YOUTH POVERTY, EMPLOYMENT, AND LEAVING THE PARENTAL HOME IN EUROPE

BY SARA AYLLÓN*

Department of Economics and EQUALITAS, University of Girona

This paper studies the nature of youth poverty dynamics in Europe. First, it analyzes to what extent experiencing poverty in a given period is *in itself* positively related to the probability of living below the poverty line again in the future. That is, we assess the degree of poverty genuine state dependence among young people. Second, we study the interrelationships between poverty, employment, and residential emancipation. The results show that youth poverty genuine state dependence is positive and highly significant, but this scarring effect is short-lived in Scandinavia compared to Southern or Continental Europe. Moreover, although we find a strong association between poverty and leaving home in Nordic countries, time spent in economic hardship does not last long. On the contrary, in Spain and Italy, young adults tend to leave their parental home much later in order to avoid falling into a poverty state that is more persistent.

JEL Codes: C33, I32, J13

Keywords: employment, feedback effects, leaving home, state dependence, youth poverty

1. INTRODUCTION

It is sometimes assumed that having little or no income is part of the experience of being young. During this phase of the life-cycle, individuals invest in their future mainly by acquiring education or experience in the labor market, and thus their shortage of economic resources is seen as a matter of course. In fact, for the great majority of young people, this will be a temporary situation and they will see their incomes rise along with their human capital investments. This paper is concerned about the rest: those for whom *temporary* becomes *permanent* and the lack of sufficient economic resources is a situation that is perpetuated not only throughout their youth but later on as adults. We claim that a better understanding of the dynamics of youth poverty is necessary if we are to design effective policies to fight it.

The objective of this paper is twofold. First, we study the nature of youth poverty dynamics in eight European countries by focusing on the analysis of poverty genuine state dependence. That is, we assess to what extent experiencing

poverty in a given period is *in itself* positively related to the probability of living below the poverty line in the future. This is valuable given the virtual absence of previous results of the consequences of youth poverty on future prospects of experiencing poverty again. Thus, we decompose poverty persistence caused by certain observed and unobserved characteristics from that due to genuine state dependence. Distinguishing between the two has significant consequences for social policy. If youth poverty is driven by genuine state dependence, helping young people to move above the poverty line today will reduce their likelihood of experiencing poverty tomorrow. On the contrary, if youth poverty is mainly due to certain characteristics, policies will have to be addressed at enhancing those that are protective factors against economic disadvantage.

The second objective of the paper is to study the interrelationship of youth poverty with employment and the decision to leave the family home. Entering the labor market and residential emancipation are key events with significant consequences on the economic well-being of young adults. Thus, we argue that youth poverty cannot be measured independently of both transitions. In this regard, we are interested, for example, in the consequences of past and current employment on poverty and, at the same time, the influence of past poverty experiences on current employment. We want to know how the poverty risk evolves after leaving the parental home and if poverty promotes or prevents residential emancipation. Taken together, these effects will help us to gain a better understanding of the nature of youth poverty dynamics in Europe.

With both objectives in mind, we build an econometric strategy consisting of a dynamic trivariate probit model for poverty, employment, and leaving the parental home. We model the three outcomes of interest simultaneously and allow for feedback effects between the three processes. That way we can properly deal with the endogeneity problems that arise when studying life transitions which are possibly taking place in a sequential manner. Our strategy improves on existing models in the literature through controls for initial conditions, unobserved heterogeneity, non-random selection of the sample, and unobserved cross-process correlations. Importantly, we expect the results to differ according to the institutional settings, the generosity of the Welfare State provision, the dynamism of youth labor markets, and cultural values, among other factors.

The main results show that there is a considerable degree of genuine state dependence in youth poverty. Economic hardship today increases *in itself* the likelihood of being poor tomorrow among young individuals. However, this scarring effect is short-lived in Scandinavia when compared to Southern or Continental Europe—that is, poverty affects many young people in Denmark and Finland but only for a short period of time. On the contrary, in Spain and Italy, fewer young people live in economic hardship but they have greater difficulties in leaving it behind. Moreover, our findings show that there is a strong association between poverty and leaving home in Denmark and Finland but its effect loses importance as time goes by. Past poverty also decreases the likelihood of employment in nearly all the analyzed countries. Finally, employment and leaving home are closely related phenomena in the cases of Mediterranean and Continental Europe. However, such a relationship does not exist in the English-speaking countries or in Scandinavia.

This paper is structured as follows. Section 2 reviews the literature on youth poverty dynamics. Section 3 presents the data set used. Section 4 briefly describes the dynamics of youth poverty in Europe and its relationship with employment and leaving home. Section 5 presents the econometric technique and Section 6 the empirical results. Section 7 summarizes our main findings.

2. Youth Poverty Dynamics in the Literature

The analysis of the dynamics of poverty during youth has received little attention in the literature despite the considerable amount of interest devoted to the study of poverty transience and the development of youth poverty studies. In fact, in the past two decades, the literature on poverty dynamics has mostly focused on the adult population while youth poverty analyses have mainly been performed from a static perspective.[1]

Thanks to the availability of comparative data, we have a rather good description of youth poverty patterns across the European Union (Middleton, 2002; Aassve *et al.*, 2006; Iacovou and Aassve, 2007). We have learned about the importance of living with the family of origin, being in a stable job, or having an employed partner as protective factors against youth poverty (Iacovou and Berthoud, 2003). We also understand the relationship between youth poverty and the life-cycle better (Kangas and Palme, 2000; Rigg and Sefton, 2004) or poverty and leaving the parental home (Aassve *et al.*, 2006; Iacovou, 2010). Nonetheless, our knowledge of youth poverty dynamics is still scarce. The existing literature is reviewed in what follows.

Aassve *et al.* (2005) study the impact of certain life events on the probability of entering into and exiting from poverty amongst young people. Their results confirm that leaving the parental home (especially in Scandinavian Europe) and childbearing are associated with poverty entries, while cohabitation with a partner stands as a protective factor against it. Furthermore, poverty exits are related not only to employment or the end of education, but mainly to job stability.

The relationship between leaving the parental home and entering poverty is further explored in Aassve *et al.* (2007) and Parisi (2008). Using propensity score matching techniques and with a sample of 13 European countries, Aassve *et al.* (2007) confirm that residential emancipation strongly increases the risk of entering poverty in those countries where leaving home occurs early, such as Denmark or Finland. The same is not true for countries where residential emancipation is delayed. In a similar fashion, Parisi (2008) estimates that, in Southern Europe, young individuals with characteristics that make them more prone to leaving, at an earlier age, or who are from poorer family backgrounds, are more likely to enter poverty when they emancipate.

Furthermore, Cantó and Mercader (2001a) study the economic consequences of youth emancipation in Spain on the family of origin. Their results show that leaving home increases the poverty entry rate of the remaining household

---

[1]See Jenkins (2000) for a review of the literature on modeling poverty transitions, and Aassve *et al.* (2006) and Iacovou and Aassve (2007) for comprehensive surveys of youth poverty studies from a static point of view.

members, pointing to the fact that the economic contribution of the young persons to the parental home prior to leaving home is important in countries such as Spain.

As regards the duration of youth poverty, Mendola *et al.* (2009) studied the persistence of poverty in several European countries by analyzing the number of periods that young adults are recorded to be below the poverty line. They find that despite the high levels of poverty experienced by young people in Nordic countries, their poverty experience is very temporary in nature thanks to the generosity of the Welfare State provision and the dynamism of labor markets. Moreover, Cantó and Mercader (2001a) show that the presence of an employed young member in the parental household in Spain significantly reduces the probability of entering poverty if the household head is not employed, or providing an exit from poverty if employed.

Thus, the literature highlights the importance of leaving the parental home and employment as key events to take into account when analyzing poverty among young adults. Nevertheless, none of the reviewed contributions take into account state dependence in poverty nor the endogeneity/simultaneity problems that arise when modeling poverty in a time of demographic and labor market transitions. This is the weakness that we tackle in this work.

3. Data and Definitions

We use data from the European Community Household Panel (ECHP) which is a harmonized cross-national longitudinal survey conducted in all members of the former European Union-15 between 1994 and 2001—except for Austria and Finland which joined in 1995 and 1996, respectively. Our analysis is based on the components from Spain, Italy, Denmark, Finland, Germany, France, the United Kingdom, and Ireland. That is, we have chosen two cases of each Welfare regime typology (Social-Democratic, Conservative, and Liberal) described in Esping-Andersen's (1990, 1999) work while including Southern Europe as a separate type.[2] The welfare state regimes theory has proven to be a useful framework for the analysis of poverty and transitions to adulthood in Europe.

Possibly the greatest advantage of the ECHP is that a standardized questionnaire is answered each year by a representative sample of individuals and households, allowing a comparative analysis across countries, like the one we propose here. Moreover, it is important to note that individuals who move, or form or join a new household are followed up at their new location. On the negative side, only the population living in private households is represented in the ECHP, and so our study does not cover young adults living in community housing or without stable accommodation. Ideally, we would have used a more recent period of analysis but the European Union Statistics on Income and Living Conditions (EU-SILC) is a rotational panel that is too short for the purpose of this study.

