Volume Title: NBER International Seminar on Macroeconomics 2004

Volume Author/Editor: Richard H. Clarida, Jeffrey Frankel, Francesco Giavazzi and Kenneth D. West, editors

Volume Publisher: The MIT Press

Volume ISBN: 0-262-03360-7

Volume URL: http://www.nber.org/books/clar06-1

Conference Dates: June 13-14, 2003 and June 18-19, 2004

Publication Date: September 2006

Chapter Title: Saving and Cohabitation: The Economic Consequences of Living with One's Parents in Italy and the Netherlands

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Chapter URL: http://www.nber.org/chapters/c0083

Chapter pages in book: (413 - 457)

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Saving and Cohabitation: The Economic Consequences of Living with One's Parents in Italy and the Netherlands

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1. Introduction

Much economic theory on saving takes the nuclear household as the benchmark for its analysis. The standard assumption is that children leave home as soon as they are of age, and that they become independent consumption units as soon as they do so.

Yet, we have evidence of wide-spread cohabitation of at least two generations in some European countries, as well as in some Far Eastern countries. In these European countries the common pattern is not so much for the elderly to live with their children, rather for grown children to leave home well after they become of age. We define those households where grown children live with their parents as "composite households." We provide evidence from Italian survey data that composite households differ in their saving behavior: for all ages over 50, composite households' saving rates are higher than nuclear households' saving rates. One possible implication is that countries characterized by higher cohabitation have higher aggregate household saving.

The economic issue we investigate is the link between cohabitation and saving. But this calls into question the reasons behind cohabitation, a topic that has been investigated in a number of papers, that point to imperfections in either the labor market or in the credit market (possibly in conjunction with the housing market). For instance, Fogli (2004) and Becker et al. (2004) stress the importance of lack of job security for the young in delaying the time of independence, while Guiso and Jappelli (2002) stress that rent controls and severe imperfections in the mortgage market make it hard for young Italians to move out of the parental home. However, recent work by Manacorda and Moretti (2006)

suggests that parental preference for living with their children may play a major role in explaining cohabitation, to the point that parents would choose to work harder to offer their grown children a higher standard of living if they remain in the parental home.

In this paper we show how differences in saving rates found in micro data can shed light on the presence and nature of these imperfections or differences in preferences across generations. In particular, we want to assess the role played by transaction costs in the housing markets. If such costs are particularly high for both trading down (by the parents) and buying or renting (by the children), and capital markets are imperfect, cohabitation may be the optimal way for the young to accumulate liquid assets necessary for the down payment and in general for the purchase of their home.

In the case where parents and grown children live together, household decisions are unlikely to be taken in a unitary way. Even if father and mother behave as one person, and they have only one child, key household decisions are likely to be the result of some form of bargaining between parents and child. For this reason, we extend Browning's (2000) "younger spouse" model to cover the case of two generations: in his model husband and wife have different survival probabilities, and therefore disagree on how much to save. In our model, the child may choose to leave home in the second period or to stay with her parents, and will base her saving decision on the preferred outcome. In either case, we can expect the child's income share to have an impact on the household saving rate.

This paper is organized as follows. The second section presents some basic facts on cohabitation in Europe, and on its consequences on saving rates. The third section presents a simple theoretical model of how composite households jointly decide how much to save and whether to continue cohabitation. The fourth section describes the two data sets used in this paper: the Italian Survey on Household Income and Wealth (SHIW) and the Dutch Socio-Economic Panel (SEP). The fifth section presents estimates for both Italy and the Netherlands, while the sixth section concludes the paper.

2. Cohabitation across European Countries

Economists often assume that adult children live on their own. This probably reflects the most common living arrangement that prevails in

some Western countries, such as Germany, the UK, or the U.S., where children tend to leave the parental home soon after they become of age or at least complete their education. And yet, there is ample evidence that this is by no means the rule even within Europe. Important studies by demographers have pointed out that the age of leaving home varies dramatically across European countries (Kiernan 1986 and 1999; Fernández Cordón 1997). In a recent and well-documented study, Billari et al. (2001) estimate that for the ten-year cohort born around 1960, for instance, median ages of leaving home were 22.5 for men and 20.5 for women in the Netherlands (very close to the UK or West Germany), as low as 20.1 for men and 19.8 for women in Lithuania, but much higher in Spain, Poland and particularly Italy (26.7 for men and 23.6 for women in Italy). This variability across countries is not a recent phenomenon, and suggests that institutional or cultural differences may play a lasting role in explaining international differences.

An interesting summary on cohabitation in Europe as recently as 1998 is presented in Figure 1, that shows the proportion of households in the European Community Household Panel headed by someone aged 50 or more with at least one child aged 25 or more in residence. This proportion is highest in Portugal, followed by Italy, Ireland, and Spain, and lowest in Denmark, followed by the Netherlands and the UK.[1]

However, even though in the Netherlands cohabitation of children aged 25+ with their parents is quite rare, the cohabitation of 18–25 is much more common. On the basis of this evidence, it makes sense to study the way cohabitation and saving decisions are taken across different countries but not necessarily to focus on a specific age group: we shall construct our empirical exercise in such a way that the leaving home decision could be taken mostly by children aged 25+ (like in Italy) or 18–25 (like in the Netherlands).

Computing saving rates in household level data is difficult. Saving can be defined as income minus expenditure, or as the change in wealth. The two definitions are not even conceptually the same, because income does not normally include capital gains (see Brugiavini and Weber 2003 for a discussion of this and many other issues). But empirically, they are likely to differ for measurement problems too: the flow definition requires finding a survey that contains high quality data on both income and expenditure, the stock-based measure

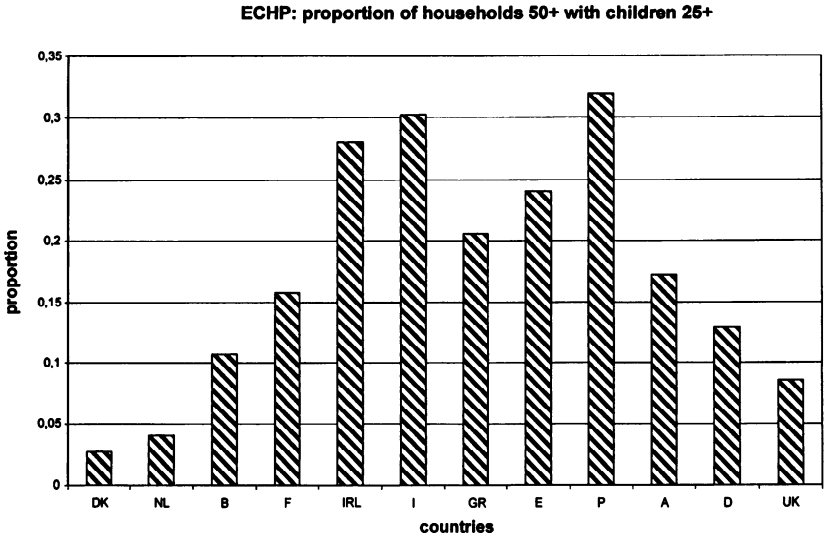

Figure 1
Proportion of composite households in European countries

requires good records of financial and real wealth for at least two points in time.

In our empirical work, we shall use both definitions when possible (Italian data) and the stock-based measure alone when expenditure data are missing (Dutch data).

We should note that saving rates in SHIW are notoriously high, but even complex corrections based on statistical matching of complementary data sources for income and expenditure do not alter the age profile all that much (Battistin, Miniaci, and Weber 2003).

There is evidence that saving rates differ according to household type, as documented in Brugiavini and Padula (2001). In Figure 2 we show how the average saving rate varies with age in SHIW 2000, according to the nature of the household (nuclear or composite). The saving rate is higher for composite households, but the endogenous nature of the child's decision to leave home prevents a clear interpretation of this empirical regularity. A point worth noting is that household saving rates could be higher for composite households because of composition effects (if better off, high saving parents induce their children to stay with them) or because the children also earn income and save to finance their move out of the parental home.

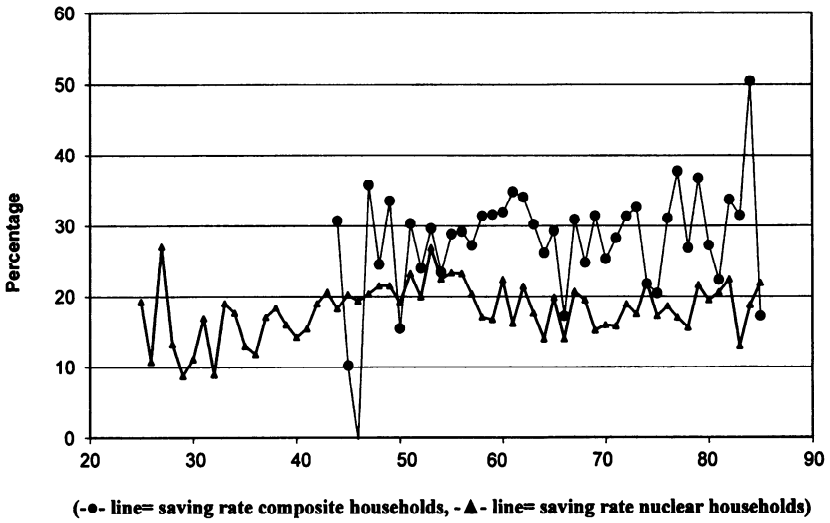

Figure 2
Saving rates by nuclear and composite households in Italy

3. Cohabitation and Saving: A Simple Model

In this section we develop a simple model that can help us assess to what extent the differences in saving rates found in micro data are due to imperfections in housing and credit markets or to differences in preferences across generations. If transaction costs in the housing market are particularly high for both trading down (by the parents) and buying or renting (by the children), and capital markets are imperfect, a long period of cohabitation may be the optimal way for the young to accumulate liquid assets necessary for the down payment and in general for the purchase of their home.

