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## Article

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ORIGINAL ARTICLE

Open Access



# Non-take-up of in-work benefits: determinants, benefit erosion and indexing

Diego Muñoz-Higueras<sup>1\*</sup> , Stephan Köppe<sup>2</sup> , Rafael Granell<sup>1</sup> and Amadeo Fuenmayor<sup>1</sup>

## Abstract

Non-take-up of welfare schemes is a key concern of policy effectiveness. Building on studies that have shown the low take-up of minimum income schemes, our case study of Ireland's Working Family Payment is the first to analyse non-take-up of an in-work benefit and its determinants with a special focus on labour market factors. Based on EU-SILC (2014–2019) we estimate a non-take-up rate between 63 and 76%, which poses a major obstacle for effective poverty prevention. Moreover, we stress that non-take-up of in-work benefits differs to minimum income schemes. We provide new evidence on how labour market characteristics play an important role in explaining non-take-up, especially self-employment and the interaction with unemployment benefits. Benefit erosion is a key factor in declining eligibility, which should be addressed by indexing wages and prices. Furthermore, we propose policy reforms around automatic enrolment or tax credits to mitigate non-take-up and alleviate in-work poverty.

**Keywords** Non-take-up, Administrative design, In-work benefits, In-work poverty, Labour market characteristics, Working family payment

**JEL Classification** C15, D04, H31, H53, I38, J38

## 1 Introduction

Ireland pioneered in-work benefits before these became more common across the EU. Introduced in 1984 the then called Family Income Supplement was implemented to mitigate the risk of in-work poverty and child poverty. In a political drive to promote the key aims of the scheme it was renamed to Working Family Payment (WFP) in 2018. While in-work benefit schemes in the rest of Europe would also include households without children, the Irish scheme is specifically targeted at working households with children. Since the inception of the scheme low take-up had been a known issue (Callan et al. 1995; Savage et al. 2015) but the labour market and social

structure has changed significantly since these studies were published. Therefore, and thanks to new data being available, it is more than timely to reassess the take-up of the WFP.

With the liberalisation of labour markets in the 1990s and 2000s, many European welfare states have introduced in-work benefits with the aim to mitigate poverty. While the main aim of these reforms was to increase employment; low pay, temporary jobs and decreasing labour market regulations can contribute to in-work poverty. Moreover, one major risk factor for in-work poverty are children in the household (Eurofound 2017; Lohmann and Marx 2018).

Policy-makers have aimed to address in-work poverty through a combination of direct (e.g. in-work benefits, tax credits, minimum wage) and indirect measures (e.g. affordable childcare). Nevertheless, means-tested in-work benefits are known to be affected by non-take-up. For instance, several studies indicate non-take-up for

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means-tested social assistance schemes is higher than 50% within Europe (Fuchs et al. 2020). If a person or household is eligible to receive an in-work benefit, but finally does not claim their social right, it undermines the effectiveness of the scheme. The problem of non-take-up is further extrapolated if certain strata in society are more prone to non-take-up than others and deteriorates their social inclusion.

Non-take-up is a multidimensional phenomenon and is affected by client, administrative, policy design and broader social and legal contexts (Oorschot 1996; Janssens and Van Mechelen 2022). So far, the literature has focussed on non-take-up of general social assistance schemes, with less attention on non-take-up rates and determinants of in-work benefits. In this article, we contribute to this literature with one of the first in-depth analysis of a wage supplement. We focus on the individual and policy design characteristics as well as labour market attachment of eligible individuals. As the Irish WFP differs from traditional non-take-up studies on minimum income schemes and non-contributory benefits, we pay more attention to the policy differences between minimum income and in-work benefit schemes. Hence, labour market characteristics as a core eligibility feature of in-work benefits such as occupational class and intensity of employment are a particular focus of our empirical analysis.

The remainder of this article is organised as follows. First, we review the relevant literature about non-take-up and in section three we contextualise in-work benefits in Ireland. In section four we present the methods, followed by results. The final section discusses policy recommendations and draws wider conclusions for the relationship of in-work benefits, non-take-up and policy design.

## 2 Determinants of non-take-up in the literature

Non-take-up of public social protection schemes is an increasingly recognised problem for welfare states. For instance, means-tested social assistance benefits in Europe report non-take-up rates between 40% and 70% (Eurofound 2015; Fuchs et al. 2020). These estimates vary by the type of benefit, the data and the methodology used, which is further complicated by data constraints (Goedemé and Janssens 2020).

Understanding the drivers of non-take-up is relevant as it affects both, the effectiveness (i.e. poverty reduction in this case) and efficiency (in terms of cost-benefit) of welfare schemes and creates inequalities between eligible populations (Hernanz and Malherbet 2004). In addition, despite the fact that governments generally focus more on the overpayment of benefits to reduce public expenditure (Matsaganis and Levy, 2010), the short-term budgetary savings of non-take-up may create significant long-term costs. For instance, prolonged child poverty

may impact a child's health, employability and criminality in the long-term with much higher costs for society (Dubois and Ludwinek 2014).

The literature differentiates between two main non-take-up types (van Oorschot 1996): Primary non-take-up refers to an eligible individual or household who is not claiming the benefit. Secondary non-take-up describes a person or household who starts the application procedure, and despite being eligible, finally does not receive it. This is also referred to as administrative error. In our empirical analysis, we will focus on primary non-take-up.

Four main determinants of non-take-up are identified in the literature: client, administration, policy design (van Oorschot 1996) – and more recently – the broader social and legal context (Janssens and van Mechelen 2022). Each of these determinants have been investigated extensively (Bargain et al. 2012a; Bruckmeier and Wiemers 2012; Hernanz and Malherbet 2004). In the most general understanding the take-up of benefits is the result of a trade-off between the costs (e.g. information costs, administrative burden, social stigma) and benefits (amount and duration). Therefore, eligible households will only submit an application if the anticipated benefits outweigh the perceived costs (Kerr 1982; Matsaganis and Levy, 2010).

### 2.1 Client

At the client level, several determinants have been identified. First, a large body of evidence suggests that insufficient benefit generosity increases non-take-up (Hernanz and Malherbet 2004). Estimations for various policy contexts suggest that a 10% increase of the benefit level reduces non-take-up by 0.5-2% (Bargain et al. 2012a; Riphahn 2001). However, in terms of benefit duration, the evidence is less clear and seems to depend more on the degree of future dependency of claimants (Bruckmeier and Wiemers 2012). Higher probabilities of claiming a benefit are observed among jobseekers, families with children and pensioners (Hernanz and Malherbet 2004).

The costs associated with claiming could be grouped by information costs and process costs, both of them contributing to higher non-take-up. Information costs are the predicted, observed, and experienced costs that a person must spend to understand the application rules of a benefit, and process costs are the costs of making the application (Janssens and van Mechelen 2022). For instance, the ease of available information, the lesser documentation required and proximity of welfare offices, reduce non-take-up (Janssens et al. 2021; Muñoz-Higueras et al. 2023). Lack of knowledge contributes to non-take-up, and is greater among immigrants and those with a higher degree of social exclusion (Aizer and Currie 2004).

Social and physiological costs, in particular the stigma associated with means-tested benefits contribute to non-take-up. For example, the more unconditional and universal the scheme is, the lower the stigma associated with it. Evidence from the UK suggests that in-work tax credits have the lowest stigma out of five means-tested schemes (Baumberg 2016), but we know little about stigma of other in-work schemes. Moreover, metropolitan areas guarantee a higher level of anonymity to avoid stigma and, hence, report higher take-up (Riphahn 2001).

Social networks might reduce administrative and information costs of an application (Bouckaert and Schokkaert 2011), but the role of non-take-up behaviour is uncertain. For example, individuals who mainly interact with people in employment find it more difficult to obtain information about social provision (Bertrand et al. 2000).

Trigger events are defined as sudden disruptive circumstances that may lead people to claim benefits (van Oorschot 1991). Such events (e.g. health problems, loss of job) change the cost-benefit balance and increase the likelihood to submit a claim.

## 2.2 Administration

The literature has highlighted multiple administrative barriers for take-up (Peeters 2020), but with our empirical data this dimension can be less explored directly.

Improving government information on eligibility conditions and application procedures, as well as targeted information such as large-scale mailing campaigns, sending social service workers to the homes of potential claimants, and avoiding stigmatizing communication play an important role in increasing the take-up of a social benefit scheme (Finn and Goodship 2014; van Gestel et al. 2022). Effective collaboration between agencies offering similar social programs is also an important factor in reducing non-take-up (Raeymaeckers and Dierckx 2012; Muñoz-Higueras et al. 2023).

