	-0.001 (0.001)	0.013 (0.011)	0.009 (0.008)
More than £44,000	-0.009 (0.009)	-0.012 (0.013)	0.002 (0.002)	0.013 (0.014)	0.007 (0.007)
PANEL C Baseline model with IV					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.013*** (0.003)	0.030*** (0.007)	0.006*** (0.002)	-0.025*** (0.006)	-0.024*** (0.006)
£26,000- £43,999	0.025*** (0.004)	0.053*** (0.009)	0.008*** (0.002)	-0.046*** (0.007)	-0.041*** (0.007)
More than £44,000	0.048*** (0.006)	0.089*** (0.011)	0.007*** (0.002)	-0.081*** (0.010)	-0.063*** (0.007)
PANEL D Interaction model with IV: ( <i>Austerity</i> ) x ( <i>Income Groups</i> )					
<i>(Austerity) x (Income Groups)</i>					
Less than £14,000	-0.044* (0.025)	-0.114** (0.054)	-0.032** (0.013)	0.090** (0.042)	0.100** (0.049)
£15,000- £25,999	-0.065** (0.029)	-0.133*** (0.049)	-0.019*** (0.006)	0.115*** (0.042)	0.101** (0.040)
£26,000- £43,999	-0.065** (0.031)	-0.116** (0.047)	-0.005 (0.003)	0.108** (0.044)	0.078** (0.035)
More than £44,000	-0.081** (0.038)	-0.108** (0.046)	0.015* (0.008)	0.111** (0.047)	0.062** (0.030)
Observations	11,911	11,911	11,911	11,911	11,911

Notes: This table reports average marginal effects of austerity on attitudes towards redistribution estimated from ordered probit regressions. Panel A reports estimated marginal effects for income category controls computed after running the fully specified model in equation Eq. (11) (Table 3, row 4). Panel B reports the marginal effects of the interaction terms from estimating ordered probit models that also include interactions between the austerity shock and each income group dummy variable. Panels C and D are equivalent to Panels A and B respectively, estimated via the instrumental variables approach. All regressions include the following set of controls: year and Government Office Region fixed effects; Local Authority (LA) characteristics such as the employment rate and migrant share at Local Authority level; Individual characteristics such as gender, age, race, disability, number of children, number of adults, marital status, benefit claims, education, employment status, union membership, and religiosity. Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table D.5: Central services spending shock and attitudes towards redistribution across income groups

	(1) Strongly disagree	(2) Disagree	(3) Neither	(4) Agree	(5) Strongly agree
PANEL A Baseline model					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.011*** (0.003)	0.028*** (0.007)	0.006*** (0.002)	-0.024*** (0.006)	-0.022*** (0.005)
£26,000- £43,999	0.023*** (0.004)	0.054*** (0.008)	0.009*** (0.002)	-0.047*** (0.007)	-0.039*** (0.006)
More than £44,000	0.046*** (0.006)	0.092*** (0.010)	0.007*** (0.002)	-0.084*** (0.010)	-0.061*** (0.007)
PANEL B Interaction model: ( <i>Austerity</i> ) x ( <i>Income Groups</i> )					
Less than £14,000	-0.004 (0.003)	-0.011 (0.008)	-0.003 (0.002)	0.009 (0.006)	0.010 (0.007)
£15,000- £25,999	0.003 (0.004)	0.007 (0.009)	0.001 (0.001)	-0.006 (0.008)	-0.005 (0.006)
£26,000- £43,999	0.002 (0.004)	0.004 (0.008)	0.000 (0.000)	-0.004 (0.007)	-0.003 (0.005)
More than £44,000	-0.001 (0.005)	-0.001 (0.008)	0.000 (0.001)	0.001 (0.008)	0.001 (0.004)
PANEL C Baseline model with IV					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.011*** (0.003)	0.028*** (0.007)	0.006*** (0.002)	-0.024*** (0.006)	-0.022*** (0.005)
£26,000- £43,999	0.023*** (0.004)	0.054*** (0.008)	0.009*** (0.002)	-0.047*** (0.007)	-0.039*** (0.006)
More than £44,000	0.046*** (0.006)	0.092*** (0.010)	0.007*** (0.002)	-0.084*** (0.010)	-0.061*** (0.007)
PANEL D Interaction model with IV: ( <i>Austerity</i> ) x ( <i>Income Groups</i> )					
<i>(Austerity) x (Income Groups)</i>					
Less than £14,000	-0.004*** (0.000)	-0.012*** (0.000)	-0.003*** (0.000)	0.010*** (0.000)	0.010*** (0.000)
£15,000- £25,999	0.003 (0.005)	0.006 (0.012)	0.001 (0.002)	-0.005 (0.010)	-0.004 (0.008)
£26,000- £43,999	0.002 (0.005)	0.003 (0.009)	0.000 (0.000)	-0.003 (0.009)	-0.002 (0.006)
More than £44,000	-0.001 (0.008)	-0.002 (0.011)	0.000 (0.002)	0.002 (0.011)	0.001 (0.006)
Observations	11,735	11,735	11,735	11,735	11,735

