

## Childcare and geographical mobility in southern Europe

Ildefonso MENDEZ\*

**Abstract.** *This article investigates the association between the availability of childcare and low geographical mobility in southern Europe where, the author argues, couples that have or plan to have children live close to their parents in order to reconcile work and family life by taking advantage of their mothers' low labour force participation rate. He presents a behavioural model showing couples' fertility, female employment and mobility decisions, and tests the model's predictions using ECHP data. The deterrent effect of a woman working on the couple's mobility is found to be significant only for couples who have children and live in southern Europe.*

Internal geographical mobility is known to be lower in Europe than in the United States. Greece, Italy, Portugal and Spain stand out within Europe for the low mobility of their population and, in particular, for the small annual proportion of people that change their region of residence. According to the Organisation for Economic Co-operation and Development (OECD, 2005), inter-regional mobility rates in 2003 measuring the ratio of gross outflows to population were approximately 0.2 per cent in Greece and Spain and 0.5 per cent in Italy and Portugal, but were much higher in France (2.1 per cent), Germany (1.4 per cent) and the United Kingdom (2.3 per cent). Interestingly, there are almost no differences between countries when looking at intra-regional mobility rates; in 2001, these were approximately 2.5 per cent in Greece, Italy and Germany and around 4 per cent in Spain, the United Kingdom and France.<sup>1</sup>

This article investigates the determinants of low inter-regional mobility in southern Europe. This is a fundamental issue for southern European

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\* University of Murcia, email: ildefonso.mendez@um.es. The author is grateful for Samuel Bentolila's advice and supervision, and for the comments received from María Dolores Collado, Juan José Dolado, Pedro Jesús Hernández, Ángel López, Ernesto Villanueva and seminar participants at the Centre for Monetary and Financial Studies (CEMFI) and University of Murcia. This article draws on an earlier CEMFI Working Paper by the author (see Mendez, 2008).

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<sup>1</sup> Author's calculations, using European Community Household Panel (ECHP) data.

countries, given their pronounced regional disparities (*ibid.*) and the fact that, in a single currency area, other policy instruments such as exchange rate realignments are not available to adjust to regional shocks.

Research on low geographical mobility has focused on institutional factors such as unemployment insurance schemes. Hassler et al. (2005) argue that differing levels of unemployment benefits account for the difference in mobility rates between the United States and Europe; Europe has more generous benefits and lower mobility. However, Tatsiramos (2009) finds that receiving benefits is not necessarily associated with lower mobility in Europe, since benefits might increase mobility by relaxing liquidity constraints in the presence of mobility and search costs.

Type of housing is also stressed in the literature as a determining factor in mobility. The common finding is that renters living in social housing, and owners, are more reluctant to move for job-related reasons, as described in, for example, Barceló (2003). Ownership rates in the United Kingdom and the United States, however, are close to those for Greece and Italy and, together with Sweden, are at the top of the OECD ranking when ownership and social renting are jointly considered.

The empirical literature has also shown that family ties and local social capital deter mobility (Spilimbergo and Ubeda, 2004; Munshi and Rosenzweig, 2009; David, Janiak and Wasmer, 2010). Alesina and Giuliano (2010) argue that culture, as expressed by the strength of family ties, affects mobility, and find that strong family ties result in greater reliance on the family as an economic unit, and lower spatial mobility, using data for over 70 countries. However, their hypothesis cannot explain the low levels of inter-regional mobility within developed countries, since they rank Italy, Spain and the United States together as countries with strong family ties, while Greece is ranked close to Norway and characterized as a country with weaker family ties than France, Italy, Spain, the United Kingdom and the United States.

This article analyses the effect of childcare opportunities on the geographical mobility of couples who have, or are planning to have, children. I argue that in southern Europe, young adults living as part of a couple choose to live close to their parents in order to reconcile work and family life, once they have children, by taking advantage of the low labour force participation rate of their mothers. That is likely to be their optimal residential choice since, among developed countries, southern European countries have the highest intergenerational gap in female labour force participation rates, the greatest degree of “rationing” in the public provision of childcare services – i.e. the least number of places per 100 children – and the greatest time transfers from mothers to young adults in the form of grandparenting time.

A partial-equilibrium job search model is presented in which couples make decisions regarding fertility, female employment and inter-regional mobility, taking into account the availability of different childcare arrangements. Family caregivers – i.e. grandmothers – do not migrate with the couple, thus making couples that have children and access to grandparenting more reluc-

Table 1. Gross internal mobility flows as a percentage of the population aged 15–64

	Inter-regional flows <sup>a</sup>						Intra-regional flows <sup>b</sup>
	Total	Age groups		Educational attainment			
		15–24	25–64	Less than upper secondary	Upper secondary	Tertiary	
Greece	0.21	0.56	0.13	0.12	0.25	0.44	2.38
Italy	0.58	n.a.	n.a.	n.a.	n.a.	n.a.	2.48
Portugal	0.54	n.a.	n.a.	n.a.	n.a.	n.a.	3.33
Spain	0.20	0.23	0.19	0.13	0.23	0.33	3.90
France	2.11	3.79	1.70	1.16	1.98	4.13	4.21
Germany	1.36	2.27	1.18	0.97	1.35	1.97	2.58
Sweden	1.79	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
United Kingdom	2.28	3.80	1.94	1.16	1.93	3.90	4.08
Australia	2.01	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Canada	0.95	1.55	0.8	n.a.	n.a.	n.a.	n.a.
Japan	2.21	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
United States	3.05	4.09	2.77	2.34	3.00	3.53	n.a.

<sup>a</sup> Gross outflows as a percentage of the population aged 15–64, 2003 (2001 for Greece, Japan and Sweden, 2002 for France and Italy). <sup>b</sup> Author's calculations using ECHP data for 2001.

Source: OECD (2005).

tant to migrate. The model is used to simulate the effects of changes in the availability of family-provided childcare.

The predictions of the model are tested using European Community Household Panel (ECHP) data for the period 1994–2001. For couples living in southern Europe, the presence of children in the household deters mobility if the woman works and if mobility is of the inter-regional kind. Similarly, couples where the woman works are less likely to move – particularly an inter-regional move – if they have children. Not accounting for the endogeneity of the woman's employment status results in considerable underestimation of the deterrent effect on inter-regional mobility of the woman working. Women in couples with children living in southern Europe are more likely to be employed, and employed women are more likely to have children, if they live in regions with greater access to family-provided childcare. For couples living in other European countries, the woman's employment status and the presence of children in the household are not found to be correlated with geographical mobility or to the regional availability of family-provided childcare.

The remainder of this article is divided into four sections. The first describes current macroeconomic evidence on country differences in internal mobility, childcare opportunities and female labour force participation. The second section presents the behavioural model. The third section describes the data, methodology and results. The fourth and final section presents the conclusions.

## Macroeconomic evidence

There is significant variation in internal mobility within developed countries. As shown in table 1, inter-regional mobility rates are lower in Europe than in the United States. In Europe, however, the situation is not uniform across countries; while the United Kingdom has particularly high rates, southern European countries – Greece, Italy, Portugal and Spain – stand out for their low rates.

Young people aged 15–24 and the highly educated are the most mobile groups, for all countries. However, inter-regional mobility rates for the young and the highly educated in Greece and Spain are lower than those for the old and the least educated, respectively, in France, Germany, the United Kingdom and the United States. Conversely, intra-regional mobility rates in southern Europe are close to those for other large European countries.