While online applications reduce the transaction costs for most people, these are less effective for groups such as older people or households in extreme poverty (Kopczuk and Pop-Eleches 2007).

Furthermore, the availability of linked administrative records and the quality of data play an important role in the possibility for reaching out to potential beneficiaries and developing automatic enrolment schemes (Janssens and van Mechelen 2022).

## 2.3 Policy design

While eligibility conditions are ultimately a political decision, such design choices not only limit the eligible population but also indirectly affect take-up through the interplay of political communication, administrative

priorities (Muñoz-Higueras et al. 2023) and client relationships (Janssens and van Mechelen 2022).

The higher the degree of targeting, the higher the non-take-up (van Oorschot, 2002). Targeted programmes are associated with more stigma (Bruckmeier and Wiemers 2012) and increase the information costs for claimants. For instance, complex targeting criteria to assess claimants' means increase the time and effort required to understand the benefit.

In addition, longer waiting periods increase non-take-up (Muñoz-Higueras et al. 2023) and cash transfers generate higher take-up rates than in-kind benefits (Schanzenbac, 2009).

Finally, while discretion offers flexibility and more personal targeting for administrators, it increases the probability of administrative errors (type II non-take-up) and claimants' uncertainty (Higueras and Pérez 2020; Peeters 2020).

## 2.4 Social and legal context

The client, administrative and policy design levels are influenced by the broader social and institutional context (Eurofound 2015; Janssens and van Mechelen 2022). For instance, Reijnders et al. (2018) demonstrate that social conventions about when it is acceptable to ask for help are a barrier to people seeking social support. Another example are how public perceptions of deservingness influence the policy design.

The majority of non-take-up studies focus on social assistance schemes, with a clear lack of in-work benefits. As a result, the literature has highlighted key client characteristics, but has not paid attention to labour market factors. Hybrid systems, like in Germany, which combine minimum income support with in-work benefits, report similar low take-up rates and determinants, but studies have not considered labour market characteristics nor could isolate those only eligible to in-work benefits (Bruckmeier et al. 2021; Wilke 2023). With our empirical analysis we will make novel contributions to this literature, while focussing on the client and policy design determinants. Due to the case study design we cannot control for the social context and the data contains less variables to test for administrative barriers. Based on the existing literature on minimum income schemes we expect similar socio-economic determinants to be associated with non-take-up for pure in-work benefits like the WFP. In addition, we explore factors associated with labour market precarity and how these interact with the usual suspects. Considering the lack of previous studies and theorising, we use an empirical driven approach without a priori hypotheses and consider our findings in relation to existing theories in the discussion.

## 2.5 Working family payment in the Irish labour market

Ireland's economy, labour market and welfare state have some peculiar features in the context of the international literature that are relevant to gain a deeper understanding of the take-up of a wage supplement scheme like the Working Family Payment.

When the old Family Income Supplement was introduced in 1984, Ireland had one of the lowest GDPs per capita in the Organization for Economic Cooperation and Development (OECD), the economy was in recession and unemployment was soaring (O'Hagan and O'Toole 2017). Since then, Ireland became one of the richest countries in the OECD per capita. Still, the labour market is characterised by low wage labour, low female labour force participation, medium employment levels and the highest gross income inequality within the European Union. In this context, minimum wage legislation and wage supplements remain essential policies to mitigate in-work poverty risks.

In addition, the liberal welfare system contributes to poverty traps (NESC, 2020). Although the income tax system is highly progressive and contributes largely to relative low net income poverty rates (Roantree et al. 2021), the reliance on means-tested and flat rate benefits contributes to stigmatisation of benefit claimants. Ireland has a relative high rate of joblessness among households with children and the strong means-testing is a key contributing factor (Härkönen 2011). Due to the means-tested system not only benefits taper off quickly, also access to services such as childcare and primary medical care is affected, which creates disincentives to work (Regan et al. 2018) and stigma (Keane et al. 2021). Furthermore, insufficiently guaranteed working hours in zero hour or no contract work arrangements are relatively common in Ireland, which is masked in the high rates of standard measure of permanent contracts (LMAC, 2022). Irish family policies used to favour strongly the male breadwinner model (Fahey and Nixon 2014), but recent policy advances in childcare provision, leave entitlements (Köppe 2023) and activation measures have increased work incentives for families and weakened the male-breadwinner model.

During the observation years 2014–2019, Ireland experienced a period of recovery from a deep economic financial crisis (Roche et al. 2017), with high economic growth rates and rising employment opportunities. Most of the austerity-imposed cuts were reinstated to pre-crisis levels, employees experienced real income growth and activation measures brought almost full employment (Köppe and MacCarthaigh 2019).

Despite these labour market inequalities in-work poverty in Ireland has been significantly below the EU average (Nolan 2008). Nolan (2008) stresses that the relative low in-work poverty rate, which is calculated for

employees, is related to higher levels of self-employment (esp. agriculture), higher share of households with three or more adults and joblessness. In particular, lone parent households with children are more likely to be out of work than being counted as in-work poor. For households with dependent children, i.e. those eligible to the WFP, the in-work poverty rate has been at 8.5% in 2008, but has since declined to 5% of the employed population (author's analysis of Eurostat, 2022). This represents about 13% of all people in poverty (Daly 2019). Research that considers the policy factors to reduce in-work poverty has shown that the relative generous minimum wage and the Irish social protection system as a whole contribute significantly to a reduction of in-work poverty and identified Ireland as a successful outlier in this regard (Cantillon et al. 2013). However, Cantillon et al. (2013) cannot single out the WFP in their analysis of means-tested transfer schemes. Recent simulations by Roantree and Doorley (2023) also show that increasing WFP thresholds is a very effective way to reduce child poverty rates.

Although multiple and complex policy schemes aim to alleviate in-work poverty, the WFP is the key wage supplement scheme to top-up earnings for low-income households with children. Furthermore, in comparative studies, the WFP is used to model take-up and poverty reduction effects of in-work benefits in Ireland (Lohmann and Marx 2018).

The eligibility criteria are as follows (Citizens Information, 2023), which did not change during the observation period:

1. Work 38 or more hours per fortnight. These can be combined with working hours of the spouse, civil partner or cohabitant. Self-employed work and job creation schemes (e.g. Community Employment, JobBridge) are not considered in computing the 38 h per fortnight.
2. At least one co-resident child. The children must be under 18 (or between 18 and 22 if they are in full-time education).
3. The household falls below the income threshold by number of children (see Table 1).
4. The job is likely to last at least 3 months.

The benefit covers the 60% of the gap between the average weekly family income and the WFP income limit for this family size. It is a tax-free benefit.

The first main feature of the scheme is the work requirement of 19 h per week. This equals part-time work for a single parent household, while couple households can combine either two casual jobs or one part-time employment, mostly associated with the male breadwinner model. The second key criterion is exclusion

**Table 1** WFP income limits for period analysed (€ per week)

Children in household	2014	2015	2016	2017	2018	2019
1	506	506	511	511	521	521
2	602	602	612	612	622	622
3	703	703	713	713	723	723
4	824	824	834	834	834	834
5	950	950	960	960	960	960
6	1,066	1,066	1,076	1,076	1,076	1,076
7	1,202	1,202	1,212	1,212	1,212	1,212
8 or more	1,298	1,298	1,308	1,308	1,308	1,308

Note: own elaboration following WFP citizen information

of households without children or adult children in the households. Finally, the exclusion of self-employed work is a design feature we investigate further in the empirical analysis.

The low take-up of WFP has been noted early on in the literature. Callan et al. (1995) estimated 25% take-up among the eligible population in 1987 based on The Survey of Income Distribution, Poverty and Usage of State Services, a precursor survey to EU-SILC (European Union Statistics on Income and Living Conditions). Subsequent studies estimated a wider range but never higher than a third of the eligible population would claim WFP, 33% in 2010 based on EU-SILC (Savage et al. 2015); 17% in 2001 based on Living in Ireland (LLI), Bargain and Doorley, 2011). The most recent simulations based on EU-SILC show that estimates vary between 13 and 53%, depending on the data source and microsimulation model used. The lower take-up is based on EUROMOD, while the higher rate is based on SWITCH. While EUROMOD is an off the shelf micro-simulation tool across the EU, SWITCH is more tailored for the Irish policy context and based on administrative data. Hence, Doorley and Kakoulidou (2023) claim that the 47% non-take-up rate is more accurate. Furthermore, this study suggests that EUROMOD overestimates non-take-up of the WFP. Administrative data suggests an increase of total claimants between 2004 and 2014, although the number of children benefiting decreased (Millar et al. 2018). Yet, none of this aggregate analysis controls for population increases nor eligibility, nor does the Department of Social Protection publishes any official take-up rate (DEASP, 2018).