Notes: This table reports average marginal effects of austerity on attitudes towards redistribution estimated from ordered probit regressions. Panel A reports estimated marginal effects for income category controls computed after running the fully specified model in equation Eq. (11) (Table 3, row 4). Panel B reports the marginal effects of the interaction terms from estimating ordered probit models that also include interactions between the austerity shock and each income group dummy variable. Panels C and D are equivalent to Panels A and B respectively, estimated via the instrumental variables mechanism. All regressions include the following set of controls: year and Government Office Region fixed effects; Local Authority (LA) characteristics such as the employment rate and migrant share at Local Authority level; Individual characteristics such as gender, age, race, disability, number of children, number of adults, marital status, benefit claims, education, employment status, union membership, and religiosity. Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

## E Robustness Checks

In this section, we present the results of additional robustness checks testing the sensitivity of our findings to alternative proxy variables for affluence, namely individual earnings and housing tenure, and to possible delays in the reaction of the redistribution preferences of individuals to the austerity shock, by using the previous year's cuts in spending in the local authority as the austerity shock.

When controlling for individual earnings<sup>18</sup>, the sample size is considerably smaller due to missing information mainly for people who are not employed. It should be noted that this smaller sample size potentially hinders the detection of any effect of the austerity shock on redistribution preferences. Table E.1 shows the effect of the austerity shock on redistribution preferences. This table is similar to Table 3, however, in row 4 it controls for both household income and individual earnings. The smaller sample size does not allow us to detect the average response to cuts when controlling for individual and area related characteristics.

Focusing next on differential responses based on financial affluence, we see in Table E.2, Panel A, that the more individuals earn the less likely they are to support redistribution. When looking at the propensity to support redistribution by earnings group as austerity increases, we see that the highest earners are those who are most likely to strongly agree or agree with more redistribution. This is the same pattern as observed when focusing on differences based on household income.

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<sup>18</sup>This variable refers to individual gross or total earnings, before income tax and national insurance and it is only asked if the respondent is in employment.

Table E.1: Attitudes towards redistribution and austerity controlling for individual earnings