### *Internal mobility and grandparenting time*

The Survey of Health, Ageing and Retirement in Europe (SHARE) is a cross-national survey of the population of individuals aged over 50 in a number of European countries.<sup>2</sup> Respondents provide detailed information on their and their children's sociodemographic characteristics and labour status, on the residential location of their children and the frequency of contact with them. Data from the first wave of SHARE data for 2004 (Wave 1, Release 3) are analysed for France, Germany, Greece, Italy, Spain and Sweden, instead of the 2006 Wave 2 data, because the data are closer in time to the years used for the estimation, i.e. 1994–2001 (the statistics in table 2 remain almost unchanged when using Wave 2 data). The Health and Retirement Study (HRS)<sup>3</sup> is used to obtain comparable indicators for the United States.<sup>4</sup> Respondents aged over 70 are excluded since, in view of their increasing health difficulties, net time transfers may flow from young adults to their parents instead.

As seen in table 2, young adults aged 20–35 in a couple in southern Europe live closer to their mothers than in France, Germany, Sweden and the United States;<sup>5</sup> approximately three out of four live less than 25 km away from their mothers in southern Europe. That number is more than 20 percentage points higher than for France, Sweden and the United States, and more than 10 points higher than for Germany.

The singularity of southern Europe also emerges regarding the frequency of grandparenting. Close to 50 per cent of southern European grandmothers

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<sup>2</sup> <http://www.share-project.org>.

<sup>3</sup> <http://hrsonline.isr.umich.edu>.

<sup>4</sup> While the English Longitudinal Study of Ageing (ELSA) provides similar information for the United Kingdom, it does not inform on the residential location of young adults that have left home, and grandparenting time cannot be isolated from help flows to other family members, neighbours or friends.

<sup>5</sup> The picture remains largely unchanged if focusing on daughters. However, the sample size for some countries and population groups is too low to investigate this.

Table 2. Grandparenting time (hours) and where young adults in a couple live in relation to their mothers, 2004

Country	Live close (%) <sup>d</sup>	Daily care (%) <sup>e</sup>	Grandparenting time						
			Median (mean) weekly hours <sup>a</sup>						
			Young adults in a couple living:		Woman in couple is: <sup>b</sup>		Grandchild <sup>b</sup> Age of youngest grandchild <sup>c</sup>		
			Close (hours)	Far (hours)	Employed (hours)	Non-employed (hours)	< 3	3–6	≥ 6
Greece	73.4	46.1	35.1 (38.0)	4.0 (6.7)	42.1 (42.1)	14.5 (26.6)	48.0 (43.9)	22.8 (29.7)	32.0 (51.6)
Italy	74.4	54.4	21.1 (25.3)	12.0 (11.9)	28.1 (27.7)	14.0 (22.5)	21.1 (21.1)	24.6 (26.0)	42.1 (40.8)
Spain	75.6	47.8	28.1 (28.5)	11.0 (17.5)	28.1 (32.3)	15.0 (20.6)	28.1 (31.6)	35.5 (28.0)	28.1 (34.8)
France	52.0	12.0	7.5 (16.8)	5.4 (12.0)	7.0 (17.9)	5.5 (9.0)	7.5 (11.9)	8.0 (22.9)	5.0 (21.9)
Germany	61.6	25.6	7.0 (13.1)	6.7 (8.1)	7.0 (13.9)	7.0 (11.0)	7.5 (11.8)	9.0 (15.2)	6.8 (17.6)
Sweden	51.3	3.6	4.6 (7.9)	3.6 (5.7)	5.0 (8.4)	3.5 (6.0)	4.0 (4.7)	5.3 (9.2)	4.0 (7.0)
United States	46.0 <sup>f</sup>	n.a.	2.9 (9.7)	1.9 (7.3)	2.9 (10.5)	1.9 (3.7)	4.8 (13.9)	2.1 (8.3)	

<sup>a</sup> Respondents taking care of their grandchildren at least one hour a week. <sup>b</sup> Only applies to young adults living close to their mother. <sup>c</sup> The HRS only informs on whether the youngest grandchild is under two or not. <sup>d</sup> Young adults aged 20–35 living less than 25 km from their mothers. <sup>e</sup> Grandmothers taking care of their grandchildren on a daily basis, of those doing so for at least one hour a week. <sup>f</sup> Young adults living less than 10 miles (16 km) from their mothers.

Source: Author's calculations using SHARE Wave 1 Release 3 and HRS data.

that take care of their grandchildren do so almost every day (“daily care” column). The corresponding numbers for their German, French and Swedish counterparts are 26, 12 and 4 per cent, respectively. These differences translate into differences in the number of weekly hours of grandparenting enjoyed by young adults in couples living close to their mothers. At the top of the distribution, the median time that Greek grandmothers devote to caring for grandchildren who live near them is 35 hours a week; close to the Greek record are Spanish and Italian grandmothers, with a median of 28 and 21 hours per week, respectively. Grandparenting time in other countries is much lower, particularly in Sweden and the United States.

The fact that country differences in grandparenting time substantially narrow when looking at young adults in couples living far from their mothers suggests that the opportunity cost of living far from the mother is highest for southern European couples. The median grandparenting time enjoyed by young adults in a couple living close to their mothers in Greece, Italy and Spain is 31, 9 and 17 hours higher than the corresponding median for those

living far away, respectively. In other countries, the difference amounts to a maximum of two hours per week.<sup>6</sup>

Table 2 also shows that, for young adults in a couple living close to their mothers, grandparenting time is higher if the woman in the couple is employed, particularly so in Greece, where the median grandparenting time is slightly higher than the 40-hour standard working week. In Italy and Spain, working young adults living close to their mothers receive almost 30 hours of grandparenting time per week. Median grandparenting time is low in the remaining countries, regardless of the employment status of the woman in the couple. Grandparenting time remains at high levels in southern Europe even when the youngest grandchild is aged over 6, and therefore in formal education. Overall, the statistics in table 2 indicate that southern European grandmothers play a fundamental role in their children's work-life balance strategy, even when their grandchildren are enrolled in formal education.

### *Internal mobility and labour force participation*

Table 3 shows labour force participation rates by sex and age for a number of developed countries. While male participation rates are fairly similar across countries, female participation rates are more disparate. Furthermore, while the participation rate of southern European women aged 25–34 is close to the OECD average for that population group, that of women aged over 45 is, on average, 40 per cent lower than the corresponding average. That is, southern European countries show the largest intergenerational gap in female participation rates. In fact, there is practically no intergenerational gap in any country outside southern Europe.<sup>7</sup>

This empirical evidence suggests that southern European countries are those with the highest stock of potential family caregivers – i.e. women aged over 45 not participating in the labour market – and are also those with the highest proportion of working women with non-participating mothers. The cross-country correlation between inter-regional mobility rates and female labour force participation rates are highest – close to 0.75 – when considering cross-country differences in the participation rate of women aged over 45.

