THE EFFECT OF YOUNG ADULTS' NEST-LEAVING ON PARENTAL HAPPINESS*

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Abstract. Nest-leaving describes the process of young men and women leaving their parental homes, and acquiring autonomy and financial independence. A series of studies over the past decades has documented vast differences in patterns of nest-leaving between Northern European countries, where the median age of leaving is around 21 for women and 23 for men, and Southern Europe, where the median age at moving out is around 26 for women and 29 for men. Several alternative hypotheses have been developed to explain these differences, focusing on such factors as labor market conditions, housing prices, and parental preferences. In this paper, I use a new longitudinal data set with data for most European countries to examine the dynamic effect of child nest-leaving on parents. I focus in particular on parents' self-reported assessments of financial satisfaction. Northern European parents report systematic gains in financial satisfaction when their adult children leave home, while Southern European parents report systematic declines, which are bigger when older children leave. This pattern points to an alternative model of the nest-leaving decision which emphasizes the role of adult children in supporting their parents, particularly in Southern Europe where incomes of the parental generation are relatively low.

Keywords: Nest-leaving, satisfaction, matching estimator, treatment effect.

JEL Classification: J12, J13

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1. Introduction

An Italian mother dreams of cooking pasta for her son until he is 35 years old, and she dreads the day when he finally leaves home. A Scandinavian mother encourages her children to leave home as soon as they finish high school, and thinks she has failed if a son or daughter is still at home at age 25. Or so the received wisdom goes.

Clearly, it is a very important decision in the life of a young adult person to leave the parental home at some point in time, or perhaps to stay on. Numerous studies - predominantly in sociology, but also in economics – have tried to assess factors that might help explain this decision-making process within specific countries, and how such processes vary over time and across cultures. Europe is a case in point: it is widely agreed that there are big differences across countries in typical patterns of nest-leaving. But there is far less agreement on the reasons for these differences, or whether they reflect choices or constraints in different countries.

This paper provides a new perspective on nest-leaving processes by assessing the effect of nest-leaving on parental happiness. Utilizing an unusually rich data source, waves 1 to 5 (1994-1998) of the European Community Household Panel (ECHP), I document the diverse patterns of nest-leaving across European countries. This initial analysis suggests a broad classification of European countries into Northern countries – where nest-leaving proceeds relatively fast – and Southern countries – where nest-leaving is delayed. I will also present some suggestive evidence that from a cross-country perspective this delayed nest-leaving process might be associated with high youth unemployment, scarce benefit availability, low housing costs, and a largely catholic population.

After identifying the varying patterns of nest-leaving, the paper focuses on the perspective of the individual household. For each country, I consider the set of "treated" households, i.e. those households in the sample where the young adult moves out at same point in time. Plotting sequences of the outcome variables of interest – parental satisfaction with the financial situation and

the housing situation – before and after the discontinuity point when treatment, i.e. nest-leaving, occurs, shows the following: (a) Parental satisfaction with the financial situation appears to decline after nest-leaving in the Southern countries, but appears to increase in the Northern countries. (b) Parental satisfaction with the housing situation displays a general upward trend regardless of the country. Using similar sequences for total and equivalized household income, I also show that at the point of nest-leaving the young adult in the Southern countries contributes significantly to household income, whereas this is not the case in Northern Europe.

In order to identify the effect of nest-leaving on parental happiness it is necessary to answer the counterfactual question, what would have happened to the treated households if the young adult had not moved out? The treatment effect is then given by the difference between the observed outcome and the counterfactual outcome. The counterfactual is constructed by matching an "identical" control household from the pool of non-treated households, i.e. those where the young adult stayed on, to each treated household. Identicalness is expressed through a set of covariates characterizing the father, the mother, the young adult, and the household.

Treatment effects of nest-leaving on parental happiness with finances and housing are estimated for individual countries, and also – given comprehensive evidence for a distinct North/South pattern accumulated throughout the paper – for country aggregates along these North/South lines. The estimates clearly show that nest-leaving has a negative impact on parental happiness with the financial situation in Southern Europe, and that the opposite is the case for Northern Europe. Sample splits show that the negative effect for Southern Europe is driven by the moving out of sons and by late movers. The treatment effect on housing satisfaction shows virtually no variation across countries – the strong finding here is that it is consistently non-negative, and positive for some countries.

Previous economic studies of nest-leaving have made more or less explicit assumptions

about how nest-leaving would influence parental utility. In current economic research, it has become fairly routine to measure utility using self-reported satisfaction levels. The findings in this paper are particularly important since a study by van Praag, Frijters, and Ferrer-i-Carbonell (2002) finds that financial satisfaction is the single most important domain satisfaction determining general satisfaction for individuals. Therefore the estimation results serve as an empirical test how plausible the assumptions made in the literature are in the European context.

The remainder is organized as follows. Section 2 presents some background information on sociological perspectives of nest-leaving, as well as on economic studies of household formation and the assumptions made and results found therein. It also contains a brief description of the data. Section 3 describes the patterns of nest-leaving and discusses the correlates of a delayed nest-leaving process. Section 4 develops the framework for the empirical analysis, focusing on the outcome variables, their evolution over time, the definition of treatment, and the matching estimator. Section 5 presents treatment effect estimates. Section 6 concludes.

2. Background

2.1. Sociological perspectives on nest-leaving

The phenomenon of nest-leaving is meant to describe the process of young people leaving their parental home, a development associated with the continuous attainment of independence, predominantly in terms of financial and residential autonomy. From a sociological perspective, this separation can be regarded as an expected normal step in the relationship between parents and children (Goldscheider and DaVanzo 1985). Leaving the parental home is usually accompanied by transitions in various aspects of life, often coinciding with distinctive lifecycle events, such as commencement or completion of studies, integration in the labor market, moving to an autonomous residence, and formation of a family, in particular marriage. Since, clearly, the process of nest-leaving

does not require either the occurrence of all of these events simultaneously nor any single one of them in particular, the patterns of moving out of the parental home are potentially quite diverse both across and within countries, dependent on the respective economic, family and cultural situation.

The decision to leave the parental home is one of the most important events in the life of young adults. In recent decades many countries – above all the US and Western Europe – have been perceived to display a relative delay in the exit of young people from their parents' household compared to previous decades. In fact, since the 1980s the average age at leaving home has increased in most Western Countries. However, while the general upward trend is similar for these countries, some differences apply: the fraction of young adults living at home is substantially larger in Southern European countries like Italy, Spain, and Greece, than in Central or Northern European countries such as France, Germany, and the UK (cf. Fernández Cordón 1997) or the United States (Goldscheider 1997).

Nest-leaving has been a major field of research in sociology, the seminal reference being Goldscheider and DaVanzo (1985). This article studies nest-leaving in the US over the time period 1972-1979, i.e. at a time when the age at nest-leaving was still decreasing. It has been well recognized in the sociological literature that several economic variables exist that are likely to have an influence on nest-leaving behavior. For instance, the public goods nature of household consumption making it cheaper for a young adult to cohabit with her parents, or the parental ability or willingness to provide financial or other subsidies for the young adult's continuing education. Moreover, the sociological literature holds that youth unemployment is the single factor exerting the greatest influence on prolonging the young adult's stay at home (Cherlin, Scabini, and Rossi 1997).

2.2. Economic perspectives on household formation

Economists have usually referred to the phenomenon of nest-leaving as "household formation". Throughout this paper, however, I will retain the label "nest-leaving", since I will specifically focus on the particular event of the young adult leaving the parental home. Moreover, this labeling clarifies the consideration of nest-leaving as a treatment (cf. section 4.2.).

Table 1 summarizes the most prominent studies on nest-leaving in economics. For the US, existing research ranges from the first bargaining model of family behavior developed in McElroy (1985) via the dynamic overlapping generations model focusing on the role of financial transfers in Rosenzweig and Wolpin (1993) to the strictly empirical analysis of adaptation behavior – in terms of school, work, and living arrangements – of young adults to changes in labor market conditions presented in Card and Freeman (2000).[1] The first two studies focus on young men, whereas the latter study considers young men and women in the US and Canada.

< Table 1 about here >

For Europe, Ermisch and DiSalvo (1997) and Ermisch (1999) study the influence of housing prices, young adults' income, and parental income on nest-leaving behavior in the UK. Manacorda and Moretti (2002) aim at assessing why Italian men remain at home in large fractions, and – based on a model assuming that cohabitation is a "good' for parents and a "bad" for children – offer the explanation that parents bribe their children so that they stay home. Finally, Martínez-Granado and Ruiz-Castillo (2002) develop a simultaneous equations model for the joint decision process on working, studying, and nest-leaving of Spanish youth.

It is of particular interest to investigate what each of these models implies regarding parental utility (U_P) and young adults' utility (U_{YA}) after nest-leaving occurred. Clearly, if – in the models based on the idea that utility-maximizing parents and young adults face the decision of coresiding or

[1] US studies commonly refer to individuals 16-25 years of age when speaking of "young adults" , whereas European studies usually refer to individuals 16-35 years of age when speaking of "young adults".

not – the young adult moves out, this means that both U_P and U_{YA} increase (McElroy 1985, Ermisch and DiSalvo 1997, Ermisch 1999). In Rosenzweig and Wolpin (1993), the direction of U_P after nest-leaving is ambiguous: it could decline, because previous cohabitation was a cheaper way to support the young adult due to scale economies, or it could increase, as the costs that previously arose in form of privacy loss vanish. The assumptions in Manacorda and Moretti (2002) imply that U_P will decrease after the young adult leaves, whereas the young adult's own utility increases.

In both Card and Lemieux (2000) and Martínez-Granado and Ruiz-Castillo (2002) there is no explicit specification of how U_P or U_{YA} might evolve after nest-leaving, but there is an implicit notion that ultimately nest-leaving is a desirable event for both parents and the young adult – especially in Card and Lemieux (2000), who find that poor labor market conditions force young adults to delay their nest-leaving (presumably against their desire to move out). In general, this is also consistent with the "safety net" hypothesis confirmed by most of the studies: If the parents essentially insure the young adult against poor labor market opportunities, this implies that for both the actually more desirable situation is to not exercise this non-employment insurance, which in turn implies that utility levels would be higher for parents and the young adult after nest-leaving.

2.3. The ECHP data

The empirical analysis in this paper utilizes data from the European Community Household Panel (ECHP), specifically waves 1 through 5, 1994-1998. The ECHP is a longitudinal database that started with a sample of 60,500 representative households in 1994 from the then twelve member states of the European Union. Austria, Finland and Sweden were included in the survey in 1995, 1996, and 1997, respectively. The ECHP is an unusually rich data source, both because of a large number of household observations for each country and, even more importantly, because of comparability across countries.

The ECHP is administered by Eurostat, the Statistical Office of the European Communities. It was initially set up to gather information on household and individual income across EU member states. In order to harmonize information a specific EU survey is used. In the fourth wave (1997) the original ECHP surveys were discontinued in Britain, Germany, and Luxembourg. Since then existing national panels have been used for these countries and converted into the ECHP shape.

