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Deprivation using satisfaction measures in Spain: An evaluation of unemployment benefits

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Abstract

The evaluation of social programs constitutes an important aspect in the modeling of economic policies. On the basis that the measurement of well being through subjective measures provides a broader perspective than through objective economic variables, this paper first identifies the determinants of deprivation in Spain, in monetary terms, and in non-monetary terms using satisfaction variables. In addition to establishing that the more unequal the income distribution within a group, the less income-satisfied is the individual, we find that unemployment is one of the main determinants of deprivation and satisfaction. Accordingly, we propose a reform of unemployment benefit policy that maintains individuals at the same utility level as when employed, rather than applying the current benefit system. Our policy conclusions reveal that the public budget dedicated to paying benefits to restore satisfaction levels, during the period 1994–1999, would have increased by €2,536,165.13 thousand on an average annually. It could be a desirable policy in good times but, since it increases public spending and thus public deficit, economic policy makers should decide whether it is adequate in rainy days.

JEL classification: C25, I38, J28

Keywords: Deprivation; Satisfaction; SPAIN; Unemployment benefits

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1. Introduction

The reduction of deprivation should be a crucial policy target in every society, with previous evidence of its measurement being particularly shown for some developing and Mediterranean countries (Cantó & Mercader-Prats, 1998; D'Ambrosio & Gradín, 2001; Shaffer, 1998). The importance of this objective mainly derives from the fact that, if deprivation persists over time, certain disadvantaged groups, such as children, the elderly or the unemployed, are at risk of becoming socially excluded. The standard approach to deprivation analysis is to use objective economic variables, such as income or consumption (Barcena-Martín, Imedio-Olmedo, & Martín-Reyes, 2007). An alternative procedure consists of analyses through subjective measures, which provide a broader perspective, in the sense that, even when reductions in income polarization, or no increases in income inequality are experienced, greater social inequality can in fact be perceived (Carletto & Zezza, 2006; Kingdon & Knight, 2006).

In this paper, we first provide in Section 2 evidence of income distribution in Spain using traditional indices of inequality and polarization (Duro, 2005; Seshanna & Decornez, 2003), as well as alternative deprivation measures (Berrebi & Silber, 1985; Podder, 1996), which are complementary since they capture both inequality and social tensions (Esteban, 1996). The observed increase in polarization, in subjective terms, can be explained by the fact that objective measures capture only some portion of individual well-being. We then study in Section 3 the determinants of deprivation, in monetary terms and in non-monetary terms using satisfaction variables. We use data from the ECHP (1994–2001) for Spain, to estimate models of categorical variables, with the aim of evaluating the extent to which subjective satisfaction measures depend on relative deprivation, and on other socio-demographic determinants.

Another objective, carried out in Section 4, is to analyze the ability of the Spanish tax-benefit system to reduce individual deprivation. Since we identify unemployment as a significant shock to satisfaction levels (Latif, 2010), policies aimed at providing incentives for individuals to return to the labour market are very important. We analyze these incentives using traditional measures. Taking into account that the welfare system provides different levels of unemployment benefits, depending on individual and household characteristics, as well as on the previous employment status, we evaluate the costs of these policies, under the current system and under a hypothetical system that maintains individuals at the same level of satisfaction as when employed. In this way, we are able to compare deprivation of the unemployed in our hypothetical system, which considers subjective welfare measures, to the existing system, which only takes into account objective measures. We also compare incentives to pass into unemployment under the two systems, thus providing efficiency results for our proposal. We find that our proposal implies a reduction in deprivation and, hence, in the likelihood of exclusion, at the cost of increased public spending, which is particularly difficult at a time of austerity policies.

2. Data and income distribution

We use the eight waves of the European Community Household Panel-ECHP for Spain,[3] a longitudinal survey conducted by Eurostat from 1994 to 2001 for 15 European Countries. The statistical unit, throughout the analysis, is the individual. We select individuals reporting positive yearly net personal income, and we are limited to seven waves, since income variables

[3] See Peracchi (2002) for a description of the ECHP.

are related to the previous year. We measure income variables in real terms by dividing nominal income in € by the consumer price index, taking 1992 as base year. In monetary terms, most individuals have a positive degree of deprivation in each period, and only those in the highest income bracket do not suffer deprivation within the group.[4] Table 1 presents the mean and standard deviations of both endogenous and explanatory variables used in the analysis. We present four columns with descriptive statistics for the whole sample, and subsamples, by different satisfaction values.

Satisfaction is a subjective, discrete and ordinal variable built on the response to the following question: "How satisfied are you with your present financial situation?" It takes values from 1 (not satisfied at all) to 6 (fully satisfied). Deprivation is a variable constructed with reference to individuals within the same reference group, who are either more satisfied or have a higher gross/net income level (GID, NID). Relative deprivation in monetary terms is then a continuous variable, built as the difference between the average income of those of the individual's reference group, with higher income than the individual, and the individual's own income. On the other hand, relative deprivation in satisfaction terms (SD) takes values from 0 (not deprived at all) to 5 (the most deprived an individual can be in satisfaction terms).[5]

Other control variables can be classified in three groups: socio-demographic characteristics of the individual, x_{it} (age, gender, marital status, education, ...), characteristics of the household to which the individual belongs, z_{it} (family members and home ownership), and tax and benefit variables, y_{it}. Particularly, y_{it} is formed by net equivalent household income (ENHI), as well as by private and public transfers individuals receive, and taxes they pay. Depending on the specification, we include dummies controlling for whether individuals receive transfers, and for the amount. The set of variables indicates receipt of private transfers (DPRIVT) and its average (PRIVT); receipt of public benefits (DPUBT) and the mean (PUBT); individuals in our sample paying taxes (DTAX), with the average (TAX). The ECHP also allows us to distinguish several kinds of public transfers: individuals can receive sickness or disability benefits (DILT), unemployment benefits (DUB), some type of retirement or widowhood benefit (DRWT), retirement benefits (DRT), widowhood transfers (DWT) and family protection benefits, mainly maternity benefits (DMT). The amount of these transfers is controlled for, respectively, by variables named ILT, UB, RWT, RT, WT and MT.

We begin by examining the distribution of income in Spain between 1994 and 2001, providing two kinds of measure, inequality and polarization indices. Table 2 (panel A) shows Gini indices. We use eight reference groups in the population, four age groups (under 35, 35–54, 55–65, over 65) and gender, and we use the initial, gross and net income in equivalent OECD household units.[6] We observe that inequality remains constant during the period studied. We show the redistributive capacity of taxes, and both taxes and transfers, and we are able to determine that redistribution in Spain during this period is mainly produced via public expenditure rather than via taxes. However, the perception of the representative consumer is that households are losing purchasing power. There is similar evidence for other countries that indicates that,

[4] When analyzing deprivation in monetary terms there is little value in considering situations in which deprivation is equal to 0, since it occurs very rarely.

[5] Satisfaction deprivation (SD) is built assuming cardinality in the data. This is supported by the work of Ferrer-i-Carbonell and Frijters (2004) who found no differences assuming either cardinality or ordinality in life satisfaction data.

[6] We compute equivalent household income using the OECD equivalence scale, which assigns value 1 to a single-person household, and gives weight of 0.7 to the other adult members, and 0.5 to each child.

Table 1
Mean and std. dev. of dependent and explanatory variables.