For the econometric modeling, our sample is an unbalanced panel that includes all individuals between 16 and 29 years of age the first time they

---

[2]See Esping-Andersen (1990, 1999) for the social and institutional characteristics that define each welfare regime. Also, see Ferrera (1996) for a discussion on the existence of a Southern European typology on its own.

participate in the survey.[3] No other restrictions are imposed on our working sample—this means that, for instance, individuals who do not leave the parental home during the observed period are modeled together with those who have already done so the first time they are interviewed, and also those observed leaving home. While we are aware that this restricts the amount of covariates to be included in the different regressions, it has the advantage of accounting for the situation of all young people, regardless of the transitions they have already been through.[4] The number of observations for each country is detailed at the bottom of Table 3.

It is important to note that poverty transitions can only be measured for the period between 1994 and 2000 (1996 to 2000 in the case of Finland). This is because all the annual income variables are collected retrospectively in the ECHP. Thus, interviews that took place during the first wave of the panel in 1994 asked about the incomes obtained in 1993. As we do not want to neglect this time bias (see Debels and Vandecasteele, 2008), we build net household income at t summing up net personal incomes reported at $t + 1$ of the individuals present in the household at t. This methodology leaves us with only seven waves to be used as we cannot build household income referring to 1993 because we do not know the household composition for that year.

Finally, and regarding the definitions of the main variables of interest, we considered as poor any young person with a household equivalent income below 60 percent of the median, with the threshold being time and country specific.[5] Also, incomes are made equivalent by using the modified-OECD equivalence scale. An individual is defined as employed if he usually works 15 or more hours per week, according to a self-defined variable. And we consider someone to have left the parental home if he lives in a household where none of the registered members are his progenitors.

4. Youth Poverty Dynamics and Their Relationship with Employment and Leaving Home in Europe

4.1. *Youth Poverty Dynamics in Europe*

In this section, we briefly describe youth poverty in Europe by focusing on risk, accumulation of years in poverty, and transitions. Table 1 presents poverty rates for young people between the ages of 16 and 29. As shown, in the Mediterranean countries, the youth poverty rate is the highest—especially in Italy where nearly one in four live below the poverty line. The United Kingdom, France, Ireland, and Finland present poverty rates of between 14 and 17 percent while the lowest rates are found in Denmark and Germany.

---

[3]Note that this age group best allows the comparative analysis between the eight countries. A larger age group would entail having to compare individuals with very different profiles in the different contexts.

[4]For example, we are unable to include parental information in our regressions since such information is not collected from young adults who had already left the parental home the first year they participated in the panel.

[5]Unfortunately, the ECHP does not contain data on consumption so robustness checks for a different distribution were not possible.

TABLE 1

Youth Poverty Rate (16–29 Years of Age) and Percentage of Youth by Accumulated Number of Years in Poverty by Country, 1994–2000

	Youth Poverty Rate	% of Youth by Accumulated Number of Years in Poverty				
		0	1	2	3+	Total
Spain	18.4	55.5	13.5	9.6	21.5	100.0
Italy	23.7	50.0	15.0	7.4	27.6	100.0
Denmark	12.3	48.2	29.0	12.6	10.2	100.0
Finland	14.6	–	–	–	–	–
Germany	12.5	72.2	10.5	5.5	11.8	100.0
France	16.5	56.4	16.2	10.8	16.6	100.0
UK	16.7	68.9	11.3	6.1	13.7	100.0
Ireland	14.0	65.6	15.2	8.1	11.1	100.0

Source: Own calculations on the ECHP, 1994–2001. The second part of the table draws from a seven-wave balanced panel.

Table 1 also shows the accumulation of years in poverty when considering a balanced panel of seven years.[6] Spain and Italy are the countries where young people are most likely to accumulate three or more poverty experiences. On the contrary, Denmark has the highest percentage of young people experiencing one annual spell and the lowest proportion of young people who have never been in poverty, indicating that economic hardship affects many young individuals but for a short period of time. Germany has the highest proportion of young people that have never spent a year in poverty. Finally, France presents similar results to those of Spain while Ireland and the United Kingdom have more favorable positions, revealing percentages similar to those of Germany.

Figure 1 shows the poverty rates at $t + 1$, $t + 2$, and $t + 3$ conditioned at poverty status at t. As shown, Mediterranean Europe is characterized by having a relatively high poverty risk conditioned at not being poor at t that does not differ much when accounting for different period lengths. At the same time, the probability of finding oneself in poverty at t and at $t + 1$ is high, especially in Italy, and it decreases slowly at $t + 2$ and at $t + 3$. Thus, a considerable group of young Spaniards and Italians experience poverty during their youth and encounter difficulties in leaving it behind.

In Scandinavian Europe, the probability of being poor at $t + 2$ and $t + 3$ if not poor at t is high but, at the same time, individuals in poverty at t quickly escape economic hardship in the following periods. Indeed, these results indicate that in Denmark and Finland, there is a significant turnover of individuals experiencing short periods of poverty. Germany presents the best possible position given that it has the lowest poverty rates conditioned at not being poor at t of all the analyzed countries. Finally, the experiences for France, the United Kingdom, and Ireland lie in-between those of Mediterranean and Scandinavian Europe.

[6]While these results are informative, they should be interpreted carefully because a balanced panel may be less representative of the studied population. Also, Finland had to be left out of this analysis because it started its participation in the ECHP later than the other countries.
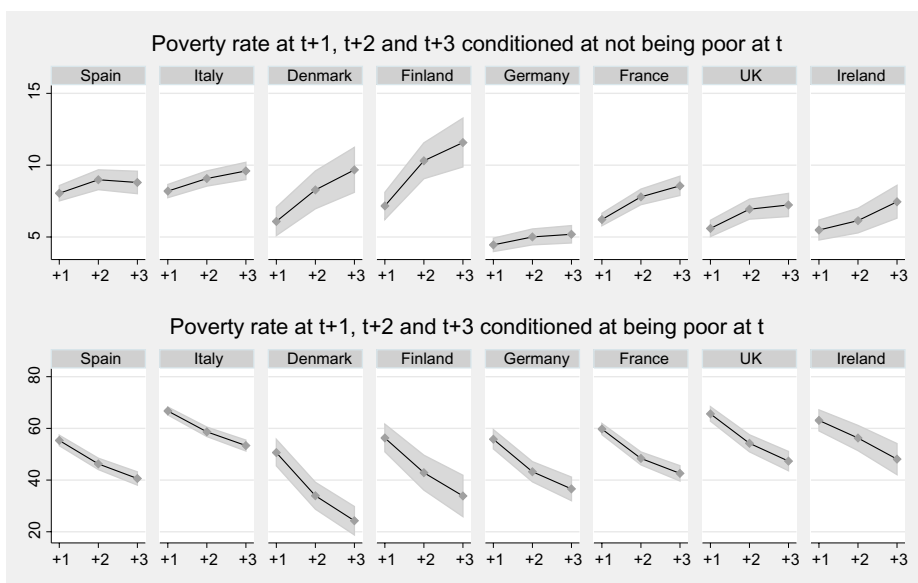
Figure 1. Youth Poverty Rate at $t + 1$, $t + 2$, and $t + 3$ Conditioned at Poverty Status at t by Country, 1994–2000

Source: Own calculations on the ECHP, 1994–2001. Bootstrapped confidence intervals with 1000 replications.

4.2. *Poverty and Leaving Home*

The relationship between poverty and leaving home is analyzed in Figure 2 which shows, for each country, the poverty headcount during the four years prior to and following residential emancipation. In the figure, $t = 0$ (marked with a vertical line) is the final period we observe young individuals in the parental home. It is important to note that the sample in this figure is limited to those individuals who are still living with their parents the first time they participate in the panel and later we observe them leaving.

Youth poverty rates before and after leaving home present striking differences in Nordic countries (see Aassve *et al*., 2005, 2006, 2007). The poverty risk for Danes and Finns is multiplied by 15 between the year prior to residential emancipation and the first year outside the parental home. This is readily explained by the fact that in both countries leaving home is closely associated with pursuing education.[7] Nevertheless, there is a clear and fast pattern of poverty risk reduction in the successive years after leaving home. Thus, for the majority of young people, time in economic hardship does not last long once outside the parental home.

---

[7]Note how this descriptive analysis does not take into account the fact that home stayers and leavers may have different characteristics that make the latter more prone to leaving home and entering poverty. The econometric model we present in the next section does take into account possible selection effects.
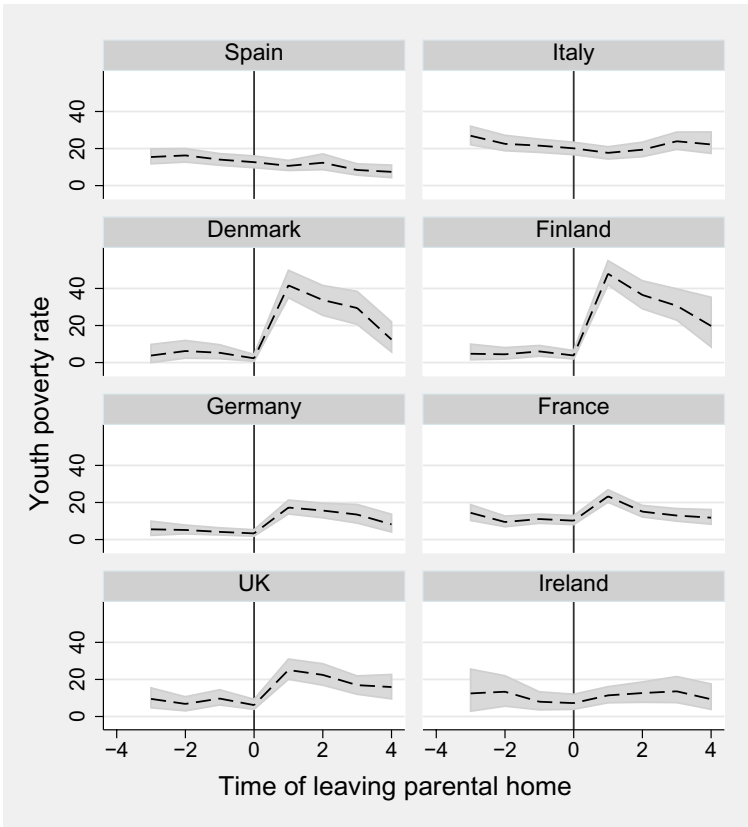
Figure 2. Youth Poverty Rate and the Time of Leaving Home

Note: $t = 0$ is the final year we observe young people in the parental home. The sample is restricted to those individuals living with their progenitors the first time they participate in the survey and are then observed leaving the parental home. Bootstrapped confidence intervals with 1000 replications.

