CARING FOR CARERS?

The Effect of Public Subsidies on the Well-Being

of Unpaid Carers

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ABSTRACT

We study the effect of long-term care subsidies and supports on the well-being of unpaid caregivers. We draw on evidence from a policy intervention, which universalized previously means-tested caregiving supports in Scotland, known as *free personal care* (FPC). We document causal evidence of an increase in the well-being (happiness) of unpaid carers after the introduction of FPC. Our estimates suggest economically relevant improvements in happiness (12 percentage point increase in subjective well-being) among caregivers exposed to FPC and who provide at least 35 hours of care per week. Consistently, these results are larger among women and non-actively employed caregivers (17 percentage point increase in happiness). Estimates are not driven by selection into caregiving; they are explained by income effects of FPC among caregivers.

KEYWORDS: caregiving, long-term care subsidies, subjective well-being, caregiver's well-being, Scotland

JEL CLASSIFICATION: 118, J22

I. Introduction

Some studies have documented that unpaid caregiving is responsible for caregivers' emotional and monetary losses, including opportunity costs of time (forgone employment and earnings) from the provision of care, which reflects in several dimensions of well-being (Van den Berg, Fiebig, and Hall 2014; Rattinger et al. 2015; Leggett et al. 2018). However, there is still fairly limited consensus in the literature on the well-being effects of caregiving, and a meta-analysis of previous evidence finds both positive and negative effects. However, the negative effects are more prominent among lower-income individuals (Pinquart and Sörensen 2003). Some studies document that caregiving can explain up to 50 percent of the total costs of dementia among caregivers (Hurd et al. 2013), and it is found to increase

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the use of antidepressants, tranquillizers, painkillers, and gastrointestinal agents (Schmitz and Stroka 2013; Stroka 2014). However, most estimates in the literature are not causal; namely, caregiving decisions are not the result of an exogenous variation in caregiving status. A common strategy to retrieve causal estimates lies in examining the effect of policy interventions that exogenously change the conditions under which caregivers provide care.¹

Subsidies that free some caring time or provide financial respite can impact caregivers' well-being. Proponents of cash subsidies argue that they increase care-receivers' choice and quality of care (Simon-Rusinowitz, Mahoney, and Benjamin 1998), by allowing family members to deliver personal care at home (Mahoney et al. 2002). For example, some studies suggest evidence of emotional, physical, and financial well-being improvements after the introduction of the Cash and Counseling Demonstration and Evaluation (CCDE) program, which offered flexible monthly allowances for Medicaid beneficiaries to hire informal caregivers as paid workers (Foster et al. 2003). A growing literature has focused on the effect of long-term care (LTC) subsidization on care choices and household behavior (McKnight 2006). However, we still know little about the extent to which the expansion of caregiving supports influences the well-being of carers.

This paper focuses on examining the causal effect of a specific policy intervention that resulted from the implementation of the Scottish Community Care and Health Act, which universalized the access to home care by offering free personal care (FPC)—namely, by establishing a network of supports and services to the Scottish population after 2002.² This reform eliminated the preexisting means tests for subsidized personal care to individuals with caregiving needs. The fact that subsidies remained means-tested in the rest of the United Kingdom constitutes a natural control group for us to study the effects of FPC. Next, we consider a number of robustness checks, including whether the reform effects were driven by individuals who were providing care at baseline (i.e., from the begining); and finally, we show a number of mechanisms explaining the channels of the effect.

We contribute to the literature by retrieving causal estimates of the effects of FPC on both caregivers' well-being and their mental health. Given that caregiving supports can influence both the decision to become a caregiver and the intensity of caregiving duties, we estimate the effect of caregiving subsidies and supports resulting from the introduction of FPC on caregivers' well-being at baseline, as well as the effect for the entire sample period. This complements previous findings indicating that caregiving increases depression (Hiel et al. 2015; Heger 2017; Zwart, Bakks, and Van Doorslaer 2017).³

Our data contain precise information on intensity (hours) of care provided by caregivers, alongside their mental health and well-being. Furthermore, the effects of the Community Care and Health Act can be captured in the British Household Panel Survey (BHPS). We employ a difference-in-differences (DiD) strategy for the period 1996–2008 in the

¹ Alternative strategies use instrumental variables to estimate local average treatment effects, using withinhousehold variation in the presence of a single parent (Heger 2017).

² According to the Office for National Statistics (2002), a person receiving personal home care in England in 2001 received an average of 7.6 hours per week at a cost of £12 per hour.

³ When different European countries are compared, the effects happen to be especially larger in southern Europe (Brenna and Di Novi 2016).

United Kingdom that contains detailed information on a number of important covariates or control variables. The sample of caregivers is large enough to carry out our analysis and has been verified with administrative records. That is, the sample is consistent with estimates that indicate that informal caregivers make up 17 percent of the Scottish population.⁴

Our findings suggest that that Community Care and Health Act increased the caregiver's happiness domains included in the General Health Questionnaire (GHQ) and measured in the post-reform period. However, the effect is significant only among caregivers providing more than 35 hours of care per week, and the effects were expectedly larger for females and caregivers out of the labor market. The results apply to both coresident and non-coresident caregivers, and we document that they are driven by changes in the income of caregivers rather than by changes in health, hospital care, employment, or leisure satisfaction.

The paper is organized as follows. The next section reports the related literature, and Section III describes the Scottish reform. Section IV reports the data, Section V describes the empirical strategy, and Section VI reports the results, robustness checks, and heterogeneity. A final section concludes and includes policy implications.

II. Well-Being Effects of Caregiving

A. STRESS, MENTAL HEALTH, AND LIFE SATISFACTION

Compared with non-caregivers, caregivers tend to report lower life satisfaction (Hajek and König 2016) and quality of life (Rafnsson, Shankar, and Steptoe 2017). Caregivers are more likely to suffer from depression compared with non-caregivers (Papastavrou et al. 2007; Molyneux et al. 2008; Buyck et al. 2011; Brenna and Di Novi 2016). They are also more likely to consume prescribed medication and use health services (Schulz and Martire 2004; Serrano-Aguilar, Lopez-Bastida, and Yanes-Lopez 2006). In particular, the meta-analysis by Vitaliano, Zhang, and Scanlan (2003) found that caregivers take more medications for physical illnesses, exhibit 23 percent higher levels of stress hormones, and reveal 15 percent lower antibody responses compared with non-caregivers. These findings are economically relevant and sustained over a long period of time; specifically, they suggest that providing care increases the risk of hypertension and diabetes and reduces the body's resistance to viruses (Vitaliano, Young, and Zhang 2004).

B. CAREGIVER CAPTIVITY EFFECT

A prominent source of caregiver stress results from the so-called captivity effect (Pearlin et al. 1990), namely, the feeling of being forced to care against one's will, out of some sense of duty. Caregiver depression is directly related to the feeling of being trapped in a particular role with no way out and the expectation that the current situation can only get worse

4 National Records of Scotland, "Population Estimates Time Series Data," https://www.nrscotland.gov.uk /statistics-and-data/statistics/statistics-by-theme/population/population-estimates/mid-year-population -estimates/population-estimates-time-series-data. (Ducharme et al. 2007; Costa-Font and Vilaplana-Prieto 2022; Costa-Font 2023). That is, informal caregiving is particularly detrimental to well-being when caregivers have no other choice but to take on the role of carer (Schulz et al. 2012). Consistently, recent evidence finds that new-onset Medicaid home care was associated with an improvement of caregivers' health by 3.39 percent with respect to average pre-onset mental health (Unger et al. 2021). If a caregiver's health deteriorates to the point where they can no longer provide care, the care-receiver may be at risk of being placed in a nursing home, and awareness of such responsability adds further pressure on the caregiver (Sanders and Power 2009).

C. CAREGIVERS' PHYSICAL HEALTH

Certain groups of caregivers are more at risk of poor physical health. Caregivers experiencing a higher level of burden of disease tend to be older (Rinaldi et al. 2005), female (Papastavrou et al. 2007; Campbell et al. 2008), and coresident with care-receivers (Conde-Sala et al. 2010).⁵ In a meta-analysis of 176 studies on physical health indicators, Pinquart and Sörensen (2007) conclude that older age, lower socioeconomic status, and lower levels of informal support are associated with poorer health. Overburden is a common mechanism, as higher levels of caregiver behavioral problems are consistently related to poorer caregiver health (Orfila et al. 2018). Compared with those with higher socioeconomic status, older people and those from lower socioeconomic groups typically report being in worse health (Jivraj and Nazroo 2014), which according to the model of caregiver burden (Pearlin et al. 1990) makes them more exposed to experience well-being shocks (Saito et al. 2018; Tough et al. 2020).