Variables	All sample	1 & 2	3 & 4	5 & 6	Variables	All sample	1 & 2	3 & 4	5 & 6
Age	45.44	43.28	46.27	47.48	DTAX	0.42	0.40	0.43	0.43
	(19.31)	(19.09)	(18.99)	(19.69)		(0.49)	(0.49)	(0.50)	(0.50)
$Age^2/100$	24.38	22.37	25.02	26.42	DUB	0.04	0.07	0.04	0.02
	(19.14)	(18.50)	(18.97)	(19.83)		(0.20)	(0.25)	(0.19)	(0.14)
Male	0.48	0.47	0.49	0.49	DRWT	0.16	0.14	0.17	0.19
	(0.50)	(0.50)	(0.50)	(0.50)		(0.37)	(0.35)	(0.37)	(0.39)
Married	0.59	0.53	0.63	0.63	DRT	0.12	0.09	0.13	0.15
	(0.49)	(0.50)	(0.48)	(0.48)		(0.33)	(0.29)	(0.33)	(0.36)
Prim. educ	0.66	0.72	0.66	0.57	DWT	0.05	0.05	0.05	0.04
	(0.47)	(0.45)	(0.47)	(0.50)		(0.22)	(0.23)	(0.22)	(0.20)
Secon. educ	0.18	0.17	0.18	0.19	DMT	0.01	0.02	0.01	0.00
	(0.38)	(0.37)	(0.38)	(0.39)		(0.10)	(0.13)	(0.08)	(0.07)
High. Educ	0.16	0.11	0.16	0.24	DILT	0.04	0.05	0.03	0.02
	(0.37)	(0.31)	(0.37)	(0.43)		(0.18)	(0.21)	(0.17)	(0.15)
Illness	0.19	0.22	0.19	0.17	DST	0.00	0.00	0.00	0.00
	(0.39)	(0.41)	(0.39)	(0.37)		(0.02)	(0.02)	(0.02)	(0.02)
Fam size	3.63	3.80	3.57	3.47	PRIVT	1718.23	1495.76	1966.09	1967.04
	(1.56)	(1.65)	(1.50)	(1.51)		(2504.29)	(2343.87)	(2724.53)	(2527.35)
Owner	0.84	0.80	0.85	0.88	PUBT	4438.62	3374.55	4552.06	6318.81
	(0.36)	(0.40)	(0.35)	(0.32)		(4220.44)	(2273.77)	(3904.35)	(6571.26)
Children < 16	0.54	0.59	0.53	0.49	TAX	3268.59	1939.67	2965.70	6024.96
	(0.86)	(0.92)	(0.83)	(0.82)		(7708.21)	(2675.35)	(6111.17)	(13,391.16)
Unemployed	0.09	0.18	0.05	0.02	UB	2485.36	2300.96	2466.62	3627.55
	(0.28)	(0.39)	(0.22)	(0.15)		(6000.52)	(1636.50)	(5532.68)	(15,588.02)
Public sector	0.08	0.04	0.09	0.12	RWT	5455.38	4332.86	5425.66	6983.57
	(0.27)	(0.19)	(0.28)	(0.33)		(3494.00)	(2010.47)	(3243.82)	(4727.13)
Service sector	0.26	0.19	0.28	0.32	RT	5809.60	4548.90	5729.34	7257.15
	(0.44)	(0.39)	(0.45)	(0.46)		(3767.81)	(2290.69)	(3406.71)	(4954.07)
Fulltime	0.37	0.28	0.42	0.44	WT	3753.01	3499.19	3807.89	4157.17
	(0.48)	(0.45)	(0.49)	(0.50)		(1965.35)	(1186.24)	(2269.34)	(2325.90)
DPRIVT	0.01	0.02	0.01	0.01	MT	1007.21	784.30	1132.80	1663.79
	(0.11)	(0.14)	(0.09)	(0.08)		(1222.05)	(889.19)	(1191.75)	(1621.85)
DPUBT	0.26	0.29	0.25	0.24	ILT	4045.65	3562.35	4137.39	5592.24
	(0.44)	(0.45)	(0.43)	(0.43)		(3085.81)	(2252.37)	(3144.89)	(4693.29)

Table 2
Inequality and polarization from 1994 to 2000 (8 reference groups).

Panel A. Variation of inequality from 1994 to 2000

	G1	G2	G3	G4	G5	G6	G7	G8
Initial income	−12.94	−7.41	24.17	−11.55	−28.81	7.85	5.51	6.63
Gross income	−4.14	−2.07	−15.80	−18.63	−12.72	−12.79	−3.93	−5.42
Net income	−16.94	−10.69	−12.11	−13.27	−8.97	−3.73	9.29	1.14
Tax and ben	21.78	23.17	228.52	13.28	−57.25	27.67	−5.68	8.88
Taxes	167.97	163.13	−34.26	−55.00	−31.65	−66.08	−102.54	−61.73

Panel B. Polarization

	Primary versus secondary and higher education				Primary and secondary versus higher education			
	Log income measure		Satisfaction terms		Log income measure		Satisfaction terms	
γ	1	1.3	1	1.3	1	1.3	1	1.3
1994	0.15	0.12	0.18	0.15	0.12	0.10	0.16	0.14
1995	0.14	0.12	0.18	0.15	0.11	0.10	0.15	0.13
1996	0.14	0.12	0.22	0.18	0.11	0.10	0.19	0.17
1997	0.14	0.11	0.17	0.14	0.10	0.09	0.15	0.13
1998	0.15	0.13	0.20	0.17	0.12	0.10	0.16	0.14
1999	0.14	0.11	0.21	0.17	0.11	0.09	0.17	0.15
2000	0.14	0.11	0.21	0.17	0.11	0.09	0.17	0.14
$\%\Delta$								
94-00	−5.60	−8.15	11.80	8.79	−4.59	−7.73	4.87	1.42

In each column, G1–G8, variations of inequality within the different groups (age × gender) are reported.
In Panel B polarization indices in income and satisfaction terms are reported for two different reference groups in the population (defined in terms of education level).
Esteban and Ray (1994) defined a polarization measure in which individuals who belong to each of the groups are identified with the members of their group (intra-group identification) and they feel alienated regarding the members of other groups (inter-group alienation): $\mathrm{ER}(\gamma, \rho') = \sum_{i=1}^{n}\sum_{j=1}^{n}\pi_i^{1+\gamma}\pi_j \left|\ln\ y_j - \ln\ y_i\right|$. Then Esteban et al. (2007) introduced an extension that allows us to deal with distributions that were not previously organised in groups $P(F;\gamma,\lambda,\rho') = \mathrm{ER}(\gamma,\rho') - \lambda\left[G(F) - G(\rho')\right]$ where F is the income distribution and γ is the parameter that indicates the sensitivity of polarization, that is, the lower and thus the less sensitive to polarization is the social planner, the closer are polarization and inequality measures and λ is the weight given to the measurement error $\varepsilon = G(F) - G(\rho')$, that is the lack of identification within groups.

even when experiencing reductions in inequality, more social inequity is perceived, possibly due to an increase in polarization (Esteban, Gradín, & Ray, 2007; Esteban & Ray, 1994; Wolfson, 1994).

The evolution of polarization, both in income and in satisfaction terms, is shown in Table 2 (panel B). The unexpected result when comparing the two kinds of polarization indices is a reduction in terms of income, and an increase in terms of satisfaction, with the polarization index being higher in satisfaction than in income terms. A potential explanation is that objective measures capture only part of individual wellbeing, while subjective measures present a more complete picture, since they include unobserved factors (psychological or sociological, or aggregate, such as social tension) affecting individual satisfaction, which are not captured by economic variables.