Source: Own calculations on the ECHP, 1994–2001.

On the contrary, in Spain and Italy, no poverty risk differences are found prior to and following residential emancipation. Young Mediterraneans stay with their parents until they can economically guarantee themselves a smooth residential transition. The period prior to emancipation is taken as an opportunity to accumulate resources (savings, home ownership, human capital, etc.) that will assure a similar level of economic well-being outside the parental home to that enjoyed while cohabiting with the parents—see Alessie *et al.* (2004a) on the effects of cohabitation on household savings decisions in Italy and the Netherlands. The patterns of poverty risk and the time of leaving home in Germany, France, the U.K., and Ireland are in-between those observed for Mediterranean and Nordic countries. We observe a certain increase in the poverty risk when leaving the parental home but it is a smoother transition, especially in Ireland, than that experienced by the Danes and Finns.
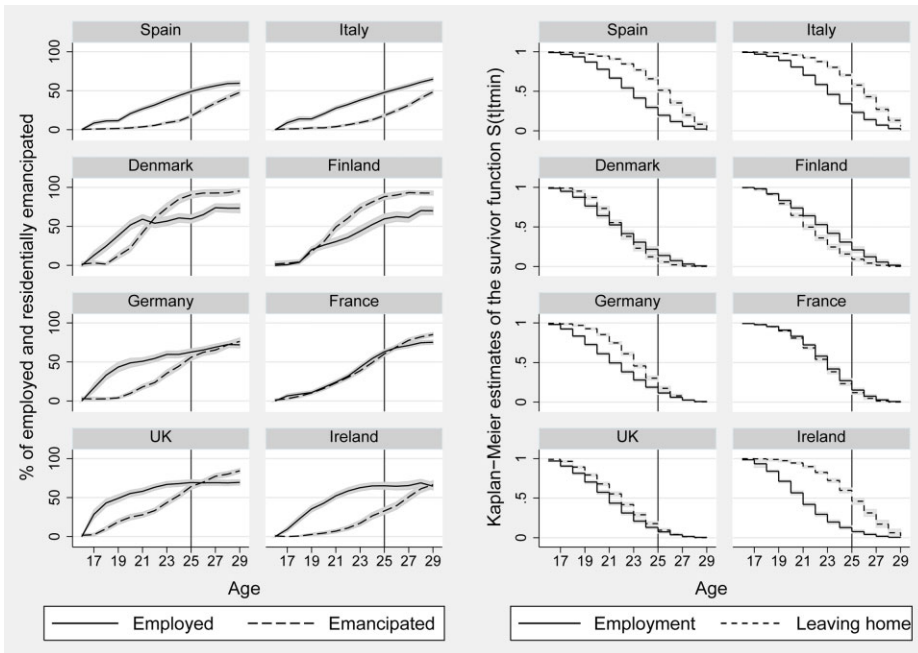
Figure 3. Percentage of Employed and Residentially Emancipated Youth by Age Group (on the Left) and Kaplan–Meier Estimates of the Survivor Function $S(t|t_{min})$ for Employment and Leaving Home (on the Right)

Source: Own calculations on the ECHP, 1994–2001. Bootstrapped confidence intervals with 1000 replications (on the left) and Hall–Wellner confidence bands for the Kaplan–Meier estimates (on the right) (see Coviello, 2008).

Moreover, does the poverty status of the family of origin influence the probability of leaving home? To answer this question, we have computed the residential emancipation rate between $t - 1$ and t conditioned by the family poverty status at $t - 1$ (not shown for brevity).[8] The same pattern emerges everywhere: young people are less likely to leave the parental home if the family of origin is in economic hardship—as already found by Cantó and Mercader (2001b) for the case of Spain. Thus, there is an association between poverty and residential emancipation that works in both directions.

4.3. *Employment and the Decision to Leave Home*

Figure 3 shows, on the left hand side, the percentage of employed and residentially emancipated young people by age group in each of the analyzed countries. On the right, the Kaplan–Meier estimates of the survivor function $S(t|t_{min})$ for

[8]Results are drawn from a small number of observations in those countries with low poverty rates in the parental home, such as in Scandinavia, and therefore should be treated with caution.

employment and leaving home illustrate how the sequence of both events takes place.[9] A vertical line at the age of 25 is drawn in each graph to ease comparison.

Interestingly, in Spain and Italy, and also in Ireland, the percentage of employed young people is always above the percentage of residentially emancipated young people. As shown by the survivor function estimates, for the majority of young individuals, the employment career starts well before leaving home. This finding is consistent with the stated results about the relationship between poverty and the decision to leave the parental home: young adults, in the abovementioned countries, delay their emancipation while accumulating enough human capital or economic resources until they feel ready to leave.

A similar pattern is found in the United Kingdom and Germany among the youngest sample. However, emancipation and employment in both countries take place in a more simultaneous fashion for *relatively* late leavers (25 or older).

In Northern Europe, however, leaving home happens earlier and before entering the labor market for the great majority of individuals, with this pattern being especially evident in Finland. Only the youngest (probably with less employability) search for their first job while enjoying the economic security of being in the parental home. After a certain age though, young people leave the parental home regardless of their situation in the labor market: employment is not an indispensable condition for leaving home.

Finally, in France, the percentage of employed young people is very similar to the percentage of young individuals who are residentially emancipated. Jurado Guerrero (2001) argues that employment is less relevant for French young adults to leave the parental home (especially for men) since market income is often combined with public benefits and family help.

In short, Figure 3 shows that the sequence of transitions is different in each country and the possible consequences on the economic well-being of young people are dissimilar as well.

4.4. *Youth Employment and Poverty*

In order to analyze the relationship between employment and poverty, we have computed the youth poverty rate depending on the presence of other adults in the household (above the age of 29) and the employment status of these other members and the young person. The first rows in Table 2 show the poverty risk of young people who do not cohabit with other adults. Unsurprisingly, employment is a crucial protection against economic deprivation for young households.

---

[9]Kaplan–Meier estimates can be calculated with delayed entry (as is the case in this study) but the interpretation changes. Rather than estimating $S(t)$, one gets $S(t|t_{min})$ which is the probability of surviving past time t given survival to time t_{min}, where t_{min} is the earliest entry time (see StataCorp, 2011). In the case of residential emancipation, this means that we need to presume that individuals have never left the parental home if the first time we observe them they are still cohabiting with their parents. This is very plausible as come-backs are very rare. In the case of employment, results need to be interpreted more carefully, taking into account that we could be missing an employment spell that began and ended before participating in the survey (e.g., a summer job). However, the results should be illustrative of most young individuals.

TABLE 2

YOUTH POVERTY RATE ACCORDING TO THE PRESENCE OF OTHER ADULTS (>29) IN THE HOUSEHOLD
AND EMPLOYMENT STATUS

	Spain	Italy	Denmark	Finland	Germany	France	U.K.	Ireland
No other adults (>29) in the household								
Young, not employed	35.9	40.1	41.3	44.6	50.7	46.8	58.9	55.3
Young, employed	11.5	13.5	8.1	8.5	10.4	6.6	9.8	4.9
Other adults in the household (>29), at least one working								
Young, not employed	18.2	26.1	5.1	5.5	8.8	13.9	8.9	10.3
Young, employed	7.9	9.5	2.8	2.2	2.8	5.8	2.9	3.0
Other adults in the household (>29), none working								
Young, not employed	38.6	47.8	25.9	20.9	41.9	51.6	55.2	41.3
Young, employed	14.1	14.6	9.0	1.4	11.7	20.2	20.4	6.7

Source: Own calculations on the ECHP, 1994–2001. Weighted results.

Furthermore, employment is also a key factor against poverty in those households where the young person lives with other adults, especially if they are not working—as shown in the second and third panels of Table 2. For example, in Spain, the presence of at least one employed young member reduces the risk of poverty from 18.2 to 7.9 percent in households where at least another adult is working and from 38.6 to 14.1 percent if no other adult is employed.[10] It is important to note that the differences in poverty risks dependent on the employment of young individuals are especially important in the Mediterranean and English-speaking countries. Also, according to the percentages of individuals in each household type (not shown), the cohabitation of employed youth with other family members occurs more often in the aforementioned countries.[11] Remaining in the parental home while preparing for residential emancipation benefits not only the young individual but also his progenitors in what can be seen as a family *win–win* strategy.

