

Static and Dynamic Poverty in Spain, 1993-2000

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Abstract

We focus on the statics and dynamics of poverty in Spain using data from the first eight waves of the European Community Household Panel from 1994 to 2001, a period not sufficiently covered by recent literature. The results confirm the pattern of poverty changes noted by other authors for the early nineteen-nineties. After this period poverty reduces slightly in incidence and intensity, but 2000 is the turning point. In the dynamic perspective, the pattern revealed is one of much mobility, but most of it short-range.

Keywords: ECHP, exit rate, income distribution, poverty dynamics, re-entry rate, Spain, static poverty.

JEL: D1, D31, I32

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1. Introduction

The interest in poverty and the methods for combating it has been sharpened in recent years by the availability of good quality micro-data in Europe. In many countries there is a large and growing collection of studies focusing on the evolution of poverty levels, but from an essentially static point of view. By contrast, there are fewer works that adopt a true dynamic approach to poverty,¹ and the numbers of studies that compare such dynamics between the different countries are even rarer. However, the creation of the European Community Household Panel (ECHP) by EUROSTAT has facilitated this kind of study as it includes data that can be compared both in time and space. In this paper we exploit this resource to throw new light on the micro-dynamics of poverty in Spain in recent years.

There is now a large number of studies on cross-sectional poverty. But it is generally acknowledged that poverty is not a static phenomenon – that static studies focusing on the percentage of households below a given income threshold at a given time only deal with one aspect of the phenomenon. The essentially dynamic character of poverty is no longer in question and recent poverty analysis based on the ECHP² reveals that entering and exiting poverty is a more common phenomenon than might be thought from static comparative studies. It also reveals that poverty is more widespread than suggested by cross-sectional studies, since this process is the result of the accumulation and attrition of household resources. In other words, once a household has fallen into poverty, it begins to spend its accumulated resources and is more likely to fall back into poverty in the future, and the longer it stays below the poverty line, the greater will be its chances of remaining poor. From this dynamic perspective, what matters is whether people are able to escape transitory spells of poverty and whether poverty is a recurrent phenomenon. So, time itself must be considered as part of the notion of poverty.

1.1. Spain: the use of micro-data on incomes

Since the late 1980s several poverty studies in Spain have been carried out exploiting the availability of high quality micro-data (Canto et al. 2003). Those that have focused on the evolution of long-run poverty in Spain have used data from the Encuesta Basica de Presupuestos Familiares,³ from which data are available for 1973-1974, 1980-1981 and 1990-1991. The unavailability of this data source after 1991 precludes analysis of developments into the 1990s, although the Spanish Household Expenditure Survey, ECPF,⁴ has been helpful in measuring poverty during the period from 1985 until the middle 1990s (Canto 2000, 2002; Canto et al. 2003). Unfortunately the ECPF

¹ See, for example Layte and Whelam (2002), Jenkins and Rigg (2001), Devicienti (2001), Jenkins (2000), Jarvis and Jenkins (1997) and Heady, Krause, and Habich (1994).

² Layte and Whelam (2002), Jenkins and Rigg (2001), Devicienti (2001).

³ A cross-sectional household budget survey carried out by the Spanish National Statistics Office (Instituto Nacional de Estadística, INE) in 1973-74, 1980-81 and 1990-91 covering income (classified by source), consumption expenditure, and dwelling characteristics in the previous calendar year.

⁴ The *Encuesta Continua de Presupuestos Familiares* is a rotating panel based on a survey conducted by the INE. It reports interviews for about 3,200 households every quarter randomly rotating at 12.5 per cent each quarter. So a household can be followed for a maximum of eight consecutive quarters. It begins in 1985.

survey was modified in 1997 and so is not comparable with earlier years. In view of these gaps the ECHP⁵ is clearly an essential data source in order to know what happened to poverty in the 1990s.

Empirical work on poverty in Spain has mainly concentrated on overall changes through time and, until now, studies of the pattern of mobility within the Spanish income distribution have been relatively rare. Canto (2000, 2002) and Canto et al. (2003) used the ECPF between the mid-eighties and mid-nineties and Ayala and Sastre (2002) used the first four ECHP waves to examine the period 1994-1997. So an analysis of income mobility using all eight currently available waves of the ECHP –1994 to 2001 – can potentially make an important contribution to understanding the Spanish situation.

1.2. Motivation

The study of income and poverty dynamics is interesting and important for many reasons. First, it has intrinsic social relevance and policy significance. The static approach can give an idea of the effect of public policy on low-income people, but longitudinal studies allow one to distinguish between a policy of enabling people to climb out of poverty from those of preventing people falling back in. Second, little research has been done on it in Spain and, up to now and, to the best of our knowledge, there are no studies on the degree of mobility in Spain for the period 1993-2000. Previous research (Canto et al. 2003) stops at 1995. Third, eight waves of data have now been released: having a longer panel has several advantages. Moreover, only with a large number of waves can one observe the incidence of long poverty spells, and also model them better, because their start dates are more likely to be observed.

Accordingly, this paper analyzes poverty in Spain from both static and dynamic points of view, using the 1994 to 2001 waves of the ECHP (European Community Household Panel). As far as dynamics are concerned our primary focus is that of estimating the poverty exit rates for a cohort of persons starting a poverty spell, together with the poverty re-entry rates in different sub-periods identified in the static approach, but in this case for the period 1993-2000. A second important contribution is the exhaustive analysis of the transitions in and out of poverty of different groups of persons, where group membership depends on the size of a person's needs-adjusted household income relative to the initial income. So, in each year, income of each person is compared to that of the following year, and we establish seven comparisons for each person in the survey. Accordingly we get the average annual transition rates. We also consider the effects of duration dependence on transition probabilities.

1.3. Outline

The paper is organized as follows. In section 2 we discuss previous results of the evolution of poverty in Spain. In section 3 we present the data set and definitions of the poverty line, unit of analysis, equivalence scales, and personal economic well-being. Section 4 then deals with the static approach to poverty in Spain. Section 5 covers the dynamic study of poverty from a descriptive standpoint and the estimation of re-entry and exiting rates. We obtain the probabilities of transition from one state to another while taking into account the length of time in the initial state. Finally section 6 deals with the conclusions.

⁵ The European Community Household Panel (the ECHP) is an annual survey of private households undertaken in the EU states covering a wide range of areas.

2. Evolution of poverty in Spain

During the second half of the seventies, the eighties and the nineties, the income distribution in Spain experienced a substantial movement towards equalization (Oliver et al. 2001) despite the increase in relative poverty during the crisis 1980-1985. As a result, the number of relatively poor households in Spain between 1970 and 1990 decreased. This result has been examined using various methodologies (del Rio and Ruiz Castillo 1999, 2001; Duclos and Mercader-Prats 1999; INE 1996). Martinez et al. (1998) find that when they compare percentages of people in poverty in 1990 to that in 1995 there seems to be a slight increase. Canto et al. (2003) find that absolute and relative poverty decrease from 1985 until 1990-1991. But the first part of the nineties, not as yet analyzed by others, appears to show stabilization in the decline of the number of the households in poverty and also a change to a slight increase. The incomes of those in the highest and the lowest part of the income distribution are further apart in 1995 than they were in 1985. However, over the whole period, 1985-1995, relative and absolute poverty measures decrease considerably.

