

Motives for pocket money allowance and family incentives

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Abstract

To explain motives underlying intergenerational transfers within a family, economists put two theoretical hypotheses forward: altruism and exchange. Empirical tests performed until now do not favor any of these models. One reason to explain this inadequacy could lie in the spurious assumption of homogeneity of behaviors. Little consideration has been given, in the study of motives, to the possibility that one or the other model could be more appropriate to characterize the behavior of a particular group. And the assumption that a single transfer motivation would be universally true seems to be questionable.

This paper seeks to thoroughly analyze the diversity of *inter vivos* transfers' motivations through the study of a theme that economists have so far ignored: pocket money. This is done by using a particularly rich data set about parental money pocket given to children. The Education survey, carried out in 1992 in France, offers two main advantages for this study. First, it provides information both on the level of financial gifts and on parents and children's characteristics, including both generations' level of income. Second, some specific questions straightforwardly give information about these transfers' motivations. Two kinds of payment are distinguished: those given regularly, and those given punctually to meet the child's needs, to pay for some household chores, or to reward good results at school.

Three models explaining these transfers from parents to children are presented theoretically. The flows of money may be motivated by altruism, exchange, or an endogenous altruism linked to preferences shaping. These three hypotheses generate differentiated predictions, which allow to identify family motivations in France. The econometric analysis puts forward the heterogeneity of family choices. It underlines the shortcomings of an aggregate approach in which payments are studied for households taken together. In this case, the test of unitary difference in income-transfer derivatives rejects the altruistic model. At a disaggregated level, regular payments must be distinguished from irregular ones. The former fit in an intertemporal framework, the latter are nearer altruistic motivations. But among them, buying of children's services and school rewards also exist.

Key words: intergenerational transfers, pocket money, altruism, exchange

1 Introduction

The parental influence on children's behavior exerts itself over many areas, as shown in the literature on socio-psychology and child development (see Bandura, 1977, Bandura and Walters, 1963). For example, the long term effects of early family experiences on beliefs of personal efficacy in young adulthood along with the intergenerational transmission of efficacy beliefs have been well documented in Schneewind (1995); the role of parents has been stressed in political attitudes (Hess and Torney, 1967), in the perception of leadership (Hartman and Harris, 1992), and also in the children's choice of career (Dryler, 1998). As one focuses on economic behavior within a family, an important target for parental influence concerns the attitudes towards consumption and savings (Moschis, 1987). From a macroeconomic perspective, this cultural process may affect the rate of saving, which is expected to be higher in society with greater parental influence (for a formal proof, see Ray and Wang, 2000).

Economists have recently tried to take into account the consequences of habits rooted during childhood on preference shaping¹. In this rational analysis of 'extended' preferences, the anticipated effects of childhood experiences on adult behavior are likely to influence parental spending on children (Becker, 1992, 1993). As claimed by Becker (1996, p. 10), *'parents have enormous influence over the experiences of their children, especially during the formative early years, and these childhood experiences can greatly influence adult preferences and choices'*. According to the preference shaping theory, parents must try to instill proper values into their children as early as possible by means of sanctions (guilt, shame) and rewards. In the formative early years where economic understanding increases significantly, especially after the age of 10 (Lunt and Furnham, 1996), childhood experiences are more likely to affect adult preferences. When children still live with their parents, they are subject to visible parental behaviors whose repetition strengthens the preference shaping effect on their development (Bandura, 1986).

The endogeneity of preference shaping has at least two consequences on the empirical analysis of parental choices. On the one hand, it shows how relevant it is to study parents' behaviors towards their children in their earliest years. On the other hand, when parents' choices are analyzed, it is important to anticipate their possible consequences on children's attitudes in the future. Our main contribution in this paper is to take into account these two phenomena in the economic analysis of parental gifts to young children, and to attempt to fill in the two following deficiencies. Firstly, current research on this subject exclusively considers financial transfers between parents and adult children, either under the form of legacies or of *inter vivos* gifts (Gale and Scholz, 1994, Laferrère, 1999). Unlike psychologists, economists have not yet shown interest in transfers to young children and have neglected to study pocket money. For them, intergenerational transfers only include expenditures on dependent children over 18, while spending on younger children living with parents is generally counted as consumption of the children (Blinder, 1988). All the same, the amounts of money that young children receive from their parents seem to be highly significant. For

¹ Initially studied in the cultural anthropology literature (Boyd and Richerson, 1985, Cavalli-Sforza and Feldman, 1981), questions related to cultural transmission and to endogenous preferences have been studied with a rational approach by Becker (1996), Becker and Mulligan (1997), Bisin and Verdier (1998, 2000), Mulligan (1997) and Rogers (1994). For example, in the economic model of cultural transmission developed by Bisin and Verdier (1998), parents act consciously to socialize their children to particular cultural qualities and children acquire their preferences by imitating individual family actions.

instance, according to Furnham (1999a), 86,7% of children between the age of 11 and 16 have a regular flow of income at their disposal, 70% of which come from pocket money.

Secondly, if economists acknowledge the existence of three main motivations behind parental transfers to children (Davies, 1996, Laitner, 1997), the only models that have been tested empirically are those founded on altruism and exchange. In the altruistic model, parents derive satisfaction from their children's well being, and income inequality between both generations is fully compensated by transfers (Becker, 1991). A competing hypothesis argues that transfers are a form of exchange which comes within the scope of a reciprocity structure, and which can be either immediate or postponed. Several mechanisms of exchange can be considered, for instance, parents can buy the services and attention of their children, or offer a repayable family bank loan (see Cox, 1987, 1990). The last motivation is given by the endogenous altruism model in which intergenerational transfers are rooted in the rational and purposeful shaping of preferences within a family, described earlier (Becker, 1993). As far as we know, economists have not yet empirically tested the validity of this theoretical hypothesis.