Besides these discrepancies and inaccuracies in measuring overall take-up, there is a clear lack of quantitative studies on the determinants of WFP non-take-up. Yet, qualitative studies highlight the inflexibility and bureaucratic burden associated with WFP. The strict two-week assessment for the benefit inadequately accounts for seasonal work and precarious gig economy, excluding certain employees from eligibility. Moreover, the multiple forms and employer signatures increase the hurdle for applications (Millar et al. 2018; Pembroke 2018). Further

descriptive studies also show a higher share of single parents among claimants (Gray and Rooney 2018), but cannot control for other socio-demographic characteristics.

Although reporting descriptive findings of non-take-up, other studies have focussed more on welfare outcomes of the WFP such as poverty reduction and employment incentives (Doorley et al. 2022; Bargain and Doorley 2011b; DEASP, 2018). Relevant for non-take-up is that WFP has a positive effect on income adequacy and a lower stigma than other means-tested benefits (Millar et al. 2018). Bargain and Doorley (2011b) report lower working hours for men and low work intensity for partnered women. In a similar vein, the means-tested unemployment benefit (JSA – Jobseekers Allowance) is more generous than the WFP on minimum wage and part-time work, because JSA claimants can work three days a week without a benefit reduction (DEASP, 2018). This means JSA claimants who comply with the 3-day-rule are better off than WFP claimants who spread the same working hours across the week. In contrast to these earlier studies, we can control for the policy interaction of WFP and JSA with the available data (see Data and methods' section).

Finally, policy studies simulate different reform options (Doorley et al. 2022). The exclusion of self-employed has been problematized (Gray and Rooney 2018). Moreover, in their conclusion Keane et al. (2021) argue that a refundable tax credit would eliminate non-take-up.

In brief, non-take-up of WFP is a known issue, but more recent studies that take advantage of the much more accurate EU-SILC data since 2014 are missing. Moreover, none of the studies has explored the determinants of non-take-up quantitatively, especially with a focus on client and policy design determinants. Simulation studies have pointed to certain policy solutions to address poverty reduction (e.g. increasing thresholds), but none had an empirical focus on non-take-up.

More broadly, the Irish WFP highlights specific policy characteristics of in-work benefits (households with children). Therefore, this study contributes to the wider literature on take-up of means-tested benefits, with a specific focus on in-work benefits in a liberal labour market regime.

### 3 Data and methods

Due to the limitations of the off-the-shelf microsimulations tools such as EUROMOD regarding WFP (see Doorley and Kakoulidou 2023), we estimate take-up directly with original EU-SILC data in Stata. For the analysis we use the cross-sectional data of the EU-SILC for Ireland from 2014 to 2019. Prior to 2014 the WFP was aggregated in the survey item with other ‘Family/Children related allowances’ and we can only identify WFP claimants correctly since then through the *HY051G* variable, which is provided by the Irish government through administrative data. Moreover, we exclude the Covid-19 pandemic years as this exceptional period had complex and unique effects on the labour market and distort take-up estimates. EU-SILC provides comparable, cross-sectional and longitudinal multidimensional data on income, poverty, social exclusion and living conditions in the EU, which allows us to simulate benefit take-up and control for a number of socio-demographic determinants of take-up.

#### 3.1 Eligibility and non-take-up simulations

Based on the benefit eligibility criteria explained previously we assess if households meet the conditions in a four-step process (see appendix for more details), using original EU-SILC data.

First, we identify the number of hours worked per fortnight as an employee and aggregate all hours by household. If someone is self-employed these hours are not taken into account. Second, despite that a general-purpose survey like EU-SILC could not contain all the information that we need to identify the eligible household, we assume that people who are working at the time of responding to the survey have been working for at least three months. Third, we use the information about the number and age of children living in the household. In addition, we can identify whether a child aged over 18 and under 22 years old is in full-time education. In this case, these dependent children qualify for the WFP and are included. Fourth, we can identify all assessable income. We disregard the benefits/allowances that are exempt from the WFP means-test (e.g. child benefit). Although not all exemptions can be uniquely identified, these are overall negligible to get accurate take-up measurements (see appendix table A.2).

After adding up all assessable income, in a second step, we calculate the theoretical amount a household is eligible to. We draw this information from the WFP thresholds (DSP, 2019). Based on Table 1 we adjust for annual changes and calculate the eligibility threshold for each household by the number of children living in the household. If the household meets the first three conditions and its adjusted disposable income is below the eligibility threshold, it is considered eligible for the WFP. In the

model we assign a binary variable for eligibility (0 is not eligible, 1 is eligible). Since we can identify now clearly the eligible population and those claiming WFP, we can use the standard formula to calculate non-take-up:

$$\text{Non-take-up rate} = \frac{\text{Eligible people, but not receiving the benefit}}{\text{Eligible population}}$$

Based on the literature, non-take-up refers to one person that is eligible to receive a social transfer, but finally does not claim it. Divided by the eligible population, the non-take-up rate provides a relative estimate of non-take-up over time.

One of the strengths of our estimates is the fact that this policy does not have a wealth test. Wealth is often one of the most difficult issues to assess and traditional estimates need to simulate different scenarios to perform validity and sensitivity checks (Fuchs et al. 2020).

Furthermore, compared to minimum income benefits, this policy does not include eligibility conditions such as the citizenship of the claimant, the residence status, or the time when the family unit was formed. Therefore, the eligibility determination is much simpler and most likely more accurate than in other studies.

In order to check the robustness of our simulated results, we conducted a sensitivity check, increasing and decreasing assessable income by 5%, which also accounts for the period effects in the EU-SILC. This also means, based on very precise estimation of eligibility criteria, we could achieve an accurate match of 73%. This is in line with other research using general purpose surveys (Frick and Groh-Samberg 2007).

Once the eligible population for the WFP has been estimated, we provide simple summary descriptive statistics by subpopulations: beneficiaries, eligible and non-take-up. These are explained as follows (Table A.3): ‘Beneficiaries’ are households who are currently receiving the WFP, as stated by variable *HY051G* in the database; ‘Eligible’ includes households who are eligible to receive the WFP, based on our simulations; ‘Non-take-up’ refers to households who are eligible to receive the WFP, but are not receiving it.

#### 3.2 Estimating the determinants of non-take-up: a probit model

To estimate the determinants of non-take-up, we consider using a probit model. This kind of model is used when the dependent variable is binary. In addition, it can control for unobservable factors, which is rather common in the analysis of non-take-up (Goedemé and Janssens 2020). Furthermore, the probit methodology captures the possible non-linear relationship between variables. All of these methodological issues can help in the interpretation of robust coefficients.

In this case, the targeted population for this model includes all households eligible for receiving the WFP (work at least 38 h as employees per fortnight with dependent children and income below the WFP threshold).

All households considered eligible to receive the policy are used for the analysis of non-take-up determinants (Table 2). The model will explain why households are claiming the WFP. Households who are eligible but do not receive the benefit (non-take-up) take the value '1', while those receiving the benefit take the value '0' (take-up).

In addition, as a robustness test, we have estimated two different models. First, an OLS approach. The results of the model are robust across the variables. While the probit models are the more accurate estimators considering the discrete variable, the OLS findings confirm the observed direction and significance of the determinants.

Secondly, in order to control for possible selection bias (Heckman 1979), we applied a Heckprobit model. Again, the results do not differ from our approach (see Appendix).

The independent variables from the descriptive findings are introduced in three separate probit models. Model one identifies the stable socio-demographic characteristics. The second model adds labour market features that are specifically relevant for an in-work benefit, compared to social assistance schemes without work requirements. Finally, the third model also considers the economic situation of the household.

Our selection of variables is based on the determinants identified in the literature review. First, related to socio-demographic characteristics, we consider the number of adults in the household and the marital status, as self-perception of being a family is considered as an important factor in the decision to take-up the benefit.