### *Internal mobility and childcare services*

Access to family-provided childcare deters mobility when alternative services of similar cost and quality are scarce or unavailable. As seen in table 4, south-

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<sup>6</sup> The opportunity cost is zero if young adults receive monetary transfers from their parents to compensate them for the childcare services they lose when living far from them. Author's calculations using SHARE data show that only 4 per cent of young adults living far from their mothers receive monetary transfers from them, with almost no variance across countries. Monetary transfers intended to help daughters to buy a house, meet legal obligations or finance further education are excluded, as are those that are unemployment-related.

<sup>7</sup> The same picture emerges when looking at differences in employment rates (see Mendez, 2008, table 5).

Table 3. Labour force participation rates by sex and age

	Women					Men				
	25-34	35-44	45-54	55-64	(3) over (1)	25-34	35-44	45-54	55-64	(7) over (5)
Greece	66.1	61.7	45.3	24.5	68.6	95.0	97.0	91.4	59.3	96.3
Italy	60.7	58.9	44.2	15.2	72.8	87.9	96.0	87.4	44.9	99.4
Portugal	81.1	78.7	65.8	38.1	81.1	92.7	95.1	90.8	63.2	97.9
Spain	69.6	59.6	42.3	20.8	60.8	92.4	95.2	90.7	57.5	98.2
Finland	77.6	87.8	87.3	41.5	112.5	90.9	92.7	87.3	45.4	96.0
France	78.0	79.2	75.6	31.6	96.9	94.1	96.4	93.4	42.0	99.2
Germany	74.3	77.1	72.8	32.8	97.9	91.1	96.0	92.7	54.2	101.7
Norway	80.2	84.4	81.6	59.5	101.8	90.8	93.3	91.0	73.8	100.2
Sweden	82.0	88.4	88.5	64.5	107.9	89.2	92.4	91.6	71.8	102.7
United Kingdom	73.2	76.6	75.4	40.8	102.9	93.7	93.1	88.8	63.2	94.7
OECD average	66.2	69.7	66.2	37.4	100.1	93.5	94.7	90.5	63.1	96.8
Std. Dev.	6.4	9.7	14.4	14.2		2.1	1.8	2.6	12.3	
Australia	68.3	70.9	68.4	31.3	100.1	92.8	92.2	87.9	60.9	94.7
Canada	77.7	79.0	73.2	38.0	94.2	91.4	92.4	88.8	59.4	97.1
Japan	62.1	65.8	69.8	49.2	112.3	97.0	97.9	97.4	84.9	100.5
United States	75.6	77.3	75.7	50.4	100.2	93.1	92.6	89.0	67.1	95.6

Note: The table reports average values for the period 1994–2000.

Source: OECD Labour Force Statistics database, available at: <http://stats.oecd.org>.

ern European countries are those with the lowest number of publicly provided childcare slots for children under three years old per 100 children, and also those with the lowest proportion of preschool children using formal (public or private) childcare services. As seen in Del Boca and Vuri (2007) for Italy, public provision of childcare in southern Europe is severely “rationed” both in the number of places available and in the number of hours of care offered; owing to strict regulations, private provision is also scarce.

Childcare arrangements vary considerably across countries. While provision of these services is mainly public in the majority of central and northern European countries, in the United Kingdom and the United States private childcare is the most common arrangement outside the family network. The cross-country correlation between inter-regional mobility rates and the proportion of preschool children in formal childcare arrangements is 0.74.

Lastly, the low fertility rate now characterizing southern Europe has not translated into a high level of childlessness relative to other developed areas, as indicated in Bettio and Villa (1998). On the contrary, the proportion of southern European women who remain childless at the end of child-bearing age is well below that for other developed countries with a higher total fertility rate

Table 4. Summary indicators of childcare arrangements in selected OECD countries

	Publicly provided slots per 100 preschool children	Proportion of preschool children using formal childcare (public or private)
Greece	3	3
Italy	6	6
Portugal	12	12
Spain	2	5
Finland	21	n.a.
France	23	29
Germany (western)	3	10
Germany (eastern)	36	36
Sweden	33	48
United Kingdom	2	34
Australia	2	15
Canada	5	45
Japan	n.a.	13
United States	1	54

Source: Wrohlich (2008) and The Family Policy Database, Version 2, 2003, available from the LIS Cross-National Data Center (formerly Luxembourg Income Study) at: <http://www.lisdatacenter.org/resources/other-databases>.

such as Finland, Sweden and the United States.<sup>8</sup> Thus, childcare arrangements are an equally or even more relevant issue in southern Europe than in other developed countries with a higher total fertility rate.

## Female employment, fertility and mobility – a behavioural model

The partial-equilibrium job-search model is intended to show how the availability of different childcare arrangements affects a couple's decisions regarding fertility, female employment and geographical mobility. The model is similar to that of Barceló (2003) but I analyse the effect of childcare on a couple's mobility instead of the effect of homeownership on individual mobility.

The unit of analysis is a heterosexual couple without children, married or unmarried,<sup>9</sup> deciding about three things: their region of residence, whether to have a child or not, and whether the woman should work – i.e. their residence, “children status” and “female employment status”. To keep the model simple it is assumed that there are two regions in the economy: A and B, two time periods: 0 and 1, and that the man is always employed. However, on-the-job search is allowed for. Let  $\lambda U$  and  $\lambda E$  be the probability of getting a job offer when the man or woman is unemployed and employed, respectively. The man or woman can receive at most one offer in each region in each period.

<sup>8</sup> See Mendez (2008), table 8.

<sup>9</sup> Throughout the article, the terms “man” and “woman” refer to one half of a couple.



The probability of an employed woman losing her job is  $\delta$ . Let  $T$  denote the “standard” number of hours associated with a job and  $w_{1,t}^j$  and  $w_{2,t}^j$  represent the man’s and woman’s wages if employed in region  $j$  in period  $t$ .<sup>10</sup>

In the model, only women devote time to childcare. Apart from maternal time, two additional inputs can be used in the production of childcare services: time transfers from close relatives in the form of unpaid childcare, represented by  $I$  and referred to as “free care”, and formal alternatives, which include public and private caregivers.<sup>11</sup> The woman cares for the child herself if she remains unemployed. If she becomes employed the couple consumes  $I$  and, if this is lower than  $T$ , the couple pays the hourly price of formal childcare services,  $\pi$ , over  $T - I$  hours. Unpaid childcare is only available if the couple and their relatives live in the same region, and never exceeds the woman’s working hours. The couple has to live in the region where they work, and raising a child also requires a monetary cost,  $\varphi$ . Couples are assumed to have joint consumption and joint utility. The instantaneous utility function takes a constant relative risk aversion (CRRA) form, and couples’ utility per period is as follows:

$$u(c_t) = u_0 \frac{c_t^\alpha}{\alpha} \tag{1}$$

where  $\alpha > 0$  and  $u_0$  indicate that, for a given level of consumption, couples derive higher utility if they have a child. That is,  $u_0 > 1$  if they have a child and  $u_0 = 1$  otherwise. In the first period,  $t = 0$ , couples and their relatives live in region  $A$  and do not move. They decide on the woman’s employment status,  $L_2 = \{e_2, u_2\}$ , and on their children status,  $CH = \{ch, nch\}$ . The decision to be made in period  $t = 0$  is  $D_0 = \{(CH, e_1, e_2, w_{1,0}^A, w_{2,0}^A), (CH, e_1, u_2, w_{1,0}^A, b)\}$ , where  $b$  refers to non-wage income such as unemployment benefits. The decision problem is described by the following Bellman equation:

$$\begin{aligned} V_0 &= \max_{\{d_0, c_0\}} u(d_0, c_0) + \beta E [V_1(s_1, d_1^*)] / s_0, d_0 \\ \text{s.t. } c_0 &+ [h_0^A \mathcal{T}(T - I) + \varphi] n_0 = y_0 \\ I &\leq T, d_0 \in D_0, s_0 = (nch, e_1, u_2) \end{aligned} \tag{2}$$

where  $h_t^j$  indicates that the couple live in region  $j$  in period  $t$  and that the woman works,  $n_0$  indicates that they have a child and  $y_0$  is the couple’s total income. Couples take into account that the optimal decision in period  $t = 0$  will affect their utility in  $t = 1$  and discount it by the factor  $\beta$ . The budget constraint indicates that if they have a child and the woman remains unemployed ( $h_0^A = 0$ ), she cares for the child herself and the cost of raising the child resumes