5. THE ECONOMETRIC STRATEGY

To study state dependence in poverty, and the described relationships between poverty, employment, and leaving home decisions, we propose the estimation of a first-order Markov chain random-effects trivariate probit model that allows for feedback effects between the three processes. This econometric strategy assesses whether young people are confronted with a sequential process of decision-making and approaches the unrealistic assumption that each process has no influence on future values of the outcomes—for example, past poverty having no effect on current employment or past employment on current residential

[10]For the case of Spain, Cantó and Mercader (2001a) were amongst the first to describe a *help-effect* from young individuals to parents especially in households where the head is unemployed or inactive. See also Ayllón (2009) for an analysis of the increasing help-effect over time provided by young people in Spain.

[11]Similarly, Iacovou and Davia (2005) also observe how in Southern Europe adult children are more likely to be economically supporting their parents. Furthermore, Blanco and Kluve (2002) find that in Southern Europe parents' financial satisfaction decreases when their children leave the family home while the contrary is found in Northern Europe.

emancipation status.[12] We are aware that the sequential scheme does not adapt equally well in such diverse contexts as those analyzed here, nevertheless we preferred to estimate the same model structure for each country and to be able to compare the different effects.

A similar econometric strategy was applied before in three poverty analyses. Biewen (2004, 2009) is our main reference. The author models, for the adult population in Germany, poverty, employment, and the decision to live with others. He finds that there is a considerable amount of genuine state dependence in the poverty status and that past poverty reduces the likelihood of employment in the future while it has a positive effect on living alone (or household split). However, his model is limited by the use of a common individual specific random effect which restricts the cross-process unobserved correlation structure (Biewen, 2009, p. 1103). In our case, we overcome this constraint by allowing random effects to be different in each equation and freely correlated, thus making the model more flexible. Conceptually, we also find it easier to think that the unobservables affecting poverty are different to those associated with employment or residential emancipation—even when possibly correlated.

Devicienti and Poggi (2011) assess how poverty and social exclusion interact at the individual level in Italy. Their results on feedback effects show how both processes are affected by a noteworthy degree of state dependence, and also how both phenomena reinforce each other. Amuedo-Dorantes and Serrano-Padial (2010) examine the poverty implications of past and current temporary employment in Spain. They find that holding a temporary contract increases not only the probability of current poverty but also of future poverty via an indirect effect that in turn increases the probability of holding a type of contract in the future with a higher poverty risk.

5.1. *Model Specification*

We define P_{it} as the individual poverty status of young individuals, E_{it} the employment status, and L_{it} the leaving home status. We assume that in period t individuals can be characterized by a latent poverty propensity p_{it}^*, a latent employment propensity e_{it}^* and a residential emancipation propensity l_{it}^* that take the form:

$$(1) \qquad p_{it}^* = \beta_0 E_{it} + \beta_1 L_{it} + \beta_2 P_{it-1} + \beta_3 E_{it-1} + \beta_4 L_{it-1} + \beta_5 Z_{it}' + c_i + u_{it}$$

$$(2) \qquad e_{it}^* = \alpha_0 L_{it} + \alpha_1 P_{it-1} + \alpha_2 E_{it-1} + \alpha_3 L_{it-1} + \alpha_4 S_{it}' + h_i + \varepsilon_{it}$$

---

[12]Martínez-Granado and Ruiz-Castillo (2002) previously modeled for the case of Spain, the relationships between leaving the parental home, entering the labor market, and pursuing studies. However, they assume that the three decisions are taken at the same point in time, something we consider to be unrealistic. As shown above, the completion of a process (e.g., employment) is for many individuals an essential condition for entering another process (e.g., leaving home) in given contexts.

(3)
$$l_{it}^* = \gamma_0 P_{it-1} + \gamma_1 E_{it-1} + \gamma_2 L_{it-1} + \gamma_3 V_{it}' + g_i + \lambda_{it}$$

(4)
$$P_{it} = I(p_{it}^* > 0)$$

(5)
$$E_{it} = I(e_{it}^* > 0)$$

(6)
$$L_{it} = I(l_{it}^* > 0)$$

where $i = 1, 2, \ldots, N$ refers to young individuals, and $t = 1, \ldots, T$ are the number of periods under study. $I(p_{it}^*) > 0$, $I(e_{it}^*) > 0$ and $I(l_{it}^*) > 0$ are binary indicator functions equal to one if the latent propensity in each case is positive and equal to zero otherwise. Furthermore, $(Z_{it}', S_{it}', V_{it}')$ are the independent variables vectors assumed to be exogenous, $(\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \alpha_0, \alpha_1, \alpha_2, \alpha_3, \gamma_0, \gamma_1, \gamma_2)$ are the feedback effects we are interested in (described below) and, generally called, $(\beta_5, \alpha_4, \gamma_3)$ are the rest of parameters to be estimated. Moreover, the idiosyncratic error terms in each process (u_{it}, ε_{it} and λ_{it}) are assumed to follow a standard normal distribution with zero mean and unit variance and to be serially independent.[13]

As already well established in the literature, the treatment of initial conditions is crucial in the estimation of dynamic panel data models, such as that proposed in equations (1) to (3). The problem of initial conditions arises because the start of the observation window may not be the same as the start of the outcome experience. As in Biewen (2004, 2009) and Devicienti and Poggi (2011), we have chosen to follow Wooldridge (2005) regarding the treatment of initial conditions. The author proposes finding the density of the dependent variables from $t = 1, \ldots, T$ conditional on the initial condition and the explanatory variables—instead of finding the density for the whole period $t = 0, 1, \ldots, T$ given the explanatory variables.[14] This involves the need to specify the density of the unobserved specific effects conditional on the dependent variables at $t = 0$ and the time-averaged explanatory variables, generally called $\overline{Z}_i$, $\overline{S}_i$ and $\overline{V}_i$.[15]

Formally, we can write the specification as follows,

(7)
$$c_i = a_0 + a_1 P_{i0} + a_2 E_{i0} + a_3 L_{i0} + a_4 \overline{Z}_i + \kappa_{1i}$$

---

[13]The models have been estimated using the software package aML (see Ayllón, 2014).

[14]Note that the initial conditions solution proposed by Wooldridge (2005) assumes that at most one lag of the dependent variable is included in the regressions.

[15]In Biewen (2009), initial conditions are only included in the first equation as only one random effect is specified. We considered the need to introduce initial conditions in each equation as each includes an individual specific error. See Hsiao (1986), Chay and Hyslop (2000), Wooldridge (2005), or Skrondal and Rabe-Hesketh (2014) for a review of the different strategies that have dealt with the initial conditions problem..

$$(8) \qquad h_i = b_0 + b_1 P_{i0} + b_2 E_{i0} + b_3 L_{i0} + b_4 \overline{S}_i + \kappa_{2i}$$

$$(9) \qquad g_i = x_0 + x_1 P_{i0} + x_2 E_{i0} + x_3 L_{i0} + x_4 \overline{V}_i + \kappa_{3i}.$$

Following Stewart (2007), we add the time-average of some observed variables in order to allow for a correlation between the individual specific effects and the time-varying variables (see also Chamberlain, 1984; Alessie *et al.*, 2004b).[16]

Estimates of the model's parameters are obtained by Conditional Maximum Likelihood (CML).[17] Moreover, the recursive structure assures identification by providing a multiplicity of exclusion restrictions as discussed in Mroz and Savage (2006).[18]

As explained by Wooldridge (2000, 2005) and in order to get consistent estimates, the residuals κ_{1i}, κ_{2i}, κ_{3i} are integrated out using a numerical integration algorithm based on Gauss–Hermite quadrature at 24 points. A trivariate normal distribution with zero mean and $\sigma^2_{k_{ji}}$ variance is assumed for κ_{1i}, κ_{2i}, κ_{3i} which are allowed to be freely correlated:

$$(10) \qquad \rho_{12} = corr(\kappa_{1i}, \kappa_{2i})$$

$$(11) \qquad \rho_{13} = corr(\kappa_{1i}, \kappa_{3i})$$

$$(12) \qquad \rho_{23} = corr(\kappa_{2i}, \kappa_{3i})$$

where ρ_{12} summarizes the association between unobservable individual factors determining poverty status and employment. If ρ_{12} is positive (negative) it means that unobservables that make individuals more likely to be poor, also make them more (less) likely to be employed. ρ_{13} accounts for unobserved heterogeneity between poverty and leaving home and ρ_{23} between employment and emancipation. It is important to remember that correlations relate unobservables such as ability, intelligence, personality traits, ambition, relationship with parents, family background and so on.

---

[16]Stewart (2007) includes the average of all the model time-varying covariates except for feedback effects and year dummies. Wooldridge (2000) also underlines the importance of including interaction terms so that the model is saturated. Following Biewen (2009), we introduced interactions between the initial conditions and some observed values. However, it made no difference to the results and we decided to exclude them from the final specification.

[17]As argued in the aML software package User's Guide: "When a closed form solution to the integral does not exist, the likelihood may be computed by approximating the normal integral by a weighted sum over 'conditional likelihoods,' i.e., likelihoods conditional on certain well-chosen values of the residual" (Lillard and Panis, 2003, p. 130). The alternative would be to use Maximum Simulated Likelihood (see Alessie *et al.*, 2004b; Contoyannis *et al.*, 2004; Devicienti and Poggi, 2011).