The fact that children's initial characteristics are an endogenous spillway from the parents as family background is consistent with observations from psychologists on the parental role in child rearing. In particular, Furnham (1999b) shows that parents use pocket money as a way to socialize and to educate children. Nevertheless, in most cases, little is known about children's savings and above all, on financial resources given by the parents (on savings, see Katona, 1975, Webley *et alii*, 1991; on pocket money, see Furnham and Thomas, 1984, Furnham, 1999a)². Yet, many studies have displayed the role of children's experiences of money on economic behavior. For example, it has been suggested that the receipt of an allowance is likely to facilitate the development of monetary competence (Abramovitch *et alii*, 1991); in support of the developmental psychology theories, older children are more sensitive to the demand for socially appropriate behavior and they are more likely to choose cooperative behavior (Zarbatany *et alii*, 1985, Fan, 2000).

This paper proposes a theoretical and empirical study of the motives behind the transfer of resources from parents to young children under the form of pocket money. We seek to understand these motivations, taking into account their future consequences on the intergenerational relationships within a family. Three theoretical hypothesis are examined: altruism, exchange, and endogenous preference shaping, yielding the predictions which are tested, using a superior dataset on family education expenses. Conducted in 1992 in France, the sample consists of 5300 families. Both parents and children characteristics are reported and the description of all kinds of money transfers given to the young for the entire school year is available. The quality of these data allows to study the different behaviors, through an econometrical analysis in which, unlike previous studies, we focus on i) the heterogeneity of motives underlying transfers within a family and on ii) the way parents use money to shape their children's preferences.

Indeed, in their attempt to examine parental motives for helping their children, previous empirical studies have analyzed observed transfers and, particularly, they have focused on the relationship between both generations' resources and the level of gifts (see among others Altonji *et alii*, 1997, Cox, 1987, Cox and Rank, 1992, McGarry and Schoeni, 1995, Schoeni, 1995). This last approach raises at least two problems.

² This is undoubtedly because the economic theory of the family has generally been restricted to the behavior of human adults and it has not really attempted to explain the behavior of children as rational maximizing agents (see Anderson and Tollison, 1991).

The first one stems from the implicit homogeneity of behaviors within families. As noted by Spilerman (2000), little consideration has been given in the study of motives to the possibility that one or the other model may be more appropriate to characterize the behavior of a particular group. The assumption that a single transfer motive would be universally true seems questionable. The second problem concerns the difficulty of detecting reciprocities, either immediate or postponed. On the one hand, with cross-sectional data, we ignore whether children will pay back what they have received from their parents. On the other hand, even when transfers in both directions are known, it might be insufficient to credit the exchange model³.

There is all the same an easier way to analyze transfers' choices within a family, by directly asking parents about their motivations when they give something to their children. It should be possible, with such a process, to describe the whole variety of families' attitudes, but, in practice, we can see that parents very often refer to altruism to describe and explain their behavior (Laitner et Juster, 1996, Logan et Spitze, 1995). Yet, the interpretation of empirical studies rarely speaks in favor of such motivations (Altonji *et alii*, 1995). The data set that we are using to analyze pocket money in France allows us to overcome the preceding difficulties, given the very good quality of the information available. When parents give some money to their children, some questions directly identify the possible existence of a return under the form of services, or good results at school. This information gives the possibility to analyze very precisely the various motives underlying transfers within a family.

The remainder of the paper is organized as follows. In section 2, we examine the different motivations on a theoretical level, and the mechanisms underlying financial transfers to children, in case of altruism, exchange or endogenous preferences shaping. At the prospect of an empirical validation, we look for differences in behaviors, which can be expected according to the type of motivation of the parents. Section 3 describes the data of the French Education survey carried out in 1992, and underlines from a descriptive point of view the importance of the volume of transfers received, and the multiplicity of their motivations. In section 4, an econometric analysis puts forward the role of parents and children's characteristics on transfers' behaviors. The altruistic model is rejected according to the data, unobservable heterogeneity being corrected, and we show that parents often use transfers as instruments of punishments and rewards towards their children. Final comments are found in section 5.

2 Theoretical analysis of transfers motivations

In order to understand the motivations behind the financial gifts from parents to children, three theoretical hypotheses can be considered: altruism, exchange, and endogenous altruism. Within each framework, we examine the various functions of financial transfers and underline their theoretical predictions.

2.1 Altruism

In the altruistic model, parents are supposed to derive satisfaction from the level of well-being of their children (Becker, 1991). Financial transfers are aimed at bringing together both parents and children's standards of living (intergenerational compensation) and the various children's ones (intragenerational compensation).

³ For instance, the fact that children receive more money when they provide some help to their parents can be explained either by exchange or by a two-sided altruism between them (see Cox and Rank, 1992).

Let us consider a family with one parent and one child, noted p and k. The altruistic parent seeks to maximize his utility U , which depends on his consumption C_p and the child's level of well being V . Conversely, this one only derives utility from his consumption C_k . The parent's utility function is then $U(C_p, V(C_k))$. Each generation gets an exogenous income, noted respectively Y_p and Y_k , and the altruistic transfer T provides an optimal reallocation of resources within the family. Admitting this assistance to be exclusively directed from parents to children, this vouches for the non-negativity constraint $T \geq 0$. The budget constraints are determined by $C_p = Y_p - T$ and by $C_k = Y_k + T$, so that both generations face a unique constraint and pool their resources for $T > 0$ ($C_p + C_k = Y_p + Y_k$). According to the first order condition such that $-U_c + U_v U_c = 0$, the marginal utility of the parents' consumption and that of the child (as it is perceived by the parent) are equalized at the equilibrium⁴. When the weighted marginal utility of the child's consumption is lower than his parent's, the marginal utility derived by the adult is not high enough to compensate the disutility caused by a smaller consumption and the transfer does not occur. Two restrictions on the income effects should be verified in the altruistic framework:

First, the parent gives all the more money that he is rich and that the child's income is low, i.e. $\partial T / \partial Y_p > 0$, $\partial T / \partial Y_k < 0$. Second, this compensation is perfectly fitted to variations of resources between both generations. In other words, when there is a shift of the parent's income towards the child, family income being held constant, this leads to an adjustment between the levels of wealth, which is just equal to the former variation in incomes between generations. This mechanism expresses itself through a difference in derivative equal to unity $\partial T / \partial Y_p - \partial T / \partial Y_k = 1$ (Cox, 1987). But, as shown by Altonji *et alii* (1997), the effect of the child's income on the amount of money received is not necessarily negative, because of the heterogeneity of preferences.