3. Determinants of deprivation and satisfaction

3.1. Theoretical framework

An important issue when calculating inequality or polarization indices is heterogeneity in society. While inequality indices only take into account individual differences with respect to the mean, polarization indices require the definition of homogeneous groups, even while a high degree of heterogeneity exists within the groups. There are important implications in the definition of the reference groups, so it is necessary when analyzing wellbeing to examine specific sub-populations, particularly when the objective is to identify disadvantaged individuals who are at risk of deprivation, at least temporarily. In those cases where these situations are permanent, poverty or social exclusion may result (D'Ambrosio & Gradín, 2001). In order to address this concern, measures at the individual level, such as relative deprivation, are good complements to inequality and polarization indices, as they allow us to study each individual situation with respect to society as a whole, and with respect to the individual reference group.[7]

The concept of relative deprivation, first introduced by Runciman (1966), indicates that an individual with income y_i feels deprived regarding another individual with income y_j in the same reference group, when $d_i(y) = (y_j - y_i)$ if $y_i < y_j$, and $d_i(y) = 0$ in the remaining cases (Hey & Lambert, 1980; Yitzhaki, 1979). The relative deprivation function of an individual can be expressed in the following way (see D'Ambrosio & Frick, 2004):

$$d_i(y) = \frac{\sum_{j=i+1}^{n}(y_j - y_i)}{n} \tag{1}$$

The deprivation measure allows for a comparison between individuals and other members of their group, capturing the distribution of the group while inequality indices only capture inequality in a specific population but not the relative effect of distribution within groups. The polarization concept is also linked to deprivation and social exclusion, since these arise from the comparison with other members of society, and the aggregate alienation experienced by an individual with respect to those of different income or satisfaction levels. Deprivation and polarization differ, since the former is asymmetric, as individuals feel alienated or deprived regarding those who are better off, whereas in polarization individuals identify with those who are equally well or worse off (Bossert, D'Ambrosio, & Peragine, 2007).

3.2. Empirical specification

We estimate models for both income satisfaction and deprivation. Our survey data on these two variables is subjective, and suffer from observability problems. Satisfaction and deprivation are six- and five-point ordinal variables, respectively, and we take this into account in the proposed econometric model. Since we have panel data, discrete choice models, which can accommodate unobserved heterogeneity, are adequate, and thus we propose the following specification:

$$v^* = \beta_1 + \beta_2 x_{it} + \beta_3 y_{it} + \beta_4 z_{it} + \beta_5 d_{it}^I + u_{it} \tag{2}$$

[7] The reference sub-populations have been analyzed from different viewpoints in the economic literature, e.g. Duesenberry (1949) from the relative consumption theory, and Buchanan (1965) from the theory of clubs. Barrett and Esteban (2005) have recently surveyed the relevance of the definition of reference groups.

where v_{it}^* is the latent well-being of individual i in period t; $i=1, \ldots, N$; $t=1, \ldots, T$. [8] v_{it} is the observed subjective satisfaction, explained by individual characteristics x_{it}, tax and benefit variables y_{it}, household characteristics z_{it}, as well as by individual relative deprivation d_{it}^I. Since panel data allow us to control for time-invariant unobserved effects, we can express $u_{it}=\alpha_i+\xi_{it}$, as composed by a standard iid white noise error term, ξ_{it}, and the term capturing individual heterogeneity, α_i. Our identifying assumption is that α_i is independent of the explanatory variables in (2). The observability rule for v_{it}^* is:

$$v_{it} = \begin{cases} 1 & if \quad v_{it}^* \leq \kappa_1 \\ 2 & if \quad \kappa_1 < v_{it}^* \leq \kappa_2 \\ \vdots & \vdots \quad \vdots \\ 6 & if \quad v_{it}^* > \kappa_5 \end{cases} \tag{3}$$

where $\kappa_1, \ldots, \kappa_5$ are cut points which are jointly estimated with the βs.[9] Since the responses to satisfaction questions are ordered, the conditional probabilities of each event can be expressed as:

$$\begin{aligned} P(v_{it}=j \mid x_{it}, y_{it}, z_{it}, d_{it}^I, \alpha_i) = \Phi(\kappa_{j+1}-\alpha_i-\beta_1-\beta_2 x_{it}-\beta_3 y_{it}-\beta_4 z_{it}-\beta_5 d_{it}^I) \\ -\Phi(\kappa_j-\alpha_i-\beta_1-\beta_2 x_{it}-\beta_3 y_{it}-\beta_4 z_{it}-\beta_5 d_{it}^I) \end{aligned} \tag{4}$$

where Φ represents the cumulative distribution function. Assuming u_{it} is normally distributed (2) corresponds to a random effects ordered probit model[10] and Φ corresponds to the cumulative distribution function of the standard normal, since we cannot identify the variance of the error.

We face a simultaneity problem in (2), since individual deprivation d_{it}^I, can be endogenous for satisfaction regarding income, v_{it}. The origin of endogeneity could be either the behaviour of individuals or feedback through unobserved effects. Moreover, problem of measurement errors in d_{it}^I can generate correlation with the mixed disturbance. Our approach to endogeneity is through the auxiliary regression:

$$d_{it}^I=\delta_1+\delta_2 x_{it}+\delta_3 y_{it}+\delta_4 z_{it}+\varepsilon_{it} \quad i=1, \ldots, N; \quad t=1, \ldots, 7; \quad I=\text{SD, NID, GID} \tag{5}$$

where the super-index I in d_{it}^I refers to satisfaction deprivation (SD), net income deprivation (NID) and gross income deprivation (GID), δ_1 is a scalar and δ_2, δ_3 and δ_4 are vectors of parameters of adequate orders. As before, x_{it} are individual characteristics, y_{it} are tax and benefit variables, and z_{it} are household characteristics, all assumed to be strictly exogenous. $\varepsilon_{it}=\eta_i+w_{it}$ are random effects with η_i representing the deviation with respect to δ_1 for individual i, while w_{it} is a usual iid error term with zero mean and constant variance.

When we use the money metric expression for deprivation, we follow the suggestion of Rivers and Vuong (1988), introducing the predicted residuals of the auxiliary regression $\hat{\varepsilon}_{it}=d_{it}^I-\hat{\delta}_1-$

[8] Although we conduct the discussion assuming a balanced panel because of simplicity in the notation, everything is also valid for unbalanced panels. In fact, the empirical exercise is carried out on the unbalanced panel.

[9] We are assuming that the βs are common across different points of the dependent variables, although we could identify different parameters for certain variables.

[10] The model is estimated using STATA 9.1 and the module "REOPROB" by Guillaume R, Frechette (see www.econ.Ohio-state.edu/frechette/html/econ.htm).

$\hat{\delta}_2 x_{it} - \hat{\delta}_3 y_{it} - \hat{\delta}_4 z_{it}$ in (2) to correct the endogeneity problem, leading to the following expression:

$$v_{it}^{*} = \beta_1 + \beta_2 x_{it} + \beta_3 y_{it} + \beta_4 z_{it} + \beta_5 d_{it}^{I} + \gamma \hat{\varepsilon}_{it} + e_{it} \tag{6}$$

where we assume e_{it} is normally distributed and is uncorrelated with the other satisfaction determinants. Although (5) is a reduced form, its coefficients are still informative. We estimate the model using the following procedure. First, we estimate each equation on the pooled cross-sections. We then use the panel data structure, including individual effects, under both fixed and random effects interpretations. Finally, we conduct statistical tests and select the best fit. We estimate (5) and use the fitted values for instrumenting d_{it}^{I} in (2). Whereas we study deprivation in income terms, we introduce the residuals of the auxiliary regression in (2), leading to (6). We first examine the determinants of individual relative deprivation, and we then show the results regarding income satisfaction. In every case, we have estimated Eq. (5) on the pooled data, and also by assuming that the individual heterogeneity corresponds to fixed and random effects. We select between pooled and panel results by means of an LM test (Breusch–Pagan), and between fixed and random effects by means of a Hausman test. Our results first indicate that the panel estimation is preferred to the pooled estimation and, second, random effects models are always rejected with respect to their fixed effects counterparts, with our explanation for this latter result being the potential correlation between the random effects and certain socio-demographic variables.

