

**n° 2003-36**

**Gone with the Windfall :  
How do Housing Allowances  
Affect Student Co-residence ?**

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We thank Katharina Wrohlich and other participants of the CESifo Summer Institute workshop of taxation and the family for their comments.

# **Gone with the windfall: how do housing allowances affect student co-residence?**

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## **Résumé**

En s'appuyant sur cinq enquêtes Logement successives, cet article examine l'effet sur la corésidence avec les parents, de l'extension aux étudiants de l'allocation logement qui a eu lieu entre 1991 et 1993. On trouve deux effets. D'abord les allocations ont incité les étudiants à quitter leurs parents. Ensuite, elles n'affectent pas seulement la décision de partir, mais le lieu de résidence et la qualité du logement choisi. Nous suggérons aussi une façon d'identifier quelle part de l'allocation a été un effet d'aubaine pour les parents. En définissant cet effet d'aubaine comme la part des allocations distribuées à des étudiants qui peuvent étudier localement, et dont le choix aurait été de vivre de façon indépendante même sans allocation, nous trouvons que la moitié de l'allocation a été une aubaine pour les étudiants et leurs parents.

## **Abstract**

Drawing on five cross-sections of the French Housing Survey, this paper examines the effects on co-residence with their parents of the extension of housing allowances to students that took place between 1991 and 1993. Two effects are found. First housing allowances provide an increased opportunity for students to move out of their parents' home. Second, the subsidy affects not just the decision to move out, but location and housing quality choices. Finally we suggest a model to identify how much of the allowance came as a windfall gain to parents. Defining the windfall gain as being the subsidies distributed to students who can study locally and whose choice would have been to live independently without the subsidy, we find that as much as half of the allowance came as a windfall gain to students and their parents.

# 1 Introduction

After the pioneering work of Börsch-Supan (1986) and Rosenzweig and Wolpin (1992, 1993), the study of home-sharing between young adults and their parents has recently become popular in Europe, with the availability of the European Community Household Panel (ECHP) which emphasized the differences between countries in co-residence patterns<sup>1</sup>. However, as stressed in Le Blanc and Wolff (2003), no standard model of co-residence has yet emerged. This should not come as a surprise, since the problem is rather intricate. Indeed, co-residence decisions between young adults and their parents involve resource sharing within the family, a difficult subject on its own (Chiappori, 1992, Manser and Brown, 1980, McElroy and Horney, 1981). It also interacts with schooling and labor supply decisions, with the parents acting as insurance for the children (Pollak, 1985, McElroy, 1985, Rosenzweig and Wolpin, 1992). The housing market features also play an important role, as supply and price of rental accommodation may vary. Finally public transfers can also differ for co-resident and non-co-resident children and thus influence co-residence, schooling and labor supply decisions (Rosenzweig and Wolpin, 1993, Börsch-Supan, 1986).

The influence of public benefits on co-residence has been studied by Börsch-Supan (1986), and Hu (2001). The former finds that household formation is highly responsive to housing costs. The latter considers a situation where a co-residing child provides a public benefit to a single parent and he shows that the smaller the loss of benefit to the parent, the more likely the child is to leave. This paper concentrates on the effect of housing allowances on co-residence choices, using a reform of housing allowances that occurred in France between 1991 and 1993. Before the reform, students living in an independent dwelling in the market rental sector were not eligible to personal housing allowances. The reform extended the eligibility to all low-income households, including students, regardless of their parents' resources. Thus, students became eligible to housing allowances, provided they lived in an independent dwelling. Intuitively, the effect of this reform on student independence should be positive. The reform should act as an incentive for a family taken as a whole to 'delocalize' young adults, since it improves its Pareto frontier under independence, without affecting it under co-residence.

This paper focuses on students because most of the problems of interrelated decisions mentioned above can be neglected in that case. The most stringent hypothesis we make is that the reform of housing allowances had no significant impact on the number of students, nor on the type of study they chose. We present figures to prove this claim. Then, we argue that labor supply is not a serious issue for students in France. Indeed, in France, higher education is nearly free and few students work during the school year. Thus, students' labor supply decision is not the main issue. As a consequence, French students usually have very little income of their own, their parents or scholarships providing most of their resources. We further argue that during the period under study, the decision to pursue into higher education depended heavily on having completed high-school, and was not impacted by the new housing subsidy to students. Lastly, a majority of independent students live alone, avoiding another collective decision problem. In this context, we can safely reduce the student's co-residence decision to a problem solved by the parents, who are the main provider of resources. The 'sharing of the pie' issue, that is how students

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<sup>1</sup>See for example Aassve et al., 2002, Blanco and Kluge, 2002, Iacovou, 2000, Le Blanc and Wolff, 2003.

and their parents might have shared the allowance is not addressed here, but we focus on the ‘size of the pie’ effect. Due to the way the allowance is computed, the ‘pie’ increases with the rent of the student’s dwelling. Thus, it is bigger in cities where housing prices are high. We should therefore see that the rise in independence following the reform was higher in high price areas.

On aggregate time series data, the reform clearly coincided with a sharp decrease of co-residence between students and their parents. Due to the absence of effect on the number of students, this drop can be attributed to the housing allowances reform. The decrease is also clear at the micro level. Moreover, the prediction that differentials in the probability of independence generated by the reform should be increasing with housing prices is also shown to hold.

Part of the new allowances may be considered as a windfall gain to students who would have been independent anyway. A way to define more precisely the importance of the windfall gain could be to look at how the parents’ transfer to a student child was modified by the introduction of housing allowances. Since our data do not provide any information on transfers, nor on the parents of independent students, we chose another strategy. We distinguish between students who have no local supply of higher education, and thus have to leave their parents, and those for whom post-high school education is available locally. Then part of the decision to co-reside relies on the local availability of higher education. If no post-high school education is supplied locally, the student moves. If local supply is available, she decides whether to co-reside or not. We define the windfall gain as the part of the allowances given to students who, having the possibility to study locally, would have left their parents even without the subsidy. Drawing on the timing of the reform we estimate the windfall gain to be around half the number of distributed allowances. However, since housing consumption has many dimensions, an effect of the subsidy may have been to allow independent students to consume more housing services, and/or to move to better areas. We find that students are less likely to share a dwelling after the completion of the reform.

The remainder of the paper is organized as follows. Section 2 presents the housing allowance and a model showing how it shifts the family budget constraint. Section 3 offers aggregate time series evidence on co-residence of young adults. In section 4, we analyze micro data before and after the subsidy reform. Section 5 offers a measure of the windfall gain and briefly discusses some other aspects of the reform. Section 6 concludes.