The data contain a rich set of variables on demographic information, income and financial situation, and accommodation on the household level, as well as additional information on employment, job seeking, income, education, health, social relations and satisfaction on the individual level. The empirical analysis considers only countries for which data for all 5 waves are available, i.e. Belgium, Denmark, France, Germany, Ireland, Italy, Netherlands, Portugal, Spain, and UK.[2]

3. Patterns of Nest-leaving

3.1. Rates of nest-leaving across Europe

Nest-leaving patterns are potentially diverse across countries, for a variety of economic, social, and cultural reasons. This section describes the sequences of leaving the parental home observed across European countries. Figure 1 depicts, for six of the ten countries in the sample, simple estimates of survivor functions given as the fraction of young adults living at home by age (16-35 years). Panels (a), (c) and (b), (d) show two strikingly different patterns of nest-leaving: Whereas in the Netherlands and above all in Denmark there is a pronounced drop in the fraction of young adults living at home already at a younger age, both in Italy and in Spain the fraction of young adults remaining at home is substantially higher at all ages, so that nest-leaving appears to proceed at a far slower rate.

[2] The data contain information on Luxembourg only up to wave 3. Greece was not considered due to coding inconsistencies across waves.

< Figure 1 about here >

Panel (e) of Figure 1 shows the situation in Belgium. Belgians seem to leave home at an "average" rate in the European context. All other countries in the sample show a pattern of young adults living at home that is either consistent with a "northern" sequence, like Denmark and the Netherlands, or with a "southern" sequence, like Spain and Italy. Specifically, the pattern for the UK and France (not depicted in the figure[3]) is in line with panel (c) depicting the Netherlands. Germans also move out faster than the Belgians, although their age/living-at-home profile is closer to the Belgian one. The pattern for the last country not shown in figure 1, Portugal, is in line with the profile for Spain. The fact that this delayed nest-leaving process is not exclusive to the countries of Southern Europe is reflected in panel (f), which shows that the age/home-leaving profile for Ireland is similar to the Italian and Spanish one.

Besides the diverse shapes of the living-at-home curves that the countries in the sample display, there is one consistent pattern emerging from figure 1. For every single country, the curve for women always lies below the curve for men, i.e. women move out faster than men and are less likely to remain in the parental home at any given age.

A different way of looking at the same phenomenon across countries is shown in Figure 2. Rather than averaging across waves, this figure exploits the panel structure of the data by estimating Kaplan-Meier survivor functions for each age group of young adults who were 16 to 31 years old at time of the first survey, i.e. at time (=wave) w the empirical estimate of the survivor function is

$$\hat{S}_c(a,w) = \frac{N_w(a) - E_w(a)}{N_w(a)} \qquad ; a=16,\ldots,31;\ w=1,\ldots,5.$$

$N_w(a)$ denotes the risk set for each age group a at time w, and $E_w(a)$ denotes the number of completed spells for age group a at time w, by country c. Figure 2 plots these survivor functions for

[3] In order to keep the presentation tractable figures generally show selected countries. All figures for the remaining countries are available from the author upon request.

the Netherlands, Denmark, Spain and Italy[4]. The graphs confirm the patterns observed in figure 1: nest-leaving occurs at a later age in Spain and Italy than in Denmark and the Netherlands. Also, women consistently move out at a younger age. Among the countries in the sample, Italy and Denmark represent the two extremes. In Denmark, nest-leaving occurs fastest, and around age 23 and 22 more than 75% of young men and women, respectively, have moved out of the parental home. In Italy, on the other hand, this process is delayed substantially, and even at age 35 more than 25% of men remain at home. Regarding the countries not depicted in figure 2, the UK and France display survivor functions similar to the Netherlands, and Germany and Belgium represent the middle-ground of the age/home-leaving distributions by age group. Portugal and Ireland also show a delay in the nest-leaving process, with Portugal in line with Spain, and Ireland slightly faster.

< Figure 2 about here >

Table 2 summarizes the findings illustrated in figures 1 and 2. The table shows the quartiles of the nest-leaving distribution for all countries in the sample[5]. Countries are sorted according to the median age at moving out for men. The table clearly reflects the patterns observed in the figures: (a) Women consistently move out at a younger age than men. (b) There are two types of countries in Europe with respect to the speed of the nest-leaving process. First, countries where young adults move out at a fast rate, notably Denmark, UK, the Netherlands, and France. Second, countries where nest-leaving is distinctly delayed, specifically Spain, Portugal, Italy, and also Ireland. In addition, Germany and Belgium represent a midpoint in this distinction, with a nest-leaving process that is not particularly fast-paced, but also not markedly delayed.

< Table 2 about here >

[4] Only individuals that are actually observed across waves contribute to the number of observations, i.e. missing values are not used as indicating "having left". This procedure results in a tendency to overestimate the fraction of young adults remaining home, if those missing in the data actually have left home.

[5] The numbers are in line with Iacovou (2001) who reports the median age at moving out for the first four waves of the ECHP.

3.2. Correlates of the age at nest-leaving

This section offers a coarse, descriptive look at some variables that might be associated with the cross-country variation observed for the rate of nest-leaving in the previous section. Table 3 presents a small set of variables that have been suggested to play a role in the household formation process. Both the theoretical (e.g. McElroy 1985) and the empirical literature (Card and Freeman 2000) has argued that local labor market conditions play a predominant role in determining a young adult's nest-leaving decision, so that one would expect that the availability of benefits for young unemployed people as well as the youth unemployment rate are correlated with the rate of leaving the parental home. A different strain of literature (Ermisch and DiSalvo 1997, Ermisch 1999) has argued on the basis of a theoretical model that housing costs can influence household formation decisions – potentially, depending on the elasticity of housing demand, this association can be positive or negative. The evidence presented in this literature suggests that higher housing costs are associated with a higher rate of young adults remaining at home.

< Table 3 about here >

Finally, it seems that frequently in the discussion of nest-leaving – at least in the cross-country context – there is some (implicit) suggestion that some sort of cultural dimension must bear upon such differences across countries, but it is evidently very difficult to get a firm grip on this issue. Admittedly, using the fraction of roman catholic persons in the population to capture such cultural differences (or similarities, for some countries) is a very coarse measure, but perhaps not too far from the stereotypical ideas people may have about these country differences.

Table 4 presents the results of simple OLS regressions of (a) the median age at moving out and (b) the age at which 75% of young adults have moved out – as reported in Table 2 – on the set of country characteristics given in Table 3. The estimates suggest that there might indeed be a positive correlation between the youth unemployment rate and the age at nest-leaving, i.e. a higher

youth unemployment rate is associated with a delay in leaving the parental home. In addition, availability of unemployment benefits appears to be negatively correlated with age at nest-leaving. Simply looking at Tables 2 and 3 reveals that it is exactly those countries where benefits are readily available (Netherlands, Denmark) in which nest-leaving occurs at young ages. On the other hand, the set of countries displaying a delay in leaving the parental home is generally characterized by low benefit availability (Spain, Portugal, Ireland, in particular Italy).

< Table 4 about here >

The coefficient on housing costs shows the strongest association with the age at nest-leaving, and it does not have the sign one would have probably expected: Rather, it seems that housing costs are negatively correlated with age at nest-leaving. However, the theoretical models (Ermisch and DiSalvo 1997, Ermisch 1999) have not ruled out this possibility, and evidence to the contrary was based on regional variation within a single country, Britain (ibid.). From a cross-country perspective, this might imply that low housing costs do not necessarily create incentives to move out, and perhaps other factors are more important. Finally, Table 4 shows that the fraction of roman catholic individuals in the population is positively associated with the age at nest-leaving. Table 3 reveals that indeed the countries with delayed nest-leaving – Italy, Spain, Portugal, Ireland – have the largest proportion of Catholics.

It has to be emphasized that no causal interpretation is given to these coefficients. This coarse exercise is merely intended to (a) illustrate that pronounced differences across European countries do exist, and (b) that some of the factors identified in the literature do seem to play a role in the nest-leaving processes.

4. The effect of young adults' nest-leaving on parental happiness

In order to get a new angle on nest-leaving processes and the differences that exist across European countries, this paper takes the perspective of the household and assesses the effects that the young adult's nest-leaving has on his or her father and mother. The idea is to consider, for each country separately, those households where the young adult leaves. Consider this nest-leaving of the young adult – i.e. the child of 16-35 years of age living with his or her parents – to be the "treatment", in the spirit of classic treatments such as taking medications in a clinical context, or participating in a training program in the labor economics context. This yields a set of treated households, and we can observe how the outcome variables (defined below) respond to the treatment.

Clearly, this does not give us a causal effect, since causal inference requires identification of the counterfactual: What would have happened to these households (in terms of the outcome variables) if they had not been exposed to the treatment, i.e. if the young adult had not left but instead stayed on? It is well-known that the difference between the factual and the counterfactual outcome then gives the causal effect of the treatment. To answer the counterfactual question, "identical" but untreated households – i.e. only differing in the fact that the young adult did not move out – will be matched to the treated households. Identicalness is expressed through a set of covariates characterizing (a) the father, (b) the mother, (c) the young adult, and (d) the household. Essentially, this procedure mimics an experiment in which treatment were randomly assigned to households.

4.1. Outcome variables

The economic outcome variable of interest is parental utility, expressed through the self-reported, by both father and mother, degree of subjective well-being, or happiness. Traditionally, economists have been reluctant to use such subjective information as a measure of utility, but at least over the

last decade this reluctance has faded. In fact, the "economics of happiness" is now a major field of economic research, and numerous studies have provided evidence for the usefulness of measuring utility by self-reported levels of well-being (cf. for instance Clark and Oswald 1994, Oswald 1997, Frey and Stutzer 2000).

In the ECHP survey four variables aim at measuring subjective well-being:

(1) Satisfaction with work or main activity,

(2) satisfaction with financial situation,

(3) satisfaction with housing situation, and

(4) satisfaction with amount of leisure time.

With respect to each of these questions, the respondent reports a level of satisfaction ranging from 1, i.e. "not satisfied", to 6, i.e. "fully satisfied". In the empirical analysis, this range will be rescaled to six equidistant values in the interval [0,1], yielding an interpretation of "% satisfied".[6] The analysis focuses on responses to questions (2) and (3), as these are the domains of subjective well-being that one would expect to be influenced by whether the child lives at home or not. Clearly, with respect to (3), the presence of the young adult at home could have an effect on parental satisfaction with the housing situation. Regarding (2), the level of parental satisfaction with the financial situation will also depend on the young adult's presence at home, since most likely it will be the case that either (i) the young adult has no own income – e.g. because she remains in education – and is financially dependent on her parents, or (ii) the young adult has some own income – e.g. because he is already working – and can therefore contribute to the subsistence of the household.

A recent paper by van Praag et al. (2002) assesses the anatomy of subjective well-being and

[6] This procedure essentially treats happiness like a continuous variable, implicitly assuming that a level of 5 [rescaled to 0.8] is twice as high as a level of 3 [rescaled to 0.4]. In general, analysis of subjective well-being assumes ordinal interpersonal comparability: if two respondents report the same levels of happiness they are assumed to enjoy the same satisfaction levels, i.e. ordinal comparability is permitted. Responses can then be explained by ordered probit or logit models. The assumption made here is somewhat stronger, but will facilitate interpretation, and in the discussion of results it will be clear that this has no influence on the qualitative results. This point will be further investigated in future research.

decomposes "general satisfaction" into a set of "domain satisfactions", specifically job satisfaction, financial satisfaction, house satisfaction, health satisfaction, leisure satisfaction, and environment satisfaction. Their empirical analysis finds that financial satisfaction appears to be the predominant domain determining the general level of subjective well-being.