<sup>10</sup> Wages are randomly drawn from the distribution function of each partner’s wage offer  $F_1(w_1)$  and  $F_2(w_2)$ , respectively, which are assumed to be independent of each other. Wage offers are independent and identically distributed across individuals and across regions. The remaining parameters of the model are assumed to be the same in both regions and for both partners.

<sup>11</sup> For simplicity, family-provided childcare is referred to as “free care”. It is acknowledged, however, that childcare provided by close relatives requires, at least, a transportation cost. Additionally, childcare provided by public institutions can also be for free, as is the case in some European countries for low-income families living in communities that have an income-dependent fee scheme for childcare facilities.

to the monetary cost  $\varphi$ . If she works, child-rearing costs include both the monetary cost and the cost of childcare services.<sup>12</sup>

At the end of  $t = 0$ , employed women lose their jobs with probability  $\delta$ . In period  $t = 1$ , both spouses may receive offers from regions A and B and may continue living in region A or move to region B. If they stay in region A they can continue working in the same jobs, or quit and accept other better-paid jobs. The couple takes the decision that maximizes their utility:

$$V_1(s_1 = (ch, E_1, l_2)) = \max_{\{d_1, c_1\}} u(d_1, c_1)$$

$$\text{s.t. } c_1 + [h_1^A \pi(T - I) + h_1^B \pi T + \varphi] n_0 = y_1 \quad (3)$$

$$I \leq T, L = \{e, u\}, d_1 \in D_1(CH, e_1, L_2)$$

The new term in the budget constraint indicates that relatives do not migrate with the couple and, thus, unpaid childcare is no longer available if the couple move to region B. Following Eckstein and Wolpin (1989), I sequentially solve the Bellman equation backwards, given the finite horizon structure of the model. In period  $t = 1$ , childless couples choose the highest income option from their choice set, no matter what region that option comes from. Couples with a child choose the option providing the highest net income after child-rearing costs; they may refuse the highest income option when it comes from region B and involves a job for the woman, due to the trade-off between the higher income they would earn and the higher childcare costs they would face in that region. Mobility costs for couples with children are increasing in  $I$  and  $\pi$ . The higher the value of  $I$  the lower the childcare costs in region A, and the higher the value of  $\pi$  the higher the cost of replacing unpaid childcare in region A by formal services in region B.

Unemployed women without children would accept a job if they were paid more than  $b$ , regardless of the region the offer is from. The same holds for unemployed women with children, in terms of net income; their reservation wage increases with  $\pi$  in both regions, and the higher the value of  $I$  the lower the reservation wage for accepting a job in region A.

Moving backwards, the woman's reservation wage in period  $t = 0$  depends on her children status and on job offer arrival rates. If, for a given children status, employed workers can change jobs more easily than the unemployed can find a job ( $\lambda_1 > \lambda_0$ ), women will prefer to accept a job in period  $t = 0$  despite the fact that they are going to be paid less than  $b$ . As in  $t = 1$ , for women with children, the reservation wage increases with  $\pi$  and decreases with  $I$ .

<sup>12</sup> The assumption that couples only use formal childcare services if family-provided childcare is lower than  $T$  is not crucial to the results. The decision problem remains the same if one assumes that couples prefer formal over informal childcare but there is rationing in the provision of formal services. Let  $\rho$  be the couples' subjective probability of getting a full-time slot in a childcare centre. The budget constraint in the Bellman equation in  $t = 0$  can now be written as  $c_0 + [h_0^A \pi(T - (1 - \rho)I) + \varphi] n_0 = y_0$ ,  $I = T$ ,  $\rho \in [0, 1]$ ,  $d_0 \in D_0$ ,  $s_0 = (nch, e_1, u_2)$ . This optimization problem is observationally equivalent to (2). Indeed, if the couple have a child, the woman works and they only use informal childcare, it cannot be known whether this is due to the fact that they were granted access to both formal and informal childcare services and they preferred family-provided childcare, or whether it is attributable to their choice set being restricted.

Having a child permanently increases the couple's utility for a given level of consumption ( $u_0$ ) but also lowers consumption via child-rearing costs. Rearing costs depend on  $\varphi$  and, if the woman works, on  $\pi$  and  $I$ . Higher values of both  $\varphi$  and  $\pi$  increase the cost of having a child, and thus the probability that the couple remain childless. The effect of  $I$  is a priori ambiguous, since it increases disposable income but at the same time lowers the probability of moving to region B in response to better employment prospects.

We will now consider some simulation evidence regarding the effect of  $I$  and  $\pi$  on female employment, fertility and family mobility. I use data from the 1994–2001 European Community Household Panel (ECHP) for Spain to set the values of  $\lambda_U$ ,  $\lambda_E$ ,  $b$ ,  $\delta$  and characterize the distribution of wages. Spain is a southern European country for which all the parameters of the model can be calibrated. Wage offers are drawn from a log-normal distribution function with mean 1.5 and standard deviation 0.5. The hourly price of formal childcare services is taken from Borra and Palma (2009) and the value of  $\varphi$  is set using data from the Institute for Family Policies (2007) on the cost of raising a child in Spain.

Parameter  $I$  is calibrated using the median of weekly hours of grandparenting time enjoyed by young adults in a couple, living close to their mothers in Spain (table 2), and  $T$  is set to 2,080 hours per year. Finally,  $u_0$  is set to match the distribution of couples in terms of children and the woman's employment status at the end of  $t = 0$  to that of ECHP Spanish couples where the woman is aged 25–45. I create a data set of 250,000 random couples and use 10,000 random observations for each pair of wage offers that might be received in period  $t = 1$  to evaluate the expected term in the value of each alternative in  $t = 0$ .

Tables 5 and 6 show the parameter values of the “benchmark” economy, calibrated using the main parameters of the Spanish economy, and the simulation results – i.e. the elasticities of mobility, female employment and fertility rates. A reduction in  $I$  increases both the reservation wage and expected childcare costs for a woman with children in region A, and thus lowers fertility and female employment rates. The elasticity of the woman's employment status with respect to  $I$  for couples with children is 0.26 and the elasticity of fertility with respect to  $I$ , conditioned on the woman working, is 0.38. These compositional effects increase inter-regional mobility since, for a given children status, couples move less if the woman works than if she does not and, for a given employment status, couples with children move less than childless couples. The reduction in  $I$  also lowers mobility costs for couples with children, and thus increases their group-specific mobility rate. The elasticity of inter-regional mobility with respect to  $I$  is  $-0.13$ .