D. SPOUSAL CAREGIVERS

Several studies have reported that spousal caregivers experience a higher level of stress compared with other caregivers (Rinaldi et al. 2005; Andrén and Elmståhl 2008). Pinquart and Sörenson (2011) find that spousal caregivers report more depressive symptoms. An explanation lies in that caregivers of elderly spouses tend to be older, and they may exhibit physical limitations that add to the burden of caring for their spouse (AARP Public Policy Institute 2013; Pearlin et al. 1990; Snyder 2000). Social isolation is another problem caregivers face (Aneshensel, Pearlin, and Schuler 1993), and the evidence suggests a positive and significant association between social isolation and caregiver burnout (Akkus 2011).

E. CAREGIVING SUBSIDIES AND SUPPORTS

Vulnerable caregivers are at greater risk of caregiver strain when they do not benefit from supports and subsidies services (Sussman and Regehr 2009). However, the caregiver's burden can be alleviated with support (economic or in-kind). Studies of caregivers caring for family members with serious or life-threatening illnesses found that when caregivers

5 Women have traditionally been the main informal caregivers (Eagly and Wood 1991; Finley 1989), have shown greater commitment to caregiving than men (Pavalko and Woodbury 2000), and have endured greater deterioration in their well-being (Pinquart and Sörensen 2006; Yee and Schulz 2000). Nevertheless, some studies show some signs of change in the gender gap, resulting from women's entry into the labor market and the effect of equality policies (Glauber 2017; Langner and Furstenberg 2020. receive information related to the progression of the illness, the level of depression considerably declines (Emanuel, Wendler, and Grady 2000; McDonagh et al. 2004). Van den Berg (2007) documents that a cash benefit (€283 on average) paid to a sample of caregivers reduces caregivers' stress and increases self-reported well-being. Similarly, Van den Broek and Grundy (2020) show that a reduction in the availability of home care in Denmark increases carers' mental health. Moreover, Vandepitte et al. (2016) conducted a systematic review and concluded that day care services are effective in decreasing caregiver burden. Hence, subsidies as well as services and supports may improve the well-being of caregivers when they experience financial hardship (Amegbor et al. 2021; Rajapakshe, Sivayogan, and Kulatunga 2019). In addition, subsidies can improve caregivers' esteem as their work becomes more visible to society (Ma et al. 2018), influences their sense of control over their own lives (Bjørkløf et al. 2016), and enhances their participation in leisure activities (Jeong and Park 2018), as well as social contact, thereby reducing feelings of loneliness (Wang et al. 2017).

III. The Scottish Reform

Unlike the rest of the United Kingdom, Scotland reformed the funding of personal care in 2001 by introducing "free" personal care (FPC), which meant that all personal charges for personal care were abolished, although charges continued for non–personal care expenses. That is, charges for care at home were removed, and a flat-rate subsidy for personal care (as well as for nursing care) to people in care homes was set (Glendinning et al. 2004; Bell and Bowes 2006, 2012).

One of the features of the Scottish reform was its swiftness. Scotland formally incepted a system of public subsidies and supports in the Community Care and Health Act on a tight timescale (Dickinson et al. 2007). Such reform replaced the preexisting model, still in place in the rest of the United Kingdom, of means-tested care whereby local authorities support only individuals whose wealth does not exceed £23,000. Elderly people in need in the rest of the UK can expect to receive only a universal attendance allowance that varies between £68.10 and £101.75 a week. In contrast, under the Community Care and Health (Scotland) Act, people aged 65 years and older are entitled to a flat-rate payment of £169 per week, and those who receive care in a nursing home receive an additional £77 per week (as of April 2014).

Additional funds were made available to local authorities on an annual, recurrent basis to pay for FPC. Evidence on the Scottish FPC reform to date suggests that costs did not spiral out of control, it has overall reduced use of care homes, and people on modest incomes benefited the most (Bell and Bowes 2006, 2012). The amount spent on care for older people accounted for around 0.2 percent of Scottish GDP, and the additional costs of providing FPC for the elderly increased this amount by around 10 percent after the reform (Bell and Bowes 2006, 2012). Public expenditure projections of LTC estimate expenditure to increase to 1.20 percent of GDP in 2051 under current funding arrangements, and around 1.45 percent of GDP in 2051 under a policy of FPC (Wittenberg et al. 2004). However, projections using aggregate macro-simulation analysis rely on a number of assumptions that exaggerate the costs of FPC, rather than on real experimental evidence of FPC.

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It is worth noting that the introduction of the FPC program was mainly politically driven and linked to the political agenda of the Scottish Labour government (Dickinson et al. 2007). Therefore, the introduction of the program was largely unanticipated, which makes it suitable to undertake an empirical program evaluation analysis.

The welfare effects of FPC are still being quantified, and the effects on caregiving arrangements are contentious. Although Bell and Bowes (2006) do not identify any evidence of short-term effects on informal caregivers, Karlsberg Scaffer (2015), drawing on a longer sample, finds suggestive evidence that the introduction of free LTC in Scotland increased the probability of women supplying informal care by around 6 percentage points. Hence, we can conclude that the evidence on the impact of FPC caregiving is mixed. However, the evidence so far suggests that the introduction of FPC sharply increased the demand for home help by 69 percent between 2002 and 2010; this home help was compensated by an increase in the charges for non-personal care and a subsequent increase in the intensity of care from an average of 6.9 to 7.6 hours per week (Bell and Bowes 2012). So far previous studies have not examined the effects on caregivers, and especially, individuals who were caregivers at baseline.

IV. Data

The British Household Panel Survey (BHPS) began in 1991 and is a multipurpose study whose unique value resides in the fact that it follows the same representative sample of individuals over a period of years. It is household based, interviewing every adult member, and contains sufficient cases for meaningful analysis of certain groups such as the elderly and their spouses. The wave 1 panel consists of some 5,500 households and 10,300 individuals drawn from 250 areas of Great Britain. Additional samples of 1,500 households in Scotland and Wales were added to the main sample in 1999, and in 2001 a sample of 2,000 households was added in Northern Ireland, making the panel suitable for UK-wide research. An important advantage of the BHPS is that it contains a boosted sample for Scotland. Furthermore, the data contain records on mental health indicators, the 12-item version of the General Health Questionnaire (GHQ-12) developed by Goldberg and Williams (1988).

The GHQ-12 is used to detect psychiatric disorders and is a consistent and reliable instrument when used in the general population (Pevalin 2000).⁶ Online Appendix Table A1 shows the descriptive statistics for the Scottish sample. This sample is composed of individuals who have provided informal care either at baseline (from 1996 until 2003)

6 The scale asks whether the respondent experienced the following symptoms or behaviors in the last few weeks: "able to concentrate," "lost much sleep over worry," "playing useful part in things," "capable of making decisions," "constantly under strain," "could not overcome difficulties," "enjoy normal activities," "been able to face up problems," "feeling unhappy or depressed," "losing confidence in oneself," "thinking of self as a worthless person," and "feeling reasonably happy, all things considered." Since we are interested in a wider concept of happiness, we focused on the most general domain, that is, "feeling reasonably happy, all things considered." For the purpose of the analysis, we have reverted the score of the four-level variable, so that a higher score would represent a more positive feeling (1 ="much less," 2 = "less so," 3 = "same as usual," and 4 = "more than usual").

or at a follow-up wave (from 2003 until 2008). This choice ensures that we are able to control both, for people who were caring at baseline and at follow-up, and allows the composition of carers to change through time. Furthermore, as the number of hours of care provided by an informal caregiver is more reliable when the caregiver is not living with the care-receiver, we focus on households without cohabiting children.⁷

Our treatment refers to individuals living in Scotland after the introduction of FPC, and our control group is composed of respondents living in the rest of the UK. This assumption has been used in literature (Karlsberg Schaffer 2015), which assumes that carers from both groups were exposed to the same care funding system before the FPC reform. In our empirical strategy we separate the effect of caregiving at baseline, which allows us to distinguish the effect of selection into caregiving from those resulting from changes in caregiving intensity among those who were supplying care at baseline.

Looking at Online Appendix Table A1, the two groups seem similar for most of the main characteristics, including age, gender, monthly income, and caring effort. Although we identify some differences in some control variables, we control for them in the empirical specification. For instance, the Scottish sample shows a lower presence of individuals with at least a degree, and a lower proportion of retired individuals. Notably, the proportion of individuals providing care in Scotland seems to have declined after the FPC reform for all intensities of care apart from the highest (50+ hours per week).