4.2. The treatment

The treatment under scrutiny is the event of the young adult leaving home, and the empirical analysis thus utilizes treated and non-treated, i.e. control, households to assess the causal effect that this treatment has on parental happiness. Clearly, this treatment is not exogenously assigned, as would be the case in a randomized experiment in a clinical trial. There is no random device determining in which family the young adult moves out and in which she stays on. However, it may seem plausible to argue that a set of covariates characterizing (a) the father, (b) the mother, (c) the young adult, and (d) the housing situation, jointly describes the household in a sufficient manner, so that it is feasible to consider treatment assignment as if it had been random, conditional on these covariates. The empirical analysis is based on this assumption.

Manski, Sandefur, McLanahan, and Powers (1992) argue that exogenous assignment may even be a mere convention for social science reporting of treatment effects, and that other treatment effects may be of interest, too. They analyze the effect that family structure during adolescence has on high school graduation. Assignment of the event of nest-leaving to households, i.e. parents, appears to be arguably less endogenous.

4.3. Outcome variable sequences

If treatment is not randomly assigned, a non-experimental study generally exploits some discontinuity that generates a treatment and comparison group. In the case of nest-leaving, the

discontinuity occurs when in some households the young adult moves out. Before assessing the effects this treatment might have on the outcome variables, it is interesting to investigate how the outcome variables for the treated population evolve over time, and whether there is any indication that at the point of discontinuity – the moment of nest-leaving – there is indeed some movement in these variables.

Let Y denote the outcome variable in general. In the ECHP sample, nest-leaving, i.e. the treatment, can occur at one of four different points in time: (i) between the first and the second wave, (ii) between the second and the third wave, (iii) between the third and the fourth, or (iv) between the fourth and the fifth. In the first case (i), we observe Y for one wave prior to nest-leaving, and for four waves afterwards. In the second case (ii), Y is observed for two waves prior to, and three waves after treatment, etc. Therefore every household is observed five times (at most), up to four waves before treatment and up to four waves succeeding treatment, depending on when nest-leaving occurs.

Let s denote the number of waves since treatment occurred (or, if s is negative, the treatment occurs –s waves later). Treatment occurs between s=0 and s=1. If there are k waves of data, then there are observations for $s \in [-(k-2),(k-1)]$. As mentioned above, the range over which each household is observed depends on the point in time at which treatment occurs. Only for the interval s=[0,1] there is information on every single household. Moreover, consider a set of $2(k-1)$ dummy variables D_h^s indicating whether household h is observed in s. Then it is possible to estimate the average value of the outcome variable at point in time s as

$$\hat{Y}_p^s = \frac{1}{N_s}\sum_h (D_h^s Y_p^s) \ ,$$

where N_s is the number of households for which $D_h^s = 1$, and $p \in \{\text{father}, \text{mother}\}$ as this is done for

both parents separately. Figures 3 and 4 plot the estimated $\hat{Y}_p^s$ for all $s \in [-(k-2),(k-1)]$ by country.[7] The outcome variables captured are parental satisfaction with the financial situation (Figure 3) and parental satisfaction with the housing situation (Figure 4).

< Figures 3, 4 about here >

Figure 3 divides countries into an upper panel (a) and a lower panel (b). The graphs in (a) give some indication that the event of nest-leaving might exert a positive effect on parental happiness. Both the long-run trend and the immediate impact after nest-leaving display an upward direction. The countries in this group are mostly from Northern Europe, notably the Netherlands, France, and Denmark, but also Spain can be found in panel (a). The lower panel (b) gathers countries for which the estimated sequence of the outcome variable suggests that treatment might have a negative effect on parental happiness with the financial situation. For the countries in this group – Italy, Portugal, and Belgium – the long-run trend and/or the short-run impact point downwards.

Accordingly, Figure 4 illustrates the estimated sequence of the outcome variable "parental satisfaction with the housing situation" by "wave since young adult left", for selected countries.[8] With respect to this outcome variable there appears to be no grouping. Rather, the graphs suggest that, if anything, then nest-leaving has in general a positive effect on parental happiness with the housing situation, irrespective of the country. One interesting thing to note is that there is some evidence of a "dip" in housing satisfaction directly preceding treatment, which then recovers directly after treatment. This pattern is found, for instance, for fathers in Denmark and Italy, mothers in France, and both fathers and mothers in the Netherlands.

[7] The idea to generate graphs in this fashion originates in Jacobson, LaLonde, and Sullivan (1993).

[8] The data for Germany do not contain information on parental satisfaction with the financial or housing situation. For the UK, information on housing satisfaction is missing.

A general observation regarding figures 3 and 4 is that the satisfaction levels of mothers almost always lies below that of fathers, regardless of country and whether the outcome variable is financial satisfaction or housing satisfaction. Moreover, given inter-national comparability in addition to interpersonal comparability, i.e. given that across countries respondents think of the same when saying they are, for instance, "80% satisfied" with a certain happiness domain, then in general satisfaction levels are lower in Southern Europe than they are in Northern Europe. In particular, Danish and Dutch parents report levels of satisfaction with their finances in the range of 0.6 to 0.8, and with their housing situation in the range of 0.8 to 0.9. At the same time, Spanish and Italian parents report levels of satisfaction with their financial situation of 0.35 to 0.5, and with their housing situation of 0.6 to 0.7.

Earlier in this section I argued that consideration of financial happiness as an outcome variable in nest-leaving processes is of particular importance because it will usually either be the case that (i) the young adult has no own income and receives financial transfers from her parents, or that (ii) she already has some income and can, at least potentially, contribute to family subsistence. Hence, besides looking at the sequences of the happiness variables, it is also interesting to analyze how household income evolves at the point of nest-leaving. Similar to the approach outlined above, Figure 5 depicts sequences of household income by country, where the average total household income at point in time s is estimated as

$$\hat{I}^s = \frac{1}{N_s} \sum_h (D_h^s I_h^s),$$

where I_h^s is the total household income for household h at time s, and N_s and D_h^s are the same as above. The equivalized household income for household h at time s is given by the household's total income divided by the household size at time s, i.e. $I_{h,e}^s = I_h^s / N_{h,s}$, and the average equivalized income is estimated accordingly.

< Figure 5 about here >

Plotting these sequences of both total household income and equivalized household income, what could be expected to happen at the discontinuity point when the young adult moves out? Consider two cases. First, if the young adult did contribute to household income prior to moving out, one should see the following movements in total income and equivalized income: Clearly, total income would fall. As total income falls, and the number of household members, too, equivalized income could either (i) remain constant, if the young adult contributed an equal share, or (ii) could fall, if the young adult contributed a relatively larger share, or (iii) it could increase, if the share contributed by the young adult was not substantial. Second, if the young adult did not contribute to household income, then total household income would remain constant. Moreover, since household size declines, equivalized income would rise.

Looking at the household income sequences across countries in Figure 5, two different patterns arise, and they are grouped into panels (a) and (b). For the countries in Panel (a) – the Netherlands, Denmark, France, and UK – total income decreases somewhat at the point of nest-leaving, and at the same time equivalized income increases somewhat. This suggests that, on average, the young adult did contribute, but not substantial. In France, for instance, total income almost remains constant and equivalized income increases substantially, implying that the French young adults did not contribute to household income before moving out. Looking at the other three Northern countries it also seems that total income goes down slightly only after an increase in the wave preceding nest-leaving, and that the long-run total income is constant. This might indicate that Northern European young adults find a job, then contribute to household income for one period, but then move out.

In the lower panel (b) a different pattern can be observed for the Southern countries Spain, Italy, and Portugal, but also for Belgium. Here the income sequences suggest that the young adult

did contribute, and that he did contribute (a) substantially, and (b) over a longer time period. This is evidenced by a pronounced drop in total income at the point of nest-leaving, along with the equivalized income remaining approximately constant. Especially in Spain and Italy there is no short-run increase in total income directly preceding nest-leaving. Rather, young adults seem to have contributed for quite some time up to the substantial decline in total income once they move out.

4.4. Matching estimation

The previous section has considered developments in the outcome variables for the treatment group only. In order to infer a causal effect of the treatment on the outcome variable, however, it is necessary to identify the counterfactual, i.e. what would have happened to the treatment group if it had not been exposed to treatment? Then the causal effect is given by the difference between the factual (=exposed to treatment) and counterfactual (=not exposed to treatment) outcomes. This section develops the matching estimator solving this problem more formally, and in more detail.

The basic unit of analysis is the household, consisting of mother, father, and the young adult, i.e. their child.[9] Consider the following binary treatment: the young adult leaving the parental home, or not leaving the parental home. For each household h the variable $D_h \in \{0,1\}$ indicates the treatment received, i.e. $D_h = 1$ if the young adult leaves the parental home. For the individual parent $p \in \{\text{father}, \text{mother}\}$ in household h we observe the treatment that his or her household received, and the outcome associated with this treatment, i.e.

$$Y_{h,p} = Y_{h,p}(0) \quad \text{if } D_h = 0,$$
$$Y_{h,p} = Y_{h,p}(1) \quad \text{if } D_h = 1,$$

where the variable $Y_{h,p}$ captures post-treatment outcomes of the variable of interest, i.e. parental

[9] Single-parent households are excluded from the analysis.

levels of satisfaction with the financial and housing situation.[10] Thus, the unit level causal effect given by

$$\Delta_{h,p} = Y_{h,p}(1) - Y_{h,p}(0)$$

is never directly observable. The essential conceptual point is that nonetheless each individual has two possible outcomes associated with herself, where one realization of the outcome variable can actually be observed for each individual, and the other one is a counterfactual outcome.[11]

Since individual-level effects cannot be observed, the estimand of interest should be a measure that summarizes individual gains from treatment appropriately. Of specific interest is the average treatment effect for the treated population (ATET),

$$E(\Delta_p \mid D_h = 1) = E(Y_p(1) - Y_p(0) \mid D_h = 1) = E(Y_p(1) \mid D_h = 1) - E(Y_p(0) \mid D_h = 1),$$

where the expectations operator E(.) denotes population averages, and the dropping of the subscript h also reflects that this parameter averages across households for each parent p. Still, only the first of the population averages in the ATET parameter is identified from observable data, whereas the second one is not, since the outcome under no-treatment $Y_p(0)$ is not observed for treated households $D_h=1$. This is precisely the counterfactual of interest: What outcome would the treated units have realized if they had not been exposed to the treatment? Since treatment is not randomly assigned, it is necessary to consider a vector of observed pre-treatment variables, or covariates, X, in order to identify the counterfactual. In this application, X consists of covariates characterizing (a) the father, (b) the mother, (c) the young adult, and (d) the household, i.e.

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[10] To keep the notation simple there is no further distinction between Y indicating financial satisfaction and Y indicating housing satisfaction at this point. Effects on both outcomes will be assessed in the empirical analysis. Also, country indices are omitted.

