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ENERGY POVERTY AND DEPRIVATION IN IRELAND

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The Community Foundation for Ireland

ESRI ECONOMIC & SOCIAL RESEARCH INSTITUTE

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This work was carried out with funding from the Community Foundation for Ireland, which is gratefully acknowledged. The analysis builds on previous work carried out under the ESRI's Tax, Welfare and Pensions and Poverty Inequality and Living Standards Research Programmes. We are grateful to colleagues at the ESRI for their helpful suggestions, as well as to three anonymous referees for their comments on an earlier draft of this paper. All views and any errors and omissions remain the sole responsibility of the authors.

FOREWORD

Energy poverty is an equality issue. As fuel bills go up, it is people and families on lower incomes that suffer the most. In rapidly increasing numbers, households are facing the choice between putting food on the table, buying back-to-school clothes or heating their home. The increases in bills are already alarming. The potential for further increases risks creating a sense of desperation which requires assurances from policymakers that action will be taken before winter arrives.

The challenge fuel poverty represents has been set out starkly in the findings of this report; up to 43 per cent of households could be at risk if energy price hikes continue and bills increase by a further 25 per cent. This is more than double the previous fuel poverty record in the early 1990s.

The price increases that have already occurred and those yet to come are going to have an enormous impact. Cost increases per average household of €21.27 per week, or €38.63 when motor fuel is included, since January 2021 are already having an impact.

This report underlines that households with lower incomes spend a much larger share of their income on fuel. That is where the need is greatest and where support must be targeted.

Many of the 5,000 voluntary, community and charitable groups we work with will be looking at this report and no doubt will reflect on it as they make pre-Budget submissions to government. The options assessed by the ESRI to assist those who will be most affected by energy inflation need urgent government attention. Cutting indirect taxes does not deliver the response required – it also, and the report is clear, blunts the incentive to reduce the use of fossil fuels. The arguments for lump-sum payments to recipients of welfare payments, increases in the Fuel Allowance and increasing PRSI credits are compelling.

This report would not have been possible without the support of anonymous donors to The Community Foundation for Ireland. We acknowledge their generosity in ensuring this timely and important research.

Denise Charlton,

Chief Executive, The Community Foundation for Ireland

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ABBREVIATIONS

CSO	Central Statistics Office
ESRI	Economic and Social Research Institute
HBS	Household Budget Survey
LIIS	Living in Ireland Survey
SILC	Survey of Income and Living Conditions
SEAI	Sustainable Energy Authority of Ireland

EXECUTIVE SUMMARY

This report – funded by the Community Foundation for Ireland – explores the issue of energy poverty and deprivation in Ireland, once again to the forefront of the policy debate given recent increases in energy prices.

Chapter 2 compares measures of self-reported energy deprivation and expenditure-based energy poverty. When discussing self-reported energy deprivation, we focus on households who report an explicit inability to keep their home adequately warm. We show that the incidence of expenditure-based energy poverty is generally greater than self-reported energy deprivation. We provide insight into some of the reasons for this difference; self-reported deprivation focuses more closely on heating-related deprivation, while expenditure-based definitions incorporate electricity expenditure, a proportion of which goes towards non-heating services. Electricity expenditure drives fuel poverty status for many households according to expenditure-based metrics, while much of the difference in expenditure and self-reported energy poverty statistics arises from expenditures on electricity. As electricity is used for many non-energy services, this is an important consideration when considering the policy response to heating-related energy deprivation.

We also highlight important socio-economic differences between groups identified as vulnerable to rising fuel prices by expenditure-based measures of energy poverty and self-reported measures of energy deprivation. First, while there is a substantial overlap between measures of energy poverty and income poverty (i.e. the official at-risk-of-poverty line), there is less between measures of self-reported energy deprivation and income poverty. Second, while expenditure-based measures of energy poverty are highest for those living in detached dwellings and lowest for those living in apartments, the reverse is true for self-reported measures of energy deprivation. Similarly, while expenditure-based measures of energy poverty show little difference between homeowners and renters, self-reported measures of energy deprivation are much higher for renters than homeowners. There are two potential reasons for this. First, homeowners may spend more on electricity, driving the greater incidence of energy poverty among this cohort. Secondly, while homeowners and those living in detached dwellings spend a larger share of their income heating their homes, they also have a greater capacity to do so, likely reflecting their – on average – higher levels of income. By contrast, renters and those living in apartments are more likely to endure energy deprivation and go without heat because they cannot afford to heat their homes.

Chapter 3 examines the impact of recent changes in energy prices on households and measures of energy poverty. We estimate that energy inflation experienced from January 2021 to April 2022 increased the cost of households' consumption by €21.27 per week on average, rising to €38.63 per week when motor fuels are included. Should energy prices rise by a further 25 per cent, we estimate this would increase to an average of €36.57, excluding motor fuels, or €67.66 if they are included.

While these increases are smaller in cash terms for lower-income households (reflecting their lower levels of expenditure on energy and motor fuel), they are much larger as a share of income. We estimate that recent increases in energy costs (including motor fuels) amount to 5.9 per cent of after-tax and transfer income for the lowest-income fifth of households compared to 3.1 percent for the highest income fifth. Similarly, we estimate that energy price increases are larger as a proportion of income for rural households, homeowners and those at risk of poverty.

We estimate that recent energy inflation has increased expenditure-based measures of energy poverty to 29.4 per cent including electricity (from 13.2 per cent in 2015/16, the latest year of data available), and to 12.7 per cent excluding electricity (up from 5.1 per cent in 2015/16). A further 25 per cent rise in energy prices would increase the share of households classified as energy-poor (including electricity) to 43 per cent: almost double its previously recorded high of 23 per cent in 1994/95.

Chapter 4 assesses options that policymakers might consider in trying to mitigate the impact of these rising energy prices on households. It shows that, while cuts to indirect taxes on energy do provide support to households particularly affected by energy inflation, such support is poorly targeted. For example, about half of the overall cost from cutting indirect taxes on energy is incurred by supporting the highest-income 40 per cent of households compared to less than a third from supporting the lowest-income 40 per cent. In addition, cuts to indirect taxes on energy blunt the incentive for households and the economy at large to reduce consumption of fossil fuels, while exacerbating existing distortions created by already reduced rates of VAT on gas and electricity: a large effective fossil-fuel subsidy.

Lump-sum payments to households – such as the recent €200 household electricity credit – do not have such distortionary effects and are better targeted at the households most affected by rising energy prices than are indirect tax cuts. However, increases to welfare payments are more targeted still because they are means-tested. A Christmas Bonus-style double welfare payment would result in gains that are larger in both cash terms and as percentage of income for lower- than higher-income households, as well as those at risk of poverty. So too would a doubling of the Fuel Allowance, although this would be restricted to longer-term beneficiaries of welfare payments and exclude those recently unemployed.

Increases to welfare payments provide little support to low-earning households without children, who are not entitled to any equivalent of the Working Families Payment. However, these households could be targeted for support by direct tax cuts if policymakers wanted to ensure that some support was provided to those outside the welfare system. While increases to income tax credits would primarily benefit higher- and upper-middle-income households (reflecting the relatively high level of income that can already be earned before income tax is paid), increasing the PRSI credit is more targeted at lower earners and renters.

Our findings have important implications for policy. If the objective is to protect those most affected by rising energy prices, cutting indirect taxes is a poorly targeted response given that most of the revenue is spent compensating high-income households who have been least affected.

Furthermore, trying to mitigate the impact of rising energy prices by cutting indirect taxes on fuel can have other undesirable effects, both in the short and longer run. In the short run, indirect tax cuts counteract the signal given by rising prices to reduce consumption, potentially exacerbating the risk of supply shortages and rationing. In the longer run, cutting taxes on energy weakens the incentive to invest in energy-saving technology and behaviour. In addition, cutting indirect taxes on energy exacerbates existing effective subsidies to burning fossil fuel, with, for example, reductions to VAT on electricity and home heating fuels further distorting consumption decisions towards such services and away from goods or services subject to the standard rate.

Instead, increases to welfare payments, the fuel allowance, and even lump-sum payments (like the household electricity credit) are better targeted at those most affected by energy inflation. Prioritising targeted supports, as opposed to broad-based supports, also reduces the likelihood of fuelling further non-energy inflation and will become even more important the longer we experience high energy prices.

CHAPTER 1

Introduction

Rising energy prices have brought concerns about the ability of households to heat their homes to the forefront of the policy agenda both domestically and abroad. In the spring ESRI Quarterly Economic Commentary, McQuinn et al. (2022) forecast that inflation – exacerbated by the invasion of Ukraine and associated rise in energy prices– will peak at almost 9 per cent in 2022: the highest level since the early 1980s, largely as a result of further expected increases in energy prices.

Lydon (2022) has shown that this inflation is higher for lower-income, older and rural households as a result of their patterns of expenditure. This has sparked interest in better understanding the effects that the recent price increases may have on vulnerable households, not least given the risks pointed to by the Fiscal Advisory Council (2022), Central Bank of Ireland Governor Makhlouf (2021) and McQuinn et al. (2022), among others, that broad-based or untargeted compensatory measures may fuel further non-energy inflation. This report aims to assist such understanding, drawing on household survey data collected by both the ESRI and the Central Statistics Office (CSO).

This report makes three primary contributions. First, we compare measures of self-reported energy deprivation and expenditure-based energy poverty in Ireland. We explore the differences between the prevalence of energy poverty and energy deprivation over the past 30 years, giving insight into some of the reasons for these differences. Households may respond to a high energy cost by spending a disproportionate share of their income on energy, resulting in fewer resources available for other goods or services. This may be considered as energy poverty. Alternatively, a household may be forced to reduce their consumption of energy in the home. This may lead to energy deprivation.

We build on previous research exploring the prevalence of energy poverty[1] or energy deprivation[2] in isolation, with little insight into how they compare. This is the first analysis to compare the prevalence of both in an Irish context. We identify the prevalence of either outcome among a number of socio-economic characteristics, providing potential reasons as to why we observe this difference.

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1 Farrell (2021), for instance, has explored the nature, determinants and prevalence of energy poverty in Ireland since 1987. Tovar-Reaños and Lynch (2021) assess energy poverty metrics and consider the determinants of energy poverty. In addition, they simulate the impact that marginal changes in energy prices due to carbon taxation may have on the prevalence of energy poverty.

2 Watson and Maître (2015) have explored the nature of energy deprivation, focusing on and whether this is distinct from general deprivation in an Irish context.

This provides qualitative insight into the nature of energy poverty and deprivation in Ireland.

The second contribution of this paper is to explore the effect that recent price increases have had on households and rates of expenditure-based energy poverty. Analyses such as this are often constrained by data availability; many data releases are intermittent and cannot capture the pace of energy price changes since summer 2021. We employ an imputation procedure to investigate the effect of recent price changes and future price increases on households accounting for changes in income and household composition (e.g. the rise in employment rates).

The third and final contribution of this report is to consider the potential policy options to mitigate the impact of rising energy prices on households. We examine cuts to indirect taxes on energy, before turning to look at cuts to direct taxes on personal income and increases to social transfers.

The structure of this report is as follows. Chapter 2 compares measures of self-reported energy deprivation and expenditure-based energy poverty over the past three decades. We employ two data sources – the Irish Household Budget Survey and the Survey of Income and Living Conditions – to compare rates of energy poverty to rates of energy deprivation. This comparison gives qualitative insight into the nature of energy poverty in Ireland.

Chapter 3 examines the impact of recent changes in energy prices on households and measures of energy poverty, while Chapter 4 assesses options that policymakers might consider in trying to mitigate the impact of these rising energy prices on households.

Chapter 5 concludes with consideration of the implications these developments have for policy.

CHAPTER 2

Historical trends in energy poverty and deprivation

This chapter will consider the incidence of energy poverty and deprivation among Irish households since 1994. The 2016 Strategy to Combat Energy Poverty[3] defined energy poverty as the inability to heat or power a home to an adequate degree. While covering expenditures on heat and other energy services in the home, many studies in this field focus on the ability of a household to keep their home adequately warm (Boardman, 1991; Healy and Clinch, 2004; Hills, 2012; O'Meara, 2015). This chapter compares two contrasting measurement approaches: expenditure-based energy poverty and self-reported energy deprivation. Through this comparison, we provide a greater understanding of the qualitative nature of energy poverty in Ireland. We shed light on the relative contribution that heating and non-heating expenditures make towards energy poverty in Ireland.

There are many ways in which households may respond to disproportionately high energy expenditures. Some households may go without energy services if they cannot afford the costs. Self-reported energy deprivation captures these effects by asking survey respondents whether they had been deprived of certain energy services during the period of analysis. Alternatively, constrained households may absorb the high cost, perhaps cutting back instead on other expenditures. Expenditure-based metrics are better able to capture this phenomenon. It is likely that both behaviours happen in varying degrees. By comparing trends associated with both metrics, insight into the factors contributing to their prevalence may be provided.

This chapter proceeds as follows. The following section will provide an overview of energy poverty metrics and their calculation. The data and methods used in this analysis will be presented in Section 2.2. Section 2.3 will present the results. First, we will compare headline energy poverty rates as calculated by expenditure-based and self-reported measures. This will be followed by a discussion of how energy poverty/deprivation varies by general poverty status, tenure, dwelling type, age group and dwelling condition.

2.1 MEASURING ENERGY POVERTY AND DEPRIVATION

Expenditure-based metrics measure energy poverty according to the proportion of disposable income spent on energy services in the household. While there are

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3 Fuel poverty and energy poverty are often used interchangeably in the literature when discussing the affordability of adequate energy resources in the context of developing countries such as Ireland. This paper will use the term 'energy poverty'. This should not be confused with the term 'energy poverty' when employed in an international development context, usually referring to inadequate access to energy.

many metrics,[4] the most common approach is to measure energy expenditures as a proportion of household income, with a household defined as being energy-poor if they spend more than 10 per cent of disposable income on energy services (Boardman, 1991). This metric is simple and transparent; however, it is not without criticism. Some households classified as energy-poor may be so because they have a large house or choose to keep it excessively warm as opposed to being forced into spending more than 10 per cent of their income on energy through necessity. This approach is most often applied using actual fuel expenditure data and so does not capture the extent to which households reduce their energy expenditures in response to price changes or income constraints.[5] To overcome this, some applications use predicted rather than actual expenditure, where possible, with predicted values aligning with expected expenditure, absent a binding budget constraint.

While predicting expenditures is one way to address this deficiency, self-reporting by households can also capture the extent to which a household goes without adequate heat in the home. These measures rely on self-reports made by householders on their capacity to afford the energy services they need (Watson and Maître, 2015). Often, the questions asked of householders cover whether they reduced their expenditure on energy services due to budget constraints, or whether their home is in such a condition that they cannot keep it adequately warm.

This chapter will focus on understanding the extent to which Irish households are unable to afford adequate heat in their home by comparing the trajectory of expenditure-based energy poverty and self-reported energy deprivation. When considering self-reported deprivation, we will focus on those households who have reported an explicit inability to keep adequately warm.

2.2 DATA AND METHODOLOGY

We use three primary data sources. The Household Budget Survey (HBS) is used to calculate expenditure-based energy poverty while both the Survey on Income and Living Conditions (SILC) and the Living in Ireland Survey (LIIS) are used to calculate self-reported measures of energy deprivation.

4 See Farrell (2021), BEIS (2021) and Tovar-Reaños and Lynch (2021) for a discussion.

5 Coyne et al. (2018) find evidence consistent with this in their study of an energy efficiency upgrade scheme in Ireland. This led to much smaller than expected energy savings, as households responded to the increased efficiency of their dwellings by increasing ‘thermal comfort’.

Expenditure-based energy poverty

The HBS contains a representative cross-sectional profile of household income and expenditure. All expenditures are recorded over a two-week period, including energy expenditures. Occupant socio-economic data are recorded, along with data on dwelling characteristics and appliance ownership. Responses are weighted to minimise any bias that may occur due to participant non-response. The HBS has been collected at regular intervals since 1987; the 1987, 1994, 1999, 2004/05, 2009/10 and 2015/16 waves are used in this paper.

While many energy poverty metrics exist (most notably the Low Income High Cost of Hills (2012), and the recent Low Income Low Energy Efficiency approach of BEIS (2021), we focus on the 10 per cent income threshold approach for clarity of exposition. A household is deemed fuel-poor if they spend more than 10 per cent of their disposable income on energy services (electricity, heating oil, gas or solid fuels). Since we use actual energy expenditures, results should be construed in this context. For further discussion of expenditure-based approaches in an Irish context, and the nuanced differences in the calculation of energy poverty that result, see Farrell (2021).

For the purposes of this analysis, we consider two energy expenditure scenarios to provide additional qualitative insight into the nature of energy poverty in Ireland. For our baseline calculation, we follow the literature (DCENR, 2011, 2016; Farrell, 2021; Scott et al., 2008; Tovar-Reaños and Lynch, 2022; Watson and Maître, 2015) and assume energy expenditures to include electricity, gas, oil and solid fuels. We adopt a secondary measure to focus on heating-related expenditures alone and exclude electricity. Space heating for about one fifth of households in Ireland is electric (c.18 per cent); the remainder are served by solid fuels (5 per cent), gas (39 per cent) or oil-fired central heating (36 per cent) (CSO, 2022). In addition, electricity is also used for services apart from heat.