V. Empirical Strategy

Our empirical strategy combines an event study with a differences-in-differences (DiD) approach examining the effect of the reform on caregivers' outcomes.

A. EVENT STUDY

To analyze how the outcome of interest changed after the introduction of subsidized LTC (or FPC) in Scotland, we use a flexible event study design as described in equation 1.

$$Y_{irt} = \beta_0 FPC_{irt} + \sum_{k=-\pm}^{k=-+} \beta_{pre}^k \mathbb{1}[D_{it} = k] \cdot FPC_{ict}$$

$$+ \sum_{k=0}^{k=6} \beta_{post}^k \mathbb{1}[D_{it} = k] \cdot FPC_{irt} \beta_2 X_{irt} + \vartheta_t + \tau_i + \varepsilon_{irt}$$
(1),

where Y_{irt} is the subjective well-being indicator, FPC_i is a binary variable that takes the value 1 if the individual *i* living in region *r* at time *t* is a beneficiary of the FPC program, and $1[D_{it} = k]$ is a binary variable that takes the value 1 if there have elapsed *k* terms between the time of the interview and the introduction of the FPC. The term k = 0 corresponds to 2002, when the policy was implemented for the first time. We estimate six years before FPC (1996–2001) and six years after FPC (2003–08). X_{irt} denotes a set of controls (gender, age, marital status, having non-cohabiting children, education level, and monthly

⁷ Following McGarry (1999), coresident children are excluded, as they may give and receive transfers in kind, which may lead to measurement errors in both the dependent and the independent variables.

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income), τ_i are individual fixed effects, ∂_t are time fixed effects, and ε_{irt} is an individual-specific error term.

The parameters of interest, β_{pre}^k and β_{post}^k , correspond to the effect of the FPC relative to year 2002. This specification allows us to test for differences in length of time of exposure to FPC and helps to provide a more detailed picture of the relationship between the outcome variables the introduction of the FPC. Additionally, it gives us the opportunity to test the validity of the DiD empirical design. If treated and control individuals exhibit similar trends before policy adoption, and only diverged after the implementation of the FPC, this constitutes strong evidence that such changes were caused by the reform rather than by an unobservable factor. In this case, we would test whether β_{pre}^k is different from zero.

B. DIFFERENCE-IN-DIFFERENCES

Next, we draw on a DiD strategy where the treatment refers to exposure to FPC in Scotland (after July 2002). Specifically, we are interested in the effect of FPC on caregivers' wellbeing (Y_{irt}) once we account for a set of relevant controls (X_{ict}).⁸ To identify a causal effect, we follow a classical strategy as follows:

$$Y_{irt} = \gamma_0 + \gamma_1 FPC_{irt} + \gamma_2 POST_t + \gamma_3 POST_t \cdot FPC_{irt} + \gamma_4 X_{ict} + \mu_t + \varepsilon_{it}$$
(2),

where FPC_{irt} is a binary variable that takes the value 1 if the individual *i* living in region *r* (Scotland or rest of UK) at time *t* is exposed to the FPC program (see Online Appendix Table A3 for the evolution of home care in Scotland), $POST_t$ is a binary variable that takes the value 1 for the post-reform period, μ_t depict time fixed effects, and ε_{it} is an individual-specific error term. We are interested in γ_3 , which refers to the change in well-being resulting from the introduction of FPC over and above the effect of time trends. Our data measure the subjective well-being of the caregiver and the number of hours of care provided, and we cluster at the UK county level. We use the two-step procedure proposed by Donald and Lang (2007) to retrieve standard errors that do not affect the validity of our results.⁹ We report baseline results and a number of robustness checks to make sure that the effect of the reform is robust and does not pick up other potential confounding effects.

Our strategy takes a number of considerations into account. FPC was implemented after June 2002, and hence we can identify the effect by comparing the wave before and after for those who would qualify to receive care based on a needs test. However, the effect of FPC might be nonlinear. In addition, the effect might be different between childless

8 Such controls include gender, age, marital status, having non-cohabiting children, education level, and monthly income.

⁹ Donald and Lang (2007) argue that when the number of regions (clusters) is small in a DiD setting, applying standard asymptotics implies that the significance of the t-statistics is overstated. In order to address this issue, we use the two-step procedure they proposed, which effectively treats the number of region-years as the number of observations. We have 18 regions: Inner London, Outer London, Rest of South East, South West, East Anglia, East Midlands, West Midlands Conurbation, Rest of West Midlands, Greater Manchester, Mereyside, Rest of North West, South Yorkshire, West Yorkshire, Rest of Yorkshire and Humberside, Tyne and Wear, Rest of North England, Wales, and Scotland.

individuals and individuals with children. The latter is particularly important in the presence of "bequest motives."¹⁰

We should acknowledge two potential limitations of our strategy. One refers to the relatively small sample size of caregivers, which varies by specification and hence might reduce the statistical power of our estimates. Online Appendix Table A1 describes the different covariates employed, and Online Appendix Table A2 describes the number of observations by age group for self-reported well-being. However, when we examine the subsample of Scotland, we observe a reasonably large number of observations for home help receipt (Online Appendix Table A3). A second limitation refers to the institutionalized population at baseline included in the data set, which has been eliminated from the estimates.¹¹

In estimating the DiD models we should acknowledge that although ordinary least squares estimates are not designed to handle ordinal outcome variables, they are appropriate for DiD model estimation for a number of reasons. First, Ai and Norton (2003) argue that the interaction effect should be calculated as the double difference of the predicted probabilities, while Puhani (2012) advocates reporting the marginal effect of the interaction term. The difference arises because in a nonlinear model the double difference is in general different from zero even when the coefficient of the interaction term is zero, and the discrepancy becomes larger when the probabilities are close to zero or one. However, if the distance between the response categories is equal, the linear approximation can be used. Second, nonlinear models violate the common trend assumption of the DiD model (Lechner 2011). For this reason, it is a common practice to estimate linear models for such ordinal data (Puhani 2012).

Third, it is notable that if the intervals between the different values of the latent wellbeing variable are quite similar (e.g., that they are uniformly distributed across the true [unobserved] latent variable), then the latent variable can be estimated in a linear fashion. Just as in the linear regression model an *F*-test is used to test the null hypothesis that all coefficients of the model except the constant term are zero. The equivalent test in the model with ordered dependent variable would be the likelihood ratio test against the null hypothesis that the model contains only a constant term and threshold parameters. Therefore, we estimate two ordered logit models: one model that includes only a constant and one that includes all explanatory variables. Both specifications return similar differences between threshold parameters (results are available upon request).

The linear specifications, which require that the differences in trends be exactly linear, are a special case of a smoothness restriction.¹² Rambachan and Roth (2019) recommend

¹⁰ According to the exchange motivation for bequests, theoretical literature on bequests argues that parents reward children who provide informal care and attention with a larger bequest (Bernheim, Schleifer, and Summers 1985).

¹¹ During the period of analysis, 175 individuals moved from their private home into sheltered accommodation (0.45 percent of total sample).

¹² Pre-trends are informative about what would have happened under the counterfactual, hence a sensitivity analysis is conducted in which confidence sets are reported under different restrictions on the set of possible violations of the parallel trends assumption (Rambachan and Roth 2019).

performing a sensitivity analysis with respect to the allowable degree of nonlinearity in the differential trends. Following this framework, we estimate the year-by-year coefficient and the variance-covariance matrix to exclude the effect of the pretreatment trend to then extrapolate to the posttreatment period. We retrieve the year-by-year coefficient and confidence intervals at different values of the Rambachan and Roth parameter; these coefficient and confidence intervals are suggestive of the degree of deviation from the previous trend. The estimated coefficient is positive with a 95 percent confidence interval for all exposure years, even under the assumption of nonlinear trends. This result indicates that, although the pretreatment trend might be different, the effect of FPC on caregivers' well-being is significant after the treatment (results are available upon request).

VI. Results

A. EVENT STUDY RESULTS

Figure 1 shows the results of the event study for all caregivers in the sample (left column) and for caregivers at baseline (right column). The corresponding coefficients and standard deviations are shown in Online Appendix Table B1. The figure illustrates a rise in happiness after 2002 of 16.32 percentage points (pp) for the entire sample, 24.77 pp for women, 23.70 pp for non-active caregivers, and 28.55 for caregivers at the bottom income quintile.¹³ Importantly, we identify no significant well-being changes in the year prior to the introduction of FPC. These significant and positive effects are sustained for all subsequent years after the reform, reaching 29.36 pp for women and 32.15 pp for the non-active in 2007. However, the effects for the sample of caregivers at baseline are stronger. The overall level of well-being increased by 26.31 pp in 2002, that is, 61 percent for all caregivers.

