

# FAMILY TIES AND UNEMPLOYMENT

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## A B S T R A C T

In this paper we build a model economy in which the prevailing family structure arises endogenously as a response to labor market conditions. In this model the members of the household (parents and young adults) either work in the market, search for a job, or produce a household good. Parents feel altruistically towards their offspring. Our first finding is that search efforts of the unemployed members of the family are strategic substitutes. The second one is that, everything else equal, young adults leave their parents' house if they receive a sufficiently high wage; otherwise, they stay. In the latter case, both young adult's and spouse's search efforts are lower, since the spouse's opportunity cost of working in the market is greater when the employed young adult stays at home. As a result, both youth's and female spouse's unemployment rates are higher. This result is in line with the evidence we have for Spain.

KEYWORDS: Family Ties; Household Good; Unemployment.

# 1 Introduction

The main feature of the prevailing family structure in Spain is that, increasingly over the last years, young adults tend to stay at their parents' house. For instance, the fraction of young men aged between 25 and 29 that stay in the parental house has increased from 53.2 percent to 65.8 percent during the period 1986-94, and this fraction for young women has increased from 35.3 percent to 47.6 percent over the same period. This behavior contrasts with that of other European countries (see Table 1),<sup>1</sup> and it is obviously related to unemployment. The average unemployment rate among young people almost doubles the average rate in Spain (see Table 2) and those that live in multi-person households constitute about the 60 percent of total unemployment (see Table 3). Nevertheless, a significant fraction of young people staying at their parents' home is neither unemployed nor studying: 45.73 percent of males and 31.51 percent of females who stay with their parents are working, and 52.51 and 54 percent of those males and females, respectively, who are working are living with their parents (see Table 4).

Cantó-Sánchez and Mercader-Prats (1999) argue that instability in the job place and the cost of housing are key to understand why young Spaniards stay with their parents. They show that more than 80 percent of school leavers hold a temporary job in 1996 and that the majority of them could not find a permanent job (see Table 5), and that housing costs have increased more than 14 percent points than the mean wage in the last years. Moreover, according with the *Panel Europeo de Hogares* (PHOGUE), in 1994 the average wage of those that stay at their parents' home is around 85.5 percent of the wage perceived by those who live by themselves and that this percentage declines with the level of education (see Table 6). Martínez-Granado and Ruiz-Castillo (1998) study the main factors that make youths to leave the parental house and those households' characteristics that affect their decision. They find that the probability of leaving is inversely related to housing costs and that it depends mainly on the probability of finding a job, which is related to the level of education and age and inversely related to the unemployment rate. With respect to households' characteristics, they find that the higher the educational attainment of parents, the higher the probability of having young people studying at home, but if both parents have a college degree, young individuals are more likely to leave. Finally, they obtain that the probability of staying appears to be positively related to the mother being not working. Thus, according with the above evidence, we can conclude that bad labor market conditions make young people to stay at their parents' home and that, apparently, the probability of staying is larger in traditional households where the mother does not work in the market.

In a different line of research, Ahn and Ugidos (1996), Cantó-Sánchez (1997) and Cebrián and Jimeno (1998) focus on how the prevailing family structure and family characteristics affect the individuals' performance in the labor market. Ahn and Ugidos (1996) find that unemployed fathers or mothers increase greatly the risk of unemployment of their children and show that this negative effect of parents' unemployment on children is much greater for the mother than for the father. Cantó-Sánchez (1997) finds that children living

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<sup>1</sup>Except for Italy that looks very similar to Spain.

in households where both parents are working may experience low unemployment rates, whereas those living in households where the mother is not working, or she is just a discouraged seeker, will experience high unemployment rates. Cebrián and Jimeno (1998) show that the level of household income affects negatively the mother's and children's probability of becoming employed, and that unemployment mainly affects to secondary earners within the household: the fraction of households where all active individuals were unemployed was 8.47 percent in 1998, whereas the average unemployment rate was 18.91 percent at that time. Furthermore, according with EPA (Spanish Labor Force Survey), the unemployment rates of those individuals categorized as female "spouses" and "children" are more than twice the unemployment rate of male "heads" (see Table 7). Thus, this evidence suggests that the average profile of an unemployed individual is affected by the prevailing family structure.

In summary, connecting these two branches of the literature, there seems to be a two-way interaction between the individuals' labor market performance and the prevailing family structure. On the one side, bad labor market conditions affect mainly "female" spouses and young people; as a consequence, the latter tend to stay at their parents' home. On the other side, the labor market performance of an individual that lives in family is affected by her or his family status and by the labor performance of the rest of the members in the household; in particular, unemployment rates of individuals other than the head of the household are high. Therefore, to better understand the behavior of unemployed workers we must explicitly study the structure of the household.

This paper provides a theoretical framework to analyze the individuals' employment search decisions within the household. The main novelty of the model we present is that the type of family structure prevailing in a society arises endogenously as a response to different labor market conditions and this, in turn, affects the individuals' incentives to look for a job. To our knowledge, there are no previous theoretical works where this issue is analyzed and so we propose to start with a very simple structure. We build a four-stage model in which parents feel altruistically towards their children. Individuals either search for a job and work in the market, or work producing a household good. This good is a public good inside the household. Young adults can either stay or leave their parents' home, and if they stay, they must share their labor income with their parents.

Our first finding is that search efforts of the unemployed members of the family are strategic substitutes. This result arises because unemployed individuals receive transfers from the rest of the family. Hence, the higher the other members' effort the higher the expected utility of being unemployed. Second, we find that, everything else equal, young adults leave their parents' home if they perceive their wage to be sufficiently high. In turn, the young adult's decision of leaving will affect the female spouse's reservation wage since her marginal utility of working at home will be larger when children or young adults stay. As a result, search efforts of both the young adult and the spouse are lower than in the case in which the perceived young's wage is sufficiently high.

Finally, we analyze the effect of allowing individuals to choose the number of hours they work in the market. The results show that allowing for part time work when young people perceive their wages to be very low, may result in a higher search effort for spouses

and a lower search effort for young people. Thus, a policy implication of introducing a flexible workweek is that it should be accompanied by measures aimed to improve young adults' labor prospects.

The rest of the paper is organized as follows: Section 2 describes the environment. Section 3 analyzes the young adult's decision of leaving, labor supplies, and their relationship. Section 4 focuses on the strategic search behavior of unemployed individuals within the household. Section 5 discusses the type of family that arises depending on the youth's wage. Section 6 discusses the effects of introducing a flexible hours regime. And Section 7 concludes.

## 2 The model

Consider a representative family composed by three members: The head, the spouse and the child, or young adult. The head and the spouse are altruistic towards their offspring, whereas the latter only cares about himself. Agents obtain utility from two kinds of consumption goods: A market good, denoted as  $c$ , and a household good, denoted as  $g$ . The latter is a public good inside the household.<sup>2</sup> At some point, the young adult must decide whether to stay within his parents' household or to leave, living on his own. Individuals are endowed with one unit of time and do not value leisure. They can either engage in household production or in the provision of the market good, if they are employed. Unemployed individuals search for a job with intensity  $s \geq 0$  at a utility cost  $c(s)$ . Search generates a job offer with probability  $\pi(s)$ , both  $c(s)$  and  $\pi(s)$  are strictly increasing in  $s$ . Individuals with different family status command different wages in the market. We will first assume that the workweek is fixed: Employed individuals work their entire unit of time in the market. In this case, the household good will be produced by the unemployed members of the family.<sup>3</sup> In section 6 we will review the case in which the individuals can decide the fraction of their time they devote to market and household production, respectively, and compare the equilibrium allocation with the one obtained assuming a fixed workweek. Throughout the paper we will assume that the head of the family is employed.

Individuals' preferences on consumption are represented by the following utility functions, where the head is indexed by 1, the spouse by 2, and the young adult by 3:

$$U_3(c_3, g_3, s_3) = \log(c_3) + \delta \log(g_3), \quad (1)$$

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<sup>2</sup>This assumption is meant to capture the fact that the marginal cost of doing the housework for an additional person is very low; relaxing it will not modify the main results of the model and will complicate unnecessarily the algebra.

<sup>3</sup>We are not considering leisure decisions, instead we are fixing (normalizing to one) the time agents devote to work and make endogenous the allocation of working time between market and home production. The utility cost of searching can be interpreted as the cost in leisure time unemployed agents have to bear if they want to become (market) employed.

$$U_i(c_i, g_i, s_i, U_3) = \log(c_i) + \delta \log(g_i) + \beta U_3(c_3, g_3), \quad i = 1, 2. \quad (2)$$

Where the parameters  $\delta > 0$  and  $\beta \in (0, 1)$  stand, respectively, for the relative weight of the household good in the agents' utility and for the parents' altruism intensity towards their offspring. The production of the household good only requires time. The technology available to produce  $g$  is represented by the function

$$g(l) = b + a \cdot l \quad a, b > 0, \quad (3)$$

where  $l$  is the total time household members do not spend working in the market. To simplify the analysis, we assume that the young adult has productivity zero in household production. Similar qualitative results as those as we are going to discuss would follow if this assumption were removed. Since the head is employed and the young adult is unproductive, the amount of household good is  $b$  if the spouse is employed or  $a + b$  if she is unemployed. Recall that this good is a public good inside the household. Therefore, the head and the spouse always consume the same amount of  $g$ . The young adult will consume the same amount of the home good as they do if he decides to stay within his parents' household, but it can be different if he decides to live on his own. In that case, he will consume an amount  $b$ .

