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**Do public scholarships crowd out parental transfers?
Evidence at the intensive margin from France**

Sébastien GROBON, François-Charles WOLFF

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Do public scholarships crowd out parental transfers ?

Evidence at the intensive margin from France

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Abstract: This paper investigates the extent to which means-tested scholarships received by higher education students crowd out parental financial support at the intensive margin. We estimate a private transfer function using survey data collected in France in 2014 on a sample of students aged 18-24 who receive public scholarships. Introducing the amount of public transfer as an exogenous covariate, we find that one additional euro of scholarship is associated with a decrease in parental transfers of 0.40 euro. Using an instrumental variable strategy that exploits the non-linear schedule of the scholarship amount, we find a larger effect with a decrease of about 0.50. Our results suggest that a substantial part of the scholarship benefits low-income parents by reducing the amount of money they give to their student children.

JEL Classification: D64, I2, I3, L38, J13, D10

Keywords: public scholarship, students, parental transfers, crowding-out effect, altruism

Declarations of interest: none

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1. INTRODUCTION

Access to higher education in OECD countries has become increasingly widespread in recent decades, with university enrolment rates rising from 40% to 60% between 1995 and 2011 (OCDE, 2013). Nevertheless, inequalities by socioeconomic background persist (Astin, 2004; Chetty et al., 2020). These inequalities are partly due to the increased reliance of young adults, particularly students, on their parents' financial transfers over the past 50 years. Parental financial transfers represent a large share of their resources (Schoeni and Ross, 2005; Wightman *et al.*, 2012; d'Albis et al., 2019; Castell and Grobon, 2020) and contribute significantly to inequalities in length of study, leaving home, and broader opportunities (Kalenkoski *et al.*, 2010; Kahn *et al.*, 2013; Jentsch & Reiter, 2018; Flaster, 2018)¹.

In this paper, we analyze the interaction between private and public transfers to students in higher education in France, as these are two of their main sources of income and determine a large part of their standard of living. The public transfers studied here are scholarships for students who meet several eligibility criteria, including limited parental resources (Fack and Grenet, 2015). Private transfers are provided by parents as regular or occasional allowances in the form of pocket money, expenses and/or direct payment of rent. We measure them using a survey database specifically designed to collect this information from youths, with precise questions on all their budget items (Castell et al., 2016). For the first time in the literature, we investigate the extent to which means-tested scholarships crowd out parental support at the intensive margin.

We contribute to the existing literature in the three following ways. First, assessing the magnitude of the crowding-out effect provides information about the effectiveness of these public scholarships in reducing student poverty. Since Barro (1974) and Becker (1974), it is well known that changes in transfers associated with government policies can be partially or fully neutralized by changes in the provision of family support. The anti-poverty effectiveness of public transfers cannot be estimated without taking into account the response of private transfers (Cox and Jakubson, 1995; Schoeni, 2002). When there is crowding-out, the effectiveness of the policy is reduced by secondary beneficiaries who were not intended to be supported by the policy (Lampman and Smeeding, 1983). While

¹ In the U.S. context, the share of college education costs financed by parents has increased over the past decade (Sallie Mae, 2022). In France, parental transfers account for a large share of young adults' resources and remain highly linked to parental income (Grobon, 2018).

means-tested benefits to students (such as the US Federal Pell Grant, the UK Maintenance Grant for living costs, or the Spanish *Becas*) are intended to both reduce student poverty and enable poor families to finance their children's education, little is known about their impact on these objectives.

Secondly, measuring the crowding-out effect allows us to examine how different theoretical models developed in recent decades predict the interaction between public and private transfers. Under altruism (Becker, 1974; 1991), parents care about the well-being of their children by making financial transfers to compensate for differences in living standards. This implies a complete crowding-out, at least in the strict version of the model. Under exchange, parents purchase the services and upstream attention of their children (Bernheim et al., 1985; Cox, 1987). Also, children who are excluded from the credit market may receive private loans from their parents, which they later repay (Cox, 1990). Both can lead to a crowding-in effect. Providing empirical evidence is important given the lack of consensus to date (Laferrère and Wolff, 2006).

Third, analyzing the flow of money between parents and children sheds light on the period when the young adult becomes an independent household with her own preferences and budget. Studying how parental transfers respond to changes in the young adult's resources provides information on the evolution of intra-household resource allocation during this critical period. This is a relevant issue not only for family economics, but also for the design of public policies for youth, as whether to target financial benefits to young adults or their parents is a dividing line in European policy models (Chevalier, 2016).

To the best of our knowledge, the crowding-out effect of means-tested scholarships on parental transfers has not been studied. A comprehensive assessment of whether public transfers actually crowd out private transfers is difficult for two main reasons².

The first reason is that exploring the crowding-out effect requires detailed data on both private transfers, parental income and children's resources. In our empirical analysis, we overcome this problem by relying on fiscal data that measure parental resources and complementing them with a 2014 survey of a representative sample of all young adults aged

² Laferrère and le Blanc (2004) investigate the effect of housing allowances on the co-residence decisions of students in France, taking advantage of a 1991-1993 reform that made independent students eligible for housing allowances. However, they only estimate the total windfall effect without measuring the potential crowding-out effect at the individual level.

18-24. We include all possible sources of income for young adults using detailed information on wages, social transfers and family transfers. The second difficulty lies in the potential endogeneity bias that results from introducing public subsidies as a covariate in a private transfer equation. In our case, students with poor parents are likely to receive more means-tested public benefits, but the low parental income also affects the amount of private transfers received. Exogenous income variation has been exploited by a few studies, all of which focus on the crowding-out effect of private support for the elderly in developing countries (Jensen, 2004; Juarez, 2009; Gerardi and Tsai, 2014).

In our analysis, we restrict our sample to students who receive scholarships based on social criteria, thus focusing on the intensive margin. We first estimate a private transfer function in which we control for both parental and student characteristics. Introducing the public scholarship amount as an exogenous covariate, we find a negative correlation between private and public transfers, such that one additional euro of scholarship is associated with a decrease in private transfers of 0.4 euro (and up to 0.5 euro). In order to provide a causal interpretation, we exploit the fact that the scholarship amount based on social criteria is calculated according to a specific and non-linear schedule, following the strategy described in Angrist and Lavy (1999). Our instrument is a discontinuous function of the endogenous parameters determining scholarship eligibility, which we control for direct and continuous effects in the private transfer function. This allows us to isolate the exogenous effect of the discontinuities in the scholarship scheme as in Angrist and Lavy (1999).

Once we control for endogeneity, we find a slightly larger crowding-out effect, such that one additional euro of scholarship reduces the private transfer amount by 0.50 euro (and up to 0.65). This result does not confirm the existence of total crowding-out as predicted by the altruistic model à la Becker, but is compatible with models of either impure altruism or exchange. The remainder of our paper is organized as follows. In the next section, we briefly describe an altruistic model of private transfers with public subsidies. In Section 3, we present the French system of student scholarships based on social criteria and provide a description of the data. Our econometric strategy is described in Section 4, followed by a discussion of our estimates of the crowding-out effect at the intensive margin in Section 5. Finally, Section 6 concludes the paper.

2. THEORETICAL FRAMEWORK

We study the interaction between private and public transfers using a two-generation model of parental resource allocation. The literature has suggested two primary motives explaining why parents may transfer resources to their children: altruism and exchange (Becker, 1991; Cox, 1987; Laferrère and Wolff, 2006). Here, we consider a setting with one altruistic parent p and one child k .

Let $U(C_p)$ be the utility function of the parent and $V(C_k)$ that of the child, with C_p and C_k being the level of consumption of each generation. We assume that U and V are twice differentiable, with $U_1 > 0$, $U_{11} < 0$, $V_1 > 0$ and $V_{11} < 0$. The parent cares for the well-being of the child such that the parent will maximize the utility function $U(C_p) + \beta_p V(C_k)$, with β_p a caring parameter such that $0 < \beta_p < 1$. Each generation is endowed with a fixed income, either Y_p or Y_k , which is used to finance private consumption C_p or C_k ³. We denote by T the financial transfer made by the parent to the child and assume that $T \geq 0$.

When there is no public transfer, the budget constraints are $C_p = Y_p - T$ for the parent and $C_k = Y_k + T$ for the child, so that the total family consumption $C_p + C_k$ is equal to the total family income $Y_p + Y_k$. There is hence income pooling within the family. The optimal private transfer is obtained from the following maximization program:

$$\max_T U(Y_p - T) + \beta_p V(Y_k + T) \quad (1)$$

From the first-order condition $-U_1(Y_p - T) + \beta_p V_1(Y_k + T) = 0$, the optimal transfer is such that the parent's marginal utility of consumption is equal to the child's marginal utility of consumption weighted by the caring parameter. The transfer depends on both the parent's and child's level of income and we have $\frac{dT}{dY_p} > 0$, $\frac{dT}{dY_k} < 0$ and $\frac{dT}{dY_p} - \frac{dT}{dY_k} = 1$. When the parent is altruistic, the private transfer increases with the parent's income Y_p , but decreases with the child's income Y_k . Thus, the gift will compensate intergenerational differences in living standards. With many children, parents will compensate inequalities within the sibship by giving more money to their less well-off children. Also, if there is a shift of one euro from the parent to the child, then the parent will reduce the private transfer by exactly one euro (Altonji et al., 1997).

³ The model can easily be extended to account for endogenous labor supply, such that the child receives additional resources from labor force participation (see Wolff, 2006).

Now, we assume that the child receives an exogenous public transfer. Denoting by S the public subsidy amount, the budget constraint of the child becomes $C_k = Y_k + T + S$. For the moment, we do not account for the financing of the public transfer and the budget constraint of the parent remains $C_p = Y_p - T$. The total family consumption $C_p + C_k$ depends on all sources of income $Y_p + Y_k + S$. We have $\frac{dT}{dY_p} > 0$, $\frac{dT}{dY_k} < 0$, $\frac{dT}{dS} < 0$ and $\frac{dT}{dY_p} - \frac{dT}{dS} = 1$. The parental transfer will be a decreasing function of the public transfer S and the strength of this decrease is all the more limited as the parent is altruistic (β_p close to 1). There is a crowding-out effect of the private transfer as a result of the public transfer, and the parent becomes a “secondary beneficiary” of the public transfer (Lampman and Smeeding, 1983)⁴.

Next, we endogenize the public subsidy, which is expressed as a function of the total family income $S = S(Y_p + Y_k)$. A family with a high total income will receive less public support than a family with a low income, so that $\frac{\partial S}{\partial Y_p} < 0$ and $\frac{\partial S}{\partial Y_k} < 0$. The optimal private transfer satisfies:

$$\max_T U(Y_p - T) + \beta_p V(Y_k + T + S(Y_p + Y_k)) \quad (2)$$

The effects of each family income on the private transfer are $\frac{dT}{dY_p} = \frac{U_{11} - \beta_p V_{11} \frac{\partial S}{\partial Y_p}}{U_{11} + \beta_p V_{11}} > 0$ and

$$\frac{dT}{dY_k} = \frac{-\beta_p V_{11} \left(1 + \frac{\partial S}{\partial Y_k}\right)}{U_{11} + \beta_p V_{11}} < 0. \text{ Since } \frac{\partial S}{\partial Y_p} < 0, \text{ it follows that } U_{11} - \beta_p V_{11} \frac{\partial S}{\partial Y_p} < 0 \text{ and thus } \frac{dT}{dY_p} > 0.$$

A rich parent will transfer more money to a child than will a poor parent, but the child will get less public subsidy because of the higher resources of the parent. For the child’s income, we assume that $-1 < \frac{\partial S}{\partial Y_k} < 0$, i.e. the public transfer is reduced by less than one euro when the child’s income is increased by one euro. Since $1 + \frac{\partial S}{\partial Y_k} > 0$, the derivative $\frac{dT}{dY_k}$ remains negative and a less well-off child receives more money from the parent than does a rich child. Overall, this framework leads to a private transfer function with a public subsidy serving as a potentially endogenous covariate that will drive our econometric modeling.

As discussed in Laferrère and Wolff (2006), the necessary conditions for complete crowding-

⁴ This crowding-out effect can even be equal to one in some circumstances. As discussed in Barro (1974), this will occur once we account for the issue of financing the public expenditures.

out are very restrictive. Parental altruism is needed, but even some small changes in the parental utility function can strongly affect the difference $\frac{dT}{dY_p} - \frac{dT}{dS}$. This is the case in the model of impure altruism proposed in Andreoni (1989; 1990)⁵. In this setting, the private transfer is a source of utility for the parent through a so-called “warm-glow”. Let $W(T)$ be the level of satisfaction derived from the private transfer, which is weighted by a coefficient γ such that $0 < \gamma < 1$. Assuming that the public transfer is exogenous, then the parent maximizes the augmented utility function $U(Y_p - T) + \gamma W(T) + \beta_p V(Y_k + T + S)$ with respect to T .