Figure 2 and Online Appendix Table B2 show the results of the event study by hours of care provided. Estimates are reported for all caregivers (left column) and for caregivers at baseline (right column). No significant effect is observed for caregivers who spend less than 10 hours per week, at least 10 hours per week, or at least 20 hours per week. However, the figure shows significant effects for caregivers providing 35, 50, or 100 hours of care. In 2002 we identify an increase in happiness of 33.1 pp for caregivers providing 35 hours of care (C35), 26.6 pp for those providing 50 hours of care (C50), and 26.3 pp for those providing 100 hours of care (C100) a week. Compared with the previous year, such change entails an increase of 178.15 percent, 48.60 percent, and 126.72 percent, respectively. Such effects remain in successive years, and become even stronger for the subsample of care-givers at baseline.

B. TRENDS

Figure A1 in Online Appendix A reports evidence of the existing trends for our measure of subjective well-being (GHQ-12, "general happiness" item). We focus on the caregiver

13 Following the literature review, on the profile of carers whose level of well-being is most affected by being a carer, the analysis is presented for the total sample and also for the subsamples of women, non-active (retired + unemployed), and people belonging to the lowest-income bracket.



FIGURE 1. Event study. Left column, all caregivers. Right column, only caregivers at baseline. This figure corresponds to an event study estimated by regressing the outcome variable for a respondent-by-term-by-year cell on a full set of event time indicators interacted with a binary variable for "treatment" and on a set of control variables. This figure reports the coefficients for event time, that is, the time path of outcome variables in treated versus untreated individuals before and after policy implementation and the 95 percent confidence intervals, with robust standard errors clustered at the region level. A color version of this figure is available online.

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FIGURE 2. Event study by hours of care provided. Left column: All caregivers. Right column: Only caregivers at baseline. This figure corresponds to an event study estimated by regressing the outcome variable for a respondent-by-termby-year cell on a full set of event time indicators interacted with a binary variable for "treatment" and on a set of control variables. This figure reports the coefficients for event time, that is, the time path of outcome variables in treated versus untreated individuals before and after of policy implementation and the



FIGURE 2. *Continued.* 95 percent confidence intervals, with robust standard errors clustered at the region level. A color version of this figure is available online.

population in Scotland for the treatment group, while the control group refers to the caregivier population in the rest of the United Kingdom, where FPC was not implemented. Figure A1 reports evidence of parallel trends that vary by intensity of care.

Figures A2–A4 in the Online Appendix report the trends in well-being measured by GHQ of caregivers (specifically, its "general happiness" domain) based on the total hours of care provided overall and specifically by women (most likely to be caregiver), the non-active population, alongside lower-income individuals.¹⁴ The general picture that emerges in Online Appendix Figure A2 is that pre-trends seem to be fairly parallel and do not show significant differences between Scotland and the rest of the United Kingdom. However, trends seem to show a different pattern in the period before the reform among those individuals providing at least 35 hours of care weekly. In Online Appendix Figure A3 we focus on the non-active population alone, and we find a similar picture as in Online Appendix Figure A2 with the treatment and the control group being closer than in the earlier case. In contrast, the trends in Online Appendix Figure A4, referring to the population in the lowest-income quintile, seem to differ in the period after the reform for the caregivers providing 35 or more weekly hours of care. Hence, we can conclude that, as expected, low-income earners are more likely to be affected by the reform.

14 The graphical analysis has been completed alongside a test of differences between treated and nontreated individuals during the pre-reform period.

To further document evidence of common pre-reform period trends, we regress the outcome variable on the treatment variable and an interaction term of a continuous time variable and an indicator for the treatment variable. If the parallel trend holds, we expect the interaction term to be statistically insignificant. Consistently, none of the estimated coefficients are significant.¹⁵

C. DIFFERENCE-IN-DIFFERENCES ESTIMATES

C.1. EFFECTS ON CAREGIVERS AT BASELINE (PROVIDING AT LEAST 10 HOURS OF CARE). In order to ensure that the effects we find account for selection into caregiving, we report a first set of estimates that include all carers who were providing care for at least 10 hours both at baseline and at the follow-up. The main DiD parameter, namely the effect of Scotland after 2002 (Table 1, panel A), is estimated using a series of dummies that identify carers who were providing care for a number of weekly hours varying from 10 hours up to over 100 hours at baseline and who were also providing care in the followup years (these specifications are identified in the tables as C10, C20, C35, C50, and C100, depending on the number of hours of care provided at baseline). All specifications control for gender, age, marital status, having non-cohabiting children, education level, monthly income, and a polynomial time trend of the second order. Some of the specifications also control for the actual number of hours of care provided (Table 1, panel B), using the categorical variable available within the BHPS data (10-19 hours, 20-34 hours, 35-49 hours, 50-99 hours, and 100+ hours). We ran these estimations for the sample of women with and without ontrols for care hours (panels C and D), the non-active population sample (including retired and unemployed in panels E and F), and the sample of lower-income repsondents (panels G and H). The number of observations and units by treatment group are available in Online Appendix Table A4.

Table 1 reports the effect of FPC measured as the effect of Scotland interacted with the period after 2002. Estimates point to an average 10–11 pp increase in caregivers' happiness for the overall sample for carers who at least provide 50 hours of care a week (C50 and C100 samples), and the estimates do not vary significantly significantly when we control for care hours provided. Consistent with the assumption that women do bear most of the caregiving responsibility, we find that the effect of FPC is stronger among the female caregivers (we estimate a happiness increase of 13 pp (16 pp) without (after) controlling for care hours provided). Such estimates suggest evidence of average happiness improvements of 2.2 percent and 5.7 percent depending on the hours of care provided. Similar effects are also found for the non-active population groups providing at least 50 hours of care a week (the effects are estimated to be 17 pp), and such effects emerge among those providing 35 hours of care at baseline when we control for hours of care. Finally, given that FPC was a universal benefit, it might not have made a significant difference to some caregivers in the lowest-income groups, as they would have been likely to benefit from previously

15 Coefficients and standard deviations for each pre-trend regression (*p*-value in parentheses): all sample, 0.0318 (0.1269); women: 0.1489 (0.0992); non-active: 0.0950 (0.1202); lowest-income quintile: 0.0017 (0.1262).

GHQ rev. (general happiness domain)	C10	C20	C35	C50	C100
		А.	Overall sam	ple	
Scotland	-0.033	-0.041	-0.037	-0.067	-0.086
	(0.047)	(0.052)	(0.061)	(0.068)	(0.073)
After 2002	0.023	0.023	0.023	0.023	0.023
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Scotland × after 2002	0.053	0.043	0.078	0.105 ^b	0.111 ^b
	(0.050)	(0.052)	(0.054)	(0.053)	(0.054)
Ν	15,863	15,863	15,863	15,863	15,863
R^2	0.013	0.013	0.013	0.013	0.013
	B. Overal	l sample, co	ntrolling fo	r care hours	provided
Scotland	-0.020	-0.019	-0.010	-0.028	-0.052
	(0.056)	(0.063)	(0.074)	(0.084)	(0.091)
After 2002	0.023	0.024	0.023	0.023	0.023
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Scotland × after 2002	0.068	0.057	0.097 ^c	0.117 ^b	0.129 ^b
	(0.054)	(0.056)	(0.058)	(0.056)	(0.058)
Ν	14,598	14,598	14,598	14,598	14,598
R^2	0.019	0.018	0.019	0.019	0.019
			C. Women		
Scotland	-0.037	-0.054	-0.056	-0.120	-0.120
	(0.067)	(0.079)	(0.099)	(0.118)	(0.118)
After 2002	-0.001	0.000	0.000	0.000	0.000
	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)
Scotland × after 2002	0.084	0.067	0.077	0.129 ^b	0.129 ^b
	(0.058)	(0.063)	(0.071)	(0.064)	(0.064)
Ν	9,471	9,471	9,471	9,471	9,471
R^2	0.007	0.007	0.007	0.007	0.007
	D. Wo	omen, contr	olling for ca	ire hours pr	ovided
Scotland	-0.035	-0.047	-0.050	-0.107	-0.107

(0.079)

(0.095)

(0.121) (0.150)

TABLE 1.	Estimation	of the	differend	e-in-diffe	erence	model	of F	PC	on
caregivers	happiness								