	(1)	(2)	(3)	(4)	(5)
	Strongly disagree	Disagree	Neither	Agree	Strongly agree
PANEL A Baseline model					
Baseline model	-0.093** (0.043)	-0.161** (0.075)	-0.004 (0.005)	0.158** (0.074)	0.099** (0.047)
+LA characteristics	-0.060 (0.043)	-0.105 (0.075)	-0.002 (0.003)	0.103 (0.074)	0.065 (0.046)
+Individual characteristics	-0.056 (0.041)	-0.096 (0.071)	-0.002 (0.003)	0.095 (0.070)	0.059 (0.044)
+Household characteristics	-0.055 (0.042)	-0.095 (0.074)	-0.002 (0.003)	0.093 (0.072)	0.058 (0.045)
PANEL B Baseline model with IV					
Baseline model	-0.239** (0.119)	-0.409** (0.202)	-0.009 (0.012)	0.402** (0.200)	0.255** (0.127)
+LA characteristics	-0.220 (0.136)	-0.378 (0.232)	-0.008 (0.012)	0.371 (0.230)	0.235 (0.145)
+Individual characteristics	-0.227* (0.135)	-0.387* (0.228)	-0.008 (0.012)	0.381* (0.226)	0.241* (0.142)
+Household characteristics	-0.207* (0.125)	-0.356* (0.213)	-0.007 (0.011)	0.350* (0.212)	0.221* (0.132)
Observations	6,441	6,441	6,441	6,441	6,441

Notes: This table reports average marginal effects of austerity on attitudes towards redistribution estimated from ordered probit specifications. Each column represents the response outcome to the attitudes question, while each row investigates how the marginal effects vary when changing the set of controls across specifications. The baseline model controls for year and Government Office Region fixed effects. These variables are included in all subsequent regressions. The second row adds Local Authority (LA) characteristics, i.e. the employment rate and migrant share at Local Authority level. The individual characteristics added in row 3 include gender, age, race, disability, number of children, number of adults, marital status, benefit claims, house tenure, education, employment status, union membership, and religiosity. Individual earnings and household income controls are included in row 4. Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table E.2: Austerity and attitudes towards redistribution across individual earnings groups

	(1) Strongly disagree	(2) Disagree	(3) Neither	(4) Agree	(5) Strongly agree
PANEL A Baseline model					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	-0.000 (0.005)	-0.001 (0.009)	-0.000 (0.001)	0.001 (0.009)	0.001 (0.006)
£26,000- £43,999	0.013** (0.006)	0.022* (0.012)	0.001 (0.001)	-0.022* (0.011)	-0.014* (0.007)
More than £44,000	0.017** (0.007)	0.029** (0.012)	0.000 (0.001)	-0.029** (0.012)	-0.018** (0.008)
PANEL B Interaction model: (Austerity) x (Income Groups)					
<i>(Austerity) x (Income Groups)</i>					
Less than £14,000	0.037 (0.060)	0.072 (0.117)	0.006 (0.010)	-0.069 (0.111)	-0.046 (0.075)
£15,000- £25,999	-0.037 (0.062)	-0.071 (0.120)	-0.006 (0.010)	0.068 (0.113)	0.046 (0.078)
£26,000- £43,999	-0.065 (0.061)	-0.107 (0.098)	0.003 (0.005)	0.107 (0.099)	0.062 (0.057)
More than £44,000	-0.140* (0.078)	-0.215* (0.115)	0.012 (0.013)	0.220* (0.120)	0.123* (0.065)
PANEL C Baseline model with IV					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	-0.001 (0.005)	-0.002 (0.009)	-0.000 (0.001)	0.002 (0.009)	0.001 (0.006)
£26,000- £43,999	0.012* (0.006)	0.022* (0.012)	0.001 (0.001)	-0.021* (0.011)	-0.014* (0.007)
More than £44,000	0.017** (0.007)	0.029** (0.012)	0.000 (0.001)	-0.029** (0.012)	-0.018** (0.008)
PANEL D Interaction model with IV: (Austerity) x (Income Groups)					
<i>(Austerity) x (Income Groups)</i>					
Less than £14,000	-0.101 (0.127)	-0.194 (0.243)	-0.016 (0.021)	0.185 (0.233)	0.126 (0.157)
£15,000- £25,999	-0.169 (0.116)	-0.326 (0.225)	-0.028 (0.025)	0.309 (0.213)	0.215 (0.149)
£26,000- £43,999	-0.221 (0.150)	-0.358 (0.237)	0.009 (0.014)	0.360 (0.241)	0.211 (0.139)
More than £44,000	-0.299* (0.161)	-0.453* (0.234)	0.028 (0.026)	0.463* (0.244)	0.261* (0.134)
Observations	6,441	6,441	6,441	6,441	6,441