3.3. Results on relative deprivation

Table 3 presents estimates of the determinants of satisfaction deprivation, and net and gross individual income deprivations, for several groups according to age, gender and level of education. We have obtained results for 6, 8 and 24 groups, but we only present the results corresponding to 8.[11] We first concentrate on the effects on deprivation of tax and benefit variables. Private transfers have a positive impact on deprivation, while the effect of public transfers is negative. The unexpected result for private transfers could be explained either because of a stigma effect, since such transfers are normally received from friends or relatives, or because the number of individuals receiving private transfers is very small in our sample. Public transfers help to reduce deprivation, an expected effect of the welfare system. Paying taxes has no effect on satisfaction deprivation, but it does have a negative effect on net income deprivation. Those who pay taxes are less deprived in net income than others in their reference group, a robust result even when we instrument the variable accounting for simultaneity (Gruber & Mullainathan, 2005).[12]

In general, the effect of socio-demographic variables is as expected and, for reasons of space, we focus our comments on the labour market situation of the individual. We observe that unemployment has strong effects on satisfaction deprivation, and on net and gross individual income deprivation. A transition to unemployment normally constitutes a reduction in income, given the unemployment benefit system, and it represents a decrease in well being, independent of income. This can arise because of a decline in self-esteem, loss of social relationships established at the workplace, or loss of the sense of contributing to society in a broader sense (socio-psychological

[11] Although we only present the results corresponding to 8 groups, the other estimates are available upon request. The 6 groups include education levels (Primary, Secondary and Higher) and gender (female, male). The 8 groups include age (under 35, 35–54, 55–65, over 65) and gender (female, male). The 24 groups include age, education and gender.

[12] Chakravarty and Moyes (2003) found the opposite effect while studying the effect of taxation on the degree of deprivation felt in society as a whole, where the more progressive the system, the higher the social deprivation.

Table 3
Relative deprivation in satisfaction and monetary terms.

Variables	Satisfaction deprivation			Net income deprivation			Gross income deprivation		
	Aggregated	Non aggregated		Aggregated	Non aggregated		Aggregated	Non aggregated	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
DPRIVT	0.44	0.45	0.43	0.21	0.21	0.17	0.57	0.59	0.52
	[0.17]***	[0.17]***	[0.18]**	[0.06]***	[0.06]***	[0.06]***	[0.11]***	[0.10]***	[0.11]***
DPUBT[i]	−0.20			−0.15			−0.28		
	[0.08]**			[0.03]***			[0.08]***		
DUNEMT[i]		0.01	0.01		−0.10	−0.12		−0.19	−0.23
		[0.01]	[0.01]		[0.00]***	[0.00]***		[0.01]***	[0.01]***
DRT[i]		−0.80	−0.46		−4.00	−3.81		−8.58	−8.61
		[0.31]***	[0.35]		[0.22]***	[0.24]***		[0.52]***	[0.56]***
DWT[i]		2.45	2.47		−6.56	−6.97		−10.84	−11.70
		[1.02]**	[1.22]**		[0.28]***	[0.33]***		[0.63]***	[0.69]***
DMT[i]		−0.01	−0.03		0.13	0.17		0.61	0.48
		[0.18]	[0.04]		[0.13]	[0.02]***		[0.33]*	[0.03]***
DILT		0.05	0.04		0.10	0.15		0.28	0.40
		[0.14]	[0.15]		[0.04]***	[0.04]***		[0.08]***	[0.09]***
DST		0.53	2.08		0.16	0.31		0.50	0.60
		[0.95]	[1.13]*		[0.17]	[0.11]***		[0.23]**	[0.18]***
DTAX[i]	−0.05	−0.03	0.02	−0.32	−0.32	−0.26			
	[0.10]	[0.10]	[0.11]	[0.05]***	[0.05]***	[0.05]***			
Age	−0.32	−0.31	−0.28	0.24	−0.34	−0.38	0.49	−0.65	−0.60
	[0.03]***	[0.06]***	[0.07]***	[0.01]***	[0.02]***	[0.02]***	[0.02]***	[0.05]***	[0.06]***
Age[2]/100	0.08	0.09	0.08	−0.12	0.39	0.44	−0.37	0.65	0.76
	[0.03]**	[0.05]*	[0.06]	[0.01]***	[0.02]***	[0.02]***	[0.02]***	[0.04]***	[0.05]***
Fam size	0.13	0.13	0.11	0.04	0.03	0.00	0.08	0.04	0.03
	[0.04]***	[0.04]***	[0.05]**	[0.02]**	[0.02]	[0.02]	[0.04]**	[0.04]	[0.05]
Owner	−0.10	−0.11	0.03	0.03	0.00	0.01	0.10	0.06	0.01
	[0.10]	[0.10]	[0.11]	[0.04]	[0.04]	[0.04]	[0.08]	[0.08]	[0.09]
Married	−0.98	−0.96	−0.95	−0.17	−0.18	−0.20	−0.16	−0.18	−0.23
	[0.14]***	[0.14]***	[0.16]***	[0.05]***	[0.05]***	[0.06]***	[0.11]	[0.11]	[0.13]*
Unemployed	1.93	1.91	1.87	0.05	−0.03	−0.02	−0.01	−0.17	−0.25
	[0.11]***	[0.11]***	[0.12]***	[0.05]	[0.05]	[0.06]	[0.13]	[0.13]	[0.15]

Table 3 (*Continued*)

Variables	Satisfaction deprivation			Net income deprivation			Gross income deprivation		
	Aggregated	Non aggregated		Aggregated	Non aggregated		Aggregated	Non aggregated	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Income source	−0.02	0.09	0.07	−0.01	0.02	0.02	−0.04	−0.03	−0.12
	[0.02]	[0.12]	[0.14]	[0.01]**	[0.04]	[0.05]	[0.01]***	[0.09]	[0.11]
Secon. educ	0.10	0.20	0.29	0.02	−0.19	−0.17	−0.03	−0.28	−0.44
	[0.12]	[0.16]	[0.19]	[0.04]	[0.06]***	[0.06]***	[0.09]	[0.13]**	[0.16]***
High. educ	0.20	0.07	0.04	−0.26	−0.03	0.03	−0.42	0.09	0.06
	[0.16]	[0.06]	[0.07]	[0.06]***	[0.03]	[0.04]	[0.13]***	[0.07]	[0.09]
Children < 16	0.07	−0.03	−0.03	0.02	−0.01	−0.01	0.19	−0.04	−0.04
	[0.06]	[0.02]	[0.02]	[0.03]	[0.01]**	[0.01]	[0.07]**	[0.01]***	[0.01]***
Illness	0.36	0.35	0.35	−0.10	−0.12	−0.10	−0.14	−0.19	−0.18
	[0.07]***	[0.07]***	[0.08]***	[0.03]***	[0.03]***	[0.03]***	[0.06]**	[0.06]***	[0.07]***
Public sector	−0.42	−0.42	−0.38	−0.04	−0.07	−0.01	0.27	0.22	0.36
	[0.15]***	[0.15]***	[0.17]**	[0.07]	[0.07]	[0.08]	[0.18]	[0.18]	[0.22]*
Service sector	−0.16	−0.15	−0.19	0.12	0.11	0.07	0.10	0.08	0.06
	[0.10]	[0.10]	[0.11]*	[0.06]**	[0.06]*	[0.06]	[0.12]	[0.12]	[0.14]
Fulltime	−1.42	−1.40	−1.47	−0.27	−0.32	−0.29	−0.12	−0.22	−0.35
	[0.12]***	[0.12]***	[0.13]***	[0.05]***	[0.05]***	[0.05]***	[0.10]	[0.10]**	[0.12]***
Constant	28.95	28.20	26.81	−2.49	14.06	14.97	−4.57	27.97	23.62
	[0.86]***	[1.74]***	[1.98]***	[0.35]***	[0.74]***	[0.78]***	[0.70]***	[1.59]***	[2.01]***
F	74.21	63.40	48.12	65.01	139.32	122.10	51.63	113.33	97.85
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
LM	13,232.80	13,214.26	10,860.31	23,736.61	16,340.64	11,573.28	32,726.57	27,034.38	17,483.12
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]

Table 3 (*Continued*)

Variables	Satisfaction deprivation			Net income deprivation			Gross income deprivation		
	Aggregated	Non aggregated		Aggregated	Non aggregated		Aggregated	Non aggregated	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Hausman	534.54	543.37	540.94	1914.84	2463.15	26,636.56		10,691.39	7326.27
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]		[0.00]	[0.00]
Observations	69,803	69,803	60,830	71,136	71,136	62,129	71,136	71,136	62,129
Individuals	16,767	16,767	16,270	16,862	16,862	16,371	16,862	16,862	16,371
R^2	0.04	0.04	0.04	0.03	0.05	0.06	0.02	0.04	0.04

To estimate the models we use an unbalanced panel. The results correspond to aggregation to 8 reference groups. Standard errors are in brackets. Columns 1, 4 and 7 report coefficients corresponding to the variable Public Transfers aggregated, while in the remaining columns we use individual, but not aggregated Public Transfers. Columns (3), (6) and (9) correspond to 6 years of data and instrumented Maternity transfers. Owning a house does not discriminate in relative terms as more than 80% of the Spanish population are home-owners.