(0.150)

GHQ rev. (general happiness domain)	C10	C20	C35	C50	C100		
After 2002	-0.012	-0.011	-0.011	-0.011	-0.011		
	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)		
Scotland × after 2002	0.105	0.090	0.112	0.162 ^b	0.162 ^b		
	(0.065)	(0.071)	(0.082)	(0.075)	(0.075)		
Ν	8,688	8,688	8,688	8,688	8,688		
R^2	0.017	0.017	0.017	0.017	0.017		
		Η	E. Non-activ	re			
Scotland	-0.045	-0.050	-0.042	-0.071	-0.081		
	(0.057)	(0.062)	(0.073)	(0.083)	(0.088)		
After 2002	0.011	0.012	0.011	0.011	0.012		
	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)		
Scotland × after 2002	0.085	0.070	0.131	0.170 ^c	0.160 ^c		
	(0.069)	(0.075)	(0.082)	(0.088)	(0.093)		
Ν	9,426	9,426	9,426	9,426	9,426		
R^2	0.020	0.020	0.020	0.020	0.020		
	F. Non-active, controlling for care hours provided						
Scotland	-0.039	-0.039	-0.027	-0.040	-0.054		
	(0.069)	(0.077)	(0.091)	(0.106)	(0.113)		
After 2002	0.010	0.011	0.010	0.010	0.010		
	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)		
Scotland × after 2002	0.108	0.098	0.171 ^c	0.206 ^c	0.202 ^c		
	(0.080)	(0.089)	(0.099)	(0.108)	(0.115)		
Ν	8,521	8,521	8,521	8,521	8,521		
R^2	0.028	0.028	0.029	0.029	0.028		
		G. Low	est-income	quintile			
Scotland	-0.017	-0.004	0.015	-0.018	-0.030		
	(0.084)	(0.095)	(0.107)	(0.133)	(0.134)		
After 2002	0.042	0.044	0.043	0.043	0.043		
	(0.052)	(0.052)	(0.051)	(0.051)	(0.051)		
Scotland × after 2002	0.073	0.056	0.103	0.160	0.173		
	(0.105)	(0.118)	(0.129)	(0.138)	(0.138)		

TABLE 1. Continued

GHQ rev. (general happiness domain)	C10	C20	C35	C50	C100
N	3,496	3,496	3,496	3,496	3,496
R^2	0.018	0.018	0.018	0.018	0.018
	H. Lowes	t-income qu	uintile, cont provided	rolling for c	are hours
Scotland	-0.035	-0.026	-0.011	-0.016	-0.031
	(0.106)	(0.127)	(0.144)	(0.187)	(0.189)
After 2002	0.034	0.035	0.034	0.035	0.035
	(0.055)	(0.055)	(0.055)	(0.054)	(0.054)
Scotland × after 2002	0.106	0.099	0.155	0.205	0.219
	(0.127)	(0.148)	(0.167)	(0.189)	(0.190)
Ν	3,169	3,169	3,169	3,169	3,169
R^2	0.026	0.026	0.027	0.027	0.027

TABLE 1. Continued

Note: C100 includes only unpaid carers who provided at baseline 100 hours or more of weekly care, C50 those who provided at least 50 hours, C35 those who provided at least 35 hours, C20 those who provided at least 20 hours, and C10 those who provided at least 10 hours. At follow-up all the carers have provided at least 10 hours of care. All models presented in the above table control for gender, age, marital status, having non-cohabiting children, education level, monthly income, and a polynomial time trend of the second order. Additionally, all treated units reside in Scotland. ${}^{\rm b}p < 0.05$, ${}^{\rm c}p < 0.10$.

means-tested care available throughout the United Kingdom among individuals with wealth below £23,000.

C.2. EFFECTS ON CAREGIVERS AT BASELINE (EXCLUDING THE IMPLEMENTA-TION YEAR). As a robustness check, we removed the year 2002 from the analysis, as the information about the reform may have affected the behavior of carers even before the FPC was implemented in law (see Table 2). Even when we exclude 2002 our estimates confirm the previous findings in Table 1, suggesting that in many instances, the effects on happiness are even stronger. We find an average 10–13 pp increase in happiness without controlling by hours of care among those who were providing at least 35 hours of care at baseline (panels A and B). As in the previous results, we find larger effects among women (17 pp), both without controlling by hours of care among individuals providing at least 50 hours of care at baseline, and after controlling for them (21 pp in panels C and D). Again, the effects are larger among non-active individuals (19 pp without controlling for hours of care, and 23 pp when controlling for them in panels E and F). Finally, no effects are found among lower-income groups consistently with a benefit extension that was means tested at baseline.

We have also reestimated our models controlling for pre-trends and using an ordered probit specification. Again results are strongly consistent with our main specification,

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GHQ rev. (general happiness domain)	C10	C20	C35	C50	C100			
		А.	Overall sam	ıple				
Scotland	-0.047	-0.054	-0.056	-0.090	-0.110			
	(0.052)	(0.056)	(0.065)	(0.071)	(0.077)			
After 2002	0.042	0.042 ^c	0.042	0.042	0.042			
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)			
Scotland × after 2002	0.068	0.055	0.097 ^c	0.128 ^b	0.136 ^b			
	(0.055)	(0.056)	(0.055)	(0.051)	(0.054)			
Ν	14,388	14,388	14,388	14,388	14,388			
R^2	0.012	0.012	0.012	0.012	0.012			
	B. Overal	Overall sample, controlling for care hours provided						
Scotland	-0.034	-0.031	-0.027	-0.048	-0.072			
	(0.061)	(0.069)	(0.079)	(0.089)	(0.098)			
After 2002	0.041	0.042	0.042	0.042	0.042			
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)			
Scotland × after 2002	0.086	0.073	0.118 ^c	0.142 ^b	0.156 ^b			
	(0.060)	(0.061)	(0.061)	(0.056)	(0.061)			
Ν	13,243	13,243	13,243	13,243	13,243			
R^2	0.019	0.019	0.020	0.020	0.020			
			C. Women					
Scotland	-0.066	-0.082	-0.084	-0.162	-0.162			
	(0.075)	(0.089)	(0.112)	(0.132)	(0.132)			
After 2002	0.002	0.003	0.003	0.003	0.003			
	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)			
Scotland × after 2002	0.115 ^c	0.097	0.108	0.175 ^b	0.175 ^b			
	(0.065)	(0.069)	(0.081)	(0.073)	(0.073)			
Ν	8,621	8,621	8,621	8,621	8,621			
R^2	0.006	0.006	0.006	0.007	0.007			
	D. Wo	omen, contr	olling for ca	re hours pr	ovided			
Scotland	-0.066	-0.075	-0.077	-0.144	-0.144			
	(0.087)	(0.107)	(0.135)	(0.165)	(0.165)			

TABLE 2. Estimation of the difference-in-difference model of FPC on caregivers' happiness excluding observations from year

GHQ rev. (general happiness domain)	C10	C20	C35	C50	C100
After 2002	-0.017	-0.015	-0.015	-0.015	-0.015
	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)
Scotland × after 2002	0.142 ^c	0.127	0.149	0.210 ^b	0.210 ^b
	(0.074)	(0.081)	(0.095)	(0.090)	(0.090)
Ν	7,921	7,921	7,921	7,921	7,921
R^2	0.018	0.018	0.018	0.018	0.018
		E	E. Non-activ	re	
Scotland	-0.057	-0.057	-0.058	-0.096	-0.111
	(0.066)	(0.071)	(0.083)	(0.093)	(0.099)
After 2002	0.042	0.043	0.042	0.042	0.042
	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)
Scotland × after 2002	0.097	0.077	0.147	0.196 ^b	0.191 ^c
	(0.078)	(0.086)	(0.092)	(0.095)	(0.102)
Ν	8,556	8,556	8,556	8,556	8,556
R^2	0.019	0.019	0.019	0.019	0.019
	F. Non-	active, cont	rolling for a	care hours p	rovided
Scotland	-0.048	-0.042	-0.039	-0.059	-0.077
	(0.080)	(0.089)	(0.103)	(0.118)	(0.127)
After 2002	0.042	0.043	0.041	0.041	0.042
	(0.035)	(0.034)	(0.034)	(0.034)	(0.034)
Scotland × after 2002	0.121	0.107	0.189 ^c	0.231 ^b	0.232 ^c
	(0.092)	(0.103)	(0.111)	(0.118)	(0.128)
Ν	7,736	7,736	7,736	7,736	7,736
R^2	0.029	0.029	0.030	0.030	0.030
		G. Low	est-income	quintile	
Scotland	-0.020	-0.007	0.016	-0.042	-0.057
	(0.098)	(0.114)	(0.126)	(0.149)	(0.150)
After 2002	0.044	0.046	0.045	0.045	0.045
	(0.057)	(0.057)	(0.057)	(0.056)	(0.056)
Scotland × after 2002	0.078	0.061	0.103	0.183	0.198
	(0.123)	(0.139)	(0.152)	(0.153)	(0.154)