Self-reported energy deprivation

Two data sources are used to calculate self-reported energy deprivation. From 1994–2001, the Living in Ireland Survey (LIIS) collected information on income and living conditions in Ireland.[6] This survey included questions on ability to heat the home. Since 2003, these data have been collected as part of the EU Survey of Income and Living Conditions (SILC). The SILC is part of an EU project to provide harmonised data on income and living conditions, collected annually. As with the LIIS, the SILC contains questions on householder ability to heat the home. The Irish

6 We use data from waves 1–6 of the LIIS (1994–1999) to avoid potential concerns about the representativeness of later waves which were augmented with a booster sample: see Roantree et al. (2021) for further information.

data are collected and managed by the Central Statistics Office (CSO) and used to monitor poverty and social exclusion in Ireland.

Both the LIIS and the SILC collect information on the income and living conditions of households alongside a large range of sociodemographic information about the household members, ranging from personal characteristics to personal income, labour market position, education and health status (Watson and Maître, 2015). We use responses to questions in the LIIS and SILC relating to whether households had to go without heating during the last 12 months through lack of money, and whether they were unable to afford to keep the home adequately warm.[7] Our measure of energy deprivation used throughout the paper is simply whether the head of household responds positively to either of these questions.[8]

2.3 RESULTS

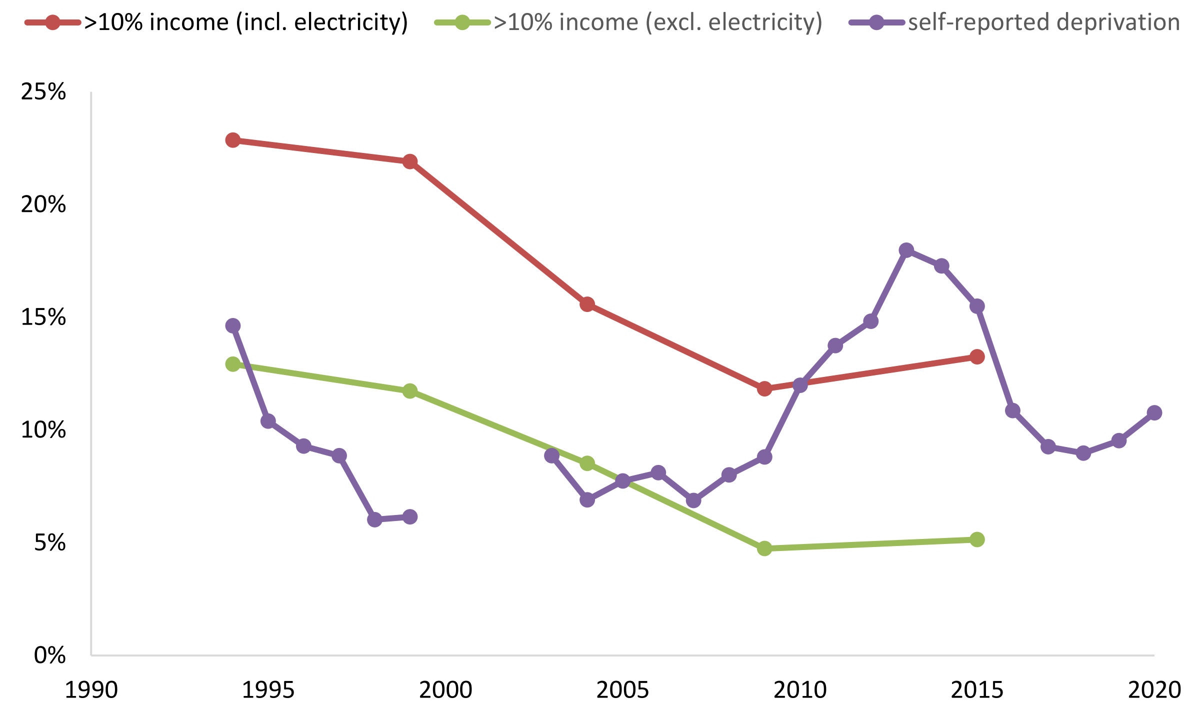
This section will compare the trajectory of energy poverty in Ireland according to self-reported energy deprivation and expenditure-based energy poverty metrics. The overall trajectory is first presented, followed by a discussion of how this varies by socio-economic cohort. The incidence of the measures by general poverty status, dwelling type, tenure, age group and housing condition is then discussed. When analysing these results, it should be noted that there is much less variation over time in expenditure-based metrics, in part because of the more intermittent nature of data collection.

Figure 2.1 compares the trajectory of headline energy poverty and deprivation metrics. Both self-reported energy deprivation and expenditure-based energy poverty measures declined over the 1990s and early 2000s before rising in the aftermath of the Great Recession. This rise is more evident in the self-reported measure of energy deprivation, perhaps in part because the data are collected at more regular intervals than expenditure on energy. However, the greater sensitivity of self-reported energy deprivation to economic conditions also mirrors that of material deprivation more generally (Roantree et al., 2021). This is consistent with households reducing their expenditure on and going without adequate energy when incomes are squeezed. While energy deprivation fell from a peak of almost 20 per cent in 2013 to 9 per cent in 2018, it has started to rise again since, despite – what Figure B.6 in the appendix shows was – relative stability in the price of most fuels over this period.

7 The phrasing of these questions in the LIIS is slightly different to that in the SILC, so may give rise to a structural break in the series. We indicate this in what follows by not connecting the lines between LIIS and SILC estimates.

8 This differs slightly from the measure used by Watson and Maître (2015), which also includes whether households were in arrears on utility bills. Appendix Table B.1 presents estimates of the share of all and selected sub-groups of households in arrears over time.

FIGURE 2.1 TRAJECTORY OF ENERGY POVERTY/DEPRIVATION IN IRELAND (1994–2020)

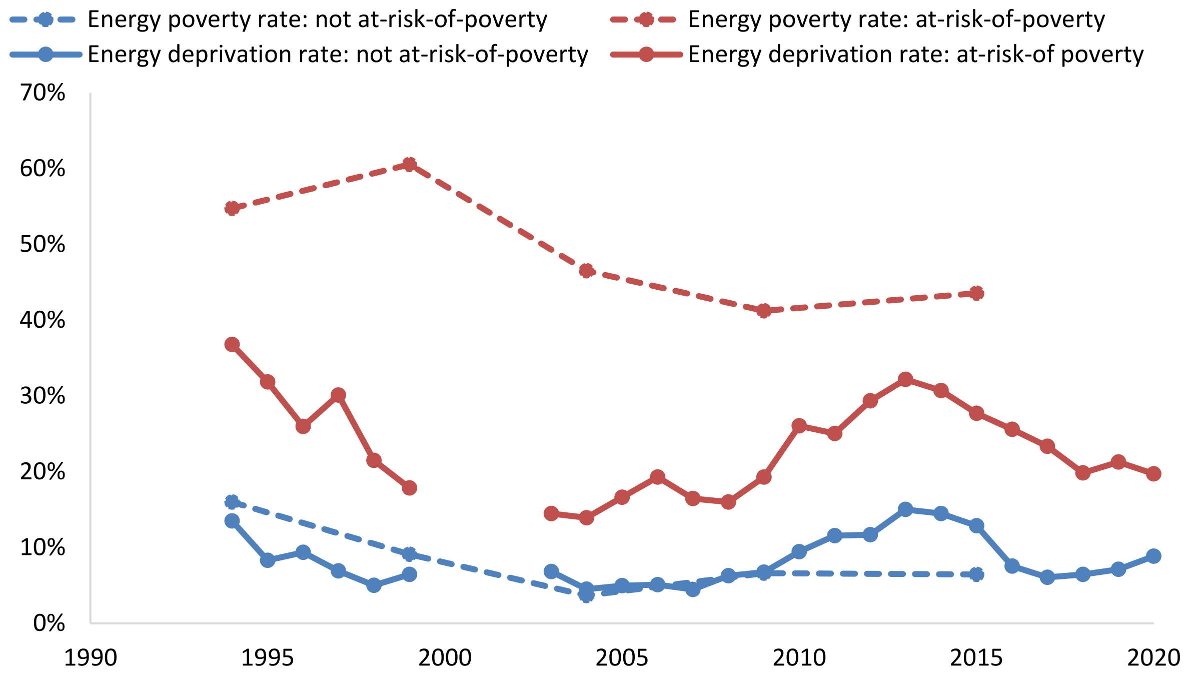


Source: Authors' calculations using the Household Budget Survey, Living in Ireland Survey, and Survey of Income and Living Conditions.

The metrics of self-reported energy deprivation used in this paper place a greater emphasis on heat-related deprivation in the household. To compare expenditure-based energy poverty on a more similar footing to these metrics of energy deprivation, we also report the headline energy poverty rates excluding electricity. While both expenditure-based energy poverty and self-reported energy deprivation are more closely aligned once electricity expenditures are removed over the 1990s and early 2000s, this is less true in recent years.

The rate of energy poverty and self-reported energy deprivation for the entire population can mask significant variation across the population. We now turn to look at the experience of different groups using both the measure of spending more than 10 per cent of income on energy, including electricity, and self-reported energy deprivation. First, we explore the extent to which energy poverty and deprivation overlaps with income poverty, as captured by households' at-risk-of-poverty status. This is defined as living in a household with less than 60 per cent of the median income level, adjusted (equivalised) for household size. Figure 2.2 shows the rates of energy poverty/deprivation for those at risk of poverty and for those that are not. We see a similar pattern for both self-reported and expenditure-based metrics; a much greater proportion of households that are at risk of poverty experience energy poverty/deprivation than households that are not at risk of poverty (i.e. above the poverty line).

FIGURE 2.2 RATES OF ENERGY POVERTY AND DEPRIVATION, BY AT-RISK-OF-POVERTY STATUS



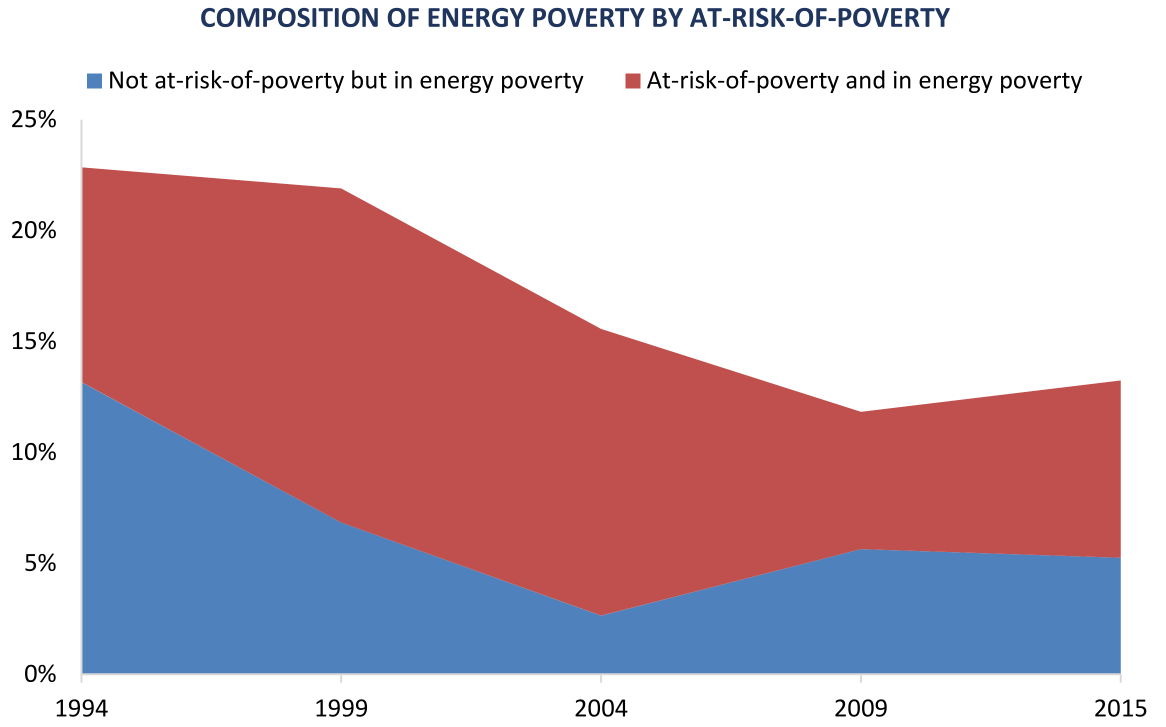
Sources: Authors' calculations using the Household Budget Survey, the Living in Ireland Survey and the Survey of Income and Living Conditions Research Microdata Files.
Note: Energy poverty calculation includes electricity.

Indeed, in 1999 almost 60 per cent of those at risk of poverty were also in energy poverty, though this has fallen in recent years: to 32 per cent in 2009/10 and 40 per cent in 2015/16. In contrast, less than 5 per cent of households who were not at risk of poverty experienced energy poverty in 2015/ 16. For self-reported measures, we estimate that 38 per cent of those at risk of poverty experienced energy deprivation in 1994, falling to 20 per cent by 2020. While for most of the period we observe that less than 10 per cent of those not at risk of poverty also reported enduring energy deprivation, this proportion rose significantly during the financial crisis and, after falling back to low levels during the recovery, has started to increase again in recent years.[9]

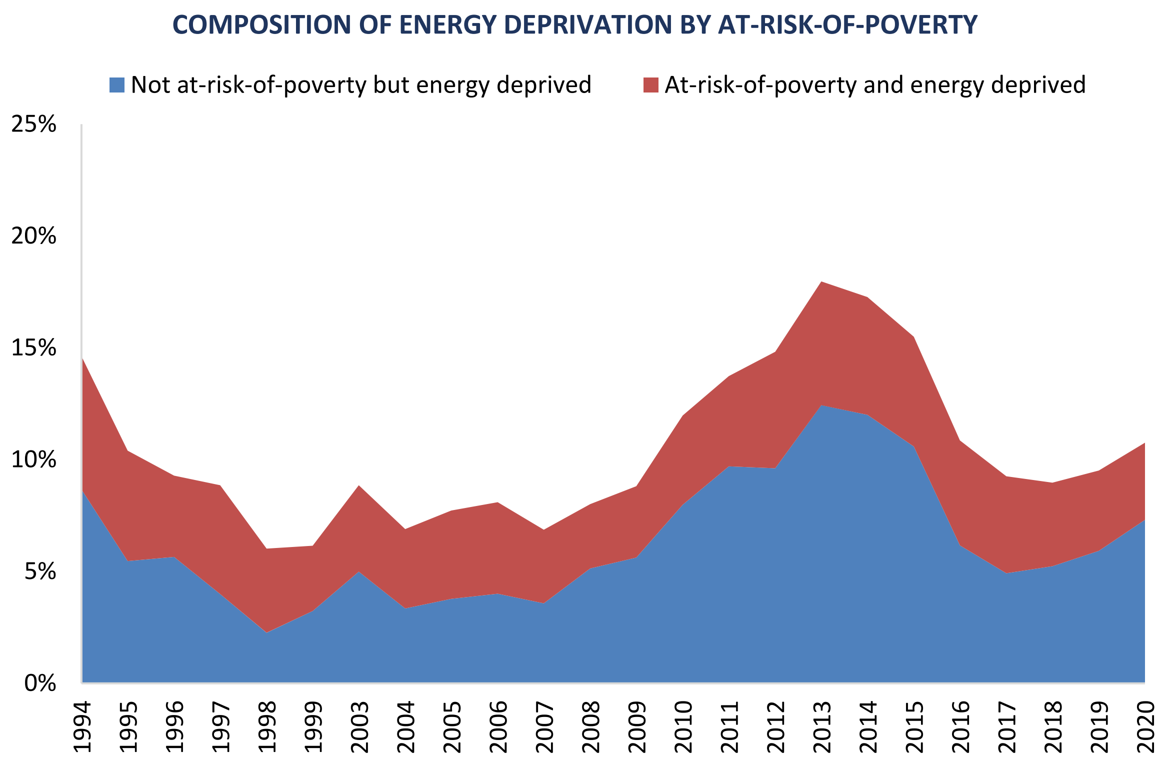
Although they face much higher rates of energy poverty and deprivation, those at risk of poverty make up a relatively small share – less than 20 per cent in 2019 – of the overall population. Thus those not at risk of poverty still make up a relatively large share of those experiencing energy poverty and deprivation. This is shown in Figure 2.3, which plots the composition of those in energy poverty and energy deprivation over time. While those experiencing energy poverty are increasingly also at risk of poverty (that is, below the income poverty line), most of those who report experiencing energy deprivation are not at risk of poverty.

9 Appendix Table B.2 shows that these households are more likely to be renters, lone parents, to live in households without anyone in paid work, and to live in poor-quality dwellings.

FIGURE 2.3 COMPOSITION OF THOSE EXPERIENCING ENERGY POVERTY AND DEPRIVATION, BY WHETHER AT-RISK-OF-POVERTY



Sources: Authors' calculations using the Household Budget Survey.
Note: Energy poverty calculation includes electricity.



Sources: Authors' calculations using the Living in Ireland Survey and the Survey of Income and Living Conditions Research Microdata Files.

Figure 2.4 shows rates of energy poverty and deprivation by dwelling type. These show some interesting contrasts, with apartment dwellers experiencing the highest rate of energy deprivation but the lowest rates of energy poverty throughout. Conversely, those living in detached houses report the highest rates of energy poverty but the lowest rates of energy deprivation.