In our simple model we assume that parents and children live for two periods: in period 1 all adult children live with their parents. In period 2 some will go and live on their own, some will remain with their parents. The parents behave as a unit (known as F), and they prefer their children to live with them (this is particularly true for Italy, according to Manacorda and Moretti's (2003) elaborations on World Value Survey data). The children prefer to live on their own, but they must pay a fixed transaction cost at the moment they leave. This could be a down-payment for home purchase, or a cash advance on rent or deposit, but

it could also be moving expenses and the costs of getting furniture and basic household appliances. Similar assumptions are made by Manacorda and Moretti (2006), who consider labor supply decisions of the parents in a static model.[2]

Crucial to our model is the assumption that individual saving cannot be negative. This is equivalent to ruling out borrowing not only outside the household, but also within. Borrowing outside the household is unlikely to be sought by the (middle-aged) parents, whose income is relatively high, and is unlikely to be granted to the children, whose jobs are typically not secure (as stressed by Becker et al. 2004). Borrowing within the household may occur if parents want or are willing to help their children to move out, as argued by Guiso and Jappelli (2002). However, this help may well be withheld as long as possible, if parents derive utility from cohabitation. We do not model this further aspect of the inter-generational game, but note the potential importance of a strategic use of transfers from parents to children to delay independence.

We assume there is only one child for convenience, and labor supply by both parents and child is exogenous. In the model we further assume certainty. Consumption is a public good within the parents' household, but it becomes private if the child leaves home. The issue is of how household saving is affected by the possibility that the child moves out. The child's decision to move out is endogenous and will therefore be known for sure in period 1. The model assumes that parents and child play a Nash game. In the case where the child decides to stay with the father this leads to a Pareto-efficient solution. In the case where she chooses to move out, this leads to an inefficient solution (too much saving, because consumption is a public good in period 1, a private good in period 2). Therefore, we shall also consider the cooperative solution for the case where the child decides to move out.

Let us denote with F the parents' variables, with K the child variables. Let P be the amount saved by the parents, S be the amount saved by the child. Let Y be income (with subscripts for periods 1 and 2, superscripts F for parents and K for the child—no superscript denotes the household total: $Y_1 = Y_1^F + Y_1^K$). Consumption in period 1 is the difference between total household income and total saving ($Y_1 - S - P$). Let λ be a 0-1 indicator: $\lambda = 1$ if in period 2 the child remains with her parents, $\lambda = 0$ if she leaves the parents' home. Let T be the transaction cost incurred if the child moves out. Finally, the constants x and z are both greater than

unity and denote respectively the preference of the parents for cohabitation and of the child for independence.

Formally, the parents choose P and the child chooses S and λ so as to maximize their utility functions that are given by:

$$U_F = U(Y_1 - S - P) + \lambda x U(P + S + Y_2) + (1 - \lambda)U(P + Y_2^F) \quad (1)$$

$$U_K = U(Y_1 - S - P) + \lambda U(P + S + Y_2) + z(1 - \lambda)U(S + Y_2^K - T) \quad (2)$$

where the budget constraint is already taken into account. Liquidity constraints imply that today's savings cannot be negative. For the sake of simplicity, we shall use throughout logarithmic utility, without loss of generality.

In the sequel we are going to first show how saving decisions are taken when the child finds it advantageous to remain with her parents in the second period, then what saving is in the case where the child moves out, and finally discuss the likely determinants of the decision to stay or move out.

The case where $\lambda = 1$ is chosen by the child is like Browning's "younger spouse" model (see Browning 2000), because consumption is a public good in both periods but one agent (the parents) values future consumption more than the other. Thus in the Nash equilibrium the parents will be the one to save first. In this case, we can work out the dictatorial solutions for parents and child, and get:

$$(P+S)_F = \frac{xY_1 - Y_2}{1+x} \quad (3)$$

$$(P+S)_K = \frac{Y_1 - Y_2}{2} \quad (4)$$

and we see that, if $x > 1$ then $(P + S)_F > (P + S)_K$. As in Browning (2000) we can establish the following two lemmas:

Lemma 1: The saving functions of parents ($P(S)$) and child ($S(P)$) are given by:

$$S(P) = \max[\min(Y_1^k, (P + S)_k - P), 0]$$

$$P(S) = \max[\min(Y_1^F, (P + S)_F - S), 0]$$

Lemma 2: Either the parents save all of their income (Y_1^F) or the child saves none of her income (Y_1^K). Hence:

$$S(Y_1^F - P) = 0$$

Then we can establish the following.

Proposition 1:
(a) The parents save all of their income if

$$Y_1^F < (S + P)_F \Rightarrow \mathrm{P} = (1 - \rho)Y_1$$

where ρ is the child's share in period 1 income. Otherwise:

$$P = (S + P)_F$$

(b) The child saves none of her income if

$$Y_1^F > (S + P)_K$$

and otherwise saves:

$$S = (S + P)_K - Y_1^F$$

(c) total household saving is therefore given by the following:

$$(\hat{P}+\hat{S})=(S+P)_K=\frac{Y_1-Y_2}{2} \quad if \quad Y_1^F<\frac{Y_1-Y_2}{2}$$

$$(\hat{P}+\hat{S}) = Y_1^F=(1-\rho)Y_1 \quad if \quad \frac{Y_1-Y_2}{2} \le Y_1^F<\frac{xY_1-Y_2}{1+x}$$

$$(\hat{P}+\hat{S})=(S+P)_F=\frac{xY_1-Y_2}{1+x} \quad if \quad Y_1^F>\frac{xY_1-Y_2}{1+x}$$

The proposition implies that income distribution within the family affects total household saving, at least for an intermediate income range, whenever the child chooses to live with her parents in both periods. Not surprisingly, in this region a higher income share of the parents increases saving.

The case where $\lambda = 0$ is less straightforward. If the child decides to move out of her parents' place, period-two consumption is a private good for both agents. The Nash solution can be found as the intersection of reaction functions, at least over a certain income range. The two reaction functions are easily derived as follows:

$$P=\frac{Y_1-Y_2^F}{2}-\frac{S}{2} \tag{5}$$

$$S=\frac{1}{1+z}[zY_1+T-Y_2^K]-\frac{z}{1+z}P \tag{6}$$

where the non-negativity constraints have been ignored, as well as the constraint that each agent's saving cannot exceed their current income. The solution to this system of equation is as follows:

$$S=\frac{2}{2+z}\left(zY_1+T-Y_2^K-\frac{z}{2}(Y_1-Y_2^F)\right) \tag{7}$$

$$P=\frac{Y_1-Y_2^F}{2}-\frac{1}{2+z}\left(zY_1+T-Y_2^K-\frac{z}{2}(Y_1-Y_2^F)\right) \tag{8}$$

and the sum of the two simplifies to the following expression:

$$P+S=\frac{(1+z)Y_1+T-Y_2^K-Y_2^F}{2+z} \tag{9}$$

and this does not depend on period 1 income distribution within the household. However, this interior solution does not hold for all possible income values.

We can establish that parents save less than the child as long as period 1 household income is sufficiently large compared to parents' income in period 2 and child's income net of transaction cost. This condition seems reasonable in view of the fact that Y_1 subsumes initial wealth of both agents.

Then the interesting case to investigate is the one where $Y_1^K < S$. In this case the child saves all of her income, whereas the parents save according to equation (5), that is:

$$P=\frac{Y_1-Y_2^F}{2}-\frac{Y_1^K}{2}=\frac{(1-\rho)Y_1-Y_2^F}{2}$$

and total household saving is:

$$P+S=\frac{Y_1-Y_2^F}{2}+\frac{Y_1^K}{2}=\frac{Y_1-Y_2^F}{2}+\frac{\rho Y_1}{2}$$

In this case, total household saving is positively affected by ρ, the child's share in period 1 income. However, this outcome is not Pareto-efficient, because there is more saving than any collective solution would imply

(period 1 consumption is a public good, period 2 consumption is private, so the two agents under-provide the public good and save more than in the efficient solution).

The child can work out whether her utility is higher under cohabitation or under independence. The preference for independence (represented by the z parameter in equation (2)) will push her to leave home; the transaction cost and her parents' preference for cohabitation (represented by the x parameter in equation (1)) will instead act in the opposite direction.

We can work out what the Pareto-efficient solution will be in the case of independence. This will serve us as a benchmark to assess the welfare loss associated to the noncooperative solution of equation (9), but is also interesting because it is the relevant solution if the two generations decide to cooperate (as argued in much of the recent literature on household decision making, see Vermeulen 2002). In the case where $\lambda = 0$ the efficient solution can be found by choosing P and S so as to maximize the following criterion function:

$$U_\mu = U(Y_1 - S - P) + \mu U(P + Y_2^F) + z(1-\mu)U(S + Y_2^K - T) \tag{10}$$

where μ is the Pareto-weight attached to the parents' utility. This will normally be a decreasing function of ρ, the child's share in period 1 income, as individual incomes affect the fall-back position of the Nash bargaining solution. Of course μ can also be a function of other exogenous characteristics.

Under logarithmic utility and ignoring inequality constraints, this leads to the following solution:

$$\frac{1}{C_t^\rho} = \beta(1+r_t)\varphi_t E_t\left[\frac{1}{C_{t+1}^\rho}\right] \tag{11}$$

$$c_H(h) = C_H\left(\frac{p_H(h)}{P_H}\right)^{-\phi}, \quad c_F(f) = C_F\left(\frac{p_F(f)}{P_F}\right)^{-\phi} \tag{12}$$

and total household saving is:

$$C_H = nC\left(\frac{P_H}{P}\right)^{-\theta}, \quad C_F = (1-n)C\left(\frac{P_F}{P}\right)^{-\theta} \tag{13}$$

We can see that if $z = 1$ total household saving does not depend on μ or on how income is allocated in period 1. This simply says that if the two

agents agree the cooperative solution is unique and independent of the Pareto weights.

The interesting case is when $z > 1$, that is when the child values independence more. Let us define $\xi = z - 1$ and write the solution as a function of ξ:

$$\hat{S}+\hat{P}=\frac{1}{2+\xi(1-\mu)}[(1+\xi(1-\mu))Y_1-Y_2^F-(Y_2^K-T)]$$

and we easily check that its derivative with respect to μ is negative as long as ξ is positive and total period 2 household income exceeds the transaction cost. Both conditions are easily met.

If μ is a decreasing function in ρ (the parents' Pareto weight is smaller when the child has more income), this implies that a higher period 1 income share of the child increases household saving.

To summarize, we have found the following:

- the child is more likely to move out if the transaction cost is low and if her preference for independence is high. Also the parents' preference for cohabitation may have a negative effect if the parents' period 1 income is sufficiently high
- if the child decides to stay home, a higher period 1 income share for her either has no effect on household saving, or a *negative* effect
- if the child decides to leave home, and parents and child play a Nash game, then a higher period 1 income share for the child either has no effect on household saving, or a *positive* effect. However, the Nash game leads in this case to a Pareto inefficient solution
- if the child decides to leave home, and parents and child play a cooperative game instead, then a higher period 1 income share for the child has again a *positive* effect.