Indeed, some children do not receive anything given the first order condition, when the inequality $U_c < U_v V_c$ holds. It is thus necessary to correct the selectivity bias resulting from corner solutions. For a given level of wealth $Y_p + Y_k$, only parents who are altruistic enough will give money to their children. Of course, caring parents will more often try to help their child when he is poor. But, considering richer children, transfer will only be observed when parents are more altruistic. In order to control for this heterogeneity between families, it is necessary to take the expectation of the gift value into account $E(T|T > 0)$. If transfers can increase or decrease according to the recipient's income, $\partial T / \partial Y_k < > 0$, the unitary difference in derivatives test still holds and we get $E(\partial T / \partial Y_p - \partial T / \partial Y_k | T > 0) = 1$ (Altonji *et alii*, 1997)⁵.

As seen above, financial transfers ensure that desired consumptions are smoothed between generations. But at the same time, altruistic parents share their wealth between their children. With this intragenerational compensation, the worst off children within a family must receive more money than their brothers and sisters. At the optimum, parents equalize their marginal utility of consumption with the weighted marginal utility of each child. Thus, parents attempt to fully compensate differences in income between beneficiaries. Nevertheless, the existence of monetary and psychological costs (for example due to family cohesion reasons) may restrict the diffusion of such practices (Wilhelm, 1996).

⁴ For the presentation, we note $U_c = dU/dC_p$, $V_c = dV/dC_k$ and $U_v = dU/dV$.

⁵ Because the difference in generations' income derivatives equals one in the altruistic model, whatever the degree of caring of parents is, this equality remains verified when the degree of altruism exceeds the limiting value given by $U_v = V_c / U_c$.

The altruistic model can be extended, taking human capital transfers to children into account. Considering a distinction between education expenses and financial gifts, two types of families emerge (Becker and Tomes, 1986, Behrman *et alii*, 1995). In wealthier families, the first priority of parents is to invest in their children's human capital, up to the point where the marginal rate of return of these expenses equals the interest rate of the capital market. Beyond this point, parents give money to the child⁶. Because they seek to level children's resources throughout their life cycle, parents are led to compensate income gaps through differentiated financial gifts. On the other hand, poorer parents content themselves with providing education to their children, albeit non optimally. In this framework, the supply of financial gifts is inefficient as it would be possible to increase children's income through a reallocation of financial transfers to the advantage of investments in human capital.

Altruistic motives can also be expressed in an imperfect way. In the paternalistic altruism model for instance, pleasure can be found in disinterested actions and parents derive some utility from money given to children (Blinder, 1974, Andreoni, 1989). The amount of money becomes an element of the utility function. If parents still seek to equalize both generations' standards of living, family neutrality cannot exist with paternalistic motivations. The fact that parents derive in a 'selfish' way some satisfaction from their transmission behavior restricts the perfect compensation that transfers could perform. Unlike altruistic gifts, paternalistic transfers do not always occur when the child needs it, but rather when the donor derives a high satisfaction from it.

2.2 Exchange and reciprocity

Various transfers principles can be considered for the exchange model. Parental money gifts can be linked to a counterpart under the form of non-market services from children. This attention payment can be either immediate or postponed. The family might as well be seen as an alternative to capital markets. In the bank loan model, parents substitute themselves for credit institutions to grant loans to their children who are liquidity constrained.

In the services payment proposed by Cox (1987), parents are supposed to be altruistic. They derive utility from the volume of services S provided by children. But looking after parents is costly for children, and they suffer from a loss of well-being. Parents utility function is given by $U(C_p, S, V(C_k, S))$, with $U_S > 0$ and $V_S < 0$. Parents give a certain amount of money T to their children and budget constraints are $C_p = Y_p - T$ and $C_k = Y_k + T$. Children are assumed to provide services to their parents only if they suffer no loss of utility compared to the situation in which no exchange takes place. This constraint is written $V(C_k, S) \geq V_0(Y_k, 0)$, where $V_0(Y_k, 0)$ is the initial case where parents give no money and the children provide no services. Given this threat point, two kinds of regime can be found. The attention payment can be written under the form $T = T_E + T_A$, where T_E is the exact price of attention measured through its market equivalent (the minimum to pay for parents) and T_A is an altruistic complement for the services that have been received (Davies, 1996). Parental motivations are the concern of altruism if $T_A > 0$ and of exchange if $T_A = 0$.

When the non-negativity constraint is not binding, i.e. $V(C_k, S) > V_0(Y_k, 0)$ the financial gift is altruistic. The loss in children's utility due to the provision of services is more than compensated. Levels of transfers T and S are determined so that $U_C = U_V V_C$ and

⁶ Investments in human capital follow a decreasing marginal rate of return law, albeit the rate of return of financial gifts is supposed to be constant.

$U_S = -U_V V_S$, which means that both marginal utilities of consumption and of services are equalized between both generations. With these altruistic behaviors, the resources compensation between generations is perfectly realized: the amount of money given to children decreases with their income, increases with their parents' income and verifies $\partial T/\partial Y_p - \partial T/\partial Y_k = 1$. The demand for services only depends on the overall family income and not on its distribution within the family. Services S can either raise or drop with both parents and children's income, but they are insensitive to a shifting in income between both generations, *i.e.* $\partial S/\partial Y_p - \partial S/\partial Y_k = 0$ ⁷.