Other characteristics, such as the educational level attained by the household head, are used as a proxy for both stigma and information cost. In this sense, as we are analysing an in-work benefit, we expect a different result compared to a minimum income scheme. In the WFP, almost 40% of the beneficiaries had attained tertiary education. We expect that the educational level reduces the information cost and not be influenced by the possible negative stigma of being in need (or at least this influence will be very weak). Related to housing tenure, there is not a wealth test in the WFP, so this variable should not have any influence on the non-take-up of the benefit. Since we consider that the stigma will be lower for in-work benefits than for a minimum income scheme, the degree of urbanisation should be a less important determinant in our model. We keep both, housing tenure and degree of urbanisation as robustness checks to avoid

misspecification problems and to be able to compare our model with results reported in the literature.

The WFP does not have any citizenship requirements, so we do not expect a negative influence of citizenship in the decision of take-up the benefit. Finally, we expect that the number of children reduces non-take-up, since the family responsibilities of an individual increase the likelihood of applying (Schenk, 2018).

Then, we consider different labour market characteristics. Compared to minimum income studies, which do not include these, we explore several novel determinants in our models, but expect a higher relevance in general.

First, we create 'Intensity of employment' to analyse the possible differences between employment structures in a household: it takes different values depending on the working-related characteristics of the household. It takes value '1' if there is a person working as employee in the household; value '2' if there is a person working as employee and another one working as self-employed or family worker in the household; and value '3' if there are two people working as employee in the household. We must remark that the self-employed hours are not considered in the eligibility test, which means households with two people working as self-employed are not eligible for receiving the WFP and are not included in our target population (see Table 2).

Second, we consider the occupation of the head of the household, as a proxy of status and social class. We also consider the different reasons for working less than 30 h per week, considering the relative low working hours requirement of 19 h per week within the eligibility criteria. We expect that people working more than 30 h will show higher non-take-up likelihood, as they do not consider themselves in a situation of need.

Finally, we analyse independently whether the household head works less than 30 h due to housework/care work. It is important to differentiate that because of the particular situation of Ireland. The childcare services cost is extremely high, so we expect that families working part-time to care for others have a higher likelihood of take-up.

The last set of variables included are the economic characteristics of the household. Due to the evidence that being within the welfare system (Stuber and Schlesinger 2006) reduces stigma and information cost, we expect that if the household is receiving another means-tested benefit, the non-take-up will be lower. We create the variable 'Benefit' and it takes value '1' if the household is receiving: old-age benefits, survivor's benefits, sickness benefits, disabled benefits and educational grants. In order to control by unemployment benefits separately, we create the variable 'Unemployment benefits' and it takes value '1' if the household is receiving jobseeker benefits. As discussed, the 3-day working rule in the Jobseeker

**Table 2** Regression output of the probit model

<b>Probit model</b>			
<b>Non-take-up determinants</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>
<b>Socio-demographic determinants</b>			
<b>Number of adults</b>			
(ref. two-adults)	− 0.2093 (0.0712) ***	− 0.1107 (0.0940)	− 0.3220 (0.0985) ***
1 adult			
3 or more adults	0.3629 (0.1545) **	0.3797 (0.1671) **	0.2903 (0.1864)
<b>Marital Status</b>			
(ref. married)			
Never Married	− 0.0548 (0.0760)	− 0.0027 (0.0787)	− 0.1157 (0.0813)
Separated/Divorced	0.1228 (0.0890)	0.1329 (0.0926)	0.1629 (0.0965) +
Widowed	0.6149 (0.1807) ***	0.6394 (0.1956) ***	0.8906 (0.2046) ***
<b>Educational Level</b>			
(ref. primary)			
Secondary	− 0.3505 (0.0978) ***	− 0.3322 (0.1001) ***	− 0.3839 (0.1056) ***
Post-secondary non-tertiary	− 0.4076 (0.1115) ***	− 0.3441 (0.1159) ***	− 0.4139 (0.1223) ***
Tertiary	− 0.4111 (0.1002) ***	− 0.4073 (0.1046) ***	− 0.3931 (0.1104) ***
<b>House Tenure</b>			
(ref. owner-occupied)			
Private renting	− 0.1031 (0.0771)	− 0.1040 (0.0801)	− 0.0259 (0.0847)
Social housing	− 0.0272 (0.0649)	− 0.0466 (0.0679)	− 0.0732 (0.0717)
<b>Degree of Urbanisation</b>			
(ref. densely-populated area)			
Otherwise	− 0.0682 (0.0555)	− 0.0082 (0.0582)	− 0.0500 (0.0614)
<b>Citizenship</b>			
(ref. Irish)			
EU country	− 0.5862 (0.0800) ***	− 0.6053 (0.0831) ***	− 0.5919 (0.0860) ***
Other country	0.0198 (0.1277)	− 0.0732 (0.1281)	− 0.1063 (0.1323)
<b>Number of children</b>	− 0.1458 (0.0213) ***	− 0.1625 (0.0220) ***	− 0.2196 (0.0239) ***
<b>Labour market determinants</b>			
<b>Working intensity</b>			
(ref. one employee)			
Employee + Self-employed/Family Worker		0.8719 (0.1385) ***	0.9547 (0.1427) ***
Employee + Employee		− 0.0687 (0.0794)	0.0391 (0.0817)
<b>Occupation</b>			
(ref. Managers + Professionals)			
Technicians and associate professionals		− 0.2338 (0.1141) **	− 0.3309 (0.1186) ***
Clerical support		− 0.3737 (0.1032) ***	− 0.4304 (0.1082) ***
Service and sales		− 0.1790 (0.0902) **	− 0.2761 (0.0959) ***
Skilled agricultural. Craft, Trades		− 0.3236 (0.1068) ***	− 0.3209 (0.1111) ***
Elementary occupations		− 0.2078 (0.1036) **	− 0.3118 (0.1092) ***
<b>Reason for working less than 30 h</b>			
(ref. > 30 h)			
Do not want to work more hours		− 0.9254 (0.1754) ***	− 0.7747 (0.1828) ***
Wants to work more hours		− 0.3168 (0.1060) ***	− 0.2499 (0.1088) **
Other reasons (education, disability...)		− 0.5104 (0.1196) ***	− 0.3561 (0.1247) ***
<b>Housework, Care work</b>		− 0.9255 (0.0860) ***	− 0.8146 (0.0902) ***
(ref. No)			
<b>Economic determinants</b>			
<b>Non-means-tested benefits</b>			
(ref. No)			− 0.1558 (0.0628) ***
<b>Unemployment benefits</b>			
(ref. No)			0.4840 (0.0579) ***
<b>Income Gap</b>			− 0.195 (0.0033) ***
<b>Income Gap squared</b>			0.0003 (0.0000) ***

**Table 2** (continued)

<b>Probit model</b>			
<b>Access to information</b>			
<b>(ref. internet and computer)</b>			
Otherwise			0.0395 (0.0726)
<b>Constant</b>	1.4575 (0.1271) ***	1.8031 (0.1595) ***	1.997 (0.1825) ***
<b>Observations</b>	3,554	3,554	3,554
<b>R<sup>2</sup></b>	0.0431	0.1105	0.1802

Note: Own elaboration

+: significance at 90%

\*\*: significance at 95%

\*\*\*: significance at 99%

Allowance works potentially as an alternative in-work benefit and may influence take-up decisions.

We expect the higher the degree of neediness, the lower the non-take-up of the household. 'Income gap', following Fuchs et al. (2020), is used as a proxy of the degree of neediness of the household and follows:

$$\text{Income Gap} = \frac{(\text{WFP amount entitled} - \text{Assessable Incomes})}{\text{WFP amount entitled}} * 100$$

To control for the effects of the increase in the degree of neediness, we also use the quadratic term of the income gap. Finally, we generate the variable 'Information cost' using the information provided in variable *HS090* and *PD080*. It takes value '1' if the household has a computer and an internet connection at home and '0' otherwise.

As we use different sets of variables in our models, it is necessary to check the possible endogeneity problems between the labour and economic characteristics. None of our tests could find any auto-correlation between the labour market characteristics and the economic situation of the household.

In a step-wise approach we estimate three models that increase the considered socio-demographic, labour market and economic variables in order to control the effects of the different sets of variables individually. Nevertheless, as the non-take-up is a multidimensional phenomenon, we discuss mainly the final model with all regressors included.

## 4 Results

### 4.1 Non-take-up over time

First we show the overall descriptive findings of take-up over time. In Figs. 1 and 2, we present the non-take-up and eligible households estimations for the WFP in the years 2014–2019. Our analysis clearly indicates that non-take-up is a relevant social problem of the WFP.