This difference likely reflects the nature of fuel poverty being experienced by different cohorts. It suggests that, while apartment dwellers are more exposed to being deprived of adequate warmth than those living in houses, those living in detached houses need to spend much more of their income to adequately heat their homes. There are many possible reasons for this, including that those who live in apartments have, on average, lower levels of resources, leading to a greater propensity to go without adequate heating.

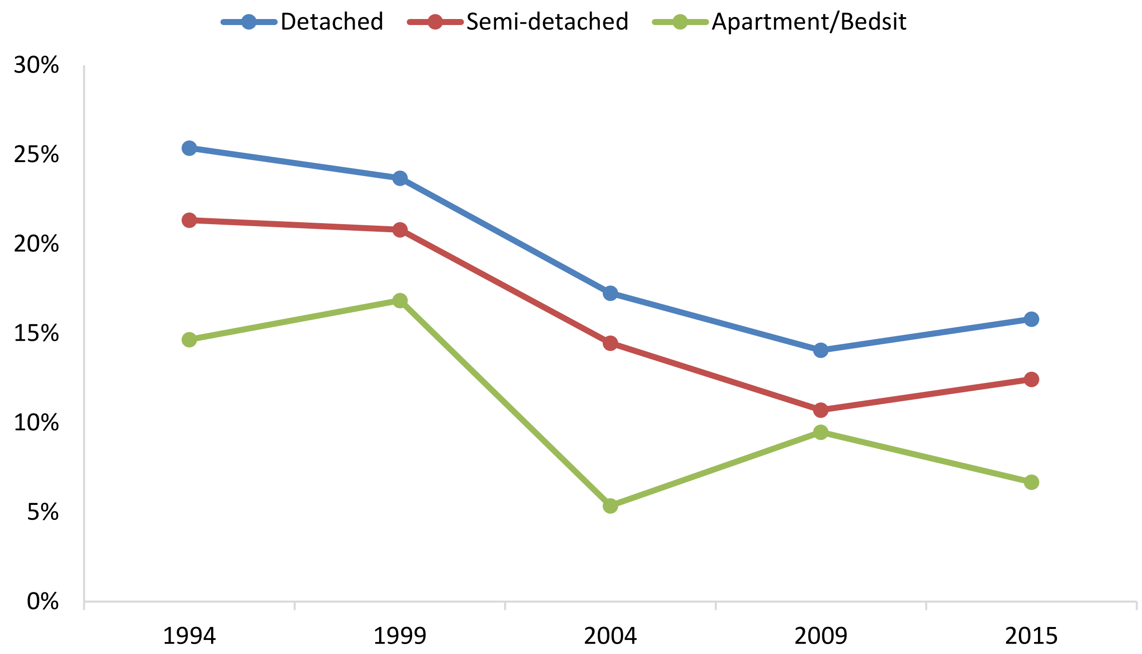
The divergence between expenditure-based and self-reported measures is also evident in housing tenure. Figure 2.5 shows that, according to expenditure-based metrics, a similar proportion of renters and homeowners experience expenditure-based energy poverty. A much clearer delineation appears with respect to self-reported energy deprivation, where we find that renters are more likely to experience energy deprivation. Figure 2.5 shows that a much higher proportion of renters, up to 35 per cent in 1994, report being deprived of adequate heat. While this fell to c.20 per cent in the late 2010s, this is much greater than the rate for homeowners of c.6 per cent. Indeed, the rate of homeowners who report being deprived of adequate heat was consistently below 14 per cent during the duration of analysis – and often below 5 per cent.

There are many plausible reasons for a greater incidence of self-reported energy deprivation among renters than expenditure-measured energy poverty. This may reflect the other sociodemographic variables correlated with rental: younger and perhaps lower-income groups who are more likely to respond to an energy-related budget constraint by reducing their consumption. The analysis in this paper does not allow for identification of such effects, but nevertheless shows that expenditure-based and self-reported measures of energy poverty can lead one to identify very different groups vulnerable to the rising cost of energy, a topic that is analysed in greater detail in Chapter 3.[10]

10 It would also be useful to consider the prevalence of energy poverty and deprivation among dwellings with poor standards of insulation. However, this information is unavailable in the HBS and the SILC datasets. The SILC data, however, identifies dwellings reporting problems with leaks, mould or damp. Taking this as a proxy for housing condition, Figure B3 of the Appendix decomposes energy deprivation according to dwelling condition. Similarly, Figure B4 of the Appendix shows the rates of energy deprivation by dwelling condition. These results show that – as one might expect – levels of energy deprivation are far higher among those with dwellings in a poor condition, although given this group makes up a relatively small share of the population, most of those reporting energy deprivation live in dwellings of better condition.

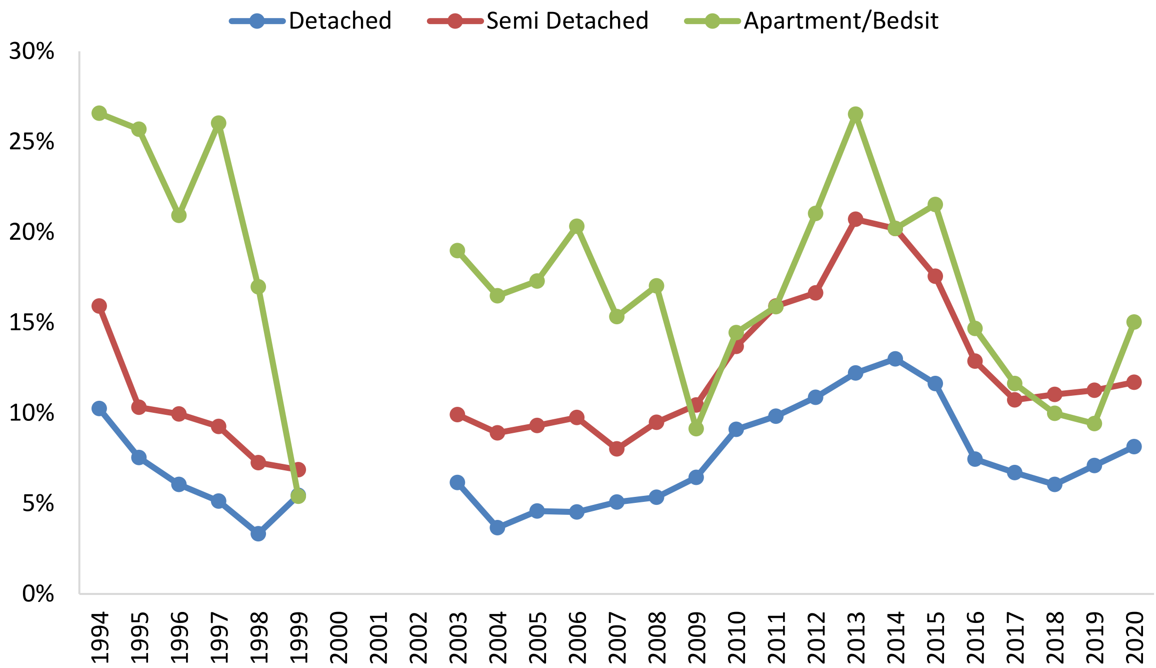
FIGURE 2.4 RATES OF ENERGY POVERTY/DEPRIVATION BY DWELLING TYPE

RATES OF ENERGY POVERTY BY DWELLING TYPE



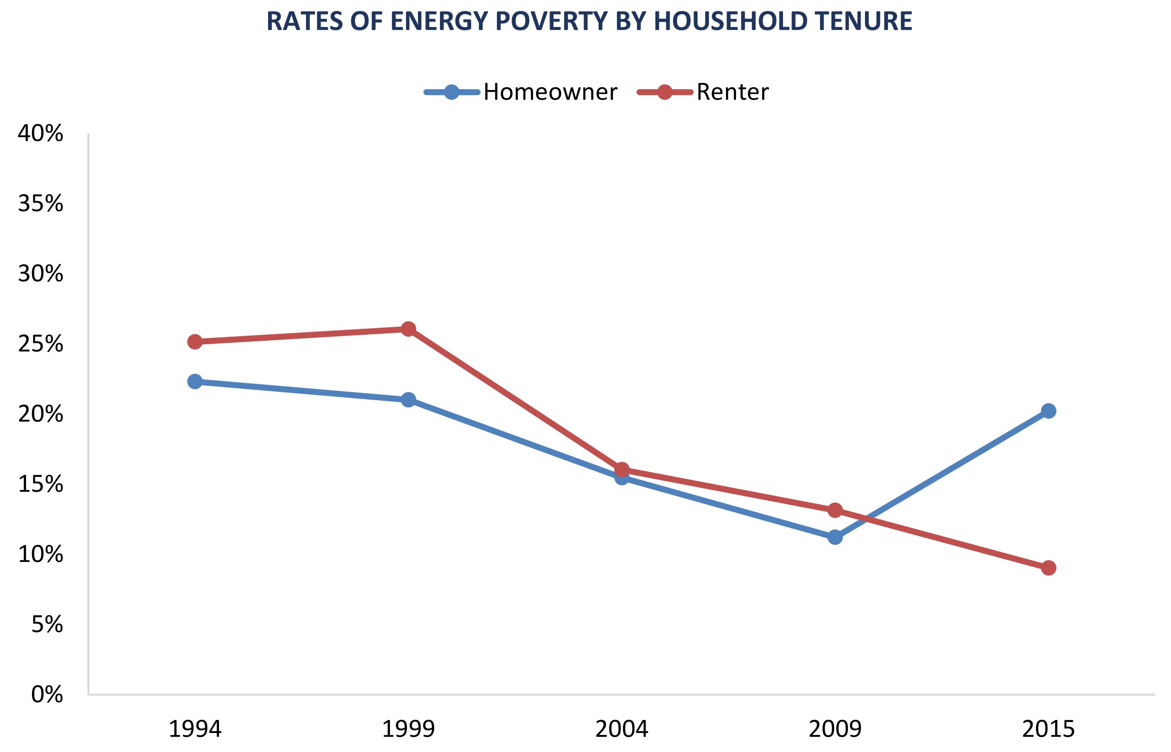
Sources: Authors' calculations using the Household Budget Survey.
Note: Excludes 'other' housing type. Energy poverty calculation includes electricity.

RATES OF ENERGY DEPRIVATION BY DWELLING TYPE

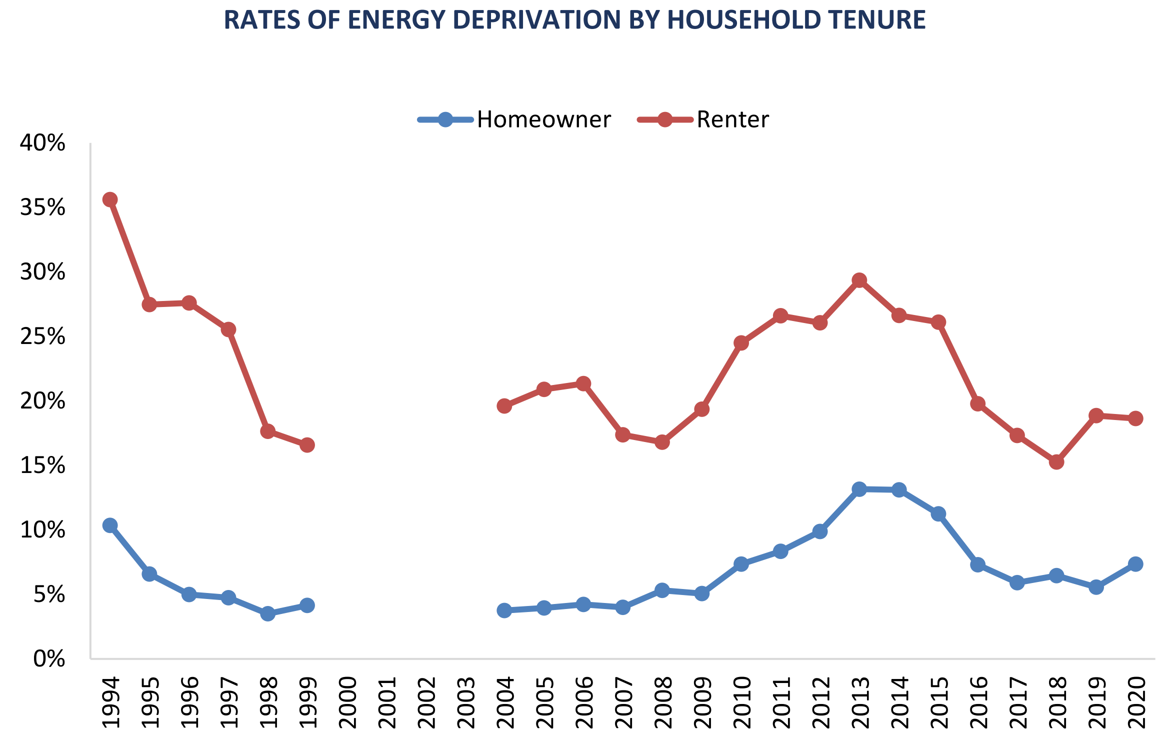


Sources: Authors' calculations using the Living in Ireland Survey and the Survey of Income and Living Conditions Research Microdata Files.
Note: Excludes small number in 'other' dwelling type. Apartment/bedsit series based on small number of observations in 1999 due to attrition from LIIS, so should be interpreted with caution.

FIGURE 2.5 RATES OF ENERGY POVERTY/DEPRIVATION BY HOUSEHOLD TENURE



Sources: Authors' calculations using the Household Budget Survey.
Note: Energy poverty calculation includes electricity.



Sources: Authors' calculations using the Living in Ireland Survey and the Survey of Income and Living Conditions Research Microdata Files.

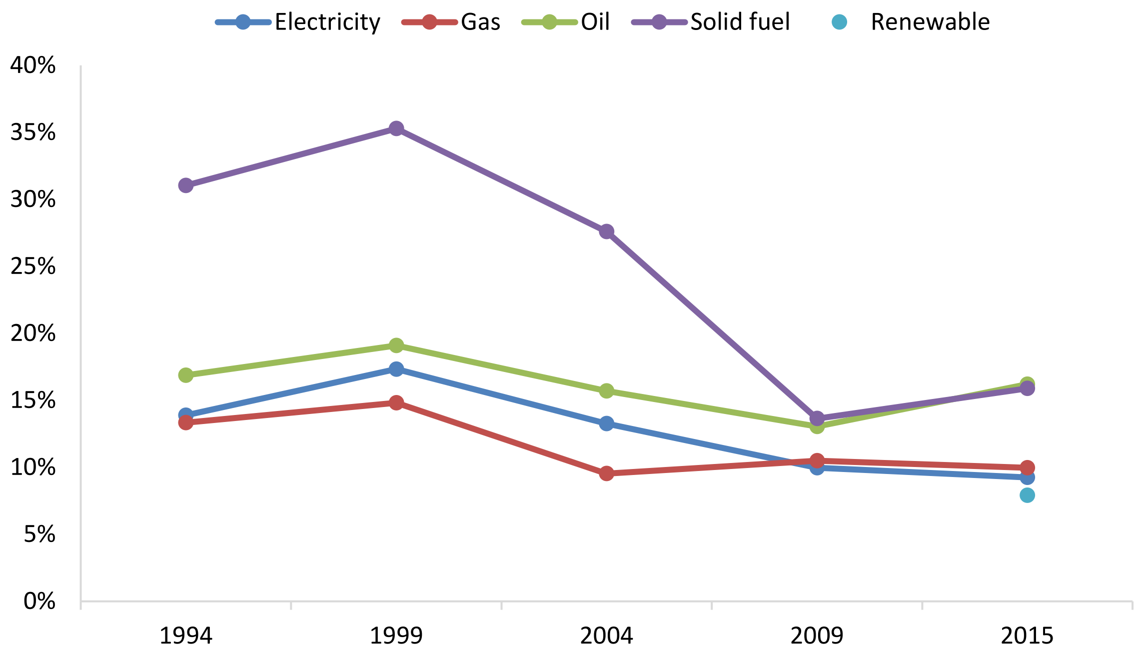
Figure 2.6 considers the incidence of energy poverty by space heating fuel type. We first consider the rates of energy poverty by space heating fuel type, followed by a decomposition of headline energy poverty rates by fuel type. The Household Budget Survey contains data on the type of space heating, which are used for this analysis,[11] but similar data are unavailable for the SILC and therefore a comparison with energy deprivation is not possible. The rate of energy poverty among households who use solid fuels as their primary space heating fuel has fallen considerably since 1994, while rates have remained relatively static for households who use oil primarily. There are many potential factors driving the decline in energy poverty among those who use solid fuels. This may reflect the decline in income poverty among cohorts who are more likely to use solid fuel, particularly older age groups. A decline in the rates of energy poverty among gas and electricity space heating users has been observed since 1994 but the drop is relatively small.

Solid-fuel users comprised the majority of those experiencing energy poverty in 1994. This showed a continuous trend of decline between 1994 and 2009, at which point a slight uptick can be observed. In 2015/16, approximately 11 per cent of the population could be categorised as being in energy poverty, and used either gas, oil or electricity as their primary fuel for space heating. These fuels have experienced considerable price changes since winter 2020/21. This suggests that, according to 2015/16 patterns of income and expenditure, approximately one tenth of the population are particularly vulnerable to recent energy price fluctuations. This, however, does not consider changes in prices since 2015/16, nor does it consider how recent changes in fuel prices may affect the incidence of energy poverty. The following section will explore these effects further.