Similar effects of period 1 child's income share are found for the saving rate.

The case where the child prefers cohabitation, and parents would like her to leave home, can to an extent be modeled by making x and z less than unity. But, given the presence of transaction costs and other penalties attached to living on her own (loss of public consumption), the child will never leave her parental home, unless forced to or bribed by her parents. This suggests that in this case the assumption of no intervivos tranfers is clearly not tenable (after all, most children leave home

eventually!). A more general model is needed that is beyond the scope of this paper.

The main conclusions of our model are unaffected if the child living with her parents can spend money on a private consumption good, as long as she also consumes some of the public good.

4. The Data

In this paper we use household survey data from two European countries: Italy and the Netherlands. The micro data we use are taken from SHIW for Italy, from SEP for the Netherlands and are described in the rest of this section.

As Figure 1 reveals, in Italy over 30 percent of households whose head is over 50 have at least one child aged 25 or more in residence. In the Netherlands this proportion is much smaller (less than 5 percent), but in recent years there has been an increase in the number of young Dutch (aged 18-24) who live with their parents, possibly because of increased house prices and rents or decreased welfare benefits for young people.

The workings of housing and credit markets are quite different in the two countries, as documented in Chiuri and Jappelli (2003): for instance, over the 1986–96 decade in Italy the ratio of outstanding mortgage debt to GDP was a meager 5.30 percent, whereas in the Netherlands the same ratio was 43.29 percent. According to the same source, over the 1990–95 period the downpayment ratio was 40 percent in Italy and 25 percent in the Netherlands (it is now lower in both countries, but still higher in the Netherlands than in Italy). Housing rental markets are heavily regulated in both countries, thus making it hard for outsiders to find rented accommodation. However, University and Local Authority housing exists in the Netherlands to a much larger extent than in Italy, so that young people have a reasonable chance of finding an apartment to rent as long as they plan to live in their home town or their University's.

To assess the extent to which renting is more widespread among the young in the Netherlands than in Italy, in Table 1 we show the proportion of individuals in different types of living arrangements in the two countries. The Table shows that young Dutch typically rent (particularly in the 20–24 age range) and then move on to purchasing their home (in the 30–34 age range almost 70 percent are home owners). Italians instead not only move out at later ages, but also make less use of rented accommodation early on. However, at a later stage (between 30

and 39 years of age), the fractions of renters and owners are of comparable size, while home-ownership prevails past age 40.

4.1 The Italian Data: SHIW

The Italian Survey on Household Income and Wealth (SHIW) is run by Bank of Italy, and documented in a number of papers. The primary purpose of SHIW is to collect detailed data on demographics, households' consumption, income and balance sheets. The SHIW surveys a representative sample of the Italian resident population. From 1987 onward the survey has been conducted every other year (with one exception) and covers about 8,000 households, defined as groups of individuals related by blood, marriage or adoption and sharing the same dwelling. The most recent wave of SHIW was conducted in the spring of 2003, and contains information on 2002. However, SHIW contains a rotating panel component: for instance, about half the 2002 sample had already taken part in the 2000 survey, and this is the sample we use. The net response rate (the ratio of responses to families contacted net of ineligible units) in 2000–2002 was 74.5 percent. See Brandolini and Cannari (1994) for more details on the survey.

Table 1
Living arrangements by age

	Italy			NL		
Age	With parents	Own	Rent	With parents	Own	Rent
16–19	1.00	0.00	0.00	0.96	0.00	0.04
20–24	0.96	0.02	0.02	0.57	0.13	0.30
25–29	0.82	0.06	0.12	0.11	0.49	0.39
30–34	0.49	0.27	0.24	0.02	0.69	0.29
35–39	0.22	0.44	0.34	0.02	0.76	0.22
40–44	0.12	0.56	0.32	0.01	0.75	0.24
45–49	0.05	0.64	0.31	0.01	0.72	0.27
50–54	0.05	0.72	0.22	0.00	0.70	0.30
55–59	0.02	0.77	0.21	0.00	0.70	0.29
60–64	0.01	0.79	0.19	0.00	0.65	0.35
65–69	0.00	0.79	0.21	0.00	0.48	0.52
70–74	0.00	0.74	0.26	0.00	0.45	0.55
75–79	0.00	0.72	0.28	0.00	0.32	0.68
80+	0.00	0.65	0.35	0.00	0.26	0.74

In this survey saving can be computed in two different ways: The standard flow definition as disposable income minus expenditure, and the change in wealth definition. These two definitions are not conceptually the same: the former typically excludes capital gains, which may be particularly relevant in the case of real wealth, but also risky financial wealth (stocks and shares); the latter does include capital gains, but does not distinguish between various forms of wealth, which may differ in liquidity and fungibility. Further differences may be tracked to the way information is collected: expenditure records are based on recall questions, and thus typically underestimated; financial wealth is also under-reported in SHIW, and pension wealth is neglected altogether.[3]

In SHIW detailed information is available on household members, including their income, age, education, sex and relation to the head. However, wealth is considered a household-level variable, and so is consumption. As for children of the head who do not live with their parents, all we know is their existence and number. We also have some information on the head's parents (such as how far away they live, and their education attainment). Wealth is recorded as of the end of the calendar year, while flows refer to the whole year.

SHIW 2002 has records on 8010 households. In all specifications, we need to condition on beginning of period wealth: to do this we must take wealth as recorded in SHIW 2000. Of all 8010 households interviewed in SHIW 2002, 3604 were also present in SHIW 2000. Given our interest in grown children, we further select the estimation sample according to the following criteria: the head must be aged 40 years or more and must have at least one child (whether in residence or not). This leaves 2662 observations. Finally, given that children aged less than 16 are unlikely to move out in the near future, we also drop those households who report having no children outside and whose oldest child at home is younger than 16 years of age. The final estimation sample contains 2411 observations, 1426 of which have at least one child living at home.

4.2 The Dutch Data: SEP

We use data from the Socio-Economic Panel (SEP). The SEP is a longitudinal survey administered by Statistics Netherlands (CBS) consisting of approximately 5,000 households. The purpose of the SEP is to provide a description of the most important elements of individual and household welfare and to monitor changes in these elements. The SEP has been launched in April 1984. The same households were interviewed

in October 1984 and then twice a year (in April and October) until 1989. Since 1990 the survey has been conducted once a year in May. In this research we mainly use data from the 1994–2001 waves because they contain information on perceived job security and satisfaction with housing arrangements.

The survey is representative of the Dutch population, excluding those living in special institutions like nursing homes. In order to arrive at a representative sample, Statistics Netherlands has applied a two-stage sampling procedure to collect the initial April 1984 sample. In the first stage, municipalities are drawn with probabilities depending on the number of inhabitants (big cities are drawn with certainty). In the second stage, addresses are selected randomly. All households present at the selected address are interviewed, up to a maximum of three households. The initial rate of unit-non response was equal to 50 percent. In order to address the problem of sample attrition, from 1986 onwards Statistics Netherlands regularly adds new households to the SEP. The yearly attrition rate is equal to about 10 percent. In order to keep the sample as representative as possible, Statistics Netherlands refreshes the sample by replacing those households who have left the sample by "similar" households. In case of refreshment samples the rate of unit-non-response is equal to about 65 percent.

In the October interviews, information has been collected at the respondent level[4] on socio-economic characteristics, income and labor market participation. The April interviews also contain information about socio-economic characteristics, but rather than gathering data about income, since 1987 the April questionnaires have included questions on a wide range of assets and liabilities. In this paper, we present summary statistics on net worth, financial wealth and real wealth. Net worth is obtained by subtracting total liabilities from total assets. We also analyze financial wealth holdings. Financial wealth has been defined as the difference between net worth on the one hand and housing equity (value of the primary residence plus life insurance mortgage minus remaining mortgage debt), other real estate and the value of the cars on the other hand. Real wealth is defined to be the difference between net worth and financial wealth.

From the 1990 wave onwards, the SEP collects for most income components information on "gross income" of the previous calendar year. Alessie and Kapteyn (2003) provide details on how disposable income can be calculated. The SEP does not contain information on consumption expenditures. As a result of this, the SEP can only measure saving

by taking the first difference of net worth. This saving measure therefore includes (unrealized) capital gains.

Every respondent (i.e., a person who is at least 16 years old) in the household has to complete a short questionnaire on assets and liabilities. However, the SEP does not contain information on cash holdings and on occupational pension wealth. For this study we have removed the self-employed from the sample because from 1990 onwards no wealth data have been collected for this group. Financial wealth has been defined as the difference between net worth on the one hand and housing equity (value of the primary residence plus life insurance mortgage minus remaining mortgage debt), other real estate and the value of the cars on the other hand.

To calculate net worth at the household level, we have chosen the following criteria (this refers to the data after imputation): we exclude observations for which (i) the head of the household or the spouse "refuses to answer" one or more questions about their assets or debts; or (ii) at least one respondent answers with "do not know" to one or more questions about his/her assets and debt. After removing the self-employed from the sample, it is possible to calculate net worth for approximately 95 percent of the households, more than in previous years (samples in the late 1980s show some evidence of selectivity, as discussed in Alessie, Lusardi, and Aldershof 1997). It appears that item non-response is especially relevant for saving and checking accounts. No attempts have been made to impute the missing values. It is worth stressing that child financial wealth is (where recorded) mostly positive, with a median value of 1700 Dfl (Dutch Guilders. All monetary values are at 1990 prices. At the time, the exchange rate was 1$ = 1.61 Dfl)). Zeros are recorded in only nine percent of the cases. For comparison, median household financial wealth in the same sample is 13000 Guilders.

The data set does not contain information on children outside the parental home, but does follow a large number of households through a relatively long time period. This allows us to estimate the probability that any child leaves home as a function of both child's and parents' characteristics. The selection criterion we adopt is that the child must have been at least 17 years old in year t (where $t = 1994, 1995, \ldots, 2000$). In our sample we have a total of 5102 observations, but for only 3015 of these we have valid records of the relevant variables (unfortunately not all children aged 16 or more accept filling in their questionnaire). This is a truncated sample by definition: in the smaller sample (3015

observations) there are 1257 children, belonging to 894 households. The exit rate (that is: the proportion of children who are at home at t but leave home at $t + 1$) is higher for women than for men, and is monotonically increasing in age between 17 years of age (when it is 7.0 percent) and 25 (when it peaks at 32 percent). Absolute numbers of children who leave home peak at age 18 (126 home leavers), but remain higher than 70 up to age 23. Relatively few individuals live with their parents past age 25, as already noted in Section 2 (less than 5 percent of the 5102 observations correspond to children of such age).