[11] This is the reason why this model for causal inference is frequently referred to as "Potential Outcome Model". Another common label is "Rubin Causal Model" due to Donald Rubin's contributions to the applicability of the model in non-experimental settings. Cf. Holland (1986) and Kluve (2002) for further discussion of the assumptions, mechanisms, and counterfactual nature of the causal model.

$X=\{X_{father}, X_{mother}, X_{young\ adult}, X_{household}\}$.

Consider the following identifying assumption: The assignment mechanism D_h is independent of the potential outcomes $(Y_h(0),Y_h(1))$ conditional on X. This assumption is commonly referred to as unconfoundedness.

By the unconfoundedness assumption it is possible to replace the no-treatment outcome for the treated population with the no-treatment outcome of the non-treated, i.e. control, population:

$$\begin{aligned} E(\Delta_p \mid X, D_h = 1) &= E(Y_p(1) \mid X, D_h = 1) - E(Y_p(0) \mid X, D_h = 1) \\ &= E(Y_p(1) \mid X, D_h = 1) - E(Y_p(0) \mid X, D_h = 0) \end{aligned}$$

This covariate-adjusted ATET is identified from observable data.

Matching then proceeds as follows. For each country there is a set of households exposed to the treatment, i.e. households where the young adult leaves. Every household and its members are characterized by a vector of covariates X. From the pool of non-treated households, one or more households are matched to every single treated households, given they satisfy a minimum distance requirement (outlined in section 5.1.) regarding X. If this oversampling technique matches two or more control households to a treated household, the control households' outcomes are averaged over their number, thus treating them as if they were a single control observation providing the counterfactual. The matching estimator for the average treatment effect is thus given by

$$\hat{\Delta}_p = \frac{1}{N_t} \sum_{h_t=1}^{N_t} \Big[Y_{h_t,p}(1) - \sum_{h_c \mid X(h_c) \in C(X(h_t))} \frac{1}{n_c(h_t)} Y_{h_c,p}(0) \Big],$$

where N_t denotes the number of treated households h_t, h_c denotes control households, $n_c(h_t)$ is the number of control households matched to a specific treated household, and $C(X(h_t))$ denotes the minimum distance C from the treated household's covariate vector $X(h_t)$ that the control household's covariate vector $X(h_c)$ has to satisfy.[12] Matching proceeds with replacement.

[12] Cf. Abadie and Imbens (2002) for a technical discussion of properties of this simple matching estimator.

5. Empirical results

5.1. Implementation of the Matching Algorithm

To answer the counterfactual question, "identical" households from the pool of control households are matched to the treated households. Identicalness is expressed in terms of covariates characterizing father, mother, the young adult, and the household. Specifically:

X_{father}, X_{mother}: Age, employment status, education, satisfaction with financial situation, satisfaction with housing situation

$X_{young\ adult}$: Age at moving out, sex

$X_{household}$: Total household income, Household size, household quality.

All covariates are measured in the wave directly preceding treatment. "Employment status" is a dummy variable indicating whether the parent is employed. "Education" is a dummy variable indicating whether the parent has a "high" educational attainment, i.e. a recognized third level education. Satisfaction variables as defined above. "Household quality" is a dummy variable indicating whether the household has its own bath.

For each of the covariates, the matching algorithm generates indicator variables to assess distance between treated and control household, i.e. whether treated and potential control household satisfy the following requirements: [1],[2] Age of mother and father +/– 5 years; [3],[4] employment status of mother and father identical; [5],[6] educational attainment of mother and father identical; [7],[8] levels of satisfaction with the financial situation of mother and father identical; [9],[10] levels of satisfaction with the housing situation of mother and father identical; [11] age at moving out of young adult identical; [12] Sex of young adult identical; [13] Total household income +/– half a standard deviation of the country's average total household income; [14] Household size identical; [15] Household quality identical.

This exact matching[13] is implemented in two different algorithms. Algorithm 1 matches a control household to a treated household if at least 10 of the 15 requirements are satisfied, where requirements [2],[4],[11],[12], as well as either [7] and [8] – if the outcome variable of interest is financial satisfaction – or [9] and [10] – if the outcome variable is housing satisfaction – must be satisfied. Algorithm 2 is not flexible and requires all conditions to be satisfied. This results in more precise estimates, while at the same time reducing the number of matches.

Table 5 presents the covariate distributions of pre-match samples for the countries that were previously found to be the predominant representatives of "Northern" and "Southern" Europe: Denmark and the Netherlands, and Spain and Italy, respectively. Sample sizes for the "stayer"=control households are fairly large because a "stayer" household represents a potential control for each two subsequent waves, given that the young adult remains at home. Table 5 contains some further interesting cross-country patterns. For instance, the fraction of employed fathers and mothers is substantially higher in the Northern countries. Moreover, the table again reflects the North-South differences in levels of satisfaction, as well as the higher average age at moving out. On average, household sizes are larger in the South.

< Table 5 about here >

5.2. Treatment effect estimates

The outcome variables of interest are father's and mother's level of satisfaction with the financial and housing situation, respectively. Outcomes are measured in the wave directly succeeding treatment. Table 6 presents average treatment effects of young adults' nest-leaving on parental

[13] Matching estimators have received substantial attention in applied and theoretical econometrics over the last few years, and their application in economics has become routine. Most applications match on the propensity score, i.e. the conditional probability of receiving the treatment. In this case estimation of the propensity score is not necessary, and exact matching is possible, as the number of covariates is not too large and the covariates are discrete (or transformed into indicator variables). Cf. also Rosenbaum (1995) for further details on implementing matching estimators in non-experimental studies.

happiness by country. For each country, the first column reports treatment effects estimated using matching algorithm 1, and the second column reports treatment effect estimates derived from matching algorithm 2. Whereas the more flexible algorithm 1 finds matches for most treated households (from 67.3% for financial satisfaction in Belgium to 95.6% for housing satisfaction in Italy), algorithm 2 substantially reduces the number of control households matched to treated households (20.2% for financial satisfaction in the UK to 55.6% for housing satisfaction in Italy).

< Table 6 about here >

As Table 6 shows, there are some countries with significant treatment effects. With respect to the financial situation, mothers in France (Algorithm 1) and fathers in the UK (Algorithm 2) appear to be happier after nest-leaving, although in the latter case the sample size is greatly reduced. On the other hand, Belgian mothers (Alg.1) and above all Italian fathers (Alg.1 and Alg.2) as well as Italian mothers (Alg.2) report a significant reduction in their satisfaction levels. Regarding happiness with the housing situation, those few treatment effect estimates that are significant are all positive. Specifically, housing satisfaction appears to improve for fathers in Denmark (Alg.1 and Alg.2) and the Netherlands (Alg.2), but also for mothers in Spain (Alg.1) and Ireland (Alg.1). These initial results are not entirely surprising, since the graphs of sequences of the outcome variables (cf. figures 3 and 4) suggested that nest-leaving might indeed have a differential effect on financial satisfaction across countries, whereas this was not the case for housing satisfaction.

Hence, primary interest in the subsequent analysis lies in financial satisfaction. Recall that a North/South pattern was observed numerous times throughout the previous sections. Looking at the signs of the insignificant treatment effect estimates on financial happiness in Table 6, this pattern emerges once more. Treatment effects might be negative for Southern countries (Portugal, Spain) and positive for Northern countries (Denmark, Netherlands).

On the basis of this North/South pattern, countries are pooled into the following five

groups:

(a) "South1" = Spain, Portugal, and Italy.

(b) "South2" = adding Belgium to the countries from South1, based on evidence discussed for Figure 3 and Table 6.

(c) "South3" = adding Ireland to "South2", since Ireland showed a "Southern" pattern of nest-leaving (cf. Tables 2 and 3, Figure 1).

(d) "North1" = Denmark, France, Netherlands.

(e) "North2" = North1 including UK.

Table 7 reports treatment effect estimates for the pooled samples. The panel to the left reports estimates for Algorithm A, which is identical to Algorithm 1 outlined above including the requirement that treated households be matched to control households from the same country. Algorithm B (panel to the right) is also identical to Algorithm 1, but allows for treated households to be matched to control households from a different country, given that all other conditions are satisfied.

< Table 7 about here >

The treatment effect estimates from the pooled sample give a very clear indication that nest-leaving has a negative effect on parental happiness in the Southern countries. This negative effect is particularly pronounced for fathers (statistically significant for all Southern groups using Algorithm A), but is also unambiguous for mothers. On the other hand, Table 7 shows that nest-leaving has a positive effect on parental happiness in the Northern countries. Whereas this finding is not robust if the UK is included, the evidence for group North1 is strong. According to the results from Algorithm B, both fathers and mothers perceive a highly significant improvement in their financial satisfaction.

The bottom part of Table 7 also reports treatment effects on housing satisfaction by country

groups. Unsurprisingly, given the above considerations, the results do not show any North/South pattern. Even though few of the estimates are significant (and if so, they are positive), one strong finding can be extracted: Nest-leaving does not have any negative impact whatsoever on parental happiness with the housing situation.

5.3. Sample splits

In addition to the results presented in the previous section, I investigate whether nest-leaving has a differential effect depending on which "type" of young adult leaves the parental home. Specifically, I will consider (a) whether it is the son or the daughter that is leaving the parental home, and (b) whether the young adult leaving the parental home is an "early" or a "late" mover. An "early" mover is defined as being among the first 50% of young adults to move out. Sample splits are performed on the matched samples by country group obtained from Algorithm A, Table 7.

Table 8 delineates the treatment effects according to the young adult's sex. Once more, a clear pattern emerges from the estimates. In the Southern group, whereas mothers do not seem to experience differing declines in financial satisfaction levels depending on whether son or daughter leave (where the sample size reduction due to the split makes the negative impacts insignificant), the fathers' decrease in financial satisfaction appears strongly, if not entirely, driven by the negative effect of the son moving out. Since young adults in the Southern group are likely to contribute to household income at the time of moving out (Figure 5) – given that fathers attribute much importance to finances, and that sons are perhaps more likely to be employed at nest-leaving because they move later – this result seems plausible.

< Table 8 about here >

For the Northern group Table 8 shows a positive treatment effect of the son's nest-leaving on mothers' financial happiness. The implication of this finding is not clear, i.e. for instance it is not

clear what exactly might be the resources that the son presumably does not require any longer after moving out. With respect to the treatment effects on housing satisfaction (bottom part of Table 8) the young adult's sex does not seem to play a role. There may only be some indication that parents in Northern countries remain slightly less happy in their home after the daughter has left.

The second sample split is performed according to "early" and "late" movers, and the corresponding treatment effect estimates are reported in Table 9. Regarding financial satisfaction in the Southern countries, the results are coherent once again. Whereas mothers' decline in satisfaction does not discriminate between early and late nest-leaving, the fathers are predominantly affected by the young adult moving out late. This result is entirely in line with the interpretation given above. For Northern countries, there is some indication that parents prefer their children to move out early. Regarding treatment effects on housing satisfaction, the distinction between early and late movers does not seem to play a role.

< Table 9 about here >

6. Conclusion

This paper has described the patterns of young adults' nest-leaving, and estimated the effects that nest-leaving has on parental happiness, in a European context. In describing the patterns, two sets of results are noteworthy. First, there are substantial differences in the nest-leaving processes across countries. In one set of countries – Denmark, UK, Netherlands, France – nest-leaving occurs at a fast rate, i.e. at young ages. In a second set of countries – Spain, Italy, Portugal, Ireland – nest-leaving is expressly delayed, and young adults remain at home in large fractions. Only few countries – Germany, Belgium – occupy the middle-ground of nest-leaving at an "average rate". Hence, even a simple description of cross-country nest-leaving processes suggests a North/South distinction.