TABLE 2. Continued

GHQ rev. (general happiness domain)	C10	C20	C35	C50	C100
N	3,177	3,177	3,177	3,177	3,177
R^2	0.018	0.018	0.018	0.018	0.018
	H. Lowes	t-income q	uintile, cont provided	rolling for c	are hours
Scotland	-0.033	-0.025	-0.003	-0.031	-0.048
	(0.123)	(0.151)	(0.168)	(0.209)	(0.211)
After 2002	0.045	0.047	0.046	0.047	0.047
	(0.059)	(0.058)	(0.058)	(0.058)	(0.058)
Scotland × after 2002	0.109	0.105	0.154	0.226	0.243
	(0.148)	(0.175)	(0.195)	(0.211)	(0.213)
Ν	2,885	2,885	2,885	2,885	2,885
<i>R</i> ²	0.029	0.029	0.029	0.029	0.029

TABLE 2. Continued

Note: C100 includes only unpaid carers who provided at baseline 100 hours or more of weekly care, C50 those who provided at least 50 hours, C35 those who provided at least 35 hours, C20 those who provided at least 20 hours, and C10 those who provided at least 10 hours. At follow-up all the carers have provided at least 10 hours of care. All models presented in the above table control for gender, age, marital status, having non-cohabiting children, education level, monthly income, and a polynomial time trend of the second order. Additionally, all treated units reside in Scotland. ^bp < 0.05, ^cp < 0.10.

and detailed results have been included in the Online Appendix (see Tables B3 and B4).

C.3. EFFECTS ON ALTERNATIVE DEFINITIONS OF "CAREGIVING." Next, we have also estimated a less restrictive version of the model that includes those carers who were providing any hours of care at any point in time. Results from this specification are reported in Tables 3 and 4. Unlike previous results, estimates in Table 3 are less precise and suggest that including 2002 increases happiness by 12–14 pp among women providing more than 100 hours of care, and by 16–21 pp among non-active caregivers providing more than 50 hours of care a week. Finally, we find some positive, though less precise, estimates among lower-income groups that vary with the inclusion of controls for hours of care.

Next, we have performed a final robustness check in which we exclude observations from the year 2002. Results are shown in Table 4. We document estimates consistent with Table 1, namely that perceived happiness increases by 10–11 pp among the overall sample, a finding that is robust to controlling for hours of care. Estimates are larger (17–18 pp) among women and, especially, among non-active populations (20–24 pp).

C.4. EFFECT OF THE EXPANSION OF THE ATTENDANCE ALLOWANCE. One potential explananton for our estimates is that some of these effects are driven by a simultaneous increase

GHQ rev. (general happiness domain)	C10	C20	C35	C50	C100
		А.	Overall sam	ple	
Scotland	0.003	-0.036	-0.018	-0.052	-0.084
	(0.049)	(0.049)	(0.057)	(0.063)	(0.073)
After 2002	0.023	0.023	0.023	0.023	0.023
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Scotland × after 2002	0.016	0.026	0.040	0.070	0.083
	(0.048)	(0.050)	(0.053)	(0.049)	(0.054)
Ν	15,863	15,863	15,863	15,863	15,863
R^2	0.013	0.013	0.013	0.013	0.013
	B. Overal	l sample, co	ontrolling fo	r care hours	provided
Scotland	0.025	-0.006	0.019	-0.004	-0.041
	(0.055)	(0.057)	(0.068)	(0.077)	(0.090)
After 2002	0.024	0.024	0.024	0.024	0.024
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Scotland × after 2002	0.014	0.022	0.036	0.059	0.080
	(0.053)	(0.056)	(0.059)	(0.056)	(0.063)
Ν	14,598	14,598	14,598	14,598	14,598
R^2	0.019	0.018	0.019	0.019	0.019
			C. Women		
Scotland	-0.052	-0.079	-0.058	-0.133	-0.158
	(0.061)	(0.070)	(0.084)	(0.098)	(0.106)
After 2002	-0.000	0.000	0.001	0.000	0.000
	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)
Scotland × after 2002	0.070	0.061	0.040	0.095	0.119 ^c
	(0.059)	(0.064)	(0.069)	(0.060)	(0.063)
Ν	9,471	9,471	9,471	9,471	9,471
R^2	0.007	0.007	0.007	0.008	0.008
	D. We	omen, contr	olling for ca	re hours pro	ovided
Scotland	-0.037	-0.058	-0.034	-0.103	-0.135

TABLE 3.	Estimation	of the	differen	ce-in-diffe	erence	model	of FPC	; on
caregivers	happiness							

(0.136)

(0.069) (0.081) (0.100) (0.122)

GHQ rev. (general happiness domain)	C10	C20	C35	C50	C100		
After 2002	-0.011	-0.010	-0.010	-0.010	-0.010		
	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)		
Scotland × after 2002	0.072	0.064	0.051	0.105	0.136 ^c		
	(0.064)	(0.070)	(0.078)	(0.069)	(0.075)		
Ν	8,688	8,688	8,688	8,688	8,688		
R^2	0.017	0.017	0.016	0.017	0.017		
		I	E. Non-activ	re			
Scotland	-0.037	-0.045	-0.032	-0.074	-0.106		
	(0.051)	(0.057)	(0.066)	(0.074)	(0.086)		
After 2002	0.012	0.012	0.011	0.011	0.011		
	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)		
Scotland × after 2002	0.064	0.061	0.112	0.160 ^b	0.166 ^c		
	(0.063)	(0.070)	(0.076)	(0.078)	(0.089)		
Ν	9,426	9,426	9,426	9,426	9,426		
R^2	0.020	0.020	0.020	0.020	0.020		
	F. Non-active, controlling for care hours provided						
Scotland	-0.023	-0.024	-0.006	-0.035	-0.072		
	(0.061)	(0.070)	(0.081)	(0.093)	(0.111)		
After 2002	0.011	0.011	0.010	0.010	0.010		
	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)		
Scotland × after 2002	0.080	0.080	0.143	0.191 ^b	0.209 ^c		
	(0.073)	(0.083)	(0.091)	(0.096)	(0.113)		
Ν	8,521	8,521	8,521	8,521	8,521		
R^2	0.028	0.028	0.029	0.029	0.028		
		G. Low	est-income	quintile			
Scotland	0.041	0.042	0.042	0.042	0.042		
	(0.052)	(0.052)	(0.052)	(0.051)	(0.051)		
After 2002	-0.044	-0.045	-0.024	-0.047	-0.078		
	(0.074)	(0.081)	(0.088)	(0.106)	(0.126)		
Scotland × after 2002	0.089	0.098	0.141	0.185	0.220 ^c		
	(0.098)	(0.105)	(0.115)	(0.112)	(0.131)		

TABLE 3. Continued

GHQ rev. (general happiness domain)	C10	C20	C35	C50	C100			
N	3,496	3,496	3,496	3,496	3,496			
R^2	0.018	0.018	0.018	0.018	0.018			
	H. Lowest-income quintile, controlling for care hours provided							
Scotland	-0.053	-0.058	-0.036	-0.033	-0.078			
	(0.091)	(0.105)	(0.116)	(0.145)	(0.180)			
After 2002	0.033	0.034	0.034	0.035	0.035			
	(0.055)	(0.055)	(0.055)	(0.054)	(0.054)			
Scotland × after 2002	0.108	0.126	0.177	0.213	0.265			
	(0.116)	(0.128)	(0.145)	(0.150)	(0.181)			
Ν	3,169	3,169	3,169	3,169	3,169			
R^2	0.027	0.027	0.027	0.027	0.027			

TABLE 3. Continued

Note: C100 includes only unpaid carers who provided at baseline 100 hours or more of weekly care, C50 those who provided at least 50 hours, C35 those who provided at least 35 hours, C20 those who provided at least 20 hours, and C10 those who provided at least 10 hours. At follow-up all the carers have provided at least 1 hour of care. All models presented in the above table control for gender, age, marital status, having non-cohabiting children, education level, monthly income, and a polynomial time trend of the second order. Additionally, all treated units reside in Scotland. ^b*p* < 0.05, ^c*p* < 0.10.

in the amount of the attendance allowance, a country-wide cash subsidy.¹⁶ However, as reported in Online Appendix Table B5, the attendance allowance after 2002 did not affect the perceived happiness of caregivers. Estimates suggest no evidence of an effect on both the overall sample and the sample of female caregivers (panels A and C). We also do not find an effect when we control for hours of care (panels B and D). Such results are consistent with the hypothesis that cash subsidies might not influence caregivers' well-being as much as subsidized supports.