An interesting exercise involves estimating the probability of leaving home in period $(t + 1)$, conditional on child's and parents' characteristics as of period t. Estimation results are presented in Table 2. In Column (1) we report marginal effects of a Probit specification, in column (2) corresponding effects estimated by OLS (linear probability model). In both cases standard errors take clustering into account. Column (3) presents a fixed effect specification instead, that is a specification that allows for child-specific intercepts (and relies on time variability for identification).

The Table shows that estimation differences between columns (1) and (2) are relatively minor. We shall therefore comment on Column (2) estimates, which are directly comparable to Column (3). The explanatory variables are divided in two groups: those that relate to the child (upper panel), and those that relate to either the parents or the head (HH, lower panel). In the first group, we have age and age squared (the conditional probability peaks at 28 years according to column 2 estimates), gender (females are 9.6 percent more likely to leave), the share of child's income and financial wealth to household income and financial wealth (this has a positive and significant effect according to the linear probability model, positive and insignificant according to the probit model), self-reported satisfaction variables on housing and job security. The housing satisfaction coefficients suggest that children are more likely to leave home if they are dissatisfied or somewhat dissatisfied with their housing situation. Small and insignificant effects are found for those who are very dissatisfied, a negative and significant effect is estimated for those who are very satisfied (the control group are those who report being satisfied). Satisfaction with job security has strong negative effects if the child is very dissatisfied or a bit satisfied. Most household variables do not appear significant in columns (1) or (2). Notable exceptions are household income (positive effect) and the dummies indicating if the financial situation has changed over the

Table 2
Probability the child leaves home—SEP

	Marginal effects probit	OLS	Child fixed effect regression
Age	1.244	1.106	1.416
	(0.140)**	(0.106)**	(0.373)**
Age^2	–0.230	–0.196	–0.010
	(0.029)**	(0.019)**	(0.070)
Female	0.098	0.096	0.000
	(0.014)**	(0.013)**	(0.000)
Income share child	0.016	0.004	0.002
	(0.014)	(0.001)**	(0.005)
Main activity= study	0.010	0.006	0.003
	(0.019)	(0.020)	(0.029)
Satisfaction with housing situation: Very dissatisfied	0.146	0.142	0.151
	(0.109)	(0.104)	(0.117)
Satisfaction with housing situation: Dissatisfied	0.180	0.171	0.101
	(0.078)*	(0.070)*	(0.072)
Satisfaction with housing situation: A bit dissatisfied	0.115	0.123	0.094
	(0.040)**	(0.040)**	(0.042)*
Satisfaction with housing situation: A bit satisfied	0.021	0.022	0.024
	(0.020)	(0.021)	(0.025)
Satisfaction with housing situation: Very satisfied	–0.031	–0.032	–0.006
	(0.014)*	(0.014)*	(0.019)
Satisfaction with job security Question not answered (not working)	–0.010	–0.017	0.004
	(0.019)	(0.020)	(0.028)
Satisfaction with job security: Very dissatisfied	–0.091	–0.123	–0.086
	(0.022)**	(0.036)**	(0.051)
Satisfaction with job security: Dissatisfied	–0.012	–0.020	–0.007
	(0.036)	(0.046)	(0.051)
Satisfaction with job security: A bit dissatisfied	–0.025	–0.030	–0.011
	(0.026)	(0.033)	(0.039)
Satisfaction with job security: A bit satisfied	–0.066	–0.082	–0.020
	(0.018)**	(0.025)**	(0.030)
Other head of household: yes	–0.035	–0.051	0.003
	(0.077)	(0.110)	(0.122)
Age household head	–0.001	–0.001	–0.026
	(0.002)	(0.002)	(0.020)
Age spouse	–0.002	–0.003	–0.018
	(0.002)	(0.002)	(0.011)
No spouse	–0.078	–0.118	–0.965
	(0.061)	(0.082)	(0.509)

Table 2 (continued)
Probability the child leaves home—SEP

	Marginal effects probit	OLS	Child fixed effect regression
Household income	1.004 (0.320)**	1.086 (0.360)**	–0.566 (0.940)
HH Financial wealth	0.052 (0.110)	0.062 (0.115)	0.178 (0.231)
Real wealth	–0.042 (0.048)	–0.019 (0.011)	0.005 (0.028)
Home size	–0.001 (0.007)	–0.003 (0.007)	–0.022 (0.018)
Home size per capita	0.017 (0.019)	0.019 (0.020)	–0.004 (0.055)
Fin. Situation HH last 12 months "has improved a lot"	0.032 (0.034)	0.028 (0.033)	0.025 (0.040)
Fin. Situation "has improved a bit"	0.042 (0.017)*	0.040 (0.018)*	0.033 (0.021)
Fin. Situation "has deteriorated a bit"	–0.029 (0.018)	–0.030 (0.017)	–0.024 (0.023)
Fin. Situation "has deteriorated a lot"	0.061 (0.036)	0.059 (0.033)	0.067 (0.039)
Constant		–1.193 (0.139)**	–0.408 (0.694)
Observations		3044	
p-value χ^2-test satisfaction job security	0.004	0.001	0.536
p-value χ^2-test fin. situation last 12 months	0.004	0.004	0.095
p-value χ^2-test satisfaction housing situation	0.000	0.000	0.163
R^2		0.08	0.19

Robust standard errors in parentheses; * significant at 5%; ** significant at 1%

last 12 months: minor improvements have a positive effect on the exit probability. Extreme changes do not have a significant impact, though. Column (3) estimates are largely insignificant but similar to those in column (2), suggesting that most variability in the data is cross-sectional. An exception is the coefficient on age. This variable changes meaning in column (3) compared to column (2), given that fixed effect regressions are similar to regressions in first differences: observations where the change in age is not one are few, and correspond such major event as divorce or death of a partner.

5. Estimation Results

The theoretical model presented above suggests that household saving is a function of the child's income share. This contrasts with the unitary model, which assumes income pooling. Household saving should increase with the child's income share if the child intends to leave her parental home eventually, decrease otherwise. The same conclusion holds for the saving rate, a more interesting variable for economic analysis.

In the sequel we present estimation results for the two countries under investigation. Care should be taken in interpreting results because of differences between the two samples. For Italy, we use the 2002 cross section (with information on 2000 wealth) to see how the household saving rate is affected, among other things, by the child's income share. We estimate over the subsample of households with at least one child at home, and correct for endogenous selectivity using relevant information that is available for all households. Given that we know very little about children who live on their own (just their total number), the information used to estimate this probability is at the household level. For the Netherlands, we have no information on the existence and number of children outside the parental home, but we are able to follow children over time (7 years at most) as long as they stay with their parents. Notably, we know their income and their financial wealth (wealth is recorded at the household level in the Italian data), and can therefore consider changes in household wealth as well as in child wealth. Separate saving rate equations can be estimated for leavers and stayers, after correcting for endogenous selectivity.

In our empirical exercise on Italian data, we define the saving rate as the difference between disposable income (the sum of net personal incomes by head, spouse and oldest child) and nondurable

consumption, divided by nondurable consumption.[5] We model the saving rate in 2002 as a linear function of previously accumulated wealth (measured as total wealth and real wealth at the end of year 2000), the ages of head and spouse, household composition variables (such as the total number of household members, including children who left home, the number of resident household members, the number of resident children aged less than 25, the number of pensioners, a dummy indicating the presence of the head's spouse and another indicating whether the oldest child is a full-time student), by broad regional dummies and by total disposable income (defined as above). We also add to the explanatory variables the child's income share variable that is computed as the ratio of personal income of the oldest child to total disposable income. This variable takes a positive value in 729 cases: in particular, income is positive for 54 full time students (out of 477) and for 675 other children living with their parents (out of 949). We find that in our estimation sample the child's income share exceeds the 20 percent mark in 605 cases (out of 1426). It is worth stressing that we have no information on wealth at the individual level, so we must take the child's income as an indicator of total resources available to her.

In the empirical implementation, we also have to address the issue of endogenous sample selectivity, because our saving rate sample is made of those households with at least one child in residence. In fact, we do not observe characteristics of children who left their parents' home, but for their total number. From our theoretical model we know that saving and cohabitation decisions are both endogenous and likely to correlate.

For this reason we follow the standard Heckman's procedure, and model the probability of observing at least one child living in a household belonging to the estimation sample as a function of variables that determine saving (except those that refer to resident children) but also of variables that should only affect the cohabitation decision. We assume that total and per-capita home size have an effect on this probability, and that the age the parent became independent (started working) is also relevant. The home size variables capture local housing conditions (thus the transaction costs of moving out), whereas the age the head became independent captures the taste for independence by both generations

In Table 3 we report estimation results. The first column presents estimates of the saving rate equation, the third column of the selectivity probability. Consistent standard errors are reported in parentheses.