Second, certain macroeconomic country characteristics seem to be associated with the delay

in nest-leaving. Simple OLS regressions have hinted at the following: If benefits are readily available, this may be associated with a faster rate of nest-leaving. Also, if the youth unemployment rate is high, nest-leaving may be delayed. In a cross-country perspective, higher housing costs are positively correlated with a younger age at moving out, perhaps indicating that this may not be a very important factor in the nest-leaving process. Finally, a slow rate of nest-leaving is observed for countries with a population that is largely catholic.

These two sets of results may not seem extremely strong. The first – nest-leaving differences across European countries – has certainly been observed before (cf. for instance Fernández Cordón 1997, Iacovou 2001). The second set – stemming from regressions using a sample with 10 observations – should not be overemphasized anyway. But nonetheless these results do show that intra-European differences in nest-leaving do exist and do persist, and they seem to do so for a reason.

The subsequent analysis has provided a new perspective on nest-leaving by estimating the effects that young adults' nest-leaving has on parental happiness. The patterns that emerge from this analysis are strong, and they give substantial new insight into nest-leaving processes. Plotting sequences of the outcome variables has shown that, while housing satisfaction after nest-leaving seems to increase in general, the outcomes with respect to financial satisfaction divide European countries into two groups: Southern countries – predominantly Italy, Spain, Portugal, but also Belgium and Ireland – and Northern countries – notably Denmark, Netherlands, France, and also the UK. This grouping is borne out by analyzing the evolution of household income at the discontinuity point of nest-leaving: Whereas in the Northern countries the young adult on average did not contribute to household income at nest-leaving, in the Southern countries the young adult did contribute, perhaps substantially, and also in the long-term. Clearly, this is consistent with the observation that nest-leaving occurs at a later age.

The treatment effect estimates further confirm the findings from describing the outcome variable sequences. In Southern countries, parents suffer a loss in financial satisfaction, while in Northern countries parents appear to be happier with their finances after nest-leaving occurred. As sample splits have shown, the negative treatment effect for Southern groups seems to be driven by the moving out of sons and late movers. With respect to the treatment effect on housing satisfaction, no cross-country pattern emerges from the estimates. The evident result here is that across countries nest-leaving has no negative effect at all, and a positive effect for some.

Based on the finding by van Praag et al. (2002) that financial satisfaction is the most important determinant of general satisfaction among a set of domain satisfaction, and can therefore serve as an appropriate measure of parental utility, the results obtained in this paper function as an empirical test of some of the assumptions in economic models of nest-leaving behavior. As outlined in section 2.2 and Table 1, most studies explicitly or implicitly assume that parental utility increases after nest-leaving. In Europe, this appears to be a reasonable assumption for Northern countries only. This paper has presented strong evidence that parental utility levels in Southern countries actually decline after nest-leaving. This is the assumption made by Manacorda and Moretti (2002). However, in their model parental utility would decrease after nest-leaving because parents intend to bribe their children so that they stay, and the parents suffer when the young adult moves out nonetheless. The evidence presented in this paper suggests a different interpretation: In the Southern countries parents suffer a utility loss when the young adult moves out because he then no longer contributes to household income. Hence, future research should focus more explicitly on the idea that low parental income is one determinant of delayed nest-leaving.

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Table 1. Economic studies of household formation

Study	Scope	Description	U_P after nest-leaving	U_{YA} after nest-leaving	Nest-leaving decision maker	Findings
McElroy (1985)	Young men's joint decision of nest-leaving and market work	Nash bargaining model of family behavior	↑	↑	Parents + young adult jointly	Safety net: Family provides non-employment insurance, i.e. parents insure son minimum level of utility when he faces poor market opportunities
Rosenzweig and Wolpin (1993)	The role of intergenerational financial transfers	Dynamic overlapping generations model incorporating choices (a) by the parental generation of coresidence and transfer provision, and (b) by the young adult of HC investment	Ambiguous: (i) ↓ as coresidence cheaper way to support son due to scale economies (ii) ↑ as costs arise in form of privacy loss	Not specified	Parents [Game context: Young adults move first (HC decision), parents second]	Young adult sons more likely to receive financial transfers while residing apart from parents, and to coreside when own earnings are low (safety net); parents appear to subsidize all forms of HC investment
Ermisch and DiSalvo (1997), Ermisch (1999)	Impact of housing prices, young adults' income, and parental income on probability that young adult lives apart from parents	Two-stage model: First, altruistic parents choose own housing, consumption, and transfers, then child makes coresidence decision conditional on parental transfers	↑	↑	Parents	Higher price of housing reduces probability of nest-leaving
Card and Lemieux (2000)	Responses in work, school, and living arrangements of North American youth to external labor market forces	Modeling framework in which youth wage and state of demand (business cycle) exogenous, youth employment determined by employers' demand functions and youth work, school, nest-leaving decisions determined by individuals	Not specified (↑ implicit)	Not specified (↑ implicit)	Young adult	Young adults adapt to depressed local labor market conditions by staying with parents → empirical observation that family acts as a safety net
Manacorda and Moretti (2002)	Young Italian men and the role of intergenerational transfers	Bargaining model based on the assumption that cohabitation is a "good" for parents and a "bad for children"	↓	↑	Parents	Parents "bribe" their children so that these stay at home, i.e. a rise in parental income increases the probability that the young adult lives at home
Martínez-Granado and Ruiz-Castillo (2002)	Joint decisions of Spanish youth of working, studying, and nest-leaving	Empirical simultaneous equations model of the joint decision process	Not specified (↑ implicit)	Not specified (↑ implicit)	Young adult	Rich pattern of interdependencies between the three decisions (same for male and female). Specifically: Higher housing prices → higher propensity to live at home; Safety net

Notes: U_P=Parental utility, U_{YA}=Young adult's utility, HC=human capital.

Table 2. Quartiles of the nest-leaving distributions

Country	25% moved out		50% moved out		75% moved out	
	men	women	Men	women	men	women
Denmark	20.2	18.8	21.3	20.1	23	21.5
UK	18.8	18.3	23.1	20	26.4	23.5
Netherlands	21.5	20	23.7	21.6	26.2	23.6
France	21.5	19.8	24.3	22.2	26.8	25.2
Germany	22.3	20.1	24.6	22.2	28.3	25
Belgium	23.4	21.5	25.5	23.8	28.5	25.9
Ireland	25.1	22.3	28.4	26	33.6	29.6
Spain	26.1	24.3	29.3	27.2	[>35]	32.5
Portugal	25.5	23.3	29.8	26.8	[>35]	33.7
Italy	27.4	24.4	30.2	27.6	34.7	32.4

Notes: Author's calculations from ECHP data, waves 1-5, 1994-1998. Countries sorted according to median age at moving out for men.

Table 3. Selected country characteristics

Country	Benefit entitlement	Housing costs	Youth unemployment	Fraction catholic
Belgium	58	23.9	21.1	0.75
Denmark	56	27.4	9.2	0.03
France	19	23.8	26.64	0.855
Germany	55	23.4	9	0.34
Ireland	32	15.9	17.86	0.916
Italy	0	19.4	31.76	0.95
Netherlands	75	21.4	10.56	0.31
Portugal	24	10.7	14.18	0.94
Spain	27	14.7	38.86	0.94
UK	47	19	14.44	0.66

Notes: "Benefit entitlement" is taken from Table 3.7 ("The unemployment benefit entitlements of young unemployed single people") of OECD (1998) and gives the initial net replacement rate at the APW (Average Production Workers) earnings level, including social assistance and housing benefits. "Housing costs" is taken from Eurostat (2002) and gives the 1995 expenditure for consumption of housing (incl. water, electricity, gas etc.) as a % of total consumption. "Youth unemployment" is the average unemployment rate for 15-24-year old men and women for the years 1994-1998, calculated from OECD (2002). "Fraction catholic" is the fraction of the catholic population, taken from CIA (2002); with the exception of Ireland [1998], the Netherlands [1998], and Portugal [1995], this is 2002 data; the "0.66" for the UK combines "Anglican and Roman Catholic".

Table 4. Correlates of the age at nest-leaving

(a) Dependent variable: Median age at moving out (average men and women)

	I	II	III	IV	V	VI	VII	VIII	IX
Youth unemployment	.189**				.133*	.035		.087	.078
	(.082)				(.059)	(.096)		(.080)	(.102)
Housing Costs		-.453**			-.372**		-.326**	-.330**	-.308
		(.139)			(.119)		(.131)	(.130)	(.192)
Benefit entitlement			-.095**				-.061*	-.034	-.031
			(.033)				(.029)	(.039)	(.046)
Fraction catholic				7.405***		6.621*			.755
				(1.951)		(2.964)			(4.446)
Constant	21.228***	33.922***	28.625***	19.930***	29.738***	19.770***	33.806***	31.119**	30.224***
	(1.769)	(2.857)	(1.500)	(1.440)	(2.981)	(1.585)	(2.400)	(3.414)	(6.457)
R-squared	.40	.57	.50	.64	.75	.65	.73	.78	.78

(b) Dependent variable: Age at which 75% of young adults have moved out (average men and women)

	I	II	III	IV	V	VI	VII	VIII	IX
Youth unemployment	.259*				.166**	.016		.098	.097
	(.122)				(.070)	(.136)		(.091)	(.117)
Housing Costs		-.722***			-.622***		-.554***	-.559***	-.557*
		(.169)			(.141)		(.150)	(.149)	(.220)
Benefit entitlement			-.139**				-.081**	-.051	-.050
			(.048)				(.034)	(.044)	(.053)
Fraction catholic				10.836***		10.473**			.074
				(2.742)		(4.202)			(5.103)
Constant	23.502***	42.933***	33.966***	21.270***	37.715***	21.196***	42.779***	39.765**	39.677***
	(2.632)	(3.466)	(2.144)	(2.025)	(3.542)	(2.248)	(2.738)	(3.907)	(7.410)
R-squared	.36	.70	.51	.66	.83	.66	.83	.86	.86

Notes: Independent variables as explained in Table 2. Number of observations N=10. Standard errors in parentheses. Significance levels are denoted *=10%, **=5%, ***=1%, two-sided test.