C.5. PLACEBOS. To enhance the robustness of our results, we have examined the effect of FPC on an unrelated event such as electoral participation in general-level elections, as FPC was a devolved reponsibility. Online Appendix Table B6 reports that, as expected, FPC does not modify caregivers' participation in a general election.

C.6. MECHANSIMS. To investigate potential mechanisms underlying prior findings, Table 5 presents the DiD estimates of the FPC on the income, employment participation,

¹⁶ The attendance allowance is a benefit for people over state pension age who need help with personal care or supervision because of illness or disability (around £60 per week if help is needed during the day or at night).

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GHQ rev. (general happiness domain)	C10	C20	C35	C50	C100
		А.	Overall sam	ple	
Scotland	-0.011	-0.056	-0.042	-0.084	-0.117
	(0.055)	(0.051)	(0.060)	(0.065)	(0.076)
After 2002	0.042 ^c	0.042 ^c	0.042 ^c	0.042 ^c	0.042
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Scotland × after 2002	0.030	0.046	0.064	0.102^{b}	0.116 ^b
	(0.054)	(0.054)	(0.054)	(0.048)	(0.053)
Ν	14,388	14,388	14,388	14,388	14,388
R^2	0.012	0.012	0.012	0.012	0.012
	B. Overal	l sample, co	ntrolling fo	r care hours	provided
Scotland	0.011	-0.026	-0.004	-0.034	-0.071
	(0.062)	(0.061)	(0.071)	(0.080)	(0.095)
After 2002	0.043	0.043	0.042	0.042	0.042
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
Scotland × after 2002	0.030	0.045	0.063	0.094 ^c	0.115 ^c
	(0.059)	(0.060)	(0.061)	(0.055)	(0.064)
Ν	13,243	13,243	13,243	13,243	13,243
R^2	0.019	0.019	0.019	0.019	0.019
			C. Women		
Scotland	-0.084	-0.108	-0.081	-0.170	-0.205 ^c
	(0.067)	(0.078)	(0.093)	(0.108)	(0.118)
After 2002	0.002	0.003	0.004	0.003	0.002
	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)
Scotland × after 2002	0.105	0.092	0.066	0.135 ^b	0.168 ^b
	(0.065)	(0.071)	(0.077)	(0.068)	(0.071)
Ν	8,621	8,621	8,621	8,621	8,621
R^2	0.006	0.007	0.006	0.007	0.007
	D. Wo	omen, contr	olling for ca	re hours pr	ovided
Scotland	-0.069	-0.085	-0.055	-0.133	-0.175
	(0.076)	(0.09)	(0.11)	(0.133)	(0.148)

TABLE 4. Estimation of the difference-in-difference model of FPC on caregivers' happiness excluding observations from year 2002

GHQ rev. (general happiness domain)	C10	C20	C35	C50	C100	
After 2002	-0.016	-0.015	-0.014	-0.015	-0.015	
	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)	
Scotland × after 2002	0.11	0.098	0.079	0.144 ^c	0.186 ^b	
	(0.072)	(0.078)	(0.088)	(0.081)	(0.088)	
Ν	7,921	7,921	7,921	7,921	7,921	
R^2	0.018	0.018	0.018	0.018	0.018	
		Ε	E. Non-activ	re		
Scotland	-0.054	-0.055	-0.049	-0.102	-0.137	
	(0.058)	(0.065)	(0.074)	(0.081)	(0.096)	
After 2002	0.042	0.043	0.042	0.041	0.042	
	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	
Scotland × after 2002	0.081	0.071	0.129	0.188 ^b	0.198 ^b	
	(0.07)	(0.08)	(0.084)	(0.083)	(0.097)	
Ν	8,556	8,556	8,556	8,556	8,556	
R^2	0.019	0.019	0.019	0.019	0.019	
	F. Non-active, controlling for care hours provided					
Scotland	-0.039	-0.031	-0.020	-0.059	-0.098	
	(0.07)	(0.08)	(0.090)	(0.103)	(0.124)	
After 2002	0.042	0.043	0.041	0.041	0.041	
	(0.035)	(0.035)	(0.034)	(0.034)	(0.034)	
Scotland × after 2002	0.099	0.092	0.162	0.221 ^b	0.241 ^c	
	(0.083)	(0.095)	(0.101)	(0.104)	(0.125)	
Ν	7,736	7,736	7,736	7,736	7,736	
R^2	0.029	0.029	0.030	0.030	0.030	
	G. Lowest-income quintile					
Scotland	-0.048	-0.051	-0.023	-0.061	-0.100	
	(0.084)	(0.093)	(0.100)	(0.117)	(0.140)	
After 2002	0.043	0.044	0.044	0.044	0.044	
	(0.057)	(0.057)	(0.057)	(0.057)	(0.056)	
Scotland × after 2002	0.095	0.105	0.140	0.198	0.241 ^c	
	(0.111)	(0.119)	(0.130)	(0.123)	(0.144)	

TABLE 4. Continued

GHQ rev. (general happiness domain)	C10	C20	C35	C50	C100	
N	3,177	3,177	3,177	3,177	3,177	
R^2	0.018	0.018	0.018	0.018	0.018	
	H. Lowest-income quintile, controlling for care hours provided					
Scotland	-0.054	-0.061	-0.032	-0.043	-0.099	
	(0.104)	(0.121)	(0.131)	(0.159)	(0.198)	
After 2002	0.045	0.046	0.045	0.046	0.046	
	(0.059)	(0.058)	(0.058)	(0.058)	(0.058)	
Scotland × after 2002	0.114	0.136	0.180	0.230	0.294	
	(0.131)	(0.147)	(0.163)	(0.165)	(0.200)	
Ν	2,885	2,885	2,885	2,885	2,885	
<i>R</i> ²	0.029	0.029	0.029	0.029	0.030	

TABLE 4. Continued

Note: C100 includes only unpaid carers who provided at baseline 100 hours or more of weekly care, C50 those who provided at least 50 hours, C35 those who provided at least 35 hours, C20 those who provided at least 20 hours, and C10 those who provided at least 10 hours. At follow-up all the carers have provided at least 1 hour of care. All models presented in the above table control for gender, age, marital status, having non-cohabiting children, education level, monthly income, and a polynomial time trend of the second order. Additionally, all treated units reside in Scotland. ^bp < 0.05, ^cp < 0.10.

health, hospitalizations, and leisure satisfaction of caregivers. Income effects can result from either further employment, the reduction of paid care, or other expenses that would take place in the absence of FPC. However, in addition to income effects, FPC can influence employment, which can in turn improve the well-being of caregivers who reevaluate their social identity (Mueser et al. 1997). FPC can improve the opportunities for leisure activities, which can also impact the subjective well-being of family caregivers (Schüz et al. 2015). Finally, FPC might free up time, which can reduce stress and hence improve health and decrease the probability of hospitalizations.

Again, we distinguish the estimates by hours of caregiving and by whether 2002, the year of the reform, is included. Results in panels A and B of Table 5 suggest that FPC entailed an increase of 10–15 pp in caregivers' income depending on the hours of care provided and whether 2002 is included in the analysis. These estimates suggest that previous estimates might be driven by changes in caregivers' income. Next, we examine whether such estimates are explained by changes in employment. We find no significant effects on employment participation, as shown in panels C and D, with the exception of caregivers who provide 20 hours of care, where there is an ambiguous increase in employee participation.