## 2 A simple model of home-leaving with housing allowances

The fact that giving a housing allowance to an independent student induces her to leave her parents is rather intuitive, but we develop a simple theoretical model to be more precise about the mechanism. The model assumes a student leaves because she and her parents have more privacy by living independently, which enhances their net utility, and because the parents get more housing consumption with one person less at home<sup>2</sup>. Since the student has no resource of her own, there is a collective budget constraint, where

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<sup>2</sup>In case the child leaves, the parents do not change dwelling, as empirically observed (Laferrère and Bessière, 2003.)

parental income and net public transfers to the family pay for all expenses. In this context a new subsidy to a child living independently shifts the budget constraint in case of independence, while it does not change it under co-residence. All things equal, that is if parents and children do not change their preferences because of the subsidy, it acts as an incentive to the family to ‘delocalize’ their young students.

More precisely a family is composed of a parent  $p$  (it can encompass a couple, and younger children), and a student child  $k$ . The parent is endowed with a fixed income  $Y_p$ . The child has no income of her own. Both agents care for a private composite consumption good treated as the numeraire, denoted by  $C_p$  or  $C_k$  respectively, and housing services, a function of  $H$ , the stock of housing capital, and  $N$ , the number of persons living in the dwelling. Specifically, housing consumption is of the form  $h = HN^{-\delta}$  with  $0 \leq \delta \leq 1$ . The parameter  $\delta$  measures the extent to which there exist economies of scale in housing consumption. The parents gain in housing consumption as the child leaves, but less if economies of scales are larger. The unit rent of housing capital is  $\rho_p$ , when the dwelling is shared,  $\rho_p$  and  $\rho_k$  when the parent and the child do not co-reside, to reflect the fact that they can live in places where housing prices differ.

The child’s  $k$  (the parent’s  $p$ ) preferences can be written as  $U_k(C_k, h(H_k, N), d)$ , where the dummy variable  $d$  indicates co-residence status, i.e.  $d = c$  if the two generations co-reside, and  $d = i$  if they live apart. These functions are supposed to be continuous, twice-differentiable, and strictly quasi-concave. The parents and the child take Pareto efficient decisions concerning the sharing of resources and the family maximizes a weighted sum of their utility<sup>3</sup>.

$$\max_{C_p, h_p, C_k, d} U_p(C_p, h_k, d) + \lambda(d)U_k(C_k, h_k, d) \quad (1)$$

Resources are shared between parents and child according to a given sharing rule  $\lambda$ . We focus on the Pareto frontiers under co-residence and independence, rather than on recovering particular sharing rules<sup>4</sup>.

Under co-residence  $h_p = h_k = H_p N^{-\delta}$  and under independence  $h_p = H_p(N-1)^{-\delta}$  and  $h_k = H_k$  (if independent, the student lives alone). Let us be more specific on the changes in the pooled budget constraint, which are what really matters here. When the child and parent share the same dwelling, the budget constraint is the following:

$$C_p + C_k + \rho_p H_p = Y_p + A^c(N, Y_p, H_p) \quad (2)$$

$A^c(N, Y_p, H_p)$  denotes the net public transfers to the household including the co-resident student. These transfers typically include family benefits and housing allowances, net of income tax. The important point is that the housing subsidy reform leaves this constraint, and thus the Pareto frontier, unchanged.

When the child lives in an independent housing, the constraint becomes:

$$C_p + C_k + \rho_p H_p + \rho_k H_k = Y_p + A^i(N, Y_p, H_p, \rho_k H_k) \quad (3)$$

$A^i(N, Y_p, H_p, H_k)$  denotes the net public transfers available to the household, which now depend on the independent child’s rent.

<sup>3</sup>Thus, we adopt a ‘collective’ model framework (Chiappori, 1992 and after). As emphasized by Browning and Chiappori (1998), this framework is broad and encompasses for example bargaining models and Beckerian altruism.

<sup>4</sup>There is one Pareto frontier and one sharing rule for each situation (co-residence and independence) because both preferences and the collective budget constraint change. Preferences change because the child’s housing production function changes.

Before the housing subsidy reform, the child does not get any housing subsidy, so that the amount of transfers is equal to  $A_b^i(N, Y_p, H_p)$ . After the reform, the independent student receives a subsidy, and the transfers now equal

$$A_a^i(N, Y_p, H_p, H_k) = A_b^i(N, Y_p, H_p) + HB(\rho_k H_k),$$

where  $HB$  denotes housing benefits, which are a function of the student's rent. In this particular case when the student has no income (in practice, it suffices that his income be low enough), housing benefits are given by:

$$HB(\rho_k H_k) = 0.9[\min(\rho_k H_k, \bar{R}) - R_0], \quad (4)$$

where  $R_0$  is a minimum participation to the rent. Thus, above the limit  $R_0$ , the allowance increases with the rent, up to a ceiling rent  $\bar{R}$ . To the extent that the ceiling is not too low, the amount of subsidy for a given type of dwelling (say, a 20 square meters, one-room apartment) will be greater, the higher the unit rent  $\rho_k$ .

An important feature of the French tax and benefit system is that a student can be attached to his parents' income tax return, providing a reduction in tax, and at the same time receive a (non taxable) housing benefit. Moreover it is not legal to ask a student applying for housing benefit for his parents resources, even if the housing benefit is means-tested. Only the student's own resources are taken into account. Hence the new housing allowance does not change the other net transfers to the family. To sum up, for a family with a student, the reform has no effect on the Pareto frontier under co-residence, but it shifts outwards the Pareto frontier under independence. The higher the unit price of rental housing, the larger the shift. Hence the following predictions:

1. as one alternative becomes more profitable whereas the other does not change, co-residence declines, whatever the process of resource-sharing within the family,
2. the rise in independence of students should be higher in high-rent cities than in low-rent cities.

These two predictions will be checked in the following sections, both at the macro and micro levels.

## 3 The aggregate evidence

### 3.1 Housing benefits and student independence: an overview

A rental assistance program to families with children was created in France after World War II, and progressively extended over the years<sup>5</sup>. In January 1991 began the final process of enlarging it to all low-income households, including students who had been excluded until then, and this independently of their parents' income. The extension was progressive: first in the Paris region in January 1991, then in cities above 100 000 inhabitants in January 1992, and finally in January 1993 in the rest of France<sup>6</sup>. For young

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<sup>5</sup>In 1971 to persons aged over 65, young workers under 25, disabled adults, and the long-term unemployed. In 1977, to renters of public housing.

<sup>6</sup>There were 1.9 millions assisted private sector tenants in 1990 (a third of all private sector tenants); they were 3.1 millions in 1997 (half of tenants, see Laferrère and le Blanc, 2002)

people the change was spectacular. At the end of the 1980s around 12% of students living in independent dwellings received housing benefits<sup>7</sup>; at the end of 1992, two years after the reform was initiated, they were 45%. At the end of 1996, the figure was as high as 65% and has stayed at this value until then (figure 1). As a benchmark, the rates of employed or unemployed youths receiving a subsidy are also shown in figure 1. They did not increase over the period. The increase in number of (non co-residing) students living in a beneficiary household is also given in tables 1 and 2.