Longitudinal studies are scarce and fairly recent. Canto (1996, 2002), Garcia and Toharia (1998) and Canto et al. (2003) use the ECHP and the ECPF to estimate poverty exits and re-entries in the period from the mid-eighties to the mid-nineties. Canto et al. (2003) finds that there is a remarkable degree of longitudinal mobility coexisting with the decrease in cross-sectional poverty in Spain. Specifically, the reduction in poverty up to 1990 seems to be more connected to high poverty exit rates than to financial aids to people in risk of poverty. However, the increase in poverty in 1991-1995 is the result both of higher poverty re-entry rates and of significant reductions in poverty exit rates. These transitions imply an important degree of mobility since they involve a great proportion of the population. But the intensity of the transition seems to be small, no more than 2 deciles in absolute terms. This means that there is a wide range of economically vulnerable households that could fall in or climb out of poverty depending on the income chances.

Garcia-Serrano et al, (2001) and EUROSTAT (2000) study static and dynamic poverty using the first three waves of the ECHP. The former claims that the proportion of poor that remain poor for the three years was 9.8%, (EUROSTAT finds 8.2%) while the proportion of non-poor who stayed non-poor was 75.1%. The rest (15.1%) made transitions between states. The degree of mobility is larger than that for European (12.7%).

Ayala and Sastre (2002) examine inequality and income mobility in a group of countries of the EU using the ECHP for the first four waves. They found significant differences in mobility indexes among countries and suggest household type and income source as explanation of the differences in mobility.

3. Data set and definitions

To some extent, of course, the comparative rarity of poverty analysis using a true dynamic approach arises from the scarcity of extensive national panels of longitudinal data.⁶ We offset the lack of such

⁶ Examples of national panels that have stimulated dynamic poverty research include the following: (1) the Panel Study of Income Dynamics, a longitudinal survey of a representative sample of US citizens and their families, ongoing since 1968 and focusing on income sources and amounts, employment, family composition changes, and demographic events; (2) the British Household Panel Survey, ongoing since 1991 and focusing on household organisation, labour market participation, education and training, income and wealth, housing and residential mobility, health and use of health services, and various opinion questions; and (3) the German Socioeconomic Panel, representative longitudinal study of

a national panel for Spain by using the ECHP, an annual survey of private households undertaken in the EU states covering a wide range of areas: demographic characteristics, the labour market, income, housing, health, education, etc.⁷ It is based on a harmonized questionnaire, created at the Community level and adapted to the various national realities by the different national statistical offices; the eight waves available (interview years) were from 1994 to 2001. Our dataset takes information from the household file, the individual file and the country file for Spain. So we use information about the household and about each of the household adult members. The original sample respondents have been followed and they, and their co-residents, interviewed at approximately one year intervals subsequently. Children of sample members begin to be interviewed as sample members in their own right when they reach age 16. This data source has several advantages: it provides repeated observations over a number of years on the same set of people, even if they change address within the EU and respondents provide information about their incomes as well as many other personal and household characteristics including their living arrangements and labour market participation (one can link changes in income to changes in circumstances) and it offers the possibility of making comparisons in the European context. It also has some drawbacks related to the reliability of income data (see Andres-Delgado and Mercader-Prats, 2001) and biases may be introduced by potential differential non-response in the initial 1994 wave and subsequently, together with differential attrition (sample drop-out) after the first interview. The use of sample weights is the conventional way to mitigate these potential biases.

3.1. Methodological choices

All analyses of income distribution and poverty, whether cross-sectional or longitudinal, have to make assumptions about the definition of personal income (components of money income and equivalences scales), the income accounting unit and measurement period. The choices made in this paper are a conventional set of assumptions and match those used by Canto et al. (2003); this will facilitate comparison of the two periods, 1985-1995 and 1993-2000.

The main income concept used in the survey is net money income, calculated by adding together net income from work (wage and salary earnings and self-employment earnings), other non-work private income (capital income, property/rental income and private transfers received) and pensions and other social transfers. Net money income includes all income received by the household as a whole and by each of its current members in the year preceding the survey. Social insurance contributions, pay-as-you-earn taxes and non-money income that may be received by the household (wages in kind, home production, imputed rents associated with owner occupation, etc.) are not included in this definition of income. The fact that this type of income is not taken into account necessarily implies an underestimation of the disposable income of households in countries such as Spain, where these components still continue to represent a fairly significant share of income and may lead to a clear bias in the analysis of income distribution (Andres-Delgado and Mercader-Prats, 2001). The net money income of each of the households is obtained from the detailed questionnaires addressed to the individuals, through the use of a series of harmonized imputation techniques. The income data provided by the ECHP is annual, and refers to the year previous to the survey, i.e., the first income data available corresponds to 1993: for this reason the period of analysis here is from 1993 to 2000.

private households ongoing since 1984 and focusing on household composition, occupational biographies, employment, earnings, health and satisfaction indicators.

⁷ Based on the ECHP User Data Base, released by EUROSTAT; on data quality see Whelan et al. (2000).

To obtain an appropriate comparable measure of individual wellbeing, two steps are necessary. First, to ensure that incomes are comparable across years, we deflate them using the Harmonised Indices of Consumer Prices (HICP) with 1996 as reference year. Second, we adjust for needs. Following the terminology in Jenkins (2000), an obvious way to write the economic measure of well-being is to use the household income-equivalent (HIE). If HIE_t is the needs-adjusted household net income in year t then:

$$HIE_t := \frac{\sum_{j=1}^n \sum_{k=1}^K x_{jkt}}{m(a, n)}$$

where j indexes individuals in the household ($j = 1, 2, \dots, n$) and k indexes income source. The denominator is an equivalence scale factor depending on household size n and on a vector of household composition variables a (ages of individuals or role within the household). So the welfare measure HIE is the sum of all household members' income adjusted by household needs. Given that each component income is subject to measurement error it is clear that the issue of "false transitions" into and out of poverty needs to be addressed – see note 14 below.

Since a given level of household income will support a different standard of living depending on the size and composition of the household, we adjust for these differences using a variety of equivalence scales.⁸ Although the choice of a particular equivalence scale could affect the conclusions drawn from a distributional study, there is little consensus about what the 'correct' equivalence scale should be⁹. For this reason we carry out a robustness analysis using different scales as suggested by Buhmann *et al.* (1988) to test sensitivity of income inequality estimates to the choice of equivalence scales. To make comparable our analysis to that of Canto *et al.* (2003) we use the OECD equivalence scale,¹⁰ and modified-OECD equivalence scale¹¹ (that differentiates among first adult, subsequent adults, and children) and three power-function scales (see Buhmann *et al.* 1988) using parameter values 0.2, 0.5 and 1.0.

The analysis is contingent on assumptions about what the population of interest is (the issue of the 'unit of analysis'), and how to measure the income of each unit within that population (the issue of the 'unit of account') (Jenkins and Rigg 2001). We consider distributions of income among individuals, not distributions of income among households or families. But because we use income data to provide a measure of the economic well-being or living standard of each individual, we need to take account of the fact that most individuals live together in families and households and benefit from income pooling and sharing. There is, inevitably, very little information available about how much income pooling and sharing actually occurs and about the heterogeneity of patterns across households. We follow conventional practice and assume that, within each household, total household income – the sum of the incomes of each household member – is distributed equally among household members. In sum, the individual is the unit of analysis, but the household is the unit of account.

⁸ For the effects of the choice of equivalence scale on poverty measurement in Spain see Mercader-Prats (1998).

⁹ For a survey of equivalence scales and related income distribution issues, and some comparisons of scale relativities, see Coulter *et al.* (1992).