Table 5. Pre-match samples for selected countries

	Denmark		**Netherlands**		**Spain**		**Italy**	
Treatment:	Leaver	Stayer	Leaver	Stayer	Leaver	Stayer	Leaver	Stayer
No. Obs.	323	1,019	526	2,947	756	11,759	824	14,001
Fathers:								
Age	49.01	47.32	51.40	49.24	57.24	53.40	57.62	54.03
Fraction employed	0.95	0.95	0.81	0.87	0.55	0.68	0.54	0.69
Fraction with high education	0.37	0.41	0.26	0.18	0.13	0.14	0.04	0.06
Satisfaction with financial situation	0.74	0.71	0.70	0.68	0.40	0.41	0.43	0.44
Satisfaction with housing situation	0.86	0.85	0.82	0.83	0.66	0.67	0.63	0.65
Mothers:								
Age	46.80	45.23	49.08	46.92	54.19	50.42	53.48	50.17
Fraction employed	0.85	0.85	0.56	0.56	0.19	0.26	0.25	0.33
Fraction with high education	0.40	0.36	0.14	0.11	0.05	0.07	0.03	0.04
Satisfaction with financial situation	0.77	0.73	0.71	0.70	0.41	0.42	0.40	0.42
Satisfaction with housing situation	0.87	0.86	0.81	0.82	0.66	0.67	0.63	0.65
Young adults:								
Average age	20.57	18.45	21.73	19.50	25.45	21.79	26.05	22.40
Fraction female	0.51	0.44	0.48	0.41	0.51	0.45	0.49	0.45
Household:								
Total income	354610	334777	75496	65641	3427430	3092376	43975	40180
Size	3.93	4.07	3.97	4.16	5.08	4.86	4.55	4.47
Fraction w/ bath	1.00	1.00	1.00	0.99	0.99	0.99	0.99	0.99

Notes: Total household income in national currencies (Italy: 1000's).

Table 6. Average treatment effects of young adults' nest-leaving on parental happiness, by country

	Belgium		**Denmark**		**France**		**Ireland**		**Italy**		**Netherlands**		**Portugal**		**Spain**		**UK**	
	Alg. 1	Alg. 2	Alg. 1	Alg. 2	Alg. 1	Alg. 2	Alg. 1	Alg. 2	Alg. 1	Alg. 2	Alg. 1	Alg. 2	Alg. 1	Alg. 2	Alg. 1	Alg. 2	Alg. 1	Alg. 2
No. treated households	275	275	323	323	772	772	853	853	833	833	526	526	588	588	756	756	451	451
ATE on financial satisfaction																		
No. Matches	185	64	238	94	669	296	739	297	795	455	432	232	555	240	686	327	361	91
(%)	67.3%	23.3%	73.7%	29.1%	86.7%	38.3%	86.6%	34.8%	95.4%	54.6%	82.1%	44.1%	94.4%	40.8%	90.7%	43.3%	80.0%	20.2%
Father	-0.025	0.018	0.007	-0.014	0.006	0.013	-0.002	-0.021	-0.024***	-0.021*	0.007	0.004	-0.007	0.004	-0.002	0.002	-0.009	0.031*
	(0.025)	(0.037)	(0.014)	(0.020)	(0.013)	(0.015)	(0.015)	(0.018)	(0.009)	(0.011)	(0.011)	(0.014)	(0.009)	(0.013)	(0.012)	(0.018)	(0.010)	(0.017)
Mother	-0.044*	-0.019	0.004	0.004	0.026**	0.003	0	-0.001	-0.012	-0.022*	0.001	-0.007	-0.01	0	-0.003	-0.004	-0.01	-0.008
	(0.026)	(0.041)	(0.013)	(0.019)	(0.013)	(0.013)	(0.015)	(0.019)	(0.010)	(0.012)	(0.010)	(0.012)	(0.010)	(0.013)	(0.012)	(0.017)	(0.009)	(0.017)
ATE on housing satisfaction																		
No. Matches	207	87	258	103	696	382	752	406	796	463	454	247	538	240	696	336		
(%)	75.3%	31.6%	79.9%	31.9%	90.2%	49.5%	88.2%	47.6%	95.6%	55.6%	86.3%	47.0%	91.5%	40.8%	92.1%	44.4%		
Father	-0.002	-0.012	0.2*	0.025*	-0.005	-0.005	0.001	-0.002	0.002	-0.015	0.005	0.014*	0.005	-0.007	0.002	0.003		
	(0.017)	(0.029)	(0.011)	(0.015)	(0.007)	(0.008)	(0.008)	(0.009)	(0.009)	(0.010)	(0.007)	(0.008)	(0.009)	(0.012)	(0.011)	(0.016)		
Mother	0.008	0	-0.003	0.01	-0.003	-0.002	0.016*	0.014	0	-0.009	0.004	0.011	0	-0.008	0.023*	0.001		
	(0.016)	(0.023)	(0.009)	(0.013)	(0.007)	(0.008)	(0.009)	(0.010)	(0.009)	(0.011)	(0.008)	(0.009)	(0.009)	(0.012)	(0.011)	(0.016)		

Notes: Significance levels are denoted *=10%, **=5%, ***=1%, two-sided test. Standard errors in parentheses.

Table 7. Average treatment effects of young adults' nest-leaving on parental happiness, country aggregates

	Algorithm A - country match required					Algorithm B - Matching across countries allowed				
	South1	**South2**	**South3**	**North1**	**North2**	**South1**	**South2**	**South3**	**North1**	**North2**
No. treated households	2177	2452	3305	1621	2072	2177	2452	3305	1621	2072
ATE on financial satisfaction										
No. Matches	1980	2165	2904	1339	1700	2110	2368	3202	1500	1918
(%)	91.0%	88.3%	87.9%	82.6%	82.0%	96.9%	96.6%	96.9%	92.5%	92.6%
Father	-0.012**	-0.013**	-0.013**	0.007	0.003	-0.01*	-0.009*	-0.001	0.016***	0.006
	(0.006)	(0.006)	(0.005)	(0.007)	(0.006)	(0.006)	(0.005)	(0.005)	(0.006)	(0.005)
Mother	-0.009	-0.012**	-0.008	0.014**	0.009	-0.012**	-0.008	0.003	0.017***	0.009*
	(0.006)	(0.006)	(0.005)	(0.006)	(0.005)	(0.006)	(0.005)	(0.005)	(0.006)	(0.005)
ATE on housing satisfaction										
No. Matches	2030	2237	2989	1408		2120	2434	3214	1511	
(%)	93.2%	91.2%	90.4%	86.9%		97.4%	99.3%	97.2%	93.2%	
Father	0.003	0.003	0.002	0.003		0.004	0.004	0.012***	0.004	
	(0.006)	(0.005)	(0.005)	(0.004)		(0.005)	(0.005)	(0.004)	(0.004)	
Mother	0.008	0.008	0.01**	0		0.008	0.01*	0.018***	0.005	
	(0.006)	(0.005)	(0.005)	(0.005)		(0.006)	(0.005)	(0.004)	(0.004)	

Notes: Country groups: South1=Spain, Portugal, Italy; South2=South1+Belgium: South3=South2+Ireland; North1=Denmark, France, Netherlands, North2=North1+UK. Significance levels are denoted *=10%, **=5%, ***=1%, two-sided test. Standard errors in parentheses.

Table 8. Average treatment effects of young adults' nest-leaving on parental happiness, country aggregates – sample split by young adult's sex

	South1		**South2**		**South3**		**North1**		**North2**	
Sex of young adult leaving	son	daughter	son	daughter	son	daughter	son	daughter	son	daughter
ATE on financial satisfaction										
Father	-0.016**	-0.006	-0.018**	-0.005	-0.018***	-0.007	0.005	0.01	0.003	0.004
	(0.008)	(0.009)	(0.008)	(0.008)	(0.007)	(0.008)	(0.008)	(0.011)	(0.007)	(0.009)
Mother	-0.009	-0.008	-0.012	-0.011	-0.007	-0.011	0.016**	0.01	0.014**	0.001
	(0.008)	(0.009)	(0.008)	(0.009)	(0.007)	(0.009)	(0.008)	(0.011)	(0.007)	(0.009)
ATE on housing satisfaction										
Father	0.006	-0.001	0.004	0.001	0.004	0	0.01*	-0.008		
	(0.007)	(0.009)	(0.007)	(0.008)	(0.006)	(0.007)	(0.005)	(0.007)		
Mother	0.012	0.002	0.011	0.003	0.015**	0.003	0.004	-0.008		
	(0.008)	(0.009)	(0.007)	(0.008)	(0.006)	(0.007)	(0.006)	(0.007)		

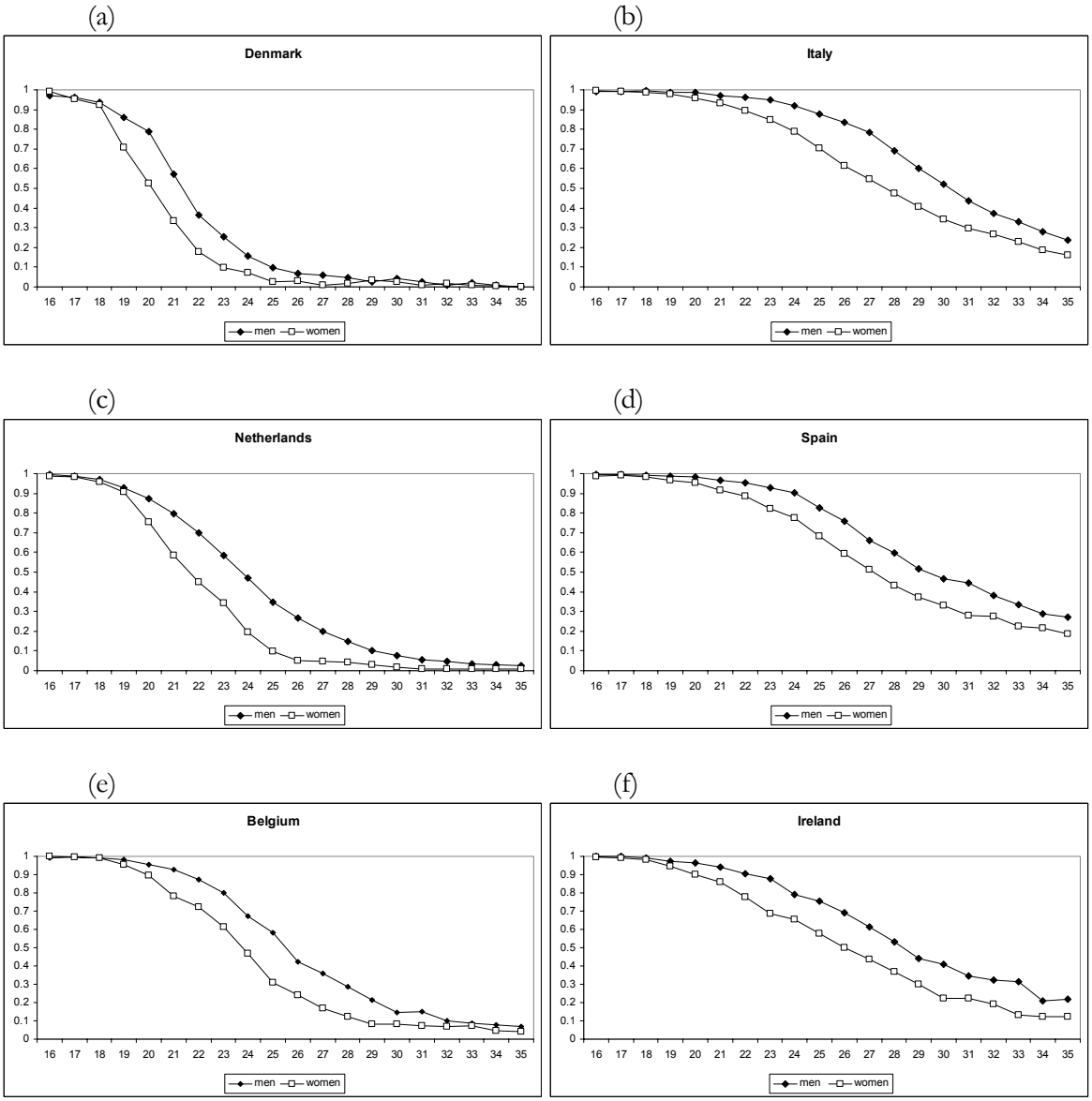
Notes: Estimates from "Algorithm A", i.e. country match required. Country groups: South1=Spain, Portugal, Italy; South2=South1+Belgium; South3=South2+Ireland; North1=Denmark, France, Netherlands, North2=North1+UK. Significance levels are denoted *=10%, **=5%, ***=1%, two-sided test. Standard errors in parentheses.