There are three possible short-term effects of granting housing benefits to independent students:

1. Some young co-resided and studied, and are now independent and study. This is the effect described in details in the above model.
2. Some were independent and in education are now in the same position, receiving a subsidy.
3. Some could not study and are now independent students receiving a housing subsidy.

Why should some individuals choose to study when housing allowances are introduced (Effect 3)? It could be because education is not locally available and moving out was too expensive. Indeed, since the cost of education is reduced, going to school becomes more attractive, compared to other choices. The aims of the governmental subsidy are likely to have been Effect 1 (more independence) and Effect 3 (more students).

At the aggregate level Effect 1 was important. The proportion of students living in independent dwellings increased from 28% to 40%, between 1988 and 1996 (figure 1 and table 1).

Even if it declined, the high number of co-residing students should be stressed: the habit for a student is to study in her region of origin, contrary to what happens in the US for instance. Moreover, some students live far from where they study. For instance, according to the 1999 census, 6.2% of students of Ile-de-France do not live in the region, and 10 to 20% of students living in the regions surrounding Ile-de-France, such as Picardie or Champagne, do not study there, but presumably in Ile-de-France (Julien et al., 2001). Thanks to extra questions asked at the French Housing Survey in 2001<sup>8</sup>, the location of parents can be compared to the location of the student child. More than 91% of students live in the same region as their parents (there are 22 regions in France). However, not all types of education are locally available. More than 80% of students study in only 30 urban areas<sup>9</sup>. It means that a sizeable proportion of students commute. Typically studying nearby is frequent for the first years after high school, but less so afterwards. Then studying goes along with living in an independent dwelling, since student residences are rare: they accomodate only 8% of students, according to the 1999 census. Universities or schools are often located in or close to city centers. What drives the cost of studying in France, besides foregone earnings, is housing price and transportation costs, since higher education in France is practically free (in most cases the cost of a year at a university consists only in registration fees, amounting to a few hundred euros).

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<sup>7</sup>Unless otherwise stated all figures are computed from the French Housing Surveys (see below, section 4.1). The benefit is granted to a household, thus a student living with a non-student roommate who is a recipient of benefit is counted as a beneficiary.

<sup>8</sup>Described below in the data section 4.1.

<sup>9</sup>Aires urbaines (Julien et al., 2001). In the same 30 cities live around 50% of the population.

However, not co-residing with the parents does not necessarily involve moving far away: 71% of non co-residing students live in the same region as their parents, and 45% in the same département (there are 95 départements).

We argue now that Effect 3 was small and that Effect 2 was important.

### 3.2 A small effect on the number of students

At first sight Effect 3 (more students thanks to the housing subsidy) may seem important. The number of students increased from 240,000 in 1984 to 651,000 in 2001. The student rate (part of the 20-29 years old who are students) went from 10% in 1984, to 14% in 1988, to around 20% from 1992 on. However the following should be noted.

First, as already mentioned, higher education in France is nearly free. This somewhat mitigates the income constraints, even if it does not eliminate them. Second, the trend in the student rate and student number is not related to the subsidy, as is clear from table 1 and figure 1. The student rate increased by 3.4 percentage points between 1984 and 1988, their number by 291,000. The increase was 3.6 points and 380,000, only slightly higher, between 1988 and 1992, whereas the housing benefits reform started at the beginning of 1991. Between 1992 and 1996 the number of students actually declined slightly (-40,000) and the student rate increased only by a modest 0.8 point, when housing benefits were enormously enlarged. Then the number of students increased by 131,000 between 1996 and 2001 (the student rate by 2.2 points), when benefits stayed put. The impression one gets is that the movement in the number of students had begun before the housing allowance reform, and that the reform accompanied the movement rather than spurred it.

Third evidence: the student rate depends heavily on the number of youths completing high school. Following a voluntary government policy (the motto was that in the long run 80% of a cohort should complete high school), the rate of access to the baccalaureate year doubled between 1985 and 2001, going from 35 to 70%. The fraction actually passing the baccalaureate increased from 26% of a cohort in 1980, to 39% in 1988, 47% in 1992, and 62% in 1996. The new *bacheliers* continued 'naturally' into higher education, at least for a few years, and the movement was accompanied by the construction or extension of new universities around the country. According to the Ministry of Education, 83% of youths who have a general baccalaureate go on to higher education and the proportion was fairly constant during the period under study (Esquieu and Poulet-Coulibando, 2002). When at the end of the period the rate of bacheliers did not rise any more, and even declined after 1997, the number of students stopped rising accordingly.

The movement has been accompanied by what happened on the labor market. The demand for labor was not strong enough to prevent young educated people to go on into higher education. Youth unemployment (the percentage of 20-29 years old who are unemployed) increased from 11 to 13% between 1988 and 1992, thus also after the increase in the student rate, that seems the leading force.

Effect 2 (already independent students now are subsidized) could in some sense be seen as a windfall effect. We try to define it more precisely below in section 5.1. A side-effect of 2, let us call it Effect 2 bis is the following:

2 bis. Some young were independent and studied are now able to move to a higher quality dwelling thanks to the subsidy.

They can choose a better location, have a larger apartment or live alone instead of sharing a dwelling. Effect 2 bis mitigates the windfall Effect 2 and may have been the aim



of the government as the bad housing conditions of students were sometimes denounced (Clanché, 1995). We study it in subsection 5.2.. We now turn to the measure of Effect 1, the new demand for independent dwellings. Note that we do not address the supply-side of the question and assume that housing supply responded to the new demand.

## 4 Measuring the effects of housing allowances on micro data

### 4.1 The data

Ideally one would like to follow the youths from their parents' home to their independent dwelling and have individual panel data. Only one dataset, the European Community Household Panel (ECHP), would provide such data for France but its sample is much too small to allow focusing on students. We rely instead on five successive cross-sections of the French Housing Survey (1984, 1988, 1992, 1996, 2001) conducted by INSEE and encompassing the period when housing allowances to students were enlarged. The questionnaire was passed between December of year  $t$  (deemed the survey year) and January  $t + 1$ . The surveys provide a sample of 9207 students representative of all 20-29 years old French students<sup>10</sup>. Among them 2928 live independently from their parents: alone (1401), in couple (900), or sharing a dwelling (627). The time series of cross-sections allows to identify the effect of the subsidy: the first extension in large cities took place between the 1988 and 1992 surveys, the final one between the 1992 and 1996 surveys. Besides, questions are framed identically across surveys, allowing time comparisons.

The drawback is that no information on parents is provided, and co-residing students' income is not known before 1996. This is why we do not attempt to model the choice to study, which is likely to depend on parents' characteristics, but concentrate on the simpler housing choice. In the last 2001 Housing Survey some extra questions were asked to households that had moved in the last four years, about their former home and whether it was their parents'. We relied on it to compare parents' and student children's locations and show that many students live close to their parents in the preceding section. It mitigates the drawback of not having data on the parents' home and in particular on the essential feature of its precise geographical location. But the sample is small (only 390 independent students of the 2001 sample) and biased toward younger students, so we do not use it in the econometric tests, relying rather on pooled cross-sections.