Non-take-up ranges between 63 and 76% in the base-line scenario (Fig. 1). It begins in a 76% in 2014, declines during the period of recovery and is stable at around 65% until 2019. This non-take-up rate might seem very high, but it is in line with previous estimates of a 25–53%

take-up rate, which equals 47–75% of the non-take-up rate. Moreover, compared to other social assistance systems, non-take-up is higher than 50% in Finland, between 50 and 64% in France or 57–76% in Belgium (Fuchs et al. 2020).

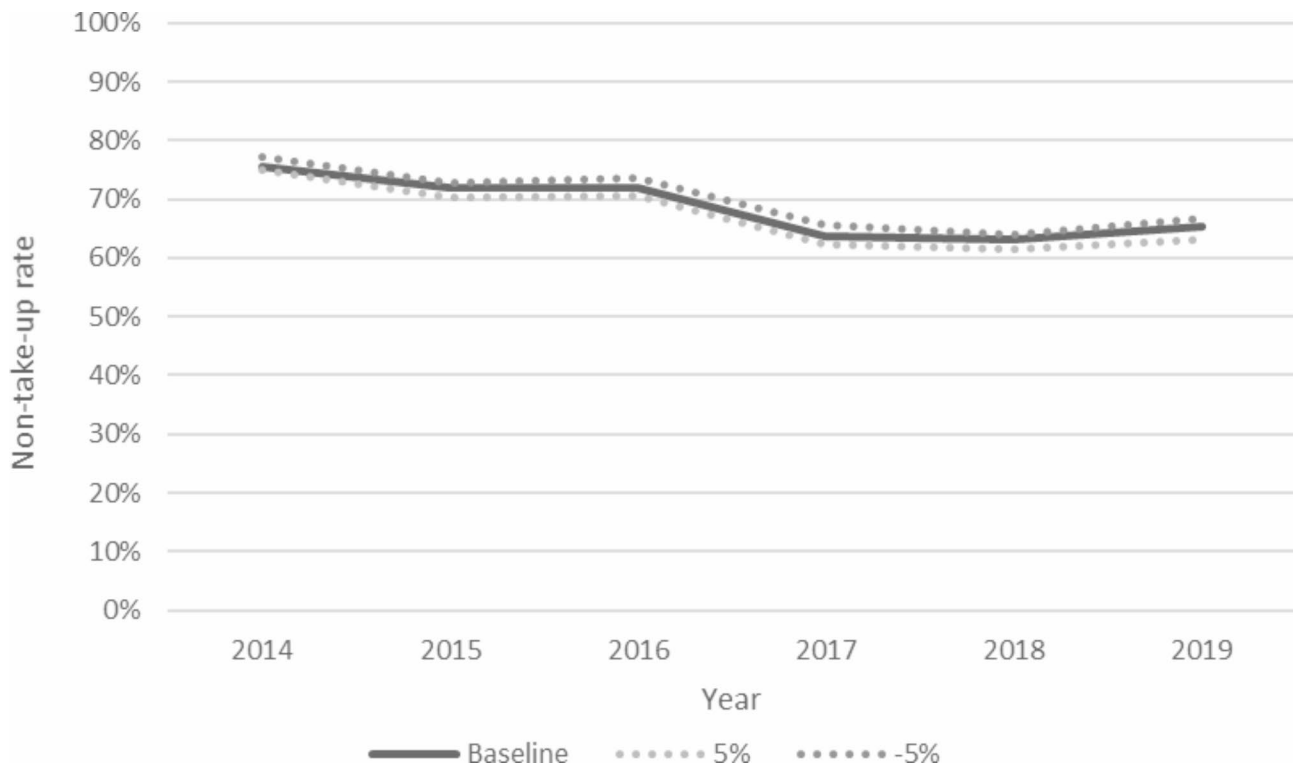
Over time, the decrease in the non-take-up rates is not explained by a better targeting of the measure. Year by year the number of eligible households declines in the sample (Fig. 2). We argue that this is due to benefit erosion, i.e. tax thresholds or benefits did not increase with prices or wages (Paulus et al. 2020). Since the WFP thresholds are not indexed to wage increases, the unadjusted thresholds meant that households simply became illegible. While the WFP thresholds only increased by 4.9% between 2014 and 2019, median net incomes rose by 26.6% and average total gross earnings by 11.2% in the same period (own estimates based on Eurostat 2023; CSO 2023). In sum, non-take-up declines, but this was driven by benefit erosion of the WFP.

### 4.2 Determinants of non-take-up

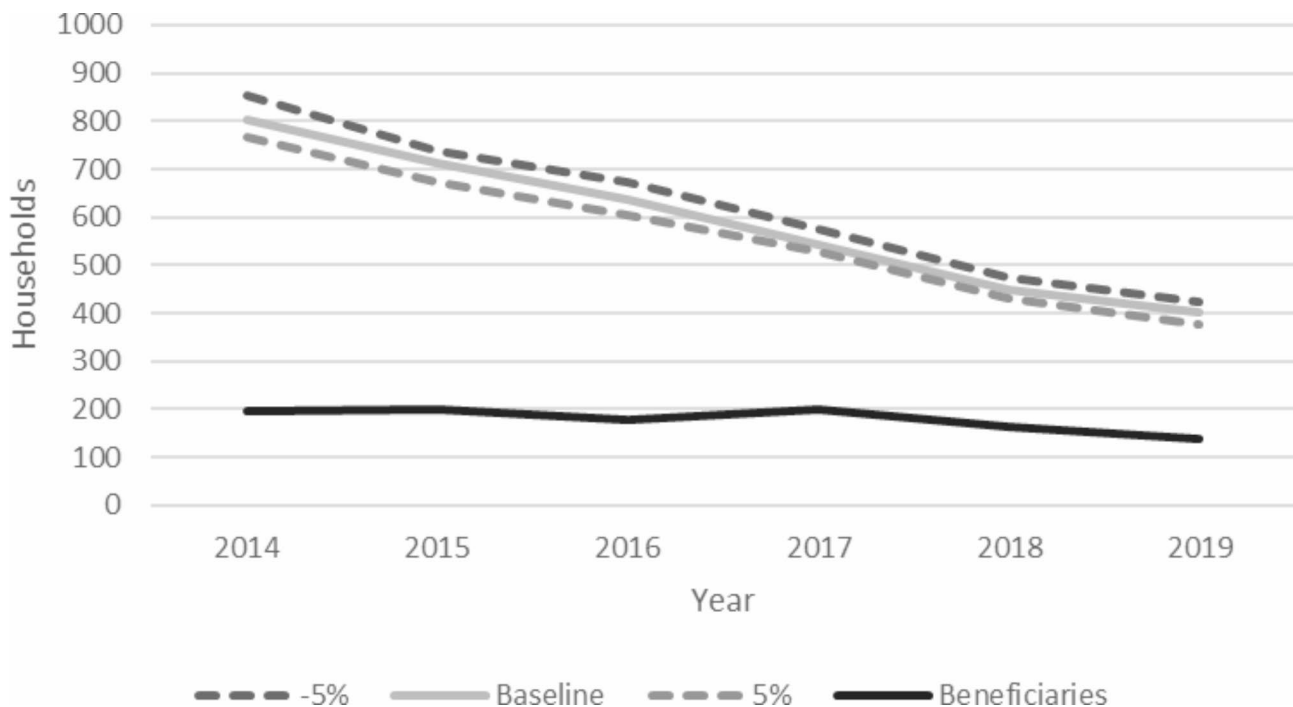
Our models estimate non-take-up determinants for eligible households and include socio-demographic, labour market and economic factors in three stepwise models.

Related to *socio-demographic* characteristics, our models challenge several previous findings in the literature:

Contrary to earlier findings, single-parent households have lower probabilities of non-take-up in model 1 and 3, but not in model 2. Since we include economic needs and receiving other benefits in model 3, it rules out that single parents have a higher benefit gap. Single parents may be more familiar with the welfare system as there are other benefits specifically designed for them. The lone parent payment is a well-known means-tested scheme in the Irish context and advocacy groups like One Family support single parents very well to access their welfare rights. Moreover, once single parents return to work, they can also apply for a transition payment. More than other demographic groups, they are potentially more in contact with welfare officers in the job centres and more



**Fig. 1** Non-take-up rate in the working family payment. Note: non-take up own estimation EU-SILC



**Fig. 2** Eligible households and beneficiaries. Note: own estimation, EU-SILC

familiar with the application procedure, who will direct potential claimants to the WFP application.

Moreover, the higher the number of adults, the higher the likelihood of non-take-up the benefit. These are

typically households with one adult child who is not considered as a dependent child (due to age-related eligibility) or households with an elderly dependent. Nevertheless, the effect becomes insignificant when the

model controls for economic variables. As noted by other studies (Bruckmeier and Wiemers 2018), the higher the number of dependent children in the household reduces non-take-up.