Notes: This table reports average marginal effects of austerity on attitudes towards redistribution estimated from ordered probit regressions. Panel A reports the estimated marginal effects for individual earnings controls computed from the fully specified model in equation Eq. (11) (Table E.1, row 4). Panel B reports the estimated marginal effects of the interaction terms from the ordered probit models that include interactions between the austerity shock and each income group control. Panels C and D are equivalent to Panels A and B respectively, estimated via the instrumental variables approach. Every regression model includes the following set of controls: year and Government Office Region fixed effects; Local Authority (LA) characteristics such as the employment rate and the migrant share at the Local Authority level; Individual characteristics such as gender, age, race, disability, number of children, number of adults, marital status, benefit claims, education, household income, union membership, and religiosity. Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

As a second robustness check, we use housing tenure as a measure of affluence. Table [E.3](#) shows the differential responses to redistribution preferences by housing tenure. In this case, the average effects on redistribution preferences, as austerity increases, are the same as in Table [3](#), where we already control for housing tenure in rows 3 and 4. Table [E.3](#), Panel A, shows that home owners are less likely to support redistribution compared to renters, all else equal. However, as austerity increases in their local authority, home owners are those who are most likely to support redistribution (Panel B). This shows that similar to the differential responses to redistribution by household income, individuals who are more affluent also in terms of wealth (as proxied by house ownership) are those who are driving the increase in redistribution support in their areas, as spending decreases.

Table E.3: Austerity and attitudes towards redistribution across household tenure types

	(1) Strongly disagree	(2) Disagree	(3) Neither	(4) Agree	(5) Strongly agree
PANEL A Baseline model					
<i>House tenure (ref. cat: renter)</i>					
Home owner	0.019*** (0.004)	0.041*** (0.008)	0.005*** (0.001)	-0.037*** (0.007)	-0.029*** (0.006)
Social housing	-0.005 (0.003)	-0.013 (0.009)	-0.003 (0.002)	0.011 (0.007)	0.010 (0.007)
PANEL B Interaction model: (Austerity) x (House Tenure)					
Home owner	-0.084** (0.033)	-0.154** (0.060)	-0.005 (0.004)	0.145*** (0.056)	0.098** (0.039)
Renter	0.016 (0.035)	0.039 (0.087)	0.008 (0.019)	-0.033 (0.073)	-0.031 (0.068)
Social Housing	0.005 (0.038)	0.013 (0.101)	0.004 (0.028)	-0.011 (0.081)	-0.011 (0.085)
PANEL C Baseline model with IV					
<i>House tenure (ref. cat: renter)</i>					
Home Owner	0.020*** (0.004)	0.041*** (0.008)	0.005*** (0.001)	-0.036*** (0.007)	-0.029*** (0.006)
Social Housing	-0.005 (0.003)	-0.013 (0.009)	-0.003 (0.002)	0.010 (0.007)	0.010 (0.007)
PANEL D Interaction model with IV: (Austerity) x (House Tenure)					
Home owner	-0.301** (0.121)	-0.540*** (0.203)	-0.015 (0.013)	0.506*** (0.195)	0.350*** (0.133)
Renter	-0.145 (0.094)	-0.350 (0.225)	-0.075 (0.051)	0.294 (0.189)	0.275 (0.179)
Social housing	-0.141 (0.091)	-0.372 (0.240)	-0.101 (0.071)	0.299 (0.193)	0.315 (0.209)
Observations	11,934	11,934	11,934	11,934	11,934