11 The identification of primary fuel for space heating takes the following approach. In HBS data waves from 1994/95–2009/10, space heating is calculated as fuel used for space heating in winter, disaggregated by central and non-central heating. For households with central heating, the fuel used is taken as the primary fuel. For households without central heating, the fuel used is taken as the primary fuel. For households with neither, the fuel – solid fuel, gas or heating oil – on which their spending is greater is taken as the primary fuel. For the remaining households who have not declared a heating system and have no oil, gas or solid-fuel expenditures, electric heating is assumed. The survey question differs slightly in 2015/16. Instead of central heating/non-central heating, the questionnaire considers full or partial central heating by fuel type. The same procedure is followed using this amended question.

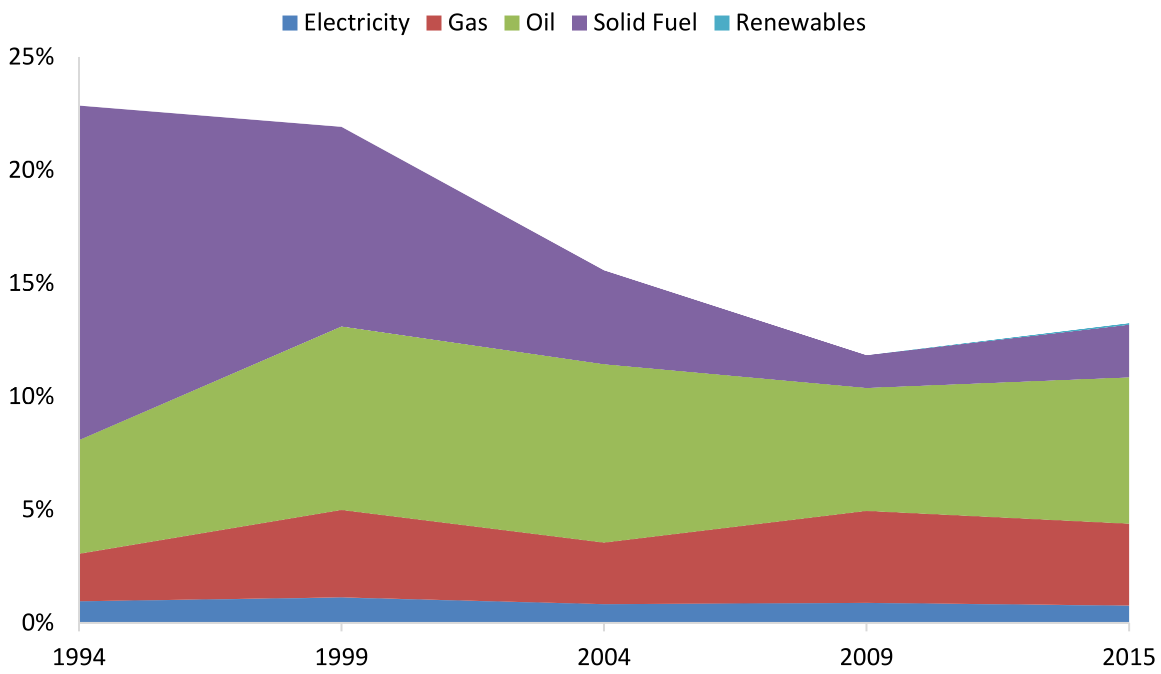
FIGURE 2.6 ENERGY POVERTY BY FUEL TYPE

RATES OF ENERGY POVERTY BY FUEL TYPE



Sources: Authors' calculations using the Household Budget Survey.
Note: Energy poverty calculation includes electricity.

COMPOSITION OF ENERGY POVERTY BY FUEL TYPE



Sources: Authors' calculations using the Household Budget Survey.
Note: Energy poverty calculation includes electricity.

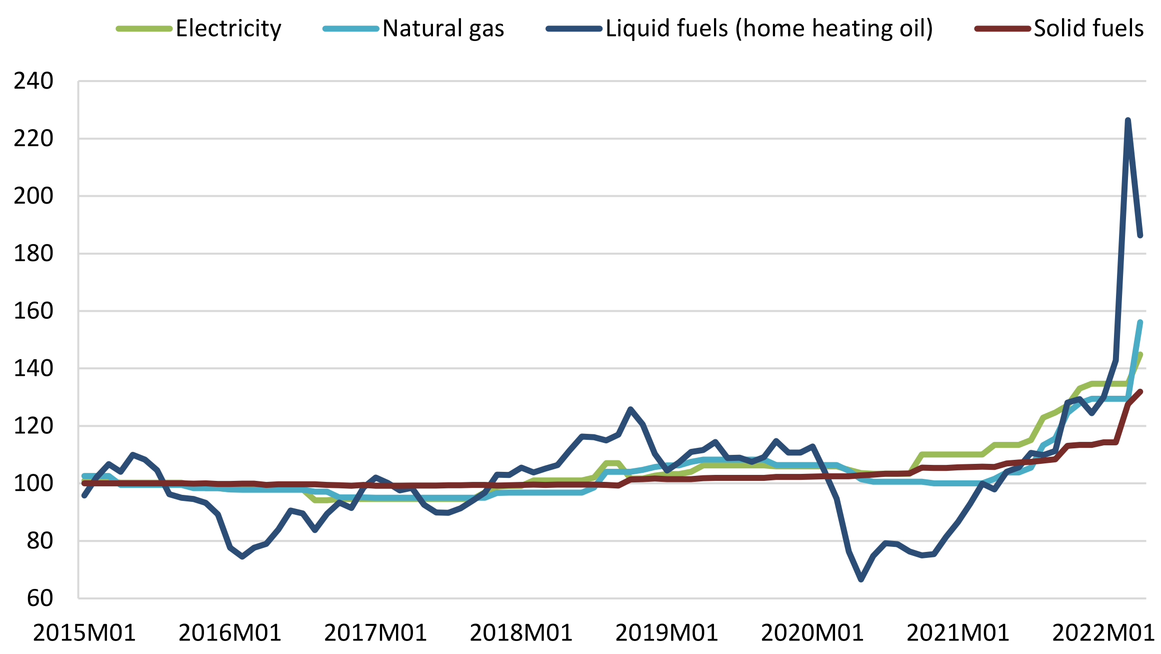
CHAPTER 3

Impact of rising energy prices on households

So far we have drawn on historical household surveys to examine changes in rates of energy poverty and deprivation over time and across groups. However, the most recent available information from these sources dates from the 2015/16 Household Budget Survey and the 2020 Survey of Income and Living Conditions. Energy prices have risen considerably since then.

This is shown in Figure 3.1, which plots changes in selected sub-indices of the Consumer Prices Index (CPI) published by the Central Statistics Office since 2015. The series show that, while prices for electricity, gas and solid fuels were quite stable between 2015 and 2020, those for home heating oil were more volatile, falling by more than 20 per cent in late 2015 before rising to more than 10 per cent above their 2015 level by 2018/2019. Home-heating oil prices fell considerably again in 2020, coinciding with the outbreak of the COVID-19 pandemic and associated public health measures which reduced global demand for oil (Wheeler et al., 2020). However, there has been a sharp increase in the price of all energy sources since early 2021, with home-heating oil prices rising to 86 per cent above their 2015 level by April 2022, electricity prices to 45 per cent above, gas prices to 53 per cent above, and solid fuels to 32 per cent above. In this chapter we examine the impacts on households of these – and potential future – energy price increases.

FIGURE 3.1 CHANGE IN SELECTED CPI SUB-INDICES (2015=100)



Note: Authors' calculations using CSO Table CPM16, indexed to average value in 2015.

3.1 MODELLING APPROACH

To investigate the potential impacts of rising energy prices on households, we adopt the approach of O'Malley et al. (2020), based on De Agostini et al. (2017) and previously applied in an Irish context by Savage (2017). This involves imputing expenditure on energy into the data used by SWITCH – the ESRI's tax and benefit microsimulation model, described in detail by Keane et al. (2022) – based on estimates from the 2015-16 Household Budget Survey (HBS).

The full details of our modelling approach are set out in Appendix B, but the overall idea is as follows. We model expenditure on energy goods and services in the HBS using household and demographic characteristics, then take the estimated coefficients from this model and use the same characteristics in SILC to predict each household's expenditure on goods liable to carbon tax. Doing so allows us to investigate the impact of recent and future price increases on households accounting for changes in income – which have been significant and greater for low- than high-income households in recent years (Roantree et al., 2021) – and household composition (e.g. the rise in employment rates). This also means that the magnitude of the estimates here is comparable with those in Chapter 4 on the impact of potential compensation options.

However, this approach is subject to two important caveats. The first relates to changes in expenditure patterns since 2015/2016 when the HBS data we estimate expenditure shares from were collected. Coffey et al. (2020) show that these changed substantially in the months following the onset of the COVID-19 pandemic, with spending on transport, for example, falling by more than half. While recent credit-card data from the Central Bank of Ireland suggest that spending patterns have returned closer to their pre-pandemic levels,[12] spending is likely to remain different for some groups. More generally, the energy efficiency of both cars and heating systems has improved considerably in recent years and such improvements will not be captured in the spending levels that we impute. As a result, we may overstate the impact of price increases for certain groups (e.g. long-distance commuters who are working more from home and those who have upgraded their home energy systems) and understate it for others (e.g. those spending more time in – and heating – energy-inefficient homes).

Secondly, we assume that households' behaviour remains unchanged in response to a change in relative prices of goods/services and labour/leisure brought about by the rise in prices. This is likely an upper bound on the magnitude of the impact of price changes on incomes as households may respond to higher prices by reducing their consumption. In the short run, although options are more

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12 See https://www.centralbank.ie/statistics/data-and-analysis/credit-and-debit-card-statistics

constrained, research suggests that some reduction in consumption is likely.[13] In the medium or longer run, households are likely to change the composition of their expenditure away from more energy-intensive products towards less energy-intensive ones (De Bruin and Yakut, 2019). Although this is likely to reduce the scale of losses relative to those estimated here, it is unlikely to alter the pattern of these losses unless the magnitude of responses also differs substantially by income level or household type. Other research published by the ESRI suggests that this is unlikely to be the case (Tovar-Reaños and Lynch, 2019).

3.2 IMPACT OF RECENT ENERGY PRICE INCREASES

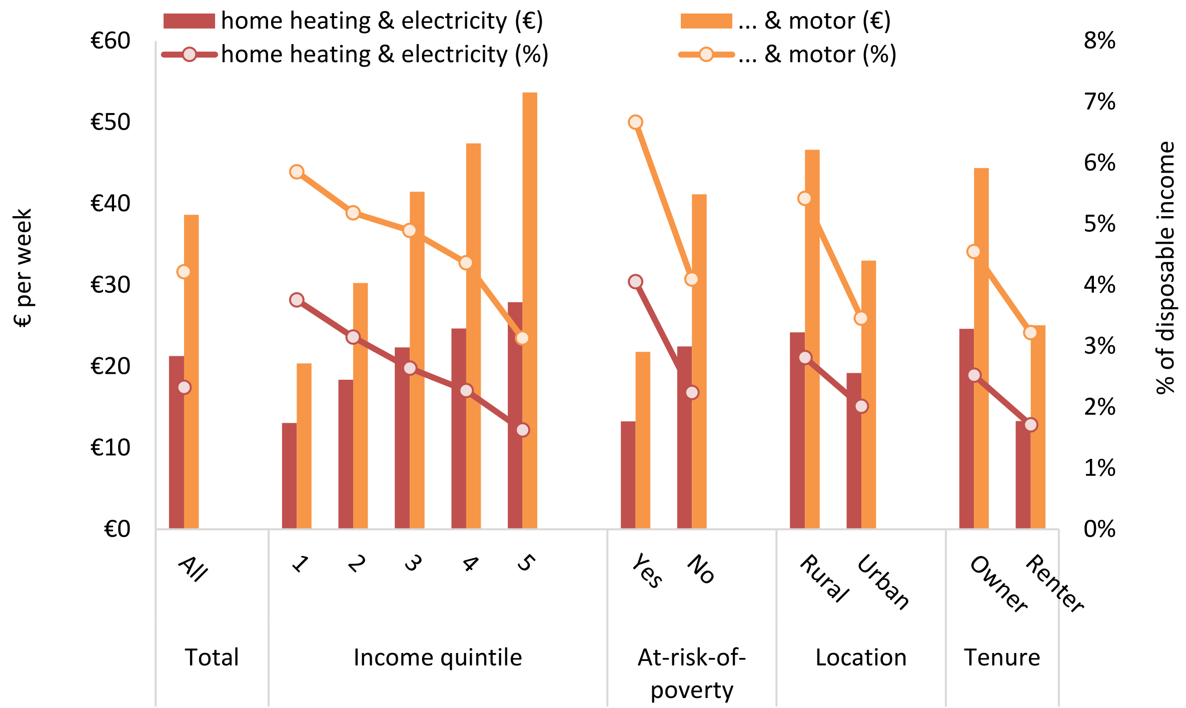
Figure 3.2 presents our estimates of the average impact of energy price increases from January 2021 to April 2022. These estimates are calculated both for all and for selected sub-groups of households, with estimates for further sub-groups of households contained in Appendix Table B.3.[14] The bars plot this impact in terms of Euro per week (left-hand axis) while the connected lines plot the impact as a percentage of disposable (after tax and benefit) income. The red series incorporates the impact of just home heating and electricity inflation, and shows that price increases amount to an average of €21.27 per week or 2.3 per cent of disposable income across all households. The orange series also includes the impact of rising motor fuel prices – which have increased by between a third and a half over the period – which increase the cost of energy inflation to an average of €38.63 per week or 4.2 per cent of disposable income across all households.

However, Figure 3.2 also shows there is a strong income gradient in the impact of energy price increases, with Euro per week estimates rising but percentage of disposable income estimates falling with income. This occurs because, while higher-income households spend more on energy in absolute terms, a larger share of lower-income households' spending is on energy, particularly home heating and electricity (Coffey et al., 2020; Lydon et al., 2022). A similar gradient is evident in terms of households' at-risk-of-poverty status, location (urban/rural) and tenure (owner/renter). In each case, the impact of energy inflation is larger as a percentage of disposable income for the group that see smaller average cash impacts.

13 During the Californian energy crisis of 2000, for instance, electricity prices unexpectedly (and rapidly) rose and the average household's electricity use fell more than 13% in about 60 days. This requires the typical household to invest in new appliances or make substantial behavioural changes in how often they are used (Reiss and White, 2008). While the context and magnitude of price changes differ in this example from the current price changes, it does provide evidence to believe that a demand response is likely in the short term.

14 More specifically, it shows the impact of a 115 per cent increase in liquid fuel (home heating oil) prices, a 31.6 per cent increase in electricity prices, a 52.6 per cent increase in gas prices, a 25 per cent increase in solid fuel prices, a 37.6 per cent increase in petrol and a 55.8 per cent increase in diesel prices. These are derived from the changes in the CPI sub-indices presented in Figure 3.1 between January 2021 and April 2022. Appendix Table B.11 presents an estimate of the impact of wider HICP inflation by income quintile, housing tenure and location, following the approach of Lydon et al. (2022) and Box B in McQuinn et al. (2022).

FIGURE 3.2 SIMULATED IMPACT OF RECENT ENERGY PRICE INCREASES, BY HOUSEHOLD TYPE



Sources: Authors' calculations using eSWITCH version 4.6 run on 2019 SILC data uprated to 2022 terms.
Note: Deciles constructed equivalising income using modified OECD equivalence scale. Spending imputed using approach detailed in Appendix; the energy CPI sub-indices from January 2021 and April 2022 are used to simulate the price rise.

This is in part because these groups tend to have lower incomes, and in part because more of their overall spending goes towards these types of goods. While not captured in these estimates, it should also be borne in mind that many of these identified vulnerable groups are less likely to have savings or other sources of accumulated wealth to draw upon when responding to such financial shocks (Lydon and McIndoe-Calder, 2021). As we will see in Chapter 4, these gradients have important implications for how policymakers can most effectively target those most affected by energy inflation.

Table 3.1 presents our estimate of the impact of these energy price increases on measures of energy poverty. The measures we estimate are expenditure-based, with households spending more than 10 per cent of income on energy classified as being in energy poverty. Chapter 2 showed that these expenditure-based measures are quite sensitive to what precisely is counted as energy expenditure and income. To isolate the effect of price changes in electricity and all other (predominantly heating) fuels, we estimate variants including and excluding electricity expenditure. Relative to 2015/16 data, we estimate that expenditure-based energy poverty has risen from 13.2 per cent to 29.4 per cent, including electricity. If we exclude electricity expenditure, those spending more than 10 per cent of their disposable income on all other energy sources rises from 5.1 per cent to 12.7 per cent. To an extent, this reflects the sensitivity of expenditure-based measures of energy poverty to changes in the numerator, with a cluster of households located near the 10 per cent threshold (Tovar-Reaños and Lynch, 2022; O'Malley et al., 2019).