Only a minority of students are on the labor market or have an independent income. In 2001 only 23% of students aged 20-29 had any earnings<sup>11</sup>. Even among independent students, two thirds had no personal earnings. For those who had, annual median income was 4,573 Euros. One out of ten of students living independently benefits from free housing (in most cases a dwelling owned by their parents), the vast majority (87%) are renters 3% are mortgagers, 1% are outright owners. Besides wages, asset income, scholarship and

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<sup>10</sup>Students living in student residences are left aside if they have not been declared as members of their parents' household. Only 8% of students were in this case in 1999, and some of them are registered as part of the household at the Housing surveys, for instance if they come back home regularly. We implicitly consider them as co-residents here.

<sup>11</sup>From pooled waves of the ECHP, Valdelièvre (2001) finds that only 8% of French students worked for more than 6 months during the year, and 32% worked for at least one month.

other public transfers, 60% of independent students mention some extra source of income, either family transfers or occasional jobs (not separated in the survey). In most cases it is likely to come from their parents who are the main providers of their resources<sup>12</sup>. 69% receive housing benefits (80% among renters), amounting to 1740 euros per year, about half their rent.

The local price data come from the Notaires-INSEE housing price indexes<sup>13</sup>. They are based on the price of a reference house or apartment estimated at the local level. We match the district price level data with the district (commune) of residence (the arrondissement for Paris) at the date of the survey. Since students are likely to live in apartments we use the apartment prices. For simplicity, only one year of prices (the last quarter of 1996) is used since what is important is the cross-sectional (geographical) variation in housing prices.

## 4.2 Estimation results

All our estimates are based on student individual samples from 1988, 1992 and 1996, a period including the exogenous shock on housing benefits.

We first estimate simple logit models linking the dependent variable  $d$ , defined as  $d = 1$  if the student lives in an independent dwelling, and  $d = 0$  if she lives with her parents, to explanatory variables. These variables include time dummies for the beginning of the reform (1992 survey) and its completion (1996 survey), the price of housing interacted with those dummies, and the highest diploma reached by the student at the time of the survey, as well as her age. These variables are indicators of the local availability of schools. Child's sex is also introduced as it is well known that young women tend to leave their parents earlier.

The Paris area (Ile-de-France) and the rest of France (the Province) are treated separately for two reasons. First, due to the high centralization of France, some types of education institutions are only located in Paris, and there is no continuity between the two housing markets. The second reason is that we want to rule out the possibility that the increase in the overall independence rate of students was driven by the fact that more and more of them live in the Province, and not by housing allowances. Figure 2 shows the evolution of the number of students and co-residence rates separately for the Paris region and the province. The independence rate increased more in the Province than in Ile-de-France, but it did increase from 30% to 36% between 1992 and 1996 in Ile-de-France (30 to 41% in the Province).

For the Province, since the reform was progressive (first in cities of more than 100,000 inhabitants, then after 1992 in smaller ones), we interact city size (less or more than 100,000 inhabitants) with the years dummies. The coefficients have the expected sign, both in 1992 and 1996 (table 3, panel A). In smaller towns, independence was no more likely in 1992 than in 1988, but it was more likely in 1996 (the coefficients for 1992 and 1996 are different at the 15% confidence level). For larger cities the effect of housing benefits is seen as soon as 1992, and is even more important in 1996 (the coefficients for 1992 and 1996 are different at the 7% confidence level). This proved that students were more likely to move out after the reform, and more so when it was completed than at the

<sup>12</sup>In 1997, 9 in 10 of students' households benefited of a regular family help (Robert-Bobée, 2002).

<sup>13</sup>Computed by the notaries from data on all transactions, with a hedonic methodology provided by INSEE (see David et al., 2002).

beginning. Price level has a positive effect. It is not straightforward to interpret because it is not the parents' home price. Even if a large proportion of students are in the same area as their parents, moving out means increasing housing consumption, because there are less economies of scales, and students live in more central locations which are more expensive than suburbs in France (see Bessière and Laferrère, 2003, or Clanché, 1995). The interactions of prices with time dummies have no effect, once city size is introduced.

For Ile-de-France, the prices for 1988 are not available<sup>14</sup>, so we proxy prices by separating the region into three areas, Paris city, Paris outskirts (Petite Couronne), and far suburbs (Grande Couronne) and interact the areas with year dummies. At each period, a student is more likely to be independent the closer she lives to the center of Paris, and, interestingly, the effect is more important in 1996 than before. The parameter for the 1996 dummy is not significant (table 3, panel B). In the Paris region, the subsidy had no effect on the overall rate of student co-residence, but students have been able to move more to central Paris and close outskirts thanks to the subsidy<sup>15</sup>.

The distribution of generous housing allowances encouraged nest-leaving of students in the province. It also resulted in transfers to families in which independence would have been chosen without the allowances. This is the windfall gain mentioned as effect 2 above. Indeed, as is well known from the literature on altruistic family transfers, in the case the parents make a transfer to their independent child (for instance, they pay for food and shelter), the theoretical effect of a housing subsidy to the child is that the parent decreases his transfer<sup>16</sup>. Then all happens as if all or part of the transfer was granted to the parent instead of the child, because the budget constraints are pooled. The exact adjustment of private transfers depends on how the increase in housing allowances is financed. As always, redistribution between families may occur, if the taxes necessary to finance the new housing allowances are not paid by those who benefit from them.

However, in order to measure the efficiency of the housing allowances with respect to increasing the proportion of independent students, we need to refine the analysis. We are interested in the proportion of families who would have chosen independence even without the subsidy. Comparing the proportion of independent students after and before the reform is not enough to measure the importance of this 'windfall gain'. A way to define it could be to look at how the parents' transfer to a student child was modified by the introduction of housing allowances. Since our data do not provide any information on transfers, nor on the parents of independent students, we choose another strategy. We take into account the local availability of post high school education. When studies of a precise kind (say, technical college, university, or medical school) are not available locally, students are forced to move from their parent's home, even though co-residence might have been the family's preferred outcome, had local supply been available. Thus, we suggest to count as 'windfall effect' of the subsidies only those subsidies going to families having freely chosen independence, that is for whom post high school education is offered locally. In order to tackle this issue, we now examine a slightly more sophisticated model. We suppose that the decision process involves two stages :

1. The student chooses what precise type of education she wants. She then considers whether local supply is available or not.

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<sup>14</sup>Because we could not get the individual arrondissement (district) codes in the micro dataset.

<sup>15</sup>A Logit with prices, for 1992 and 1996 only, also shows that students have moved to higher price areas thanks to the subsidy.

<sup>16</sup>See for instance Laferrère and Wolff (2003) for a survey of models of family transfers.

2. If no local supply is available, she leaves her parents' home. If local supply exists, the parent and the student decide on the best strategy, i.e. co-residing or not.