When the equality $V(C_k, S) = V_0(Y_k, 0)$ holds, motivations come under exchange and the altruistic component is null ($T_A = 0$). Parents are the only one to derive a utility benefit from this money-services reciprocity and the marginal utility of consumption remains lower than the children's one⁸. Within this regime, the transfer payment occurs when the pseudo-price of parental demand of attention exceeds the pseudo-price of the children's supply of services. Like in the case of altruism, the probability of a financial transfer is then an increasing function of parents' income and a decreasing function of children's income. The money gift, which is the exact counterpart of received attention, can be written under the following form $T = pS$, where p is the shadow price of services. Within the exchange regime, the amount of money received always increases with the parents' income, whereas it can raise or fall with the children's income. The predictions thus are $\partial T/\partial Y_p > 0$ and $\partial T/\partial Y_k < 0$.

The richer the parents, the more ready they are to spend some money in order to enjoy children's services, with increasing amounts. The children's income effect depends on the attention supply and demand elasticities. On the one hand, richer children will be less careful with their parents. On the other, their services will be more valued than their brothers and sisters' services. If the overall effect is undetermined in the general case, the relation appears to be positive for a given amount of attention (Cox and Rank, 1992). In this case, when children's services have no close market substitutes, parental demand becomes totally inelastic. They are ready to pay a higher price for their rich children's care. In case of exchange, money transfers rather work in favor of resources anticompensation between generations ($\partial T/\partial Y_k > 0$).

In case of exchange, a positive interaction between money transfers and services provided by children is by definition expected. The effect of income on the provision of services differ from that observed for altruism. Here, a rise in children's income tend to lower their supply of services, given the decline of their consumption marginal utility, and $\partial S/\partial Y_k < 0$. Conversely, parents ask for more care when their income rises, because they derive a higher satisfaction out of it, *i.e.* $\partial S/\partial Y_p > 0$. If this model allows to make a distinction between altruistic and exchanging motivations, the asymmetry of the tests used must be stressed. A positive effect of the child's income on the amount of transfer received rejects the altruistic hypothesis, and is more in favor of exchange. But a negative effect of this

⁷ This result stems from the fact that the level of attention does not appear in the budget constraints.

⁸ This result derives from the implicit hypothesis of the altruistic model according to which parents are dominant. Exchange might as well be formalized through a Nash equilibrium, in which both generations derive utility from this purchase of services. The non cooperative framework does not change the results (see Cox and Rank, 1992).

variable is compatible with altruism and exchange. These common results make the motives identification difficult.

The previous model can be considered within a two-periods framework (Cox, 1990, Cox and Jappelli, 1990). In this set, the counterpart given by children is not under the form of services but of a money repayment. Unlike parents who have free access to capital market, children cannot easily borrow some money in return for their future income. Given this liquidity constraint, children need both their present income as well and their parents' financial transfers to satisfy their current consumption needs. They only agree to receive assistance if their initial marginal utility without transfer is not lower than their utility with transfers. Two regimes must be distinguished depending on whether children are at their reservation utility level or not. In the altruistic case, the children's utility rises, and parental transfer can be assimilated to a consumption grant. In case of exchange, in the first period, children accept an intergenerational loan, at a rate that can be higher than the market rate⁹. The repayment takes place during the second period, through a financial transfer to parents. The predicted effects of income variables obtained in the previous model remain the same. The level of assistance rises with parents' income, and with children's permanent income in both regimes. The probability of assistance falls with children's current income in both regimes, but the effect is indeterminate for the financial amount under an exchange motive.

The principle of a family loan can be considered in a non-altruistic framework with three generations. Following the intertemporal exchange model proposed by Cigno (1991, 1993), selfish parents grant their children loans in order to be paid back in the future. At the same time, they reimburse the debt contracted during their youth to their own parents. This system of loans guarantees that transfers are Pareto efficient. The reimbursement of the received investment is justified, because there exists a threat to be imitated by future generations if the agent fails to reimburse his parents. Given the donors' selfishness, this model leads to predictions that differ from other models. Parents' income should have little influence on the amount of transfer paid to children. This can be explained by the lack of altruism of agents and by the existence of fixed costs of adhesion to the family network. The liquidity constraint favors transfers because the lack of access to the credit market imposes the realization of financial dealings within the family. Last, transfers received from parents lead to higher transfer towards children.

2.3 Endogenous altruism and preferences shaping

Approaches based on altruism and exchange overlook the family transfers dynamic over the life-cycle, except for the mutualist model (Cigno, 1993). Yet, this element is fundamental to explain the occurrence of transfers. Let's take a few examples. When they wish to buy some services, parents are never sure that their children will be ready to do so. In case of family loan, parents are not absolutely certain that children will pay their debt back. Altruistic parents will transfer money to their children, but if they need some help, they have no guarantee that children will be ready to assist them. All these scenarios have something in common. They show that it is in parents' interest to protect themselves from children's default.

The idea developed by Becker (1993) around this issue refers to a rational moulding of preferences. Given the importance of parental attitudes towards their children's future choices, parents try to anticipate their probable impact, and, they will rationally adjust their present transfer behavior. For example, parents have an incentive to protect themselves against old-

⁹ In the model of Cox and Jappelli (1990), the intergenerational loan interest rate cannot be higher than the market rate. The non-negativity constraint does not apply on utility levels, but on the amount of actual transfer.

age diseases by instilling very early into their children a willingness to help out if that becomes necessary. Given these expectations for old-age support, parents will then try to instill feelings of guilt or shame for misbehavior into their children. These values can generate an indirect commitment between generations to protect against the need of care in old age. As claimed by Becker (1993), this connection between childhood experiences and adult behavior lessens the need to rely on the altruism hypothesis inside the family, but the analysis is not restricted to a self-interested perspective. Indeed, Akerlof (1983) and Frank (1988) argue that the best way to appear altruistic in the expectation that this behavior will be imprinted on the children is to actually be altruistic¹⁰. Altruism is then replaced by a rational formation of desirable values including filial love.