Finally, the elasticities of female employment, fertility and inter-regional mobility with respect to  $\pi$  are all negative. A reduction in  $\pi$  lowers both the reservation wage and expected childcare costs of a woman with children, and thus increases fertility rates and female employment rates. Additionally, it lowers mobility costs for couples with children, increasing their group-specific mobility rate. The latter effect totally offsets the compositional effect and the elasticity of the inter-regional mobility rate with respect to  $\pi$  is approximately  $-0.25$ .

Table 5. Parameter values of the “benchmark” economy

Parameter	Value	Parameter	Value
$u_0$	1.20	$\delta$	0.05
$\beta$	0.98	$\pi$	0.60
$\alpha$	0.50	$\varphi$	1 144
$\lambda_0$	0.25	$T$	2 080
$\lambda_1$	0.30	$b$	0.495

Table 6. Simulation results: Elasticities of mobility, female employment and fertility rates

Increase by 35 per cent	Elasticities				
	Mobility	Female employment	Fertility	Female employment <sup>a</sup>	Fertility <sup>b</sup>
$I$	-0.129	-0.066	0.176	0.258	0.376
$\pi$	-0.251	-0.047	-0.200	-0.272	-0.435

<sup>a</sup> Conditioned on the couple having children. <sup>b</sup> Conditioned on the woman working.

## Data, methodology and results

Data from the 1994–2001 ECHP are used. The ECHP is a representative panel of households and individuals in 14 European countries,<sup>13</sup> which is particularly useful for the analysis of spatial mobility, since persons who move are followed up at their new location. It distinguishes between two types of residential move within a country: moves within the same region (intra-regional) and moves to a different region (inter-regional). Additionally, the ECHP informs on whether the move was for job-related, house-related or simply personal reasons. Analysis is restricted to job-related moves in large countries: four southern European countries (Greece, Italy, Portugal and Spain) plus Finland, France and the United Kingdom.<sup>14</sup>

The estimation sample comprises couples where the woman is aged 25–45, men are employed or looking for a job, and women are either employed, unemployed or “housewives”. Couples in which at least one person is self-employed, and couples that do not live together or that get divorced during the sample period, are dropped out of the sample. To distinguish between the causes and consequences of a move, the information for the covariates is obtained from the year preceding that of the move. Descriptive statistics of the estimation sample are provided in table 7.

<sup>13</sup> The total duration of the ECHP was eight years, running from 1994 to 2001 (eight waves). The Member States involved were Austria, Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom. For more information, see: <http://ec.europa.eu/eurostat/web/microdata/european-community-household-panel>.

<sup>14</sup> Germany is excluded from the analysis, since information on migration records is not provided for individuals living there.

Table 7. Descriptive statistics of the estimation sample

	Finland	France	United Kingdom	Greece	Italy	Portugal	Spain
Inter-regional moves <sup>a</sup>	1.7 (43)	1.5 (143)	2.3 (100)	0.4 (18)	0.4 (43)	0.3 (20)	0.5 (41)
Intra-regional moves <sup>a</sup>	5.1 (133)	6.5 (623)	3.5 (149)	5.3 (257)	4.2 (406)	6.6 (393)	6.7 (584)
Man employed	92.9	95.1	96.1	94.2	94.2	97.1	89.6
Woman employed	81.4	70.2	80.5	46.6	52.0	71.2	41.1
Children <sup>b</sup>	77.6	86.6	74.5	89.1	85.7	86.4	83.6
Homeowners	79.7	61.5	85.8	70.6	68.3	63.5	78.7
<i>Man's educational level</i>							
Tertiary	39.1	21.0	49.1	29.7	10.2	7.8	26.8
Upper secondary	43.8	41.1	13.4	35.3	41.2	13.7	19.4
<i>Woman's educational level</i>							
Tertiary	49.6	25.6	42.0	26.2	8.7	10.1	23.2
Upper secondary	37.3	35.7	14.3	34.6	42.9	12.9	19.7
<i>Live in same region since birth</i>							
Man	28.4	59.8	84.6	61.0	81.2	85.6	69.7
Woman	25.9	61.6	82.4	62.5	80.5	88.0	72.7
Man's age	38.3 (6.7)	38.3 (6.9)	37.9 (6.9)	40.4 (6.9)	39.6 (6.5)	38.4 (6.9)	38.1 (6.6)
Man in bad health <sup>c</sup>	1.4	2.9	5.9	0.8	2.8	3.7	2.0
Woman in bad health <sup>c</sup>	0.7	3.8	6.6	1.4	2.8	6.0	2.8
<i>Regional variables</i>							
Family care <sup>d</sup>	12.3	13.4	1.2	21.9	39.3	11.1	13.5
Abundant family care <sup>e</sup>	1.9	2.8	n.a.	10.0	18.6	5.4	7.1
Free care <sup>f</sup>	12.2	29.6	48.0	42.1	37.9	28.4	39.8
Sample size	2590	9577	4294	4812	9709	5990	8781

Notes: The table reports percentages for discrete variables, with mean and standard deviation in brackets for continuous variables. <sup>a</sup> Percentage of moves (number of moves in brackets). <sup>b</sup> Percentage of households with at least one child aged under 14. <sup>c</sup> Indicates whether respondents declare that, in general, their health is bad or very bad. <sup>d</sup> Regional share of women aged 50–70 who look after children on a daily, unpaid basis. <sup>e</sup> Regional share of women aged 50–70 who look after children more than 28 hours per week, unpaid (information not provided for individuals living in the United Kingdom). <sup>f</sup> Regional share of households with children looked after on a regular, unpaid basis by someone other than their parent or guardian.

Source: Author's calculations, based on ECHP data.

The estimation is performed separately for southern countries and other European countries, since these two groups of countries may differ from each other in many other aspects apart from the availability of family-provided childcare. Each of these two groups of countries is split into four samples, according to whether the couple have children or not and whether the woman works or not. More than 80 per cent of the couples have at least one child, independently of whether they live in southern Europe. Southern countries stand out for their low female employment rates.

The goal of the estimation is to identify the effect of the presence of children in the household, and the woman's employment status, on family

mobility. The effect of the woman working is identified by comparing couples that have the same children status but a different woman's employment status. The effect of the presence of children is identified by comparing couples with children to couples without, for a given woman's employment status. Thus, there are four effects of interest for each of the two groups of countries, for a given type of mobility (intra- or inter-regional).