### Timing of the actions

1. Unemployed individuals search for a job without communicating it to the rest of the family. They search taking as given the other individuals' employment status, if employed, or search effort, if unemployed.
2. Individuals receive an offer with a probability that is directly related to the level of their search effort. This offer is observed by all family members. Individuals decide whether to accept or to reject the offer and, if the workweek is flexible, the fraction of time they want to work in the market.
3. The young individual decides whether to stay at his parents' home or to leave.
4. Agents engage in production activities and consumption takes place. The allocation of consumption across members of the parents' household is decided using an exogenously given sharing rule. We discuss this issue in the following subsection.

The model will be solved backwards and so we start by finding the consumption allocations that will take place once agents know what fraction of their time endowments will be allocated into the market, and once the young adult has decided whether to stay or to leave his parents' home.

## 2.1 Consumption allocations

We follow the efficiency approach proposed by Chiappori (1992), Chiappori *et al.* (1998) and Blundell *et al.* (1998). The idea underlying this approach is the following: Spouses engage in a bargaining process to decide the allocation of aggregate resources. Any allocation resulting from this process is Pareto efficient and, thus, there exists a weighting factor  $\mu$  belonging to  $[0, 1]$  such that the allocation maximizes the objective function  $\mu \cdot U_1 + (1 - \mu) \cdot U_2$  subject to an aggregate budget constraint. The weighting factor  $\mu$  will depend on the individuals' wages and their employment status. Nevertheless, to simplify our analysis, we suppose that the bargaining process that determines the sharing rule of aggregate resources is already given at stage one; therefore,  $\mu$  does not depend on employment status. We are just assuming that sharing rules determining intra-household allocations vary more slowly than the employment status of the members of the household.<sup>4</sup> Furthermore, we assume that the young adult has no power in the bargaining process. In the final section we discuss more at length how letting the sharing rule to vary with employment status would affect the results presented in this paper.

There are two additional features that distinguish our household setting from Chiappori's (1992) two-agent one-good framework. First, the two members of the collective decision unit (parents) care about the utility of a third member (young adult) which has no decision power on the sharing rules imposed within his parents' household<sup>5</sup>. Second, agents must allocate their time endowments between the production of the (private) market good and the (public) household good.<sup>6</sup>

Let  $w_j$  and  $h_j$  be, respectively, the wage and the fraction of time agent  $j$  spends working in the market,  $j = 1, 2, 3$ . Given the employment status and wages of all household members, the consumption allocations when the young adult has decided to stay at his parents' home are the solution to the following program:

$$\max_{c_1, c_2, c_3} \{ \mu U_1 + (1 - \mu) U_2 \} \quad [P] \quad (4)$$

$$\begin{aligned} \text{s. t. } c_1 + c_2 + c_3 &\leq w_1 + w_2 \cdot h_2 + w_3 \cdot h_3, \\ c_1, c_2, c_3 &> 0, h_j \in \{0, 1\}, j = 2, 3. \end{aligned}$$

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<sup>4</sup>There are no empirical findings backing this assumption. Blundell *et al.* (1998) estimate labor supplies and sharing rules for couples where both partners are working or are voluntarily unemployed. The sharing rules they estimate depends on both partners' wages and employment status. We cannot use their results because in our model there does exist involuntary unemployment.

<sup>5</sup>Assuming egoistic preferences for all agents and defining the appropriate weights in the planner's utility function will yield the same results. In any case, the young adult will leave the parents' home when some minimum utility is not guaranteed.

<sup>6</sup>Apps and Rees (1997) extend Chiappori's (1992) work to take account of household production. In their framework, sharing rules affect not only the consumption of the market good but also the private consumption of the household good.

where  $\mu \in [0, 1]$  is the weighting factor that determines the exact location of the consumption allocations on the Pareto frontier. The solution to problem  $[P]$  is given by:

$$c_1^P = \frac{\mu}{1+\beta}W, \quad c_2^P = \frac{1-\mu}{1+\beta}W, \quad c_3^P = \frac{\beta}{1+\beta}W, \quad W = (w_1 + w_2h_2 + w_3h_3). \quad (5)$$

In case the young adult has decided to leave his parents' home, the consumption allocations will be the solution to:

$$\max_{c_1, c_2, T} \{ \mu U_1 + (1 - \mu) U_2 \} \quad [A] \quad (6)$$

$$\text{s. t. } c_1 + c_2 + T \leq w_1 + w_2h_2,$$

$$c_3 \leq w_3h_3 + T,$$

$$c_1, c_2 > 0, \quad T \geq 0, \quad h_j \in \{0, 1\}.$$

where  $T$  represents the amount of the market good parents transfer to their offspring. This transfer is a function of wages and employment status,

$$T = \max \left\{ \frac{\beta (w_1 + w_2h_2) - w_3h_3}{1 + \beta}, 0 \right\} \quad (7a)$$

Notice that if  $\beta (w_1 + w_2h_2) \leq w_3h_3$  the transfer will be zero.<sup>7</sup> If the transfer is positive, the young consumes the same amount of the market good either living at his parents' or living on his own. Therefore, the consumption allocations that solve program (A) are determined by the following rules:

$$\text{If } T = 0, \quad c_1^A = \mu (w_1 + w_2h_2), \quad c_2^A = (1 - \mu) (w_1 + w_2h_2),$$

$$\text{and } c_3^A = w_3h_3. \quad (8)$$

$$\text{If } T > 0, \quad c_j^A = c_j^P, \quad j = 1, 2, 3, \quad (9)$$

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<sup>7</sup>Parents actually would like to receive a transfer from their child in this case.



where  $c_j^P$  is the solution to program (P) given in expression (4).<sup>8</sup>

Since the home good is a public good inside the household, the consumption of  $g$  is not subject to any sharing rule and so both the head of the family and the spouse will consume the same amount of it. Recall that this amount does not depend on the young adult's staying or leaving the parents' household. It only depends on the spouse's employment status. The young's staying or living decision will only affect his own consumption level of the home good. Thus, we can write the production of  $g$  as a function of  $h_2$  alone:

$$g_i^P(h_2) = g_i^A(h_2) = b + a(1 - h_2) \equiv g(h_2), \quad i = 1, 2. \quad (10)$$

$$g_3^P(h_2) = g(h_2), \quad g_3^A(h_2) = b. \quad (11)$$

**Indirect Utility from Consumption** Given the employment status of all family members and the young's decision of staying or leaving the parents' house, the solutions to the above problems determine the value functions associated to each possible situation. Let  $V$  and  $V_3$  stand for the indirect consumption utility functions associated, respectively, to the parents' collective unit (weighted sum of their utilities) and to the young adult. Taking into account (5), (8), (9), (10) and (11), we define the following three situations:

1. *The young adult stays at his parents' home (P).*

$$V(h_2, h_3; P) = \log m + (1 + \beta) \left[ \log \sum_j w_j h_j + \delta \log g(h_2) \right], \quad (12)$$

$$V_3(h_2, h_3; P) = \log n + \log \sum_j w_j h_j + \delta \log g_P(h_2), \quad (13)$$

2. *The young adult stays alone (A) and receives a positive transfer (T).*

$$V(h_2, h_3; A, T) = \log m + (1 + \beta) \log \sum_j w_j h_j + \delta \log g(h_2) + \beta \delta \log b, \quad (14)$$

$$V_3(h_2, h_3; A, T) = \log n + \log \sum_j w_j h_j + \delta \log b. \quad (15)$$

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<sup>8</sup>Notice that the fraction of aggregate labor income that the young adult receives from his parents,  $\beta/(1+\beta)$ , is invariant with respect to their bargaining power, which is captured by the weighting factor  $\mu$ . This implies that  $\mu$  is assumed to be invariant with respect to young's decision about staying or leaving his parents' house.

**3.** *The young adult, if employed, leaves and stays alone ( $A$ ) but receives no transfer.*

$$V(h_2, h_3; A) = \log v + \log(w_1 + w_2 h_2) + \delta \log g(h_2) + \beta V_3(h_2, h_3; A) \quad (16)$$

$$V_3(h_2, h_3; A) = \log w_3 h_3 + \delta \log b \quad (17)$$

where  $m = \mu^\mu (1 - \mu)^{1-\mu} \beta^\beta / (1 + \beta)^{1+\beta}$ ,  $n = \beta / (1 + \beta)$ , and  $v = \mu^\mu (1 - \mu)^{1-\mu}$ .

In the next section, we use these value functions to characterize the young's decision of leaving and labor supplies.

### 3 Labor supplies and the young adult's decision of leaving

The head and the spouse constitute a collective decision unit and so they jointly decide how to allocate their time endowments between household and market activities. In contrast, we assume that the young adult takes his own decision, but if he becomes employed and decides to stay at the parental house, he must share his labor income according with his parents' sharing rules. If the workweek is fixed and the head, by assumption, is already employed, the parents' labor supply decision reduces to accept or to reject a job offer received by the spouse. That is, it reduces to either allocating the spouse's time entirely in market production or in home production. We will show that this decision depends on whether the young adult decides to stay at the parental house or not. On the other hand, the young adult's labor supply decision is trivial since his productivity in home production is zero: given the employment status of his parents, he is better off being employed than unemployed and so he will always accept a job offer.

We limit our analysis to a subset of the parameter space, that ensures meaningful equilibrium outcomes, characterized by the following assumptions:

**Assumption 1.**  $\left(\frac{b}{b+a}\right)^\delta > \left(\frac{\beta}{1+\beta}\right)$ .

**Assumption 2**  $\left(\frac{b}{b+a}\right)^\delta > 1/2$ .

Assumption 1 ensures the existence of a positive young's wage level above which the young adult's utility gain of leaving the parental house without a transfer when the spouse is unemployed is positive (i.e.: the difference  $V_3(0, 1; A) - V_3(0, 1; P)$  can be positive if the young's wage is sufficiently high). If this assumption is not satisfied, staying (and so accepting the sharing rule) is always preferred to leaving. Assumption 2 is a sufficient condition for the spouse's reservation wage being always smaller than the head's wage,

and it implies that the marginal productivity of household work is not too large. If this assumption is not satisfied, the subset of the parameter space characterized by a head's wage (first earner's wage) larger than the spouse's wage (second earner's wage) could be empty.