Thus, co-resident students are those for whom local supply is available and co-residence is deemed the best strategy. On the contrary, independent students comprise students for whom local supply is not available, and students for which it is, but independence is chosen as the best outcome (figure 3).

The main virtue of writing down such a decision model is to shed some light on the implicit exogeneity hypotheses our limited data impose. By supposing that the choice to study and the chosen type of education are exogenous, we neglect the effects of housing allowances on the composition of the student population, i.e. what we called Effect 3 in the preceding section. Thus, we are implicitly working as if only Effects 1 and 2 were present; moreover, we do not measure Effect 2bis for the moment.

Define two latent variables  $A^*$  and  $B^*$ , reflecting respectively the local availability of studies of a particular type, and the propensity to split off. We specify:

$$\begin{aligned} A^* &= X_a \gamma_a + \varepsilon_a \\ B^* &= X_b \gamma_b + \varepsilon_b \end{aligned}$$

$X_a$  is supposed to depend on the education level already reached by the student (her highest diploma). We expect local supply to decrease as the education level increases. Due to the impossibility to distinguish between the different precise type of studies within each education level, we also introduce age as a regressor, expecting that local supply decreases when age increases.

The variable  $B^*$  reflects the co-residence outcome that would be chosen, independently of the local availability problem. If the extension of housing benefits had a impact on co-residence, it should be reflected in this variable. Ideally,  $X_b$  should contain the parents' income, which is not known in the data. We include a dummy for 1996, housing prices, prices interacted with the 1996 dummy, age of the student, and a sex dummy.

The only observed variable is the co-residence outcome, noted  $d$ . It is linked to the latent variables by the relation:

$$\begin{aligned} d &= 0 \text{ if and only if } A^* \geq 0 \text{ and } B^* \leq 0, \\ d &= 1 \text{ otherwise.} \end{aligned}$$

We assume that  $(\varepsilon_a, \varepsilon_b)$  is jointly normal, the two disturbances being uncorrelated. Since only a discrete outcome is observed, the variances of the disturbances are not identified and we normalize them to 1, as is usual. The econometric model was first introduced by Poirier (1980), and the likelihood of the sample writes:

$$\ln L = \sum_{d=0} \ln P(A^* \geq 0, B^* \leq 0) + \sum_{d=1} \ln(1 - P(A^* \geq 0, B^* \leq 0)),$$

Due to the independence hypothesis of the two residuals, the joint probability in the first RHS term can be written as a product of two cdf of the standard normal law, i.e.:

$$P(A^* \geq 0, B^* \leq 0) = \Phi(X_a \gamma_a) \Phi(-X_b \gamma_b).$$

The main identifying assumption (apart from functional form for the distribution of residuals) is that the education level of the child has an impact only on the probability

of local availability, and not on the co-residence decision. Results from the maximum likelihood estimation of the model are shown in table 4. As expected, the local availability of education decreases with education level and with age. As in the simple logit models, the propensity for independence is significantly lower for males, increases with age, and with housing prices. The coefficient of the 1996 dummy is positive and significant. The coefficient of housing prices after the reform is negative, but not statistically significant. The fit of the model is perfect at the aggregate level (i.e. the proportion of independent students in 1992 and 1996 is correctly predicted), which is hardly surprising since the model is no more parsimonious than a standard probit. However, the fit is also good when the sample is broken down by education level. The proportion of independent students is perfectly predicted for high school level, nearly perfectly for graduate level, and slightly underestimated for the post-graduate group.

We next use the model to simulate what co-residence would have been in 1996 in the absence of allowances. Figures shown in table 5 are sample average of the corresponding probabilities computed at the individual level. For example, the proportion of students with locally available studies is computed as:

$$p_1 = \sum_{i \in s} \hat{P}(A_i^* \geq 0) = \sum_{i \in s} \Phi(X_a \hat{\gamma}_a)$$

As expected, this proportion is higher, the lower the education level reached by the student. Controlling for education level, average availability is not different in 1992 and in 1996. The second quantity we look at is the proportion of students who would chose independence, would their studies be available locally:

$$p_2 = \sum_{i \in s} \hat{P}(B_i^* \geq 0) = \sum_{i \in s} \Phi(X_b \hat{\gamma}_b).$$

In 1992, this proportion increases with education, which reflects the average age differences between the three sub-samples. However the difference between the three groups (.06) is low, compared to the .22 difference in observed outcomes, which is the combination of supply and demand-side factors.

In 1996, the proportion rises in each group by about .15. Interestingly, simulating the independence outcome for the 1996 students in the absence of allowances results in proportions of students preferring and effectively choosing independence by education level nearly identical to those of 1992.

To sum up, while there has been no significant effect of housing allowances on student co-residence in the Paris area, the effect is highly significant for students living in the Province. There the effect is less significant during the first period, at the beginning of the reform, than between 1992 and 1996, when it is totally implemented.

The next section is devoted to a qualification of the adjustments of behaviors after the reform.

## 5 After the reform

### 5.1 A measure of the transfers to parents

Armed with the second model, we now propose to call ‘windfall effect’ the ratio of two quantities: i) the amount of housing allowances granted to families who would have chosen independence without allowances, where local supply is available, and ii) the total amount of housing allowances. We approximate the amounts by the corresponding proportions of subsidized students. We compute them from the model in section 4. Recall that this

model is based on students having completed high school, and living in the Province. All students are supposed to be renters and to effectively perceive housing allowances. The numerator of the ratio is computed as:

$$p_w = \sum_{i \in s} \hat{P}(A_i^* \geq 0, B_i^* \geq 0) = \sum_{i \in s} \Phi(\tilde{X}_b \hat{\gamma}_b) \Phi(X_a \hat{\gamma}_a),$$

where  $\tilde{X}_b$  denotes the covariates of the independence latent variable ‘without allowances’, that is where the dummy variable for 1996 is set to zero. The corresponding figure is 23.2% of students. The denominator is just the proportion of students choosing independence in presence of housing allowances, i.e.

$$p_a = \sum_{d=1} (1 - \Phi(X_a \gamma_a) \Phi(-X_b \gamma_b)),$$

which is 46.2%. Thus, the windfall gain can be estimated to be 50%. This is a conservative figure, since students not having completed high school are excluded. However the independence rate is low among that group; when they are incorporated, the new value for the windfall effect is 51%.

This estimation of the windfall gain is quite large, especially when one acknowledges that housing allowances to independent students represent about .8 billion euros each year. Indeed, the Government had to a certain extent foreseen this adverse effect when the reform of housing allowances was undertaken in 1991. The allowances were to be means-tested (as they are), and parental income was to be included in the student’s income. However this feature was deemed not legal by the Commission Nationale Informatique et Liberté, the French public service in charge of checking the legality of computerized procedures regarding citizens. Thus, the Caisses d’Allocations Familiales, who manage housing allowances, were not allowed to match files to recover the parents’ income or verify the students’ declaration, thus decided not to ask students any information about their parents’ income.