Finally, we examine the effects on caregivers' self-reported health, as physical health and hospitalizations might change after the provision of supports to caregivers. However,

	C10	C20	C35	C50	C100	
		A. Income				
Scotland	-0.084	-0.101 ^c	-0.086	-0.115	-0.122	
	(0.061)	(0.059)	(0.069)	(0.077)	(0.079)	
After 2002	-0.095^{a}	-0.097^{a}	-0.097^{a}	-0.097^{a}	-0.097^{a}	
	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	
Scotland × after 2002	0.016	0.065	0.102 ^c	0.128 ^b	0.105 ^c	
	(0.062)	(0.051)	(0.055)	(0.060)	(0.059)	
Ν	16,249	16,249	16,249	16,249	16,249	
R^2	0.233	0.233	0.233	0.233	0.233	
		B.	Income, no 20	02		
Scotland	-0.089	-0.118 ^c	-0.110	-0.143 ^c	-0.139 ^c	
	(0.068)	(0.062)	(0.072)	(0.078)	(0.084)	
After 2002	-0.103^{b}	-0.104^{b}	-0.105^{b}	-0.105^{b}	-0.104^{b}	
	(0.042)	(0.042)	(0.042)	(0.042)	(0.042)	
Scotland × after 2002	0.018	0.079	0.124 ^c	0.155 ^b	0.120 ^c	
	(0.075)	(0.063)	(0.068)	(0.073)	(0.071)	
Ν	14,732	14,732	14,732	14,732	14,732	
R^2	0.230	0.230	0.230	0.230	0.230	
			C. Employment	t		
Scotland	-0.006	0.006	0.013	0.009	0.010	
	(0.021)	(0.025)	(0.029)	(0.032)	(0.035)	
After 2002	-0.003	-0.002	-0.002	-0.002	-0.002	
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	
Scotland × after 2002	0.015	0.006	0.004	-0.005	0.002	
	(0.029)	(0.036)	(0.040)	(0.046)	(0.049)	
Ν	16,245	16,245	16,245	16,245	16,245	
R^2	0.011	0.011	0.011	0.011	0.011	

TABLE 5. Mechansims: Estimation of the difference-in-difference of FPC on caregivers' income, employment, health, hospitalizations, and leisure satisfaction (carers providing at least 10 hours/week at baseline and follow-up)

	C10	C20	C35	C50	C100		
	D. Employment, no 2002						
Scotland	-0.066	-0.104^{b}	-0.082	-0.070	-0.078		
	(0.045)	(0.047)	(0.052)	(0.058)	(0.063)		
After 2002	-0.031 ^c	-0.031 ^c	-0.031 ^c	-0.031 ^c	-0.031 ^c		
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)		
Scotland × after 2002	0.044	0.089 ^c	0.074	0.103	0.114		
	(0.047)	(0.051)	(0.058)	(0.068)	(0.073)		
Ν	13,539	13,539	13,539	13,539	13,539		
R^2	0.437	0.437	0.437	0.437	0.437		
			E. Health				
Scotland	-0.203 ^b	-0.213 ^b	-0.268^{a}	-0.208 ^b	-0.229 ^b		
	(0.083)	(0.089)	(0.097)	(0.102)	(0.110)		
After 2002	0.019	0.021	0.020	0.020	0.020		
	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)		
Scotland × after 2002	0.052	-0.022	0.067	0.039	0.043		
	(0.086)	(0.099)	(0.102)	(0.116)	(0.124)		
Ν	15,777	15,777	15,777	15,777	15,777		
R^2	0.086	0.086	0.086	0.085	0.085		
		F. Health, no 2002					
Scotland	-0.185 ^b	-0.180 ^c	-0.229 ^b	-0.155	-0.180		
	(0.089)	(0.098)	(0.107)	(0.110)	(0.120)		
After 2002	0.014	0.016	0.014	0.014	0.014		
	(0.040)	(0.040)	(0.040)	(0.040)	(0.040)		
Scotland × after 2002	0.031	-0.058	0.025	-0.018	-0.011		
	(0.102)	(0.118)	(0.124)	(0.139)	(0.151)		
Ν	14,260	14,260	14,260	14,260	14,260		
<i>R</i> ²	0.086	0.086	0.086	0.085	0.085		
		G. Hospitalizations					
Scotland	0.001	0.019	0.035	0.031	0.035		
	(0.025)	(0.031)	(0.036)	(0.039)	(0.043)		

TABLE 5. Continued

	C10	C20	C35	C50	C100			
After 2002	0.0001	0.001	0.001	0.001	0.001			
	(0.015)	(0.014)	(0.014)	(0.014)	(0.014)			
Scotland × after 2002	0.008	-0.007	-0.018	-0.026	-0.023			
	(0.033)	(0.040)	(0.045)	(0.051)	(0.055)			
Ν	14,728	14,728	14,728	14,728	14,728			
R^2	0.011	0.011	0.011	0.011	0.011			
		H. Hospitalizations, no 2002						
Scotland	0.001	0.019	0.035	0.031	0.035			
	(0.025)	(0.031)	(0.036)	(0.039)	(0.043)			
After 2002	0.000	0.001	0.001	0.001	0.001			
	(0.015)	(0.014)	(0.014)	(0.014)	(0.014)			
Scotland × after 2002	0.008	-0.007	-0.018	-0.026	-0.023			
	(0.033)	(0.040)	(0.045)	(0.051)	(0.055)			
Ν	14,728	14,728	14,728	14,728	14,728			
R^2	0.011	0.011	0.011	0.011	0.011			
		I. Leisure satisfaction						
Scotland	-0.315	-0.280	-0.315	-0.301	-0.346			
	(0.193)	(0.199)	(0.232)	(0.248)	(0.262)			
After 2002	-0.081	-0.081	-0.083	-0.084	-0.084			
	(0.062)	(0.062)	(0.062)	(0.062)	(0.062)			
Scotland × after 2002	-0.041	-0.061	0.039	0.079	0.056			
	(0.160)	(0.139)	(0.149)	(0.170)	(0.182)			
Ν	12,505	12,505	12,505	12,505	12,505			
R^2	0.121	0.120	0.120	0.120	0.120			
		J. Leisure satisfaction, no 2002						
Scotland	-0.173	-0.076	-0.061	-0.097	-0.141			
	(0.224)	(0.237)	(0.268)	(0.293)	(0.317)			
After 2002	0.068	0.069	0.066	0.064	0.064			
	(0.111)	(0.110)	(0.110)	(0.110)	(0.110)			
Scotland × after 2002	-0.180	-0.262	-0.211	-0.122	-0.144			
	(0.191)	(0.172)	(0.186)	(0.208)	(0.229)			

TABLE 5. Continued

	C10	C20	C35	C50	C100
N	11,028	11,028	11,028	11,028	11,028
R^2	0.120	0.119	0.119	0.119	0.119

TABLE 5. Continued

Note: C100 includes only unpaid carers who provided at baseline 100 hours or more of weekly care, C50 those who provided at least 50 hours, C35 those who provided at least 35 hours, C20 those who provided at least 20 hours, and C10 those who provided at least 10 hours. At follow-up all the carers have provided at least 10 hours of care. All models presented in the above table control for gender, age, marital status, having non-cohabiting children, education level, monthly income, and a polynomial time trend of the second order. Additionally, all treated units reside in Scotland. ^ap < 0.01, ^bp < 0.05, ^cp < 0.10.

our estimates in panels E, F, G, and H of Table 5 do not suggest evidence of any significant effects on health and the probability of hospitalization. Finally, we examine the effect on leisure satisfaction, and again our findings in panels I and J suggest no evidence of either effect on leisure satisfaction. These results suggest that although FPC increases well-being by providing some respite and additional income to caregivers, it is likely resulting from the reduction in the use of paid care, as such well-being effect does not directly affect health, leisure satisfaction, or labor market participation, but gives rise to significant income effects.

VII. Conclusion

This paper studies the effects of the expansion of caregiving supports on the caregiver's happiness. We study the causal effect of the introduction of FPC in Scotland on caregivers' well-being using an event study and a DiD approach. We estimate an average 10–11 pp increase in caregivers' happiness for the overall sample for carers who provide at least 50 hours of care a week. The estimates do not vary significantly when we control for hours of care provided. Consistent with the assumption that women bear most of the caregiving responsibility, we find that the increased happiness effect of FPC is stronger among female caregivers. Such estimates suggest that on average happiness improves by 2.2 percent and 5.7 percent depending on the hours of care provided. As expected, event study results suggest a consistent rise in happiness after the introduction of FPC. The effects on happiness appear to be driven by an improvement in caregivers' financial status (income effects), as we identify improvement in caregivers' income but no effects on their physical health or employment participation.

Overall, these results provide us with economically relevant evidence to understand the effects of FPC on caregivers' well-being. The overall picture is that the extension of subsidized services and supports improves the well-being of female caregivers, and caregivers who do not participate in the labor market. The mechanisms of the effect include changes in caregivers' income, which result from a reduction in paid care. Estimates are robust to placebo tests and other robustness checks. This is important evidence in light of reform proposals expanding the subsidy for caregiving supports in the United States.

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