[18]The condition of logical consistency forces the recursive structure of the model in the case of multiple equation probit models with endogenous regressors. It is important to note, however, that the existence of one varying exogenous regressor is sufficient to avoid identification problems (see Wilde, 2000).

Note that if $\beta_3 = \beta_4 = \alpha_1 = \alpha_3 = \gamma_0 = \gamma_1 = 0$, the recursive structure of the proposed model would not be necessary and we could consistently estimate the three equations separately. If the aforementioned coefficients were different from zero but $\rho_{12} = \rho_{13} = \rho_{23} = 0$, again, we could estimate the equations separately by assuming that the lagged values of each outcome used as explanatory variables are weakly exogenous. Otherwise, joint estimation is necessary in order to obtain consistent estimates.

Another important advantage of the model is that it allows attrition to depend on the initial conditions in an arbitrary way. The CML allows a different attrition probability depending on the initial value of each of the outcomes. Thus, attrition is taken into account without the need to explicitly model it.[19] As argued by Biewen (2004, 2009), not allowing for serial correlation in the idiosyncratic error terms is a limitation of this kind of model but it would be exceedingly difficult to estimate it given the multiple equations structure of the current model.

5.2. State Dependence and Feedback Effects

In the poverty equation, we include poverty status at $t - 1$ with the idea of capturing the sign and degree of *genuine state dependence* in the poverty status once observed and unobserved heterogeneity is controlled for. As argued by Weber (2002) and Devicienti and Poggi (2011), if we did not consider unobserved heterogeneity, state dependence would be overestimated. We expect genuine state dependence in the poverty status to be positive everywhere—implying that poverty in a given year increases *in itself* the probability of being poor in the following year. Moreover, the coefficient of the poverty status in the initial year should point to the fact that persistence seems to be longer lasting in Mediterranean countries than in Northern Europe.

In terms of feedback effects, the poverty equation includes as an explanatory variable whether the individual has left the parental home or not. According to the descriptive statistics, we should not find any great differences regarding the poverty risk among residentially emancipated and non-emancipated young people in Mediterranean countries, while this occurs much more in Northern Europe. Still, lagged emancipation status should reflect the fact that poverty decreases at a faster rate for Finns and Danes. Finally, employment and lagged employment is included in the equation from which we expect a negative sign.

As regards the employment equation, and following the sequential conditioning structure proposed in Biewen (2004), we include as explanatory variables lagged employment, current and lagged emancipation status, and lagged poverty.[20] From lagged employment status we expect a positive sign in all the

[19]See Cappellari and Jenkins (2002, 2004) for a methodology on poverty transitions that explicitly models sample retention.

[20]We have chosen to model employment in the second equation rather than leaving home as we preferred the association of current emancipation status on employment rather than the other way round—however, the results went in the same direction when we did so. Moreover, note that we are not modeling a fully simultaneous model, thus the consistency of our estimates is guaranteed (see Maddala, 1983).

analyzed countries as state dependence in employment is significant in the labor market (see Heckman, 1981; Arulampalam *et al.*, 2000; Stewart, 2007). Furthermore, we expect a positive influence of emancipation status (current and lagged) on employment since a higher level of individual income is necessary to support oneself outside the parental home. However, as shown in Figure 3, emancipation does not necessarily have any influence on the employment status of Scandinavian youth.

The association of lagged poverty status with employment is still less clear. On the one hand, amongst those young adults living in the parental home, one may think that economic hardship may precipitate young individuals to enter the labor market in order to help their family. If that were the case, we could anticipate a positive sign between lagged poverty and current employment. On the other hand, it is also well known that poverty is intergenerationally transmitted, thus individuals from an economically deprived background have fewer opportunities in the labor market. If this is the case, we can expect a negative sign—possibly weaker in Nordic countries where the intergenerational transmission of poverty is highly mediated by more egalitarian educational systems and policies (see, for instance, Jäntti *et al.*, 2006).

As regards the leaving home equation, we have included lagged employment, leaving home, and poverty statuses. As before, we expect lagged employment to be positively related to residential emancipation—though not necessarily significant in Nordic countries where employment is not an inevitable condition for emancipation. Furthermore, we expect a highly significant and positive sign for lagged emancipation status when measuring state dependence outside the parental home, as "come-backs" are rare in the analyzed countries. Finally, the association between lagged poverty status and leaving home decisions is difficult to predict. In the descriptive analysis of Section 4, it was argued that economic hardship in the family of origin does not seem to precipitate young people to leave the parental home. Nevertheless, it is difficult to unravel an explanation for this. In those contexts where family ties are strong, young individuals may feel more responsible for their parents' well-being and thus remain in the parental home to offer help and companionship. Also, individuals from poorer backgrounds may have not only fewer opportunities in the labor market but also less residential emancipation possibilities. Leaving the parental home requires a considerable amount of economic resources often provided by progenitors.

As regards the covariates, each equation includes age, age-squared, sex, maximum level of education acquired during the analyzed period, and regional and year dummies to account for differences in the labor and housing markets as well as the business cycle. Moreover, the average of each time-varying variable is also introduced. We are aware that the information available in the data set makes a full parsimonious fit of each outcome impossible. For instance, we do not have information about parental background for those young adults who had already left the parental home the first time they were interviewed. Also, one needs to be careful when introducing certain covariates given the possible endogeneities arising with the feedback effects—for example, information about the presence of a partner or housing tenancy would be highly correlated with the leaving home

status. Accordingly, our results can be seen as descriptive correlations rather than causal effects.

6. Empirical Results

We comment on our empirical findings contained in Table 3 by focusing first on our results relating to state dependence and feedback effects. To facilitate their interpretation, we also present average partial effects (APE) which show, in absolute terms, the impact of a change in an explanatory variable on the risk of poverty, employment or emancipation—see Table 4. Note we have only computed APE for underlying coefficients which are statistically significant at least at the 95 percent confidence level. Separate regressions by gender have been computed and are commented on throughout the text, if relevant. These results are available from the authors upon request. The results related to unobserved heterogeneity and its correlations as well as some robustness checks are discussed at the end of this section.

6.1. *Poverty*

The first rows in Table 3 show the results of the poverty equation. As Mroz and Savage (2006) argue, the estimates can be interpreted as the impact of exogenously induced changes in the *possibly* endogenous determinants. As expected, poverty status at $t - 1$ is positive and highly significant in each of the analyzed countries which proves the existence of genuine state dependence in youth poverty. As with the adult population, being poor today increases in *itself* the chances of being poor tomorrow for young people too. APEs in Table 4 indicate that genuine state dependence in poverty varies from 11 to 20 percentage points—the lowest being in Spain and Ireland and the highest in Denmark.

However, to fully understand the poverty experiences of young people we need to look at the coefficient for the initial poverty status, P_0. When doing so, results indicate that Danes and Finns do face problems of economic hardship during their youth, however it is a temporary situation as the coefficient for P_0 becomes smaller. On the contrary, in Mediterranean Europe, young people face more difficulties in escaping poverty: the scarring effect of poverty increases over time, pointing to more persistent poverty experiences. The cases of Germany, France, and the United Kingdom lie in-between while the poverty experience in Ireland is similar to that in Spain or Italy.

The results also show how being outside the parental home is strongly associated with poverty not only in Finland and Denmark, but also in the rest of the countries except for the Mediterranean ones. In Finland, for instance, emancipation means an increase of 30 percentage points in the poverty risk. However, it is important to note how in most countries, the sign reverses and is negative for those who have been away from the parental home for at least two years (L_{t-1}). Taken together, leaving home is still positively associated with poverty but less strongly as time goes by, highlighting the temporary nature of economic hardship because of the emancipation experience—not only for Finns and Danes, but also for Germans, the French, and the British. In Spain and Italy, we do not find evidence

TABLE 3

Selected Coefficients for the Trivariate Probit Model on Poverty, Employment, and Emancipation with Feedback Effects
(standard errors in parentheses)