The first-order condition is $-U_1(Y_p - T) + \gamma W_1(T) + \beta_p V_1(Y_k + T + S) = 0$, so the parent’s marginal utility of consumption is the sum of the weighted marginal utility of the child’s consumption and the marginal satisfaction of helping the child. From a static comparative analysis, the derivatives $\frac{dT}{dY_p}$ and $\frac{dT}{dS}$ are such that $\frac{dT}{dY_p} = \frac{U_{11}}{U_{11} + \gamma W_{11} + \beta_p V_{11}}$ and $\frac{dT}{dS} = \frac{-\beta_p V_{11}}{U_{11} + \gamma W_{11} + \beta_p V_{11}}$. It follows that $\frac{dT}{dY_p} - \frac{dT}{dS} = \frac{U_{11} + \beta_p V_{11}}{U_{11} + \gamma W_{11} + \beta_p V_{11}} < 1$. Under impure altruism, the crowding-out effect is incomplete and depends on both the intensity of the parameter γ and the concavity of the intrinsic utility W derived from the private transfer. The crowding-out effect is expected to be lower when the parental utility depends more on the “warm glow”. Finally, incomplete crowding-out can also occur under alternative models. A crowding-in effect is even possible under exchange (Cox and Jakubson, 1995). In the model developed by Cox (1987), parents provide their children with money in exchange for their attention and services. In this case, the effect of the child’s income on the transfer amount cannot be signed because it depends on the parental elasticity of demand for services. In the absence of market substitutes, the demand for attention is likely to be inelastic and the relationship between private transfer and the child’s income should be positive (Cox, 1987, Cox and Rank, 1992).

⁵ Incomplete crowding-out may occur even under perfect altruism. This would be the case if the child’s labor supply is endogenous or if the child’s effort is private information (Fernandes, 2011).

3. CONTEXT AND DATA

3.1 Student scholarships in France

We begin with a description of the student scholarship program. In France, student scholarships are intended to cover part of the living expenses of low-income households, depending on the number of dependent children and the distance to the place of study. They are awarded to about one-third of higher education students. Of the 2,470,700 students in higher education during the 2014–2015 academic year, around 62% (1,531,300) attended public universities. For that year, the number of recipients of scholarships based on social criteria was 655,858, representing 27% of the total number of students and 36% of those enrolled in a course of study that gives entitlement to a scholarship.

The higher education system in France is primarily funded by the State (Ministry of Higher Education, 2015). Education is not completely free, but public funding implies much lower tuition fees compared to the United Kingdom and the United States. As a consequence, a small proportion of students resort to loans (less than 10% according to our data) or paid work, around 20% in the period 2013–2015 (Zilloniz, 2017). Nevertheless, for families with low household income, the cost of studying instead of working can be a serious problem. For instance, 36% of French students from disadvantaged backgrounds reported that they did not have enough money to cover their needs (Belghith *et al.*, 2017). The French system of public scholarships is designed to help some of these families by allowing them to pay no tuition fees and for some of them to have part of their living expenses covered by a monthly amount based on various social criteria, as described below. These scholarships are granted to young people on the basis of both their individual circumstances and their family resources.

The official scheme offers eight levels of scholarships, ranging from the lowest level 0, which only waives tuition fees, to the highest level 7, with a grant of 554 euros per month. The intermediate levels are 101 euros (level 0A), 167 euros (level 1), 251 euros (level 2), 321 euros (level 3), 392 euros (level 4), 450 euros (level 5) and 477 euros (level 6)⁶. Eligibility for each level depends on parental resources (taxed income based on the family's annual tax return from two years ago) and a certain number of points for eligibility criteria awarded to

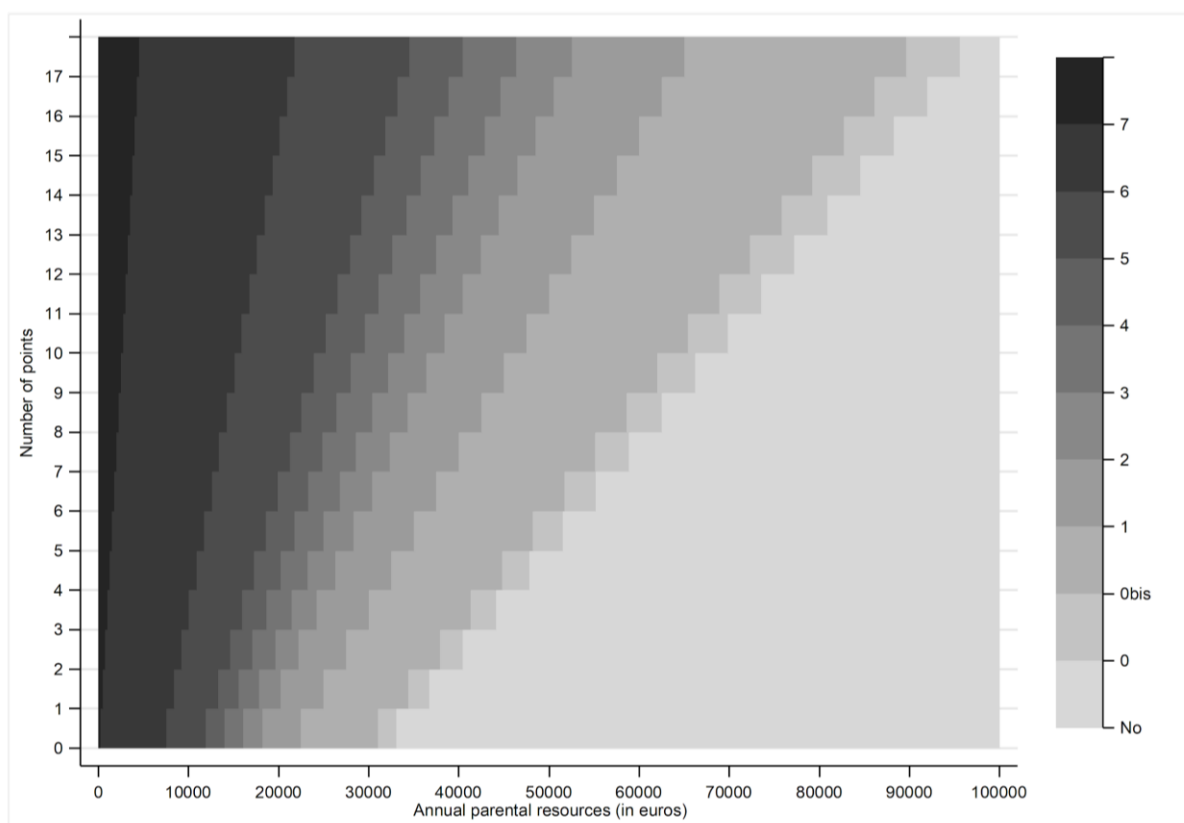
⁶ See the official decree: JORF n°0191, August 20th 2014, page 13803, text n° 9, available online at <https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000029374754>. The scholarships are based on social criteria and awarded over a 10-month period to students in formal education.

each family based on family structure (calculated by the number of siblings) and the distance between the parental home and the place of study. One eligibility point is awarded for a distance between 30 and 249 kilometers, and 2 points are awarded for a distance of 250 kilometers or more. In addition, two points are given for each sibling with a tax liability, and four points for each sibling in higher education.

Overall, the public scholarship amount paid to the student is a non-linear combination of both the number of points and the parents' tax income. We plot the detailed scholarship scheme in Figure 1, with the gray intensities indicating the different levels. For a given level of family income, students have access to higher levels of scholarship if more points are awarded to their household. Symmetrically, for a given number of points, the official scheme associates ranges of parental resources that determine eligibility for a higher amount of grant the lower the parental resources⁷. In what follows, we will exploit this discontinuous scheme to estimate the effect of public scholarship transfers on private transfers.

⁷ See JORF n°0191, August 20th 2014, page 13804, text n° 10, available online at <https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000029374760>.

Figure 1. Scholarship scheme for students in France (2014–2015)



Source: authors' calculations, adapted from official schemes.

Note: the official scheme includes seven levels of scholarship (from 0, the lowest amount, to 7, the highest). The number of points depends on the family structure. For details on the calculation of these points and the official scheme, see http://www.education.gouv.fr/pid25535/bulletin_officiel.html?cid_bo=81151 and <https://www.legifrance.gouv.fr/eli/arrete/2014/8/5/MENS1416785A/jo/texte>.

3.2 The ENRJ Survey

Our empirical analysis is based on fiscal data on parental incomes matched with a household survey completed by young adults aged 18 to 24 and their parents in France in 2014. The National Survey of Youth Resources (*Enquête Nationale sur les Ressources des Jeunes*, hereafter ENRJ) is, to the best of our knowledge, the only data source available in France for studying the interactions between public and private transfers to students. The ENRJ provides the first representative sample of all young people living in France, either with their parents, in an independent dwelling, or in a community such as a campus⁸. It was conducted from October 1 to December 31, 2014 by the French Ministry of Social Affairs (DREES) and the National Institute for Statistics and Economic Studies (INSEE).

As far as private transfers are concerned, a specific module has been dedicated to the different forms of help received from family members, distinguishing between regular funds that are not assigned to a specific type of expenditure but are given to the young person who can manage it freely, and other forms of additional help for specific expenditures. The various transfers are reported by the young respondents themselves and are recorded by budget item, namely expenditure on housing, food, transport, clothing, communication, education and leisure. This by-item approach identifies all transfers from parents, regardless of their frequency and nature.

All parental assistance that was a transfer or an expense was counted, but that was not the case for all in-kind assistance. In particular, the survey asked young adults how much money they were able to save on food provided by their parents, but no rent was imputed for the house provided free by their parents. In the latter case, however, condominium fees and home maintenance expenses paid by parents were taken into account⁹. For each item, we know the amount on a monthly basis: each young adult was asked to report the average amount per month received from parents for regular assistance, not the amount received in the exact month of the survey, and to exclude one-time expenses¹⁰. All the different inflows

⁸ The data were collected using a flexible method combining face-to-face and telephone interviews, which was successful despite the diversity of living situations. The various questionnaires are available online at the following URL: <https://data.progedo.fr/studies/doi/10.13144/lil-1120?tab=documents>.

⁹ For an extended analysis of parental transfers that takes into account in-kind transfers associated with cohabitation, including imputed rent, see Castell and Grobon (2020).

¹⁰ For instance, the exact questions used to measure regular financial transfers were: “Do you receive regular financial support (in cash or directly into your bank account) from your parents?” with possible responses of “yes” or “no” and, if yes, “What is the average amount of this support per month ?”.

were added together to obtain the total amount of private transfers. Appendix B3 proposes a robustness check by excluding first-year students, who might underestimate the amount of regular parental support by erroneously referring to the situation before they started higher education. The results remain unchanged, which seems to confirm the absence of such bias. The ENRJ survey also includes other types of resources that support students, such as other social income (unemployment benefits, housing allowances and family allowances) and wages. Students were asked whether they received a public scholarship. If so, the respondents indicated the level of scholarship received (from 0 to 7), to which we associate the official amount. Each student also reported the amount of scholarship they received per month. This allows us to compare the self-assessed amount to the amount associated with the self-assessed scholarship level. The survey also includes information on the residence of both the young adult and the parents, which allowed us to construct distance variables. No information is available on the number of siblings in higher education, but it can be inferred from the probability of being in school given the young person's age, as observed in a panel survey conducted by the Ministry of Higher Education.

Interviews were conducted with both the young adult and at least one of the parents (both parents in the case of separation), with 5,800 young adults and 6,300 parents responding to the survey. As emphasized in Altonji et al. (1997), information on both the child's and the parent's economic situation is crucial for estimating a private transfer function. The ENRJ adopted this dual approach in order to maximize the precision of the matching between the ENRJ survey and the administrative data provided by the tax authorities¹¹. This makes it possible to obtain accurate measures of parental income while also controlling for the characteristics of both the young adult and their parents. In the case of separated parents, both parents were interviewed in order to obtain more accurate information on this population, for which the determinants of transfers may be more complex (Furstenberg, 1995).

Our empirical analysis is based on a measure of parental resources constructed as the sum of the individual incomes of both parents when they form a single household, and the maximum of both when the parents are separated and form two households. This allows us to better account for the specificity of separated parental households. In the Appendix

¹¹ For details on the matching process, see Grobon et al. (2018).