Considering pocket money, parents have at least two good reasons to appeal to such encouragement mechanisms, designed to shape children's preferences. The first immediate benefit stems from the fact that children will be induced to manage their money in a more effective way. This can avoid inefficiencies generated by altruism, for instance when children choose on their own free will to remain poor (by working less or by spending more) in order to obtain higher transfers from their parents. In a more altruistic perspective, it is in the parents' interest to favor their children school path (caring for their future). Through a system of sanctions and rewards, they will encourage their children to work harder. The latter will then reach a higher social status and earn more money. Parents will thus be able to diminish their future gifts. On the children's point of view, this training reduces their present utility, but raises their future satisfaction in a larger extent (see Hess and Torney, 1967). The second sort of benefit, on the long run, fits in a process of socialization, suggested previously, when children are expected to help out in old age because of guilt or related motives.

One of the difficulties with endogenous altruism, is to find its theoretical prediction. We can expect richer parents to more often use sanctions and rewards mechanisms, because they can afford it. Moreover, the richer the parents, the more utility they derive from their children's services. Parents can rely on financial flows of income for their old years (pensions, assets), whereas children's services are uncertain. Because desirable values have no market substitutes, investing in education to instill them is more profitable. As for children, the situation is more complex. It can be preferable to incite those doing the best at school, but they will have less time for their old parents.

3 Pocket money in France

3.1 The data

The data set we analyze comes from a survey completed in 1992 in France, on parental investments in children's education¹¹. This survey turns on a representative sample of 5300 households including at least one child between 2 and 25 years old, living or not at the parental home. It includes an extensive household questionnaire on family composition, and the household's characteristics, including family income. One of the distinctive features of the survey is that one or possibly two children have been randomly selected in each family, and parents were questioned about the provision of money (for children who were 6 and older) and of time to each of them during the preceding school year (September to June). Money

¹⁰ Cox and Stark (1996) and Jellal and Wolff (2000) propose a different approach of rational inculcation of preferences. Following a demonstration effect, parents set a good example to their children by helping their own parents, in order to be imitated by their children in the future.

¹¹ Enquête sur les efforts d'éducation des familles, Institut National de la Statistiques et des Etudes Economiques (Insee), Institut National d'Etudes Démographiques (Ined).

gifts were detailed according to their regularity, and interestingly, for irregular allowances, parents were asked to describe their justification: were they given to fulfill children needs, as services payments or as school rewards. Some information about non-monetary incentives has as well been collected. For example, does television sometimes serve as a means of punishment or reward? A sample of 6000 children between 6 and 25 has thus been collected, providing some precise information on individualized resources coming from the parents, and the motivations underlying them¹².

Furthermore, a specific questionnaire has been administered to the subgroup of students (about 450 persons) who were asked to describe their personal sources of income (apart from that coming from their parents and described earlier). For the last 12 months, we know how much they got from grants, private lessons, job during the summer or the academic year, repayable student loan, training course, pre-hiring contract, rent subsidy, or single parent allowance.

3.2 Descriptive results

Allowances given to children by their parents seem to be widespread. As shown in Table1, about 74% of children between the age of 5 and 25 receive some money, either regularly or not. On average, children have received 2258 francs between September 1991 and June 1992, the duration of a school year, and this amount exceeds 3000 francs for the subpopulation of recipients.

Parental transfers take two distinct forms. Some allowances are given regularly, the amount of money being fixed in advance. But in some other cases, the payment takes place unevenly, depending on circumstances. Irregular allowances are slightly more frequent than steady ones (53 against 45% of the children are concerned), but their amount is half lower (637 francs for the former, 1577 for the latter). The circumstances under which they are given are not precisely known apart from two cases: when the money has been given in return for some work done for the parents, and secondly as a reward to their success at school. In both cases, about 10% of the children are concerned, receiving respectively 286 francs and 470 francs per school year. It can already be seen that parental motives may vary from one family to the other, and that at least two kinds of motivations emerge: one tenth of the parents give money in return for a service, another tenth is more concerned with preference shaping.

The mean values of the variables to be used in the subsequent analysis are reported in table 2 for the entire sample of families (and consequently the entire sample of children), and separately by whether or not the child received any financial assistance. As one could expect, the parents of children receiving an allowance are better off financially. They are also older, more qualified, and their social status is higher. The existence of brothers and sisters lowers the likelihood of transfer, and the amount of money received. Although many factors might interfere (effect of wealth for example), this is partly due to the interaction between quantity and quality of the children.

Respondents making transfers are more often divorced. This might be a way to give some more responsibilities to the children, through financial independence. It might also be the sign of more frequent substitutions between parental time and money, because separated parents have less time to look after their children than those living together. Pocket money might as well be a way of putting pressure on the child to give preference to the donor to the

¹² The sample of children can be considered as representative of the population of children in France, as only children, and children coming from two children families represent % of the cases. A slight underrepresentation of children from large families remains.

detriment of the former partner. If divorced parents give more often, widowed parents give higher amounts of money. They are also probably older; they are on average wealthier and above all, have older children with more needs.

Children receiving some cash are on average older than those who do not. Table 3 shows that half of the children between 6 and 10 receive some money, and this proportion grows steadily until the age of 17, at which more than 85% of the youth get an allowance. This figure remains the same until the age of 25. The rate of increase of the amount of money received is quite different: the allowance grows slowly until 12 or 13, and more rapidly afterwards. This is a result of the interference of two phenomena: needs increase with age, but as they grow up, some children become financially self-sufficient. After a given age, if children are still supported by their parents, they get a relatively high amount of cash.

Regular and irregular allowances seem to be governed by different schemes. When children are young, irregular allowances are twice as frequent as regular ones, but their amount is low, compared to pocket money. As children grow up, pocket money becomes more common, and both kinds of transfer are equally used at the age of 23 (67%). Their level increases rapidly, but irregular allowances remain always lower than regular ones. Through unsteady transfers, it is obvious that parents try to keep some sort of control over their child's behavior. The payment gives the opportunity to discuss the expense, and thus, to inculcate some principles. But this way to instill preferences into the child probably loses its power when he (or she) grows up, and after a given age, irregular allowances come up to another concern. Their purpose is just to meet the child's occasional needs, and they reveal a form of altruism from the parents. When the child grows up, payments become more regular, and he gradually acquires some autonomy. Pocket money increases rapidly with age, and this kind of expenditure reaches high levels with older children.