## 5.2 How did students’ housing consumption change?

We now look more precisely at the living arrangements of young students. Table 6 shows that these arrangements have changed, following the reform. Before housing allowances were introduced, the rise in the number of students went along with an increase in the proportion of independent students sharing a home with friends (from 18 to 26% between 1984 and 1988) and a parallel decrease in the proportion living alone (from 40 to 34%) (lines 1 and 2 of table 6). After the subsidy reform was implemented, the trend reversed: the proportion of independent students living alone increased steadily up to 55% in 2001 and the proportion sharing a dwelling fell to 16%. Interestingly, life with a partner also decreased.

The subsidy has also accompanied a modification of the spatial distribution of students. The percentage living in a urban area of more than 100,000 inhabitants but outside Ile-de-France increased from 39% to 47%, while at the same time the proportion living in small cities decreased from 35% to 31% and the proportion of those living in Ile-de-France changed little (from 26% to 24%).

Econometrics has shown that in some instances students seemed to have moved to higher price areas after housing allowances were introduced. The increase in the number

of independent students was important in city centers compared to suburbs (figure 4)<sup>17</sup>. Independent students have chosen better locations (more expensive, hence presumably closer to universities and schools) thanks to the subsidy. By contrast co-residing students are living in worse locations (lower prices) than before.

## 6 Conclusion

This paper focused on a reform of the French system of housing allowances, which granted housing subsidies to students living in independent dwellings. This reform resulted in an increased opportunity for parents to ‘delocalize’ students. This opportunity arises because the household’s Pareto frontier is shifted outwards in case of separate dwellings, but does not change under co-residence. Thus, that students should be more independent after the reform does not depend on the precise model of resource sharing within the family: it is the result of an increase in the ‘size of the pie’. Since the housing allowances computation makes the shift in the budget constraint greater the higher the housing prices, students’ independence rates are predicted to respond more to the reform in high price areas.

In spite of incomplete data (cross sections containing few information on parents), but thanks to their time series nature and to the exogenous shock of housing allowances, we were able to show the influence of housing allowances on parent and student children’s co-residence decisions.

Students moved out of their parent’s home thanks to housing allowances. This occurred more in the province than in the Ile-de-France region where nevertheless they were able to leave the cheapest and farthest areas to be closer to the center. The effect is more pronounced in the second period than when the subsidy had just been introduced. The allowances seem to have allowed students to live in better quality housing or closer to the city centers, and to live alone (instead of sharing dwellings) more frequently.

As the new subsidy were not family means-tested, richer families who would have ‘delocalized’ their children even in the absence of the subsidy benefited from it. This ‘windfall effect’ is estimated to represent 50% of the total allowances to independent students.

The fact that the rates of independence remain high among students some ten years after the reform means that the short-term inflation effect of housing allowances on the rent levels, which has been observed locally and at the national level (Laferrère and le Blanc, 2002) did not translate into a strong long-term effect by which landlords would have captured all the rents created by the allowances. Looking further into this question would require data on individual house prices and rents and to examine location and transportation choices more precisely.

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<sup>17</sup>It would be interesting to look more closely at the effect of housing allowances on housing quality to qualify Effect 2 bis more precisely. We leave it for further research.

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**Table 1. Evolution of the number of students**

	1984	1988	1992	1996	2001
All students (thousands) (1)	859	1150	1530	1491	1623
Co-resident (thousands) (2)	620	834	1073	902	971
Independent (thousands) (3)	240	317	457	589	651
% independent (3)/(1)	27.9	27.5	29.9	39.5	40.1
Subsidized students (thousands) (4)	32	39	204	384	453
% independent subsidized (4)/(3)	13.5	12.3	44.7	65.2	69.6

Source: Authors' computation from French Housing Surveys, INSEE

**Table 2. Changes in the number of students, over four years periods (thousands)**

	1984-88	1988-92	1992-96	96-2001
All students	291	380	-39	132
Independent students	77	140	132	62
Co-resident students	214	240	-171	69.3
Subsidized students	7	165	180	68.7

Source: Authors' computation from French Housing Surveys, INSEE

Table 3. Logit model : probability to live in an independent dwelling, 1988-1996

Variable	A. Province		B. Ile-de-France	
	Parameter Estimate	Standard Error	Parameter Estimate	Standard Error
Intercept	-8.8994	0.6355	-8.7494	0.9285
Age	0.2143	0.0225	0.2955	0.0375
Sex : male	-0.3293	0.0758	-0.3591	0.1410
Education level				
Post-graduate	1.3910	0.1681	0.5710	0.2657
Graduate	1.3125	0.1572	0.3920	0.2760
High school	1.2238	0.1464	0.7938	0.2499
Less than high school	Ref		Ref	
Geographical area				
Less than 100K	Ref			
Less than 100K*1992	0.1911	0.4747		
Less than 100K*1996	0.7163	0.4731		
More than 100K*1988	1.7931	0.2051		
More than 100K*1992	2.0034	0.4844		
More than 100K*1996	2.7181	0.4852		
Far suburbs			Ref	
Paris outskirts 1988			0.3377	0.3662
Paris outskirts 1992			0.3577	0.3009
Paris outskirts 1996			0.8713	0.3400
Paris 1988			1.7490	0.3466
Paris 1992			1.5804	0.2913
Paris 1996			2.4119	0.3335
Housing prices				
Price	0.1629	0.0786		
Price*1992	0.0311	0.0957		
Price*1996	0.0091	0.0953		
1992			0.1324	0.3750
1996			-0.1231	0.4015
Number of observations	4497		1238	

**Table 4: Decision model : maximum likelihood estimates for the Province**

Parameter	Point Estimate	Std. error.	Est./s.e.	Prob.
Local availability equation				
Intercept	2.4201	0.9586	2.525	0.0116
Post-graduate level	-0.9079	0.7150	-1.270	0.2042
Graduate level	-0.6583	0.6699	-0.983	0.3258
High school	Ref.	//	//	
Age above 20 (/10)	-1.9025	0.5682	-3.348	0.0008
Independence equation				
Intercept	-2.0981	0.2696	-7.782	0.0000
Male	-0.1478	0.0562	-2.630	0.0086
1996 dummy	0.5888	0.2483	2.372	0.0178
Age above 20 (/10)	0.5576	0.3643	1.531	0.1258
Housing price	3.0138	0.4492	6.710	0.0000
Housing price x 1996 dummy	-0.3853	0.4554	-0.846	0.3976
Mean log-likelihood	-0.606133			
Number of observations	2951			

**Table 5 : Decision model : predicted local availability rates and co-residence propensity before and after the reform, by education level**