TABLE 3.1 SIMULATED IMPACT OF RECENT ENERGY PRICE INCREASES ON ENERGY POVERTY

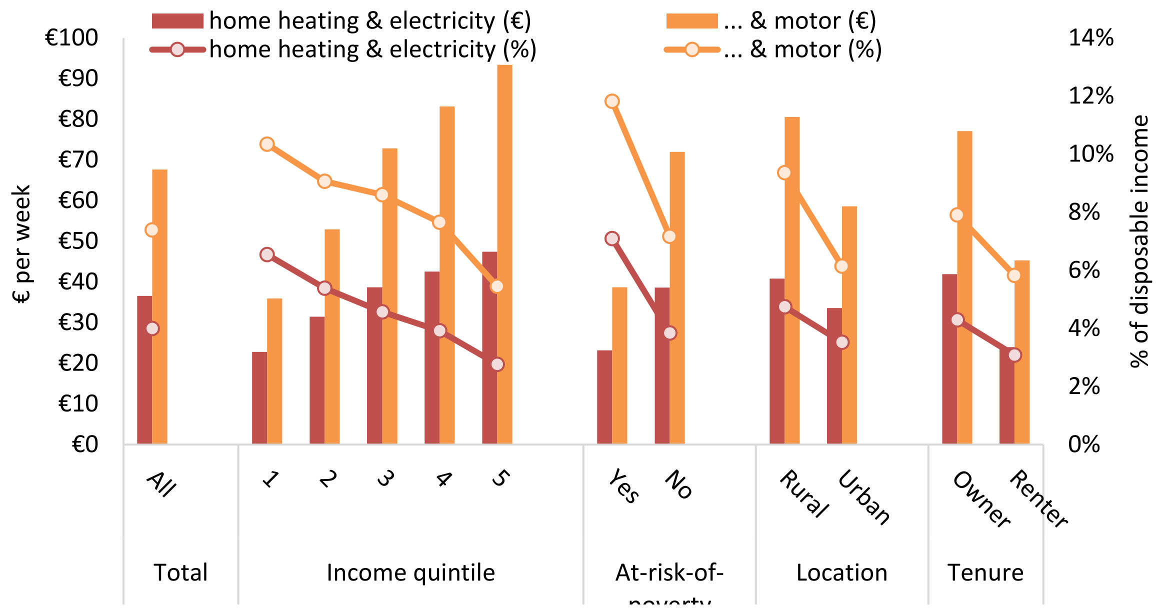
Energy spending >10% of disposable income:	Excluding electricity	Including electricity
2015/16	5.1%	13.2%
Nowcast	12.7%	29.4%

Sources: Authors' calculations using eSWITCH version 4.6 run on 2019 SILC data uprated to 2022 terms.
Note: The energy CPI sub-indices from January 2021 and April 2022 are used to simulate the price rise.

3.3 IMPACT OF POTENTIAL FUTURE ENERGY PRICE INCREASES

Figure 3.3 presents our estimates of the average impact of potential future energy price increases.[15] Specifically, we simulate the impact of a further 25 per cent increase in energy prices, broadly calibrated to the anticipated rise in electricity and gas prices in May.[16] We assume the same proportional increase in liquid fuel, solid fuel and motor fuel prices, though there is likely to be some variation in these.

FIGURE 3.3 IMPACT OF SIMULATED ENERGY PRICE INCREASES, BY HOUSEHOLD TYPE



Sources: Authors' calculations using eSWITCH version 4.6 run on 2019 SILC data uprated to 2022 terms.
Note: Deciles constructed equivalising income using modified OECD equivalence scale. Spending imputed using approach detailed in Appendix. The energy CPI sub-indices from January 2021 and April 2022 are used to simulate the price rise, plus additional 25 per cent increase.

15 Table B.4 presents estimates for further sub-groups of households.
16 See https://www.rte.ie/news/business/2022/0330/1289331-electric-ireland-price-hike/

TABLE 3.2 SIMULATED IMPACT OF POTENTIAL ENERGY PRICE INCREASES ON ENERGY POVERTY

Energy spending >10% of disposable income:	Excluding electricity	Including electricity
2015/16 estimate	5.1%	13.2%
Forecast	20.5%	43.0%

Sources: Authors' calculations using eSWITCH version 4.6 run on 2019 SILC data uprated to 2022 terms.
Note: The energy CPI sub-indices from January 2021 and April 2022 are used to simulate the price rise, plus additional 25 per cent increase.

The bars show that such further levels of energy inflation would increase the impact on households to an average of €36.57 per week excluding motor fuel (4.0 per cent of disposable income) and €67.66 per week (7.4 per cent of disposable income) including motor fuel. Again, these impacts exhibit strong gradients with respect to household income, at-risk-of-poverty status, location and tenure.

Table 3.2 presents our estimates of energy poverty levels incorporating the additional energy inflation presented in Figure 3.3. These are substantially higher than the estimates in Table 3.1, ranging from between 20.5 per cent excluding electricity to 43.0 per cent when electricity is included. Increases of this magnitude would leave energy poverty rates at their highest recorded level, surpassing rates seen in 1994.

To summarise, the impact of recent – and potential future – increases in energy prices is substantial, especially for lower-income households whose main source of income is social transfers (CSO, 2022). We now turn to assess options that policymakers might consider in trying to mitigate these impacts.

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CHAPTER 4

Policy options

This chapter considers potential policy options to mitigate the impact of rising energy prices on households. It begins by examining cuts to indirect taxes on energy, before turning to look at cuts to direct taxes on personal income and increases to social transfers.

4.1 INDIRECT TAX CUTS

Much of the public discussion around potential policy responses to rising energy costs has focused on cuts to indirect taxes on energy.[17] There are currently three main indirect taxes on energy: excise duties (levied at a rate per litre or megawatt hour), the carbon tax (levied at a rate per tonne of CO_2-equivalent) and VAT (levied at a reduced rate of 13.5 per cent on electricity and home heating fuels).

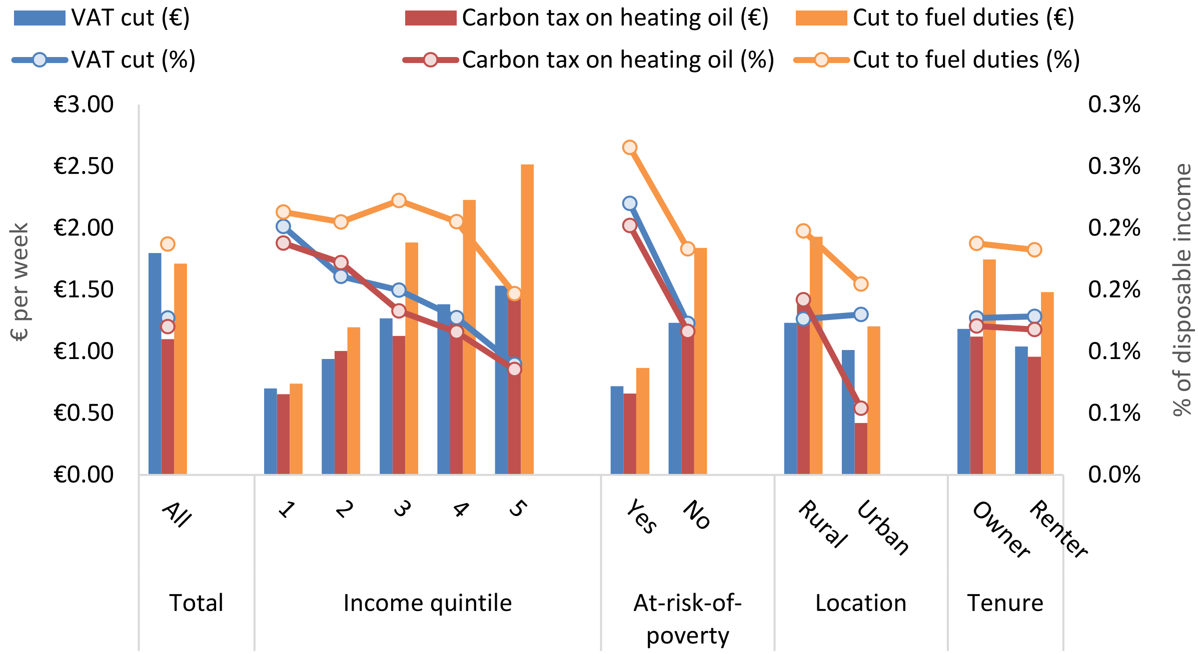
While cutting any of these taxes would offer support to households affected by rising energy prices, doing so might also have unintended or undesirable effects. Rising prices can help avoid shortages or rationing in the event of supply constraints, with research showing that price caps can increase the risk of shortages and blackouts (Reiss and White, 2008). In the long run, price caps also weaken the incentive to invest in energy-saving technology and behaviour. In addition, cutting indirect taxes on energy exacerbates existing effective subsidies to burning fossil fuel (de Bruin et al., 2019), with, for example, reductions to VAT on electricity and gas further distorting consumption decisions towards such services and away from goods or services subject to the standard rate.

Figure 4.1 shows the impact of various proposed cuts to indirect taxes on energy in terms of both cash gains (the bars, Euro per week) and as a percentage of disposable income (the connected lines).[18] The blue series show that reducing VAT on electricity and gas from 13.5 to 9 per cent would lower households' bills by an average of €1.16 per week (0.1 per cent of disposable income). Although gains would be larger in cash terms for higher-income households (an average of €1.53 per week for the highest income quintile compared to €0.70 for the lowest-income quintile), they would be smaller as a percentage of disposable income (0.1 per cent compared to 0.2 per cent).

17 See, for example, https://www.thejournal.ie/vat-energy-costs-5724186-Mar2022/

18 We do not show the impact of measures on our estimates of energy poverty as these are predominantly determined by and sensitive to the numerator (energy expenditure), with changes to the denominator (after-tax and welfare income) of the magnitude we consider having little impact. Appendix Table B.5-6 contain estimates for other sub-groups.

FIGURE 4.1 SIMULATED IMPACT OF INDIRECT TAX MEASURES, BY HOUSEHOLD TYPE



Sources: Authors' calculations using eSWITCH version 4.6 run on 2019 SILC data uprated to 2022 terms.
Note: Deciles constructed equivalising income using modified OECD equivalence scale. Spending imputed using approach detailed in Appendix.

Similarly, while cash gains are larger for homeowners and those at risk of poverty, gains as a percentage of disposable income are larger for renters and those who already reported an existing inability to heat their home. Both cash and proportional gains are larger for those living in rural than urban areas, reflecting rural households' greater expenditure on energy in both absolute terms and as a percentage of income.

The red series in Figure 4.1 shows the impact of removing the carbon tax on home heating oil. The average impact is similar to the cut to VAT on electricity and gas at €1.10 per week or 0.1 per cent of disposable income. However, although the results show the same pattern of gains in cash and proportional terms by household income, tenure and at-risk-of-poverty status, they differ substantially by location. This is because there is much greater reliance on home heating oil in rural areas that are not connected to the natural gas grid, and very little usage in urban areas.

Finally, the orange series shows the impact of cutting excise duty on petrol and diesel by 50c per litre. We estimate that households would gain by an average of €1.71 per week (0.2 per cent of disposable income). However, unlike the other indirect tax changes considered, the gradient of gains as a percentage of income is flat across the lowest four income quintiles. This reflects the fact that a smaller share of lower-income households' total spending goes on motor fuel than of higher-income households' total spending.

In all cases, the indirect tax cuts would only compensate households for a fraction of the increase in energy prices that has been experienced since 2021. This is despite a non-trivial cost, which we estimate in excess of €110 million per year for the cut to VAT and the abolition of carbon tax on heating oil, and €170 million per year for the cut in motor fuel duties.[19] Furthermore, although the gains from cutting VAT or the carbon tax on heating oil are largest as a share of disposable income for lower-income households proportionally most affected by energy price increases, most of the cost arises from cutting taxes for higher-income households. This is because higher-income households spend more in absolute terms on energy and motor fuel. As a result, about half of the overall cash gains from cutting indirect taxes on energy go to the two highest-income quintiles compared to less than a third to the two lowest-income quintiles. This illustrates the fundamental trade-off policymakers face between targeting measures towards those most affected and the cost of the measures, a topic we return to in Chapter 5. We now turn to assess potential direct tax and welfare changes, considering whether these can more effectively target support towards households most affected by energy inflation.

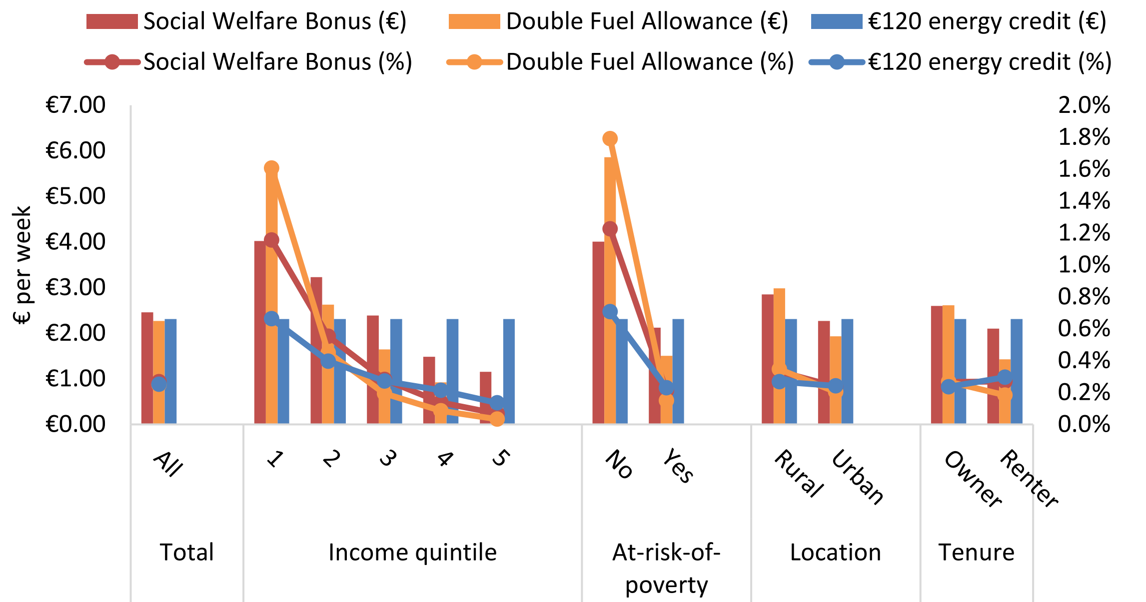
4.2 DIRECT TAX AND WELFARE CHANGES

We examine direct tax and welfare changes that would each cost around €230 million per year. Figure 4.2 presents our estimate of the impact of social welfare changes: a double social welfare payment akin to the annual Christmas bonus, a doubling of the fuel allowance, and a €120 lump-sum electricity credit. While all three changes would increase average household incomes by the same amount (€2.30-€2.50 per week, or 0.25 per cent of disposable income), there are differences in the impact of the measures across groups.

Unlike cuts to indirect taxes, the first two changes would benefit lower-income households most both in cash terms and as a share of disposable income. This is because social welfare payments are means-tested, meaning few higher-income households are in receipt of the payments and so cannot gain from their increase. The fuel allowance increase is slightly more progressive than the social welfare bonus – with an average gain of €5.59 vs €4.02 per week for the lowest income quintile – but is restricted to longer-term claimants of social welfare payments, such as Jobseeker's Benefit, so excludes some low-income welfare-dependent households.

[19] Our costings are based on the estimated gain to households from the tax cuts, but many non-household users (like businesses or public authorities) would also benefit; this is not captured in our survey data and would have an additional Exchequer cost.

FIGURE 4.2 SIMULATED IMPACT OF WELFARE MEASURES, BY HOUSEHOLD TYPE



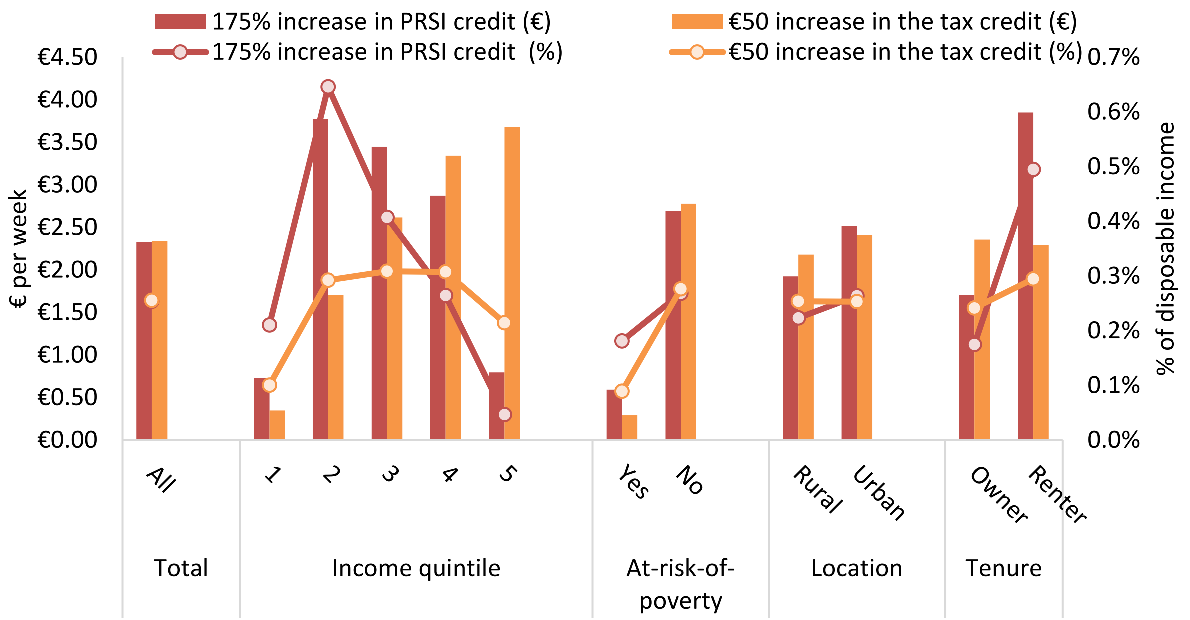
Sources: Authors' calculations using eSWITCH version 4.6 run on 2019 SILC data uprated to 2022 terms.
Note: Deciles constructed equivalising income using modified OECD equivalence scale. Spending imputed using approach detailed in Appendix.