Table 3
SHIW saving rate equations

	Saving rate (flow definition)	Saving rate (change in fin. wealth)	Probability of at least one child at home
Total Wealth (2000)/100	–0.0350 (0.0165)*	–4.5476 (0.1974)**	0.0480 (0.0409)
Real Wealth (2000)/100	0.0081 (0.0182)	4.9267 (0.2175)**	–0.0395 (0.0447)
Head's Age	–0.0074 (0.0043)	–0.1226 (0.0518)*	–0.0490 (0.0047)**
Spouse's Age	–0.0065 (0.0035)	–0.0322 (0.0428)	–0.0441 (0.0063)**
No Spouse	–0.4763 (0.2159)*	–2.0178 (2.5991)	–2.8815 (0.3883)**
Total Family Size	0.0568 (0.0189)**	0.3991 (0.2284)	0.1109 (0.0429)**
Northern Italy	–0.2503 (0.0378)**	0.1627 (0.4539)	–0.2196 (0.0756)**
Central Italy	–0.2280 (0.0409)**	–0.1265 (0.4896)	–0.0303 (0.0887)
Number of pensioners	–0.0529 (0.0291)	–0.1508 (0.3503)	–0.1874 (0.0550)**
Family Size (resident)	–0.1405 (0.0241)**	0.1593 (0.2959)	
Total personal income/100	2.3424 (0.1010)**	1.6441 (1.2110)	
Income share of oldest child	0.2702 (0.0752)**	–1.2067 (0.9230)	
Number of children <24	0.0411 (0.0251)	–0.2686 (0.3047)	
Oldest child is a student	–0.1152 (0.0391)**	–0.7729 (0.4737)	
Income of Head and Spouse/100			0.3966 (0.3037)
Home size			0.0055 (0.0018)**
Home size/Total Family Size			–0.014 (0.0065)*
Age Head Started Work			0.0221 (0.0087)*
Constant	0.7203 (0.2590)**	6.8413 (3.1151)*	5.1128 (0.3863)**
Mill's ratio	0.3204 (0.1097)**	2.6698 (1.3331)*	
Observations	1426	1426	2411

The probability of observing at least one child living with the head decreases with the head's and spouse's age and with the number of pensioners, it increases with the total number of household members (whether present or not). Home size has a positive effect, as well as the age when the head started working. Per-capita home size (defined as the ratio of home squared meters to total household members) has a negative impact on this probability. Wealth and income variables are instead not significant.

The saving rate is negatively affected by beginning of period wealth, by the number of resident household members and by the student status dummy. Total personal income has a strong positive effect, and so does the total number of household members. The income share of the oldest child has a significant and positive effect on the saving rate: a 1 percent increase in this share boosts the saving rate by .27 percent.

This result is in line with the theoretical model presented above, as long as children who live with their parents intend to leave home eventually.

We also estimated a similar specification for a saving rate equation where saving is defined as the change in financial wealth between years 2000 and 2002. This is a noisy measure, and parameter estimates (reported in column 2 of Table 3) are imprecisely estimated. In particular, those coefficients that retain significance have the same signs as in column 1, but many parameter estimates are not significantly different from zero, including those on the two income variables.

In Table 4 we report parameter estimates of four saving equations for the Dutch SEP data. The estimation sample is further reduced compared to Table 2 because observations presenting outliers in the dependent variables have been dropped. The results of the selection probability equation are omitted but are very similar to those reported in Table 2.[6]

The upper portion of Table 4 contains parameter estimates corresponding to child-level variables, the lower part to household or HH variables. The dependent variable in columns (1) and (2) is the change in *household* financial wealth between times $(t-1)$ and t to household income over that year: column (1) is estimated over the sample of households where the child leaves at time $(t+1)$— or *"leavers"* (439 observations in all); column (2) over the sample where the child stays with the parents at $(t+1)$—or *"stayers"* (2374 observations). The dependent variable in columns (3) and (4) is the ratio of the change in *child* financial

Table 4
SEP saving rate equations

	Household saving rate	Household saving rate	Child saving rate	Child saving rate
Children variables (measured at time t)	exit=1	exit=0	exit=1	exit=0
Age	–0.4042	–0.1010	0.0118	–0.0483
	(0.5797)	(0.1884)	(0.2203)	(0.0649)
Age^2	0.0857	0.0298	0.0065	0.0160
	(0.1157)	(0.0349)	(0.0440)	(0.0120)
Income share child	0.1501	–0.0163	–0.0656	–0.0019
	(0.1263)	(0.0045)**	(0.0479)	(0.0016)
Main activity= study	–0.0486	–0.0162	–0.0227	–0.0113
	(0.0572)	(0.0234)	(0.0217)	(0.0081)
Satisfaction with job security Question not answered (not working)	–0.0326	0.0124	–0.0146	–0.0322
	(0.0573)	(0.0232)	(0.0218)	(0.0080)**
Satisfaction with job security: Very dissatisfied	–0.0869	0.0757	–0.0185	–0.0256
	(0.1742)	(0.0511)	(0.0661)	(0.0176)
Satisfaction with job security: Dissatisfied	0.0016	–0.0677	–0.0063	–0.0374
	(0.1056)	(0.0516)	(0.0402)	(0.0178)*
Satisfaction with job security: A bit dissatisfied	–0.0029	0.0170	–0.0351	–0.0085
	(0.0871)	(0.0404)	(0.0332)	(0.0139)
Satisfaction with job security: A bit satisfied	0.0513	0.0013	0.0282	–0.0240
	(0.0809)	(0.0326)	(0.0308)	(0.0112)*
Household (parent) variables (measured at time t)				
Other head of household: yes	0.1787	0.0723	0.1056	0.0401
	(0.2757)	(0.1310)	(0.1049)	(0.0452)
Age household head	–0.0035	0.0001	–0.0014	–0.0002
	(0.0048)	(0.0019)	(0.0018)	(0.0007)
Age spouse	–0.0034	0.0040	0.0013	0.0004
	(0.0052)	(0.0021)	(0.0020)	(0.0007)
No spouse	–0.1471	0.1853	0.0574	0.0148
	(0.2573)	(0.1022)	(0.0979)	(0.0352)
Household income	4.8260	1.9247	0.1796	–0.3129
	(1.1007)**	(0.4619)**	(0.4187)	(0.1592)*
HH Financial wealth	–2.1673	–1.4179	–0.0131	0.1973
	(0.4022)**	(0.1712)**	(0.1531)	(0.0590)**
Real wealth	0.3368	0.0492	0.0531	0.0009
	(0.1891)	(0.0278)	(0.0719)	(0.0096)
Constant	0.6342	–0.1293	–0.0646	0.0823
	(0.7687)	(0.2196)	(0.2922)	(0.0757)
Mill's ratio	–0.0287	–0.0088	0.0310	–0.0023
	(0.0801)	(0.082)	(0.0305)	(0.0276)
Observations	439	2374	439	2374
p-value χ^2-test satisfaction job security	0.95	0.46	0.73	0.00
p-value χ^2-test age function	0.74	0.11	0.37	0.00

Standard errors in parentheses; * significant at 5%; ** significant at 1%

wealth between times $(t-1)$ and t to household income over that year. Again, one column refers to leavers, the next to stayers. In the lower part of the Table we also report coefficients on the selectivity correction term (the Mill's ratio), the constant and the number of observations in each group (leavers and stayers).

The key explanatory variable is the child's "income" share. In the Dutch data, this is defined as the ratio of the child's cash in hand (income plus liquid assets minus debt) to household cash in hand. In fact, as noted in Section 4, SEP records individual wealth as well as income, and cash in hand is a better indicator of bargaining power than income. Cash in hand is positive for the vast majority of the children in our estimation sample (2914 out of 3044—for comparison, child income is positive for 2616 observations). The child's share in cash in hand exceeds the 20 percent mark in 148 cases when the child is a student, and in 737 cases when the child is not (in our sample we have 1738 students, and 1306 not students).

Turning our attention to column (1) estimates (leavers), we notice that household income has a positive effect on the household saving rate, household financial wealth a negative effect. These are the only two coefficients that are significant at conventional levels. Household real wealth also has a positive coefficient, and so does the "income" (more precisely cash in hand) share of the child, but in both cases the t-statistic is little over unity. Column (2) estimates (stayers) of household income and financial wealth effects are similar (albeit smaller in absolute terms), while the child's "income" share is significantly negative. This result agrees well with the model predictions. In neither column are the job-security variables significant, suggesting that this particular motive for precautionary saving is of little consequence for total household saving.

The third column—child saving rate equation for leavers—has no significant coefficient, reflecting in part the small sample size and the greater variability in the dependent variable. Column (4) estimates—child saving rate for stayers—are more precise (the sample size is much larger). Significant coefficients are found on the variable indicating that the child is not working, two job security dummies and financial wealth. The coefficient on child's "income" share is negative but with an absolute t-ratio of just over unity. Perhaps the most interesting implication of this second set of estimates is that lack of job security plays a negative role on the child's saving rate: compared to the control group (very satisfied with job security) all stayers save less.

The empirical results presented in this Section can be summarized as follow:

1. In the Italian data, the child's income share has a strong, positive effect on household saving
2. In the Dutch data, the same variable has a negative effect on household saving if the child stays with the family at least one more year; it has a positive (but insignificant) effect if the child leaves next year.

These results can be reconciled with the theoretical model predictions if we take into account the institutional differences across the two countries' housing and credit markets (already discussed in Section 4). In Italy renting is not an option for most of the young, and there is a heavy transaction cost to be borne related to the purchase of housing stock (large down-payment requirements). In the Netherlands, cheap renting accommodation is available, and the young—who can also borrow more liberally—typically rent for a few years and then buy their home. The relatively small transaction cost—particularly for would-be renters—may explain why leavers do not apparently use their income to save more (even though the point estimate is positive and its lack of precision is likely due to the small sample size). The negative effect of the child's income share for those who stay is also consistent with the notion that the transaction cost is relatively small: those children who do not leave immediately do not need to start saving up towards their move, and behave as if they intended to stay with their parents forever.

6. Conclusions

In this paper we have addressed the issue of how the saving rate is affected by the decision of young adults to leave the parental home or to stay. This issue is of great relevance in some Southern European countries, where children stay with their parents well into their late 20s and early 30s, but is becoming more important in some Central-Northern European countries, albeit at younger ages (18–24). For this reason this paper uses micro data from a Southern European country, Italy and from a Central-Northern country, the Netherlands.

We have developed a two-period game-theoretical model of the joint consumption-cohabitation decision, and found that the household saving rate should be affected by the child's income share. Such effect should be positive for children who intend to leave, negative for those

who intend to stay in the parental home. Things that we have not considered in our theoretical model are uncertainty and multiple periods. Uncertainty in the unitary model implies less saving when there are more income earners if labor income risk is not fully insurable. This is not necessarily true in a collective model, as explained by Mazzocco (2004) and is not borne out in estimation. Multiple periods would allow us to distinguish between late leavers and early leavers (at present, we only consider leavers and stayers). Finally, we have not considered here transfers from parents to children, or intra-family borrowing.

Empirical results from both countries are supportive of the key model predictions. We find strong positive effects of the child's income share on the saving rate in Italy, where we are able to calculate saving as the difference between disposable income and consumption but only use cross-sectional variability in estimation (and cannot therefore distinguish leavers from stayers). We also find some significant effects of the child's income share on household saving rate in the Netherlands, where saving is computed as the change over time in financial wealth. In the Dutch data we observe households over a long time period, and we can therefore distinguish between stayers and leavers. Interestingly, the effect of the child's income share is significantly negative for stayers, positive (albeit insignificant) for leavers.