¹⁰ This scale weights by 1 the first adult in the household, by 0.7 each remaining adult, and by 0.5 each person younger than 14.

¹¹ This scale assigns value 1 to the first adult in the household, 0.5 to each remaining adult, and 0.3 to each person younger than 14.

The definition of poverty used in this paper is based on income. An individual is defined to be poor if he or she has an income falling below a particular low-income cut-off (the ‘poverty line’). The poverty line used for our analysis is 60 per cent of contemporary median income. Only in the static approach do we also use an ‘absolute’ poverty line (fixed in real terms, 60 per cent of median income of 1993, regardless of the distributions being compared). Again our choice is motivated to ensure comparability with Canto et al. (2003).

For the *static* approach, our analysis is based on a panel of households for each year. In order to describe distributions of personal incomes, the cross-sectional weight of the interviewed households has to be multiplied by the number of persons belonging to the household. However, the *dynamic* approach is based on a balanced panel sub-sample of adults (people aged 16 or above) in complete respondent households for all waves for which they are in the panel. We use this adults-only panel for all eight waves to estimate poverty exit and re-entry rates. This feature of the survey has been under-exploited in poverty analysis in Spain.

The use of sample weights is the conventional way to mitigate potential biases, introduced by potential differential non-response, together with differential attrition, and we have used the relevant sample weights where appropriate.¹²

We measure poverty incidence, poverty intensity, inequality and the effect of duration dependence on transition probabilities using a range of indices in order to obtain robust conclusions to the sensitivity of the poverty measures. We compute the FGT poverty measures defined by Foster et al. (1984) with the sensitivity parameter s set to values greater than or equal to 2. We also obtain the Head Count ratio, the Poverty Gap Ratio and the Coefficient of Variation. For the longitudinal approach we estimate the poverty exit rates for a cohort of persons starting a non-poverty spell and also the transitions in and out of poverty of different groups of persons, depending on initial income.

3.2. Comparison with Canto et al. (2003)

The major difference between this study and that of Canto et al. (2003) is the data source. Ours is based on the ECHP while Canto et al. use the ECPF, a rotating panel survey which interviews households every quarter and substitutes 1/8 of its sample at each wave. Because households are kept in the ECPF panel for a maximum of two years it makes no sense to analyse persistent poverty using ECPF which uses information collected from each household at a pair of interviews one year apart, i.e. at each household’s first and fifth quarters of participation in the survey. In the ECHP we can follow an individual over 8 years, in interviews one year apart.

In our dynamic approach the unit of analysis is the individual rather than the family or household, which are not stable units for longitudinal analysis: only individuals can be followed through time. However, the ECPF only gives information by *household*: this constrained Canto et al. (2003) in their choice of unit of analysis.

In the ECPF information is collected on each household’s income during the previous three months. In the ECHP, information is collected on each household’s income during the previous year.

¹² In cross-sectional analysis at country level, the normalised cross-sectional weights and in longitudinal analysis over the eight waves (persons interviewed in all these waves), the normalised base weights of wave 8. This is as recommended by EUROSTAT.

4. Poverty trends: 1993-2000

4.1. Income distribution

Before analyzing poverty during 1993-2000, we take a cross-sectional perspective on changes in the distribution of needs-adjusted household income in Spain in this period derived from the ECHP.

Table 1 provides a standard cross-sectional view of changes in the distribution of needs-adjusted household income in Spain during 1993-2000. We have replicated the results for a variety of equivalences scales but, to save space, we present results using only the modified OECD scale, as used by EUROSTAT. Over the eight years average income rose 25.5% in real terms, but the period divides into two sharply contrasting parts: from 1993 to 1996 average income rose only slightly (0.6%) and actually fell in some years; but 1997-2000 saw a remarkable increase in average income (24.7%). Median income follows roughly the same pattern; in the first half of the period there was no clear trend, but in the second half there was strong growth. The movement of average and median income will affect poverty estimates, discussed in section 4.3 below.

Table 1: Needs-adjusted household average and median income in Spain: 1993-2000.

	Individuals	Households	Average	Median
1993	22,583	7,206	1,281,465	1,063,912
1994	20,973	6,522	1,281,878	1,062,779
1995	20,130	6,267	1,283,475	1,054,106
1996	18,888	5,794	1,289,040	1,064,000
1997	17,786	5,485	1,340,540	1,106,278
1998	17,170	5,418	1,435,713	1,206,686
1999	16,268	5,132	1,532,255	1,293,621
2000	15,880	4,966	1,607,971	1,370,234

Source: Own construction using the ECHP (1994-2001)

Note: Income per equivalised individual in pesetas of 1996. Equivalisation using modified OECD scale.

These conclusions – which are robust to the choice of equivalence scale –confirm to some extent a conjecture of Canto et al. (2003). From the ECPF they concluded that 1992-1995 was a period of decreasing average and median income and at the end of 1995 there appeared to be a change in the trend. We now see that 1996 is the turning point: from 1993 to 1996 there was no clear trend (slight increments and decrements) and from 1996 income increased steadily.

4.2. Absolute poverty

Absolute poverty measures are obtained by using a poverty line defined as 60% of 1993 median income; the results are given in Table 2, Table 3 and Figure 1, corresponding to the head count ratio of poverty (H) and of extreme poverty, income gap ratio (I) and coefficient of variation (CV); and FGT indices with parameter $s=1, 2, 3, 4$ and 5. In each table the point estimate of the statistic is given as a percentage. We test the differences of estimates at t and $t-1$ and the significance of the year-to-year changes is indicated in parentheses by the corresponding P -value (i.e. the probability of

obtaining values of the test statistic that are equal or greater than the observed test statistic, if the null hypothesis is true).

Table 2. Absolute poverty measures in Spain: 1993-2000

	Incidence (H)		Extreme poverty		Intensity (I)		Inequality among poor (CV)	
1993	19.59%		4.44%		32.18%		38.38%	
1994	18.99%	(0.49)	4.10%	(0.46)	31.62%	(0.67)	38.01%	(0.79)
1995	18.35%	(0.50)	4.74%	(0.23)	33.30%	(0.26)	39.79%	(0.33)
1996	20.34%	(0.05)	5.74%	(0.12)	34.49%	(0.44)	40.34%	(0.61)
1997	16.65%	(0.00)	4.42%	(0.05)	33.51%	(0.56)	39.44%	(0.80)
1998	14.98%	(0.14)	2.81%	(0.01)	30.19%	(0.08)	35.64%	(0.60)
1999	11.17%	(0.00)	2.36%	(0.40)	29.69%	(0.82)	37.47%	(0.00)
2000	10.11%	(0.29)	1.93%	(0.35)	32.11%	(0.33)	39.02%	(0.00)

Source: Own construction using the ECHP (1994-2001)