In addition, other studies only explain the effects on non-take-up by household composition, but our models also include marital status. Interestingly, compared to a married household, widowed households have a significant higher likelihood of non-take-up. This reveals a likely interaction between means-tested and insurance-based benefits. Surviving spouses receive insurance-based pension entitlements (i.e. Widow's/Widower's/Civil Partner's Contributory Pension, Guardian's Payment Contributory) and the application process for these is relatively straightforward. Yet, applying in addition to the more cumbersome WFP is an extra step surviving spouses only seem to take if their need is higher. Moreover, perception of a fair benefit claim could also be a motive. While already receiving the insurance-based benefit, it takes additional knowledge and courage to apply for the means-tested benefit in addition.

Our findings regarding educational level are very relevant and challenge the literature. Earlier studies have shown that higher educational level increases non-take-up of social assistance schemes (Frick and Groh-Samberg 2007), mainly due to increased stigma for those with tertiary education. Yet, we show the opposite for a wage supplement scheme. The higher the educational level, the lower the non-take-up, with increasing effect sizes. While minimum income schemes are associated with stigma for those with a higher educational background, the opposite seems the case for in-work benefits. Without the associated stigma, their educational background may also facilitate to navigate the application process and welfare system better.

The effects of the geography and built environment are rather limited. We find no evidence for urban and regional effects, and the same outcomes are observed in relation to house tenure among the eligible population.

Contrary to the literature, we show that non-citizen status reduces non-take-up (Frick and Groh-Samberg 2007; Fuchs et al. 2020), but this is only significant for EU migrants. Crucial for the scheme is the absence of cumbersome residence criteria. Working migrants have no waiting periods, which reduces any hurdles for non-take-up.

Regarding the *labour market* determinants, our models show the unique non-take-up patterns of in-work benefits, where labour market attachment becomes a key factor of eligibility and take-up. Especially, the work intensity and reasons for working less than part-time work stand out.

Since the WFP design encourages the male breadwinner model, the work intensity indicator compares single

earner households (employees) with dual employees and dual earners, where one is self-employed. Compared to single earner households, there are no significant differences with dual earner households.

Nevertheless, households with a self-employed earner are less likely to claim the benefit. Here the policy design and eligibility criteria are relevant to understand the observed non-take-up. In our estimations of eligibility, these households are eligible as they meet the income threshold at the household level and working hour criteria through the employed partner, while the working hours of the self-employed partner do not count to meet the criteria. In other words, the combined income of the couple is below the WFP income threshold, but they do not apply to claim WFP.

We consider three main reasons to explain their lower take-up. First, in the communication of the eligibility criteria, it always states that the self-employed work does not count to the minimum working hours, which may be interpreted as self-employed are not eligible. The government supported Citizens Information website does not state explicitly that couples with one self-employed are eligible to apply, as long as their partner meets the working hour criterium (Citizens Information, 2022). Hence, vague and insufficient targeting of communication may contribute the lower take-up. Second, the reported self-employed income would be under much more scrutiny when applying for the WFP. Self-employed workers may fear additional taxes on their income. Moreover, self-employed income tends to fluctuate and the reported income may insufficiently capture self-employed income. Finally, these couples may not perceive themselves as vulnerable, as both partners work. Applying for the WFP may also be associated with more stigma as the self-employed income would be insufficient to make ends meet. Compared to employees, who may shift blame to their employers for low pay or insufficient hours, self-employed workers would have more agency about their working conditions and income, which means they could be blamed for their own insufficient income.

In addition, we confirm earlier findings (Hümbelin 2019) that households with a higher social class are less likely to apply for means-tested benefits, because they are associated with stigma, as non-take-up is, on average, higher among managers and professionals.

Another relevant result is related to the reasons why households work less than 30 h. Compared to those working more than 30 h, which equals at last part-time work, all subcategories indicate a lower non-take-up. Again, WFP eligibility criteria shape these findings. The 19-hour criterion supports work intensity below the European wide definition of part-time work. In this context non-take-up among workers working more than the required minimum 19 h is significant higher. Workers in

this more standard employment context, some of these full-time, might not perceive themselves as vulnerable and stigmatised if they would apply for in-work benefits. Again, with the available data, it is impossible to test the reasons for the higher take-up among the subgroups, but we discuss all three subgroups in turn.

The first subgroup are employees that want to work more hours but cannot find a suitable job. We link this to zero-hours contracts, which are very common in Anglo-Saxon countries, and precarious jobs in the gig economy. Due to their precarious employment situation, they might feel less stigmatised and are more open to apply for the WFP. Yet, their effect size is smaller compared to the second and third subcategory.

Second, a significant group of employees do not want to work more hours. These employees seem aware of the benefit and indicate a higher take-up compared to those with at least 30 h of work. They might feel content with their employment situation and use the WFP to boost their income. For policymakers this poses the question how to encourage higher voluntary working hours, especially as higher working hours are one of the main routes out of in-work poverty (Lohmann and Marx 2018).

Third, when the head of the household works less than 30 h because of care work, non-take-up is reduced. Since we control for number of children and lone parents, care duties are an independent factor of higher take-up. This points to unaffordable childcare services (potentially also long-term care) for these families. Ireland belongs to a small group of countries with extremely high childcare cost, which discourages female labour force participation or only very limited attachment to the labour market (OECD, 2023). Free childcare is limited in Ireland to pre-school care (3 h) and primary school hours (ca. 4.5/5.5 h). While some limited work suits to boost the household income during this time, increasing working hours beyond the school day would require additional and costly after school care. Encouraging and making additional working hours, therefore, requires concerted and integrate welfare transfers and social services. Both results, work intensity and less than part-time working hours, have policy implications that we scrutinise further in the discussion.

The final set of characteristics focuses on the *economic characteristics* of the household in model 3. The first two variables consider receiving the unemployment benefit and other means-tested benefits separately. As highlighted in the literature review both are likely to have different effects on take-up. First, similar to single parents, receiving other benefits reduces non-take-up, because recipients are already in the welfare system and would be encouraged to apply for the WFP. The other direction is also possible, once claiming WFP, recipients might be made aware of other benefits they can claim in addition.

Either way, having gone through a means-tested process, reduces the hurdle to apply for another benefit.

The effect of unemployment benefit is strong indication for the policy interaction with the WFP highlighted in the literature review. With our model, we are the first to show this empirically. The unusual 3-day rule within the jobseeker's allowance, allows to be in-work and claim unemployment benefits. In these circumstances, employees rather choose the unemployment benefit, instead of the in-work benefit they are also eligible to. Our models cannot show if this is also the financially rational decision and indeed the JSA claim is more beneficial. Yet, it highlights a policy inconsistency that would require further research and policy attention.

Regarding the income gap, it confirms the literature that the higher the degree of need, the lower the non-take-up. With each Euro the income gap increases the non-take-up decreases. Nevertheless, the effect is very weak. Moreover, with the quadratic term we present the first study that also found a slight non-linear relationship. It means that not only non-take-up is lower close to the income threshold, but also those with extremely low income.

Finally, as a proxy for information costs, we use the presence of a computer and internet connection in the household, which is not significant in any model. It should be noted that more than 97% of the households in our sample have an internet connection, which means it measures more digital exclusion of a minority than specific information costs. Nor does the indicator capture direct knowledge or other hidden information costs. Finally, the constants show that there are other unobserved factors contributing to non-take-up, although the labour market factors have the strongest effect to improve model fit overall.

## 5 Discussion and conclusions

In this article we have analysed the non-take-up of the Working Family Payment. We have estimated the overall non-take-up rate and the key socio-economic and policy determinants behind the non-take-up. This is relevant because the WFP is the main in-work benefit in Ireland to mitigate child poverty. Moreover, the present study broadens the international non-take-up literature that focuses on minimum income and social assistance schemes by scrutinising non-take-up of an in-work benefit. Furthermore, compared to studies of hybrid systems combining general social assistance and in-work benefits (Bruckmeier et al. 2021), we can isolate one specific in-work benefit targeted at families. This perspective on an in-work benefit challenges several assumptions stated in the literature about the determinants of non-take-up. In the national policy context, we provide the first study on non-take-up after the global financial crisis with a focus

on the recovery period and which policy lessons can be learned from this period.