	Spain	Italy	Denmark	Finland	Germany	France	U.K.	Ireland
Poverty equation								
Constant	−1.1197	−1.7876**	−1.1126	0.6692	−0.6824	−0.6420	3.3587***	−4.8222***
	(0.8080)	(0.7823)	(1.9050)	(1.7286)	(1.1208)	(1.0413)	(1.3008)	(1.4354)
E_t	−0.4822***	−0.4479***	−0.4766***	−0.6857***	−0.4901***	−0.7075***	−0.5286***	−0.7250***
	(0.0471)	(0.0448)	(0.0979)	(0.1121)	(0.0603)	(0.0591)	(0.0770)	(0.0977)
L_t	0.1328	−0.0086	2.2872***	2.4491***	1.3195***	1.0554***	1.6016***	0.6685***
	(0.0830)	(0.0742)	(0.0979)	(0.1664)	(0.1098)	(0.0927)	(0.1367)	(0.2078)
P_{t-1}	0.6363***	0.7710***	1.1104***	0.9770***	0.9367***	1.0160***	1.1099***	0.8605***
	(0.0411)	(0.0359)	(0.0949)	(0.1214)	(0.0582)	(0.0548)	(0.0741)	(0.0981)
E_{t-1}	−0.1599***	−0.1739***	−0.1165	−0.3277***	0.0344	−0.3992***	−0.3297***	−0.2190**
	(0.0453)	(0.0463)	(0.0910)	(0.1027)	(0.0609)	(0.0590)	(0.0681)	(0.0885)
L_{t-1}	−0.0274	0.1990**	−0.5853***	−0.9524***	−0.4522***	−0.6617***	−0.4763***	−0.2159
	(0.0926)	(0.0798)	(0.1443)	(0.1442)	(0.1074)	(0.0880)	(0.1211)	(0.1971)
P_0	1.0398***	1.0200***	0.3675***	0.8218***	1.0625***	0.8633***	0.7610***	1.0956***
	(0.0587)	(0.0530)	(0.1083)	(0.1530)	(0.0889)	(0.0767)	(0.0980)	(0.1342)
E_0	−0.0270	0.0523	−0.3454***	0.0212	−0.1929***	0.1578**	−0.3443***	−0.3371***
	(0.0588)	(0.0594)	(0.1090)	(0.1273)	(0.0698)	(0.0685)	(0.0875)	(0.1188)
L_0	0.1546*	−0.0667	−0.5229***	−0.4116**	−0.2793***	−0.1501	−0.2224*	−0.0712
	(0.0856)	(0.0786)	(0.1482)	(0.1684)	(0.1022)	(0.0939)	(0.1225)	(0.1936)
Employment equation								
Constant	−8.8534***	−5.1345***	−1.0752	−6.3979***	1.1658	−10.1952***	−2.0498*	−4.6895***
	(0.8354)	(0.8288)	(1.3706)	(1.2803)	(0.8515)	(0.9713)	(1.0937)	(1.2440)
L_t	0.3112***	0.2359***	−0.2487*	0.1556	0.5558***	0.7320***	−0.0883	0.0823
	(0.0791)	(0.0807)	(0.1467)	(0.1336)	(0.0939)	(0.0827)	(0.1060)	(0.1861)
P_{t-1}	−0.1822***	−0.4215***	−0.2143**	−0.0696	−0.2224***	−0.2338***	−0.2251***	−0.2302**
	(0.0459)	(0.0454)	(0.1031)	(0.1112)	(0.0588)	(0.0607)	(0.0749)	(0.1050)
E_{t-1}	0.8706***	1.3161***	0.9606***	0.8140***	1.1507***	1.0633***	1.0922***	0.9614***
	(0.0348)	(0.0386)	(0.0669)	(0.0831)	(0.0400)	(0.0434)	(0.0545)	(0.0649)
L_{t-1}	−0.4180***	−0.2546***	−0.1425	−0.0255	−0.1646*	−0.2599***	0.0031	0.0250
	(0.0789)	(0.0854)	(0.1330)	(0.1283)	(0.0911)	(0.0757)	(0.1176)	(0.1650)
P_0	−0.0344	0.1310***	−0.1473	−0.0886	−0.1271**	0.0017	−0.2131**	0.0401
	(0.0521)	(0.0501)	(0.1044)	(0.1124)	(0.0634)	(0.0637)	(0.0832)	(0.1196)
E_0	1.0215***	1.2571***	0.6275***	0.5309***	0.7537***	0.9001***	0.8740***	1.0791***
	(0.0550)	(0.0695)	(0.0792)	(0.0980)	(0.0559)	(0.0640)	(0.0785)	(0.0997)
L_0	−0.0276	−0.0656	0.3336***	−0.0435	−0.1588*	−0.3296***	−0.0864	−0.2870
	(0.0831)	(0.0864)	(0.1082)	(0.1350)	(0.0826)	(0.0764)	(0.1001)	(0.1824)

Leaving home equation

Constant	−12.7953***	−11.2746***	−32.1944***	−23.5741***	−13.8132***	−12.4658***	−7.5917***	−7.6581***
	(1.6095)	(1.6498)	(5.8317)	(6.2153)	(2.2191)	(1.6497)	(1.5365)	(2.1285)
P_{t-1}	−0.0716	−0.2238***	0.2447	−0.5304*	−0.1114	−0.4099***	−0.0442	0.1704
	(0.0892)	(0.0833)	(0.4355)	(0.2788)	(0.1697)	(0.1095)	(0.1444)	(0.1844)
E_{t-1}	0.1548**	0.0236	0.0007	−0.1363	0.2507**	0.4461***	−0.1016	−0.0727
	(0.0678)	(0.0795)	(0.1791)	(0.1754)	(0.1006)	(0.0880)	(0.1009)	(0.1459)
L_{t-1}	3.9051***	4.0042***	3.8366***	3.2072***	3.8277***	3.2849***	3.2488***	4.3581***
	(0.1584)	(0.1542)	(1.2038)	(0.3831)	(0.2023)	(0.1594)	(0.1171)	(0.3178)
P_0	−0.0477	0.0995	−0.4307	0.1987	0.0612	0.1168	0.0504	0.0510
	(0.0801)	(0.0778)	(0.4405)	(0.2549)	(0.1591)	(0.0958)	(0.1334)	(0.1582)
E_0	0.1798***	0.3934***	0.0331	0.2131	0.2451**	−0.0382	0.1482	0.1803
	(0.0688)	(0.0917)	(0.2116)	(0.2027)	(0.1063)	(0.0916)	(0.0986)	(0.1178)
L_0	0.4641	0.6775*	1.4753	1.7133*	0.9974**	0.6537**	0.3481**	−0.0973
	(0.3135)	(0.3818)	(1.6453)	(0.9829)	(0.3944)	(0.2616)	(0.1663)	(0.8067)
σ_{κ_1}	0.7153***	0.7140***	0.4048***	0.5220***	0.7340***	0.6136***	0.6674***	0.6218***
	(0.0361)	(0.0322)	(0.0959)	(0.1070)	(0.0553)	(0.0478)	(0.0678)	(0.0821)
σ_{κ_2}	0.8119***	0.7799***	0.4633***	0.5521***	0.6746***	0.6527***	0.7591***	0.8144***
	(0.0330)	(0.0377)	(0.0646)	(0.0760)	(0.0378)	(0.0415)	(0.0513)	(0.0628)
σ_{κ_3}	0.6015***	0.8212***	0.9187***	0.9599**	0.9493***	0.5776***	0.5776***	0.1962
	(0.1423)	(0.1553)	(0.2416)	(0.3960)	(0.1532)	(0.1221)	(0.0937)	(0.8561)
ρ_{12}	−0.0029	0.0387	−0.6503**	−0.3278	−0.3343***	−0.0423	−0.4670***	−0.1688
	(0.0566)	(0.0562)	(0.2696)	(0.2155)	(0.0778)	(0.0875)	(0.0953)	(0.1353)
ρ_{13}	0.1577	0.0295	−0.6481*	0.0874	−0.0002	0.3944**	0.0340	0.2231
	(0.1016)	(0.0775)	(0.3840)	(0.2373)	(0.1137)	(0.1568)	(0.1898)	(1.1552)
ρ_{23}	0.3543***	0.3749***	0.4630*	0.0791	−0.2024**	−0.2256*	−0.1273	0.5283
	(0.0953)	(0.0798)	(0.2406)	(0.2065)	(0.1009)	(0.1368)	(0.1269)	(2.2594)
ln-L	−17,789.81	−18,420.72	−3,710.68	−4,664.16	−11,506.58	−10,797.26	−7,414.69	−5,423.57
N	20,138	23,239	4,995	5,268	15,591	13,629	10,454	7,487

Source: Own calculation on the ECHP, 1994–2001. Significance: *** 99% confidence level, ** 95% and * 90%. All regressions include age, age-squared, sex, maximum level of education acquired, regional (except for Denmark) and year dummies, as well as the time-average of age and age-squared.

TABLE 4

Average Partial Effects for State Dependence and Feedback Effects from the Trivariate Probit Model on Poverty, Employment, and Emancipation (when significant at least at 95% confidence level)

	Spain	Italy	Denmark	Finland	Germany	France	U.K.	Ireland
Poverty								
E_t	−7.3	−7.5	−6.3	−8.3	−5.1	−9.9	−6.1	−7.8
L_t	−	−	18.5	29.5	11.7	12.9	13.6	7.3
P_{t-1}	11.6	15.6	20.3	15.6	12.8	18.7	16.6	11.9
E_{t-1}	−2.4	−2.9	−	−3.8	−	−5.4	−3.6	−2.2
L_{t-1}	−	3.4	−8.3	−12.3	−4.6	−9.3	−5.3	−
Employment								
L_t	6.9	4.1	−	−	12.4	16.1	−	−
P_{t-1}	−4.0	−7.3	−5.0	−	−4.9	−4.7	−4.4	−4.6
E_{t-1}	21.9	30.3	26.4	22.1	30.4	26.3	25.7	22.5
L_{t-1}	−8.8	−4.2	−	−	−	−4.9	−	−
Leaving home								
P_{t-1}	−	−1.4	−	−	−	−2.9	−	−
E_{t-1}	1.0	−	−	−	1.5	3.6	−	−
L_{t-1}	81.7	78.0	29.8	42.8	57.5	62.9	67.6	92.7

Source: Own calculation on the ECHP, 1994–2001.

of differences between the poverty risk of leavers and stayers (see Mendola *et al.*, 2008, for a similar result).[21]

Unsurprisingly, we find current and lagged employment to be significant and negatively related to the poverty status—with this effect being at its strongest in Finland and France. However, the consequence of employment on current poverty seems limited in terms of time as coefficients lose importance and may become imprecisely estimated.

As regards the rest of the covariates (not shown for brevity purposes), it is worth highlighting the importance of the highest level of education acquired as a protective factor against youth poverty, with the exceptions of Denmark and Finland.