Services payments and school rewards are mainly used for young children. Parents' motives behind these transfers are of two different kinds. School rewards belong to the range of incentives that parents can use to encourage their child to work. But preference shaping must be set up early. The amounts are low for young children, but as they grow older, the reward becomes much more substantial, this being the price to pay to maintain their efficiency. Service payments do occur at an early age, rarely after the child reaches his majority. Their amounts are by half lower than rewards, but, like them, they grow significantly with the child's age. The similarity in the distribution by age of those two kinds of transfers might show that the underlying parental motives are identical: incitements to work hard at school, to help at home, etc. The decrease of the incidence of service payments with age might as well be the sign that children prefer to sell their time outside (baby sitting for instance), and earn more money.

4 Econometric analysis

4.1 Overall analysis

We now explore the relationship between transfers and the characteristics of the recipient and the donor through an econometric analysis. We begin by estimating a probit model with the dependant variable equal to one if a financial assistance is provided to the child (regularly or not), and zero otherwise. The probability of transferring depends on a set of variables included in the model. The parents' characteristics are the level of the household's total income, the number of dependent children living inside or outside the parental home, the social status, the level of education, the marital status and the age of the head of the

household. Also included are the child's characteristics: sex, and age. The level of education has not been introduced, given its very high correlation with the age. The age classes chosen roughly correspond to the main education cycles. The first column of table 4 shows that the older the child is, the more likely he is to receive some pocket money. Boys and girls have about the same probability of receipt. These results seem to refute the idea according to which parents devote more resources to boys, given their higher rate of return on the labor market¹³.

The multivariate analysis reveals the main influence of the level of parental income on the probability of transfer. As one could expect, its effect is positive, monotonic, and highly significant. The effect of the age of the head of the household, its level of schooling, strongly correlated to income, disappears. But controlling for wealth, the effect of social status remains significant, senior executives, professionals, junior executives, and independents giving more often pocket money to their children than other groups. In confirmation of table 2, the negative effect of the size of the family is not surprising, due to the well-known quantity/quality interaction. Surprisingly, children with married parents have a lower probability of receiving assistance than children whose parents are divorced or single. As suggested by McGarry and Schoeni (1995), whose analysis of transfers to elder children produces the same effect, a married couple has fewer resources per person (controlling for income) and can therefore afford less transfer. As in the descriptive analysis, the age of the child is positively related to the existence of a gift, the child's needs growing rapidly as he gets older.

We next turn to a discussion on the relation between these variables and the actual amounts of pocket money given. According to the data, some children do not receive any money from their parents. It is thus necessary to take these null amounts into account, for the estimation of the amount equation. In accordance with previous works, two regressions have been performed. In the first one, a full maximum-likelihood estimation of a Heckman selection model (Heckman, 1976) is performed. It provides consistent, asymptotically efficient estimates for the model. The correlation between residuals of the participation equation and of the amount equation has been accounted for. However, this selection model strongly depends on the model correctness, and it leads to instability and convergence difficulties when the model is not properly specified¹⁴. Thus, following Altonji *et alii* (1996), and Schoeni (1997), we estimate a Tobit model by a maximum likelihood procedure since the amounts of transfers are censored at zero. We have also attempted to use a least absolute deviation regression to estimate the conditional mean function, but the results are very close to those obtained using the Tobit model and they are accordingly not reported.

Given the importance and the significance of the Mills ratio, the first specification leads to lower results than the second one, but the conclusions drawn from the two estimates are identical. We expect the same relationships to hold between the variables and the amount of pocket money that held in the Probit equation. We find that the respondent being in a high-income quintile has a significant positive effect on gift behavior. Controlling for income, some qualification effects remain significant: parents with a high school diploma give higher

¹³ In the altruistic model with education and transfers (Becker and Tomes), two types of families can be distinguished. In rich families, parents invest in education until a certain optimum, and give financial transfers. In this case, boys and girls reach the level of human capital. In poorer families, only education investments should be observed, and boys are given an advantage over their sisters, because their salary is usually higher.

¹⁴ A solution can be found to this problem, if some variables strongly affect the chances of observing a positive gift value, but not the amount of transfer. Heckman (1979) proposes a two-step procedure estimate with full-information standard errors. It involves estimating a maximum-likelihood probit model, and then the amount regression including the Mill's ratio. The results obtained with this two-step procedure and those of the full selection model are identical.

allowances than the others. Married parents tend to give less, so as parents with many children. The age of the child remains the main source of disparity in the amount of the transfer, older children getting much more than younger ones.

These first econometrical results are rather difficult to interpret, in regard to the theoretical models. Two justifications may be found. The first one concerns the lack of children's characteristics in the regression, except for age and sex. But as seen previously, one of the main criteria used to identify parents' motivations is given by the effect of the child's income on the amount of money received. So long as too young children are considered, such a test cannot be performed, except for those (few) having personal incomes. A second reason stems from the fact that the preceding regression considers overall family transfers, taking all the parents into account. The survey proposes information on various types of transfers, which can correspond to various types of motivations. We are now going to integrate these issues, often ignored, to set up a precise picture of parental motivations.

4.2 A test of altruistic motives

The data that we have at our disposal allow us to test precisely the validity of the altruistic model. If some caring motives do exist between generations, we expect the derivative of the parents' income on their amount of transfer less the derivative of the child's income to be equal to one. In practice, this test is difficult to perform because it raises two major problems.