* Individual significance at the 10% level.

** Individual significance at the 5% level.

*** Individual significance at the 1% level.

problems also captured by unobserved effects).[13] Working in the public sector helps to reduce satisfaction deprivation, while working in the services sector contributes to increase net income deprivation.[14] Finally, full-time employment is perceived to be the most important factor in reducing perceived individual deprivation.

Results presented in columns 2, 3, 5, 6, 8 and 9 of Table 3, show the effect on deprivation of receiving public transfers, differencing unemployment, retirement, widowhood, maternity, illness and scholarships. The magnitude and significance of individual and household characteristics are very similar to those observed in columns 1, 4 and 7 of Table 3. For the sake of simplicity, we only comment on the receipt of the different public transfers. Unemployment, retirement, widowhood and illness transfers have a negative effect on deprivation, which indicates the adequacy of the welfare system in reducing deprivation. However, maternity transfers positively influence income deprivation on a before-tax basis. Since income is not controlled for when analyzing the striking effect of transfers on deprivation, an income effect could reverse this result.

Public transfers form part of the welfare system, being designed to increase welfare or reduce deprivation after the occurrence of a shock. As a result, the dummies indicating whether individuals receive transfers can be endogenous and, in order to account for this simultaneity problem, we instrument these variables in the following way. The UB dummy is instrumented by the proportion of unemployed individuals in the corresponding reference group and time period, using data drawn from the Spanish Labour Force Survey. The MT dummy is instrumented by the proportion of individuals who give birth, or expect to give birth, in the corresponding reference group and year, using data from the Spanish Fertility Survey.[15] The results are very similar to those obtained without instrumenting the dummies for receipt of transfers. We have also estimated specifications instrumenting RT and WT dummies, using data drawn from the Spanish Institute of Social Security, corresponding to the cohorts and time periods of our sample. We find very similar results to those obtained when those variables were not instrumented.

Besides the indicators, the amount received enables us to perform a deeper analysis of their effects on deprivation. We present the results in Table 4, which reports the estimates on the subsample of individuals who received private transfers (column 1) and public transfers (column 2). Column 3 presents the effects of the amount of tax paid on relative satisfaction deprivation, together with the other determinants. The effects of the individual household variables, as well as of the amount of transfers, on relative satisfaction deprivation, for the different subsamples of individuals receiving diverse transfers, are reported in columns 4–9. The effect of the amount of transfers on satisfaction deprivation exhibits a U-shaped pattern. Individual deprivation is reduced up to a certain threshold at a rate, and beyond that at a lower rate, that is, once the threshold is crossed, a greater amount of transfers is needed to produce the same reduction in deprivation. In the case of taxes, the more tax individuals pay, the less deprived they feel, since they are wealthier compared to those of their reference group and to society as a whole.[16]

[13] The same result has been found by Waters and Moore (2001), who analyze whether the unemployed suffer economic deprivation, and how this leads to psychological problems.

[14] The average wage in the public sector is lower than in the other sectors captured in our specification.

[15] We should note that the fertility survey only covers the period 1994–1999.

[16] We are aware that the selection of the subsamples to carry out the estimations could be endogenous and, as a consequence, these results should be analyzed with caution.

Table 4
Relative satisfaction deprivation for each of the transfers (i) received.

Variables	PRIVT	PUBT	TAX	UB	RWT	MT	ILT	RT	WT
Transfer (i)	2.25	−1.48	−0.15	−1.01	−1.95	−4.05	−3.43	−2.20	−1.08
	[3.75]	[0.30]***	[0.05]***	[0.45]**	[0.46]***	[2.19]*	[1.04]***	[0.58]***	[1.09]
Transfer^2 (i)	−11.92	0.67		0.41	2.90	−13.25	−2.18	5.58	1.15
	[15.07]	[0.20]***		[0.23]*	[1.03]***	[13.63]	[6.96]	[1.47]***	[1.20]
Age	0.03	−0.06	−0.03	0.02	−0.04	0.01	0.02	−0.08	−0.03
	[0.06]	[0.01]***	[0.01]***	[0.01]***	[0.02]**	[0.01]	[0.01]***	[0.03]**	[0.02]
Age^2/100	−0.05	0.03	−0.00	−0.02	0.02	−0.01	−0.02	0.04	0.00
	[0.06]	[0.01]***	[0.01]	[0.01]***	[0.01]	[0.01]	[0.01]***	[0.02]**	[0.02]
Fam. size	−0.03	0.01	0.02	0.01	0.00	−0.00	0.00	0.01	0.00
	[0.09]	[0.01]	[0.01]***	[0.01]*	[0.01]	[0.02]	[0.01]	[0.01]	[0.02]
Owner	−0.06	−0.00	−0.01	−0.07	0.04	−0.10	−0.11	0.07	−0.01
	[0.15]	[0.02]	[0.01]	[0.02]***	[0.03]	[0.04]***	[0.03]***	[0.03]**	[0.05]
Married	0.20	−0.09	−0.06	−0.07	−0.13	−0.12	−0.02	−0.10	0.00
	[0.19]	[0.03]***	[0.02]***	[0.02]***	[0.05]***	[0.04]***	[0.03]	[0.05]**	[0.00]
Unemployed	0.18	0.12	0.16	0.18	−0.08	0.20	0.11	−0.22	−0.06
	[0.11]	[0.02]***	[0.02]***	[0.02]***	[0.08]	[0.05]***	[0.07]*	[0.19]	[0.09]
Income source	0.01	0.01	0.00	0.02	−0.00	0.02	0.03	0.01	−0.02
	[0.02]	[0.01]**	[0.00]	[0.01]***	[0.01]	[0.01]**	[0.01]***	[0.02]	[0.02]
Secon. educ	0.05	0.03	−0.01	−0.07	0.02	−0.12	−0.04	0.01	0.03
	[0.18]	[0.03]	[0.01]	[0.03]***	[0.04]	[0.05]**	[0.05]	[0.04]	[0.08]
High. educ	0.12	−0.02	−0.01	−0.15	−0.03	−0.22	0.02	−0.03	−0.13
	[0.31]	[0.04]	[0.02]	[0.03]***	[0.06]	[0.07]***	[0.05]	[0.06]	[0.13]
Children < 16	−0.10	−0.01	−0.00	0.02	−0.00	0.06	0.06	−0.01	−0.02
	[0.10]	[0.01]	[0.01]	[0.01]*	[0.02]	[0.02]***	[0.02]***	[0.03]	[0.03]
Illness	−0.02	0.05	0.03	0.08	0.05	0.15	0.08	0.04	0.05
	[0.11]	[0.01]***	[0.01]***	[0.02]***	[0.01]***	[0.05]***	[0.03]***	[0.01]***	[0.02]***
Public sector	0.27	0.07	−0.05	−0.03	0.17	−0.04	−0.05	1.39	0.16
	[0.26]	[0.04]	[0.02]***	[0.04]	[0.11]	[0.06]	[0.08]	[0.34]***	[0.11]
Service sector	0.07	−0.01	−0.02	−0.03	−0.03	−0.04	−0.00	−0.18	0.05
	[0.13]	[0.03]	[0.01]	[0.02]	[0.06]	[0.05]	[0.04]	[0.14]	[0.07]