### 3.1 Staying or leaving the parents' house

Expressions (13), (15), and (17) are used to characterize under which conditions the young adult decides to leave or to stay. If both the young adult and the spouse are unemployed the former will prefer to stay since his consumption of the market good will be the same in either situation, but the consumption of the household good is greater when he stays. If the young adult is unemployed and the spouse is employed, he will be indifferent about leaving since he will consume the same amounts of both goods either in or out of his parents' home. In that case, we assume that he stays at his parents'. If he has a job, his decision will depend on his wage relative to his parents' labor income and the amount of the home good consumed in each possible situation.

Let  $w_3^L$  be the young adult's wage that makes him indifferent between staying or leaving his parents' house when he finds a job and the spouse is unemployed. Let  $\eta(h_2)$  be the threshold, given the spouse's employment status, such that for any  $w_3$  below that threshold, the parents transfer some market good to him. The analytical expression for this threshold can be easily obtained from expression (7a). It can be shown that  $w_3^L$  is always above  $\eta(1)$ , given Assumptions 1 and 2. This is equivalent to say that for any  $w_3 \geq w_3^L$  the young leaves and does not receive any transfer.

**Lemma 1** *Given the employment status and labor supplies of all family members, the young adult's decision of staying or leaving the parents' house is the following:*

- (i) *If  $w_3 h_3 < \eta(h_2)$ , he stays, for all  $h_2 \in \{0, 1\}$ .*
- (ii) *If  $w_3 h_3 \geq \eta(h_2)$ , he leaves if the spouse is employed, or if she is unemployed and  $w_3 \geq w_3^L$ .*

$$w_3^L = (\beta z)^{-1} \eta(0), \quad z \equiv \left( \frac{1+\beta}{\beta} \right) \left( \frac{b}{b+a} \right)^\delta - 1.$$

Whenever the young's labor income,  $w_3 h_3$ , is lower than  $\eta(h_2)$ , he would receive a positive transfer of the market good if he decides to live on his own. This transfer guarantees that his consumption of the market good is the same whether he leaves or stays; but since the consumption of the home good living at his parents' is always greater than or equal to the amount consumed living on his own, he stays. If his labor income is lower than  $\eta(h_2)$ . This is always the case when the young adult is unemployed.

On the other hand, if  $w_3 h_3 \geq \eta(h_2)$ , the young adult does not receive any transfer of the market good when he decides to live on his own, his consumption level of that good is larger when he leaves. So, if the spouse is employed, he will leave because his home good consumption will be the same in or out of his parents' house. In contrast, if the spouse is unemployed, the consumption of the home good will be larger at his parents'

house and so he will leave if his wage is sufficiently large to compensate him for the loss in the consumption of that good,  $w_3 \geq w_3^L$ .

An implication of Lemma 1 is that young adults demand a higher wage to leave the parental house when the spouse is unemployed. This implies that, given the employment status of the spouse, children whose mothers are not working demand a higher wage to leave the parental house than those whose mothers are employed. This result is in line with the finding of Martínez-Granado and Ruiz-Castillo (1998).

### 3.2 The spouse's labor supply

The spouse's decision of accepting or rejecting a job hinges on the young decision of leaving the parental house and so, it can depend on the young's employment status. Under a fixed workweek, accepting or rejecting a job offer means to supply either the entire unit of labor in the market or to supply zero. The following three Lemmas provide the spouse's reservation wages under the three possible scenarios: the young adult stays, the young adult, if employed, leaves and receives a positive transfer, and the young adult leaves and receives no transfer. Let  $\omega_i = w_i/w_1$  denote the wage of individual  $i$  relative to the head's wage,  $i = 2, 3$ .

**Lemma 2** *Suppose we are in case (P); that is, the young adult stays at his parents' home. Then, the spouse's reservation wage,  $r_2(h_3; P)$ , depends on the young's employment status,  $h_3$ , and satisfies  $r_2(0; P) < r_2(1; P)$ . The spouse's labor supply is the following:*

(i) *If  $\omega_2 < r_2(0; P)$ , then  $h_2 = 0$  for all  $h_3$ .*

(ii) *If  $r_2(0; P) \leq \omega_2 < r_2(1; P)$ , the spouse accepts a job if the young adult is unemployed.*

(iii) *If  $r_2(1; P) \leq \omega_2$ , then  $h_2 = 1$  for all  $h_3$ .*

Where  $r_2(h_3; P) \equiv \left[ \left( \frac{b+a}{b} \right)^\delta - 1 \right] (1 + \omega_3 h_3)$ .

**Lemma 3** *Suppose we are in case (A,T); that is, the young adult leaves and receives a positive transfer. Then, the spouse's reservation wage,  $r_2(h_3; A, T)$ , depends on the young's employment status,  $h_3$ , and satisfies  $r_2(0; A, T) < r_2(1; A, T)$ . The spouse's labor supply is the following:*

(i) *If  $\omega_2 < r_2(0; A, T)$ , then  $h_2 = 0$  for all  $h_3$ .*

(ii) *If  $r_2(0; A, T) \leq \omega_2 < r_2(1; A, T)$ , the spouse accepts a job if the young adult is unemployed.*

(iii) *If  $r_2(1; A, T) \leq \omega_2$ , then  $h_2 = 1$  for all  $h_3$ .*

Where  $r_2(h_3; A, T) \equiv \left[ \left( \frac{b+a}{b} \right)^{\frac{\delta}{1+\beta}} - 1 \right] (1 + \omega_3 h_3)$ .

Lemmas 2 and 3 imply that the spouse's reservation wage when the young adult stays or leaves with a positive transfer depends on the young's employment status and that,

given this employment status, the spouse's reservation wage is larger when the young stays at the parental house. This is so because, in that case, the spouse's utility of working at home is larger. Nevertheless, the spouse's reservation wage when the employed young leaves with no transfer can be lower than her reservation wage when he stays. This result follows from Lemma 4.

**Lemma 4** *Suppose we are in case (A); that is, the employed young leaves and receives no transfer. Then, the spouse's reservation wage does not depend on the young's employment status,  $r_2(A)$ , and satisfies  $r_2(A) = r_2(0; P)$ . The spouse's labor supply is*

- (i) *If  $\omega_2 < r_2(0; P)$ , then  $h_2 = 0 \forall h_3$ .*
- (ii) *If  $\omega_2 \geq r_2(0; P)$ , then  $h_2 = 1 \forall h_3$*

These Lemmas imply that mothers of young people that stay home demand a higher market wage to participate in the labor market, so they are less likely to work. This result, coupled with the previous one—children of mothers who do not work are more likely to stay at their parents house—suggest that we may see two types of families: One in which young people stay longer at their parents', where the mother does not participate in the labor market, and other in which the young individuals leave and their mothers are part of the labor force. The findings of Cantó-Sánchez (1997), Cantó-Sánchez and Mercader (1999) and Martínez-Granado and Ruiz-Castillo (1998) point in this direction.

### 3.3 Interaction between the young adult's and the spouse's decisions

To conclude this section we have to analyze the interaction between the young adult's leaving decision and the spouse's labor supply described above. The resulting equilibrium outcomes correspond, respectively, to stages three and two of the model.

As already mentioned, it is not difficult to check that Assumptions 1 and 2 imply that  $\eta(1) \leq w_3^L$ . That is, the wage that makes the young adult indifferent about leaving when the spouse is unemployed is such that, for any spouse's employment status, at that wage, he will not receive any transfer when leaving. Then, it follows from Lemma 1 that either if  $w_3 < \eta(0)$  or if  $\eta(0) \leq w_3 < \eta(1)$ , the young adult will choose to stay regardless of the spouse employment status (he will be indifferent about leaving when the spouse is employed). On the other hand, if the young's wage is such that  $\eta(1) \leq w_3 < w_3^L$ , he will leave if the spouse is employed, but he will stay otherwise. It is shown in Lemma A1 in the Appendix that whenever  $\eta(1) \leq w_3$ , the relative spouse's wage must satisfy  $\omega_2 < r_2(1, P)$ . That is, the spouse only accepts an offer if she foresees that the employed young leaves, provided that her relative wage satisfies  $\omega_2 \geq r_2(0, P)$ . But the young stays if she rejects a job offer or she receives none, and leaves (with no transfer) if she receives a job offer and accepts it. It is easy to show that the spouse's utility of not working when the employed young stays at the parental house,  $V_2(0, 1; P)$ , is greater than her utility of accepting a job offer when the young lives alone,  $V_2(1, 1; A)$ , if  $w_3 < w_3^L$  and  $\omega_2 < r_2(1, P)$ . Therefore, in case  $\eta(1) \leq w_3 < w_3^L$ , the spouse will reject a job offer ( $h_2 = 0$ ) and the

young adult will stay at his parents'. It follows that whenever  $w_3 < w_3^L$ , the young adult will stay. Finally, if  $w_3^L \leq w_3$ , the young adult will choose to leave and will receive no transfer since  $\eta(1) \leq w_3$ . Proposition 1 summarizes these results.