6.2. *Employment*

In relation to the results in the employment equation, the only statistically significant coefficient common across all countries is that which captures genuine state dependence in the employment status which is positive and significant, as expected. The highest genuine state dependence in the employment status is found in Germany and Italy. For instance, in Germany, past employment increases the likelihood of current employment among young people by 30 percentage points— this is only slightly lower than that found by Biewen (2009) among German men aged 26 to 65 (33 percent).

[21]However, note that separate regressions by sex show that actually the coefficient for L_t on poverty is positive and statistically significant at 95% for boys in both Mediterranean countries while it is not precisely estimated for girls in Spain and it is negative for them in Italy. Thus, the effects by gender offset each other. The higher poverty probability among males is probably explained by the fact that boys aged 16 to 29 are relatively "early leavers" in these countries.

The current leaving home status is not significant in Scandinavia or the English-speaking countries, indicating that employment and residential emancipation are not such interlinked phenomena. In Continental and Mediterranean Europe the association between emancipation and employment is strong: leaving the parental home increases the incentives to be employed. It is important to note that separate regressions by gender indicate that in Italy and Spain this coefficient is only precisely estimated among men. Surprisingly though, the coefficient for lagged emancipation status (L_{t-1}) on employment is negative in Spain, Italy, and France. Again, results stratified by gender show that this effect is driven by females who are less likely to be employed once they have been residentially emancipated for at least two years and may be engaged in childbearing.

As regards the influence of lagged poverty on employment, we were not sure whether to expect a positive sign—indicating that young individuals are precipitated into entering the labor market to help their families out of economic hardship—or a negative one—pointing out a certain degree of intergenerational poverty transmission. Our results show that the effect of poverty being transmitted across generations dominates and takes the form of fewer opportunities in the labor market. In Italy, for instance, past poverty reduces the chances of employment in the labor market by 7 percent. However, it is worth noting that the coefficient is not significant in Finland and less precisely estimated in Denmark, conforming to the well-known fact that the transmission of poverty across generations is less important in these countries.

Girls are less likely to be employed in all the analyzed countries and age follows the usual inverted U-shape. Education has different degrees of importance depending on the institutional context.

6.3. *Leaving Home*

As expected, having left the parental home in the residential emancipation equation is positive and one of the most significant coefficients across equations. Only on rare occasions do young people who have decided to leave the parental home come back to it.

Lagged employment status is positive in Spain and in Continental Europe, indicating that employment is a prerequisite to emancipation.[22] In relation to lagged poverty status, interestingly, the coefficient is negative and significant only in France and Italy while not precisely estimated in Spain—even though it is characterized as being a country of strong family ties. In France and Italy, poverty delays emancipation while economic hardship in the family of origin does not mean the same among Spaniards, once other factors are controlled for. Moreover, in France the effect is only statistically significant among men and in Italy among women.

Age is a strong determinant in leaving home decisions and girls are more likely than boys to leave the parental home—as already well established in the literature. Holding a university degree clearly reduces the probability of being away from the parental home in Spain and Italy while the contrary is true for Denmark. Again,

---

[22]The results are not very apparent. However, note that the relationship between employment and leaving home is already accounted for in the employment equation.

this is readily explained by completely different educational systems that promote or prevent leaving home decisions among students.

6.4. *Unobserved Heterogeneity and Correlations*

The estimated standard deviations of the random effects and their correlations are presented at the bottom of Table 3. Importantly, the standard deviations for practically all random effects are statistically significant at the 99 percent confidence level which emphasizes the importance of considering individual-specific effects in the present analysis. Unobserved heterogeneity explains persistence in a given status because those unobserved characteristics which make someone more likely to be poor, employed, or residentially emancipated exhibit persistence over time.

As regards the correlations between unobservables, in five out of the eight countries analyzed, there is at least one correlation which is statistically significant at 95 percent. It is important to bear in mind that the significance of the correlations highlights the importance of estimating the three processes jointly. Moreover, the results also underline that the three processes are not similarly interlinked through unobserved heterogeneity everywhere. Possibly, the sequencing scheme does also fit better in certain contexts (namely Germany and the Mediterranean countries) compared to others (Ireland or Finland).

Unobserved factors driving poverty are negatively associated with those that drive employment in Germany and the United Kingdom, and less strongly in Denmark. It is reasonable to think that the unobservables that make individuals more likely to be poor also reduce their chances of being employed. Interestingly, this same correlation is not significant in Mediterranean countries. Any interpretation of this result is difficult. However, it is possible to think that in countries with strong family ties, young people may feel forced to enter the labor market in order to help their families out of poverty, and, as a result, offset the difficulties they encounter when looking for a job.

Similarly, the unobservables that make someone more likely to be employed, also make him more likely to leave the parental home in Mediterranean Europe— for example, a resolve for self-sufficiency, a career-driven personality, etc. Interestingly, the same is not true in Germany. Actually, the unobservable factors driving employment are negatively related with factors driving residential emancipation, which highlights the fact that many Germans leave the parental home for reasons other than employment.

The results point to the importance of accounting for the interdependencies existing between employment and leaving home that exist in Mediterranean Europe and Germany, via not only observed but also unobserved heterogeneity. The same is indicated for the interrelationship between poverty and employment in Germany, the United Kingdom, and Denmark. Instead, and according to these results, unobservables associated with both poverty and leaving home seem less problematic everywhere.

6.5. *Robustness Checks*

Different robustness checks were carried out. Separate regressions that do not integrate out the individual specific effects have shown that state dependence in

each phenomenon would be greatly overestimated in the three equations (especially if not including a control for the initial conditions). The overestimation of state dependence is partly corrected when accounting for unobserved heterogeneity but not completely in separate models.

The joint model proposed in this paper also presents important differences compared to the results obtained with separate regressions in terms of current and feedback effects. For brevity purposes, only two are discussed here. First, in the case of Spain, current leaving home status (L_t) would be wrongly associated with poverty. Also, the effect of leaving home on employment would be highly overestimated. It is important to recall at this point that the joint model finds a positive and highly significant correlation between unobservables that associate employment and leaving home in Spain. Thus, the joint model reminds us that the interrelationship between both phenomena needs to be accounted for not only through observed characteristics but also via correlated unobserved heterogeneity—a result that separate regressions cannot indicate. The cases of Denmark and Germany provide a second example: separate regressions would overstate the negative influence of past poverty experiences on employment. The joint model used in this paper diminishes the importance of this effect and shows that the interrelationship between both phenomena occurs via unobservables as well.

Admittedly, when the interrelationships between the studied phenomena are not much affected by correlated unobserved heterogeneity, the joint model proposed in this paper does not represent a great gain in terms of the interpretation of the parameters of interest compared to separate regressions that account for feedback effects, initial conditions, and unobserved heterogeneity.

7. Conclusions

This paper studies the nature of youth poverty in eight European countries using data from the ECHP for the period 1994–2000. Our main objectives were to separate *genuine state dependence* in the poverty status from observed and unobserved characteristics and to explore the relationships between poverty, employment, and residential emancipation. In order to do so, we used a dynamic trivariate probit model with random effects that controls for unobserved heterogeneity and initial conditions while considering the possible endogeneities between poverty, employment, and leaving the parental home by allowing feedback effects and free correlations between random effects. We followed the model proposed in Biewen (2009) but we made the error structure more flexible by adding a different random effect in each of the outcome equations.

Our results confirm that there is a considerable amount of genuine state dependence in the poverty status in all the analyzed countries, although poverty experiences differ greatly in duration according to the institutional context. Poverty lasts longer in the Mediterranean countries than in Finland or Denmark. In Scandinavia, poverty affects many young individuals but only for a short period of time, while in Spain or Italy, fewer young adults live below the poverty line but for multiple periods. Germany, France, and the United Kingdom lie in-between while Ireland behaves similarly to the Mediterranean countries.

The results also show the differing significance of the feedback effects considered. First, leaving home is not associated with poverty in Italy and Spain while there is a positive and strong relationship with poverty in the rest of the countries (especially in Finland and Denmark). However, not only in Scandinavia, but also in Germany, France, and the United Kingdom, the influence of leaving home on poverty is limited in terms of time as the sign for lagged residential emancipation status becomes negative. That is, leaving home increases the chances of being poor but only for a short period. Second, poverty decreases the chances of youth employment everywhere (except Finland) by between 4 and 7 percentage points. Third, employment and leaving home are closely related phenomena not just in Spain and Italy but also in Germany and France. In Scandinavia and the English-speaking countries though, such a link does not exist. Fourth, genuine state dependence in the employment and residential emancipation statuses are positive and strong. And, finally, past poverty has a negative influence on leaving home in Italy and France (albeit weak).

As regards the model specification, the results confirm the importance of considering unobserved heterogeneity and the correlations between random-effects. However, the link between the three estimated processes via unobservables is not equally strong in all countries. Actually, in Mediterranean and Continental Europe a joint model of the kind presented here is more relevant—especially in terms of the relationship between employment and leaving home, and poverty and employment.

The results call for two types of policies aimed at fighting youth poverty. First, policies that raise youth (or their family) incomes above the poverty line would avoid the scarring effect of poverty on future economic hardship. This is especially relevant in countries where poverty affects fewer young people but for longer periods of time—as is the case in Spain and Italy. Second, policies should enhance those characteristics observed as having a positive effect against poverty, for instance, by increasing an individual's chances in the labor market. Similarly, in those countries where poverty is closely related with leaving home, namely Denmark and Finland, more emphasis should be placed on smoothing residential transitions since poverty affects the great majority (even if only for a short while).