Table 4 (*Continued*)

Variables	PRIVT	PUBT	TAX	UB	RWT	MT	ILT	RT	WT
Fulltime	−0.24	−0.23	−0.14	−0.15	−0.21	−0.20	−0.19	−0.01	−0.29
	[0.13]*	[0.02]***	[0.01]***	[0.02]***	[0.07]***	[0.05]***	[0.04]***	[0.14]	[0.08]***
Constant	1.69	4.26	2.68	1.31	3.75	1.72	1.22	4.88	3.47
	[1.29]	[0.28]***	[0.11]***	[0.12]***	[0.68]***	[0.23]***	[0.14]***	[1.13]***	[0.86]***
F	0.81	19.37	52.03	860.31	4.65	568.86	271.94	4.14	2.78
	[0.75]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
LM	67.14	4305.21	6048.88	191.47	2988.09	14.84	355.64	2154.02	909.65
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Hausman	294.92	237.17	124.91		232.60	29.45	26.23	320.32	99.88
	[0.00]	[0.00]	[0.00]		[0.00]	[0.20]	[0.56]	[0.00]	[0.00]
Observations	1325	27,777	42,584	4895	17,276	1009	3794	12,755	5341
Individuals	922	8274	11,895	2453	4172	717	1554	3241	1418
R^2	0.10	0.03	0.05		0.01			0.01	0.02

Transfer (i) corresponds to PRIVT, PUBT, TAX, UB, RWT, MT ILT, RT and WT. To estimate the models we use an unbalanced panel. The results correspond to aggregation to 8 reference groups. Standard errors are in brackets.

* Individual significance at the 10% level.

** Individual significance at the 5% level.

*** Individual significance at the 1% level.

3.4. Results on income satisfaction

Table 5 presents the coefficients of the random effects ordered probit models obtained by adjusting equations for individual subjective well-being. The first column presents the effect of satisfaction deprivation on welfare, and the remaining two columns report the effect of income-relative deprivation on well-being. Since deprivation variables are endogenous in satisfaction equations, we adjust the auxiliary regression (5) and we estimate (6), that is, we extend the satisfaction equations to include the predicted residuals obtained in the first step, and we calculate robust standard errors.

The more satisfaction deprived an individual is, in comparison to the reference group, the less economically satisfied is the individual, a similar result as the one found by D'Ambrosio and Frick (2004). We find that absolute income is important in explaining satisfaction, but we also find that, even when including net household equivalent income, relative income still significantly affects individual welfare, with this result being common in the literature, Clark and Oswald (1996), Easterlin (1995, 2001), Ferrer-i-Carbonell (2005), Ferrer-i-Carbonell and Van Praag (2003), Luttmer (2005) and Senik (2004, 2005), among others. Deprivation, however, positively affects satisfaction, but at a decreasing rate, the threshold of net household equivalent income being €17637.

When we study deprivation in monetary terms, and introduce third and fourth order polynomials, we find some unexpected significant regressors, an indication of the multidimensional character of the concept, as emphasised by Chakravarty and D'Ambrosio (2006), Bossert et al. (2007) and Pérez-Mayo (2005). This multidimensional character could include the inability to satisfy maintenance needs and functions such as goods, facilities and opportunities, normal in the household environment (Ayala, Labeaga, & Navarro, 2009), health, activity status, educational level, social integration and leisure. Their effects are not only exhibited by the absolute measure of the variables, but also by the measures relative to their values in the reference group. Thus, satisfaction deprivation constitutes a more accurate measure of welfare, since it includes the aforementioned dimensions of deprivation. It can then serve better than only objective measures in attempting to maintain individual welfare.

We can observe the apparent paradox that the most satisfied are at the same time the most deprived, on a comparative basis, since they belong to groups with higher levels of income. The introduction of group splines solves the apparent paradox since, within a group, the more deprived the individual, the less income satisfied the individual, the effect of relative income on satisfaction being negative. We also include the variance of income of each group, in attempting to determine the group's internal structure. In this way, we analyze whether the well-being of individuals is affected by income inequality within the group, not only by income levels. When both net and gross incomes are considered, the higher the income dispersion within a group, the less economically satisfied are the members of that group. The available empirical evidence suggests that, when there are many reference groups in very unequal societies, these societies tend to be more stable than when the number of reference groups is smaller, since deprivation in the former case is not very high (Yitzhaki, 1982). With income variation within groups, we show that individual economic well-being depends on the perceived deprivation of those members of the group who declare a higher satisfaction or income, but also depends on how income is distributed within each group.

Individual demographic variables, household composition determinants and economic conditions show the expected signs, with positive events influencing economic satisfaction positively, and negative events affecting satisfaction negatively, as expected. These results confirm previous

Table 5
Individual's subjective wellbeing (public transfers instrumented).

Variables	Satisfaction deprivation	Net income deprivation	Gross income deprivation
Age	−0.07	−0.06	−0.06
	[0.01]***	[0.01]***	[0.01]***
Age^2/100	0.05	0.06	0.06
	[0.00]***	[0.01]***	[0.01]***
Male	−0.00	−0.12	−0.10
	[0.02]	[0.03]***	[0.02]***
Fam. size	0.00	−0.03	−0.03
	[0.01]	[0.01]***	[0.01]***
Owner	0.18	0.16	0.15
	[0.02]***	[0.02]***	[0.02]***
Married	0.05	0.15	0.13
	[0.03]**	[0.02]***	[0.02]***
Unemployed	−0.35	−0.73	−0.74
	[0.05]***	[0.03]***	[0.03]***
Income source	0.01	0.00	0.01
	[0.01]***	[0.01]	[0.01]*
Secon. educ	0.14	0.06	0.02
	[0.02]***	[0.02]***	[0.03]
High. educ	0.27	0.13	0.00
	[0.02]***	[0.03]***	[0.04]
Children < 16	−0.04	−0.04	−0.05
	[0.01]***	[0.01]***	[0.01]***
Illness	−0.07	−0.15	−0.14
	[0.02]***	[0.02]***	[0.02]***
Public sector	0.08	0.16	0.08
	[0.03]***	[0.03]***	[0.03]***
Fulltime	0.17	0.38	0.28
	[0.04]***	[0.03]***	[0.03]***
DPRIVT	−0.24	−0.26	−0.27
	[0.04]***	[0.05]***	[0.05]***
DPUBT^i	0.13	0.33	0.34
	[0.04]***	[0.05]***	[0.05]***
DTAX^i	−0.10	−0.05	−0.01
	[0.02]***	[0.02]**	[0.02]
ENHI	0.55	0.66	0.63
	[0.03]***	[0.03]***	[0.03]***
Deprivation	−1.54	13.27	6.65
	[0.21]***	[1.39]***	[0.81]***
Deprivation^2		−3.76	−0.89
		[0.84]***	[0.19]***
Intra-group variance		−10.31	−2.40
		[4.96]**	[0.90]***
Predicted residuals		−9.53	−4.53
		[1.36]***	[0.80]***
Number observations	62,878	46,141	46,141

To estimate the models we use an unbalanced panel. The results correspond to aggregation to 8 reference groups. Standard errors are in brackets. Predicted residuals are introduced in the satisfaction estimation and come from an income deprivation estimation in a first stage.

* Individual significance at the 10% level.
** Individual significance at the 5% level.
*** Individual significance at the 1% level.

Table 6
Satisfaction, deprivation and income changes after a change in employment status.