(Section B1), we consider a variant where incomes are constructed as the sum of individual parental incomes, regardless of the parents' marital status. The definition of parental resources does not affect our conclusions.

In our paper, we examine the magnitude of the crowding-out effect at the intensive margin, i.e. we focus on the sample of students receiving a public scholarship. This sample restriction allows us to know the precise eligibility criteria for the public transfer, as these students rarely benefit from other social transfers. The fact that these students are mostly dependent on parental transfers (Castell et al., 2014) is also relevant for studying the interaction between public and private transfers. In addition, the change from receiving no scholarship to receiving even a small amount of scholarship may have an influence on the decision to continue studying (Fack and Grenet, 2015). Thus, the focus on the intensive margin allows us to rule out the issue of the endogenous decision to go on to university.

The ENRJ survey identifies 949 young adults who receive a public scholarship, although not all of them are enrolled in higher education. We focus on respondents benefitting from a higher education scholarship based on social criteria (N = 810). By definition, level 0 consists only of an exemption from university tuition fees, so there is no monthly public grant for students receiving this level. Thus, we further restrict our attention to students whose scholarship ranges from level 0A to level 7. We end up with a sample comprising 696 young adults who are matched to their parents¹². In the Appendix (section B2), we examine the relevance of our results using an extended sample that includes students receiving a level 0 grant, and reach very similar conclusions.

¹² The full sample includes all students receiving a public scholarship and reporting a strictly positive amount as defined by the survey's corrected level variable, taking into account the consistency between the reported level and the other information provided (n=696). Empirical analyses using the reported scholarship level are estimated on the subsample of young people who reported a level that entitled them to a positive amount as defined by the uncorrected variable (n=674).

Table 1 describes the characteristics of the selected students and their parents. The proportion of male students in the sample is 53.4% and the average age of the students is 19.8 years. Around 16% of the students have a paid job during their studies. In addition, 46.3% of students live in an independent dwelling and 79.9% of students live close to their place of study¹³. Nearly one-third of the students in our sample have divorced parents, and about half of their parents have completed high school. Overall, the monthly scholarship amount reported by students is 279.5 euros. By comparison, the average amount of assistance received from parents is 274.5 euros.

¹³ Living in proximity corresponds to situations where students live 100 km or less from the parental home or students indicated that they chose their place of study primarily because of its geographic proximity.

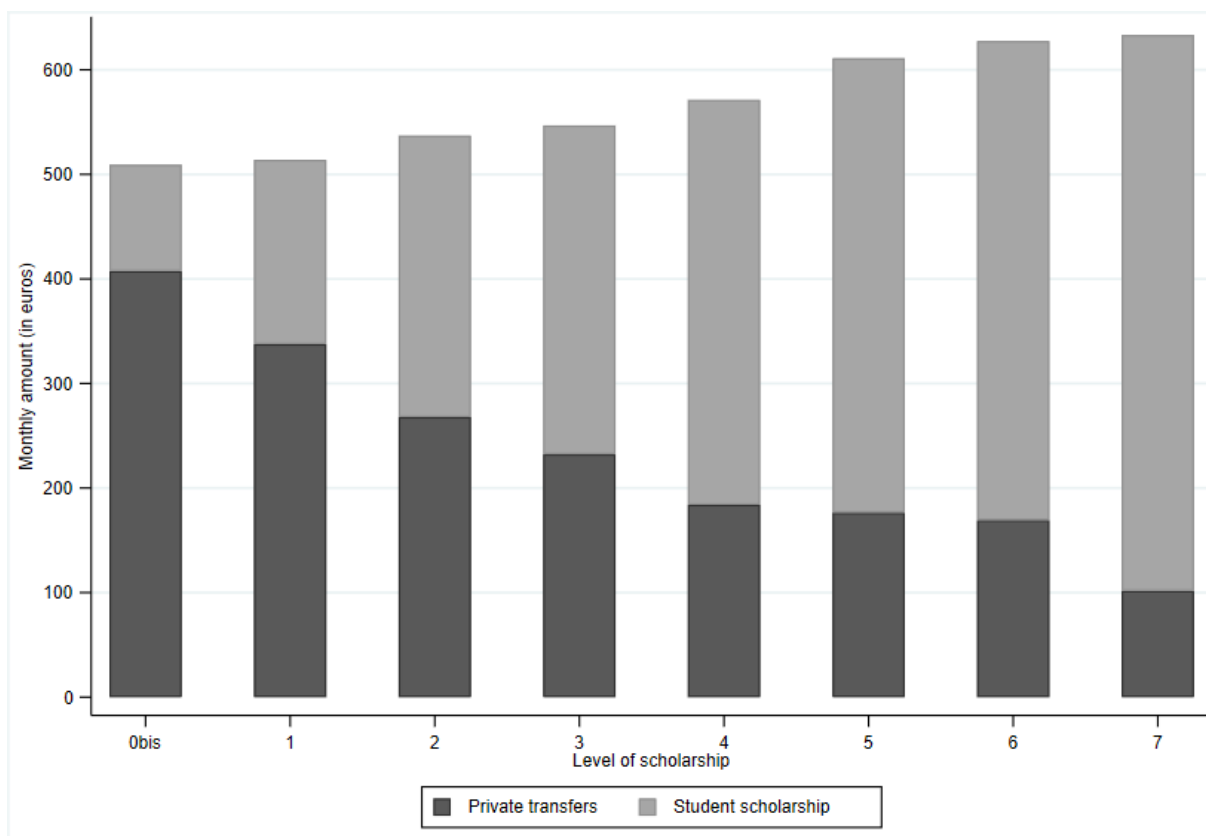
Table 1. Descriptive statistics of the sample

Variables		Average amount (in euros)		Proportion
		Private transfers	Student scholarship	
<i>Characteristics of student</i>				
Gender	Male	276.7	283.7	0.534
	Female	272.0	274.7	0.466
Age	18	321.8	261.1	0.279
	19	298.8	273.4	0.240
	20	223.9	302.0	0.174
	21	250.3	277.9	0.122
	22	240.8	275.8	0.101
	23	255.6	307.3	0.056
	24	178.4	338.3	0.029
Siblings	0	242.6	307.7	0.205
	1	323.6	249.0	0.351
	2	272.4	277.9	0.303
	≥3	203.8	317.6	0.141
Proximity to study location		257.6	282.2	0.799
Lives with a spouse		273.6	291.2	0.046
In an independent dwelling		290.6	285.7	0.463
Participation in the labor market		243.2	279.7	0.157
<i>Characteristics of parents</i>				
Divorced		281.7	316.4	0.320
Education	Primary-secondary	191.4	339.0	0.205
	Vocational training	243.6	276.1	0.286
	High school	325.5	275.3	0.182
	More than high school	325.6	247.3	0.326
Parental income	Quintile 1	139.9	438.5	0.200
	Quintile 2	220.1	340.4	0.200
	Quintile 3	276.6	249.5	0.200
	Quintile 4	338.6	191.6	0.200
	Quintile 5	398.5	176.4	0.200
All (N=696)		274.5	279.5	

Source: authors' calculations, Drees-Insee – ENRJ Survey 2014.

According to Figure 2, there is a relative stability in the amount of total transfers (public and private) received by students who have been granted one of the first four levels of scholarship: 509 euros for level 0A, 514 euros for level 1, 537 euros for level 2 and 547 euros for level 3. For higher levels, the total amount of transfers tends to increase gradually, from 571 euros for level 4 to 633 euros for level 7. At the same time, the respective contributions of private and public transfers to total support vary greatly according to the level of scholarship. Parents behave as if they were trying to adjust their own financial support so that their children can maintain a minimum level of resources (around 500 to 600 euros per month). The relative weight of public transfers is 28.9% for the lowest level (0A), then it increases to 56.8% for level 2, 74.4% for level 4, and 86.5% for the highest level, with some heterogeneity in the level of private transfers at a given scholarship level.

Figure 2. Average amounts of private transfers and student scholarship

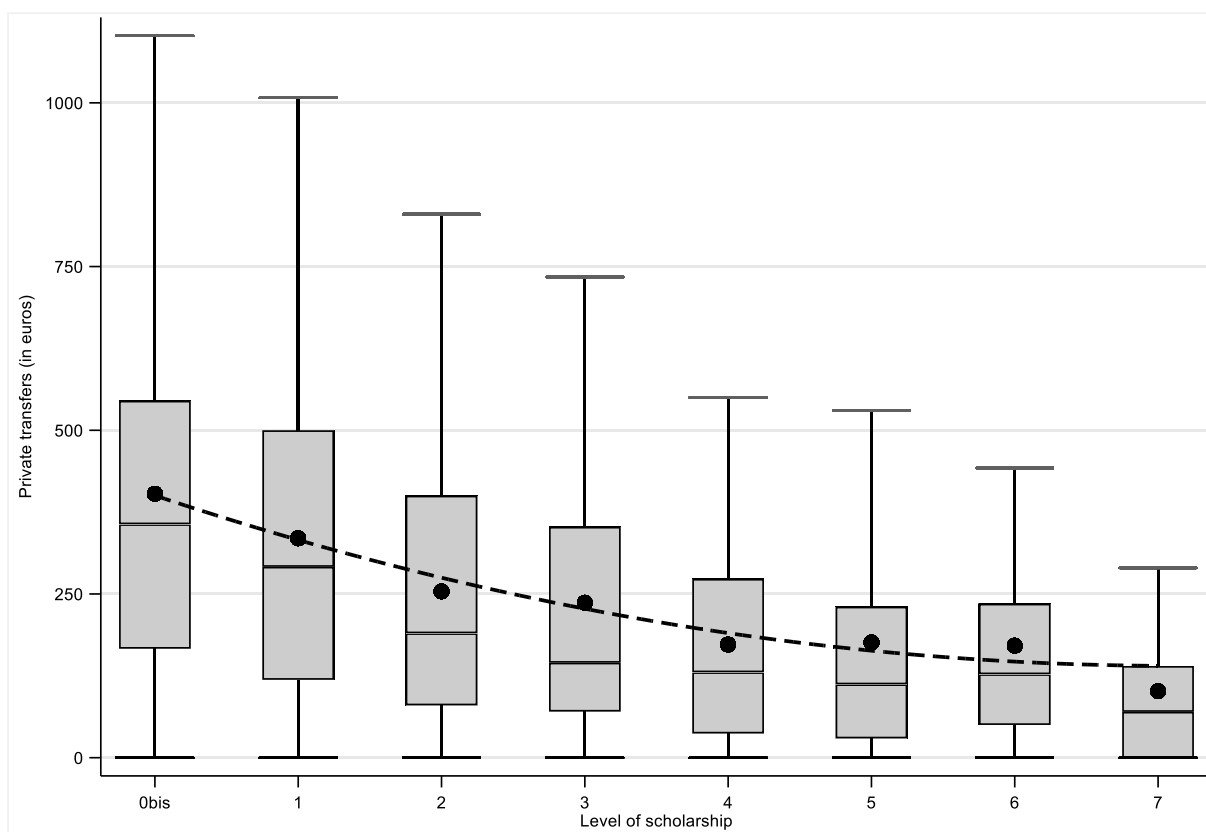


Source: authors' calculations, Drees-Insee – ENRJ Survey 2014.

We further examine the relationship between private and public support in Figure 3. We consider a box plot in which we plot the 25th percentile, the median and the 75th percentile of family transfers for each scholarship level. The correlation between the two types of resources is clearly negative¹⁴. This pattern suggests some crowding-out effect of private transfers by public scholarships. At the same time, the provision of family support is expected to depend on the characteristics of both students and their parents. As shown in Table 1, private transfers increase with parental income: 139.9 euros for parents in the 1st quintile of income, 276.6 for the 3rd quintile and 398.5 for the 5th quintile. Parents with higher education also tend to help their young adult children more systematically and with higher amounts. Conversely, public transfers are lower as parental income increases. This is due to the fact that the public scholarship is a means-tested benefit. Private and public transfers also vary with the age of the recipient and the number of siblings.

¹⁴ The coefficient of correlation between the private and public transfers is equal to -0.378.

Figure 3. Relationship between private transfers and student scholarship



Source: authors' calculations, Drees-Insee – ENRJ Survey 2014.

Note: the box plot shows the median and the interquartile range, with the mean represented by the bullet point. The dashed line corresponds to a quadratic fit of the average private transfers calculated for each scholarship level.

Note: the dashed line represents a quadratic fit.