For the sake of simplicity, the empirical model presented is that showing the effect that the woman working has on the inter-regional mobility of couples with children. Let  $y_{1it}$  be an indicator variable that equals 1 if household  $i$  has moved to a different region within year  $t$ , and zero otherwise. There exists an underlying response variable  $y_{1it}^*$  that measures the expected net gains from moving to a different region, explained by the equation

$$y_{1it}^* = \gamma Z_{it-1} + \beta X_{it-1} + \varepsilon_{it} \quad (4)$$

where  $Z_{it-1}$  is a dummy variable that equals 1 if the woman works and zero otherwise,  $X_{it-1}$  includes the covariates,  $\gamma$  and  $\beta$  are unknown parameters to be estimated and  $\varepsilon_{it}$  is a time-varying normally distributed error term with variance normalized to 1. A family move is observed whenever the expected net gain from moving is positive, and thus the probability of moving conditional on the covariates is written as

$$\text{prob}(y_{1it} = 1) = \text{prob}(\gamma Z_{it-1} + \beta X_{it-1} + \varepsilon_{it} > 0) = F(\gamma Z_{it-1} + \beta X_{it-1}) \quad (5)$$

where  $F$  is the cumulative distribution function of  $-\varepsilon_{it}$ . The estimation sample includes couples with children living in the same group of countries. The other effects of interest are identified by using the appropriate samples and redefining variable  $Z_{it-1}$  to indicate the presence of children in the household, when necessary. The corresponding intra-regional effects are identified by replacing  $y_{1it}$  by  $y_{2it}$ , where  $y_{2it}$  equals 1 if the family move to a different location within the same region within year  $t$ , and zero otherwise.

It is necessary to control for the endogeneity of both the presence of children in the household and the woman's employment status. As the behavioural model illustrates, when deciding whether to have a child, couples take into account that they will be less likely to move in response to better employment prospects. That is particularly the case if the woman works, if they live in a country where childcare is mainly family-provided – as is the case in southern Europe – and if mobility is of the inter-regional kind. Following Heckman (1978), I control for endogeneity by estimating equation (6) jointly with the auxiliary equation that accounts for how couples self-select into the category indicated by the dummy variable  $Z_{it-1}$ .

$$\text{prob}(Z_{it-1} = 1) = \text{prob}(\delta W_{it-1} + u_{it-1} > 0) = G(\delta W_{it-1}) \quad (6)$$

where  $W_{it-1}$  includes household and regional determinants of  $Z_{it-1}$ ,  $\delta$  is a vector of unknown parameters to be estimated,  $u_{it-1}$  is a normally distributed error term with variance normalized to 1 and  $G$  is the cumulative distribution of  $-u_{it-1}$ .

Equation (6) and the auxiliary equation are jointly estimated using a bivariate probit model.<sup>15</sup> Wilde (2000) shows that identification in recursive multiple equation probit models with endogenous dummy regressors requires no exclusion restriction in the exogenous variables if each equation contains at least one varying exogenous regressor. As exogenous regressors, I include regional variables such as the unemployment rate, the employment rate of women aged 25–45 and the share of households where the woman is aged 25–45 that have at least one child. The latter two variables are included when analysing the effect of the woman working and the effect of the presence of children, respectively. These variables capture regional-specific patterns of female employment and fertility that are exogenous to couples but likely to affect their choices.

I also include three variables that inform on the availability of unpaid childcare in the region where the couple live: the share of women aged 50–70 who look after children on a daily basis without pay, the share of women aged 50–70 who look after children for more than 28 hours per week without pay, and the share of households where children are looked after on a regular, unpaid basis by someone other than their parent or guardian. The latter variable controls for family-provided childcare, but also for public childcare for low-income families in some European countries. I introduce the various regional variables separately or together, since there could be some correlation across individuals in these variables. The regional variables are described in the lower part of table 7.

Finally, I present conditional fixed effects logit model estimates as a robustness check. The conditional fixed effects logit estimator provides unbiased and consistent estimates of the coefficients of the outcome equation (5), regardless of the form of dependence between the error term in that equation and the covariates. In this model, the estimation sample is restricted to those couples that move during the sample period, and the explanatory variables are the changes in  $Z$  and  $X$ ; the model therefore only identifies the effect of time-varying covariates.<sup>16</sup>

### *Empirical results*

Table 8 summarizes the estimates for the effect of the woman working for couples living in southern Europe. The bivariate probit estimates indicate that couples with children take decisions regarding mobility and the woman's employment simultaneously. The estimated correlation between the errors of the mobility and selection equations is significant and positive for both inter- and intra-regional moves; it is strongly significant, however, for inter-regional moves. According to these estimates, the probability of a couple with children moving to a different region almost vanishes if the woman works. That

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<sup>15</sup> Sánchez-Mangas and Sánchez-Marcos (2008) and Manski et al. (1992) proceed in this way to evaluate the effect of a family policy on female labour force participation, and to examine the probability of high school graduation as a function of family structure, respectively.

<sup>16</sup> See Chamberlain (1980) for further details of the conditional fixed effects estimator.

**Table 8. Woman working and geographical mobility – southern European countries**

	With children			No children	
	Univariate	Bivariate	CFE	Univariate	Bivariate
<b>A. Inter-regional moves</b>					
Woman works	-0.486** (0.104)	-1.434** (0.390)	-1.545~ (0.806)	0.069 (0.261)	-0.395 (1.963)
Abundant family care <sup>a</sup>	-0.020 (0.016)	-0.008 (0.017)	-0.026 (0.079)	0.002 (0.031)	0.004 (0.031)
Unemployment rate <sup>b</sup>	-0.013 (0.009)	-0.011 (0.008)	-0.065* (0.028)	-0.010 (0.007)	-0.010 (0.008)
Female employment rate <sup>c</sup>	-0.034 (0.032)	-0.020 (0.032)	-0.093* (0.036)	0.008 (0.014)	0.011 (0.019)
<i>Selection equation</i>					
Abundant family care	—	0.035** (0.006)	—	—	0.030* (0.015)
Unemployment rate	—	0.004 (0.003)	—	—	-0.003 (0.002)
Female employment rate	—	0.038** (0.005)	—	—	0.023** (0.004)
Correlation coefficient	—	0.533** (0.147)	—	—	0.258 (0.910)
Log likelihood	-303.4	-12 120.9	-58.8	-28.5	-808.8
Sample size	20 757	20 757	205	1 526	1 526
<b>B. Intra-regional moves</b>					
Woman works	0.056 (0.036)	-0.416~ (0.237)	-0.209 (0.197)	0.141 (0.133)	-0.364 (0.381)
Abundant family care	0.008~ (0.004)	0.018* (0.005)	0.032~ (0.019)	0.007 (0.010)	0.012 (0.010)
Unemployment rate	0.002 (0.002)	0.003** (0.001)	-0.002 (0.007)	-0.009 (0.008)	-0.010 (0.007)
Female employment rate	0.006 (0.008)	-0.008** (0.004)	0.006 (0.059)	-0.013** (0.005)	-0.006 (0.004)
<i>Selection equation</i>					
Abundant family care	—	0.035** (0.006)	—	—	0.030* (0.015)
Unemployment rate	—	0.004 (0.003)	—	—	-0.003 (0.002)
Female employment rate	—	0.038** (0.005)	—	—	0.023** (0.004)
Correlation coefficient	—	0.280* (0.142)	—	—	0.315 (0.296)
Log likelihood	-2 889.7	-14 508.3	-944.0	-219.5	-999.1
Sample size	20 757	20 757	3 350	1 526	1 526

Notes: Standard errors adjusted for regional clustering are given in brackets. The above regressions control for the man's age and employment status, both partners' levels of education, health status and migration records, and whether they own their home or not.

Regional and time effects are captured by including region and year dummies: <sup>a</sup> the regional share of women aged 50–70 taking care of children at least 28 hours/week without pay; <sup>b</sup> the regional unemployment rate; <sup>c</sup> the regional employment rate of women aged 25–55 years. ~, \* and \*\* indicate significance at the 10, 5 and 1 per cent levels, respectively.