**Proposition 1** *In equilibrium, the employed young individual always stays at the parental house if his wage satisfies  $w_3 < w_3^L$ . Otherwise, he leaves and receives no transfer.*

The main implication of Proposition 1 is that the young's decision of leaving, in equilibrium, depends solely on the wage he receives in the market, and not on the spouse's employment status. Thus, this Proposition characterizes two different scenarios regarding the search behavior of the members of the family.

## 4 Search efforts

In this section we analyze the first stage of the model where unemployed individuals engage in searching activities, taking into account the two scenarios characterized in Proposition 1. In the first scenario, the young adult's wage is such that, if he becomes employed, he prefers to stay at his parents' home. In the second one, the young's wage is sufficiently high so he decides to leave and receives no transfer. Naturally, the young's search effort will increase with the young's market wage, but we know that these two scenarios will also affect the spouse's labor supply since it hinges on the young's decision of leaving. We analyze each scenario in turn, and then we will undertake some comparative statics between both of them.

Let  $\theta s_j$  be the probability of finding a job for agent  $j$  with search effort  $s_j$ , and let  $\frac{1}{2}s_j^2$  be the utility cost of the search activity. Assume that the spouse and young adult search simultaneously and so that each agent will determine his/her search effort taking as given the other's effort. Given the consumption allocations defined in expressions (5), (8), (9), (10) and (11), the spouse and young adult will maximize, respectively, their expected utilities conditioned on their employment status. If the young adult remains unemployed, or becomes employed but his market wage is relatively low, he cannot be strictly better off by leaving his parents' house and so, the optimal consumption allocations will be given by (5) and (10). With probability  $\theta s_3$ , if the young adult's wage is relatively high, he will leave his parents' house and so, the optimal consumption allocations will be given by (8), (10) and (11).

### 4.1 The employed young stays

We know that for the young to stay at his parents' house it must happen that his wage satisfies  $w_3 < w_3^L$ . We also know that, in that case, the spouse's reservation wage depends on the young's employment status. Therefore, according to Lemma 2, we have two possible cases where the spouse's search intensity can be positive. In the first case, the spouse's wage lies between her reservation wage for  $h_3 = 0$  and her reservation wage for  $h_3 = 1$  :

the spouse accepts a job offer if the young is unemployed, and rejects it if the young is employed. In the second one, the spouse's wage is greater than her reservation wage when the young is employed and she will always accept a job offer.

#### 4.1.1 The spouse only accepts an offer if the young is unemployed

According to Lemma 2, if the young adult stays at the parental house, the spouse will only accept a job offer if the young adult remains unemployed whenever the spouse's wage satisfies the following inequality:

$$r_2(0; P) \leq \omega_2 < r_2(1; P). \quad (18)$$

In that case, the young adult solves the following problem:

$$\max_{s_3 \in [0,1]} \left\{ \theta^2 s_3 s_2 V_3(0, 1; P) + \theta s_3 (1 - \theta s_2) V_3(0, 1; P) \right. \\ \left. + (1 - \theta s_3) \theta s_2 V_3(1, 0; P) + (1 - \theta s_3) (1 - \theta s_2) V_3(0, 0; P) - \frac{1}{2} s_3^2 \right\}.$$

Notice that with probability  $\theta^2 s_3 s_2$  both young and spouse receive a job offer. Since the young always accepts a job offer, it follows from (18) that the spouse remains unemployed because she will reject any offer. So with probability  $\theta^2 s_3 s_2$ , the utility of the young is  $V_3(0, 1; P)$ . The young finds a job and the spouse does not with probability  $\theta s_3 (1 - \theta s_2)$ . In that case, the associated young's utility from consumption is  $V_3(0, 1; P)$ . The interpretation of the rest of the cases follows in a similar way.

The young adult problem can be written in a more compact form as follows:

$$\max_{s_3 \in [0,1]} \left\{ \theta s_3 X(0; P) + (1 - \theta s_3) \theta s_2 Y(0; P) + V_3(0, 0; P) - \frac{1}{2} s_3^2 \right\}, \quad (19)$$

where  $X(h_2; P) \equiv V_3(h_2, 1; P) - V_3(h_2, 0; P)$  stands for the young's utility gain of becoming employed when the spouse spends  $h_2$  hours in the market and he stays at his parents' home, and  $Y(h_3; P) \equiv V_3(1, h_3; P) - V_3(0, h_3; P)$  stands for the young's utility gain from the spouse employment given that he spends  $h_3$  hours in the market and stays at his parents' home. Therefore, the young adult's search decision rule will be given by:

$$S_3(s_2) = \min \{ \theta [X(0; P) - \theta s_2 Y(0; P)], 1 \}. \quad (20)$$

The problem solved by the spouse can be written in the same fashion and its solution is the following searching function:

$$S_2(s_3) = \min \{ \theta(1 + \beta)Y(0; P) - \theta^2 s_3(1 + \beta)Y(0; P), 1 \}. \quad (21)$$

If follows from (13) and the definition of  $Y(h_3; P)$  that, for any spouse's wage satisfying  $r_2(0, P) \leq \omega_2$ ,  $Y(0; P)$  is non negative and so that (20) and (21) are both non increasing.

#### 4.1.2 The spouse always accepts a job offer

The spouse will always accept a job offer when the young stays at the parental house, regardless of his employment situation, if the spouse's wage satisfies the following inequality (Lemma 2(iii))

$$\omega_2 \geq r_2(1; P). \quad (22)$$

Proceeding as in the previous case, the optimal search functions for the young and the spouse are given, respectively, by the functions:

$$S_3(s_2) = \min \{ \theta X(0; P) - \theta^2 s_2 [Y(0; P) - Y(1; P)], 1 \}, \quad (23)$$

$$S_2(s_3) = \min \{ \theta(1 + \beta)Y(0; P) - \theta^2(1 + \beta)s_3(Y(0; P) - Y(1; P)), 1 \}. \quad (24)$$

It is easy to check that  $Y(0; P) - Y(1; P)$  is non negative for any spouse's relative wage satisfying (22) and so that in this case both  $S_3$  and  $S_2$  are also non increasing.

## 4.2 The employed young leaves and receives no transfer

According to Proposition 1, the young leaves and receives no transfer if his market wage satisfies  $w_3 \geq w_3^L$ . Lemma 4 tells us that, in this case, the spouse reservation wage does not depend on the young's employment status, and so that the spouse's search effort can be positive whenever her market wage satisfies the following inequality:

$$\omega_2 \geq r_2(0; P). \quad (25)$$

Under this condition, the spouse will always accept a job offer and so, we can write the young adult's search problem as follows:

$$\max_{s_3 \in [0,1]} \left\{ \theta s_3 X(0; A) + (1 - \theta s_3) \theta s_2 Y(0; P) - \frac{1}{2} s_3^2 \right\}, \quad (26)$$



where  $X(h_3; A)$  has the same interpretation as expression  $X(h_3, P)$  defined above but referring to the case in which the employed young leaves. The solution to this problem yields the following search decision function:

$$S_3(s_2) = \min \{ \theta X(0; A) - \theta^2 s_2 Y(0; P), 1 \}. \quad (27)$$

Similarly, the spouse's searching rule must solve the following program:

$$\begin{aligned} \max_{s_2 \in [0,1]} \{ & (1 - \theta s_3) [\theta s_2 Z(0; P) + V_2(0, 0; P)] + \\ & + \theta s_3 [\theta s_2 Z(1; A) + V_2(0, 1; A)] - \frac{1}{2} s_2^2 \}, \end{aligned} \quad (28)$$

where  $Z(0; P) = V_2(1, 0; P) - V_2(0, 0; P)$  and  $Z(1; A) = V_2(1, 1; A) - V_2(0, 1; A)$  represent the spouse's utility gain from being employed when the young is, respectively, unemployed and staying, and employed and living alone. It is easy to check that  $Z(0; P) = (1 + \beta) Y(0; P)$  and that  $Z(1; A) = Y(0; P)$ , so that the difference  $Z(1; A) - Z(0; P)$  is given by  $\beta Y(0; P)$  and so that this difference is non-negative. This result allows us to write the solution to program (28) as follows:

$$S_2(s_3) = \min \{ \theta [1 + (1 - \theta s_3) \beta] Y(0; P), 1 \}. \quad (29)$$

Therefore, we can conclude that the search efforts of the young adult and the spouse are strategic substitutes in the household setting presented in this model. The higher (lower) the spouse's search effort, the lower (higher) the young adult's search effort. We call this effect (captured in each case by the slope of the reaction function) the "strategic" effect. The following Proposition states that this strategic effect is lower the larger the gender gap (the smaller the spouse's wage relative the head's wage). Moreover, since the spouse's search effort is positively affected by  $\beta$ , the strategic effect implies that, in all cases, the young's equilibrium search effort is inversely related to the altruism factor.

**Proposition 2** *Let  $(s_2^*, s_3^*)$  be an interior solution to the spouse and child's searching game for a given altruism intensity  $\beta \in (0, 1)$ . Then: (i) The larger the gender gap between the spouse and head's wages, the weaker the strategic effect between  $s_2$  and  $s_3$ . (ii) A marginal increase in the altruism parameter implies an interior solution  $(s_2^{*'}, s_3^{*'})$  such that  $s_2^{*'} > s_2^*$  and  $s_3^{*'} < s_3^*$ .*

## 5 A comparison of the two scenarios: the young adult stays and the young adult leaves

In this model economy two types of families arise endogenously depending on the young's market wage. One in which the young adult stays at his parents' home regardless of his employment situation, and another in which he leaves as soon as he finds a job. The critical value of the young's market wage that defines these two scenarios depends solely on the head's wage and not on the spouse's wage (Proposition 1). This result follows from the equilibrium interaction between the young's decision of leaving and the spouse's labor supply, the latter depending on the former. The spouse's reservation wage is greater when the employed young stays at the parental house and hence, it can depend on the young's wage (Lemmas 1–4).