First of all, it requires some detailed information both on the amount of money given, and on the parents' and children income, whereas generally, only one source of income is reported, which is the one of the person interviewed. The French education survey allows to realize this test precisely on the subpopulation of students, because they have been interviewed with a specific questionnaire. It reports the level of their personal income during the academic year, as well as its source: grant, training course, paid job, repayable student loan, etc. Moreover, the main questionnaire gives the level of the parents' income, and the amount of pocket money that the young receives. Together, missing values being deleted, the sample consists of 450 students, for which the three necessary variables are known to test the altruistic model, that is the donors' income, the receiving child's income, and the level of the transfer.

As shown by Altonji *et alii* (1997), the estimation of the differences in derivatives raises two econometrical difficulties. The first one stems from the fact that the degree of altruism of parents towards children is observable. To bypass this obstacle, we just need to estimate a predicted difference between derivatives, because transfers are only given to children if the level of parents' altruism is higher than a given minimum value, incomes of both generations being held constant. As we consider richer children, parents always have to be more altruistic to give them some money. Because the difference in derivatives is always equal to one, whatever the degree of altruism is, this condition holds for a degree of altruism bounded in a narrow interval. The second problem concerns the selection bias, due to the fact that some parents don't give any money to their children. The test of unitary difference is only verified for operating transfers. This bias is corrected by using the selection-corrected derivative estimator for non-separable limited dependent variables models developed by Altonji *et alii* (1997). A brief description of the (underlying) econometric procedure is given in appendix.

Before examining the results about the difference in derivatives, we study the effect of both generations income obtained with a Heckman specification (1976). More precisely, a generalized Tobit model has been estimated using a maximum likelihood method, so that the couple of residuals intervening in both equations (discrete and continuous choice) is supposed

to follow a normal bivariate law. Admittedly, the estimators obtained might be biased in the frame of a transfers' model in which the vector of explanatory variables and the degree of altruism would not be separable. This is at least true as long as no additional restrictions are imposed on the nature of potential interactions between observable factors and non-observable degree of altruism. Nevertheless, these estimators give the possibility to compare the observed effects for young children with previous studies focusing on older generations.

The results of the estimation for the subsample of students are presented in table 5. Despite the small amount of observations, the Heckman model converges rapidly, and in the most satisfactory way. Although variables appear to be rarely significant, the regression reveals all the same the weight of income variables in transfers' behavior. *Ceteris paribus*, the probability that a child receives some money increases with his degree of poverty, and with the wealth of his parents. Both effects are significant at the 1% level, but the marginal incidence of these income variables on the probability of transfer remains weak. This can be the expression of a low degree of altruism from the parents, as suggested by Cigno *et alii* (1998). Anyway, this sort of intergenerational compensation is compatible both with models based on altruism, and with exchange models.

The only way to discriminate between the exchange and the altruism theoretical hypothesis is to examine the effect of the child's income on the level of pocket money received. According to the data on students, and after correction of the selectivity bias, it appears that parents tend to give higher amounts of cash as they are wealthier and as children are better off too (at the 5% level). In the absence of preferences heterogeneity, this effect is not compatible with the altruistic model, in which parents should give more to poorer children. But this anticompensation is consistent with the exchange models, for instance for services payments, or family loan repayment (Cox, 1987, 1990).

This positive effect of children's income has been frequently observed in France, in studies on various forms of transfers during a life cycle. This is particularly true for bequests, (Arrondel and Masson, 1991), for donations given by older parents to their adult children (Arrondel and Wolff, 1998, Arrondel and Laferrère, 2001), and for financial gifts to children between 20 and 30 (Wolff, 2000). These similarities of the findings at different stages of a life cycle suggest that parents may retain the same kind of motives throughout their existence.

The test dealing with difference in transfer-income derivatives allows to determine whether caring behaviors do exist in France. The estimators obtained for different specifications, with and without heterogeneity bias correction, are shown in table 6. Considering a linear regression on positive amounts, both kinds of income seem to have a positive effect, but that of the child is higher. The difference in derivatives is thus negative, but of weak intensity. *Ceteris paribus*, taking one franc from parents to give it to the child increases its transfer by 0.083 franc. This result tends to invalidate the altruistic model in which this difference should equal one. The confidence interval shows that the value obtained is statistically different from unity. The correction of heterogeneity bias does not change the conclusions. The marginal effect of the child's income becomes relatively lower, (0.05 instead of 0.098), but the difference in derivatives remains negative¹⁵. The income of both generations being held constant, a redistribution of one franc in favor of the child raises the transfer by 0.026 franc.

¹⁵ Given the sign of both parents' and children's income on the probability of transfer (respectively positive and negative), we expect the bias related to altruism heterogeneity to be positive for parents and negative for children. These effects are verified on data. The parents' income derivative is higher after the bias being corrected, the child's income derivative decreases (see table 6).

The econometric methodology proposed by Altonji *et alii* (1997) allows to introduce non linearities in both generations' incomes. If polynomial forms are chosen for income variables (quadratic or cubic), the findings related to the effect of the child's income are slightly different. Estimated at the average income level, the coefficient on income appears to be negative and the difference in derivatives becomes positive. Its intensity nevertheless remains limited: 0.02, without any correction of the estimators, 0.06 after correction. Two remarks can be made about this finding. First, the econometric estimation conducted on French data reveals that a linear specification for income is better suited for transfers' behavior. Second, the unitary value is always rejected, according to the related confidence intervals. All these results lead to reject the caring motives.

Our analysis also considers a distinction between regular and irregular allowances. Because the latter are likely to be designed to meet the child's needs, parents' behavior should more often be motivated by altruistic considerations, and the difference between derivatives should vary according to the type of allowance. The results obtained here tend to favor this interpretation. Without any correction of the coefficients, the difference in derivatives equals -0.145 for regular transfers and -0.031 for irregular ones¹⁶. When the heterogeneity bias is being corrected, the corresponding values are -0.021 for the former, and 0.003 for the latter. In this last case, the figure obtained shows a redistribution to the advantage of the poorer generation. Parents who give money irregularly seem to be more often concerned about their child's well being. But the compensation remains in any case too weak to validate the altruistic model.