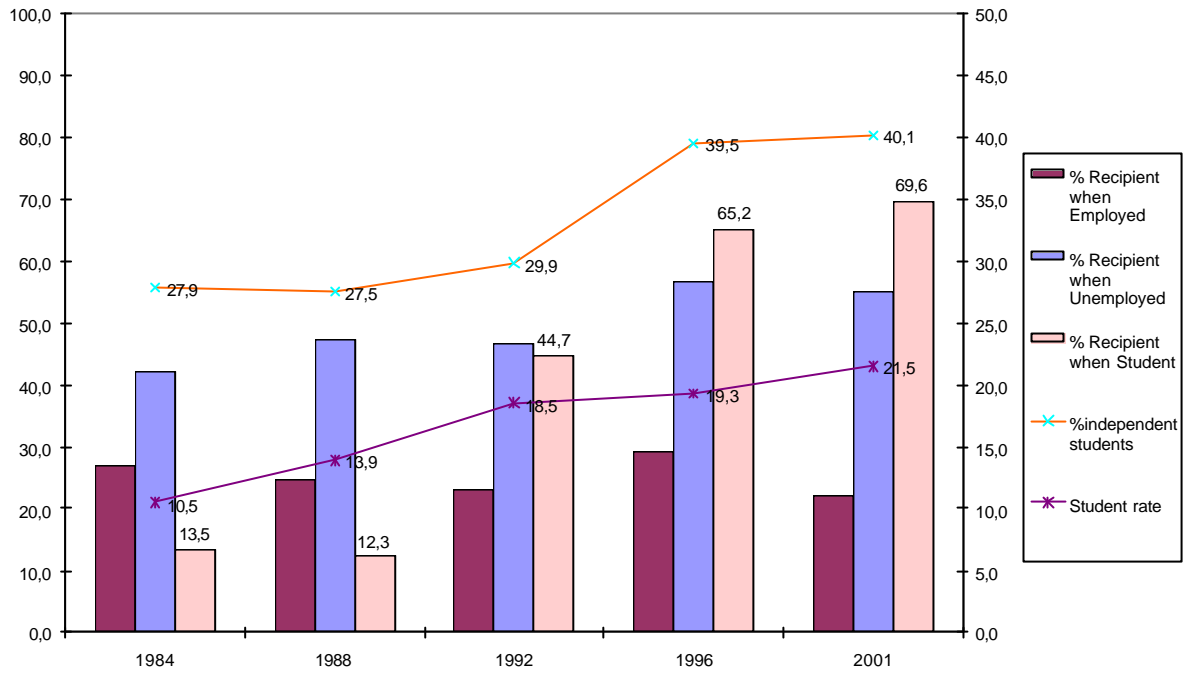
	1992	1996	1996 without housing subsidies
Proportion of students with studies locally available			
High school	.98	.98	.98
Graduate level	.91	.91	.91
Post-graduate level	.80	.79	.79
Overall	.93	.92	.92
Predicted proportion of household where independence would be the most favoured outcome			
High school	.25	.39	.25
Graduate level	.26	.43	.29
Post-graduate level	.32	.47	.33
Overall	.26	.42	.28
Observed proportion of independent students			
High school	.26	.40	.27
Graduate level	.33	.50	.36
Post-graduate level	.48	.57	.47
Overall	.31	.46	.33

Table 6 . Housing choices of independent students (%)

	Alone	Couple	Share	Other
1984	39.9	38.4	18.2	3.5
1988	34.0	39.9	26.0	1.0
1992	42.8	30.0	25.1	2.1
1996	50.9	28.3	19.4	1.4
2001	55.4	27.1	16.0	1.5

Source: Authors' computation from French Housing Surveys, INSEE

**Figure 1. Student rate, independence rate and rate of housing subsidy reception (20-29 independent youths)**



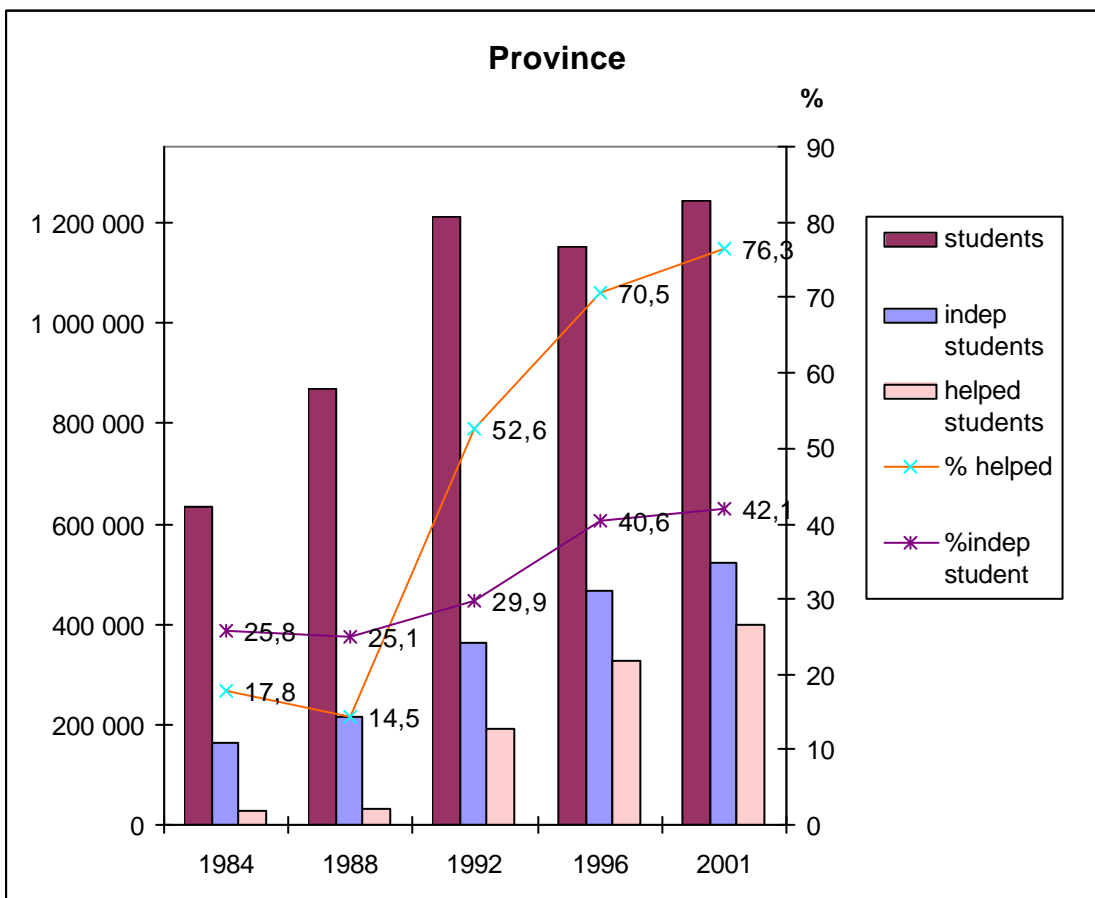
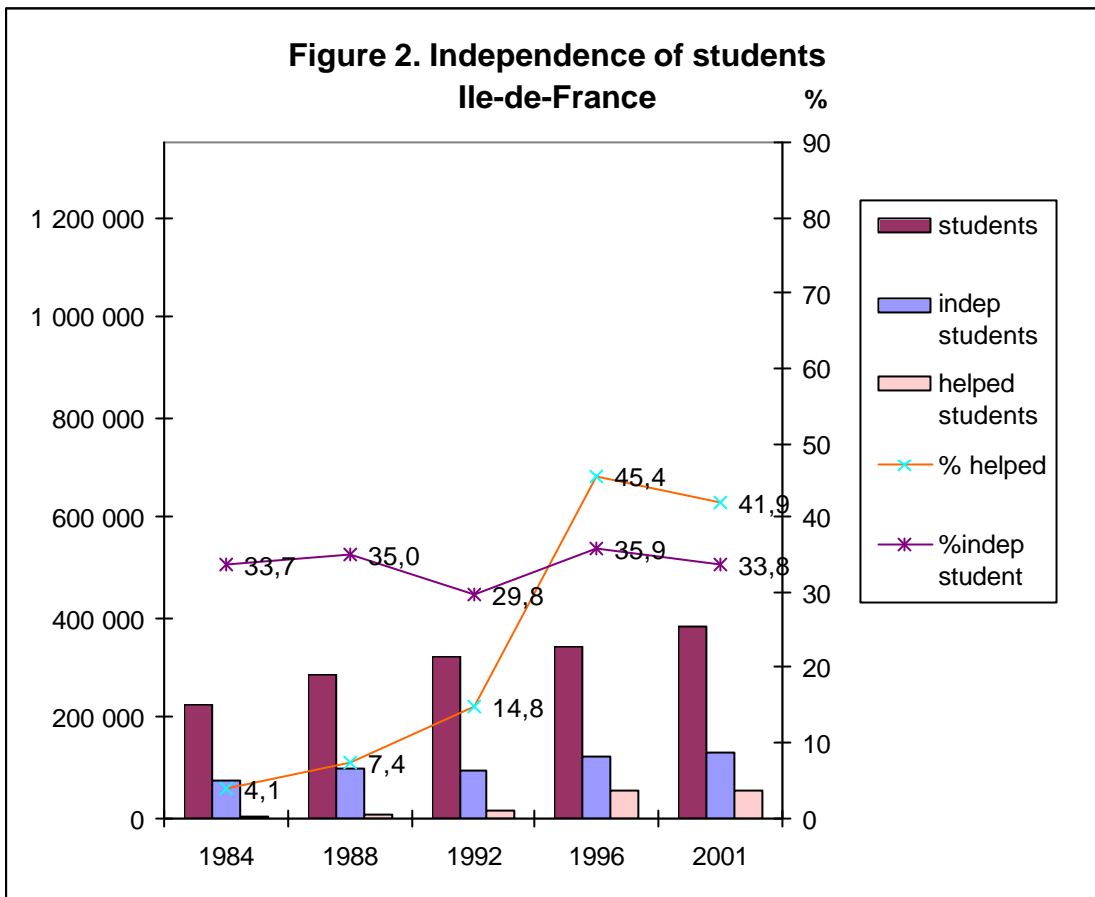