Notes: This table reports average marginal effects of austerity on attitudes towards redistribution estimated from ordered probit regressions. Panel A reports the estimated marginal effects for income controls computed from the fully specified model in equation Eq. (11) (Table 3, row 4). Panel B reports the estimated marginal effects of the interaction terms from the ordered probit models that include interactions between the austerity shock and each household tenure type control. Panels C and D are equivalent to Panels A and B respectively, estimated via the instrumental variables approach. Every regression model includes the following set of controls: year and Government Office Region fixed effects; Local Authority (LA) characteristics such as the employment rate and the migrant share at the Local Authority level; Individual characteristics such as gender, age, race, disability, number of children, number of adults, marital status, benefit claims, education, employment status, household income, union membership, and religiosity. Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

It is possible that there is a delayed reaction to the austerity shock. For this reason, as an additional robustness check, we control for the previous year's spending cuts to capture the austerity shock. This means that the reaction to austerity cuts during the year 2010-11 is excluded altogether and thus the sample size is smaller. Table E.4 is similar to Table 3, with the only difference being that we control for the previous year's spending cuts per area and exclude the year 2010-11<sup>19</sup>. After controlling for Local Authority, individual and household characteristics, we do not detect an average change in redistribution preferences as spending decreases in the Local Authority.

Table E.5 shows a similar pattern to Table 4 for both Panels A and B with respect to the differential average preferences to redistribution by income group and the differential changes in preferences to redistribution by income group as austerity increases in their area. The more affluent individuals are, the less likely they are to support redistribution, while the more austerity increases in their area, the most affluent group is the one that is likely to support more redistribution. The size of the effects is relatively small compared to those in Table 4 but that might be due to the exclusion of 2010-11, which was the year when the initial shock of austerity cuts was detected and could potentially lead to a relatively greater attitudinal response.

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<sup>19</sup>As mentioned earlier, Local Authority spending in 2009-10 is not comparable to spending in 2010-11 so we cannot use this value as the lagged austerity shock in 2010-11.

Table E.4: Attitudes towards redistribution and austerity controlling for the lagged austerity shock

	(1)	(2)	(3)	(4)	(5)
	Strongly disagree	Disagree	Neither	Agree	Strongly agree
PANEL A Baseline model					
Baseline model	-0.086*** (0.033)	-0.172** (0.067)	-0.020** (0.009)	0.157*** (0.061)	0.121** (0.048)
+LA characteristics	-0.043 (0.031)	-0.086 (0.063)	-0.010 (0.008)	0.079 (0.057)	0.061 (0.044)
+Individual characteristics	-0.026 (0.030)	-0.051 (0.059)	-0.006 (0.007)	0.047 (0.054)	0.036 (0.042)
+Household characteristics	-0.027 (0.030)	-0.053 (0.060)	-0.006 (0.007)	0.048 (0.055)	0.037 (0.043)
PANEL B Baseline model with IV					
Baseline model	-0.295** (0.127)	-0.572** (0.232)	-0.067*** (0.026)	0.522** (0.212)	0.413** (0.170)
+LA characteristics	-0.272** (0.136)	-0.528** (0.252)	-0.062** (0.028)	0.482** (0.230)	0.380** (0.184)
+Individual characteristics	-0.245* (0.129)	-0.477** (0.240)	-0.055** (0.027)	0.435** (0.220)	0.342** (0.174)
+Household characteristics	-0.229* (0.124)	-0.448* (0.234)	-0.052** (0.026)	0.408* (0.213)	0.320* (0.169)
Observations	10,017	10,017	10,017	10,017	10,017

Notes: This table reports average marginal effects of lagged austerity shocks on attitudes towards redistribution estimated from ordered probit specifications. Each column represents the response outcome to the attitudes question, while each row investigates how the marginal effects vary when changing the set of controls across specifications. The baseline model controls for year and Government Office Region fixed effects. These variables are included in all subsequent regressions. The second row adds Local Authority (LA) characteristics, i.e. the employment rate and migrant share at Local Authority level. The individual characteristics added in row 3 include gender, age, race, disability, number of children, number of adults, marital status, benefit claims, house tenure, education, employment status, union membership, and religiosity. Household income controls are included in row 4. Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table E.5: Austerity and attitudes towards redistribution across household income groups controlling for lagged austerity shock