This behavior of the young adult seems to fit the evidence we have for Spain: The average wage perceived by individuals aged 23–30 who stay with their parents is around 86% of the average wage perceived by those who live by themselves. In this section we want to analyze how this different behavior of the young induced by the difference in the market wage affects in turn his own search effort and the search effort of the spouse. Thus, we follow Proposition 1 and define two scenarios: (1) young people receive a wage below  $w_3^L$  and (2) young people receive a wage greater than or equal to  $w_3^L$ . We will refer to the first scenario as that of the “traditional” family and to the second one as that of the “modern” family. Then, we infer differences in unemployment rates between each scenario, for each type of individual. For the comparison of these two scenarios we focus the analysis on the case where the spouse's wage satisfies (18). This implies that the young's and the spouse's search functions in the “traditional” family are those given by expressions (20) and (21), respectively, and those in the “modern” family are determined by expressions (27) and (29). The main results of comparing the equilibrium search efforts between different scenarios are stated in Proposition 3 and illustrated in Figure 1.

**Proposition 3** *Let the spouses in the “modern” and “traditional” families receive the same market wage, satisfying condition (18) Then, at an interior equilibrium:*

- (i) *The strategic effect of the young's search effort on the spouse's is larger in the “traditional” than in the modern “family”.*
- (ii) *The search effort of the young adult is greater in the “modern” than in the “traditional” family.*
- (iii) *The spouse's search effort is greater in the “modern” than in the “traditional” family if the young's wage relative to the heads' in each scenario,  $\omega_3^M$  and  $\omega_3^T$ , respectively, satisfy*

$$1 + \omega_3^T \geq \left[ \left( \frac{b}{b+a} \right)^\delta \cdot \frac{\omega_3^M \cdot (1 + \beta)}{(1 + \omega_3^M) \cdot \beta} \right]^\beta.$$

Part (i) of Proposition 3 comes from direct observation of the spouse's search function

in each scenario. Notice that the spouse's search effort is more sensitive to changes in the young's search effort in the "traditional" than in the "modern" family. The second part follows trivially since the young's search effort increases with his market wage. The third part of the Proposition is proved in the Appendix. The inequality stated imposes a lower bound to  $\omega_3^T$  with respect to  $\omega_3^M$ . Graphically, this inequality implies that the ratio between the intercept levels of the functions  $S_3^T$  and  $S_3^M$  with the vertical axis is not too small.

This Proposition states that if the wage the young receives in the "modern" family is larger than that prevailing in the "traditional" one, both the young adult and the spouse in the "modern" family will choose a higher search effort. A larger young's effort is a straightforward implication, but a higher spouse's effort is not. An increase in  $w_3$  has two effects of opposite sign on the spouse's search effort. On the one hand, it decreases the spouse's effort, since the young's and the spouse's effort are strategic substitutes. On the other hand, since the employed young adult leaves, a higher young's wage lowers the spouse's utility of working at home, which increases her search effort. The lower bound imposed on  $\omega_3^T$  ensures that this negative strategic effect is more than compensated by the positive effect on her utility of working in the market.

This section points out that the prevailing family structure in an economy may depend on labor market conditions. Our model predicts that whenever young adults receive a low wage (which we have identified as  $w_3 < w_3^L$ ), employed young adults stay at their parents' home, whereas the opposite occurs otherwise. Moreover, young adults who command a low wage in the market will choose a low search effort when unemployed. This behavior affects negatively the spouses' search effort, as we have already seen. If the probability of finding a job only depends on the individual effort, these results imply that unemployment rates of spouses' and young adults should be higher when the young adults' wage is low. This implication matches the evidence we have for Spain. The model is also able to offer predictions on how youth's and spouse's reservation wages and search efforts change with head's earnings: reservation wages increase with head's earnings and consequently, search efforts decrease. These implications are in line with the findings reported by Cebrián and Jimeno (1998).

Notice that this result is obtained solely because of the existence of a household good. If it did not exist or the spouse had productivity zero in the provision of  $g$ , the result would not appear: a low young's search effort would always imply a higher search effort of the spouse. If we thought of fathers as spouses which zero productivity at home, the model would imply that, given the employment status of the mother, the father's search effort would be higher in "traditional" families than in "modern" families.<sup>9</sup> Since in Spain there are many more "traditional" than "modern" families, the model points that we should see much lower unemployment rates in male heads than in female spouses and youths, as it is the case in Spain.

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<sup>9</sup>In the current model setup, assume that the head is unemployed and the spouse is employed. Assume further that the head is not productive in the provision of the household good. Alternatively, assume that the spouse is unemployed, that  $w_2$  is some non labor income, and that the spouse provides the amount of household good  $b$ . In both cases if  $w_3 < w_3^L$  we would obtain a low youth's search effort and a high head's effort. The opposite would occur if  $w_3 \geq w_3^L$ .

We have also seen that in the case where the employed young adult stays at home the spouse's reservation wage is higher than in the case where the employed young leaves the parents' home. Although it is out of the scope of this paper, this result has an implication about spouses' participation rates. Suppose that instead of a representative family we had many heterogeneous families where individuals differed in their level of human capital, and that the market wages reflect these differences in human capital. In that case we would obtain that spouses' participation rates would be lower in those families in which employed young adults stay at their parents' home. Since spouses tend to be women, by extension this model would imply that the female participation rate would be lower in those countries, as the Southern European countries, where employed young adults tend to stay at their parents' house.

## 6 Flexibility in the workweek length

In this section we analyze how the availability of a flexible workweek affects the labor supply of the spouse and how this, in turn, influences the young adult's decision of leaving. By flexible workweek we mean that the individuals who have received a job offer, at the stage two decide not only whether to accept it, but also the number of hours they want to supply. The availability or not of part time jobs will not affect the young's labor supply because he will always choose to work full time. Likewise, if the head of the family is employed, it must be true that  $h_1 = 1$ .<sup>10</sup>

As in the fixed workweek case, the spouse's reservation wages will depend on the labor status of the young adult when his market wage is below a certain threshold. But now these reservation wages will be smaller than those in the fixed case, for any given  $h_3$ . Moreover, the optimal allocation of the spouse's productive time between market and home activities will imply that the young may decide to stay for wages at which he preferred to leave under a fixed workweek. The wage that makes him indifferent about leaving when the spouse is unemployed is obviously the same as in the fixed case, but when the spouse is employed the wage that makes the young indifferent is higher under a flexible workweek regime than under a fixed workweek regime. This result follows because the spouse offers exactly the fraction of time that maximizes the young's utility if he stays. So, under a flexible workweek,  $w_3^L$  depends on  $h_2$ .

Let  $h_2(h_3; P)$  and  $h_2(h_3; A)$  denote the spouse's labor supplies when the young stays at his parents' and lives alone, respectively, given his employment status  $h_3$ . The following Lemmas characterize, respectively, the young adult's decision of leaving and the spouse's labor supply conditioned on the young's choice.

**Lemma 5** *Under a flexible workweek, given the employment status and labor supplies of all family members, the young adult's decision of staying or leaving the parents' house will be the following:*

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<sup>10</sup>This always be optimal if we assume that the head's market wage is higher than the spouse's market wage.

(i) If  $w_3 h_3 < \eta(h_2)$ , he stays  $\forall h_2, h_3 \in [0, 1]$ .

(ii) If  $w_3 h_3 \geq \eta(h_2)$ , he leaves if the spouse is employed and  $w_3 \geq w_3^L(h_2(1; P))$  or if she is unemployed and  $w_3^L(0) \leq w_3 < w_3^L(h_2(1; P))$ .

Where,  $w_3^L(h_2) = \eta(h_2) / \beta z$ ,  $z \equiv \left(\frac{1+\beta}{\beta}\right) \left(\frac{b}{b+a(1-h_2)}\right)^\delta - 1$ .

Notice that  $w_3^L(0) < w_3^L(h_2(1; P))$  and so that, in contrast with the fixed case, we have that the employed young will stay either if his wage is below  $w_3^L(0)$ , or if his wage lies between  $w_3^L(0)$  and  $w_3^L(h_2(1; P))$  and the employed spouse supplies exactly the amount of labor that maximizes his utility of staying. As the next Lemma shows, this labor supply is the spouse's optimal allocation of time to market activities when the young is employed and stays at his parents' house,  $h_2(1; P)$ .

**Lemma 6** (a) *If the young stays at his parents' house, under a flexible workweek, the spouse's labor supply is determined by the following rules:*

(i) If  $\omega_2 < r_2^f(h_3; P)$ , then  $h_2(h_3; P) = 0$ .

(ii) If  $\omega_2 \geq r_2^f(h_3; P)$ , then  $h_2(h_3; P) = \min \left\{ \frac{b+a}{a(1+\delta)} - \frac{\delta a(1+\omega_3 h_3)}{\omega_2}, 1 \right\}$ .

Where  $r_2^f(h_3; P) = \frac{\delta a}{b+a} (1 + \omega_3 h_3)$  is the spouse's reservation wage.