Source: Author's calculations, based on ECHP data.



probability is 5.5 per cent for a couple with average sample characteristics if the woman is not employed, and 0.3 per cent if she works. The probability of a couple with children moving within the same region also decreases if the woman works, but the effect is lower than for an inter-regional move. In particular, the probability of an intra-regional move is 10.5 per cent for a couple with average characteristics if the woman is not employed and 4.5 per cent if she works. The univariate probit estimates that do not control for endogeneity underestimate the negative effect of the woman working on family mobility.

The selection equation estimates show that women living in southern Europe are more likely to be employed if they live in regions with greater access to family-provided childcare (*Abundant family care*), particularly so if they have children. Marginal effects calculated for a couple with average sample characteristics indicate that the elasticity of the likelihood of a woman with children being employed with respect to the variable *Abundant family care* is about 0.23. The variable *Family care* – i.e. the regional share of women aged 50–70 who look after children on a daily basis without pay – is also positively correlated with the probability of women with children being employed, but the estimated coefficient and its significance are lower than those for *Abundant family care*. Conversely, no statistical association is found between the probability of women with children being employed and the regional share of households with children looked after on a regular, unpaid basis (*Free care*).<sup>17</sup>

The conditional fixed effects estimates confirm that couples with children in southern Europe are less likely to move to another region if the woman works. The estimated effect of the woman working is close in magnitude to the estimation obtained using the bivariate probit model. The conditional fixed effects estimates cannot be obtained for all the effects of interest because this estimator restricts the sample to couples that move and, given the low mobility rates, it would require a relatively large sample size.

For childless couples living in southern Europe, the estimates in table 8 reject both the endogeneity of the woman's employment status and the hypothesis that couples move less if the woman works. The estimates in table 9 suggest that couples with children living in southern Europe move less than childless couples only if the woman works and mobility is of the inter-regional type. However, the estimated effect is only slightly significant. This effect comes from the univariate probit estimates, since the bivariate estimates reject simultaneity. The selection equation estimates indicate that couples where the woman works are more likely to have children if they live in a southern region with access to abundant family-provided childcare and where there is a higher percentage of couples with children.

The estimates in tables 10 and 11 show that couples living in other European countries do not take mobility considerations into account when making decisions regarding female employment and fertility. Also, the variables that approximate family-provided childcare (*Family care* and *Abundant*

<sup>17</sup> These estimates are available from the author upon request.

Table 9. Children and geographical mobility – southern European countries

	Woman works			Woman does not work	
	Univariate	Bivariate	CFE	Univariate	Bivariate
<b>A. Inter-regional moves</b>					
Children	-0.351~ (0.197)	-0.453 (0.405)	—	0.352 (0.339)	0.364 (0.577)
Abundant family care <sup>a</sup>	0.022 (0.016)	0.022 (0.016)	—	-0.024 (0.022)	-0.011 (0.016)
Unemployment rate <sup>b</sup>	-0.009 (0.009)	-0.009 (0.009)	—	-0.011 (0.008)	-0.008 (0.004)
Children, regional <sup>c</sup>	-0.008 (0.022)	-0.008 (0.022)	—	0.037 (0.051)	-0.033 (0.014)
<i>Selection equation</i>					
Abundant family care	—	0.011~ (0.006)	—	—	0.018~ (0.010)
Unemployment rate	—	0.003 (0.002)	—	—	0.002 (0.003)
Children, regional	—	0.011 (0.007)	—	—	0.017~ (0.010)
Correlation coefficient	—	0.058 (0.104)	—	—	0.386 (0.382)
Log likelihood	-110.3	-3293.5	—	-221.9	-1885.1
Sample size	11 440	11 440	—	10 843	10 843
<b>B. Intra-regional moves</b>					
Children	0.136 (0.093)	-0.451 (0.373)	0.181 (0.406)	0.159 (0.139)	0.567 (1.218)
Abundant family care	-0.003 (0.004)	-0.003 (0.002)	0.041~ (0.025)	0.004 (0.005)	-0.001 (0.006)
Unemployment rate	0.001 (0.002)	0.001 (0.002)	-0.003 (0.009)	0.003 (0.003)	-0.001 (0.002)
Children, regional	0.015* (0.007)	-0.015* (0.007)	0.028 (0.238)	-0.014 (0.014)	-0.003 (0.009)
<i>Selection equation</i>					
Abundant family care	—	0.011~ (0.006)	—	—	0.018~ (0.010)
Unemployment rate	—	0.003 (0.002)	—	—	0.002 (0.003)
Children, regional	—	0.011 (0.007)	—	—	0.017~ (0.010)
Correlation coefficient	—	0.312~ 0.176	—	—	-0.209 (0.620)
Log likelihood	-1694.6	-4876.8	-514.2	-1419.1	-3806.1
Sample size	11 440	11 440	1 891	10 843	10 843

Notes: Standard errors adjusted for regional clustering are given in brackets. The above regressions control for the man's age and employment status, both partners' levels of education, health status and migration records, and whether they own their home or not.

Regional and time effects are captured by including region and year dummies: <sup>a</sup> the regional share of women aged 50–70 taking care of children at least 28 hours/week without pay; <sup>b</sup> the regional unemployment rate; <sup>c</sup> the regional share of households with at least one child. ~ and \* indicate significance at the 10 and 5 per cent levels, respectively.

Source: Author's calculations, based on ECHP data.

Table 10. Woman working and geographical mobility – Finland, France and the United Kingdom

	With children			No children	
	Univariate	Bivariate	CFE	Univariate	Bivariate
<b>A. Inter-regional moves</b>					
Woman works	0.037 (0.026)	-0.232 (0.411)	0.320 (0.376)	0.124 (0.287)	0.587 (0.595)
Free care <sup>a</sup>	-0.005** (0.002)	-0.005* (0.002)	-0.040 (0.030)	-0.020** (0.005)	-0.020 (0.027)
Unemployment rate <sup>b</sup>	0.003 (0.006)	0.002 (0.006)	0.002 (0.013)	-0.009 (0.016)	-0.012 (0.010)
Female employment rate <sup>c</sup>	0.006** (0.002)	0.008* (0.004)	-0.043 (0.051)	-0.057** (0.008)	0.003 (0.035)
<i>Selection equation</i>					
Free care	—	-0.005** (0.001)	—	—	0.005 (0.010)
Unemployment rate	—	-0.002~ (0.001)	—	—	0.006 (0.011)
Female employment rate	—	0.045** (0.001)	—	—	0.038~ (0.020)
Correlation coefficient	—	0.157 (0.228)	—	—	-0.178 (0.383)
Log likelihood	-700.2	-6427.3	-203.2	-137.4	-622.6
Sample size	10928	10928	701	1365	1365
<b>B. Intra-regional moves</b>					
Woman works	0.091* (0.045)	0.449 (0.336)	0.293 (0.190)	0.349 (0.281)	1.009 (1.394)
Free care	0.007** (0.002)	0.007** (0.002)	0.048 (0.046)	0.015** (0.004)	0.014** (0.005)
Unemployment rate	-0.001 (0.006)	-0.001 (0.005)	0.010 (0.010)	-0.012 (0.009)	-0.012 (0.010)
Female employment rate	0.007~ (0.004)	0.002 (0.004)	-0.062 (0.080)	-0.012 (0.012)	-0.010 (0.014)
<i>Selection equation</i>					
Free care	—	-0.005** (0.001)	—	—	0.005 (0.010)
Unemployment rate	—	-0.002~ (0.001)	—	—	0.006 (0.011)
Female employment rate	—	0.045** (0.001)	—	—	0.038~ (0.020)
Correlation coefficient	—	-0.219 (0.212)	—	—	-0.401 (0.893)
Log likelihood	-1877.6	-7604.6	-671.0	-228.3	-622.6
Sample size	10928	10928	2354	1365	1365

Notes: Standard errors adjusted for regional clustering are given in brackets. The above regressions control for the man's age and employment status, both partners' levels of education, health status and migration records, and whether they own their home or not.