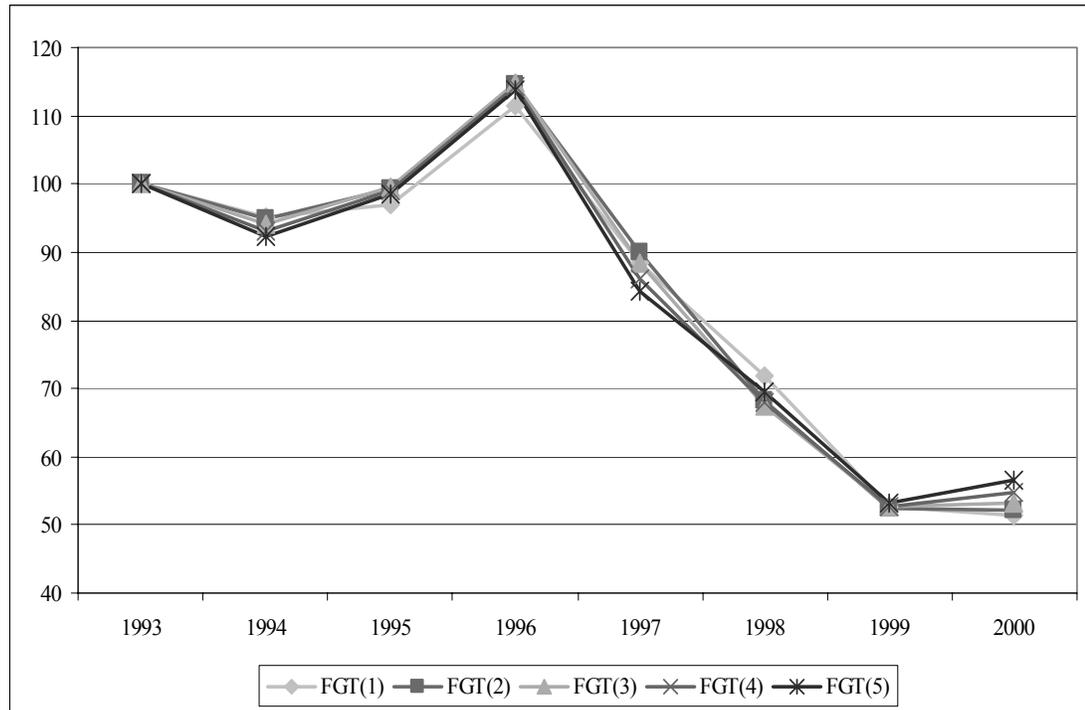
Notes: Poverty line 60% of 1993 median income. Income in real terms of 1996. Modified OECD equivalence scale
P values for differences of estimates at *t* and *t*-1 in parenthesis

From 1993 the absolute poverty head-count ratio declines slightly, but in 1996 it jumped to a value higher than that of 1993; from 1996 onwards it decreases markedly, from 20.3% to 10.11%. The head-count ratio of extreme poverty¹³ follows the same pattern except for 1994-95; both versions of the head-count ratio are consistent with the pattern of change of median and average income. The income gap ratio (measuring the mean distance separating the population from poverty line) shows that the intensity of poverty increased in 1995, 1996 and also – in contrast to the head-count ratios – in 2000; in other years poverty intensity fell. The coefficient of variation, measuring the spread of income distribution, reinforces this conclusion: in 1995, 1996 and 2000 inequality increased, around 4.7%, 1.4% and 4.1% respectively, but the amount depends on the equivalence scale.

We also estimate FGT indices that capture the severity of poverty and relative inequalities among the poor. All FGT(*s*) for *s* = 1, ..., 5 show the same trend: a rise in poverty in 1995, 1996 and 2000, a fall in the remaining years. Over the whole period, poverty declined around 45% (the smaller the parameter, the bigger is the reduction of poverty) similar to the reduction in the head-count ratio. This is in contrast to the reduction in the income gap ratio (0.2%) and opposite to the change in dispersion, which grew by 1.7%. The increase in absolute poverty in 1995, 1996 and 2000 is greater, the greater the sensitivity parameter *s*, showing that poorer people were the least benefited by the increment in average and median income. On the other hand, in 1994 and 1997 the larger is *s*, the larger is the reduction in poverty: during this period the poorest benefited the most. In the remaining years the reduction in poverty is affected more or less homogeneously. 2000 is a special case: poverty fell for lower values of the sensitivity parameter *s* and increased for higher values of *s* with respect to 1999, showing that the poorest of the poor were hit the hardest.

¹³ Proportion of population under 30% of the median income of 1993 in real terms.

Figure 1. Absolute poverty in Spain 1993-2000. Variation of the FGT(s) index



Source: Own construction using the ECHP (1994-2001)

Note: needs-adjusted (modified OECD scale) household income in real terms of 1996

Table 3. Absolute poverty measures in Spain: 1993-2000

	FGT(1)		FGT(2)		FGT(3)		FGT(4)		FGT(5)	
1993	6.30%	3.36%			2.26%	1.73%			1.41%	
1994	6.00%	(0.44)	3.18%	(0.54)	2.13%	(0.57)	1.61%	(0.58)	1.31%	(0.58)
1995	6.11%	(0.81)	3.33%	(0.65)	2.25%	(0.65)	1.71%	(0.67)	1.39%	(0.70)
1996	7.02%	(0.06)	3.84%	(0.14)	2.60%	(0.23)	1.97%	(0.31)	1.61%	(0.36)
1997	5.58%	(0.01)	3.01%	(0.02)	2.00%	(0.04)	1.49%	(0.05)	1.19%	(0.06)
1998	4.52%	(0.03)	2.29%	(0.04)	1.52%	(0.09)	1.17%	(0.22)	0.98%	(0.38)
1999	3.32%	(0.01)	1.76%	(0.17)	1.19%	(0.22)	0.91%	(0.29)	0.75%	(0.32)
2000	3.25%	(0.87)	1.75%	(0.70)	1.20%	(0.96)	0.94%	(0.85)	0.80%	(0.81)

Source: Own construction using the ECHP (1994-2001)

Notes: Poverty line 60% of 1993 median income. Income in real terms of 1996. Absolute poverty measures in Spain: 1993-2000. OECD modified equivalence scale

P values for differences of estimates at *t* and *t*-1 in parenthesis

4.3. Relative poverty

In order to take account of the effect on poverty of income growth, we adjust the poverty line each year in line with the income distribution. Specifically we take the poverty line as 60% of the

contemporary median needs-adjusted household income, a threshold that varies in real income terms. As a result the poverty measure changes are due only to income redistribution and are less pronounced than those in absolute poverty.

Table 4. Relative poverty measures in Spain: 1993-2000

	Incidence (H)		Extreme poverty		Intensity (I)		Inequality among poor (CV _q)	
1993	19.59%		4.44%		32.18%		38.38%	
1994	18.98%	(0.49)	4.10%	(0.46)	31.55%	(0.64)	38.02%	(0.79)
1995	17.97%	(0.28)	4.60%	(0.35)	33.38%	(0.23)	39.97%	(0.22)
1996	20.34%	(0.02)	5.74%	(0.07)	34.50%	(0.48)	40.34%	(0.81)
1997	18.18%	(0.05)	4.59%	(0.09)	33.22%	(0.00)	38.77%	(0.29)
1998	18.88%	(0.55)	3.51%	(0.09)	31.74%	(0.00)	34.57%	(0.03)
1999	18.02%	(0.48)	3.37%	(0.81)	29.35%	(0.00)	33.76%	(0.69)
2000	18.82%	(0.52)	3.70%	(0.63)	30.68%	(0.00)	34.37%	(0.75)

Source: Own construction using the ECHP (1994-2001)

Notes: Poverty line 60% of median contemporary income. Income in real terms of 1996. OECD modified equivalence scale.