While both the social welfare bonus and double fuel allowance are also very well targeted towards those at risk of poverty, they are less well targeted towards renters who – as we saw in Chapter 2 – face higher rates of energy deprivation relative to homeowners. This reflects the fact that pensioners – who make up a large share of the beneficiaries of both measures – are much more likely to own their own home than low-income working-age adults. In contrast, the €120 lump-sum electricity credit results in proportionally larger gains for renters than homeowners, but is less progressive than the two other social welfare measures. This is because higher-income households gain by the same amount in cash terms as lower-income households. As a result, while still progressive, the electricity credit can be considered somewhat less well targeted towards those most affected by energy inflation (though better targeted than indirect tax cuts).[20]

While welfare changes can therefore be designed to accurately target the households most adversely affected by rising energy prices, the absence of an income support for low-income working individuals without children means that policymakers may also wish to look at changes to direct taxation.[21]

20 Appendix Table B.7 and 8 contain estimates for other sub-groups.
21 The introduction of such a support – a feature of social welfare systems in many advanced economies – has been suggested by the National Economic and Social Council (2020), Roantree (2020) and Keane et al. (2021) among others.

FIGURE 4.3 SIMULATED IMPACT OF DIRECT TAX MEASURES, BY HOUSEHOLD TYPE



Sources: Authors' calculations using eSWITCH version 4.6 run on 2019 SILC data uprated to 2022 terms.
Note: Deciles constructed equivalising income using modified OECD equivalence scale. Spending imputed using approach detailed in Appendix.

Figure 4.3 shows the estimated impacts of two direct tax measures aimed at lower earners: increasing the Pay Related Social Insurance (PRSI) credit from €12 to €33 and increasing the main income tax credits by €50 per year.[22] We estimate that both these measures would increase households' incomes by about €2.30 per week (0.3 per cent of disposable income). While neither tax cut is well targeted towards those at risk of poverty or the very lowest-income households (who typically do not have earnings high enough to pay income tax or PRSI), increasing the PRSI credit results in gains that are highest for those in the second-lowest income quintile. This contrasts with increasing the main income tax credits, which benefits households in the middle of the income distribution most as a share of income and results in largest cash increases for higher-income households.[23]

Taken together, these results show that the direct tax and welfare system provide a much more precise means of targeting support towards the households most adversely affected by rising energy costs than cuts to indirect taxes. The final chapter of this report summarises the findings of our research and its implications for policy.

22 The PRSI credit reduces the PRSI liabilities of lower earners. Increasing the credit by this amount could require making refunds to some taxpayers in a similar way to how Revenue made payments to firms during the course of the pandemic.

23 Appendix Table B.9 and 10 contain estimates for other sub-groups.

CHAPTER 5

Conclusion

This report has examined energy poverty and deprivation in Ireland, a topic that rapidly rising prices have recently returned to the forefront of public debate.

While expenditure-based measures of energy poverty and self-reported measures of energy deprivation have both declined over time, the two approaches suggest that between 5 and 15 per cent of households were experiencing problems adequately heating their homes before the recent rise in prices. Variation in the level of these estimates is partly due to whether or not electricity is included in energy expenditure, but also reflects a conceptual difference in what is being measured. Self-reported measures of energy deprivation place a greater emphasis on heat-related deprivation in the household, while expenditure-based measures can include some households with large or excessively heated homes and exclude others whose incomes are too low to allow them to keep their homes adequately heated.

We also highlight important socio-economic differences between groups identified as vulnerable to rising fuel prices by expenditure-based measures of energy poverty and self-reported measures of energy deprivation. First, while there is a substantial overlap between measures of energy poverty and income poverty (as captured by the at-risk-of-poverty line), there is less overlap between measures of self-reported energy deprivation and income poverty. Second, while expenditure-based measures of energy poverty are highest for those living in detached dwellings and lowest for those living in apartments, the reverse is true for self-reported measures of energy deprivation. Similarly, while expenditure-based measures of energy poverty show little difference between homeowners and renters, self-reported measures of energy deprivation are much higher for renters than homeowners. This suggests that, while homeowners and those living in detached dwellings spend a larger share of their income heating their homes, they also have a greater capacity to do so, likely reflecting their, on average, higher levels of income. By contrast, renters and those living in apartments are more likely to endure energy deprivation and go without heat because they cannot afford it.

This illustrates the importance of developing more sophisticated measures of energy poverty, something previously highlighted by O'Malley et al. (2020) and Tovar-Reaños and Lynch (2020). From this perspective, the recent establishment of a research network on fuel poverty by the Department of Communications, Climate Action and Environment is welcome; better measurement is crucial for developing effective policy.[24]

The collection of more regular data is also crucial; the most recently available information on energy poverty was collected in 2015/16 and that on energy deprivation in 2020. Energy prices have risen substantially since then, with electricity prices now 45 per cent above their 2015 level and home heating oil and gas prices even higher. Chapter 3 investigated the potential impacts of these energy price increases on households and rates of energy poverty. Our estimates suggest that these impacts are likely substantial, with increases to date amounting to an average of €21.27 per week or 2.3 per cent of disposable income across all households (almost twice that amount if increases in the price of motor fuel are included). These impacts are proportionally much larger for lower-income and rural households, as well as those at risk of poverty.

Chapter 4 assessed options policymakers might consider in trying to mitigate the impact of these rising energy prices on households. It showed that, while cuts to indirect taxes on energy do provide support to households particularly affected by energy inflation, such support is poorly targeted. For example, about half of the overall cash gain – and so cost incurred – from cutting indirect taxes on energy goes to the two highest income quintiles compared to less than a third to the two lowest income quintiles.

Furthermore, trying to mitigate the impact of rising energy prices by cutting indirect taxes on fuel can have unintended or undesirable effects, both in the short and longer run. In the short run, indirect tax cuts counteract the signal given by rising prices to reduce consumption, potentially exacerbating the risk of supply shortages and rationing. In the longer run, cutting taxes on energy weakens the incentive to invest in energy-saving technology and behaviour, running counter to policy commitments to reduce the level of greenhouse-gas emissions. In addition, cutting indirect taxes on energy exacerbates existing effective subsidies to burning fossil fuel, with, for example, reductions to VAT on electricity and home-heating fuels further distorting consumption decisions towards such services and away from goods or services subject to the standard rate.

Lump-sum payments to households – such as the recent €200 household electricity credit – do not have such distortionary effects and are better targeted than indirect tax cuts towards the households most affected by rising energy prices. However, increases to welfare payments are more targeted still because they are means-tested. A Christmas Bonus-style double welfare payment would result in gains that

24 See https://www.kildarestreet.com/wrans/?id=2022-02-15a.506

are larger in both cash terms and as percentage of income for lower- than higher-income households, as well as those who already had difficulties in keeping their home adequately heated. So too would a doubling of the Fuel Allowance, although this would be restricted to longer-term beneficiaries of welfare payments and exclude those recently unemployed. All three of these options have the added appeal that they can be timed to be paid to beneficiaries at the particular times of year when energy bills are highest.

Increases to welfare payments provide little support to low-earning households without children, who are not entitled to any equivalent of the Working Families Payment. However, these households could be targeted for support by direct tax cuts if policymakers wanted to ensure some support was provided to those outside the welfare system. While increases to income tax credits would primarily benefit higher- and upper-middle-income households (reflecting the relatively high level of income that can already be earned before income tax is paid), increasing the PRSI credit is more targeted at lower-earners and renters.

While there appears to be a strong appetite among policymakers to compensate households for recent and future energy price increases, there are limits to what government can do. This is not least given the risks pointed to by the Fiscal Advisory Council (2022), Central Bank of Ireland Governor Makhlouf (2021) and McQuinn et al. (2022), among others, of higher spending on compensatory measures fuelling further (non-energy) inflation. Such concerns make it all the more important to ensure that the measures enacted are well designed and well targeted towards groups most adversely affected by energy inflation.

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APPENDIX

A. IMPUTATION OF ENERGY EXPENDITURE INTO SWITCH SILC DATA

Our approach to imputing energy expenditure follows O'Malley et al. (2020), which is based on that of De Agostini et al. (2017), previously applied in an Irish context by Savage (2017). We model expenditure on energy goods and services in the HBS using household and demographic characteristics, then take the estimated coefficients of this model and use the same characteristics in SILC to predict each household's expenditure on goods liable to carbon tax. The details of this approach are described below.

Step 1: Estimate non-durable expenditure

The first step is to use the HBS data to estimate non-durable expenditure using an unconditional ordinary least squares (OLS) model as follows:

$$\ln NDE = \alpha_E + \sum_m \beta_E (\ln y)^m + \gamma_1 \boldsymbol{x} + \gamma_2 \ln y * \boldsymbol{x} + \gamma_3 (\ln y)^2 * \boldsymbol{x} + \epsilon_E$$

where $\ln NDE$ denotes the logarithm of non-durable expenditure (total spending less that on furniture, appliances and equipment), y denotes disposable income, $\boldsymbol{x}$ is a vector of control variables, and $\alpha_E, \beta_E, \gamma_1, \gamma_2 \; and \; \gamma_3$ are parameters to be estimated. Here, m is set to 3. The parameters estimated from this model are used later in Step 4.

The vector of control variables includes a range of demographic and household characteristics. Household characteristics include the following variables; household size, tenure of accommodation, family type, car ownership, the number of dependent children, the number of working members of the household, the number of rooms in the dwelling, the type of accommodation, and rural/regional indicators.

Other household head (HRP) characteristics include work status, gender, age, education and marital status. For the purposes of this specific step, the model also includes the interaction of each of these demographic and household characteristics with the logarithm of disposable income and its square.

Step 2: Estimate budget shares of goods subject to the carbon tax

The next step is to estimate the budget shares of electricity and goods subject to the carbon tax. Due to the large proportion of households that have zero expenditure on many of the five different types of fuel captured in the HBS (gas, liquid fuel, solid fuel, petrol and diesel), this estimation is done in two stages.

The first stage estimates a probit model in order to calculate the probability of having non-zero expenditure:

$$\Pr(dE_c = 1) = \psi(\alpha_{c,0} + \sum_m \beta_{c,0}(\ln NDE)^m + \gamma_{c,0}\,\boldsymbol{x} + \epsilon_{c,0})$$

The dependent variable is the probability of having positive expenditure on a given fuel, c. The exponent of NDE, m, is set to 2, while the vector of covariates contains the same demographic and household characteristics as before.

The second stage uses an OLS regression to estimate budget shares of non-durable expenditure for a given fuel, $w_c = \frac{E_c}{NDE}$, conditional on having positive expenditure for that fuel.

$$\mathrm{w_c} = \alpha_c + \sum_m \beta_c(\ln NDE)^m + \gamma_c\,\boldsymbol{x} + \epsilon_c \;\; if\; dE_c = 1$$

A second-order polynomial is again used for the expenditure term, while the control variables are the same as before.[25] The estimated coefficients from both stages of this step are later used in Step 5.

Step 3: Adjust the income distribution from SILC to match the HBS

The distribution of disposable income from SILC is then adjusted to align it to the HBS data. We take the weekly disposable income for each household simulated by SWITCH under the baseline tax and welfare policy (described below) in 2015/2016 prices, then identify outliers in the distributions of disposable incomes in both the SILC and HBS datasets. This is done using the Chauvenet method for detecting outliers, an iterative procedure where an observation is marked as an outlier if it falls outside the criterion chosen. In this case, the criterion assumes a lognormal distribution:

$$(ln\, y - \overline{ln\, y})\,/\sigma_{\ln y} > Z_{(1-2N)^{-1}}$$

where $\overline{\ln y}$ is the mean and σ is the standard deviation of disposable income. Once outliers have been identified, the distribution of disposable income is standardised by scaling it using these moments of disposable income in the HBS, specifically:

$$\tilde{y} = \left(\frac{y - \bar{y}}{\sigma_y}\right) * \sigma_{y,HBS} + \bar{y}_{HBS}$$

Step 4: Impute non-durable expenditure

Once the variables in the SILC dataset have been constructed such that they have the same structure as their HBS counterparts, non-durable expenditure is imputed

25 Price is not included as a control in this equation as the exercise is a static microsimulation one, with the aim of imputing expenditures from the HBS to SILC rather than predicting what similar households would spend today given the higher level of prices. Such a dynamic microsimulation approach would require a more detailed demand system estimation like that adopted by Tovar-Reaños and Lynch (2019).

into the SILC data. This simply involves taking the estimated coefficients from Step 1 above and the values of the variables to generate predicted values of non-durable expenditure for each household in our SILC dataset.

The independent variables for income, as well as their interactions with the control variables, are the adjusted series (from Step 3) and not the original series in the SILC dataset. This means that our imputation procedure accounts for the lower level of employment and disposable income in 2020 arising from pandemic-related job losses, though it assumes that the relationship between expenditure and these (along with other demographic variables) is the same as in 2015/2016. The resulting imputation of non-durable expenditure is then adjusted in the same manner as income in Step 3 before being used as a variable in the next step.

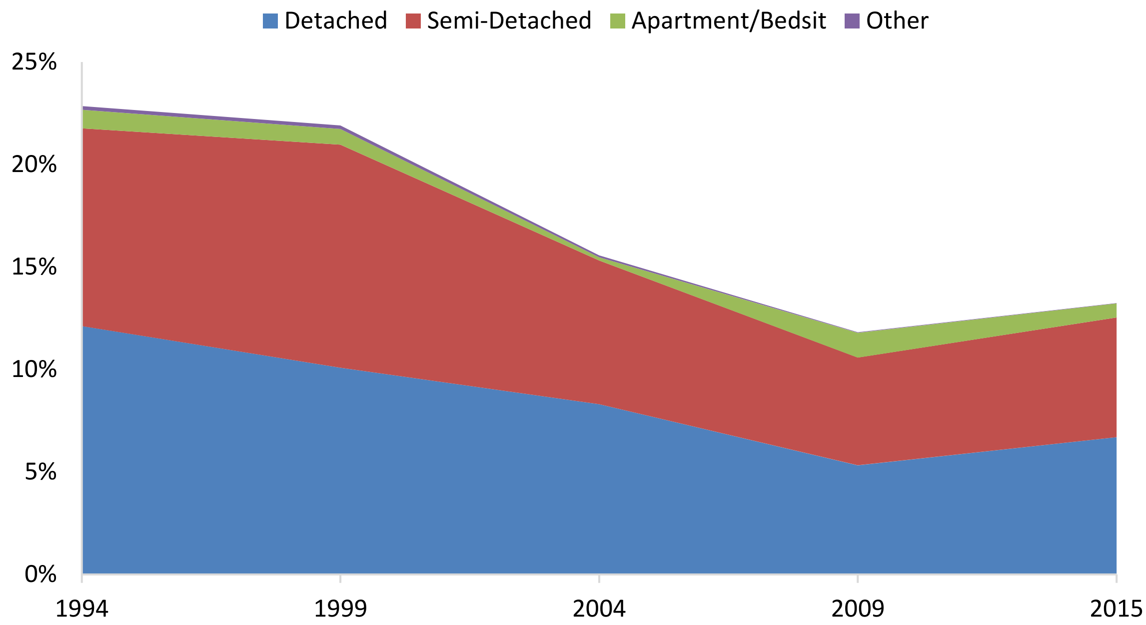
Step 5: Impute budget shares

In the same manner as the previous step, budget shares are imputed following the two-stage procedure using the estimates from Step 2. The non-durable expenditure variables and their polynomials are again the adjusted series rather than the original prediction.