4. ESTIMATION STRATEGY

We turn to an econometric analysis to investigate how public scholarships affect financial transfers received by students. We try to estimate the effect of a one euro increase in the public scholarship on the amount of private transfer received by children, conditional on having received a scholarship. The main difficulty to overcome is the endogeneity of the amount of public aid, which is not randomly assigned. We assume that the private transfer amount T depends both on the scholarship S and on a set of family and individual characteristics summarized by the vector X , which includes in particular the parental income Y_p . We consider the following linear model to explain the amount of private assistance T received by a student who also benefits from a scholarship:

$$T = \delta S + X\beta + \varepsilon \quad (3)$$

where δ and β are parameters to be estimated and ε is an error term such that $E(\varepsilon) = 0$. The coefficient of interest is δ which is expected to be negative if there is a crowding-out effect. Estimating (3) using Ordinary Least Squares (OLS) allows for a causal interpretation of the crowding-out effect under the assumption of the exogeneity of public scholarship, while holding other control variables constant. In our context, two sources of endogeneity are likely to bias the magnitude of the coefficient δ .

The first and main source of endogeneity arises from the fact that the amount of public aid S is not randomly assigned to students. For example, families with more resources are expected to provide larger financial transfers to their students, regardless of the amount of public aid received. Since the public transfer received is also based on family resources, the causal effect of public aid on private transfers is difficult to separate from the underlying relationship between family resources and private transfers. This means that the scholarship amount may be correlated with the residual of the regression.

We turn to an instrumental variable (IV) estimator to provide a causal interpretation of the scholarship's effect, following the empirical strategy used in Angrist and Pischke (1999). The instrument is based on the discontinuities in the eligibility schedule for public transfers. Campbell (1969) shows that the effect of a student scholarship on post-scholarship academic outcomes can be estimated even if the scholarship is awarded on the basis of past outcomes, which are obviously endogenous, provided that the scholarship is awarded on a discontinuous scale. The existence of discontinuous thresholds for scholarship receipt allows

controlling for the continuous effect of past outcomes while measuring the effect of the scholarship on subsequent outcomes using the discontinuity points.

In our framework, the endogenous regressor S is determined by a discontinuous function of two covariates, which are parental income Y_p and the number of points N (see Figure 1). In order to identify the causal effect of S on T , the IV estimation of the parental transfer function relies on nonlinearities in the relationship between the scholarship and the covariates that determine the amount of public aid. At the same time, the direct influence of parental income and number of points on private transfers is controlled for by using smooth functions in the vector of control variables X . We make the reasonable assumption that the effect of parental income and household size on the private transfer follows a continuous functional form, while it has no specific reason to follow arbitrary discontinuities as in the scholarship schedule. While parental support may vary differently depending on the number of children under 18 or those in higher education (which is the case in the official scale), Grobon (2018) shows that both numbers have very similar effects for a given level of parental income¹⁵.

Due to our limited sample size, we cannot conduct RDD estimations using pairwise comparisons of adjacent scholarship levels at the discontinuity (level 2 versus level 3 for instance) as in Fack and Grenet (2015). However, a similar approach is still possible in the full sample, with an instrumental variable that reflects all discontinuities. Angrist and Lavy (1999) consider both a full sample and a sample “around the discontinuity” when estimating the effect of class size on academic achievement¹⁶, which Van Der Klaauw (2002) refers to as the “RD-motivated IV approach”. The analysis across the discontinuities has the advantage of extracting the relationship between the variables determining eligibility for the public transfer and the variable of interest, since the eligibility variables are fixed. However, controlling for these eligibility variables with a functional form that matches the relationship between them and the variable of interest makes it possible to include observations further away from the discontinuity zone in the analysis without affecting the quality of the

¹⁵ In Appendix B4, we present a robustness check where we include equivalence-adjusted parental income, which is equal to disposable income (income + benefits - taxes) divided by the number of consumption units linked to household size. This allows us to account for the effect of household size on private transfers in a different way. The OLS results are slightly higher, but remain in the same order of magnitude, while the IV results are unchanged.

¹⁶ See Table IV in Angrist and Lavy (1999, p. 554).

estimation (see the discussion in Van Der Klaauw, 2002).

Although the rule relating the covariates to the amount of the public scholarship is deterministic (published by decree), our problem corresponds to a case of fuzzy setting. This is because the ENRJ survey has imperfect information on both parental income and the covariates that determine the number of points for eligibility. This is particularly the case for the schooling situation of siblings, which is calculated using the age of the siblings, the distance between the parents' home and the place of study, which is approximated by the distance between the young person's home and the parents' home, and the fiscal data, which are based on the previous year's income rather than the income of two years earlier. A causal analysis using discontinuities remains possible as long as the assumption of continuity of the residuals conditional on the assignment variables is still verified (Van Der Klaauw, 2002).

Following Angrist and Lavy (1999), we rely on a two-stage regression design to estimate $T = \delta S + X\beta + \varepsilon$. The instrument is a predicted amount of scholarship S^T , which is calculated using parental fiscal income, available information on the number of children, whether they are studying or not, and the distance between the parents' and the young adult's residence. Let S^T be the theoretical amount of a scholarship granted by the official scheme for a level of parental income Y_p and a number of points N . We express the relationship between S^T and both Y_p and N as $S^T = f(Y_p, N)$. The first-stage regression is:

$$S = \gamma S^T + X\theta + \zeta \quad (5)$$

where γ and θ are parameters to be estimated and ζ is a residual. Since f is a deterministic function of Y_p and N , and since Y_p and N are expected to be correlated with the amount of private transfer provided by the parent, the identifying assumption is that any continuous effects of the variables underlying Y_p and N on the parental support are partialled out of the instrument through X in the first stage and controlled for in the second stage regression¹⁷. Regardless of the motivation of the private transfer T , we expect a positive correlation between parental income and financial support (Laferrère and Wolff, 2006). Moreover, the private transfer should be negatively correlated with the number of siblings. In summary,

¹⁷ Regressors include the student's gender, age, and number of siblings (ages 0-17 and 18-24, respectively), as well as parental characteristics: their age, degree, and income, and whether they are separated. These control variables are common for the estimation of a private transfer function (see for example Cox and Jakubson, 1995).

the instrument reproduces all the discontinuities of the scale in the above-mentioned f -function and allows to measure the effect of these discontinuities net of the continuous effect of the variables defining the schedule. We also assume that the possible error that biases our instrument S^T is orthogonal to the error that biases both the amount S and the level L of the reported scholarship.

Another identifying assumption is that parents do not strategically exploit the formal rule leading to the public scholarship amount. It is hardly credible that parents would reduce their labor force participation or give birth to a new child in order to make their student child eligible for a higher public scholarship amount. It could be argued that parents might try to change the income they report to the tax authorities. However, because the scholarship amounts are based on the previous year's tax income, which itself is based on the amounts reported two years earlier, such manipulation seems highly unlikely. Moreover, as noted in Fack and Grenet (2015), the fact that the official thresholds are released late in the year and after candidates have applied prevents parents from manipulating the discontinuity of the thresholds.

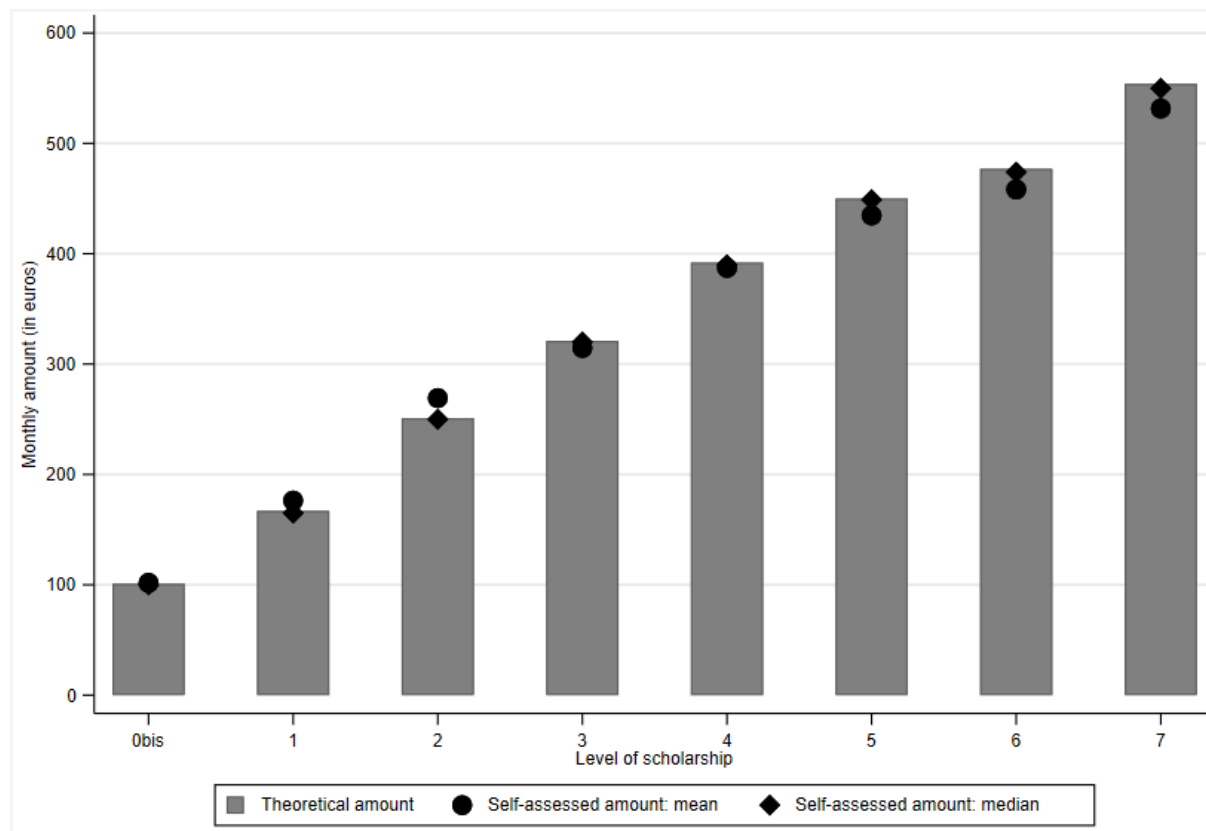
The second potential source of endogeneity is related to measurement error in the scholarship S . Intentionally or not, students may misreport the importance of the public assistance they receive. If students with large scholarships routinely report a smaller amount of money because receiving public assistance is considered as a stigma (Moffitt, 1983), then the estimated coefficient $\hat{\delta}$ will overestimate the crowding-out effect. Conversely, if students granted the lowest scholarships report higher amounts than they actually receive, then the OLS estimator would underestimate (in absolute value) the magnitude of the crowding-out effect. In the presence of random measurement error in reported scholarship amounts, the crowding-out effect may also be biased toward 0 (Hutcheon et al., 2010).

The ENRJ survey provides two separate measures of the scholarship amount: the level of scholarship, which ranges from 0A to 7, and a continuous monthly amount (both measures are self-reported). A priori, the measurement error should be less severe when using the scholarship level. Indeed, students receive a letter indicating when they are recipients of the scholarship indicating the level to which they are eligible, so we can associate the official amount with that level. Conversely, the amount reported directly by the student may be less accurate. First, students may not be aware of the exact scholarship amount published by the decree. Second, students may report an approximate or rounded amount. Third, students

may calculate an amount using a 12-month rather than a 10-month schedule when converting the annual amount to a monthly allowance.

Figure 4 shows the theoretical amount associated with each level and the self-assessed amount, for which we plot the mean and median. Overall, the average amounts observed in both cases are very close. The monthly amount declared by the students (279.5 euros) is slightly lower (2.3%) than the average theoretical amount corresponding to the self-declared level (286.1 euros). The differences in the average amounts are slightly greater above level 3. Students report lower amounts compared to the theoretical ones, with a gap of around 5% for levels 5 to 7. Around 15% (14.9%) of students report an amount exactly equal to the theoretical amount associated with the scholarship level. When a margin of plus or minus 5% is applied to the theoretical amount associated with each level, 70.1% of the self-reported amounts fall within the interval. Overall, the self-reported and theoretical amounts tend to coincide, but there are a few situations where scholarship amounts are either over- or under-reported.

Figure 4. Theoretical and self-assessed amounts of student scholarship



Source: authors' calculations, Drees-Insee – ENRJ Survey 2014.

A simple way to evaluate the potential role of measurement errors is to introduce as a covariate the theoretical amount S^L associated with the self-reported scholarship level L instead of the self-reported amount:

$$T = \delta^L S^L + X\beta + \varepsilon \quad (4)$$

If we admit that there is relatively less error in the reported level L than in the self-assessed amount S (which seems to be a reasonable assumption, although not directly testable), then the estimated coefficient $\hat{\delta}^L$ will be corrected for part of the bias due to measurement error.