First, our results show that non-take-up of the WFP ranges from 63 to 76% over the period 2014–2019. It first declines during the recovery period and remains stable at around 65% until 2019. We confirm earlier studies and reveal a consistently high non-take-up that undermines the long-term effectiveness of the scheme. With our robustness checks and meticulous modelling of policy features (e.g. children in full-time education) we are very confident that the overall level of non-take-up is accurately measured. Since we cannot replicate the exact approach earlier studies have taken, our findings reiterate that the persistently high non-take-up is a major policy design flaw.

Overall, we provide strong evidence for policymakers that the WFP fails to reach its target population of low-income working families. We also know from non-take-up of social assistance schemes that non-take-up ranges between 40 and 80%, which means non-take-up of the WFP is certainly at the upper end in international comparison. Moreover, considering that the target population are families with children to mitigate in-work poverty, the non-take-up is outrageously high as it means these families and their children are living on lower incomes as they would deserve according to their social rights.

Second, while we observe declining non-take-up during our observation period, this is mainly driven by policy drift and insufficient indexing of welfare benefits in Ireland in general, and specifically of the WFP. In other words, the WFP is not better targeted or more households apply for the benefit, simply the number of eligible households is declining because the income thresholds do not keep pace with increasing wages. The continuous decline of eligible households is clear evidence for benefit erosion due to the lack of indexing WFP thresholds to wages or prices. According to our analysis the amount of the WFP increased by only 4.9% between 2014 and 2019, while gross and net incomes have increased by 11 and 26%, respectively, in the same period (CSO, 2023). Compared to other welfare states (e.g. Nordic countries), social benefits in Ireland are not indexed and are subject to annual budget negotiations and political decisions. This is particularly relevant for means-tested benefits. Research has shown that means-tested benefits are much more vulnerable to austerity and policy drift (Nelson 2007). Recent policy proposals suggest to introduce indexing for pensions (Select Committee for Budgetary Oversight 2022), although our analysis indicates that it could be more pressing for the WFP. This would ensure that the WFP is indeed an income floor for working parents that keeps track with wage increases at the top of the income distribution, while also incentivising work in general. Without indexing, work incentives diminish and

– more concerning – child poverty among working parents will remain a relevant social problem with resulting long-term disadvantages for the affected children.

Third, while we confirm largely the existing literature in relation to some socio-demographic and economic determinants of non-take-up, we introduce labour market variables as relevant factors for non-take-up of in-work benefits. We are the first to conceptualise labour market determinants of non-take-up in the context of a wage supplement scheme, which offers not only new theoretical insights into non-take-up factors, but also crucial policy lessons to minimise non-take-up. These lessons are not only relevant for in-work benefits, but also for hybrid minimum income schemes that have built-in income supplement schemes (e.g. Germany, see Wilke 2023).

Three labour market determinants are particularly relevant for the WFP and point to wider lessons for the future design of in-work benefit schemes: Namely, we showed how self-employed are discriminated by policy design, lower work intensity than part-time work and the bi-weekly assessment are design issues:

For the self-employed, their working hours are not considered to meet the structural eligibility criteria, but their individual income is considered in the means-test at the household level. This creates not only a communication dilemma how self-employed are treated in the WFP and contributes to their lower take-up, but also poses questions about fairness. Certainly, the exclusion of low-level self-employment shall stop benefit fraud, but there might be other proxies that could identify sufficiently working self-employed on low incomes. We have discussed three potential underlying mechanisms of low take-up if a self-employed earner is in the household, but this requires further research to identify potential motives and mechanisms empirically.

The second labour market factor is insufficient working hours. The in-work poverty literature emphasises that increased working hours are a route out of poverty, but this requires guaranteed hours and a policy that can accommodate weekly changes in income through the tax system. In the WFP, claimants would have to inform the welfare office on a weekly basis, depending on the number of hours worked. In addition, working hours are assessed at household level, therefore employers cannot process this. This effortful process can introduce strategic behaviour, such as not accepting a job if it implies the temporary loss of the WFP, or not reapplying for the benefit after losing it.

To address the issue of fluctuating wages and a cumbersome application process, an automatic application process on a monthly or annual basis would suit the modern labour market much better. Refundable tax credits, as in the United States and United Kingdom (Keane et al. 2021), have shown to be very effective in targeting

low-income earners as well efficient in reducing poverty. Compared to the current WFP, the full benefits are only felt at the end of the tax year, but it would also encourage seasonal work and would not penalise those in precarious jobs with unpredictable working hours. Furthermore, automatically applied tax credits avoid non-take-up and create a simpler, transparent and non-stigmatising in-work benefit.

We propose, however, to maintain the weekly basis of the WFP, which is a better solution for present monetary hardship and avoids the problem of being entitled to a refundable tax-credit in the future, which is only effectively paid out a year later. The current model needs to be supplemented at the end of the year as a mechanism to balance the weekly operation of the WFP. The exact simulation of the impact of such a reform would be subject for future research.

We have also identified some employees that are satisfied with the lower working hours, in particular those with childcare duties, who represent 3.7% of all WFP beneficiaries. For this relatively small group, transfers alone are probably insufficient. Ireland has one of the highest childcare costs in the OECD, which pose a serious hurdle to increase working hours, when the extra income is not sufficient to cover formal childcare provision. Further research has to explore what this specific subgroup needs and how labour market activation, regulation and social service can support working parents in low-income employment. For instance, the social investment and labour market activation literature has shown that bringing mothers in the labour market has long-term benefits for gender equality, child development and household incomes. Making work attractive on low incomes facilitates pays off in the long-term as it reduces welfare dependence. Our analysis has shown that the WFP alone seems insufficient to increase working intensity of the entire household such as working more hours and activating the caring partner.

A silver lining of our findings is that at aggregate level in-work poverty is relatively low compared to other European countries and has remained at the same level since the early 2010s. Yet, while we have measured non-take-up it remains unclear if the WFP is indeed contributing to this lower in-work poverty rate. While recent findings indicate an effective child poverty reduction (Roantree and Doorley 2023), we do not know the effect on in-work poverty. Further research would have to assess how the non-take-up is affecting household poverty and deprivation as well as how much of the WFP actual contributes to mitigate in-work poverty. Our study has at least highlighted to policymakers that the current WFP is inadequately designed to address non-take-up, let alone target low-income families effectively.

Appendix

To make the text as clear as possible, we have included three parts in this [appendix](#). In the first part we explain the main methodological choices related to eligibility and non-take-up simulations. The second part shows the descriptive statistics for different subpopulations. Finally, the third part explains the robustness controls applied in the estimations of non-take-up determinants.

Eligibility and non-take-up simulations

This research shows strengths and weaknesses of the estimates, which is not common in the literature (Frick and Groh-Samberg 2007). We have more than 73% of households correctly estimated and explanations for which we cannot identify all the beneficiaries.

When simulating the WFP, we found 290 cases that we label as ‘failures,’ representing about 27% of the total number of beneficiaries. These households are currently receiving the Working Family Payment but, according to our simulations, they are not eligible to it.

The presence of errors in the estimations does not invalidate our analysis. As noted by Fuchs et al. 2020; despite the robustness of our estimates, it is important to remark that only average annual entitlements can be simulated. The direct effect is that some households may be defined as ineligible even though they could have been eligible (and receiving) in some months of the year. In addition, it’s worth noting that using survey-based data can be subject to response error and problems in income valuation. Given that this is a wage supplement with strong conditionality on the number of hours worked and the duration of the job, this could have a greater impact on households with self-employed workers or in a temporary unemployment situation (Bruckmeier and Wiemers 2012). Therefore, some of these failures are consistent with the literature. Finally, we also show some allowances that we cannot exclude from the assessable income, perhaps we are overestimating the assessable income of some households.

Errors in estimations are even necessary, because the absence of errors in the estimates could show an excessively restrictive estimation model. (Frick and Groh-Samberg 2007).

Table A.1 presents the mean of WFP received by each household, differentiating between the ‘correct’ and ‘fail’ estimations.

Table A.1 Mean of Working Family Payment receiving by sub-samples

	Observations	Mean	Standard deviation
Fail	290	3,947.65	3,565.75
Correct	786	6,102.75	4,280.52

Note: Own elaboration

The ‘fail’ households receive on average 35% less than the ‘correct’ group. This is consistent with our hypothesis: at some point during the year, they were eligible to receive the benefit, but on an average basis, there were not eligible. If the assessable income is reduced by 10%, our correct estimations increase to 77%. Following Frick and Groh-Samberg (2007), we consider this ‘fail’ as an eligible population.

In the assessable income estimation, the following benefits/allowances are deducted from the total disposable household income. They are provided by administrative data.