Table 9. Average treatment effects of young adults' nest-leaving on parental happiness, country aggregates – sample split by young adult's age

	South1		**South2**		**South3**		**North1**		**North2**	
Young adult moves out:	early	late	early	late	early	late	early	late	early	late
ATE on financial satisfaction										
Father	-0.005	-0.02**	-0.006	-0.022**	-0.011	-0.015**	0.015*	-0.002	0.005	0.002
	(0.008)	(0.009)	(0.007)	(0.009)	(0.007)	(0.007)	(0.009)	(0.010)	(0.007)	(0.008)
Mother	-0.008	-0.01	-0.012	-0.011	-0.009	-0.007	0.014*	0.014	0.006	0.012
	(0.008)	(0.010)	(0.007)	(0.009)	(0.007)	(0.008)	(0.009)	(0.010)	(0.007)	(0.008)
ATE on housing satisfaction										
Father	0.005	0	0.006	-0.001	0.003	0.001	0.002	0.004		
	(0.007)	(0.009)	(0.007)	(0.008)	(0.006)	(0.007)	(0.006)	(0.006)		
Mother	0.009	0.006	0.008	0.007	0.011*	0.008	-0.003	0.001		
	(0.007)	(0.009)	(0.007)	(0.009)	(0.006)	(0.007)	(0.007)	(0.006)		

Notes: Estimates from "Algorithm A", i.e. country match required. "Early" moving out=among the first 50% to leave home. Country groups: South1=Spain, Portugal, Italy; South2=South1+Belgium; South3=South2+Ireland; North1=Denmark, France, Netherlands, North2=North1+UK. Significance levels are denoted *=10%, **=5%, ***=1%, two-sided test. Standard errors in parentheses.

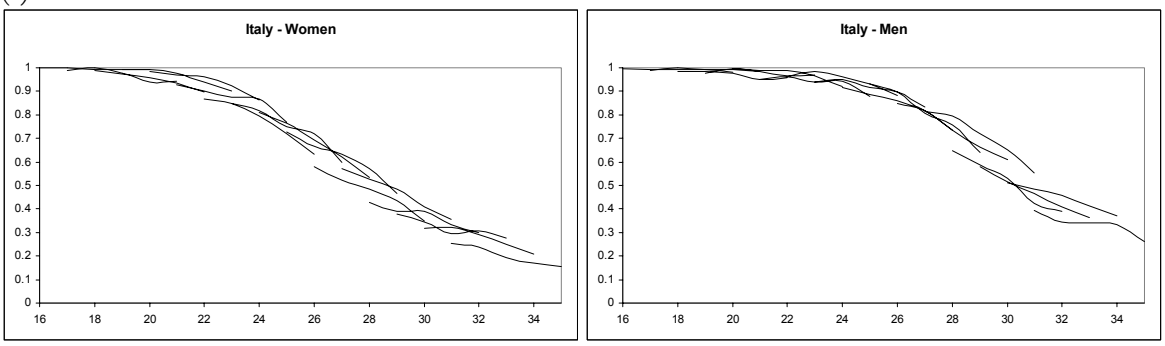
Figure 1. Living at home – by country, sex, and age



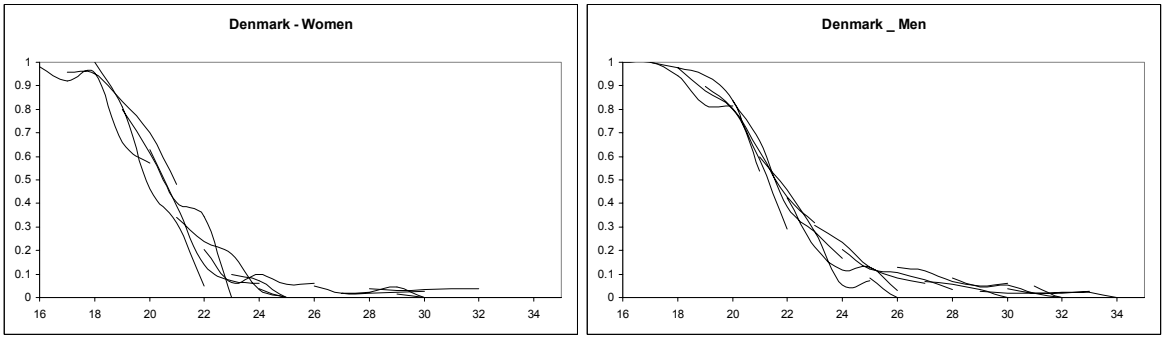
Notes: Author's calculation from ECHP data, averages across waves 1-5, 1994-1998. Remaining countries: France and UK like Netherlands, Germany in-between Belgium and Netherlands, Portugal like Spain.

Figure 2. Living at home – Survivor functions by country, sex, and age in first wave

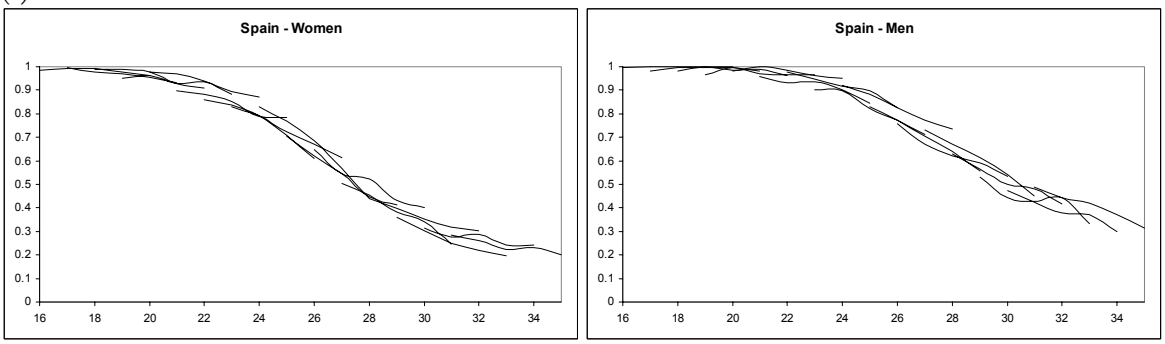
(a)



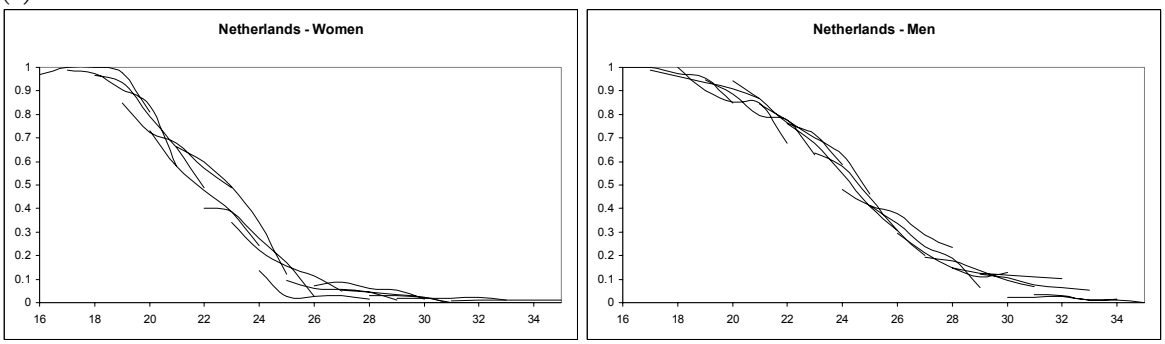
(b)



(c)



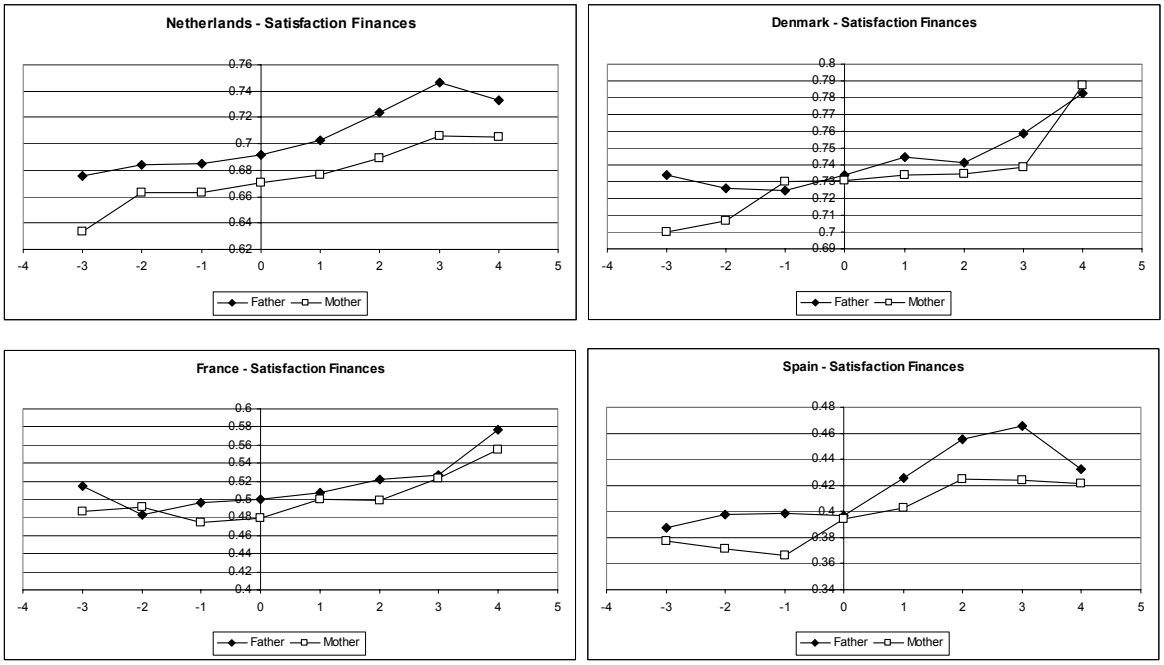
(d)



Notes: Author's calculation from ECHP data, waves 1-5, 1994-1998.