5. RESULTS

5.1. OLS estimates

We begin by presenting linear estimates explaining the amount of private transfer under exogenous scholarship. The OLS estimates with robust standard errors are presented in Table 2. Without any family characteristics, the variation in the scholarship explains 14% of the variation in family support. We find a negative coefficient of -0.63 for the public scholarship amount, suggesting a large crowding-out effect (column 1). Since the scholarship itself depends on characteristics such as parental income and family structure, this magnitude is likely to overestimate the true effect of public transfers on parental support.

Table 2. OLS estimates of private transfers, with exogenous level of student scholarship

Variables	(1)		(2)		(3)	
	coef	t-test	coef	t-test	coef	t-test
<i>Exogenous scholarship</i>						
Self-assessed amount	-0.63***	(-11.13)	-0.41***	(-5.48)	-0.42***	(-5.66)
<i>Characteristics of student</i>						
Female			14.11	(0.82)	14.94	(0.86)
Age			-21.76***	(-3.74)	-20.66***	(-3.48)
Number of siblings 0–17			-20.81**	(-2.30)	-18.79**	(-2.11)
Number of siblings 18–24			-4.29	(-0.38)	-4.8	(-0.42)
Proximity to study location					-47.84*	(-1.92)
Lives with a spouse					17.59	(0.41)
In an independent dwelling					4.08	(0.21)
Participation in the labor market					-29.14	(-1.33)
<i>Characteristics of parents</i>						
Age			4.56***	(2.90)	4.46***	(2.83)
Divorced			50.12***	(2.65)	47.53**	(2.52)
Education Primary-secondary			<i>Ref.</i>		<i>Ref.</i>	
Vocational training			5.84	(0.27)	7.75	(0.36)
High school			76.68***	(2.73)	74.99***	(2.67)
More than high school			45.98*	(1.90)	43.31*	(1.79)
Monthly parental income (fiscal)			0.03***	(4.07)	0.03***	(3.69)
Constant	450.78***	(21.85)	476.01***	(3.65)	508.89***	(3.75)
Number of observations	696		696		696	
R ²	0.14		0.22		0.23	

Source: authors' calculations, Drees-Insee – ENRJ Survey 2014.

Note: estimates from OLS regressions with robust standard errors. Significance levels are 1% (***), 5% (**) and 10% (*).

In column 2, we introduce a set of family characteristics that capture these confounding factors. The OLS estimates still suggest a substantial crowding-out effect of public transfers by private transfers, as an increase of one euro in the scholarship is associated with a decrease of 41 cents in parental transfers. In other words, students who receive one additional euro through a scholarship benefit from a net gain in resources equal to 59 cents: the rest is absorbed by a reduction in private transfers. This pattern is consistent with previous studies of family transfers to students in France. In particular, Wolff (2012) found that one additional euro of financial resources received by children (either wages or public transfers) reduces parental support by around 30 cents. As shown in column 3, the magnitude of the crowding-out effect is not affected by adding potentially endogenous regressors such as the proximity of the parental home to the place of study, living with a spouse, living independently or having a paid job.

The other coefficients in Table 2 provide information on the determinants of private transfers to young adults. Males and females receive similar support on average. A high number of siblings aged between 0 and 17 puts some pressure on the total amount of resources that parents can devote to their student children. Conversely, the number of siblings aged 18-24 has no effect. Compared to parents with primary or secondary education, parents with a high school diploma give their children about 77 euros more. Private transfers are positively correlated with parental income, but are less sensitive to changes in parental resources. An increase of 1,000 euros in monthly parental income is associated with an increase of 30 euros in the transfer amount.

In Table 3, we estimate the same regressions using alternative measures of the public transfer. Since students may make errors in reporting their scholarship amount, the underlying bias could be reduced by considering the theoretical amount associated with the self-reported level, assuming that there is no error in the reported level¹⁸. Comparing panel A and panel B, we find very similar results: -0.407 for the self-assessed amount and -0.435 for the theoretical scholarship amount. The fact that the magnitude of the crowding-out effect is very close in both cases is evidence of the consistency between the two measures. In panel C and D, we consider the self-assessed parental income variable instead of the fiscal

¹⁸ This reduces the sample size to 674 students as the scholarship level is unknown for 22 students.

income. This leads to very similar magnitudes of the crowding-out effect: -51.8 cents with the self-assessed scholarship (panel C) and -54.6 cents with the theoretical amount of scholarship (panel D).

The marital situation of the parents may have some influence on the provision of financial transfers. As shown in Table 2, the private support of divorced parents is on average 50 euros higher than that of parents who stayed together. Although each divorced parent on average provides less money to their young adult children (Furstenberg et al., 1995; Grobon, 2018), children may still receive money from two different households, which may lead to an equal or even higher total amount received. Therefore, we conduct a separate analysis for intact and non-intact families and present the corresponding estimates in Table 3. The crowding-out effect is higher for non-intact families using parental fiscal data (columns 3 and 4, panels A and B). In addition, the private transfer is more sensitive to parental income when the sample is restricted to intact families.

Table 3. OLS estimates of private transfers

Variables	(1) All families		(2) All families		(3) Non-Intact families		(4) Intact families	
	coef	t-test	coef	t-test	coef	t-test	coef	t-test
Panel A. Self-assessed amount of student scholarship and parents' fiscal income								
Student scholarship	-0.41***	(-5.48)	-0.42***	(-5.66)	-0.44***	(-3.56)	-0.37***	(-3.61)
Fiscal parental income	0.03***	(4.07)	0.03***	(3.69)	0.03**	(2.00)	0.03***	(3.00)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	696		696		223		473	
R ²	0.22		0.23		0.27		0.20	
Panel B. Theoretical amount of student scholarship and parents' fiscal income								
Student scholarship	-0.44***	(-5.58)	-0.45***	(-5.75)	-0.53***	(-3.98)	-0.35***	(-3.40)
Fiscal parental income	0.03***	(3.86)	0.03***	(3.47)	0.02*	(1.67)	0.04***	(3.33)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	674		674		218		456	
R ²	0.22		0.23		0.28		0.20	
Panel C. Self-assessed amount of student scholarship and parents' self-assessed income								
Student scholarship	-0.52***	(-8.06)	-0.52***	(-8.17)	-0.49***	(-3.98)	-0.43***	(-5.04)
Self-reported parental income	0.02***	(3.11)	0.02***	(3.03)	0.01	(0.95)	0.05***	(3.92)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	696		696		223		473	
R ²	0.21		0.22		0.26		0.22	
Panel D. Theoretical amount of student scholarship and parents' self-assessed income								
Student scholarship	-0.55***	(-8.09)	-0.55***	(-8.16)	-0.58***	(-4.41)	-0.42***	(-5.07)
Self-reported parental income	0.02***	(2.76)	0.02***	(2.64)	0.00	(0.45)	0.05***	(4.25)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	674		674		218		456	
R ²	0.22		0.23		0.28		0.22	

Source: authors' calculations, Drees-Insee – ENRJ Survey 2014.

Note: estimates from OLS regressions with robust standard errors. Significance levels are 1% (***), 5% (**) and 10% (*). Basic controls include gender, age, numbers of student's siblings (aged 0–17 and 18–24), age, divorced, education and parents' income. Extended controls for the student additionally include proximity to study location, living with a spouse, in an independent dwelling and participation in the labor market. Monthly parental income is defined as the sum of the individual incomes of both parents when they form a single household, and the maximum of both when the parents are separated and form two households.

5.2. IV estimates

We now relax the exogeneity assumption of the public scholarship amount and turn to an IV estimation of the crowding-out effect. As a first step, we consider the official amount of scholarship associated with each self-reported level as the instrument, i.e. S is expressed as a function of S^L along with the other control variables in a first stage. As shown in panel A of Table 4, there is a very strong and positive correlation between the instrument and the self-assessed scholarship amount. This is due to limited measurement error in the self-assessed amount of scholarship. A comparison of the OLS and IV estimates shows a slight increase in the magnitude of the crowding-out effect: a one euro increase in the scholarship amount reduces the parental transfer by 48 cents after instrumentation, compared to 41 cents under exogeneity (column 1). Very similar results are obtained with extended controls (column 2), and the coefficient of the scholarship amount is higher (in absolute value) for non-intact families than for intact families (columns 3 and 4).

In panel B of Table 4, the scholarship amount is instrumented using the predicted transfer S^T calculated from the official scheme. For each student, we calculate S^T using the number of points N and the parental fiscal income Y_p . According to the first-stage estimates, we find that the predicted scholarship S^T is strongly correlated with the self-assessed amount. However, the coefficient associated with the instrument is around 0.63 (column 1). This suggests that for some students, we are not able to accurately predict the amount of scholarship that they are expected to receive. This could be due to the fact that we only consider the one-year lagged value of parental fiscal income (rather than the two-year lagged income) and we have imperfect information on both the number and student status of siblings.

Table 4. IV estimates of private transfers

Variables	(1) All families		(2) All families		(3) Non-intact families		(4) Intact families	
	coef	t-test	coef	t-test	coef	t-test	Coef	t-test
Panel A. Instrument: self-assessed scholarship level								
<i>IV first stage: student scholarship</i>								
Instrument: amount corresponding to the self-assessed level (S^L)	0.90***	(45.55)	0.90***	(44.79)	0.93***	(37.25)	0.87***	(28.48)
R ²	0.87		0.87		0.85		0.88	
F-test of excluded instrument	2074.44		2006.37		1387.41		811.22	
<i>IV second stage: parental transfer</i>								
Student scholarship	-0.48***	(-5.59)	-0.50***	(-5.77)	-0.57***	(-4.08)	-0.41***	(-3.40)
Parental income	0.03***	(3.25)	0.03***	(2.84)	0.02*	(1.78)	0.03**	(2.57)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	674		674		218		456	
R ²	0.22		0.22		0.26		0.20	
Panel B. Instrument: predicted scholarship								
<i>IV first stage: student scholarship</i>								
Instrument: predicted amount by the scheme using our data (S^T)	0.63***	(9.32)	0.62***	(9.11)	0.73***	(6.55)	0.53***	(7.52)
R ²	0.52		0.52		0.36		0.61	
F-test of excluded instrument	86.79		83.06		42.86		56.55	
<i>IV second stage: parental transfer</i>								
Student scholarship	-0.58***	(-3.27)	-0.64***	(-3.58)	-0.75***	(-2.78)	-0.40	(-1.54)
Parental income	0.02	(1.53)	0.02	(1.07)	0.02	(1.25)	0.03	(1.44)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	696		696		223		473	
R ²	0.21		0.22		0.24		0.20	

Source: authors' calculations, Drees-Insee – ENRJ Survey 2014.

Note: estimates from 2SLS regressions, with robust standard errors. Significance levels are 1% (***), 5% (**) and 10% (*). Basic controls include gender, age, numbers of student's siblings (aged 0–17 and 18–24), age, divorced, education and income for parents. Extended controls for the student additionally include proximity to study location, living with a spouse, in an independent dwelling and participation in the labor market. Monthly parental income is defined as the sum of the individual incomes of both parents when they form a single household, and the maximum of both when the parents are separated and form two households.

Although significantly lower than in panel A, the F-test of the excluded instrument is equal to 86.8, which is much higher than the common threshold of 10 for detecting a weak instrument (Bound et al., 1995; Staiger and Stock, 1997). However, the recent paper by Lee et al. (2022) suggests that the current practice based on a first-stage F greater than 10 may be misleading. According to these authors, a true 5 percent test requires an F-statistic greater than 104.7, meaning that the critical value should be 3.43 rather than 1.96 with a threshold of 10. We thus implemented the new tF test proposed by Lee et al. (2022), which gives F-dependent adjusted t-ratio critical values. Probably because of the high F value (close to 90), we find very little change with the tF adjustment. The t-value after F adjustment remains at 1.96 at the 5 percent level, but is around 2.8 at the 1 percent level.

Turning to the second-stage estimates, the magnitude of the crowding-out effect is now -58 cents: this is around 43% higher than the coefficient under exogeneity. Controlling for proximity to the place of study, living with a spouse, living in an independent dwelling and participation in the labor market, the coefficient of the public scholarship is -64 cents. As shown in columns 3 and 4, the difference in crowding-out between separated parents and those who stayed together is higher in the IV estimation. For separated parents, one additional euro of scholarship reduces the parental transfer by 75 cents. For households of parents who stayed together, the marginal effect is divided by two (-40 cents). This confirms that non-intact families are more responsive to a variation in the young adult's resources. It also suggests that the stronger IV crowding-out effect compared to OLS is mainly driven by this subsample.