(b) *If the young leaves his parents' house, under a flexible workweek, the spouse's reservation wage,  $r_2^f(h_3; A)$ , and labor supply,  $h_2(h_3; A)$  are given, respectively, by  $r_2^f(0; P)$  and  $h_2(0; P)$ , and so they do not depend on  $h_3$ .*

**Corollary 1** *Suppose that  $\omega_2 \geq r_2^f(h_3; P)$ . Then, given  $h_3$ , if  $w_3 < w_3^L(h_2(1; P))$ , the spouse's labor supply is given by  $h_2(h_3; P)$ . Otherwise, it is given by  $h_2(0; P)$  for all  $h_3$ .*

The interpretation of this Corollary when  $h_3 = 0$  is trivial since the unemployed young will stay at his parents' house and, in that case, the spouse's labor supply is given by  $h_2(0; P)$ . If the young has found a job,  $h_3 = 1$ , the spouse (provided she has found a job too) will supply  $h_2(1; P)$  if he stays or  $h_2(0; P)$  if he leaves. But if his wage is below that level that makes him indifferent about leaving,  $w_3^L$ , he will stay; otherwise, he will leave.

Next we focus on the equilibrium outcomes associated to the environments identified above as "modern" and "traditional" families. Namely, we identify the "modern" family with those families where the young adults receive a market wage that satisfies  $w_3 \geq w_3^L(0)$ , and the "traditional" society as that in which the young adult receives a wage  $w_3 < w_3^L(0)$ .

In contrast with the fixed workweek regime, there is another threshold level below which the employed young in the "modern" family will choose to stay when the spouse is employed,  $w_3^L(h_2(1; P))$ . Considering young's wages above that threshold level will increase the search effort of the young belonging to a "modern" family but does not change the qualitative comparisons we want to establish between both types of families. For that

reason and to keep comparisons more straight between the fixed and flexible regimes, we concentrate the analysis of the “modern” family on the interval  $[w_3^L(0), w_3^L(h_2(1; P))]$ . Moreover, concerning the spouse’s relative wages, we maintain the analysis restricted to the case defined by (18).

## 6.1 The young adult stays

Suppose that the spouse’s wage belongs to the interval  $[r_2^f(0; P), r_2^f(1; P))$ . That is, the spouse will accept a job offer when it occurs if the young adult remains unemployed or when he becomes employed and leaves the parents’ house; otherwise, she rejects it. Since in this subsection we are focusing on equilibria where the young stays, it follows that when the young finds a job, the spouse will never accept an offer.

Following the same steps as in the fixed workweek regime, it is not difficult to see that both the young’s and the spouse’s reaction functions have the same structure as before. The only difference is that they are now evaluated at  $h_2 = h_2(0; P)$  instead of  $h_2 = 1$  when we consider the young’s utility gain from the spouse’s employment:

$$S_3^{FT}(s_2) = \min \{ \theta [X^T(0; P) - \theta s_2 Y^F(0; P)], 1 \}, \quad (30)$$

$$S_2^{FT}(s_3) = \min \{ \theta (1 - \theta s_3) (1 + \beta) Y^F(0; P), 1 \}. \quad (31)$$

where  $F$  stands for flexible,  $T$  for “traditional”, and  $Y^F(0; P)$  is equal to  $V_3(h_2^T(0; P), 0; P) - V_3(0, 0; P)$ . It follows that  $Y^F(0; P) \geq Y(0; P)$ , with a strict inequality when the spouse prefers to work part time. Therefore, introducing a flexible workweek increases the search effort of the spouse and decreases the search effort of the young, everything else being the same. Note that we only need the superscript  $T$  when we refer to the young’s adult utility gain of becoming employed since  $Y$  and  $Y^F$  do not depend on the young’s wage.

## 6.2 The employed young adult can leave

Suppose that the spouse’s wage belongs to the interval  $[r_2^f(0; P), r_2^f(1; P))$ . That is, the spouse will accept a job offer when it occurs if the young adult remains unemployed or when he becomes employed and leaves the parents’ house, being the spouse’s labor supply in either situation given by  $h_2(0; P)$ ; otherwise, she rejects it. Since in this subsection we are assuming that the young’s wage belongs to the interval  $[w_3^L(0), w_3^L(h_2(1; P))]$ , it follows that he will stay only if  $h_2(1; P)$  is positive. But since the spouse’s wage is smaller than  $r_2^f(1; P)$ , we have that  $h_2(1; P)$  is zero. Therefore, under these assumptions, the employed young always leaves and so the spouse supplies  $h_2(0; P)$ .

In this case, the young's and spouse's reaction functions are given, respectively, by:

$$S_3^{FM}(s_2) = \min \{ \theta X^M(0; A) - \theta^2 s_2 Y^F(0; P), 1 \}, \quad (32)$$

$$S_2^{FM}(s_3) = \min \{ \theta [1 + (1 - \theta s_3) \beta] Y^F(0; P), 1 \}, \quad (33)$$

where  $M$  means that the function  $X(0; A)$  is evaluated at young's wages in the interval  $[w_3^L(0), w_3^L(h_2(1; P))]$ . For the same reason as before, introducing a flexible workweek increases the search effort of the spouse and decreases the search effort of the young, everything else being the same.

We have shown that introducing flexibility increases the search effort of the spouse and decreases that of the young in both scenarios, a "modern" and a "traditional" family. In either case, as in the fixed workweek, a marginal increase of  $\beta$  will have the same consequences for equilibrium efforts, but now the positive influence of altruism on the spouse's search effort will be stronger and the negative influence on the young's search effort will be weaker. This is so because the spouse's reaction function under a flexible workweek becomes flatter in the  $(s_2, s_3)$  plane; that is, becomes more sensitive to changes in  $s_3$ . The following proposition summarizes these results.

**Proposition 4** *Introducing a flexible workweek increases the search effort of the spouse and decreases the search effort of the young at an interior solution. Moreover, given an interior solution, the positive effect of a marginal increase in  $\beta$  on the spouse's search effort becomes stronger and the negative effect on the young's search effort becomes weaker.*

### 6.3 Comparing both scenarios

We have shown that introducing flexibility increases the spouse's participation in the labor market since, under this regime, she will be willing to work at lower wages. But now the young has a lower incentive to look for a job, because the increase in family income associated to the spouse's employment becomes a more likely outcome. The question is whether introducing flexibility may reduce the difference in search efforts between "modern" and "traditional" families. We will show that the difference between the equilibrium search efforts of the young increases with flexibility, whereas the response of spouses in either type of family becomes smaller. The intuition is that the negative effect of flexibility on the young's search effort will be more severe when the young wages are relatively low because, in that case, the probability of benefiting from a family transfer is also larger.

**Proposition 5** *Under conditions in Proposition 3, a flexible workweek increases the difference  $s_3^M - s_3^T$  and decreases the difference  $s_2^M - s_2^T$ .*

## 7 Final comments

In this paper we have built a simple model economy in which the prevailing family structure arises endogenously as a response to labor market conditions. The key element that drives this result is the presence of a home (non-market) good. We have shown that if the employed young adults perceive their market wage to be very low, they stay at their parents' home, and they leave otherwise. In the former case their search effort is lower than in the second, and this has implications for the spouses' search behavior. In case the employed young stays at home, the spouse's marginal utility of working at home increases and so her search effort decreases. In an economy where employment rates depend on the individuals' search efforts, other things being equal, this search behavior will imply high unemployment rates for young adults that decide to live with their parents and for their mothers. These results seem to match some of the evidence we have for Spain, where the majority of young adults stay at the parental house and unemployment affects mainly to young adults and female spouses..

Several assumptions have been made that need some discussion. We have assumed throughout the paper that the head of the household is employed. The model, therefore, cannot capture the full interaction between the three members of the family but delivers predictions on how youth's and the spouse's reservation wages change with the head's earnings and could be used to analyze the interaction between head's and young adult's search efforts.

We have also assumed that head and spouse allocate consumption according to a sharing rule that does not depend on employment status. A straight extension of the model would be to allow for it. Our intuition is that the spouse's reservation wages will be affected and, in fact, they will decrease, which implies that her search effort will be higher for any given level of the youth's search effort. Nevertheless, the employed youth's decision of leaving or staying does not depend on the sharing rule and will not change: the young adult will stay if his wage is low enough and, in that case, the search effort of the unemployed young will also be low. There still will be two effects of opposite sign on the spouse's search effort: on the one hand a lower young's effort induces a higher effort in the spouse but, on the other hand, her marginal utility of working in the market will fall. Thus, we believe the results of the paper will remain essentially unchanged.

Another assumption is that the model is abstracted away from leisure. Introducing leisure decisions would not alter the main results of the paper. If individuals obtained utility from leisure they would have higher reservation wages and lower search efforts than in the current setting, but the type of interaction between the spouse and the youth will still appear in this extended framework. Finally, we have used a simple form of logarithmic preferences. This assumption has unable us to obtain closed solutions for the young adult's threshold wage and for the spouse's reservation wages which, in turn, do not depend on the parents' sharing rule parameter. Allowing for more general preferences will not affect the qualitative results of the model.

Bentolila and Ichino (1999) find that unemployment imposes on German and British households larger losses of consumption than on its Italian and Spaniard counterparts.



They argue that the transfers activated by family ties are the main responsible for the lower loss in Southern countries. The insurance mechanism activated by the family has two consequences: It decreases the cost of setting public programs to subsidize unemployed individuals but, on the other hand, it affects the incentives the individuals have to look for a job. Whether these incentives are positively or negatively affected by family ties will depend on the status of the individual within the family. To make a quantitative assessment of the distortions that family ties create we need to model the household and how all its members interact. This model is just a first step in this direction.

Table 1: Young individuals living with their parents, by age group, as percentage of age group totals.

Sex	Men				Women			
Age group	20-24		25-29		20-24		25-29	
Year	1986	1994	1986	1994	1986	1994	1986	1994
Spain	88.1	91.5	53.2	65.8	76.6	84.3	35.3	47.6
Italy	87.8	92.2	49.6	66.0	70.4	82.4	25.5	44.1
France	56.9	61.8	19.3	22.5	36.4	41.6	8.4	10.3
U. Kingdom	57.2	56.8	21.9	20.8	33.8	37.0	8.6	10.8

Source: Cantó-Sánchez and Mercader-Prats (1999).