	Empl. (t) − Unempl. ($t+1$)		Unempl. (t) − Empl. ($t+1$)	
	UB	No UB	UB	No UB
Satisfaction (t)	2.83	2.68	2.28	2.12
Satisfaction ($t+1$)	2.45	2.22	2.96	2.84
$\%\Delta$ Satisfaction	−13.55	−16.93	29.96	34.34
Deprivation (t)	1.68	1.75	1.91	2.03
Deprivation ($t+1$)	1.85	1.98	1.63	1.67
$\%\Delta$ Deprivation	10.45	13.44	−14.68	−17.63
Net income (t)	6151.32	3693.73	5058.80	3269.20
Net income ($t+1$)	5772.61	3113.78	5741.71	4282.18
$\%\Delta$ Net income	−6.16	−15.7	13.5	30.99
ENHI (t)	5985.45	5383.16	5535.20	5171.29
ENHI ($t+1$)	5964.58	5233.19	5718.25	5843.75
$\%\Delta$ ENHI	−0.35	−2.79	3.31	13
Observations	962	1007	855	1439

Figures under column UB represent those obtained when after the transition to unemployment the individual perceives unemployment benefits while under No UB they have not rights to perceive any benefit.

empirical evidence as, for instance, by Clark, Oswald, and Warr (1996). The labour situation of the individual is, again, an important determinant of satisfaction, with unemployment being the most significant one (Clark & Oswald, 1994; Winkelmann & Winkelmann, 1995, 1998; Layard, 2005). As in the case of the previous analysis of relative deprivation, both working in the public sector and having a full-time job have positive effects on individual subjective well-being.

The fact that the individual receives private transfers has a negative effect on satisfaction, as does the receipt of public transfers (Table 5). When we instrument the dummy variable of individuals receiving public transfers, using the proportion of individuals who receive such transfers in the corresponding cohort and time period, the effect becomes positive, indicating a simultaneity problem between the indicator of receiving transfers and satisfaction measures. If the individual pays taxes, well-being is reduced, that is, it takes the reverse sign after being instrumented. Another indication of the endogeneity of deprivation is the significance of the residuals of the auxiliary equation.

4. Evaluation of the current unemployment benefit system and some proposed reforms

Subjective measures of well-being seem to be richer than objective measures when analyzing certain aspects of deprivation, due to its multidimensional character. However, the benefits of the welfare system in trying to restore losses to well-being after a shock are generally defined based on objective measures. This is the case in the unemployment system of most countries, with Spain being no exception. We have shown in the previous section that the labour market status of the individual, in general, and unemployment in particular, are important determinants of satisfaction and deprivation.

We find that those transiting from employment into unemployment suffer a decrease in satisfaction. The fall in satisfaction and the increase in deprivation are smaller for individuals entitled to unemployment benefits, than for those who do not receive benefits (columns 1 and 2 of Table 6). If we look at those individuals who were unemployed and then returned to work, we observe that those who were not receiving benefits increased their satisfaction and decreased

Table 7
Simulated transfers to those that become unemployed.

Panel A. Simulated transfers to those individuals that become unemployed

	Not entitled to perceive UB		Entitled to perceive UB		Unemp. with	
		$\sum_{i=1}^{N_R} cc_i \times fe_i$		$\sum_{i=1}^{N_R} cc_i \times fe_i$		
1994	7942.12	2,573,672	6161.40	2,898,177	5663.68	5,222,615
1995	7226.28	2,190,885	8908.87	3,776,611	4470.89	4,288,358
1996	6066.44	1,855,964	7686.85	2,958,719	4127.77	3,992,717
1997	8503.93	3,512,585	8454.85	2,190,260	4140.66	3,729,447
1998	6294.02	2,269,837	3082.07	736,525	4670.20	3,171,991
1999	6298.16	2,481,260	7407.45	1,635,888	5437.51	3,028,758
1994–1999	7113.39	1,956,761	7151.96	1,931,207	4751.79	3,905,648

Panel B. Simulated transfers to those individuals that become unemployed

	Not entitled to perceive UB		Entitled to perceive UB	
	$\sum_{i=1}^{N_R} cc_i \times fe_i$		$\sum_{i=1}^{N_R} cc_i \times fe_i$	
1994	1051.37	62,540.91	826.25	34,614.88
1995	1058.85	52,625.50	500.81	6598.08
1996	736.57	51,136.57	236.30	11,149.47
1997	807.52	17,519.47	181.03	5900.23
1998	1119.30	97,805.94	288.95	4020.32
1999	494.38	18,041.54	436.57	13,018.92
1994–1999	896.74	54,432.49	509.82	18,206.95

Panel A indicates the amount transferred to those individuals who become unemployed, and are entitled or not to unemployment benefits.
Panel B indicates the amount transferred to those individuals who become unemployed, and are entitled or not to unemployment benefits, conditioned on such a policy not providing incentives to fall into unemployment.

their deprivation more than those who received benefits while unemployed (columns 3 and 4 of Table 6).

This empirical evidence allows us to compare the current unemployment benefit system with a hypothetical one that consists of compensating unemployed individuals. The aim of our proposal is to maintain the unemployed individuals at the same indifference level they declared in the survey in the period prior to unemployment. We use the estimated parameters to conduct our simulations and to evaluate the costs of this hypothetical system. We evaluate the incentives of the current system in order to identify whether individuals opt out of unemployment or, given the absence of incentives, choose to remain unemployed. We balance these incentives with those derived after implementing the proposed reform of the unemployment benefit system. Finally, we compare the costs of the proposed reform to the costs of the current structure, both in economic and in efficiency terms.

First, we suggest policies to take individuals out of a deprivation situation, whenever the system does not achieve its goals. To that end, we perform two simulation exercises. In the first, we calculate how much transfers should be increased in order for recipients of unemployment benefits to remain at the same indifference level as when they were employed, taking as a measure of utility

that provided by the subjective satisfaction measure (see Table 7). The welfare system provides support, but it is dependent on the specific legislation prevailing at the moment of transiting into unemployment. The amount needed to restore previous levels of average satisfaction is €7151.96 p.a., with this figure being an average during the 1994–2000 period, while the minimum wage for 1998 in Spain was €6847.20 p.a. Our second exercise looks at those individuals who fall into unemployment in a certain period and do not receive benefits. We calculate the amount of transfers they should receive from the tax-benefit system in order to maintain the same level of well-being as prior to unemployment, assuming again that the subjective level of satisfaction they provide in the survey is equivalent to their level of well-being. The amount of benefits the government should provide is, on average, €7113.39 p.a.

Another population of potentially deprived individuals corresponds to those who remain unemployed. It is difficult to evaluate the level of transfers that the government should provide, since their situation is heterogeneous. Specifically, we would need to know the length of the unemployment spell, whether they receive income from some regional government, and other unavailable information, in order to conduct a simulation. A look at the row data shows no pattern in the evolution of satisfaction measures or income levels. As a result, we should be cautious in inferring any value related to the optimal level of possible transfers and, in consequence, we prefer to omit this inference.

After implementing these two exercises, we assess how much the government should spend to reduce deprivation of individuals. We impose two strong assumptions. The first consists of considering the enhanced satisfaction of individuals, simply by increasing the amount of transfers received. This is a partial equilibrium analysis, and is not an attempt to carry out a cost-benefit analysis, since we would need a structural framework that considers the increased amount in public revenues needed to finance transfer increases. If such an increase in public transfers comes from an increase in taxes, individual behaviour could change, and the effect would not then be the one we have estimated. We believe this implementation would be justified, since governments are concerned with individual well-being, and their primary aim is to increase individual welfare.

In order to calculate the costs to the unemployment system of our proposal, we use the subsamples of unemployed individuals receiving benefits, and we aggregate the data to the population using the grossing up factors. The total amount spent by the government is divided by the number of unemployed individuals, and the average is €4751.79 p.a. The difference between the transfers received and the proposed transfer, €7151.96 p.a., aggregated again to population figures, represents a 4.48% annual average increase in the public budget for unemployment benefits. On the other hand, the government should give €7113.39 p.a. to those who do not receive benefits. This implies an average increase of 14.81% in the annual budget dedicated to unemployment. The public budget for paying benefits to restore satisfaction levels, during the period 1994–1999, is €13,147,564.16 thousand and the total budget under our proposal would reach an annual average of €15,683,729.29 thousand. The cost of the proposed reform is greater than the cost of the current unemployment system, although the difference is not so great when we only consider those entitled to unemployment benefits. In the two scenarios we assume complete take-up by unemployed individuals, although we are aware that this only happens under certain circumstances. This difference is much greater in the case where we include in our simulations those individuals not entitled to benefits.