In both panels A and B of Table 4, we consider only one instrument to explain the scholarship amount, so that we cannot run overidentifying restriction tests. We re-estimate the private transfer equation using two-stage least squares with two instruments: the theoretical amount associated with the self-reported level and the predicted amount from the official scheme¹⁹. In the private transfer equation, we find a negative and significant coefficient for the public scholarship. The marginal effect is -49 cents, which is very close to the coefficients reported in column 1 of panels A and B. The Hansen J statistic is equal to 0.864 and the p-value of the corresponding chi-squared is 0.353 (with one degree of freedom), which means that the null hypothesis of valid instruments cannot be rejected.

¹⁹ These additional results are available upon request.

As they stand, our results suggest a partial crowding-out of public transfers by private transfers. Under altruism, the parental transfer T is a decreasing function of the amount of public transfer S ($\frac{dT}{dS} < 0$) and the following condition should hold: $\frac{dT}{dY_p} - \frac{dT}{dS} = 1$. Consider the sample of all students (column 1, Table 4). With the reconstructed instrument S^T , we have $\frac{dT}{dY_p} = 0.02$ and $\frac{dT}{dS} = -0.58$ so the difference in the derivatives is $\frac{dT}{dY_p} - \frac{dT}{dS} = 0.60$. The standard error of this difference is 0.17 (t=3.65), so the confidence interval ranges between 0.278 and 0.927 at the 95 percent level. The upper bound is below the unitary value expected under altruism, but the neutrality condition imposed by the altruistic setting is a very stringent condition that has not been verified so far in countries such as France or the United States (Altonji, 1997; McGarry, 2016; Wolff, 2000).

Overall, our results are in the same direction as those reported for the same country by Wolff (2012), who examines the pattern of private transfers using a sample of 21,400 students aged 17–25 years²⁰. At the intensive margin (private transfer amount), the marginal effect of the parental income ranges from 0.01 to 0.06, depending on the subsample. Regarding student's resources, Wolff (2012) considers the sum of all public transfers (scholarships, housing allowances, and other social benefits) that they receive plus income from any paid activities. He finds that one additional euro of income can reduce the transfer amount received from parents by up to 30 cents. This is considerably lower than our own estimates, but we focus on a specific sample of students receiving a public scholarship and examine how private transfers respond to public transfers rather than to total resources. Since students eligible to scholarships are more likely to come from modest families, this may explain why we find a large sensitivity of parental transfers to the young person's situation.

Finally, one might ask to what extent our results can be generalized to all public benefits received by young adults. In a related study, Laferrère and Le Blanc (2004) investigate the effect of housing allowances on the co-residence decisions of students in France. Using a reform that took place between 1991 and 1993 that made independent students eligible for housing allowances, they show that about half of the total allowances represent a windfall effect, i.e. students with high-income parents would have nonetheless decided to live

²⁰ The proportion of parents providing money to their children is equal to 77.5%, with an average amount of around 200 euros per month.

independently even without the subsidy. For these families, such a pattern can be interpreted as a windfall effect of private transfers being crowded out by public transfers. Although Laferrère and Le Blanc (2004) do not estimate the size of the crowding-out effect at the micro level, their results are fully consistent with our own conclusions.

5.3. Heterogeneity analysis

In this subsection, we further examine changes in the magnitude of the crowding-out effect for two characteristics of the students: age and housing status. As discussed in our theoretical section, the existence of a difference in transfer derivatives below the unit value predicted by the Beckerian model does not allow us to clearly distinguish between different motives for parental transfers. The focus on specific characteristics of young people allows us to examine whether one can come close to the prediction of Becker's (1991) altruistic model in situations where parental transfers are high and cover a larger share of young people's expenses. Nevertheless, these analyses should be considered as exploratory due to the small size of some subsamples.

In Appendix A1, we distinguish between young people who live with their parents, those who have their own private dwelling and those who live in shared accommodation (subsidized student housing). According to the OLS estimates, the crowding-out effect is more important for young people with their own private dwelling (0.67) than for those in collective accommodation (0.45) or cohabiting with their parents (0.31). Thus, it seems that the situation of young people with their own private dwelling is closest to the model of perfect altruism, with two separate households and a significant proportion of the young person's consumption expenditure covered by transfers from parents to the young person. As shown in Table 1, the amount of parental transfers is on average higher for young people with their own accommodation.

In the other two situations, the crowding-out mechanism is likely to be modified by the fact that part of the transfer is made in kind. In the case of coresidence, the parents are already hosting and feeding their child, so they will provide lower monetary transfers. In the case of housing in a university residence, part of the public transfer is provided in kind through the provision of low-cost accommodation, which also reduces the need for parents to provide a large monetary transfer. We have also estimated IV regressions by housing status. To ensure a sufficient sample size, we only distinguish between students who live with their parents

and those who do not. Our results confirm a higher crowding-out effect among students who have their own accommodation.

Focusing on age, Appendix A2 shows a higher crowding-out effect for the youngest scholarship holders. According to the OLS estimates, its magnitude is 0.49 for those aged 18-19, against 0.27 for those aged 20 and over. The youngest scholarship holders are those for whom the parental transfer is the highest, and their situation is closer to that of an extended household that includes the parents. The latter are more likely to determine their transfer level in such a way as to ensure a minimum amount for their child and to adjust it precisely according to the public transfer received. Conversely, it can be assumed that parents give their student children greater budgetary autonomy as they grow older, since they use paid employment to finance their studies. This is the case for 21% of scholarship holders aged 20 or over, compared to less than 11% of those aged 18-19. In such a situation, parents should be less likely to adjust their transfer level to their child's income, especially if they have imperfect information about the child's income.

6. CONCLUDING COMMENTS

In this paper, we have examined how parents adjust their private transfer decisions according to the public scholarships their children receive for higher education. This allows us to provide, for the first time, evidence on any crowding-out effect of public transfers on private transfers among students. We contribute to a scarce literature on the impact that public transfers have on private transfers in developed countries (Cox and Jakubson, 1995; Schoeni 2002). For our empirical analysis, we rely on a dataset that matches fiscal data on parental income with individual data on young adults collected in France.

Our main results can be summarized as follows. First, assuming that the public scholarship is exogenous, we find a reduction in private transfers of about 40 cents per additional euro of public scholarship. We then rely on an instrumental variable strategy to provide a causal interpretation of the crowding-out effect. We obtain a slightly larger effect, such that one additional euro of scholarship reduces the amount of private transfer by about 50 cents according to our most reliable specification. When we calculate the difference between the parental income transfer derivative and the child scholarship transfer derivative, we find a point estimate of approximately 0.6, so that the unitary value expected under altruism does

not fall within the corresponding confidence interval. Conversely, models of private transfers motivated by either impure altruism or exchange cannot be rejected.

Our results are important from a public policy perspective. Public transfer programs for young adults are designed to help those in the most difficult financial situations. In the case of scholarships, the goal is also to make the young person's extended studies sustainable for the whole family. Since, according to our data, one-third of scholarships benefit families below the poverty line and since scholarships can have positive effects on both university enrollment and additional years of education, crowding-out cannot be seen as a measure of policy ineffectiveness²¹. In fact, the crowding-out effect may even offer some opportunities as it allows poor parents to reduce the sacrifices they make when investing in their child's education, to the extent that such sacrifices affect their children's educational choices.

Several caveats should be kept in mind when interpreting our results. First, we focus on the crowding-out effect on a specific sample of students, enrolled in university and receiving a public grant. It would be interesting to consider all public transfers received by young adults and students, not just those receiving means-tested scholarships. In the case of universal transfers for young adults, policymakers need to consider the benefits of universal access against a potential windfall effect for wealthy parents (Laferrère and Le Blanc, 2004), who may be secondary recipients through reductions in the money they give to their student children (Lampman and Smeeding, 1983).

Second, we have examined the magnitude of the crowding-out effect only at the intensive margin. It would be useful to study parental support at both the extensive and the intensive margins, although this would require simultaneous modeling of all relevant decisions made by young adults as well as a better understanding of the determinants of the number of years spent at university until graduation. At the extensive margin, parents are expected to be less sensitive to the financial resources of their children, and the receipt of a student grant may even induce the family to increase its support for the student to supplement public aid and make further study possible. This implies that the crowding-out effect measured on the whole sample of students should be much lower. Considering all French

²¹ In France, Fack and Grenet (2015) have shown that these means-tested scholarships increase college enrollment rates by 5 to 7 percent, student persistence and even degree completion. Scholarships are also expected to reduce the need for students to work. This can also improve the situation for students, as paid work while in university means less time spent attending classes and doing homework, and reduces the chances of passing exams (Beffy et al., 2009; Wolff, 2017).

students, Wolff (2012) finds a value of 0.1 for the difference in transfer-income derivatives, which is far from the unitary value predicted by the altruistic model (Altonji et al., 1997).

Third, our estimation strategy suffers from potential pitfalls. On the one hand, we consider the student's self-reported level of scholarship as instrument. While this variable appears to function accurately as an instrument for the self-assessed amount in the survey (with a high F-statistic and a high correlation with the self-reported amount), its validity rests on the assumption that students are correctly reporting the level of their scholarship. Although it seems reasonable, this assumption remains untestable. On the other hand, we use a predicted scholarship level based on survey responses and fiscal data. However, we do not have access to the two-year lagged fiscal income used in the official scheme (only the one-year lagged income) and we can only impute siblings' status for points. The lack of administrative data is such that this instrumental variable may produce a more statistically uncertain estimate.

Overall, it would be interesting to conduct a new survey on a large sample of students receiving public scholarships with very detailed questions on parental transfers. This dataset would need to be merged with administrative data on both parental income and sibling composition. With a larger sample and precise data on the eligibility criteria, one could turn to an RDD design that would lead to a comparison of sub-samples adjacent to the thresholds, as in a classical RDD setting (for instance level 2 versus level 3, conditional on a certain number of points). Also, some elements of comparison with other European countries would be extremely interesting to better understand the role of public education policies on family support. All these issues are left for future research.

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APPENDIX

A. HETEROGENEITY ANALYSIS

A1. Student's housing situation

Table A1.1 OLS estimates of private transfers based on the student's housing situation

Variables	(1) Students living at parental home		(2) Students living in shared accommodation (subsidized student housing)		(2) Students living in their own dwelling (private housing)	
	Coef	t-test	Coef	t-test	Coef	t-test
Panel A. Self-assessed amount of student scholarship and parents' fiscal income						
Student scholarship	-0.31***	(-2.93)	-0.45***	(-3.45)	-0.67***	(-4.27)
Fiscal parental income	0.03**	(2.32)	0.01	(0.89)	0.04**	(2.42)
Control variables	YES: BASIC		YES: BASIC		YES: BASIC	
Number of observations	374		158		164	
R ²	0.18		0.23		0.33	
Panel B. Theoretical amount of student scholarship and parents' fiscal income						
Student scholarship	-0.33***	(-3.01)	-0.43***	(-2.98)	-0.66***	(-4.12)
Fiscal parental income	0.03**	(1.97)	0.01	(1.10)	0.04**	(2.47)
Control variables	YES: BASIC		YES: BASIC		YES: BASIC	
Number of observations	362		152		160	
R ²	0.17		0.24		0.34	
Panel C. Self-assessed amount of student scholarship and parents' self-assessed income						
Student scholarship	-0.44***	(-5.50)	-0.47***	(-4.30)	-0.78***	(-5.47)
Self-reported parental income	0.02*	(1.84)	0.01	(1.16)	0.04***	(2.73)
Control variables	YES: BASIC		YES: BASIC		YES: BASIC	
Number of observations	374		158		164	
R ²	0.17		0.23		0.35	
Panel D. Theoretical amount of student scholarship and parents' self-assessed income						
Student scholarship	-0.44***	(-5.33)	-0.47***	(-4.02)	-0.78***	(-5.43)
Self-reported parental income	0.01	(1.42)	0.01	(1.31)	0.04***	(2.66)
Control variables	YES: BASIC		YES: BASIC		YES: BASIC	
Number of observations	362		152		160	
R ²	0.17		0.24		0.35	

Source: authors' calculations, Drees-Insee – ENRJ Survey 2014.

Note: estimates from OLS regressions with robust standard errors. Significance levels are 1% (***), 5% (**) and 10% (*). Basic controls include gender, age, numbers of student's siblings (aged 0–17 and 18–24), divorced, education and parents' income. Parental income is monthly.