The evidence is best explained if we take into account differences in housing and credit markets across the two countries, implying that transactions costs for children who leave the parental home are much more important in Italy than in the Netherlands.

Notes

The paper was presented at the NBER 2004 International Seminar On Macroeconomics, Reykjavik, Iceland, and the Econometric Society World Congress, London, 2005. We are grateful for helpful discussions with Gianpiero Dalla Zuanna, Raffaele Miniaci, and Antonio Nicolò and for comments by our discussants, Mihir Desai and Michael McMahon, and by conference audiences. Work supported in part by the European Union under contracts HPRN-CT-2002-00235 (Economics of Aging in Europe - AGE) and QLK6-CT-2002-002426 (Advanced Multidisciplinary Analysis of New Data on Ageing – AMANDA). The second and third authors also acknowledge financial support from the Italian Ministry of Education, Universities and Research (MIUR). This study is based on the Social Economic Panel (SEP) survey administrated by Statistics Netherlands. The views expressed in this study are of the authors and do not necessarily reflect the views of Statistics Netherlands.

1. We are grateful to Raffaele Miniaci for making this Figure available to us.

2. Barbagli et al. (2003) also stress that in Italy leaving parental home late may be the best choice for children who value independence, but cannot afford to move out without incurring substantial costs.

3. Brugiavini and Weber (2003) discuss some conceptual issues on the definition of saving; Battistin, Miniaci and Weber (2003) investigate the properties of consumption data based on recall questions.

4. A respondent is a member of the household who is at least 16 years old.

5. The saving rate here is defined as $Y - C/C$ (where Y is the sum of personal incomes of parents and child, and C is nondurable consumption). Taking the ratio of saving to income creates problems with zero or negative income observations. The alternative definition we adopt is due to Attanasio (1998): it is a monotonic transformation of the standard definition when income is positive and consumption is a normal good. The saving rate here is defined as $Y - C/C$ (where Y is total household income and C is nondurable consumption). For consistency, we also take the ratio of the change in financial wealth over time to C.

6. We have assumed that the following variables only affect the exit probability and not the saving behavior: dummies indicating the perception of the housing situation by the child, dummies indicating past changes in financial situation and the gender of the child (females are much more likely to leave earlier).

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Comment

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The Alessi, Brugiavini, and Weber (ABW) paper provides an illuminating introduction to the consequences of income shares for savings decisions within composite households. The increasing prevalence of such households and the importance of savings decisions to broader macroeconomic questions justify a much larger literature on the topic than is currently available. The ABW paper begins the process of understanding the myriad issues that these trends raise. As it happens, the ABW paper also succeeds on a different, more personal level. Anyone with significant experience as a child or a parent will find several opportunities to reflect on their own experiences with the ties that bind.

The relevance of such composite households extends beyond the stereotypical *mammoni* ("mama's boys") of Italy. Young women living at home in Japan have been christened *parasaitu shinguru* ("parasite singles") and "boomerang" children are increasingly common in the U.K. These populations have grown sufficiently such that marketers target this new customer segment, given their high levels of disposable income, and sociologists have begun to debate the consequences of the blurred distinction between adolescence and adulthood. Of course, such composite households are just one example of the rich variety of households (joint households, single parent families, childless families) that are increasingly relevant and that the profession often abstracts from. ABW begin the process of trying to understand how the dynamics of composite households can influence savings decisions. While ABW raise several interesting questions (Do composite households save more and, if so, why? How do housing market characteristics give rise to cohabitation decisions?), the question that their paper addresses best is somewhat more narrow—should income shares matter for savings decisions of composite households and, if so, how?

The model has a fairly straightforward intuition with a few critical ingredients. Children face a transaction cost upon departure from the family, children and parents have conflicting preferences over their departure with parents favoring cohabitation, some fraction of consumption is public within the composite household and there is neither uncertainty nor multiple periods. The results depend on whether the children choose to stay or leave and the solution method. For the case of children who choose to stay, a Nash solution provides, unsurprisingly, a special case of the predictions of the younger spouse model presented in Browning (1995)—the distinctive horizons of parents (older husbands) and children (younger wives) create distinct preferences over savings and overall saving decisions depend, unlike the typical unitary family model, on income shares of children as a result. Specifically, higher income shares for children who stay lead to reduced savings. The Nash solution for children who choose to leave provides for a non-Pareto outcome so ABW emphasize the cooperative solution. This cooperative solution reflects the nature of the pareto weights assumed in the model. The parent's pareto weight is modeled as a decreasing function of the child's income share so higher income shares for leavers are associated with higher savings.

The predictions emerging from the model—that higher income shares for stayers lead to reduced savings and higher income shares for leavers lead to higher savings—are then tested with data from Italy and the Netherlands. The Italian data indicates that higher child income shares are associated with higher savings. This result is difficult to reconcile with the unitary family model but, while intriguing, cannot be used to affirm the ABW model given the inability to identify stayers and leavers in the Italian data. Said another way, coefficients of either sign could be regarded as bolstering the ABW model in this data. The Dutch data is more helpful in this regard as the panel-nature of the data allows identification of the cohabitation decisions of children. Here, ABW find not only that income shares matter for household savings decisions but that they matter in the way their model predicts—higher income shares are associated with lower (higher) savings for stayers (leavers)—though it would be useful to know if the coefficients are different in a statistically significant way or if a pooled setting would provide statistically significant results. Nonetheless, the paper successfully marries together an intuitive model and interesting data with fruitful results.

Several aspects of the model and empirical results deserve comment. First, bribes by parents to children often take the form of private con-

sumption (e.g., an automobile) and this would clearly have distinctive implications for savings decisions. While there is little doubt that public consumption is important in this setting, bribes of private consumption could reverse the implications of the model. While the model incorporates a variety of interesting features (e.g., differing preferences for cohabitation, transaction costs upon exit), it is difficult to view the empirical tests as confirming the model without explicit consideration of alternative hypotheses. For example, could differential riskiness of labor income across generations (as in Becker et al. 2002) explain these empirical patterns rather than differing preferences over cohabitation? Indeed, are simply distinctive housing transaction costs for the generations (as in Guiso and Jappelli 2002) sufficient to generate these results? In other words, it would be useful to consider these readily available alternatives in order to bolster ABW's interpretation of the results as either evidence of exit costs or conflicting preferences over cohabitation. Finally, this setting seems particularly ripe for considering mainstays of the savings literature—the effects of pension wealth and *inter vivo* transfers—given the magnitude of such wealth and the intergenerational dynamics of these decisions.

The crux of the matter in the ABW paper, of course, is the conflicting preferences of children and parents. ABW rely heavily, though not exclusively, on the intuition that children seek independence and parents seek dependence. It seems equally, if not more, plausible that parents are seeking independence and children are enjoying dependence. Survey evidence is hardly the last word on this given the ambivalence prompted in parents faced with the departure of their children. Even in the Italian setting it is not clear who is enjoying cohabitation more. Consider the case of Giuseppe Andreoloni—a noted Neapolitan doctor and legislator. Subsequent to his divorce, he was compelled to pay monthly support payments (€800) to his 30–year–old son (already living off a large trust fund) as the court found that "You cannot blame a young person, particularly from a well-off family, who refuses a job that does not fit his aspirations. The parents have to pay for their upkeep." Such decisions suggest that composite households might not reflect the romantic notion of a daring child and doting parents but rather a dilatory child and duty-bound parents. Further research might usefully devise tests of which mapping of preferences is borne out by the data rather than assuming the source of this conflict.

Identification of these effects, ultimately, will hinge on exogenous sources of variation in key attributes of the model. While beyond the

scope of the ABW paper, such shocks might include labor responses to changes in retirement ages, as in Manacorda and Moretti (2003), regional variation in financial development (and presumably varying transaction costs to exit) as in Guiso, Sapienza, and Zingales (2004), or changed (if they ever come) educational fee structures. Hopefully, future generations within this stream of scholarship will thank ABW for the foundation they have laid but also begin to stray by undertaking such econometric investigations.

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Comment

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1. Introduction

The saving rate, as a summary variable of the consumption behavior of agents, is an important concept to understand. The European Central Bank's (ECB) June 2004 macroeconomic projection suggests that concerns about pension systems are likely to lead to a sustained higher saving rate, preventing a more marked recovery in consumption growth in the euro area:

"concerns about the course of public finances and, in particular, the longer-term prospects for the public health care and pension systems are likely to continue to restrain a decline in the saving ratio over the horizon." (ECB 2004).

In order to understand the extent to which the saving rate is driven by concerns of this type, it is also necessary to understand other factors that may be affecting savings. The potentially important influence of family structure on saving was first highlighted by Fisher (1956) when he coined the term "the bachelor theory of saving" to describe the absence of family size considerations in traditional theories of saving.

This interesting paper by Rob Alessie, Agar Brugiavini, and Guglielmo Weber discusses the impact of cohabitation between adult children and their parents on saving. It presents a two-period game theoretical model where the child has to decide whether to move out of the parental home. This decision is affected by a transaction cost of leaving and setting up a new home (T); the child's preference for independence (z); and by the consumption loss induced by the move (consumption is a public good while the child lives in the parental home). It then uses household survey data, the Survey on Household Income and Wealth (SHIW) for Italy and the Socio Economic Panel (SEP) for the Netherlands, to test the implications of the model.

Though the results of this paper concern the impact of cohabitation on individual household saving, my main interest is in examining some of the potential macroeconomic implications of the results. In particular, a number of my comments relate to avenues for future research, which may help to bridge the gap between the household implications of cohabitation and its macroeconomic implications.

2. The Macro-Micro Savings Link

The basic link between micro-saving information and the aggregate saving rate is given by equation (1); this expresses the aggregate saving rate as the weighted sum of household saving rates, where the weight is share of income in total income.

$$sr_t = \sum_{j=1}^{N} \alpha_t^j sr_t^j \tag{1}$$

where sr_t^j is the period t saving of household j (as a percentage of disposable income), and α_t^j is the weight of household j's income in total population income in period t.