P values for differences of estimates at *t* and *t*-1 in parenthesis

Table 4 presents the resulting relative poverty measures: the head-count ratio fell slightly during the period, but showed no clear trend; from 1994-1996 it increased by about 7% but from 1996 to 2000 it increased and decreased alternately by about 18%. The head-count ratio of extreme poverty shows similar behaviour: from 1994 to 1996 it increased, fell from 1997 to 1999 extreme poverty reduced and finally, in 2000, it increased. There is no clear trend in poverty intensity from 1993-1995, but from 1996 to 1999, when poverty is stable, intensity reduced (for all equivalence scales, between 4% and 13%) but in 2000 it rose again. The coefficient of variation roughly follows the same pattern as the income gap ratio.

Table 5. Relative poverty measures in Spain: 1993-2000

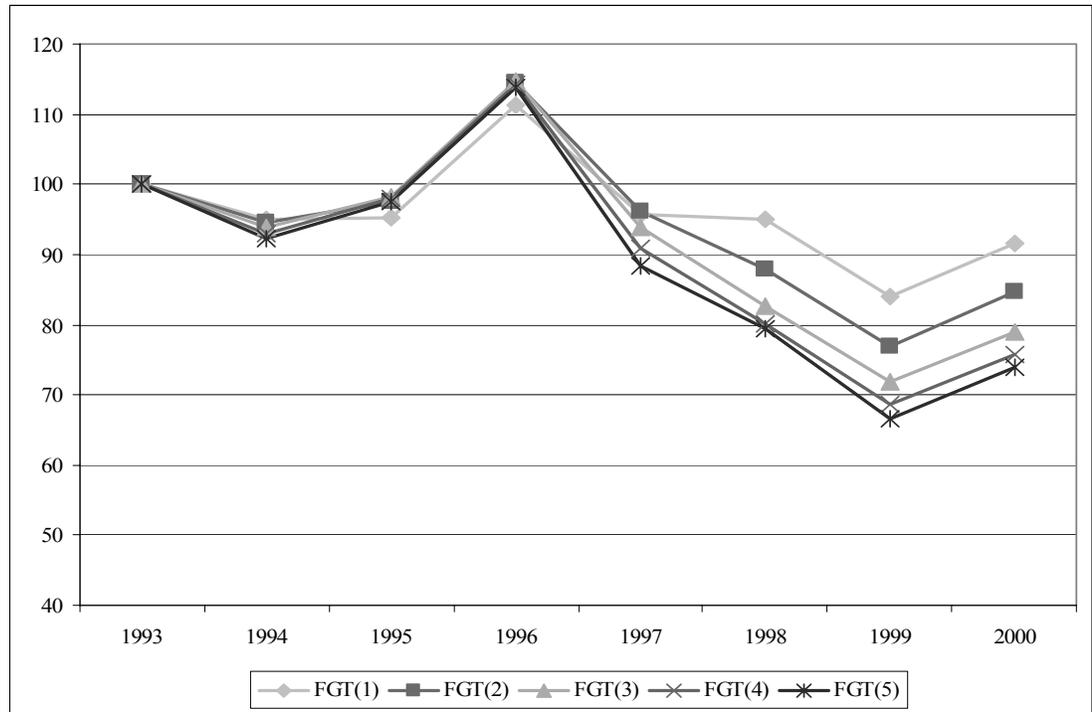
	FGT(1)		FGT(2)		FGT(3)		FGT(4)		FGT(5)	
1993	6.30%		3.36%		2.26%		1.73%		1.41%	
1994	5.99%	(0.42)	3.18%	(0.53)	2.12%	(0.56)	1.60%	(0.57)	1.30%	(0.58)
1995	6.00%	(0.98)	3.28%	(0.75)	2.22%	(0.72)	1.69%	(0.73)	1.38%	(0.74)
1996	7.02%	(0.04)	3.84%	(0.11)	2.60%	(0.19)	1.97%	(0.27)	1.61%	(0.33)
1997	6.04%	(0.06)	3.22%	(0.09)	2.12%	(0.10)	1.57%	(0.11)	1.25%	(0.11)
1998	5.99%	(0.93)	2.95%	(0.45)	1.87%	(0.39)	1.38%	(0.48)	1.12%	(0.60)
1999	5.29%	(0.17)	2.58%	(0.29)	1.62%	(0.40)	1.18%	(0.45)	0.94%	(0.46)
2000	5.77%	(0.36)	2.84%	(0.47)	1.79%	(0.57)	1.31%	(0.62)	1.05%	(0.64)

Source: Own construction using the ECHP (1994-2001)

Notes: Poverty line 60% of median contemporary income. Income in real terms of 1996. OECD modified equivalence scale

P values for differences of estimates at t and $t-1$ in parenthesis

Figure 2. Relative poverty in Spain 1993-2000



Source: Own construction using the ECHP (1994-2001)

Note: needs-adjusted (modified OECD scale) household income in real terms of 1996

Table 5 complements the relative poverty measures of Table 4, and Figure 2 clarifies the trend in the FGT measures over the period. The family of FGT measures allows us to assess who among the poor is most affected by income redistribution. Taken together these indices show that, over the whole period, poverty reduction is greater, the greater the poverty sensitivity s , but, in the years where poverty increased, it increased most for high values of s : the poorest of the poor were affected most by the redistribution in each direction.

5. Poverty dynamics: 1993-2000

After the static approach our main aim is to produce a longitudinal complement to the cross-sectional analysis. How individuals' incomes change from one year to the next is something that cannot be inferred from the previous results. Are the people poor this year the same people who were poor last year? Poverty rates can be stable in time but there can be longitudinal flux in which individuals enter and exit poverty. We calculate low-income exit and re-entry rates to show that there is considerably more turnover in the low-income population than can be deduced from the static analysis. These rates are crucial in the design of an anti-poverty policy.

Table 6. Low-income sequence patterns

Number of years in poverty	Percentage
0	55.74%
1	13.50%
2	9.31%
3	4.89%
4	4.71%
5	4.12%
6	2.97%
7	2.22%
8	2.55%

Source: Own construction using the ECHP 1993-2000

Note: Percentages calculated using the ECHP longitudinal weights.

As noted in section 3.1 the dynamic approach is based on a balanced adults-only sub-sample for the eight waves. Table 6 and Table 7 summarise the income sequence patterns for our longitudinal sample. We find that 2.55 % of the sample had low income in all eight interviews. This proportion is more than 16,000 times larger than the proportion one would expect to find were the chances of having low income at each interview statistically independent (0.0002%). Put another way, of the group of people with incomes below 60% median size-adjusted income in 1993, 54.5% still had low income when interviewed in wave 2. About 41.6% of the original wave 1 low-income group had low incomes in waves 1-3, 31.3% in waves 1-4, 25.1% in waves 1-5, 19.3% in waves 1-6, 15.2% in waves 1-7, and 13% in waves 1-8.

Table 7. Percentage of poor in wave 1 that is poor in consecutive years

Consecutive waves	Percentage
1-2	54.46%
1-3	41.57%
1-4	31.28%
1-5	25.10%
1-6	19.32%
1-7	15.22%
1-8	13.00%

Source: Own construction using the ECHP 1993-2000

Note: Relative poverty based on needs-adjusted income (modified OECD scale)

Although a minority of the population had low income in every wave, many more had low income in one period or another: 2.22% had low income in seven interviews out of eight (smaller than in wave eight, because we do not examine low income spells other than around the time of the panel interviews), 2.97% in six waves out of eight and so on. But what is striking is that 44.26% of the sample is touched by low income at least once over an eight-year period (more than twice the proportion with low income at one interview, around 19%). So the finding of Jarvis and Jenkins (1997) that there is much year-to-year income mobility for all income groups is confirmed by the fact that almost 45% of our balanced adults-only panel experienced low income at least once during the period of study. Although there is a small group of people who are persistently poor (2.55%), it

is the relatively large number of low-income escapers and low-income entrants from one year to the next that is particularly striking.