B. ADDITIONAL FIGURES AND TABLES

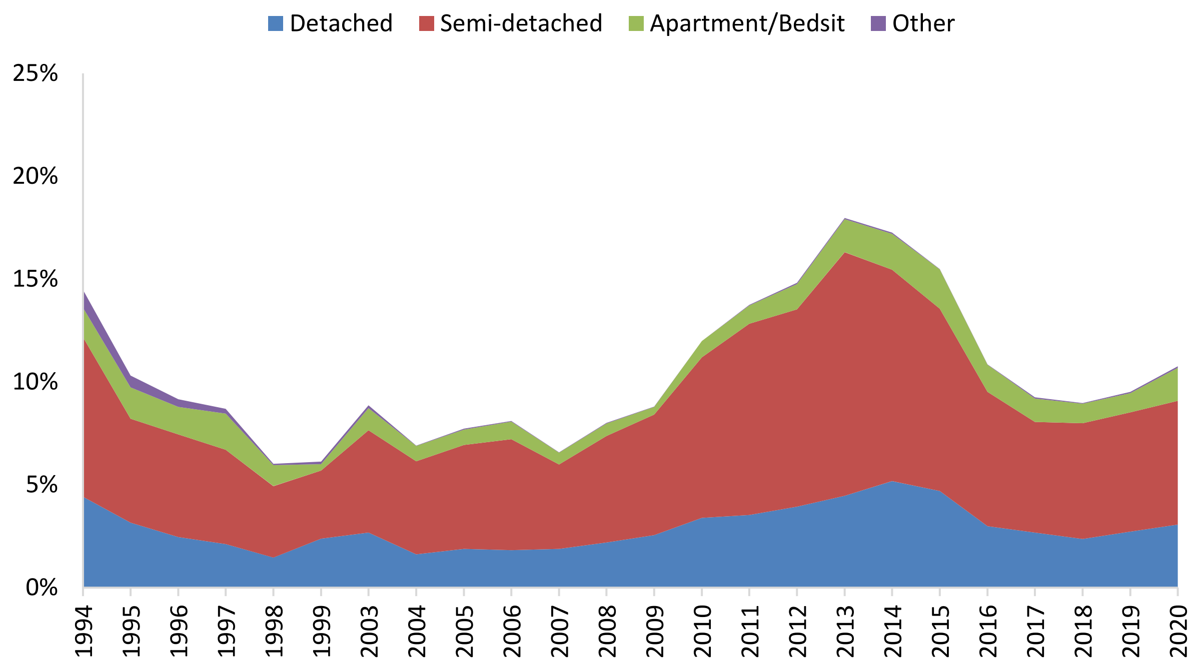
FIGURE B.1 COMPOSITION OF ENERGY POVERTY/DEPRIVATION BY DWELLING TYPE

COMPOSITION OF ENERGY POVERTY BY DWELLING TYPE



Sources: Authors' calculations using the Household Budget Survey.
Note: Energy poverty calculation includes electricity.

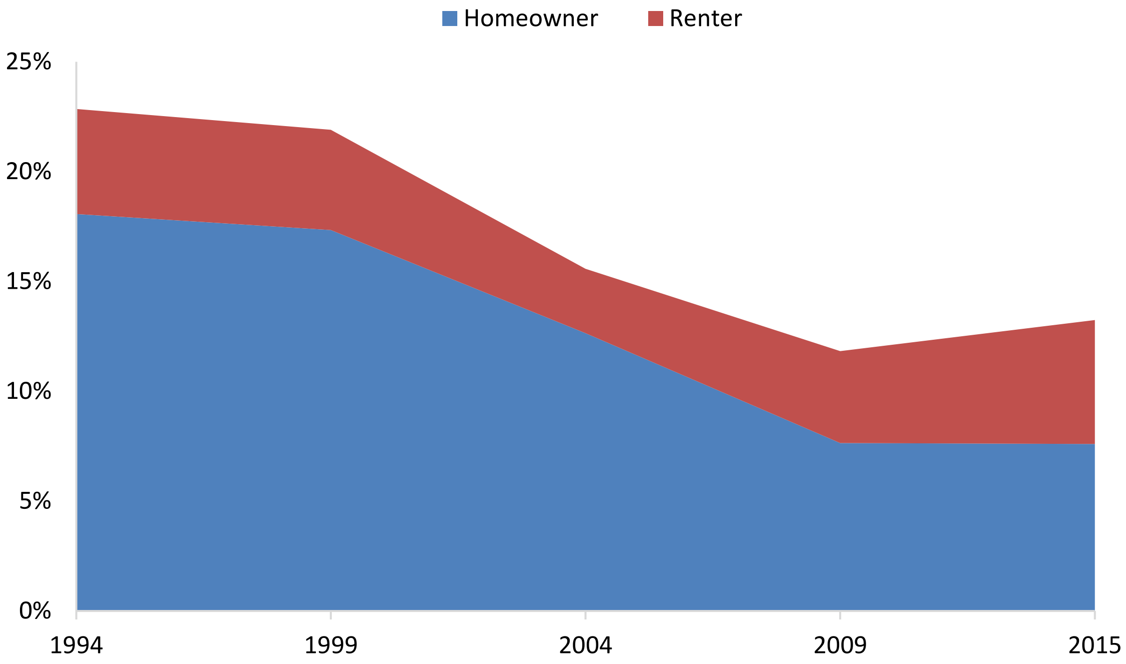
COMPOSITION OF ENERGY DEPRIVATION BY DWELLING TYPE



Sources: Authors' calculations using the Living in Ireland Survey and the Survey of Income and Living Conditions Research Microdata Files.

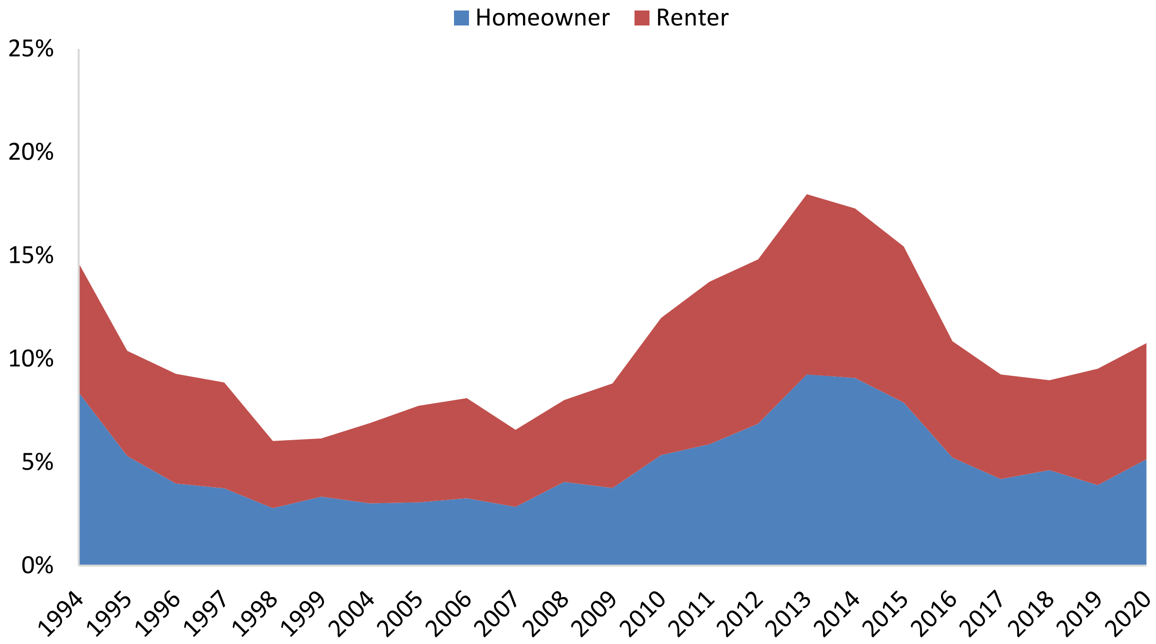
FIGURE B.2 COMPOSITION OF ENERGY POVERTY/DEPRIVATION BY HOUSEHOLD TENURE

COMPOSITION OF POVERTY BY HOUEHOLD TENURE



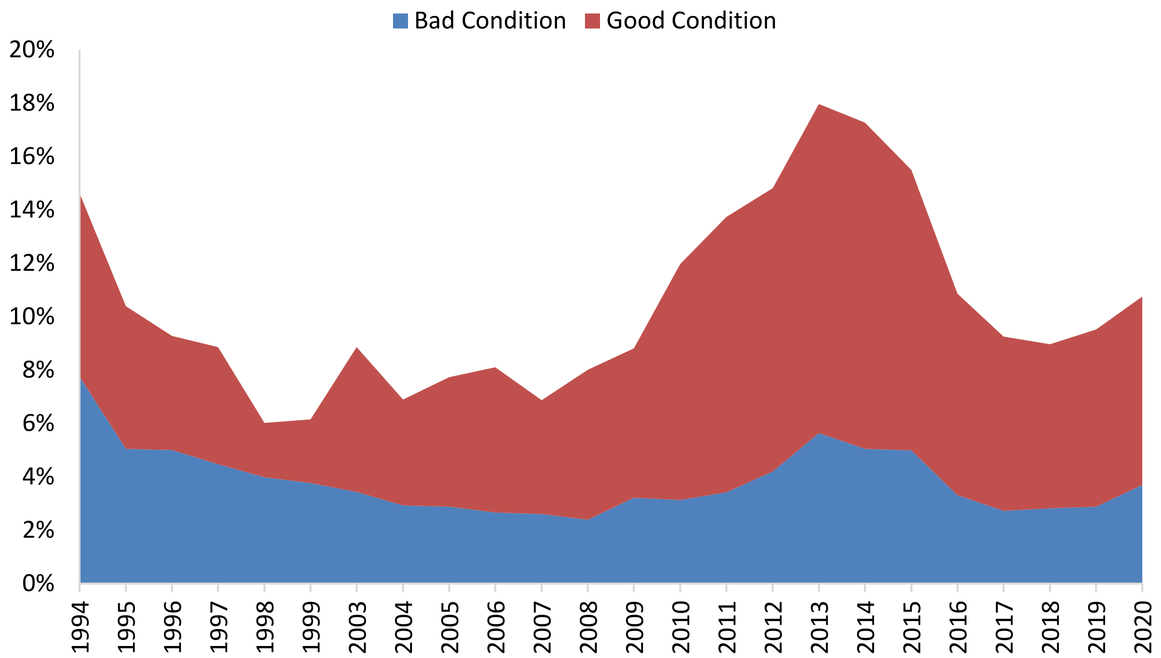
Sources: Authors' calculations using the Household Budget Survey.
Note: Energy poverty calculation includes electricity.

COMPOSITION OF ENERGY DEPRIVATION BY HOUSEHOLD TENURE



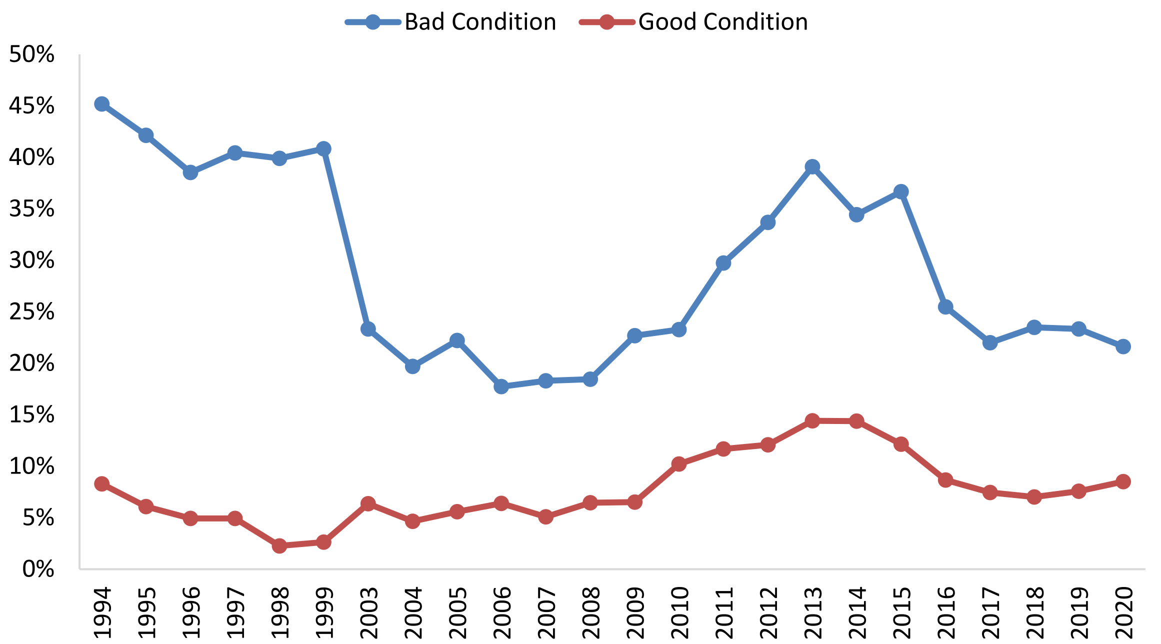
Sources: Authors' calculations using the Living in Ireland Survey and the Survey of Income and Living Conditions Research Microdata Files.

FIGURE B.3 COMPOSITION OF ENERGY DEPRIVATION BY DWELLING CONDITION



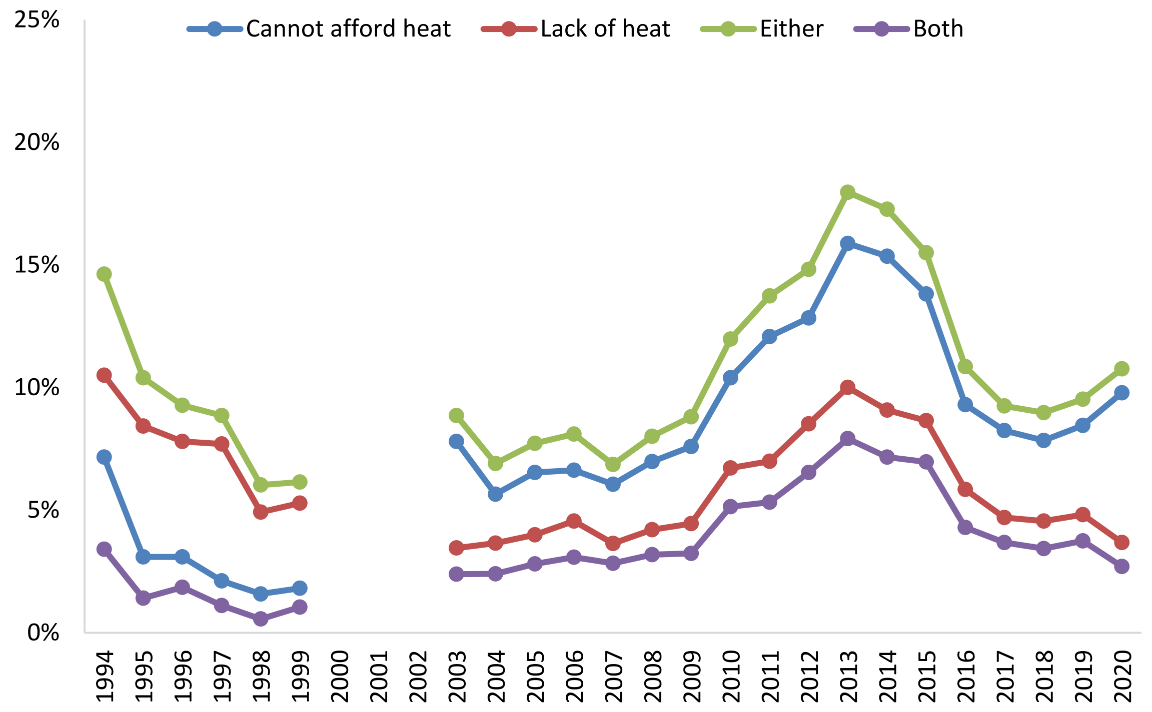
Sources: Authors' calculations using the Living in Ireland Survey and the Survey of Income and Living Conditions Research Microdata Files.

FIGURE B.4 RATES OF ENERGY DEPRIVATION BY DWELLING CONDITION



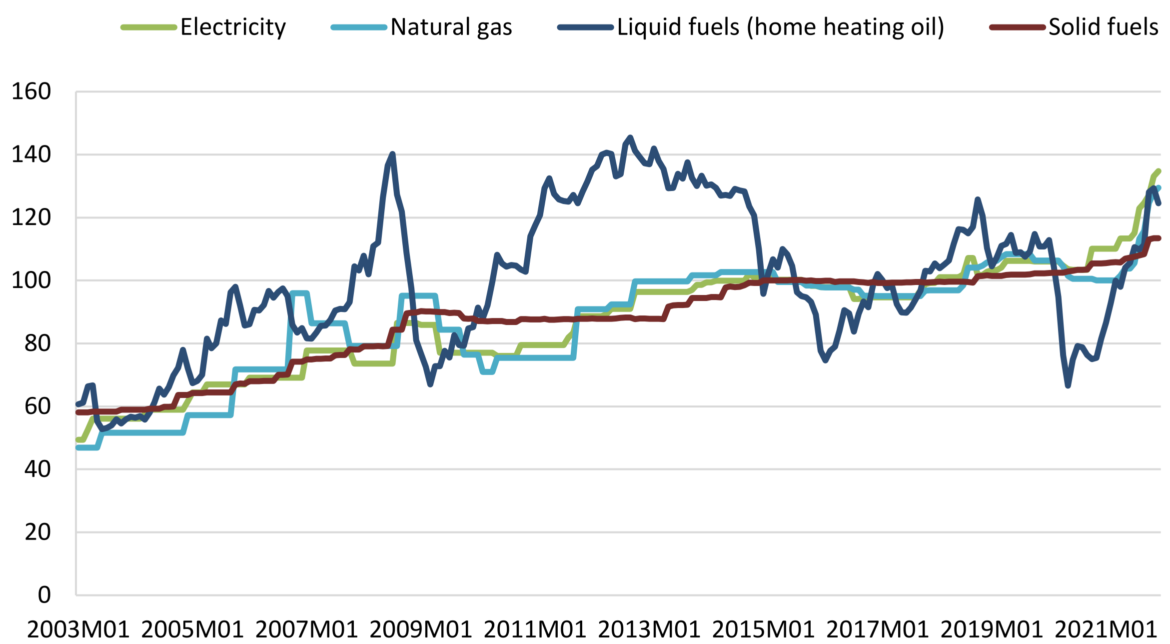
Sources: Authors' calculations using the Living in Ireland Survey and the Survey of Income and Living Conditions Research Microdata Files.