The key result of this paper is that whether or not a child who is currently living at home with her parents is going to leave in the next period affects household saving in the current period (or the saving taken between period 1 and 2). The decision to stay or leave is exogenous in this model, and the magnitude of the effect depends on the share of the child's income in total family income. The following table summarizes the main results:

Child intends staying or going?	Type of solution	Impact of higher income share of child in period 1 on household saving
Child will stay	Nash Efficient	Non-positive – in the intermediate income range
Child will leave	Nash Pareto-inefficient	Non-negative
Child will leave	Co-operative Efficient	Non-negative (Parents Pareto-weight decreases in child labor share)

In terms of equation (1), if the cohabiting child will leave (*stay*), the household saving rate (sr_t^j) will be higher (*lower*). Moreover the relative increase (*decrease*) in household saving will be larger, the more of the family's share of total income (α_t^j) is made up of child income. Assuming that child income is not zero, this suggests that, ceteris paribus, a country with higher cohabitation, but where the children intend to leave, will have a higher saving rate.

I now consider three particular questions which are important to understand the impact and policy implications of cohabitation on saving rates:

1. What happens to household saving when a second household is set up?
2. What are the interesting trends we need to understand?
3. What is the impact of aging?

2.1 *What Happens to Household Saving When a Second Household Is Set Up?*

The model in this paper is a simple two-period model and so only tells us the impact that the child's decision to stay or leave has on saving while she is in the household. This is acknowledged by the authors in their discussion of possible avenues for further work, but let me mention a few reasons why understanding this would be important to considering the macro-economic effects of cohabitation.

One can think about this paper's model in the following simplified way: (adult-aged) children who live with their parents do not bear the costs of running the household; this is borne by the parents (e.g., rent/mortgage, electricity).[1] Therefore in period 1, out of a given income, the cohabiting child can purchase nonhousehold consumption (C) and save the remainder. If the child moves out and sets up their own household in period 2, they must finance the costs of the household (T) as well as nonhousehold consumption (C); their saving likely falls, and if T is large, C may also have to fall. In other words, setting up a household involves assuming responsibility for a certain amount of nondiscretionary expenditure. This assumes some fixed costs to a household and nonseparability of these household costs.

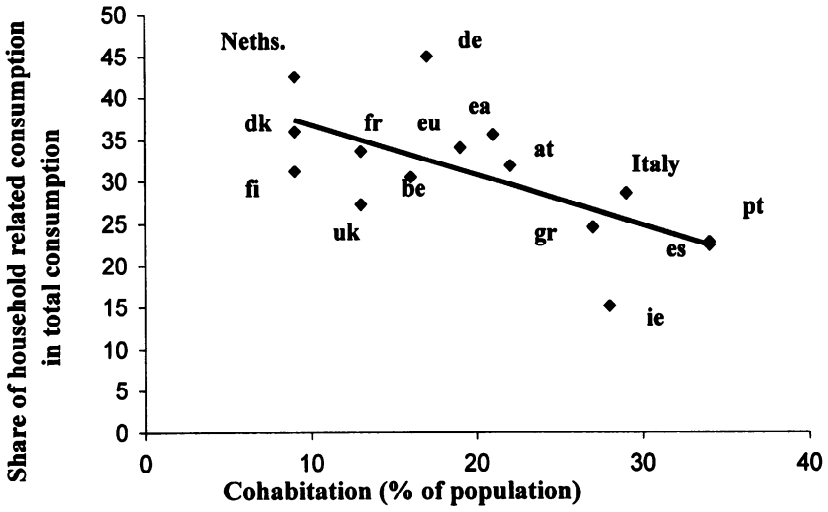
The child who intends to leave knows that this will happen and so saves while at home to cover this. If the child does not intend moving out, then they don't need to save for these future "household costs" and

therefore consume more while in the parental home—but this will be consumption of nonhousehold items.

If there was a period 3, households would save in period 2 also and it would be interesting to see how the aggregate saving rate of the (now separate) composite household changes. This would depend on how the formation of new households affected demand for goods and services. If we assume that housing transactions costs are not perfectly separable, the share of housing related goods and services may be higher. Chart 1 shows a scatter of cohabitation compared to share of the consumption basket that is made up of housing costs, suggesting a negative relationship.[2]

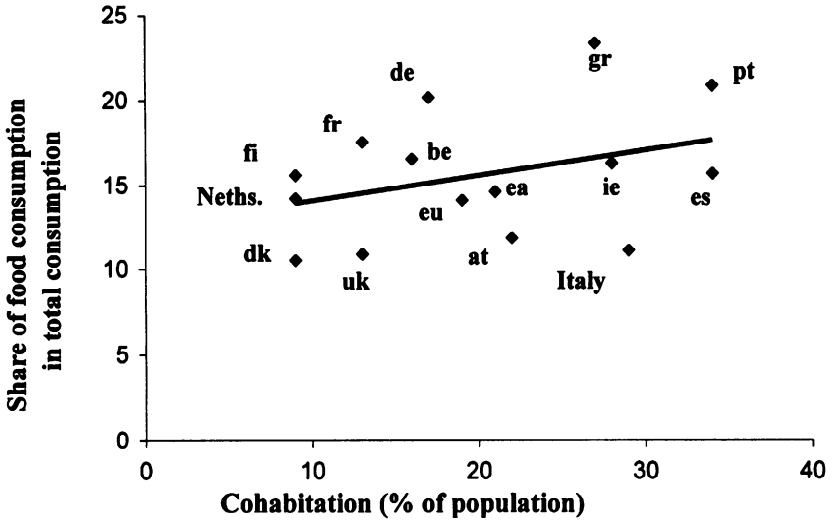
Also demand for food might be higher. Using data for many countries including the U.S., the UK, and France, Deaton and Paxson (1998) find that contrary to their theoretical model, a household with less people in it, spends a higher amount per head on food. While this may be explained by better waste control by larger households or the existence

Chart 1
Scatter plot of cohabitation versus the share of household related consumption



Source: Eurostat's New Cronos Database.
All EU-15 countries in 2000 included except Luxembourg and Sweden for whom comparative data on cohabitation is unavailable.
Cohabitation is approximated by the percent of total households with three or more adults, with or without dependent children in 2000. This is very similar to the measure used in Figure 1 in Alessie et al. (2004). Share of housing related consumption is calculated using 2000 HICP weights.

Chart 2
Scatter plot of cohabitation versus the share of food consumption



Source: Eurostat's New Cronos Database.
All EU-15 countries in 2000 included except Luxembourg and Sweden for whom comparative data on cohabitation is unavailable.
Cohabitation is approximated by the percent of total households with three or more adults, with or without dependent children in 2000. This is very similar to the measure used in Figure 1 in Alessie et al. (2004).
Share of food in total consumption is calculated using 2000 HICP weights.

of direct economies of scale in food consumption or preparation, the result suggests a higher number of households will increase the share of food in the consumption basket. Chart 2 illustrates this for European Union countries.[3]

The macroeconomic impact of this higher demand for certain goods and services depends on their supply; if their supply is plentiful, there could be higher demand without inflationary pressure. However, supply is not necessarily plentiful which means there could be an inflationary impact. For example, since housing supply is normally relatively inelastic there could be an impact on house prices.

2.2 *What Are the Interesting Trends We Need to Understand?*

In order to understand the likely macro implications, it is also important to consider the trends in a number of variables. Firstly, has cohabitation been falling or rising, at what rate has it been changing and is

this trend likely to continue? This will let us know whether or not the saving rate is likely to be boosted further by cohabiting children who intend to leave. On the other hand if these children will decide that they shall remain at home longer, perhaps the aggregate saving rate will decline.

The Italian econometric results are consistent with those children living at home intending to leave; after controlling for other factors, there is a positive and significant effect of child income share on household saving. But Italy has persistently higher cohabitation, so it would be necessary to try to understand why those intending to leave do not. The authors discuss the important role of different credit and housing markets; I return to this below.

The Dutch econometric results in the paper cannot be interpreted in this way as leavers and stayers are distinguished. It may also be interesting, in addition to Table 4, to see the results from an aggregate (Italian style) equation.[4] But unfortunately the Dutch results are affected by the definition of saving being limited to change in financial assets: as with the Italian regressions based on the change in financial wealth, the econometric results are less robust.

The Italian results seem consistent with Eurostat's baseline population projections, the number of Italian children living in the parental home is expected to decrease from 36.6 percent of the population in 1995 (above the EU average of 32.3 percent) to 27.0 percent in 2025.[5] The overall EU average falls to 25.2 percent. For the Netherlands, this proportion is much flatter (30.5 percent in 1995, 28.8 percent in 2010, 28.8 percent in 2025). The impact of these changes depends on the effect on the saving rate of more households in the economy.

There are many factors, including country-specific cultural factors, which drive the decision to leave the family home. An interesting extension to this paper would be to try to endogenize the decision to stay or leave; this would allow an analysis of the impact of changing parameters on cohabitation. Also some further analysis of the factors which drive T might indicate what the trend of cohabitation would be.

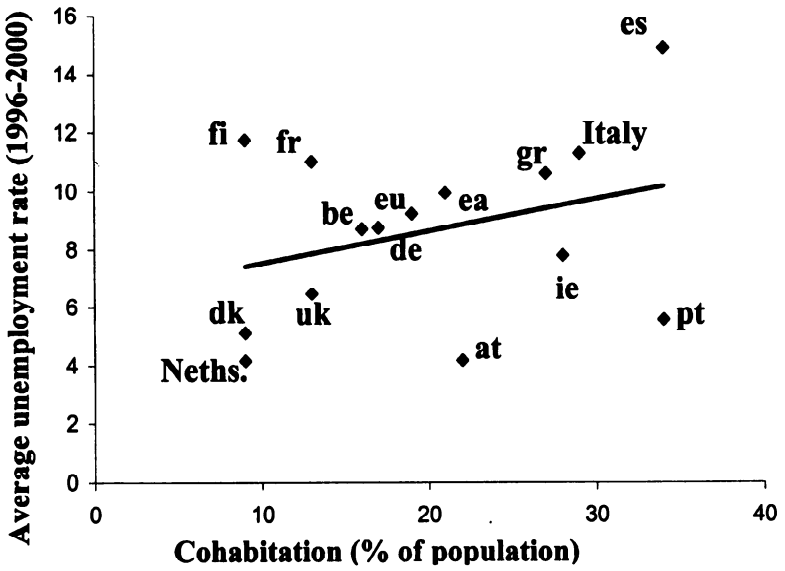
One potential reason discussed by the authors is the workings of the credit market. In this simple model it is not possible to borrow to finance T; either within the household or from outside the household. One example of where this credit constraint is likely to bind is third level education. In Italy, students typically study at local universities and live in their parental home for their undergraduate education. In some countries, people typically move away to study. Goldschneider

and DaVanzo (1989) find that, for the U.S., continuing in education beyond high school decreases the probability of young adults leaving the parental home via a marriage pathway, but increases the probability of leaving into premarital residential independence. This result is likely to be more similar to the case of the Netherlands; availability of University and Local Authority housing in Netherlands makes it easier for Dutch cohabiting children to move away to University, but also to move out in their own town.