Another relevant dimension of the effects of our proposed reform is related to the consequences for the incentives to job search by the unemployed. Since a reform affecting the incentives to be unemployed would be undesirable, we are interested in evaluating the kind of incentives the government provides to those deprived individuals, in order for them not to remain unemployed,

as this would increase the likelihood of an individual being socially excluded. The initial decision to leave unemployment lies with the individual. The tax-benefit system can provide both positive and negative incentives to leave unemployment and, in order to evaluate these incentives we calculate the variation in average tax rates (VATR) for those individuals unemployed in $t-1$ who transit to employment in t:

$$\text{VATR} = 1 - \left(\frac{\text{Net income}_t^k - \text{Net income}_{t-1}^l}{\text{Gross income}_{t-1}^l} \right) \tag{7}$$

where k and l represent employment or unemployment status, depending on whether we evaluate transitions from employment to unemployment, or vice versa. In fact, VATR $-$ 1 measures the percentage difference in income between the two situations, so that if VATR $-$ 1 is positive, the income of the individual is higher when unemployed (employed) than when employed (unemployed). Then, we should interpret values of VATR less than 1 for unemployed (employed) individuals as those for which the tax-benefit system provides incentives to abandon unemployment (employment). Values of VATR above 1 indicate that the system provides benefits that, together with fiscal treatment, generate disincentives to abandon unemployment (employment). Our proposal is intended to produce more positive effects for those individuals who are less prone to abandon unemployment, although we also expect this to be more costly to the public budget.

We have calculated VATR using a breakdown of demographic variables. Although we do not present these results, which are available upon request, we can briefly describe them. The proportion of married individuals with incentives to abandon unemployment is higher, as is the proportion of those who work in the industrial sector. We also observe that, for those with more incentive to abandon unemployment, for instance, those working in industry or those with a higher level of education, satisfaction increases more and deprivation decreases more, when they take employment, than for those who have few or no incentives. We also observe that income of those with incentives to abandon unemployment increases, whereas that of those who have no incentives decreases, but this is a result of legislation, which requires acceptance of a job offer. However, on average, the benefits, together with the tax-benefit system, do not provide incentives to abandon unemployment. There is a high degree of heterogeneity, with occupation being, as expected, an important determinant of the decisions of individuals to transit to employment. On the other hand, VATR values for employed individuals who transit to unemployment have also been calculated. On average, 50% of individuals without benefit entitlement have incentives to transit from employment to unemployment, since their VATR while unemployed increases, thus indicating that the tax-benefit system generates disincentives to remain employed. The propensity to exit from employment decreases by 32% when the individual does not expect to receive benefits.

In order to compare the proposed reform with the current system, in terms of efficiency, we calculate the changes in VATR between the two situations. We present in Table 8 the changes produced for the sub-sample of individuals entitled to unemployment benefits, and for those without such entitlement. The main diagonals correspond to individuals who do not experience changes in VATR. The upper part of each of the matrices reports individuals with incentives to fall into unemployment under the current system, who do not have such incentives under the proposed reform. As expected, the proportion of those individuals is always zero, since the proposed reform compensates them with a higher income than the actual system. The lower part of the matrices reports the percentage of individuals experiencing increases in the incentives to remain employed, as measured by VATR. In the case of individuals entitled to benefits, this proportion is more than 53%, while for those without entitlement to benefits, it is 42.5%. In both cases, the reform produces

Table 8
Comparison of incentives under the two unemployment benefits (UB) systems.

Panel A. From employment to unemployment (no UB)			
	New proposal		
Current UB system	$I \leq 1$	$I > 1$ & ≤ 1.2	$I > 1.2$
$I \leq 1$	47.27	0.00	0.00
$I > 1$ & ≤ 1.2	13.60	5.16	0.00
$I > 1.2$	25.32	3.38	5.26
Panel B. From employment to unemployment (with UB)			
		New proposal	
Current UB system	$I \leq 1$	$I > 1$ & ≤ 1.2	$I > 1.2$
$I \leq 1$	35.86	0.00	0.00
$I > 1$ & ≤ 1.2	26.92	6.86	0.00
$I > 1.2$	25.47	0.94	3.95

Figures in the table correspond to percentages of changes among intervals of VATR when changing the current UB system to apply a new reform, consisting in compensating individuals with additional income to maintain their welfare levels unchanged.

no disincentives for 47.0% and 57.5%, respectively. Policy makers should interpret whether the reduction in the propensity to generate deprivation and exclusion compensates for the increase in the proportion of discouraged individuals.

5. Some policy implications

We have studied deprivation through variables that proxy satisfaction, and we have proposed that some social policies aimed at reducing deprivation could be implemented, since if deprivation persists or worsens over time (Bossert et al., 2007), there is a risk of certain vulnerable groups, such as the unemployed, becoming socially excluded (Cantó & Mercader-Prats, 1998; D'Ambrosio & Gradín, 2001). Since unemployment has a strong negative effect on satisfaction, an adequate design of unemployment benefits could constitute a fundamental pillar of the welfare system in maintaining levels of individual welfare. In particular, public transfers, and specifically, unemployment benefits, in addition to retirement and widowhood benefits, make important contributions to sustain and improve the well-being of the individual. In this context, we have proposed a reform of the unemployment benefit policy that maintains individuals at the same level of utility, defined using the subjective satisfaction measure declared in the survey, as when the individual was employed, rather than applying the current benefit system. Our proposal implies that the government should provide, on average per individual, an amount to unemployment benefit recipients equal to €7151.96 per annum. This figure represents a 4.48% increase in the public budget with respect to the existing system. On the other hand, the government should provide €7113.39 p.a. to those who do not receive benefits, representing an increase of 14.81%. Thus, the public budget dedicated to paying benefits to restore satisfaction levels, during the period 1994–1999, would have increased by €2,536,165.13 thousand annual average. Moreover, as we are concerned with the incentives to job search by the unemployed, we show the groups of individuals under the current and the proposed reform who have incentives to remain or to become employed. Whether this proposal is realistic at a time when Spain has to comply with the European Stability and Growth Agreement is a question for policy makers, since it

increases the budget at the risk of affecting the deficit under the current austerity policies in public spending.

Our modeling of the unemployment benefit policy in Spain is in line with the existing evidence, which gives significant weight to demographic characteristics, specifically, employability, to explain welfare duration programs. Thus, whereas some earlier papers studied the effects of social benefits on unemployment duration (Ahn & Ugidos, 1995; Arranz & Muro, 2004; Bover, Arellano, & Bentolila, 2002), the recent paper of Ayala and Rodriguez (2007) is the first Spanish study focusing on the dynamics of participation in anti-poverty programs. Specifically, this study focuses on welfare duration using information on the employability of recipients and their social problems, with the data used covering the history of the specific social program. Their results confirm that employability constitutes one of the main determining factors of the duration of welfare spells in Spain. Our proposal discourages unemployed individuals from returning to the labour market 26% more than does the existing unemployment benefit system, but it also reduces significantly the probability of exclusion of the unemployed. Whether to emphasize one or another policy is a matter for the economic policy makers.

Overall, the policy results of our modeling confirm that reforms of the labour market systematically proposed by national governments to guarantee a timely and sound mechanism in economic crisis situations, such as is currently occurring at a global level, with this commonly including changes in unemployment benefits programs, must be considered as a fundamental tool in pursuing a balance between economic growth and the maintenance of desirable levels of welfare among individuals.

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