Table A1.2 IV estimates of private transfers based on the student's housing situation

Variables	(1) Students living at parental home		(2) Students living in their own dwelling	
	coef	t-test	coef	t-test
<i>IV first stage: student scholarship</i>				
Instrument: amount corresponding to the self-assessed level (S^L)	0.87***	(25.61)	0.92***	(38.89)
R ²	0.88		0.87	
F-test of excluded instrument	655.9		1512	
<i>IV second stage: parental transfer</i>				
Student scholarship	-0.38***	(-3.01)	-0.60***	(-5.25)
Parental income	0.02	(1.53)	0.02**	(2.16)
Control variables	YES: BASIC		YES: BASIC	
Number of observations	362		312	
R ²	0.17		0.27	
<i>IV first stage: student scholarship</i>				
Instrument: predicted amount by the scheme using our data (S^T)	0.46***	(4.83)	0.75***	(7.72)
R ²	0.55		0.49	
F-test of excluded instrument	23.31		59.53	
<i>IV second stage: parental transfer</i>				
Student scholarship	-0.40	(-1.01)	-0.86***	(-4.52)
Parental income	0.02	(0.67)	0.01	(0.35)
Control variables	YES: BASIC		YES: BASIC	
Number of observations	374		322	
R ²	0.18		0.24	

Source: authors' calculations, Drees-Insee – ENRJ Survey 2014.

Note: estimates from 2SLS regressions, with robust standard errors. Significance levels are 1% (***), 5% (**) and 10% (*). Basic controls include gender, age, numbers of student's siblings (aged 0–17 and 18–24), age, divorced, education and income for parents. Extended controls for the student additionally include proximity to study location, living with a spouse, and participation in the labor market.

A2. Student's age

Table A2.1 OLS estimates of private transfers based on the student's age

Variables	(3) Students aged 18-19		(4) Students aged 20 or more	
	Coef	t-test	Coef	t-test
Panel A. Self-assessed amount of student scholarship and parents' fiscal income				
Student scholarship	-0.49***	(-4.63)	-0.27***	(-2.60)
Fiscal parental income	0.02*	(1.84)	0.05***	(4.43)
Control variables	YES: BASIC		YES: BASIC	
Number of observations	361		335	
R ²	0.20		0.24	
Panel B. Theoretical amount of student scholarship and parents' fiscal income				
Student scholarship	-0.50***	(-4.45)	-0.32***	(-3.03)
Fiscal parental income	0.02**	(1.98)	0.05***	(4.01)
Control variables	YES: BASIC		YES: BASIC	
Number of observations	349		325	
R ²	0.20		0.25	
Panel C. Self-assessed amount of student scholarship and parents' self-assessed income				
Student scholarship	-0.60***	(-6.70)	-0.42***	(-4.55)
Self-reported parental income	0.00	(0.00)	0.04***	(3.97)
Control variables	YES: BASIC		YES: BASIC	
Number of observations	361		335	
R ²	0.19		0.24	
Panel D. Theoretical amount of student scholarship and parents' self-assessed income				
Student scholarship	-0.62***	(-6.55)	-0.46***	(-4.91)
Self-reported parental income	-0.00	(-0.20)	0.03***	(3.65)
Control variables	YES: BASIC		YES: BASIC	
Number of observations	349		325	
R ²	0.20		0.25	

Source: authors' calculations, Drees-Insee – ENRJ Survey 2014.

Note: estimates from OLS regressions with robust standard errors. Significance levels are 1% (***), 5% (**) and 10% (*). Basic controls include gender, numbers of student's siblings (aged 0–17 and 18–24), age, divorced, education and parents' income. Extended controls for the student additionally include proximity to study location, living with a spouse, in an independent dwelling and participation in the labor market.

Table A2.2 IV estimates of private transfers based on student's age

Variables	(3) Students aged 18-19		(4) Students aged 20 or more	
	coef	t-test	coef	t-test
<i>IV first stage: student scholarship</i>				
Instrument: amount corresponding to the self-assessed level (S^L)	0.92***	(38.02)	0.88***	(27.86)
R ²	0.895		0.845	
F-test of excluded instrument	1445		776	
<i>IV second stage: parental transfer</i>				
Student scholarship	-0.54***	(-4.54)	-0.37***	(-3.05)
Parental income	0.02	(1.53)	0.05***	(3.66)
Control variables	YES: BASIC		YES: BASIC	
Number of observations	349		325	
R ²	0.20		0.25	
<i>IV first stage: student scholarship</i>				
Instrument: predicted amount by the scheme using our data (S^T)	0.74***	(7.50)	0.52***	(5.74)
R ²	0.56		0.49	
F-test of excluded instrument	56.18		32.91	
<i>IV second stage: parental transfer</i>				
Student scholarship	-0.78***	(-3.36)	-0.30	(-1.11)
Parental income	-0.00	(-0.05)	0.05**	(2.31)
Control variables	YES: BASIC		YES: BASIC	
Number of observations	361		335	
R ²	0.18		0.24	

Source: authors' calculations, Drees-Insee – ENRJ Survey 2014.

Note: estimates from 2SLS regressions, with robust standard errors. Significance levels are 1% (***), 5% (**) and 10% (*). Basic controls include gender, numbers of student's siblings (aged 0–17 and 18–24), age, divorced, education and income for parents. Extended controls for the student additionally include proximity to study location, living with a spouse, in an independent dwelling and participation in the labor market.

B. ROBUSTNESS CHECKS

B1. Non-intact families' income

Our main analysis is based on an income constructed as the sum of the individual incomes of both parents when they form a single household, and the maximum of both when the parents are separated and form two households. This allows us to better account for the specificity of separated parent households. We present here a variant in which incomes are constructed as the sum of individual parental incomes, regardless of the parents' marital status. The overall results are largely unchanged. They also confirm the relevance of our main concept because transfers are less sensitive to the income of separated parents and the instrumentation on this sub-group shows a lower coefficient in the first stage (see Table B1.2, panel B, third column).

Table B1.1 OLS estimates of private transfers with income variant for separated parents

Variables	(1) All families		(2) All families		(3) Non-Intact families		(4) Intact families	
	Coef	t-test	Coef	t-test	Coef	t-test	Coef	t-test
Panel A. Self-assessed amount of student scholarship and parents' fiscal income								
Student scholarship	-0.44***	(-6.09)	-0.46***	(-6.27)	-0.45***	(-3.66)	-0.37***	(-3.61)
Fiscal parental income	0.03***	(3.42)	0.02***	(3.10)	0.02	(1.49)	0.03***	(3.00)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	696		696		223		473	
R ²	0.21		0.22		0.26		0.20	
Panel B. Theoretical amount of student scholarship and parents' fiscal income								
Student scholarship	-0.48***	(-6.16)	-0.49***	(-6.33)	-0.55***	(-4.10)	-0.35***	(-3.40)
Fiscal parental income	0.02***	(2.99)	0.02***	(2.66)	0.01	(0.93)	0.04***	(3.33)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	674		674		218		456	
R ²	0.22		0.23		0.28		0.20	
Panel C. Self-assessed amount of student scholarship and parents' self-assessed income								
Student scholarship	-0.52***	(-8.06)	-0.52***	(-8.17)	-0.49***	(-3.98)	-0.43***	(-5.04)
Self-reported parental income	0.02***	(3.11)	0.02***	(3.03)	0.01	(0.95)	0.05***	(3.92)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	696		696		223		473	
R ²	0.21		0.22		0.26		0.22	
Panel D. Theoretical amount of student scholarship and parents' self-assessed income								
Student scholarship	-0.55***	(-8.09)	-0.55***	(-8.16)	-0.58***	(-4.41)	-0.42***	(-5.07)
Self-reported parental income	0.02***	(2.76)	0.02***	(2.64)	0.00	(0.45)	0.05***	(4.25)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	674		674		218		456	
R ²	0.22		0.23		0.28		0.22	

Source: authors' calculations, Drees-Insee – ENRJ Survey 2014.

Note: estimates from OLS regressions with robust standard errors. Significance levels are 1% (***), 5% (**) and 10% (*). Basic controls include gender, age, numbers of student's siblings (aged 0–17 and 18–24), age, divorced, education and parents' income. Extended controls for the student additionally include proximity to study location, living with a spouse, in an independent dwelling and participation in the labor market.

Table B1.2 IV estimates of private transfers with income variant for separated parents

Variables	(1) All families		(2) All families		(3) Non-intact families		(4) Intact families	
	coef	t-test	coef	t-test	coef	t-test	Coef	t-test
Panel A. Instrument: self-assessed scholarship level								
<i>IV first stage: student scholarship</i>								
Instrument: amount corresponding to the self-assessed level (S^L)	0.92***	(52.81)	0.92***	(51.88)	0.93***	(38.06)	0.87***	(28.48)
R ²	0.87		0.87		0.85		0.88	
F-test of excluded instrument	2788.65		2691.04		1448.24		811.22	
<i>IV second stage: parental transfer</i>								
Student scholarship	-0.52***	(-6.15)	-0.53***	(-6.32)	-0.59***	(-4.18)	-0.41***	(-3.40)
Parental income	0.02***	(2.65)	0.02**	(2.30)	0.01	(1.12)	0.03**	(2.57)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	674		674		218		456	
R ²	0.21		0.22		0.26		0.20	
Panel B. Instrument: predicted scholarship								
<i>IV first stage: student scholarship</i>								
Instrument: predicted amount by the scheme using our data (S^T)	0.64***	(11.45)	0.64***	(11.31)	0.49***	(4.99)	0.53***	(7.52)
R ²	0.49		0.49		0.30		0.61	
F-test of excluded instrument	131.07		127.92		24.86		56.55	
<i>IV second stage: parental transfer</i>								
Student scholarship	-0.60***	(-3.42)	-0.65***	(-3.75)	-0.83**	(-2.19)	-0.40	(-1.54)
Parental income	0.02	(1.38)	0.01	(1.02)	0.01	(0.62)	0.03	(1.44)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	696		696		223		473	
R ²	0.21		0.21		0.23		0.20	

Source: authors' calculations, Drees-Insee – ENRJ Survey 2014.

Note: estimates from 2SLS regressions, with robust standard errors. Significance levels are 1% (***), 5% (**) and 10% (*). Basic controls include gender, age, numbers of student's siblings (aged 0–17 and 18–24), age, divorced, education and income for parents. Extended controls for the student additionally include proximity to study location, living with a spouse, in an independent dwelling and participation in the labor market.

B2. Inclusion of level 0 scholarship holders

Our main sample does not include level 0 scholarship students, as these do not receive any public transfer payments and concern a wider public, likely to divert us from our objective of analyzing the effect of a change in scholarship amount at the intensive margin only. This seems all the more justified given that the shift from levels offering no payment to those offering a payment provokes a change in study continuation and access to higher education behavior, as shown by the work of Fack and Grenet (2015). However, the results obtained in this new scope remain very similar, with the exception of the IV results for the scholarship amount reconstructed in our data, which turn out to be higher. With both IV methods F-test of excluded instrument is much weaker on this extended sample, which confirms the relevance of our main approach.

Table B2.1. OLS estimates of private transfers including level 0 scholarship holders

Variables	(1) All families		(2) All families		(3) Non-Intact families		(4) Intact families	
	Coef	t-test	Coef	t-test	Coef	t-test	Coef	t-test
Panel A. Self-assessed amount of student scholarship and parents' fiscal income								
Student scholarship	-0.38***	(-5.59)	-0.40***	(-5.83)	-0.37***	(-3.38)	-0.37***	(-3.88)
Fiscal parental income	0.03***	(3.95)	0.03***	(3.56)	0.02*	(1.75)	0.03***	(2.88)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	733		733		231		502	
R ²	0.21		0.22		0.25		0.21	
Panel B. Theoretical amount of student scholarship and parents' fiscal income								
Student scholarship	-0.39***	(-5.82)	-0.40***	(-5.98)	-0.41***	(-3.65)	-0.36***	(-4.02)
Fiscal parental income	0.03***	(4.00)	0.03***	(3.70)	0.02	(1.52)	0.03***	(3.30)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	733		733		231		502	
R ²	0.22		0.22		0.26		0.21	
Panel C. Self-assessed amount of student scholarship and parents' self-assessed income								
Student scholarship	-0.49***	(-8.16)	-0.49***	(-8.36)	-0.42***	(-3.81)	-0.42***	(-5.33)
Self-reported parental income	0.02***	(3.04)	0.02***	(2.95)	0.01	(0.92)	0.04***	(3.80)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	733		733		231		502	
R ²	0.21		0.22		0.25		0.22	
Panel D. Theoretical amount of student scholarship and parents' self-assessed income								
Student scholarship	-0.49***	(-8.39)	-0.49***	(-8.49)	-0.45***	(-4.05)	-0.41***	(-5.75)
Self-reported parental income	0.02***	(3.08)	0.02***	(3.01)	0.01	(0.67)	0.05***	(4.33)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	733		733		231		502	
R ²	0.21		0.22		0.25		0.22	

Source: authors' calculations, Drees-Insee – ENRJ Survey 2014.