	(1) Strongly disagree	(2) Disagree	(3) Neither	(4) Agree	(5) Strongly agree
PANEL A Baseline model					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.011*** (0.003)	0.028*** (0.008)	0.007*** (0.002)	-0.024*** (0.007)	-0.022*** (0.006)
£26,000- £43,999	0.025*** (0.004)	0.056*** (0.009)	0.010*** (0.002)	-0.050*** (0.008)	-0.042*** (0.007)
More than £44,000	0.045*** (0.006)	0.090*** (0.011)	0.010*** (0.002)	-0.083*** (0.010)	-0.061*** (0.007)
PANEL B Interaction model: ( <i>Austerity</i> ) x ( <i>Income Groups</i> )					
Less than £14,000	0.005 (0.034)	0.015 (0.094)	0.005 (0.029)	-0.012 (0.076)	-0.013 (0.081)
£15,000- £25,999	-0.017 (0.045)	-0.040 (0.104)	-0.008 (0.019)	0.036 (0.092)	0.030 (0.077)
£26,000- £43,999	-0.023 (0.051)	-0.043 (0.098)	-0.002 (0.006)	0.041 (0.093)	0.028 (0.062)
More than £44,000	-0.105* (0.061)	-0.155* (0.089)	0.016 (0.012)	0.160* (0.092)	0.084* (0.049)
PANEL C Baseline model with IV					
<i>Income Groups (ref. cat: Less than £14,000)</i>					
£15,000- £25,999	0.011*** (0.003)	0.028*** (0.008)	0.007*** (0.002)	-0.023*** (0.006)	-0.022*** (0.006)
£26,000- £43,999	0.025*** (0.004)	0.056*** (0.009)	0.010*** (0.002)	-0.050*** (0.008)	-0.042*** (0.007)
More than £44,000	0.045*** (0.006)	0.089*** (0.011)	0.009*** (0.002)	-0.082*** (0.010)	-0.062*** (0.007)
PANEL D Interaction model with IV: ( <i>Austerity</i> ) x ( <i>Income Groups</i> )					
<i>(Austerity) x (Income Groups)</i>					
Less than £14,000	-0.139 (0.096)	-0.378 (0.252)	-0.117 (0.075)	0.305 (0.204)	0.329 (0.218)
£15,000- £25,999	-0.194 (0.119)	-0.440* (0.260)	-0.081* (0.047)	0.387* (0.229)	0.328* (0.196)
£26,000- £43,999	-0.237* (0.137)	-0.441* (0.245)	-0.024 (0.018)	0.419* (0.232)	0.284* (0.162)
More than £44,000	-0.360** (0.168)	-0.518** (0.230)	0.055 (0.035)	0.534** (0.238)	0.288** (0.132)
Observations	10,017	10,017	10,017	10,017	10,017

Notes: This table reports average marginal effects of austerity on attitudes towards redistribution estimated from ordered probit regressions. Panel A reports the estimated marginal effects for income controls computed from the fully specified model in equation Eq. (11) (Table E.4, row 4). Panel B reports the estimated marginal effects of the interaction terms from the ordered probit models that include interactions between the lagged austerity shock and each household income group control. Panels C and D are equivalent to Panels A and B respectively, estimated via the instrumental variables approach. Every regression model includes the following set of controls: year and Government Office Region fixed effects; Local Authority (LA) characteristics such as the employment rate and the migrant share at the Local Authority level; Individual characteristics such as gender, age, race, disability, number of children, number of adults, marital status, benefit claims, education, employment status, union membership, and religiosity. Standard errors in parenthesis are adjusted for clustering at the Local Authority level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.