Regional and time effects are captured by including region and year dummies: <sup>a</sup> the regional share of women aged 25–45 that do not pay for childcare on a regular basis; <sup>b</sup> the regional unemployment rate; <sup>c</sup> the regional employment rate of women aged 25–55; ~, \* and \*\* indicate significance at the 10, 5 and 1 per cent levels, respectively.

Source: Author's calculations, based on ECHP data.

Table 11. Children and geographical mobility – Finland, France and the United Kingdom

	Woman works			Woman does not work		
	Univariate	Bivariate	CFE	Univariate	Bivariate	CFE
<b>A. Inter-regional moves</b>						
Children	0.028 (0.097)	0.235 (0.241)	-0.477 (0.480)	-0.082 (0.217)	0.806 (0.731)	—
Free care <sup>a</sup>	-0.002 (0.003)	-0.002 (0.003)	-0.036 (0.027)	-0.026** (0.004)	-0.010~ (0.006)	
Unemployment rate <sup>b</sup>	0.002 (0.005)	0.002 (0.005)	-0.008 (0.016)	-0.001 (0.008)	0.001 (0.015)	
Children, regional <sup>c</sup>	0.022 (0.003)	0.018** (0.005)	0.050 (0.073)	-0.063** (0.015)	-0.036 (0.040)	
<i>Selection equation</i>						
Free care	—	0.001 (0.002)	—	—	0.004 (0.005)	
Unemployment rate	—	0.002 (0.002)	—	—	0.007 (0.008)	
Children, regional	—	0.035** (0.007)	—	—	0.035** (0.012)	
Correlation coefficient	—	-0.201 (0.140)	—	—	-0.470 (0.451)	
Log likelihood	-374.1	-3788.8	-184.7	-205.8	-816.2	
Sample size	9142	9142	625	3151	3151	
<b>B. Intra-regional moves</b>						
Children	0.047 (0.065)	0.925 (1.385)	0.208 (0.396)	0.267 (0.250)	— <sup>d</sup>	0.415 (1.101)
Free care	0.010 (0.001)	0.004 (0.004)	0.039 (0.034)	0.011 (0.009)		0.065 (0.054)
Unemployment rate	-0.001 (0.007)	-0.002 (0.006)	-0.008 (0.014)	-0.006 (0.004)		0.012 (0.016)
Children, regional	-0.004~ (0.001)	-0.007 (0.025)	-0.180 (0.322)	-0.032 (0.038)		-0.101 (0.238)
<i>Selection equation</i>						
Free care	—	0.001 (0.002)	—	—		—
Unemployment rate	—	0.002 (0.002)	—	—		—
Children, regional	—	0.035** (0.007)	—	—		—
Correlation coefficient	—	-0.524 (0.890)	—	—		—
Log likelihood	-1517.2	-4677.2	-485.1	-591.2		-185.7
Sample size	9142	9142	1771	3151		604

Notes: Standard errors adjusted for regional clustering are given in brackets. The above regressions control for the man's age and employment status, both partners' levels of education, health status and migration records, and whether they own their home or not.

Regional and time effects are captured by including region and year dummies: <sup>a</sup> the regional share of women aged 25–45 that do not pay for childcare on a regular basis; <sup>b</sup> the regional unemployment rate; <sup>c</sup> the regional share of households with at least one child; <sup>d</sup> none of the specified models converges; ~, \* and \*\* indicate significance at the 10, 5 and 1 per cent levels, respectively.

Source: Author's calculations, based on ECHP data.

*family care*) are not found to be statistically correlated with the probability of the woman working or the probability of the couple having children. Moreover, no evidence is found that either the woman's employment status or the presence of children deter the couple's mobility in these countries. Finally, additional estimates show that the probability of a family move is not lower if the man works, and that the regional availability of family-provided childcare does not affect the man's employment status. These results are also obtained for couples living in southern Europe.<sup>18</sup>

These findings are in line with the predictions of the behavioural model: couples living in countries where childcare is mainly family-provided make decisions regarding the woman's employment taking mobility considerations into account. Family-provided childcare helps them to reconcile work and family life given the scarcity of formal alternatives of reasonable cost, but also lowers their likelihood of moving in response to employment shocks.

## Conclusions

This article investigates the low inter-regional mobility that makes southern European countries stand out among developed countries. I argue that this phenomenon is, at least partially, determined by the specificities of childcare opportunities in southern European countries, since these countries have the highest intergenerational gap in female labour force participation rates and also the highest degree of "rationing" in the public provision of childcare services. This combination means that the optimal choice for young adults living as part of a couple is to live close to their parents in order to take advantage of the low labour force participation rate of their own mothers in order to reconcile work and family life once they have children. This deters the mobility of the most mobile population group in any country: young adults who have left home.

I develop a partial-equilibrium job search model in which couples make decisions regarding fertility, female employment and inter-regional mobility, given the availability of different childcare arrangements. Family caregivers, i.e. grandmothers, do not move with the couple, thus making couples that have children and access to grandparenting more reluctant to move. The model is calibrated using data for Spain, and simulation results show that a reduction in the availability of family-provided childcare increases inter-regional mobility, and lowers fertility rates and female employment rates. A reduction in the price of childcare services is found to increase fertility, female employment and inter-regional mobility rates.

The predictions of the behavioural model are confirmed using 1994–2001 ECHP data. For couples living in southern Europe, the presence of children in the household deters inter-regional mobility only if the woman works. Similarly, couples where the woman works are less likely to move to another

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<sup>18</sup> These estimates are available from the author upon request.

region only if they have children. I also find that women with children living in southern Europe are more likely to be employed, and employed women are more likely to have children, if they live in regions with greater access to family-provided childcare. I also find that not accounting for the endogeneity of the woman's employment status results in considerable underestimation of the deterrent effect on the couple's mobility of the woman working. None of these findings are obtained for couples living in other European countries.

These findings suggest that geographical mobility will increase in southern Europe following the narrowing of the intergenerational gap in female labour force participation rates. That reduction is expected, since the participation rate of young women in southern European countries is currently at the OECD level. In addition, the reduction in the availability of family-provided childcare services will lower fertility and female employment rates in these countries. However, our findings suggest that an increase in the provision of public childcare services would partially or totally offset the expected consequences of the reduced availability of family-provided childcare services in southern Europe, since it effectively increases fertility, female employment and geographical mobility rates. The increase in the number of immigrants in southern Europe in recent decades, willing to work below market rates, may further increase the internal mobility of native inhabitants of southern Europe by lowering the relative price of services such as childcare. This, in turn, may further contribute to increasing fertility and female employment in southern Europe.

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