Our results should be understood as a first attempt to measure state dependence in poverty among young people while accounting for the complex interrelationship with employment and leaving home—even with the obvious limitation in the number of covariates we were able to include in our models.

References

Aassve, A., M. A. Davia, M. Iacovou, and L. Mencarini, "Poverty and the Transition to Adulthood: Risky Situations and Risky Events," Working Paper 2005-23, ISER, 2005.

Aassve, A., M. Iacovou, and L. Mencarini, "Youth Poverty and Transition to Adulthood in Europe," *Demographic Research*, 15, 19–50, 2006.

Aassve, A., M. A. Davia, M. Iacovou, and S. Mazzuco, "Does Leaving Home Make You Poor? Evidence from 13 European Countries," *European Journal of Population*, 23, 315–38, 2007.

Alessie, R., A. Brugiavini, and G. Weber, "Saving and Cohabitation: The Economic Consequences of Living with One's Own Parents in Italy and the Netherlands," NBER International Seminar on Macroeconomics, 1, 413–57, 2004a.

Alessie, R., S. Hochguertel, and A. Van Soest, "Ownership of Stocks and Mutual Funds: A Panel Data Analysis," *Review of Economics and Statistics*, 86, 783–96, 2004b.

Amuedo-Dorantes, C. and R. Serrano-Padial, "Labour Market Flexibility and Poverty Dynamics: Evidence from Spain," *Labour Economics*, 17, 632–42, 2010.

Arulampalam, W., A. Booth, and M. Taylor, "Unemployment Persistence," *Oxford Economic Papers*, 52, 24–50, 2000.

Ayllón, S., "Poverty and Living Arrangements among Youth in Spain, 1980–2005," *Demographic Research*, 20, 403–34, 2009.

———, "From Stata to aML," *Stata Journal*, 2014, forthcoming.

Biewen, M., "Measuring State Dependence in Individual Poverty Status. Are There Feedback Effects to Employment Decisions and Household Composition?" IZA Discussion Papers 1138, Institute for the Study of Labor (IZA), 2004.

———, "Measuring State Dependence in Individual Poverty Histories when There Is Feedback to Employment Status and Household Composition," *Journal of Applied Econometrics*, 24, 1095–116, 2009.

Blanco, A. and J. Kluve, "Why Not Stay Home? Determinants of Nest-Leaving Behaviour in Germany and Spain," Unpublished Working Paper, UC Berkeley, 2002.

Cantó, O. and M. Mercader, "Pobreza y Familia: son los jóvenes una carga o una ayuda?" *Papeles de Economía Española*, 88, 151–65, 2001a.

———, "Young People Leaving Home: The Impact on Poverty in Spain," in B. Bradbury, S. Jenkins, and J. Micklewright (eds), *The Dynamics of Child Poverty in Industrialised Countries*, UNICEF, Cambridge University Press, Cambridge, 2001b.

Cappellari, L. and S. P. Jenkins, "Who Stays Poor? Who Becomes Poor? Evidence from the British Household Panel Survey," *Economic Journal*, 112, C60–C67, 2002.

———, "Modelling Low Income Transitions," *Journal of Applied Econometrics*, 19, 593–610, 2004.

Chamberlain, G., "Panel Data," in Z. Griliches and M. Intriligator (eds), *Handbook of Econometrics*, Vol. 2, North Holland, Amsterdam, 1247–318, 1984.

Chay, K. Y. and D. Hyslop, "Identification and Estimation of Dynamic Binary Response Panel Data Models: Empirical Evidence Using Alternative Approaches," Unpublished Discussion Paper, University of California at Berkeley and UCLA, 2000.

Contoyannis, P., A. M. Jones, and N. Rice, "Simulation-Based Inference in Dynamic Panel Probit Models: An Application to Health," *Empirical Economics*, 29, 49–77, 2004.

Coviello, E., "Confidence Bands to the Survivor Function," Paper presented at the 5th Italian Stata Users Group Meeting, Milan, 2008.

Debels, A. and L. Vandecasteele, "The Time Lag in Annual Household-Based Income Measures: Assessing and Correcting the Bias," *Review of Income and Wealth*, 54, 71–88, 2008.

Devicienti, F. and A. Poggi, "Poverty and Social Exclusion: Two Sides of the Same Coin or Dynamically Interrelated Processes?" *Applied Economics*, 43, 3549–71, 2011.

Esping-Andersen, G., *Three Worlds of Welfare Capitalism*, Cambridge Policy Press, Cambridge, 1990.

———, *Social Foundations of Post-Industrial Economies*, Oxford University Press, Oxford, 1999.

Ferrera, M., "The 'Southern Model' of Welfare in Social Europe," *Journal of European Social Policy*, 6, 17–37, 1996.

Heckman, J. J., "Heterogeneity and State Dependence," in S. Rosen (ed.), *Studies in Labor Markets*, University of Chicago Press, Chicago, 91–139, 1981.

Hsiao, C., *Analysis of Panel Data*, Cambridge University Press, Cambridge, 1986.

Iacovou, M., "Leaving Home: Independence, Togetherness and Income," *Advances in Life Course Research*, 15, 147–60, 2010.

Iacovou, M. and A. Aassve, *Youth Poverty in Europe*, Joseph Rowntree Foundation, York, 2007.

Iacovou, M. and R. Berthoud, "Employment and Poverty Among Young People. A European Perspective," *Representing Children*, 15, 258–70, 2003.

Iacovou, M. and M. A. Davia, "Who Supports Whom? Co-Residence Between Young Adults and Their Parents," Paper presented at the EPUNet Conference 2006, Universitat Pompeu Fabra, Barcelona, Spain, May 8–9 2006, 2005.

Jäntti, M., B. Bratsberg, K. Roed, O. Raaum, R. Naylor, E. Österbacka, A. Björklund, and T. Eriksson, "American Exceptionalism in a New Light: A Comparison of Intergenerational Earnings Mobility in the Nordic Countries, the United Kingdom and the United States," Discussion Paper 1938, Institute for the Study of Labor, Bonn, 2006.

Jenkins, S. P., "Modelling Household Income Dynamics," *Journal of Population Economics*, 13, 529–67, 2000.

Jurado Guerrero, T., *Youth in Transition. Housing, Employment, Social Policies and Families in France and Spain*, Ashgate, Hereford, 2001.

Kangas, O. and P. Palme, "Does Social Policy Matter? Poverty Cycles in OECD Countries," *International Journal of Health Services*, 30, 335–52, 2000.

Lillard, L. A. and C. W. Panis, *aML Multilevel Multiprocess Statistical Software*, Version 2.0, EconWare, Los Angeles, CA, 2003.

Maddala, G. S., *Limited-Dependent and Qualitative Variables in Econometrics*, Cambridge University Press, Cambridge, 1983.

Martínez-Granado, M. and J. Ruiz-Castillo, "The Decisions of Spanish Youth: A Cross-Section Study," *Journal of Population Economics*, 15, 305–30, 2002.

Mendola, D., A. Busetta, and A. Aassve, "Poverty Permanence Among European Youth," ISER Working Papers 2008–04, Institute for Social and Economic Research, 2008.

———, "What Keeps Young Adults in Permanent Poverty? A Comparative Analysis Using ECHP," *Social Science Research*, 38, 840–57, 2009.

Middleton, S., "Transitions from Youth to Adulthood," in M. Barnes, C. Heady, S. Middleton, J. Millar, F. Papadopoulos, G. Room, and P. Tsakloglou (eds), *Poverty and Social Exclusion in Europe*, Edward Elgar, Cheltenham, 2002.

Mroz, T. A. and T. H. Savage, "The Long-Term Effects of Youth Unemployment," *Journal of Human Resources*, XLI, 259–93, 2006.

Parisi, L., "Leaving Home and the Chances of Being Poor: The Case of Young People in Southern European Countries," *Labour*, 22, 89–114, 2008.

Rigg, J. and T. Sefton, "Income Dynamics and the Life Cycle," CASEpaper 81, Centre for Analysis of Social Exclusion and London School of Economics, 2004.

Skrondal, A. and S. Rabe-Hesketh, "Handling Initial Conditions and Endogenous Covariates in Dynamic/Transition Models for Binary Data with Unobserved Heterogeneity," *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, 63, 211–37, 2014.

StataCorp, *Stata Survival Analysis and Epidemiological Tables Reference Manual*, Release 12, StataCorp LP., College Station, TX, 2011.

Stewart, M. B., "The Interrelated Dynamics of Unemployment and Low-Wage Employment," *Journal of Applied Econometrics*, 22, 511–31, 2007.

Weber, A., "State Dependence and Wage Dynamics. A Heterogeneous Markov Chain Model for Wage Mobility in Austria," Economic Series 114, Institute for Advanced Studies (Vienna), 2002.

Wilde, J., "Identification of Multiple Equation Probit Models with Endogenous Dummy Regressors," *Economics Letters*, 69, 309–12, 2000.

Wooldridge, J. M., "A Framework for Estimating Dynamic, Unobserved Effects Panel Data Models with Possible Feedback to Future Explanatory Variables," *Economics Letters*, 68, 245–50, 2000.

———, "Simple Solutions to the Initial Conditions Problem in Dynamic, Non Linear Panel Data Models with Unobserved Heterogeneity," *Journal of Applied Econometrics*, 20, 39–54, 2005.