Table 2: Youth unemployment rates by age group in 1994. Different EU countries.

Unemployment rate	Young	Total
Spain	45.0	24.10
Italy	32.1	11.30
France	29.5	12.60
U. Kingdom	14.7	9.3

Source: Eurostat (1996).

Table 3: Distribution of unemployed workers by family status, 1993. As percentage of total unemployment.

	Living in family						% of unem. in fam. with 0 employed
	Spouses		Single parents		Young	Total	
	Men	Women	Men	Women	and others		
Spain	20.40	19.60	0.20	1.60	56.20	98.10	36.90
Italy	11.70	17.50	0.60	1.80	65.30	97.00	31.90
France	24.20	33.50	0.60	4.70	25.30	88.30	34.50
U. Kingdom	32.50	16.10	1.10	4.40	28.20	82.20	41.10

Source: OECD Employment Outlook (1995).

Table 4: Distribution of individuals aged 18-35, by activity, and as percentage of totals.

LIVING WITH THEIR PARENTS	Men		Women	
	YES	NO	YES	NO
Percent. of total	66.71	33.29	55.47	44.53
Working	45.73	82.88	31.51	33.13
Studying	25.20	1.40	36.57	4.56
Work. and stud.	4.11	7.45	5.55	3.79
Not work, not stud.	24.96	8.27	26.37	58.52

Source: Martínez-Granado and Ruiz-Castillo (1998).

Table 5: Temporary jobs held by new school leavers aged 16 to 29 years one year after leaving school. As percentage of all jobs held.

	Men			Women		
	Total	Training	Involuntary	Total	Training	Involuntary
Spain	85.8	15.5	69.4	87.4	14.6	71.0
Italy	32.8	53.5	17.7	51.9	41.4	25.2
France	68.3	33.5	-	66.3	28.9	-
U. Kingdom	27.3	11.7	25.9	25.7	10.0	25.3

Source: Cantó-Sánchez and Mercader-Prats (1999).

Table 6: Mean of hourly wages for individuals aged 23-30 according to level of education and whether they live with their parents or not.

	Level of education attained			Total
	Primary ed.	High school	College	
Independant	607.42	775.96	1036.19	809.62
Dependant	614.05	608.66	902.37	691.88
Dep. as % of Ind.	101.10	78.44	70.10	85.45

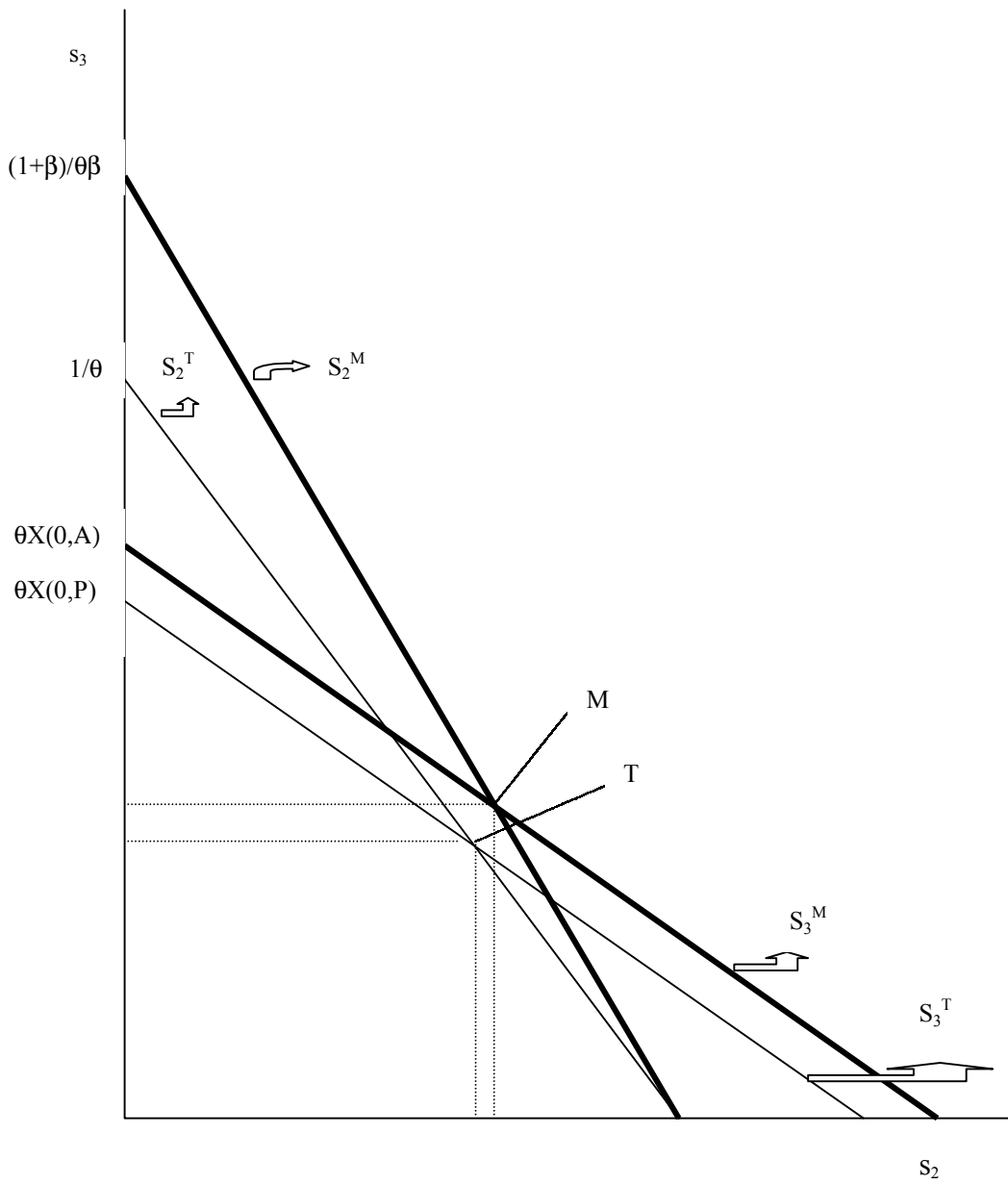
Source: *Panel Europeo de Hogares* (POGUE) 1993-1994.

Table 7: Unemployment rates by sex and by relationship to head of household

	Men		Women	
	Active	U rate	Active	U rate
Head	6,119.50	9.38	806.70	17.52
Spouse	294.60	8.02	3,075.20	22.85
Children	3,034.80	27.52	2,202.30	39.07

Labor Force Survey, last quarter 1997.

Active population in thousands



**Figure 1:** “Modern” and “Traditional” families searching efforts. The spouse wage relative to the head’s wage is the same,  $\omega_2^M = \omega_2^T$ . The young adult’s wage relative to the head’s wage are different,  $\omega_3^M > \omega_3^T$ .

# Appendix

**Proof of Lemma 1.** If  $h_3 = 0$  the young trivially stays. If  $h_3 = 1$ , there are two cases: (i)  $h_2 = 1$ . For any  $w_3 < \eta(1)$  is easy to check that  $V_3(1, 1, P) = V_3(1, 1, A, T)$ . Thus, we assume he stays. For any  $w_3 \geq \eta(1)$  the employed young living out of his parents' house does not receive any transfer,  $T = 0$ , and  $V_3(1, 1, P) \leq V_3(1, 1, A)$ . The inequality holds strictly if  $w_3 > \eta(1)$ . (ii)  $h_2 = 0$ . Then for any  $w_3 < \eta(0)$  we have that  $V_3(1, 1, P) > V_3(1, 1, A, T)$ , so the young stays. If  $w_3 \geq \eta(0)$  we have two cases. If  $w_3 \in [\eta(0), w_3^L]$  the young stays. We just have to compare  $V_3(0, 1, P)$  and  $V_3(0, 1, A)$ . By definition of  $w_3^L$ , for any  $w_3 \geq w_3^L$ , the youth leaves without any transfer.

**Proof of Lemma 2.** The expression of the reservation wages come from direct comparison of  $V_2(1, h_3, P)$  and  $V_2(0, h_3, P)$ , shown in expression (12).

**Proof of Lemma 3.** The expression of the reservation wages come from direct comparison of  $V_2(1, h_3, A, T)$  and  $V_2(0, h_3, A, T)$ , shown in expression (14).

**Proof of Lemma 4.** The expression of the reservation wages come from direct comparison of  $V_2(1, h_3, A)$  and  $V_2(0, h_3, A)$ , shown in expression (16).

**Lemma A1:** If  $\eta(1) \leq w_3 < w_3^L$ , then  $\omega_2 < r_2(1, P)$ . *Proof:* (1)  $\eta(1)/w_1 = \beta(1 + \omega_2)$ ,  $w_3^L/w_1 = 1/\left[\left(\frac{1+\beta}{\beta}\right)\left(\frac{b}{b+a}\right)^\delta - 1\right] \equiv \omega_3^L$ . (2)  $r_2(1, P) = \left[\left(\frac{b+a}{b}\right)^\delta - 1\right](1 + \omega_3)$ . (3) Suppose that  $\omega_2 \geq r_2(1, P)$ . Summing up 1 to each side of the inequality and taking into account that  $1 + \omega_2 \leq \omega_3/\beta$ , it yields that  $\omega_3 \geq \omega_3^L$ , which is false. Therefore,  $\omega_2 < r_2(1, P)$ .