A second important example is risk insurability. As the authors themselves discuss, one potential extension would be to analyze a model with uncertainty. Chart 3 shows that cohabitation is higher in those countries where average unemployment is higher. Similar findings are reported in Goldscheider (1998).

Once an understanding of cohabitation trends is established, it is necessary to consider the distribution of income of the cohabiting children as this determines the magnitude of the impact of cohabitation on

Chart 3
Scatter plot of cohabitation versus the unemployment rate



Source: Eurostat's New Cronos Database.
All EU-15 countries in 2000 included except Luxembourg and Sweden for whom comparative data on cohabitation is unavailable.
Cohabitation is approximated by the percent of total households with three or more adults, with or without dependent children in 2000. This is very similar to the measure used in Figure 1 in Alessie et al. (2004).
Standardized ILO unemployment rates.

saving. If child income share is typically very small, then perhaps the findings in this paper will have little impact on macroeconomic savings. If the income share is usually zero, the impact on the saving rate is zero! The data on the distribution of child income share used in this study is skewed toward a zero income share although there are differences between the distribution in Italy and the Netherlands (see Chart 4). Excluding those children in full-time education, the child income share is generally higher though still typically below 50 percent.[6] This suggests that the aggregate effect may be quite small.

Over time, this distribution is likely to be driven by the steepness of the age-profile of earnings. This may be determined by many factors including economic growth, the nature of work and on the job training and learning, and the effects of changing participation (including female participation).

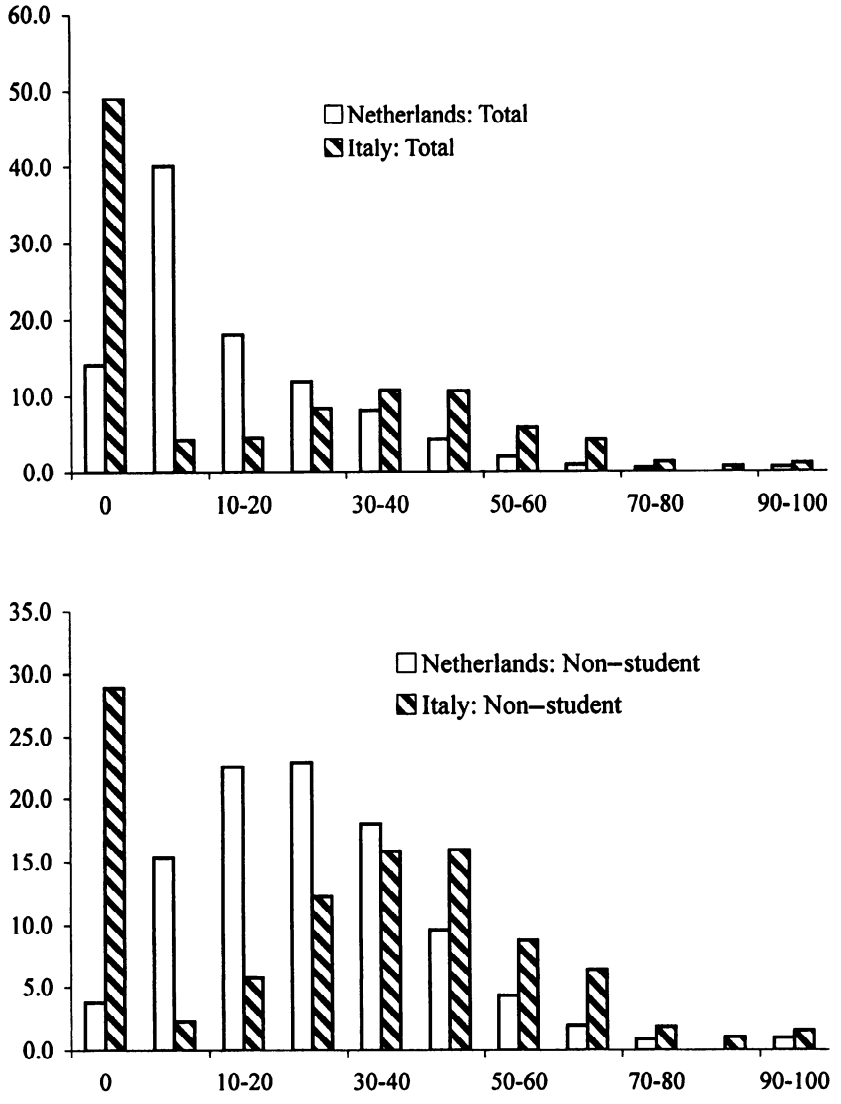
2.3 *The Impact of Aging and Care*

There is a general phenomenon in most industrialized countries of rising life expectancy and falling fertility rates. Combined with the effects of the baby-boom generation, this places extra pressure on pension systems and means that people may now be expected to save more. See, for example, Feldstein and Siebert (2002). As these systems are likely to be reformed, the young may receive lower future benefits and perhaps pay higher contributions. The elderly, living longer, may spend rather than bequeath more of their wealth. This means that the young need to save even more than would otherwise be the case. Perhaps longer cohabitation, by avoiding the fixed costs of running an individual household, may help to achieve this higher saving.

The elderly are also affected, requiring more support in old age as they live longer. A solution may be a reverse cohabitation—either the children move back in with their parents or more likely the parents move in with the children (in their new home). Of course this argument depends on an element of filial piety, which is widespread in Asian cultures and may become more widespread in western cultures. As the population begins to decline, another implication could be a lower cost of leaving home (T) as the demand for housing falls. Or perhaps immigration could be relied upon to help offset the effect of a falling labor force?

But this raises an issue of who is the head of household? In surveys, analysis is often based around the head of the household; he or she is

Chart 4
The distribution of child income share: total and non-students



usually defined as the person most responsible for family finances. Figure 2 in Alessie et al. (2004) suggests that some composite households are headed by parents aged 70 or older; but it is likely at some point that the aged head of household (even if they own the house) should be considered to be a person in care.

And it also raises the issue of notional saving; that is taking account of notional pension wealth. Consider the following simple example. Agents in period t can receive nonpension income (y) and pension payment (p). They pay two contributions out of their nonpension income—social security contributions are for a PAYE pension system (the contribution rate is τ_s) and taxes (the contribution rate is τ_{tax}).[7] Social security contributions ($\tau_s \cdot y$) therefore represent notional savings (ns). Measured (or private) saving is given by the standard definition of disposable income less consumption.

Disposable income (y^d) is given by:

$$y_t^d = \underbrace{y_t + p_t}_{\text{total 'income'}} - \underbrace{\left(y_t \cdot \tau_{tax} + y_t \cdot \tau_s\right)}_{\text{total 'government deductions}}$$

$$\Rightarrow y_t^d = y_t(1-\tau_{tax}) + p_t - ns_t$$

In this case, the saving rate is given by:

$$\Rightarrow sr_t = \frac{s_t}{y_t^d} = \frac{y_t^d - c_t}{y_t^d} \tag{2}$$

$$\Rightarrow \quad = 1 - \frac{c_t}{y_t(1-\tau_{tax}) + p_t}$$

Now consider a measure of total savings that includes notional saving as saving; I follow Jappelli and Modigliani (1998) and consider a concept of earned income (y^{earn}). Since social security contributions are for a PAYE pension system (τ_s), these constitute part of earned income (and since not consumed, will mean that notional savings (ns) form part of savings). But as pension payments (p) reflect the drawing down of this notional pension wealth, these are not included as part of earned income.

Therefore, earned income (y^{earn}) is given by:

$$y_t^{earn} = y_t(1-\tau_{tax})$$

The saving rate is:

$$\Rightarrow SR_t^T = \frac{s_t^T}{y_t^{earn}} = \frac{y_t^{earn} - c_t}{y_t^{earn}} \quad (3)$$

$$\Rightarrow = 1 - \frac{c_t}{y_t(1-\tau_{tax})}$$

Brugiavini et al. (2000) highlight that when using the SHIW data, discretionary saving is positive at all ages, while mandatory saving is positive during the working life and negative during retirement. Overall total saving (correctly measured) is positive during the working life, and negative in retirement. The generosity of the Dutch social security pension system is likely to have similar distorting effects (see evidence cited in Alessie and Kapteyn (2003) on the displacement impact of large notional saving wealth in the Netherlands). This paper focuses on measured (discretionary) saving. Not correcting for notional saving will bias up the saving rate in households containing retired members (who receive a pension payment, p) and will also distort the income share of cohabiting children.

3. Conclusions

So to summarize, this paper suggests that there may be very important effects from cohabitation on saving. In order to fully understand the implications of these household level effects on the macroeconomy requires analysis of a number of other things. Future work will hopefully address these issues and perhaps we will more fully understand the extent to which aggregate saving rates are influenced by the adult children cohabiting with their parents for longer.

Notes

The author would like to thank, without implicating, Charles Bean, Francesco Giavazzi, Andrew Hauser, and James Talbot for useful comments and discussions. However, this paper represents the views and analysis of the author alone and should not be thought to represent those of the Bank of England or Monetary Policy Committee members.

1. This is not the exact way the household transaction cost (T) is modeled in the paper, but one can think about the transaction cost being deducted from the parent's income endowment in period 1 and 2. Also, this example ignores the fact that consumption in period 1 is a public good; Alessie et al. (2004) point out that this should not alter the model's results as long as the child also consumes some of the public good.

2. The negative relationship remains even if the shares are controlled for differences in income per head.

3. The negative relationship in this chart is not statistically significant (regardless of whether income is controlled for).

4. This involves using only the 2001 cross-section, not distinguishing the "leavers" and "stayers," and concentrating on household level data.

5. These data come from Eurostat (2003) and reflect the baseline scenario.

6. The authors kindly provided the data from their study for this chart.

7. We can modify this set-up to allow for tax/contribution payments from pension (or one can think about net pension payments).

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