Figure 3. Parental satisfaction with financial situation, treatment sample – waves since nest-leaving

(a)



(b)

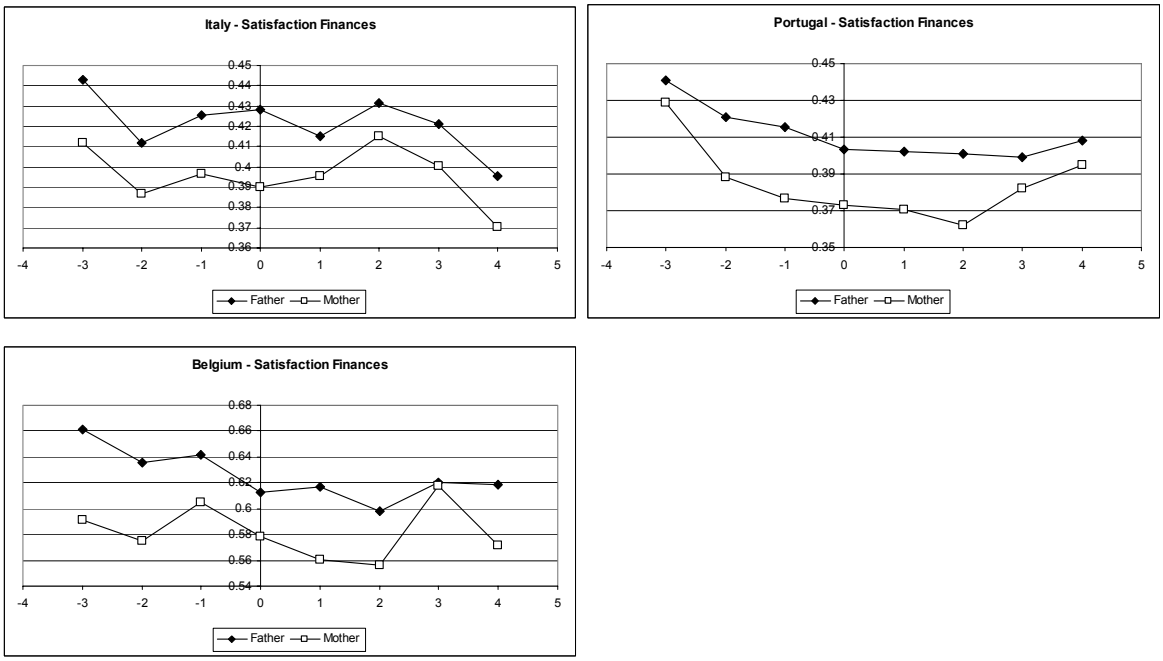


Figure 4. Parental satisfaction with housing situation, treatment sample – waves since nest-leaving

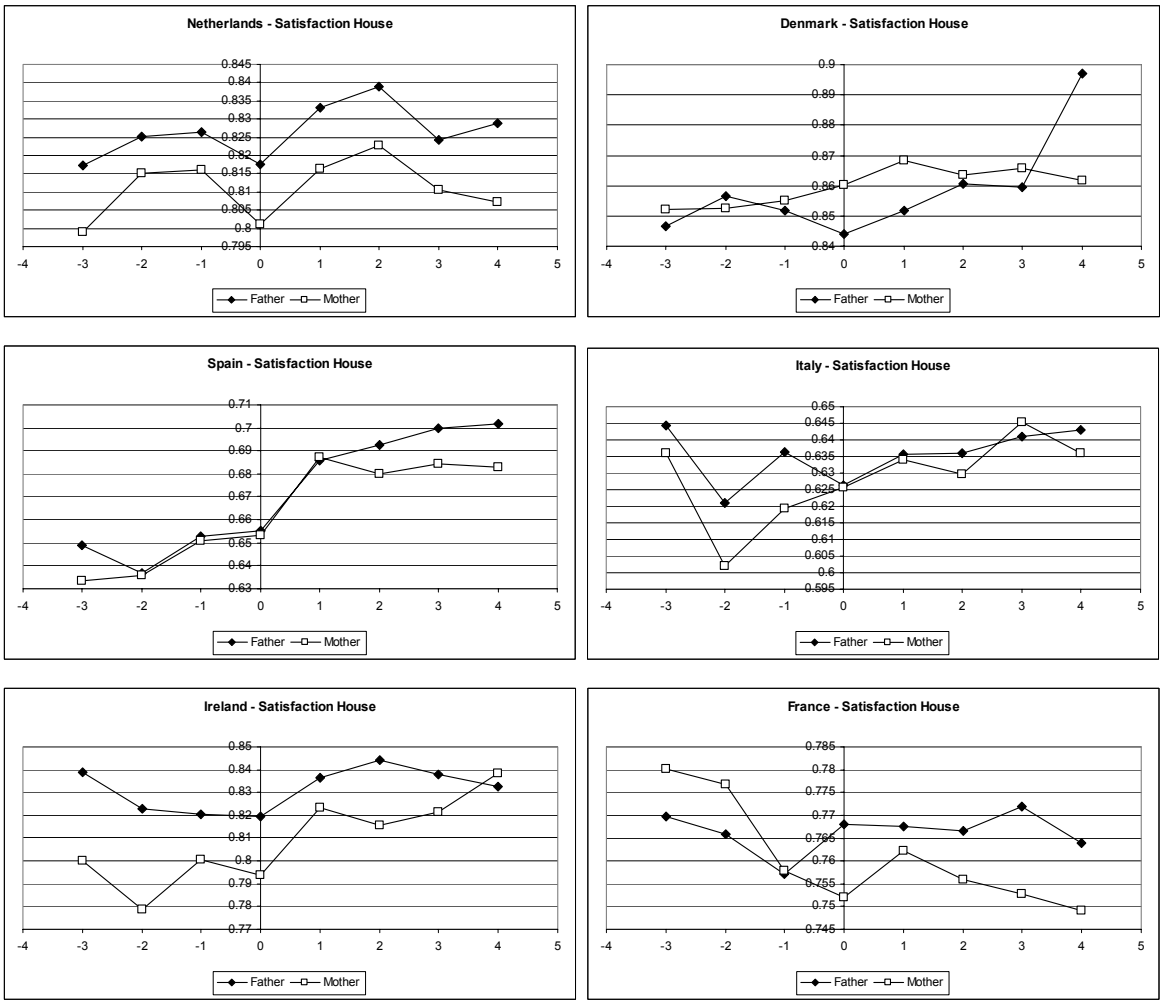
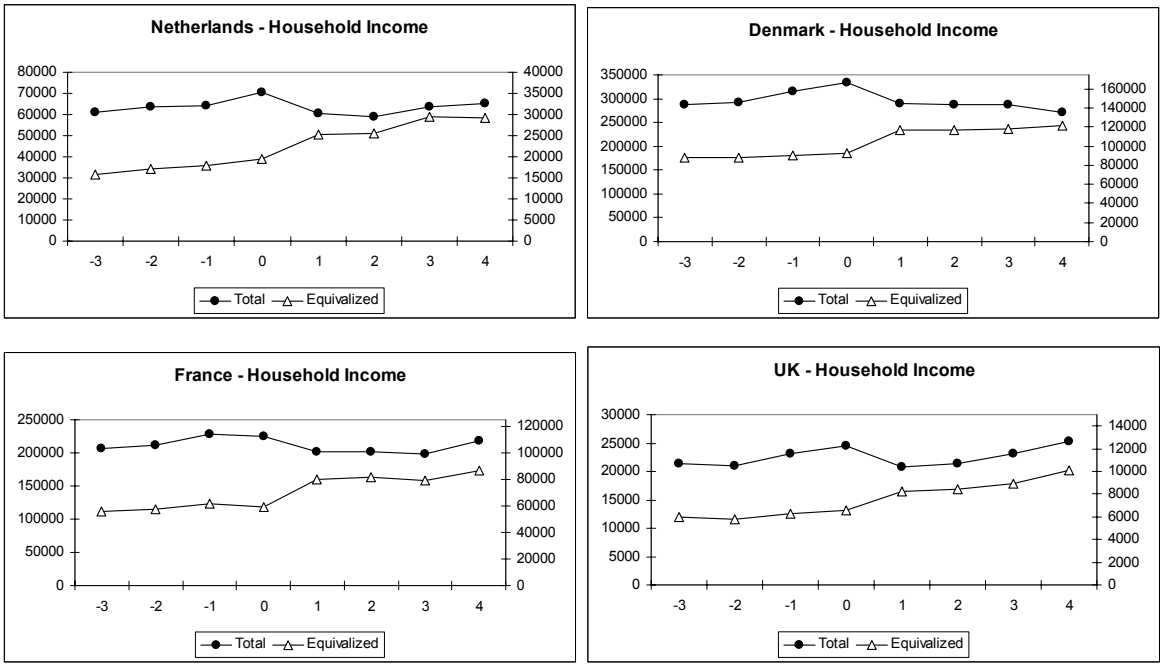
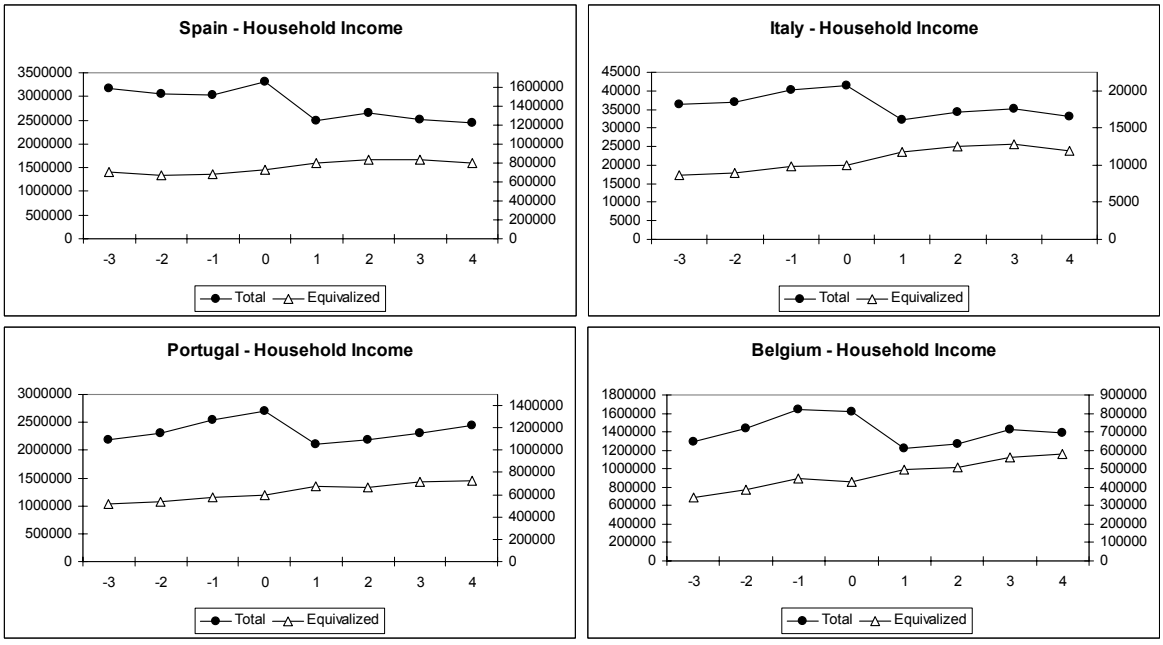


Figure 5. Measures of household income – waves since nest-leaving

(a)



(b)



Notes: Income in National Currencies (Italy: 1,000s). Axes scaled so that maximum of Y-axis to the right (equivalized income) equal to half of the maximum of Y-axis to the left (total income).