**Proof of Lemma 5.** If  $h_3 = 0$ , then  $V_3(h_2, 0; P) \geq V_3(h_2, 0; A, T)$ , so the young stays. If  $h_3 = 1$ : (i) If the young leaves, then  $T > 0$  but  $V_3(h_2, 1; P) \geq V_3(h_2, 1; A, T)$  for all  $h_2 \in [0, 1]$ , so he stays. (ii) If the young leaves, then  $T = 0$  and  $h_2 = h_2(1; A)$ . If the young stays, then  $h_2 = h_2(1; P)$ .  $V_3(h_2(1; A), 1; A) \geq V_3(h_2(1; P), 1; P)$  iff  $w_3 \geq w_3^L(h_2(1; P))$  since  $V_3(h_2, 1; A)$  does not depend on  $h_2$ . So he stays if  $w_3 < w_3^L(0)$ , he leaves if  $w_3 \geq w_3^L(h_2(1; P))$ , and if  $w_3^L(0) \leq w_3 < w_3^L(h_2(1; P))$ , he leaves if  $h_2 = 0$  or he stays if  $h_2 = h_2(1; P)$ .

**Proof of Lemma 6.** (a)  $h_2(h_3; P) = \arg \max V_p(h_2, h_3; P)$  subject to  $h_2 \in [0, 1]$ . The result follows from (12) in the text. (b)  $h_2(h_3; A) = \arg \max V_p(h_2, h_3; A)$  subject to  $h_2 \in [0, 1]$ . It follows from (16) that  $h_2(h_3; A) = h_2(0; P)$  since  $V_3(h_2, h_3; A)$  does not depend on  $h_3$ .

**Proof of Corollary** The results follow from Lemma 8 and Lemma 9, since the young always stays when the spouse is employed if  $w_3 < w_3^L(h_2(1; P))$ . And he leaves otherwise.

**Proposition A1.** Under a fixed workweek, there always exists a unique interior solution to the searching game. *Proof:* Let  $\tilde{S}_3(s_2) = S_2^{-1}(s_2)$ . (1) The young stays. Case 1: It follows from (20) and (21) that  $\tilde{S}_3(0) > 1$  and  $S_3(0) < 1$  for reasonable values of  $\omega_3$  (i.e.:  $w_3/w_1 \leq 9$ ). Moreover,  $S_3(s_2) = 0$  at  $s_2 > 1$  since  $\omega_2 < r_2(1; P)$  at Case 1, and  $\tilde{S}_3(s_2) = 0$  at  $s_2 < 1$  since  $\omega_2 < 1$ . Therefore,  $\tilde{S}_3(s_2)$  cuts  $S_3(s_2)$  at an interior solution. Case 2: Taking into account that  $1 > Y(0; P) > Y(1; P)$ , the above results also apply to equations (23) and (24), but now  $S_3(s_2) = 0$  at  $s_2 > 1$  because  $\omega_2 + \omega_3 > \omega_2$ . (2) The

employed young always leaves. From (27) and (29), the same as before applies, but now  $S_3(s_2) = 0$  at  $s_2 > 1$  because  $\omega_3 \geq \omega_3^L$ .

**Proof of Proposition 1.** It follows from Lemmas 1 to 4 and Lemma A1.

**Proof of Proposition 2.** (1) The young stays. (i) The strategic effect of  $s_2$  on  $S_3$  is given by  $S_3'(s_2)$ . If the gender gap between spouses wages is large (Case 1), it follows from (20) that  $S_3'(s_2)_{C1} = -\theta^2 Y(0; P)_{C1}$ ; if this gender gap is relatively small (Case 2), it follows from (23) that  $S_3'(s_2)_{C2} = -\theta^2 [Y(0; P) - Y(1; P)]_{C2}$ . Let  $\Lambda(\omega_2) = |S_3'(s_2)_{C1}| - |S_3'(s_2)_{C2}| = \theta^2 \left[ \log(1 + \omega_2) + \log\left(\frac{1 + \tilde{\omega}_2/(1 + \omega_3)}{1 + \tilde{\omega}_2}\right) + \delta \log \frac{b}{b+a} \right]$  where  $\omega_2 \in [r_2(0; P), r_2(1; P))$  and  $\tilde{\omega}_2 \in [r_2(1; P), 1)$ . Let  $\bar{\omega}_2$  be such that  $\Lambda(\bar{\omega}_2) = 0$ . Then,  $\log(1 + \bar{\omega}_2) > \log(1 + r_2(1; P))$  iff  $\left(\frac{b+a}{b}\right)^\delta < 1 + \frac{\tilde{\omega}_2}{1 + \omega_3}$ , the last inequality is true by definition of  $\bar{\omega}_2$ . It follows that  $\bar{\omega}_2 > r_2(1; P)$  and so  $\Lambda(\omega_2) < 0$  for  $\omega_2 \in [r_2(0; P), r_2(1; P))$ , since  $\Lambda'(\omega_2) > 0$  for all  $\omega_2 > 0$ . Therefore, the strategic effect (in absolute value) is larger in Case 2 than in Case 1. The same result follows for  $S_2$  with respect to  $s_3$  since  $|S_2'(s_3)_{C1}| - |S_2'(s_3)_{C2}| = \theta^2(1 + \beta)\Lambda(\omega_2)$ . (ii)  $S_2(s_3)$  shifts outwards and becomes steeper in the  $(s_2, s_3)$  plane under a marginal increase of  $\beta$ , whereas  $S_3(s_2)$  is not affected, both in Case 1 and Case 2. Hence,  $s_2^* > s_2^*$  and  $s_3^* < s_3^*$ . The shift in  $S_2(s_3)$  increases with the strategic effect. It follows that the effect of  $\beta$  will be stronger in Case 2 than in Case 1. (2) The employed young leaves. The reactions functions do not change as we increase  $\omega_2$ , and since  $Y(0; P)$  is increasing in  $\omega_2$ , the results follow.

**Proof of Proposition 3.**  $S_3^M(s_2) > S_3^T(s_2) \forall s_2$  and both functions have the same slope.  $S_2^M(s_3) > S_2^T(s_3)$  for all  $s_3 > 0$  and the former is steeper (in absolute value) in the  $(s_2, s_3)$  plane. It follows that  $s_3^M > s_3^T$ . If  $S_3^M(0)/S_3^T(0) < (1 + \beta)/\beta$ , then  $s_2^M > s_2^T$ . This sufficient condition is equivalent to

$$(1 + \omega_3^T) \geq \left[ \left(\frac{b}{b+a}\right)^\delta \left(\frac{\omega_3^M}{1 + \omega_3^M}\right) \left(\frac{1 + \beta}{\beta}\right) \right]^\beta.$$

**Proof of Proposition 4.** (1) A marginal increase in  $\beta$  does not affect  $S_3^{FT}(s_2)$  and shifts  $S_2^{FT}(s_3)$  outwards in the  $(s_2, s_3)$  plane, which becomes flatter. Therefore,  $s_3^{FT}$  decreases and  $s_2^{FT}$  increases with  $\beta$ . The shift in  $S_2^{FT}(s_3)$  is proportional to  $Y^F(0; P)$  and hence flexibility enhances the positive effect of  $\beta$  on  $s_2$ . Since  $S_2^{FT}(s_3)$  is steeper (flatter in the  $(s_2, s_3)$  plane) than  $S_2^T(s_3)$  in the fixed workweek case, it follows that the negative effect of  $\beta$  on  $s_3^S$  is weaker in the flexible workweek case. (2)  $S_3^{FM}(s_2)$  shifts to the origin, since  $X(0; A, P)$  is decreasing in  $\beta$ , but its slope is not affected.  $S_2^{FM}(s_3)$  becomes flatter in the  $(s_2, s_3)$  plane as before, but now for very large values of  $s_3$ , a marginal increase in  $\beta$  lowers  $s_2$ :  $S_2^{FM}(s_3)_\beta \leq S_2^{FM}(s_3)_\beta$  for  $s_3 \geq 1/\theta > 1$ . It follows that, in equilibrium,  $s_2^{FM}$  increases and  $s_3^{FM}$  decreases with  $\beta$ . For the same reason as in (1) flexibility in the workweek enhances the positive effect of  $\beta$  on  $s_2$ . Likewise, the indirect (negative) effect of  $\beta$  on  $s_3^{FM}$  is weaker than in the fixed workweek case, and the direct (also negative) effect that operates through  $X(0; A)$  is the same, so the overall effect of  $\beta$  on  $s_3^{FM}$  is weaker than in the fixed workweek case.

**Proof of Proposition 5.** Computing the interior solutions for the “modern” family (equations (27) and (29)), and for the “traditional” family (equations (20) and (21)), respectively, it is easy to see that  $s_3^M - s_3^T = A + B$ , where the factor  $A$  is equal

to  $\theta^3 (1 + \beta) Y^2 [1 / (1 - \theta^4 (1 + \beta) Y^2) - 1 / (1 - \theta^4 \beta Y^2)]$  and  $B = \theta X^M / (1 - \theta^4 \beta Y^2) - \theta X^T / (1 - \theta^4 (1 + \beta) Y^2)$ .

Introducing flexibility increases the value of  $Y$ , and both  $A$  and  $B$  are strictly increasing in  $Y$ . Therefore,  $s_3^{FM} - s_3^{FT} > s_3^M - s_3^T$ . Then, it must be true that  $Y^F \cdot (s_2^{FM} - s_2^{FT}) < Y \cdot (s_2^M - s_2^T)$  and hence that  $s_2^{FM} - s_2^{FT} < s_2^M - s_2^T$ , since  $Y^F > Y$ .

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