**Table A.2** Deducted income for the Working Family payment

Family/children related allowances	Working Family Payment (WFP)
	Child Benefit (CB)
	Respite Care Grant Scheme (RCG)
	Domiciliary Care Scheme
Social exclusion allowances	Optical Benefit
	Dental Benefit
	Exceptional Needs Payments, DRAS Refund scheme
	Humanitarian Assistance Scheme
	Creche Supplement
	Travel Supplement
	‘Other Supplements’ from DEASP admin data
Housing allowances	Amount received from charitable organisation
	Direct Provision Allowance
	Rent Allowance (RA), Rent Supplement (RENT)
	Mortgage Supplement (MORT)
	HAP
	Exceptional Needs Payments
	Heat Supplement
	Other rent subsidy ID’d from RTB data
	Household Benefits (Free TV License + Electricity Allowance or Gas Allowance)
	Fuel Allowance
	Telephone Support Allowance
	Living Alone Increase
Income received by people aged under 16	

Note: own elaboration following WFP citizen information

Nevertheless, we cannot disregard whether income from letting a property qualifies as non-assessed income, so we compute all income from letting of property. In addition, related to student grants, we are unable to identify both the ‘1916 Bursary Fund from the Department of Education’ or ‘University payments made under the Higher Education Scholarships for Adult Learners’, which are not taken into account to the assessable income of up to a maximum of €7000 per year.

As we mentioned before, one of the main factor identified in the literature as a problem in the estimation of assessable income is the income period mismatch

(Goedemé and Janssens 2020). It has not been possible to solve this problem, but we have tried using the LONG data from EU-SILC. This keeps the same household for 4 years, so a priori it might be a better strategy. However, when using the LONG dataset, we lost information necessary to estimate the eligibility of the household. We don’t have information on the number of months the child is studying (necessary to qualify a child as a dependent child) or the total number of hours usually worked in a second or third job (necessary to meet the hours worked per fortnight condition). It was therefore not possible to use this dataset to estimate the eligibility of a household.

### Differences between subpopulations

Our subpopulations of interest are explained as follows; ‘Beneficiaries’: households who are currently receiving the WFP, as stated by variable HY051G in the database; ‘Non-take-up’: households who are eligible to receive the WFP, but are not receiving it; ‘Eligible’: households who are eligible to receive the WFP, according with our simulations. This group is the sum of the other two.

**Table A.3** Differences between subpopulations

Sub-populations Observations		Beneficiaries (1,086)	Non-take-up (2,468)	Eligible (3,544)
<b>Socio-demographic characteristics</b>				
Age		39.66	41.16	40.61
Sex	Male	23.72%	24.83%	24.38%
	Female	76.28%	75.17%	75.62%
Marital Status	1. Never Married	34.95%	35.57%	35.13%
	2. Married	47.27%	45.78%	45.57%
	3. Separated or divorced	15.56%	14.11%	15.01%
	4. Widowed	2.19%	7.93%	4.14%
Citizenship	Irish	76.51%	84.96%	82.88%
	EU	19.79%	10.17%	12.45%
	OTH	3.69%	4.86%	4.66%
Highest Educational Level Attained	1. Primary education	6.61%	11.75%	10.32%
	2. Secondary Education	39.88%	42.03%	42.36%
	3. Post-secondary non-tertiary education	14.29%	13.41%	13.84%
	4. Tertiary education	39.20%	32.53%	33.46%

**Table A.3** Differences between subpopulations

Sub-populations Observations		Beneficiaries (1,086)	Non-take-up (2,468)	Eligible (3,544)
House Tenure	1. Outright owner	39.58%	40.03%	39.12%
	2. Tenant or subtenant paying rent at prevailing or market rate	25.28%	22.97%	23.96%
	3. Accommodation is rented at a reduced rate or is provided free	35.13%	36.99%	37.29%
Degree of urbanisation	1. Densely-populated area	30.24%	27.59%	28.27%
	2. Intermediate area and Thinly-populated area	69.75%	72.40%	71.72%
Number of children		2.38	2.29	2.28
<b>Labour Market characteristics</b>				
Status in employment	Head			
	Self-employed	3.13%	5.21%	4.50%
	Employee	96.86%	94.78%	95.49%
	Partner			
Occupation (ISCO-08)	Self-employed	3.74%	12.38%	10.27%
	Employee	96.25%	87.61%	89.72%
	1. Managers and Professionals	6.87%	10.81%	9.74%
	2. Technicians and Associate Professionals	10.51%	9.51%	9.58%
	3. Clerical Support Workers	15.22%	12.58%	13.61%
	4. Service and Sales Workers	36.65%	36.11%	36.39%
	5. Skilled Agricultural, Forestry and Fish + Craft and Related Trades Workers + Plant and Machine Operators	13.75%	14.31%	14.01%
	6. Elementary Occupations	17.97%	16.65%	16.63%

**Table A.3** Differences between subpopulations

Sub-populations Observations		Beneficiaries (1,086)	Non-take-up (2,468)	Eligible (3,544)
Reason for working less than 30 h	1. Working more than 30 h per week	66.57%	83.99%	79.41%
	2. Do not want to work more hours	3.69%	1.33%	1.94%
	3. Wants to work more hours but cannot find a job(s) or work(s) of more hours	7.57%	5.34%	5.74%
	Personal illness or disability			
	4. Housework, looking after children or other persons	16.38%	5.51%	8.49%
Type of contract	5. Undergoing education or training + Number of hours in all job(s) are considered as a full-time job + Other reasons	5.77%	3.80%	4.38%
	Head of household			
Number of hours usually worked per fortnight	Permanent job/work contract	93.80%	84.64%	87.12%
	Temporary job/work contract	6.19%	15.35%	12.87%
	Partner			
Income characteristics	Permanent job/work contract	89.31%	83.18%	85.17%
	Temporary job/work contract	10.68%	16.81%	14.82%
WFP assessable income		28,502.59	18,670.25	19,644.58
Is receiving non means-tested benefits?	Yes	32.51%	25.44%	26.45%
	No	67.48%	77.30%	73.54%
Is receiving unemployment benefits	Yes	40.64%	49.10%	46.47%
	No	59.35%	50.89%	53.53%
Income Gap		26.29%	43.46%	41.23%
Information cost	Internet and computer	84.78%	78.24%	79.91%
	Internet or computer	15.21%	21.75%	20.08%

Note: own elaboration

There are important differences between the sub-populations of interest. These relate to socio-demographic characteristics. In terms of labour market characteris-

tics. Self-employed are more than 10% in the non-take-up group, but virtually non-existent in the other groups. There are also differences by occupation. Non-take-up is higher in skilled agriculture, forestry and fishing, which overlaps with self-employed farmers. Two thirds of the non-take-up group want to work more hours but cannot find another job or because they are looking after children. The relationship with the labour market is more unstable in the non-take-up group.

The non-take-up group is comparatively poorer than the others. One fifth of the non-take-up group receive another means-tested benefit, compared to one third of the beneficiaries.

### Heckman selection model

As a robustness check, we considered the Heckman approach to account for potential selection bias (Heckman 1979). In this sense, non-take-up refers to a highly selective demographic group of the target population. We rather could assume that the eligible population has specific social characteristics and behaviours compared to the non-eligible population. Standard logit/probit models maybe cannot control for such a bias and, therefore, we tried the Heckprobit as a robustness control, which is specifically designed to handle this problem. These models have been widely used in the economic literature (Ayala and Paniagua 2019; Oliver and Spadaro 2017; Fuenmayor et al. 2024) and also in the specific context of analysing non-take-up (Frick and Groh-Samberg 2007; Fuchs et al. 2020) to control for the potential selection bias of the sample.

The results demonstrate the presence of selection bias in the sample. However, this does not affect the outcomes of the models, as the direction and significance of the coefficients remain consistent. Consequently, we have decided to retain a straightforward probit model, as it is easily interpretable.

### Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12651-024-00385-8>.

Supplementary Material 1

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### Authors contribution

CRedit matrix by author. DM: Diego Muñoz-Higueras; SK: Stephan Köppe; RG: Rafael Granell Pérez; AF: Amadeo Fuenmayor Fernández.

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### Data availability

The data that support the findings of this study are available from Eurostat but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available.

### Declarations

#### Ethics approval and consent to participate

The research has been approved by the Eurostat Ethics review process (RPP 201/2020-EU-SILC-HBS).

#### Consent for publication

All authors consent the publication of this research.

#### Competing interests

The authors report there are no competing interests to declare.

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