Table 8. Poverty entry and exit.

	Entry rate	Exit rate
1993-1996	8.97%	40.77%
1997-2000	7.40%	39.02%
Total	8.07%	39.80%

Source: Own construction using the ECHP 1993-2000

Note: Relative poverty based on needs-adjusted income (modified OECD scale)

Table 8 presents poverty dynamics results. We find that 39.8% of individuals considered poor in a given year exit this situation one year after. At the same time, 8.1% of non-poor adults fall into poverty. We identified two distinct periods in the static approach: so we estimate exit and entry rates for both periods. In the first period, 1993-1996, in which the growth in income was moderate, exit and entry rates were bigger than in the second period, where income increased at high rates. All this results in the number of net exits being smaller in 1993-1996 than in 1997-2000. The poverty dynamics results for the whole period are very similar to those of Canto et al. (2003) for 1985-1995. In particular the exit rate is the same (39.9%) and entry rate is slightly smaller (6.4%)

5.1. Transition analysis

It is interesting to know the income levels of those who fall into and climb out of poverty: were movers' incomes in the previous year near the poverty line or far away from it? In order to know the effectiveness of income redistribution we are interested in the income levels of those who make transitions into or out of poverty and in exits to income levels away from the poverty line.

Table 9. Income level with respect to the median of those who exit or enter poverty

	Entering individuals	Entry rate	Exiting individuals	Exit rate
>0, ≤10			4.24%	37.75%
>10, ≤20			3.95%	34.14%
>20, ≤30			9.07%	37.48%
>30, ≤40			14.22%	35.32%
>40, ≤50			28.20%	41.55%
>50, ≤60			40.32%	41.95%
>60, ≤70	37.85%	32.53%		
>70, ≤80	21.81%	17.56%		
>80, ≤90	11.92%	10.09%		
>90, ≤100	7.65%	6.72%		
>100, ≤120	8.97%	4.49%		
>120, ≤160	6.68%	2.82%		
>160	5.12%	1.55%		
Total	100.00%	8.07%	100.00%	39.80%

Source: Own construction using the ECHP 1993-2000.

Note: Relative poverty based on needs-adjusted income (modified OECD scale)

Table 9 illustrates the economic characteristics of poverty and non-poverty spells: it presents the distribution of individuals who fall into and exit poverty and the rates of exit and entry depending on the level of income as a percentage of the median. As expected, a large percentage of individuals who have recently exited poverty or have fallen into it have incomes very near the poverty line: 40% of individuals who exit poverty and 38% of those who enter poverty make transitions from points near to the poverty line.

Among those who are not in poverty, but are near the poverty line (60% to 70% of the median) almost one in three (32.5%) fall into poverty the next year. From those who fall into poverty, 20.8% were in the upper part of the distribution, income above the median. These results are similar to, but more pessimistic than, those of Canto et al. (2003) for 1985-1995: those near the poverty line are more likely to fall into poverty (one in three as against one in four). On the other hand, 4.24% of those who exit poverty have incomes below 10% of the median. This group has an exit rate (37.75%) not very different to that of the group right above the poverty line (41.95%). The reasons for this include temporary income variations, temporary income absence, and measurement error. In sum, poverty entries are affected by the location in the income distribution (higher incomes are less likely to fall into poverty) while poverty exits do not depend on the poverty gap. Exits seem to be homogeneous throughout the distribution, so we suspect that there are other factors that influence them.

We are interested not only in the location in the income distribution before the transition, but also in destinations one year later. Examining year-to-year income mobility allows us to analyse changes in income without considering a poverty line. Table 10 shows average annual transition rates between 13 income groups where group membership depends on the size of a person's needs-

adjusted household income relative to fixed real income thresholds. The pattern revealed is one of much mobility, but most of it short-range.

Poverty entries take place predominantly from incomes near the poverty line. Of all those who entered poverty, 71% end up in the group with incomes between 40% and 60% of the contemporary median: this percentage is larger as the initial income is smaller. On the other hand, of individuals who exit poverty, 52% end up with incomes between 60% and 80% of the median, and 12% with incomes over 120% of the median. It is remarkable that those near the poverty line are the ones who move to adjacent groups above the poverty line, while those in the lower income groups are the ones who jump to the higher income group. To be specific, between 9% and 26% of each income group finish with incomes above 120% of the median, and between 40% and 62% of each income group terminates at 60% to 80% of the median. These results are consistent with those found for Spain in the period 1985-1992 (Canto 2003) where 75% move to a position below median income (77% in 1993-2000) and 87.5% move to positions below 125% of the median (88% below 120% of the median in 1993-2000).

Table 10. Transition matrix.

	>0, ≤10	>10, ≤20	>20, ≤30	>30, ≤40	>40, ≤50	>50, ≤60	>60, ≤70	>70, ≤80	>80, ≤90	>90, ≤100	>100, ≤120	>120, ≤160	>160
>0, ≤10	16.70	9.10	8.10	5.40	13.20	9.70	4.00	11.00	4.60	2.40	6.10	4.40	5.30
>10, ≤20	10.00	9.20	16.60	9.80	11.50	8.80	9.80	8.30	6.20	3.80	1.70	3.30	1.10
>20, ≤30	1.50	8.30	16.50	15.10	11.70	9.50	15.00	4.10	4.00	6.30	4.80	2.40	0.90
>30, ≤40	2.20	4.90	7.90	17.90	19.10	12.60	7.90	8.50	6.40	4.60	2.60	3.80	1.60
>40, ≤50	1.40	2.50	3.80	12.80	20.50	17.40	10.10	7.10	8.80	4.40	5.80	4.20	1.10
>50, ≤60	1.20	1.00	1.90	6.10	16.90	30.90	14.80	11.20	4.70	3.20	4.20	1.70	2.10
>60, ≤70	0.70	0.90	2.00	2.70	8.10	18.10	27.20	13.70	8.50	4.50	7.40	3.20	3.00
>70, ≤80	0.40	0.40	1.10	3.00	4.70	8.10	17.70	24.30	13.90	8.70	8.20	8.20	1.50
>80, ≤90	0.40	0.00	2.20	1.40	2.50	3.60	9.00	17.60	22.60	14.30	14.30	10.10	1.90
>90, ≤100	0.60	0.20	0.80	1.70	1.30	2.20	5.80	11.00	17.90	20.60	20.10	14.10	3.70
>100, ≤120	0.20	0.20	0.50	0.50	1.10	2.00	3.00	6.40	8.80	14.60	33.80	20.10	8.90
>120, ≤160	0.10	0.10	0.70	0.30	0.70	0.90	1.90	2.50	4.30	5.50	20.00	43.10	19.90
>160	0.30	0.00	0.10	0.10	0.70	0.40	0.60	0.70	0.90	1.40	4.00	16.00	74.90

Source: Own construction using the ECHP 1993-2000.

Note: Relative poverty based on needs-adjusted income (modified OECD scale)

Now look at the percentage change in income with respect to the initial income of those who enter and exit poverty (Table 11). 51% of those who enter poverty experience a change of less than 40% in their incomes, while 34% have changes between 40% and 70%. Among those who exit poverty, 21% have changes in income smaller than 40%, but almost half of them have changes greater than 100%, and 13% of people who exit poverty experience changes of more than 300%.