Figure 3. A decision model of students' choice

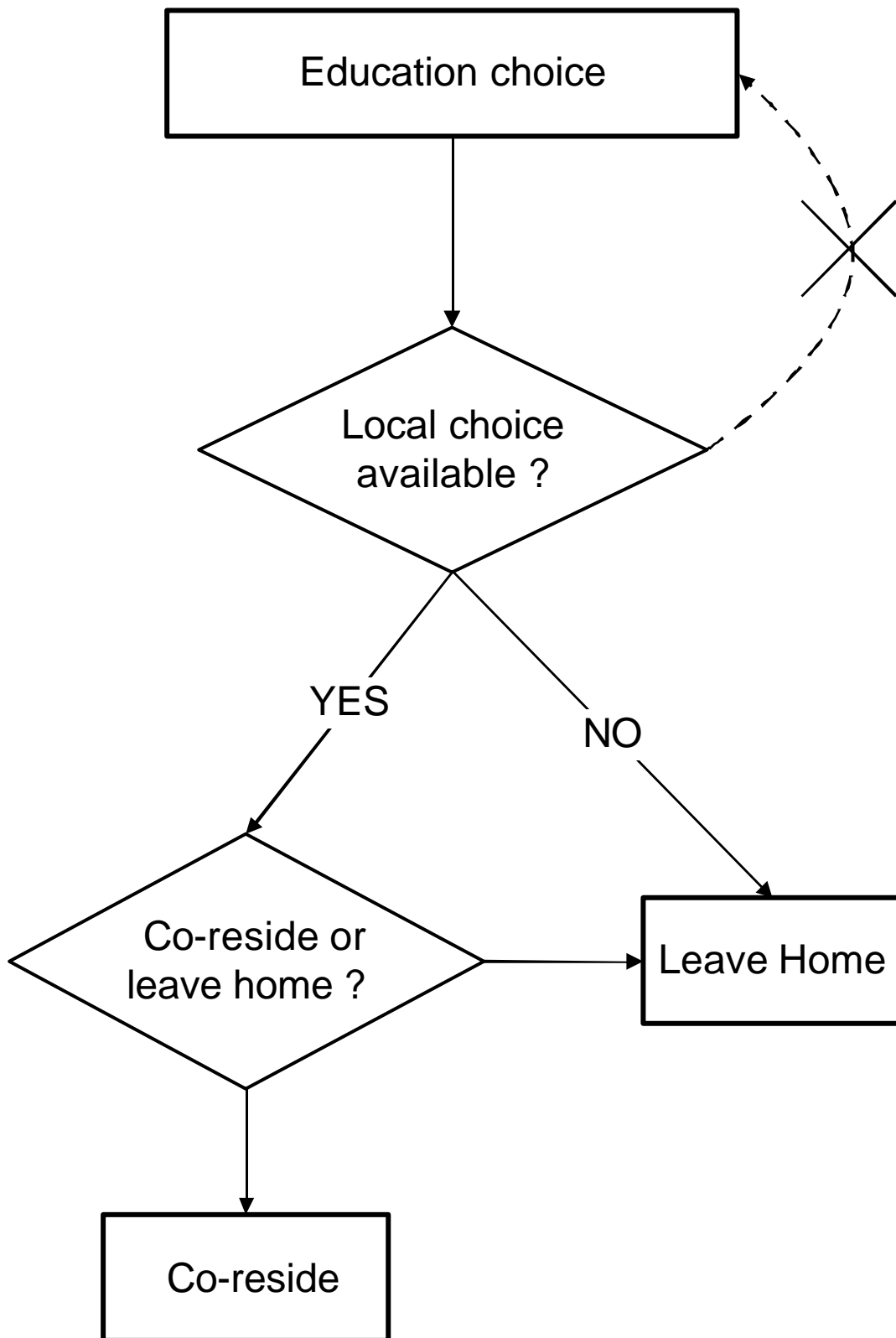




Figure 4. Evolution in the number of independent students by city size between 1992 and 1996