Note: estimates from OLS regressions with robust standard errors. Significance levels are 1% (***), 5% (**) and 10% (*). Basic controls include gender, age, numbers of student's siblings (aged 0–17 and 18–24), age, divorced, education and parents' income. Extended controls for the student additionally include proximity to study location, living with a spouse, in an independent dwelling and participation in the labor market. Monthly parental income is defined as the sum of the individual incomes of both parents when they form a single household, and the maximum of both when the parents are separated and form two households. Parental income is monthly.

Table B2.2. IV estimates of private transfers including level 0 scholarship holders

Variables	(1) All families		(2) All families		(3) Non-intact families		(4) Intact families	
	coef	t-test	coef	t-test	coef	t-test	Coef	t-test
Panel A. Instrument: self-assessed scholarship level								
<i>IV first stage: student scholarship</i>								
Instrument: amount corresponding to the self-assessed level (S^L)	0.84***	(35.39)	0.84***	(35.19)	0.90***	(35.57)	0.78***	(21.07)
R ²	0.86		0.86		0.86		0.87	
F-test of excluded instrument	1252		1239		1265		443.8	
<i>IV second stage: parental transfer</i>								
Student scholarship	-0.46***	(-5.87)	-0.48***	(-6.05)	-0.46***	(-3.73)	-0.45***	(-4.04)
Parental income	0.03***	(3.06)	0.02***	(2.73)	0.02	(1.56)	0.03**	(2.08)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	733		733		231		502	
R ²	0.21		0.22		0.25		0.21	
Panel B. Instrument: predicted scholarship								
<i>IV first stage: student scholarship</i>								
Instrument: predicted amount by the scheme using our data (S^T)	0.59***	(8.32)	0.58***	(7.91)	0.69***	(5.76)	0.50***	(6.54)
R ²	0.52		0.53		0.34		0.62	
F-test of excluded instrument	69.14		62.63		33.21		42.78	
<i>IV second stage: parental transfer</i>								
Student scholarship	-0.76***	(-3.74)	-0.83***	(-3.93)	-0.81***	(-2.81)	-0.66**	(-2.19)
Parental income	0.00	(0.25)	-0.00	(-0.18)	0.01	(0.46)	0.01	(0.28)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	733		733		231		502	
R ²	0.18		0.18		0.20		0.19	

Source: authors' calculations, Drees-Insee – ENRJ Survey 2014.

Note: estimates from 2SLS regressions, with robust standard errors. Significance levels are 1% (***), 5% (**) and 10% (*). Basic controls include gender, age, numbers of student's siblings (aged 0–17 and 18–24), age, divorced, education and income for parents. Extended controls for the student additionally include proximity to study location, living with a spouse, in an independent dwelling and participation in the labor market.

B3. Exclusion of first-year students

The purpose of this check is to ensure that the measurement of regular private transfers from parents is not biased by a reporting bias concerning first-year students. Despite instructions from interviewers to report regular monthly parental aid corresponding to the current situation, some may refer to the situation prior to the start of their higher education studies. This would underestimate the amount of aid declared, and could distort the estimate of eviction. In the absence of a variable distinguishing between first-year and second-year students, first-year scholarship students are identified in the database as those aged 20 or under, studying in first or second year, who had not applied for a scholarship the previous year. Excluding these students, however, the results remain unchanged, suggesting an absence of reporting bias.

Table B3.1 OLS estimates of private transfers without first year students

Variables	(1) All families		(2) All families		(3) Non-Intact families		(4) Intact families	
	Coef	t-test	Coef	t-test	Coef	t-test	Coef	t-test
Panel A. Self-assessed amount of student scholarship and parents' fiscal income								
Student scholarship	-0.37***	(-4.62)	-0.39***	(-4.83)	-0.33**	(-2.35)	-0.41***	(-3.78)
Fiscal parental income	0.04***	(4.06)	0.03***	(3.64)	0.05***	(2.99)	0.03**	(2.34)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	590		590		185		405	
R ²	0.22		0.23		0.28		0.21	
Panel B. Theoretical amount of student scholarship and parents' fiscal income								
Student scholarship	-0.42***	(-4.99)	-0.43***	(-5.17)	-0.44***	(-2.92)	-0.41***	(-3.87)
Fiscal parental income	0.03***	(3.74)	0.03***	(3.32)	0.04**	(2.57)	0.03**	(2.46)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	574		574		181		393	
R ²	0.23		0.24		0.30		0.21	
Panel C. Self-assessed amount of student scholarship and parents' self-assessed income								
Student scholarship	-0.49***	(-7.00)	-0.49***	(-7.09)	-0.44***	(-3.12)	-0.42***	(-4.64)
Self-reported parental income	0.03***	(3.65)	0.03***	(3.63)	0.02	(1.61)	0.05***	(3.90)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	590		590		185		405	
R ²	0.22		0.23		0.26		0.23	
Panel D. Theoretical amount of student scholarship and parents' self-assessed income								
Student scholarship	-0.52***	(-7.26)	-0.52***	(-7.28)	-0.55***	(-3.68)	-0.42***	(-4.88)
Self-reported parental income	0.02***	(3.25)	0.02***	(3.21)	0.01	(1.11)	0.05***	(4.15)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	574		574		181		393	
R ²	0.23		0.24		0.28		0.23	

Source: authors' calculations, Drees-Insee – ENRJ Survey 2014.

Note: estimates from OLS regressions with robust standard errors. Significance levels are 1% (***) , 5% (**) and 10% (*). Basic controls include gender, age, numbers of student's siblings (aged 0–17 and 18–24), age, divorced, education and parents' income. Extended controls for the student additionally include proximity to study location, living with a spouse, in an independent dwelling and participation in the labor market. In the absence of a variable distinguishing between first-year and second-year students, first-year scholarship students are identified in the database as those aged 20 or under, studying in first or second year, who had not applied for a scholarship the previous year. Monthly parental income is defined as the sum of the individual incomes of both parents when they form a single household, and the maximum of both when the parents are separated and form two households.

Table 4. IV estimates of private transfers without first year students excluded

Variables	(1) All families		(2) All families		(3) Non-intact families		(4) Intact families	
	coef	t-test	coef	t-test	coef	t-test	Coef	t-test
Panel A. Instrument: self-assessed scholarship level								
<i>IV first stage: student scholarship</i>								
Instrument: amount corresponding to the self-assessed level (S^L)	0.89***	(38.50)	0.88***	(37.85)	0.90***	(28.00)	0.87***	(26.95)
R ²	0.86		0.86		0.84		0.88	
F-test of excluded instrument	1482		1432		784		726	
<i>IV second stage: parental transfer</i>								
Student scholarship	-0.47***	(-4.96)	-0.49***	(-5.15)	-0.49***	(-2.98)	-0.48***	(-3.85)
Parental income	0.03***	(3.09)	0.03***	(2.65)	0.04***	(2.65)	0.02*	(1.79)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	574		574		181		393	
R ²	0.22		0.23		0.29		0.21	
Panel B. Instrument: predicted scholarship								
<i>IV first stage: student scholarship</i>								
Instrument: predicted amount by the scheme using our data (S^T)	0.57***	(8.19)	0.57***	(7.96)	0.70***	(6.16)	0.49***	(6.50)
R ²	0.53		0.54		0.41		0.60	
F-test of excluded instrument	69.98		64.07		43.60		39.72	
<i>IV second stage: parental transfer</i>								
Student scholarship	-0.44**	(-2.10)	-0.49**	(-2.37)	-0.46	(-1.47)	-0.38	(-1.30)
Parental income	0.03**	(1.99)	0.03	(1.61)	0.04**	(2.21)	0.03	(1.27)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	590		590		185		405	
R ²	0.22		0.23		0.28		0.21	

Source: authors' calculations, Drees-Insee – ENRJ Survey 2014.

Note: estimates from 2SLS regressions, with robust standard errors. Significance levels are 1% (***), 5% (**) and 10% (*). Basic controls include gender, age, numbers of student's siblings (aged 0–17 and 18–24), age, divorced, education and income for parents. Extended controls for the student additionally include proximity to study location, living with a spouse, in an independent dwelling and participation in the labor market. In the absence of a variable distinguishing between first-year and second-year students, first-year scholarship students are identified in the database as those aged 20 or under, studying in first or second year, who had not applied for a scholarship the previous year. Monthly parental income is defined as the sum of the individual incomes of both parents when they form a single household, and the maximum of both when the parents are separated and form two households.

B4. Controlling for equivalence-adjusted parental income

As household structure is likely to create discontinuities in the link between private transfers and income, we propose here a variant controlling for parents' equivalence-adjusted income, which takes account of household structure through the modified OECD equivalence scale. Formally, this income is equal to the quotient between disposable income (income + benefits - taxes) and a number of consumption units linked to household size. For separated parents, we consider the maximum equivalence-adjusted income between the two parents' households. The results below do not alter the conclusions reached in our main specification.

Table B4.1. OLS estimates of private transfers controlling for equivalence-adjusted parental income

Variables	(1) All families		(2) All families		(3) Non-Intact families		(4) Intact families	
	Coef	t-test	Coef	t-test	Coef	t-test	Coef	t-test
Panel A. Self-assessed amount of student scholarship and parents' equivalence-adjusted fiscal income								
Student scholarship	-0.48***	(-7.68)	-0.48***	(-7.74)	-0.47***	(-4.00)	-0.42***	(-5.01)
Fiscal parental income	0.01***	(3.96)	0.01***	(3.80)	0.00**	(2.00)	0.01***	(3.46)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	696		696		223		473	
R ²	0.22		0.23		0.27		0.21	
Panel B. Theoretical amount of student scholarship and parents' equivalence-adjusted fiscal income								
Student scholarship	-0.50***	(-7.62)	-0.51***	(-7.69)	-0.55***	(-4.38)	-0.41***	(-4.76)
Fiscal parental income	0.01***	(3.71)	0.01***	(3.49)	0.00*	(1.77)	0.01***	(3.49)
Control variables	YES: BASIC		YES: EXTENDED		YES: BASIC		YES: BASIC	
Number of observations	674		674		218		456	
R ²	0.22		0.23		0.29		0.21	

Source: authors' calculations, Drees-Insee – ENRJ Survey 2014.

Note: estimates from OLS regressions with robust standard errors. Significance levels are 1% (***), 5% (**) and 10% (*). Basic controls include gender, age, numbers of student's siblings (aged 0–17 and 18–24), age, divorced, education and parents' income. Extended controls for the student additionally include proximity to study location, living with a spouse, in an independent dwelling and participation in the labor market. Equivalence-adjusted monthly parental income takes account of household structure through the modified OECD equivalence scale. It is equal to the quotient between disposable income (income + benefits - taxes) and a number of consumption units linked to household size. When the parents are separated and form two households it equals the maximum of both equivalence-adjusted incomes.

Table B4.2. IV estimates of private transfers controlling for parental equivalence-adjusted income

Variables	(1)	
	coef	t-test
Panel A. Instrument: self-assessed scholarship level		
<i>IV first stage: student scholarship</i>		
Instrument: amount corresponding to the self-assessed level (S^L)	0.94***	(64.56)
R ²	0.87	
F-test of excluded instrument	4169	
<i>IV second stage: parental transfer</i>		
Student scholarship	-0.51***	(-7.66)
Parental adjusted fiscal income	0.01***	(4.08)
Control variables	YES: BASIC	
Number of observations	674	
R ²	0.22	
Panel B. Instrument: predicted scholarship		
<i>IV first stage: student scholarship</i>		
Instrument: predicted amount by the scheme using our data (S^T)	0.66***	(23.02)
R ²	0.52	
F-test of excluded instrument	529.9	
<i>IV second stage: parental transfer</i>		
Student scholarship	-0.57***	(-6.37)
Parental adjusted fiscal income	0.01***	(3.61)
Control variables	YES: BASIC	
Number of observations	696	
R ²	0.22	

Source: authors' calculations, Drees-Insee – ENRJ Survey 2014.

Note: estimates from 2SLS regressions, with robust standard errors. Significance levels are 1% (***), 5% (**) and 10% (*). Basic controls include gender, numbers of student's siblings (aged 0–17 and 18–24), age, divorced, education and income for parents. Extended controls for the student additionally include proximity to study location, living with a spouse, in an independent dwelling and participation in the labor market. Equivalence-adjusted monthly parental takes account of household structure through the modified OECD equivalence scale. It equals the quotient between disposable income (income + benefits - taxes) and a number of consumption units linked to household size. When the parents are separated and form two households it equals the maximum of both equivalence-adjusted incomes.