So, the average changes in income of those who enter poverty (41%) are not particularly large, but 7% of them have significant changes in income (more than 80%). In contrast, those who exit poverty have a wide range of variation in incomes: larger changes are more likely in the case of small initial incomes.

Table 11. Rate of change in income between t-1 and t in absolute value

<i>Percentage of change</i>	Entering individuals	Exiting individuals	<i>Percentage of change</i>	Entering individuals	Exiting individuals
>0, ≤10	10.9%	1.5%	>150, ≤160	0.0%	1.1%
>10, ≤20	15.8%	6.1%	>160, ≤170	0.0%	3.8%
>20, ≤30	12.0%	6.5%	>170, ≤180	0.0%	1.4%
>30, ≤40	13.0%	6.3%	>180, ≤190	0.0%	2.1%
>40, ≤50	13.1%	8.8%	>190, ≤200	0.0%	0.7%
>50, ≤60	10.6%	5.5%	>200, ≤210	0.0%	1.0%
>60, ≤70	10.3%	5.7%	>210, ≤220	0.0%	1.3%
>70, ≤80	7.0%	3.4%	>220, ≤230	0.0%	1.4%
>80, ≤90	3.3%	5.1%	>230, ≤240	0.0%	0.5%
>90, ≤100	4.0%	3.2%	>240, ≤250	0.0%	0.5%
>100, ≤110	0.0%	5.0%	>250, ≤260	0.0%	0.4%
>110, ≤120	0.0%	4.1%	>260, ≤270	0.0%	1.5%
>120, ≤130	0.0%	4.4%	>270, ≤280	0.0%	0.9%
>130, ≤140	0.0%	2.7%	>280, ≤290	0.0%	0.4%
>140, ≤150	0.0%	1.4%	>290, ≤300	0.0%	0.7%
			>300	0.0%	12.7%

Source: Own construction using the ECHP 1993-2000.

Note: Relative poverty based on needs-adjusted income (modified OECD scale)

5.2. Exit rates and re-entry rates

Not only is the *level* of income important when an individual climbs out of poverty, but also the *elapsed time* that the individual is out of low income. With eight waves of the ECHP, we can estimate the probability of entering or escaping low income for individuals with various low income-spell durations. We take into account the individual's likelihood of falling back into poverty shortly after exit. The qualitative importance of an exit is clearly determined by its capacity to maintain the individual persistently out of poverty after its occurrence. This section evaluates the "quality" of recorded poverty exits.

The exit and re-entry rates that are relevant in this context are those that refer to the experience of a cohort of persons starting a low-income spell (and so with the possibility of exit thereafter) and those finishing a low-income spell (and at risk of re-entry thereafter). To estimate exit rates, we use data for cohorts of persons beginning a low-income spell in the second wave or after; to estimate re-entry rates, we use data for a cohort of persons finishing a low-income spell in any wave before the eighth. Low-income exit rates were calculated by dividing the number of persons ending a low-income spell after d waves by the total number with low income for at least d waves. Low-income re-entry rates were calculated analogously (Bane and Ellwood, 1986). Since the unit of observation is a person in a spell of poverty, persons with multiple spells during the period were included each time they had a spell.

Estimates of poverty exit rates for a cohort of persons starting a poverty spell, together with estimates of the proportions remaining poor after given lengths of time are given in Table 12. Table 13 provides similar information, but about re-entry rates to poverty for those people who end a poverty spell.¹⁴

¹⁴ Some points to note. First, the amount of information is relatively limited, because there are only eight waves of data, so that exit rates for long durations cannot be estimated. Second, there are potential measurement error issues. We did

Table 12. Proportion remaining poor, and exit rate from poverty, by duration, for all persons beginning a poverty spell.

Number of interviews from the start of poverty spell	Number of spells at risk of exit at start of period	Cumulative proportion remaining poor	Annual exit rate from poverty.
1	3360	0.5636	0.5583
2	1460	0.3900	0.3640
3	798	0.3105	0.2269
4	511	0.2765	0.1159
5	365	0.2566	0.0745
6	150	0.2478	**

Note: Kaplan-Maier product-limit estimates based on all non-left censored poverty spells, pooled from the ECHP waves 1-8.

The substantive estimates are in Table 12. By construction (the exclusion of left-censored spells), all persons starting a poverty spell are poor for at least one year. The exit rate from poverty after one year with low income is 0.56. This rate falls further to about 0.36, 0.23, 0.12 and 0.07 for the subsequent interviews reporting low incomes. The shape of the non-parametric hazard implies a decreasing probability of exiting poverty as time in poverty lengthens. This probability decreases sharply when the individual has remained in poverty for one year. From one year on, the exit rate continues to fall, although more slowly over time. The results imply that, for those starting a low-income spell, 56% still have low income after one year, 39% after two years, and 25% after six years. It means that after six years of low income, more than 75% of an entry cohort would have escaped poverty. However, if an exit does not take place within three years the probability of it happening afterwards is very low. The exit rates imply a median poverty-spell duration for a cohort beginning a spell of between two and three years.

We need to analyse poverty re-entry rates to get better predictions of poverty experience. Relying on single-spell estimates underestimates people's total experience of poverty over a given period because a significant proportion of people experience multiple spells of poverty (Stevens 1999).

not make any adjustments for measurement error. In all our analyses, we treated any income movement across the poverty line as a poverty transition. Some previous research has attempted to distinguish between 'genuine' transitions (where movements into and out of poverty represent a significant difference in terms of access to resources), and smaller income variations that may arise from income volatility and misreporting and are arguably less significant (Bane and Ellwood 1986, Duncan *et al.* 1993, Jenkins 2000, Devicienti 2001). We also utilised this approach – see the appendix – but our analysis shows that making this distinction made little difference to the conclusions drawn. The analysis used transitions from all data.

Table 13. Proportion remaining non-poor, and poverty re-entry rates, by duration, for all persons ending a poverty spell

Number of interviews from the start of non-poverty spell	Number of spells at risk of poverty re-entering at start of period	Cumulative proportion remaining non-poor	Annual re-entry rate to poverty.
1	7410	0.8847	0.1224
2	6150	0.8459	0.0448
3	5520	0.8194	0.0318
4	5090	0.7970	0.0277
5	4800	0.7884	0.0108
6	2340	0.7834	**

Note: Kaplan-Maier product-limit estimates based on all non-left censored poverty spells, pooled from the ECHP waves 1-8.

Table 13 provides information about poverty re-entry rates for all persons ending a poverty spell (again left-censored spells have been excluded from the calculations). Re-entry rates fall from 0.12 one year after leaving poverty to 0.01 after five years. The largest reduction in the re-entry rate takes place during the first year after exit. From then onwards the probability of returning to poverty continues to decrease but at a lower rate. The re-entry rates imply that, for a cohort of persons starting a spell out of low income, about 21.7% will have fallen back into poverty in the subsequent five years. However, if a re-entry does not take place within 1 year, the probability of it happening afterwards is very low. It means that individuals successful in leaving poverty for a year, in general leave it for some longer time. We can conclude that as time out of poverty increases the re-entry probability decreases rapidly. The longer the duration of the non-poverty spell, the less probable a return to poverty becomes.

It is important to take the exit and re-entry probability results together as Jarvis and Jenkins (1997) pointed out. This implies that low-income spell repetition is an important phenomenon in Spain, and needs to be taken into account alongside the issue of single long-term low-income spells.