FIGURE B.5 COMPONENTS OF SELF-REPORTED ENERGY DEPRIVATION (1994–2020)



Sources: Authors' calculations using the Living in Ireland Survey and the Survey of Income and Living Conditions Research Microdata Files.

FIGURE B.6 CHANGE IN SELECTED CPI SUB-INDICES 2003–2021 (2015=100)



Note: Authors' calculations using CSO Table CPM16, indexed to average value in 2015.

TABLE B.1 SHARE OF HOUSEHOLDS IN ARREARS ON UTILITY BILL IN POPULATION GROUPS

Year	Overall	Not at risk of poverty	At risk of poverty	Renter	Homeowner	Detached House	Semi-detached House	Apartment / Bedsit
1994	8.8%	6.7%	16.7%	20.1%	6.2%	4.9%	11.4%	12.6%
1995	6.1%	4.3%	12.4%	14.1%	4.2%	4.9%	7.1%	8.7%
1996	6.7%	5.0%	12.8%	16.5%	4.3%	4.6%	8.5%	6.1%
1997	5.3%	3.6%	10.7%	12.7%	3.3%	3.2%	7.4%	2.5%
1998	3.9%	2.7%	7.4%	10.7%	2.2%	2.0%	5.0%	9.2%
1999	3.9%	2.6%	7.6%	10.8%	2.2%	3.2%	4.7%	3.4%
2004	7.2%	5.26%	13.15%	19.4%	4.2%	3.3%	10.0%	14.7%
2005	6.1%	4.43%	11.74%	16.7%	3.1%	2.9%	8.2%	10.2%
2006	6.2%	4.57%	12.29%	17.4%	2.9%	2.7%	8.3%	11.6%
2007	6.0%	3.74%	14.16%	17.3%	2.6%	3.7%	6.9%	16.0%
2008	7.7%	6.26%	14.32%	18.4%	4.4%	4.0%	10.0%	15.7%
2009	9.6%	8.13%	16.99%	20.8%	5.6%	5.3%	12.1%	16.8%
2010	11.4%	9.47%	21.94%	22.2%	7.4%	6.7%	14.0%	17.5%
2011	12.7%	10.27%	23.01%	25.8%	7.0%	9.3%	14.4%	16.0%
2012	15.1%	12.71%	26.31%	25.4%	10.6%	10.0%	18.3%	16.4%
2013	16.4%	13.71%	29.56%	28.3%	11.5%	10.3%	20.1%	19.2%
2014	15.8%	13.24%	28.62%	25.8%	11.5%	12.1%	18.2%	18.8%
2015	13.4%	10.85%	25.42%	23.7%	9.2%	9.1%	16.0%	18.5%
2016	10.7%	8.07%	22.18%	19.9%	6.9%	7.0%	12.5%	16.3%
2017	8.8%	6.40%	19.50%	15.3%	6.2%	6.0%	10.7%	10.3%
2018	7.4%	5.37%	16.10%	14.8%	4.4%	4.4%	9.1%	10.4%
2019	7.9%	5.80%	18.12%	16.0%	4.4%	3.7%	10.9%	8.0%
2020	7.5%	5.65%	16.43%	17.1%	3.3%	4.7%	8.7%	11.5%

Sources: Authors' calculations using the Living in Ireland Survey and the Survey of Income and Living Conditions Research Microdata Files.

TABLE B.2 ESTIMATES FROM PROBIT REGRESSION MODEL OF FUEL DEPRIVATION (FOR THOSE NOT AT RISK OF POVERTY)

Average Marginal Effects	Model 1	Model 2
Disability in Household	0.014*	0.011
Education:		
Lower secondary	0.024	0.022
Upper secondary	-0.003	-0.002
(ref.: Post-secondary)		
Family Type:		
Single Adult	0.033*	0.032*
Lone Parent Family	0.117***	0.107***
(ref.: Couple)		
Couple with dependent children	0.015	0.017
Single Adult (65 years old or older)	0.019	0.019
Couple (at least on aged over 65)	-0.007	-0.007
Non-related household	0.005	0.001
3 Adults +	0.001	0.0002
3 Adults + with dependent children	0.056***	0.055***
Dublin City	0.007	0.006
Household with no-one in paid employment	0.061***	0.058***
Household owns home	-0.042***	-0.032***
House in poor condition		0.056***
Adj. R-squared	0.048	0.061
N	7,166	

Sources: Authors' calculations using the Survey of Income and Living Conditions Research Microdata Files.
Notes: *** p<.001; ** p<.01; * p<.05; ± p<.10.

TABLE B.3 SIMULATED IMPACT OF RECENT ENERGY PRICE INCREASES, BY HOUSEHOLD TYPE

Household type	Heating & electricity (€pw)	Heating & electricity (%)	… & motor fuel (€pw)	… & motor fuel (% income)
All	€21.27	€38.63	2.3%	4.2%
Income quintile				
Lowest	€13.08	€20.36	3.8%	5.9%
2	€18.37	€30.27	3.1%	5.2%
3	€22.37	€41.46	2.6%	4.9%
4	€24.65	€47.42	2.3%	4.4%
Highest	€27.89	€53.68	1.6%	3.1%
Can afford to heat home adequately				
Yes	€16.71	€29.20	2.6%	4.6%
No	€21.75	€39.63	2.3%	4.2%
Dwelling location				
Rural	€24.20	€46.64	2.8%	5.4%
Urban	€19.21	€33.01	2.0%	3.5%
Housing tenure				
Homeowner	€24.63	€44.38	2.5%	4.5%
Renter	€13.31	€25.06	1.7%	3.2%
Dwelling condition				
Good	€21.60	€39.31	2.3%	4.2%
Poor	€18.94	€33.81	2.3%	4.2%
Dwelling type				
Detached	€27.19	€50.09	2.8%	5.2%
Semi-detached	€18.83	€33.69	2.1%	3.8%
Flat/other	€11.16	€20.25	1.4%	2.5%
At-risk-of-poverty				
Yes	€13.26	€21.80	4.1%	6.7%
No	€22.47	€41.16	2.2%	4.1%

Sources: Authors' calculations using eSWITCH version 4.6 run on 2019 SILC data uprated to 2022 terms.
Note: Quintiles of equivalised income using modified OECD equivalence scale. Spending imputed using approach detailed in Appendix. The simulated price rise shown is that experienced between January 2021 and April 2022.

TABLE B.4 SIMULATED IMPACT OF POTENTIAL FUTURE ENERGY PRICE INCREASES, BY HOUSEHOLD TYPE

Household type	Heating & electricity (€pw)	Heating & electricity (%)	… & motor fuel (€pw)	… & motor fuel (% income)
All	€36.57	€67.66	4.0%	7.4%
Income quintile				
Lowest	€22.78	€35.97	6.5%	10.3%
2	€31.47	€52.94	5.4%	9.1%
3	€38.69	€72.87	4.6%	8.6%
4	€42.52	€83.17	3.9%	7.7%
Highest	€47.43	€93.40	2.8%	5.4%
Can afford to heat home adequately				
Yes	€29.17	€51.73	4.6%	8.2%
No	€37.35	€69.33	4.0%	7.3%
Dwelling location				
Rural	€40.79	€80.58	4.7%	9.4%
Urban	€33.61	€58.59	3.5%	6.1%
Housing tenure				
Homeowner	€41.90	€77.13	4.3%	7.9%
Renter	€24.00	€45.33	3.1%	5.8%
Dwelling condition				
Good	€37.12	€68.82	4.0%	7.4%
Poor	€32.72	€59.43	4.0%	7.3%
Dwelling type				
Detached	€45.75	€86.40	4.7%	8.9%
Semi-detached	€32.92	€59.70	3.7%	6.7%
Flat/other	€20.25	€36.89	2.5%	4.6%
At-risk-of-poverty				
Yes	€23.19	€38.66	7.1%	11.8%
No	€38.58	€72.01	3.8%	7.2%

Sources: Authors' calculations using eSWITCH version 4.6 run on 2019 SILC data uprated to 2022 terms.
Note: Quintiles of equivalised income using modified OECD equivalence scale. Spending imputed using approach detailed in Appendix. The simulated price rise shown is that experienced between January 2021 and April 2022, plus additional 25 per cent.

TABLE B.5 SIMULATED IMPACT OF INDIRECT TAX MEASURES (€ PW), BY HOUSEHOLD TYPE

Household type	VAT cut	Cut to carbon tax	Cut to motor oil duties
All	€1.16	€1.10	€1.71
Income quintile			
Lowest	€0.70	€0.65	€0.74
2	€0.94	€1.00	€1.20
3	€1.27	€1.13	€1.88
4	€1.38	€1.26	€2.23
Highest	€1.53	€1.47	€2.52
Can afford to heat home adequately			
Yes	€0.99	€1.61	€2.16
No	€1.29	€0.75	€1.40
Dwelling location			
Rural	€1.23	€1.38	€1.93
Urban	€1.01	€0.42	€1.20
Housing tenure			
Homeowner	€1.18	€1.12	€1.75
Renter	€1.04	€0.96	€1.48
Dwelling condition			
Good	€1.18	€1.12	€1.75
Poor	€1.04	€0.96	€1.48
Dwelling type			
Detached	€1.19	€1.72	€2.21
Semi-detached	€1.19	€0.80	€1.49
Flat/other	€0.93	€0.27	€0.95
At-risk-of-poverty			
Yes	€0.72	€0.66	€0.87
No	€1.23	€1.17	€1.84

Sources: Authors' calculations using eSWITCH version 4.6 run on 2019 SILC data uprated to 2022 terms.
Note: Quintiles of equivalised income using modified OECD equivalence scale. Spending imputed using approach detailed in Appendix.

TABLE B.6 SIMULATED IMPACT OF INDIRECT TAX MEASURES (%), BY HOUSEHOLD TYPE

Household type	VAT cut	Cut to carbon tax	Cut to motor oil duties
All	0.1%	0.1%	0.2%
Income quintile			
Lowest	0.2%	0.2%	0.2%
2	0.2%	0.2%	0.2%
3	0.1%	0.1%	0.2%
4	0.1%	0.1%	0.2%
Highest	0.1%	0.1%	0.1%
Can afford to heat home adequately			
Yes	0.1%	0.2%	0.3%
No	0.1%	0.1%	0.1%
Dwelling location			
Rural	0.1%	0.1%	0.2%
Urban	0.1%	0.1%	0.2%
Housing tenure			
Homeowner	0.1%	0.1%	0.2%
Renter	0.1%	0.1%	0.2%
Dwelling condition			
Good	0.1%	0.1%	0.2%
Poor	0.1%	0.1%	0.2%
Dwelling type			
Detached	0.1%	0.2%	0.2%
Semi-detached	0.1%	0.1%	0.2%
Flat/other	0.1%	0.0%	0.1%
At-risk-of-poverty			
Yes	0.2%	0.2%	0.3%
No	0.1%	0.1%	0.2%

Sources: Authors' calculations using eSWITCH version 4.6 run on 2019 SILC data uprated to 2022 terms.
Note: Quintiles of equivalised income using modified OECD equivalence scale. Spending imputed using approach detailed in Appendix.

TABLE B.7 SIMULATED IMPACT OF WELFARE MEASURES (€ PW), BY HOUSEHOLD TYPE

Household type	Social welfare bonus	Double Fuel Allowance	€120 lump sum
All	€2.46	€2.27	€2.31
Income quintile			
Lowest	€4.02	€5.59	€2.31
2	€3.23	€2.62	€2.31
3	€2.39	€1.64	€2.31
4	€1.48	€0.93	€2.31
Highest	€1.15	€0.56	€2.31
Can afford to heat home adequately			
Yes	€3.19	€2.40	€2.31
No	€2.39	€2.26	€2.31
Dwelling location			
Rural	€2.85	€2.98	€2.31
Urban	€2.27	€1.93	€2.31
Housing tenure			
Homeowner	€2.60	€2.61	€2.31
Renter	€2.10	€1.43	€2.31
Dwelling condition			
Good	€2.40	€2.23	€2.31
Poor	€2.82	€2.57	€2.31
Dwelling type			
Detached	€2.79	€2.70	€2.31
Semi-detached	€2.47	€2.07	€2.31
Flat/other	€1.14	€1.59	€2.31
At-risk-of-poverty			
Yes	€4.01	€5.86	€2.31
No	€2.12	€1.50	€2.31

Sources: Authors' calculations using eSWITCH version 4.6 run on 2019 SILC data uprated to 2022 terms.
Note: Quintiles of equivalised income using modified OECD equivalence scale. Spending imputed using approach detailed in Appendix.

TABLE B.8 SIMULATED IMPACT OF WELFARE MEASURES (%), BY HOUSEHOLD TYPE

Household type	Social welfare bonus	Double Fuel Allowance	€120 lump sum
All	0.3%	0.2%	0.3%
Income quintile			
Lowest	1.2%	1.6%	0.7%
2	0.6%	0.4%	0.4%
3	0.3%	0.2%	0.3%
4	0.1%	0.1%	0.2%
Highest	0.1%	0.0%	0.1%
Can afford to heat home adequately			
Yes	0.4%	0.3%	0.3%
No	0.3%	0.2%	0.2%
Dwelling location			
Rural	0.3%	0.3%	0.2%
Urban	0.3%	0.2%	0.3%
Housing tenure			
Homeowner	0.3%	0.3%	0.2%
Renter	0.3%	0.2%	0.3%
Dwelling condition			
Good	0.3%	0.2%	0.2%
Poor	0.3%	0.3%	0.3%
Dwelling type			
Detached	0.3%	0.3%	0.2%
Semi-detached	0.3%	0.2%	0.3%
Flat/other	0.1%	0.2%	0.3%
At-risk-of-poverty			
Yes	1.2%	1.8%	0.7%
No	0.2%	0.1%	0.2%

Sources: Authors' calculations using eSWITCH version 4.6 run on 2019 SILC data uprated to 2022 terms.
Note: Quintiles of equivalised income using modified OECD equivalence scale. Spending imputed using approach detailed in Appendix.

TABLE B.9 SIMULATED IMPACT OF DIRECT TAX MEASURES (€ PW), BY HOUSEHOLD TYPE

Household type	Increase in PRSI credit	Increase in income tax credit
All	€2.33	€2.34
Income quintile		
Lowest	€0.73	€0.35
2	€3.77	€1.71
3	€3.45	€2.62
4	€2.87	€3.34
Highest	€0.80	€3.68
Can afford to heat home adequately		
Yes	€2.97	€1.65
No	€2.27	€2.40
Dwelling location		
Rural	€1.92	€2.18
Urban	€2.51	€2.41
Housing tenure		
Homeowner	€1.71	€2.36
Renter	€3.85	€2.29
Dwelling condition		
Good	€2.33	€2.39
Poor	€2.27	€1.96
Dwelling type		
Detached	€1.86	€2.34
Semi-detached	€2.86	€2.35
Flat/other	€1.47	€2.20
At-risk-of-poverty		
Yes	€0.59	€0.29
No	€2.70	€2.78

Sources: Authors' calculations using eSWITCH version 4.6 run on 2019 SILC data uprated to 2022 terms.
Note: Quintiles of equivalised income using modified OECD equivalence scale. Spending imputed using approach detailed in Appendix.

TABLE B.10 SIMULATED IMPACT OF WELFARE MEASURES (%), BY HOUSEHOLD TYPE

Household type	Increase in PRSI credit	Increase in income tax credit
All	0.3%	0.3%
Income quintile		
Lowest	0.2%	0.1%
2	0.6%	0.3%
3	0.4%	0.3%
4	0.3%	0.3%
Highest	0.0%	0.2%
Can afford to heat home adequately		
Yes	0.3%	0.2%
No	0.2%	0.3%
Dwelling location		
Rural	0.2%	0.2%
Urban	0.3%	0.3%
Housing tenure		
Homeowner	0.2%	0.3%
Renter	0.5%	0.3%
Dwelling condition		
Good	0.3%	0.3%
Poor	0.3%	0.2%
Dwelling type		
Detached	0.2%	0.2%
Semi-detached	0.3%	0.3%
Flat/other	0.2%	0.3%
At-risk-of-poverty		
Yes	0.2%	0.1%
No	0.3%	0.3%

Sources: Authors' calculations using eSWITCH version 4.6 run on 2019 SILC data uprated to 2022 terms.
Note: Quintiles of equivalised income using modified OECD equivalence scale. Spending imputed using approach detailed in Appendix.

TABLE B.11 ESTIMATE OF HICP INFLATION BETWEEN JAN 2021 AND APR 2022, BY GROUP

Household type	Food	Non-energy industrial goods	Energy	Services	Total
All	1.1	1.2	3.9	3.0	9.2
Income quintile					
Lowest	1.5	1.1	4.7	2.8	10.1
2	1.4	1.3	4.4	2.7	9.8
3	1.2	1.3	4.1	2.9	9.6
4	1.0	1.3	3.5	3.2	9.0
Highest	0.8	1.3	2.9	3.6	8.6
Dwelling location					
Rural	1.2	1.4	5.0	2.7	10.3
Urban	1.1	1.2	3.5	3.2	9.0
Housing tenure					
Homeowner	1.3	1.3	4.6	2.8	10.0
Mortgage	1.1	1.4	3.8	3.1	9.3
Renter	1.2	1.0	3.1	3.4	8.8

Sources: Authors' calculations using Household Budget Survey and monthly Eurostat HICP following approach of Box B in McQuinn et al. (2022) and Lydon (2021).
Note: Quintiles constructed equivalising income using modified OECD equivalence scale.

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