6. Conclusions

It is probably still true to say that we know much less about income mobility and poverty dynamics than we do about secular trends in inequality and poverty (Jenkins 2000): there is a substantial amount of income mobility to be explained, and this longitudinal flux exists even where there is cross-sectional stability in income inequality. Until now, studies that try to take account of the pattern of mobility within the Spanish income distribution have been rare: the main focus has been on the development of overall poverty rates through time. By using eight waves of the ECHP, this paper has provided new insights on a period of substantial change.

From an analysis of overall changes in income distribution (our “static” approach) it is clear that the period divides into two sharply contrasting halves: 1993-1996 with a slight increase in average income and 1997-2000 with a remarkable increase in average income.

Absolute poverty. To some extent absolute poverty tracked these income changes: the absolute poverty head-count ratio initially declined slightly, jumped 1996 and, from then on, decreased steadily and markedly; extreme poverty follows a similar pattern (except in 1995). However, poverty intensity actually grew at the end of the period (2000) and it is clear that the decline of poverty in the second half of the nineties is attributable to the overall growth in incomes more than to explicit redistribution in favour of the poor.

Relative poverty. The head-count ratio slightly decreased during the period. Results confirm the stabilization or even slight poverty increase in the middle nineties noted by Canto et al. (2003). After 1996 poverty reduced slightly in incidence and intensity, but 2000 seems to be a turning point as poverty starts to grow.

However, this picture of stability in relative poverty disappears if one examines year-to-year income mobility instead. The pattern revealed is one of much mobility, but mostly short-range. Income mobility also means that the proportion of population who are touched by poverty over the eight-year period is substantially larger than the proportion of the population who are poor in any one year. In the first half of the period (1993-1996) entry and exit rates are larger than in the second period, when income grows steadily. Results considering the effects of duration dependence on transition probabilities indicate that one half of the individuals who start a poverty spell in Spain exit one year later, and among those who exit poverty in Spain, one in eight return to it shortly after exit. We can conclude that low-income mobility is a significant empirical phenomenon in Spain.

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8. Appendix I

In the poverty-dynamics literature concern is often expressed for those transitions in and out of low income that occur within a small interval centred on the poverty line. The poverty line that delineates the states of “poor” and “not poor” is arbitrarily defined, like all low-income cut-offs. It is implausible to treat small income changes as a genuine transition out of or into poverty, when it is likely to be due to transitory income shocks or measurement errors that do not significantly affect the individual’s living standard. To avoid this threshold effect, Bane and Ellwood (1986), Duncan et al. (1984) and Jenkins (1999) define exits from poverty (out of poverty) as occurring only if post-transition income is greater (less) than 110% (90%) of the poverty line. However, these adjustments to the actual transitions are somewhat arbitrary and it is not clear whether they can really filter out

“genuine” poverty transitions only. We compare these estimated hazard rates with the ones obtained without any modifications to the actual transitions.

As the adjusted definition of transition makes it more difficult for an individual to cross the poverty line, it is not surprising to observe a decrease (increase) in the estimated exit rates (survivor function) in Table A1 compared to Table 12. This is even more dramatic in the case of the estimated re-entry rates and survivor function reported in Table A2 in comparison to Table 13. Previous research on poverty dynamics acknowledged the problem but no sensitivity analysis was carried out.

Table A1. Proportion remaining poor, and exit rate from poverty, by duration, for all persons beginning a poverty spell.

Adjusted transitions.

Number of interviews from the start of poverty spell	Number of spells at risk of exit at start of period	Cumulative proportion remaining poor	Annual exit rate from poverty.
1	3110	0.6712	0.3934
2	1660	0.4954	0.3015
3	980	0.4003	0.2123
4	650	0.3531	0.1254
5	474	0.3360	0.0495
6	360	0.3234	**

Note: Kaplan-Maier product-limit estimates based on all non –left censored poverty spells, pooled from the ECHP waves 1-8.

As illustrated in Table 12 and Table A1, the estimated hazard rates show evidence of negative duration dependence. For the cohort of individuals just starting a poverty spell, about one third (39%) would have left during the first year if the adjusted definition is used (while if no adjustments are made to the observed transitions, the exit rate at duration one is 55%, some 13% higher than before). After five years the probability of escaping poverty is 5% (7.5% in the unadjusted transitions case). In almost all years the adjusted exit rates remain smaller than the unadjusted ones. For the cohort of individuals just starting a poverty spell, about 67% would have left after the first year if the adjusted definition of transitions is used; and after five years 32% would still have low income, higher figures than in the unadjusted case.

Table A2. Proportion remaining non-poor, and poverty re-entry rates, by duration, for all persons ending a poverty spell.

Adjusted transitions.

Number of interviews from the start of non-poverty spell	Number of spells at risk of poverty re-entering at start of period	Cumulative proportion remaining non-poor	Annual re-entry rate to poverty.
1	7220	0.9246	0.0784
2	6350	0.8894	0.0388
3	5840	0.8655	0.0273
4	5330	0.8499	0.0182
5	5120	0.8447	0.0061
6	4900	0.8379	**

Note: Kaplan-Maier product-limit estimates based on all non-left censored poverty spells, pooled from the ECHP waves 1-8.

Table A2 shows the estimated re-entry rates and survivor function out of poverty. Once again, negative duration dependence emerges. Re-entry rates are much smaller than exit rates but still point to a significant risk that individuals fall back into poverty. Using the adjusted definition of transition, almost 8% of the individuals ending a poverty spell will again have low income after the first year; within five years, 15% of the poverty escapers will have fallen back into poverty. For all years the adjusted re-entry rate remains smaller than the unadjusted ones.

Taken together the results of both tables imply that two fifths of the individuals who start a poverty spell in Spain exit one year later, and among those who exit poverty in Spain, 7% return to it shortly after exit. Despite the difference in exit and re-entry rates the conclusions are similar to those obtained in the main text.

9. Appendix II

To measure poverty and inequality we have used a variety of complementary indices:

Incidence of poverty (headcount index): This is the share of the population whose income is below the poverty line

$$H = \frac{q}{n}$$

q = number of individuals whose income is below the poverty line

n = number of individuals in the population.

The main drawback is that this measure is not sensitive to changes in income among the poor if they still continue being poor.

Depth of poverty (poverty gap): This provides information regarding how far off households are from the poverty line. This measure captures the mean aggregate income shortfall relative to the poverty line across the whole population. It is obtained by adding up all the shortfalls of the poor (considering the non-poor have a shortfall of zero) and dividing the total by the population. Put differently, it gives the total resources needed to bring all the poor to the level of the poverty line (divided by the number of individuals in the population).

$$I = 1 - \frac{\mu_p}{z}$$

μ_p = average income of the poor

z = poverty line

Coefficient of variation amongst the poor, measures the dispersion of income amongst the poor

$$CV_p = \frac{S_p}{\mu_p}$$

P90/P10: ratio of the ninetieth and tenth percentiles. Higher values of the coefficient show less inequality in the distribution.

Gini index: is defined as

$$G = \frac{1}{2\mu} \sum_{i=1}^q \sum_{j=1}^q |x_i - x_j| f_i f_j$$

It varies between 0, perfect equality and 1, maximum inequality

Foster-Greer-Thorbecke class of poverty measures. The general formula for this class of poverty measures depends on a parameter s which takes a value of zero for the headcount, one for the poverty gap. The larger the value of s the larger is the aversion towards inequality amongst the poor.