A final issue concerns the endogeneity of the child's income at these young ages. In particular, our data set does not allow building up any proper permanent income indicator. On a theoretical point of view, it is difficult to anticipate the effect of their future income on the transfer they receive. On the one hand, the presence of unobservable elements that could raise the future income might as well influence the current income in a positive way. Thus, the current income derivative of the transfer is expected to be relatively lower, because the child's future income should reduce both the amounts of present and future transfers (Altonji *et alii*, 1997). And on the other hand, the fact that children might be liquidity constrained can lead to the opposite outcome. When children have no access to the capital market, altruistic transfers will decrease with the current child's income, but they will increase with his permanent income (Cox, 1990). The information available is not precise enough to instrument the child's income to know whether this variable is endogenous or not. On an empirical point of view, Altonji *et alii* (1997) and Wolff (2000) have tried to correct the possible bias due to the child's income endogeneity. In both cases, the correction of the bias does not change the conclusions: the difference in derivatives remains low, contrary to the unitary value predicted by altruism. Obviously, this outcome also applies to the Education survey.

4.3 Heterogeneity within the families

The preceding analysis on the probability of transfer and its conditional amount nevertheless hides the heterogeneity of behavior between respondents. Thanks to the good precision of questions included in the Education survey, we can extend the analysis by considering two main factors of diversity between family choices. First, the type of transfer used to help the child –whether regularly or not- is observed. Secondly, the various functions of irregular transfers, particularly in the case of payment of the children's attention and of good results at school are examined.

¹⁶ The difference between both types of transfer mainly concerns the level of anticomensation. The child's income derivative of the transfer is 0.159 for regular allowances and 0.036 for irregular ones.

First of all, we must try to see whether parents' motivations differ depending on whether they give money regularly or not. In order to take into account some possible specificity in the econometric analysis, equations associated with these two forms of transfers have been jointly estimated. Using standard econometric techniques, which only require the integration of a bivariate normal law, we can easily obtain efficient and convergent estimators, dealing with the correlation between residuals of both independent equations. This procedure is used both in the discrete case, with a bivariate Probit model, and in the continuous case, with a bivariate Tobit model, using the maximum likelihood method. In the bivariate Tobit model, the amounts are introduced under a logarithmic form¹⁷. Results are in Table 7.

In order to determine whether the various forms of transfers concern the same populations, a first simple test consists in looking at both sets of coefficients and in deciding whether they are identical or not, using a Chow test. For the bivariate Probit model, a chi2 value of 218.92 is obtained, which is significant at the 1% level, with 20 linear restrictions; the chi2 statistic for the bivariate Tobit model reaches 109.6 and is also significant at the 1% level. Obviously, the data allow to reject the idea according to which motives would be identical in both forms of transfers. Some heterogeneity is observed on parents' as well as on children's characteristics. For instance, for transfer decisions, the chi2 statistics respectively add up to 46.9 for parents' determinants (16 linear restrictions) and to 50.1 for children's (3 linear restrictions), and they are significant at the 1% level in both cases¹⁸.

Interestingly, it must be noted that differences in coefficients are relatively higher for children than for parents in the bivariate Probit model. These gaps can only be explained by an age effect, because gaps related to the sex variable are not significant. This incidence of age reveals the progressive rise in the child's financial autonomy. As children grow up, parents seem to favor regular payments at the expense of occasional gifts. They attempt to make them aware of their responsibilities, and induce them to take the existence of hazards in terms of needs into account, in spite of a fixed level of financial resources. This type of transfer allows parents to get round children's possible cheating. In order to grant themselves some of their parents' money, children can deliberately put themselves into a situation of poverty, either by not working enough (lazy child), or by not sparing enough (prodigal child) (see Bergstrom, 1989). Thanks to steady payments, parents avoid to face this Good Samaritan dilemma, even if preengagement strategies between parents and children regarding family resources allocation are not always efficient (Lindbeck and Weibull, 1990, Bruce and Waldman, 1990).

Consequently, is it possible then to associate specific motivations according to the type of transfer used? It will be shown next that the first type of transfer is more a matter of intertemporal exchange and the second one falls within the scope of altruistic motivations, through a comparison of the effects of parents' characteristics on both types of gifts.

A first discriminating variable is given by the parents' income. Its marginal effect is noticeably higher for irregular allowances, with a coefficient of 0.130, instead of 0.089¹⁹. As noted by Cigno *et alii* (1998), the weak influence of income on transfer decisions is likely to reveal a limited parental altruism. Parents' caring seems to be higher for irregular gifts,

¹⁷ In our analysis, we focus on the differentiated effects of the variables on each type of amount of transfer. The logarithmic specification, in which coefficients depend on the average level of transfers (they are quite different from regular and irregular allowances) avoids scales problems

¹⁸ The constant is excluded from the various statistical tests, to study the symmetry of the characteristics' influence for each generation. The results are similar for the amounts of transfer, with significant differences between coefficients for both parents (chi2=33.4) and children (chi2=22.09).

¹⁹ Both coefficients are nevertheless not significantly different. The obtained chi2 statistic with one linear regression equals one and is insignificant with a 31.7% level.

because they try to take children's needs into account, unlike steady allowances for which amounts are fixed in advance. Differentiated effects of the number of brothers and sisters can be interpreted in the same way, although differences are not significant. The adjustment to the number of brothers and sisters is more sensitive for punctual gifts. The effect of education varies according to the type of transfer, with a chi2 statistic of 8.81 (with 4 linear restrictions) and significant at the 10% level. For a given income, the level of schooling has a negative effect on irregular allowances and a positive effect on regular ones. Parents with higher education more often choose the latter. But at the same time, the effect of social status is less pronounced for punctual gifts, and more frequent among professionals and executives.

Regular allowances are better fitted in an intertemporal framework, such as that proposed by Cigno (1991, 1993). In this setting, parents show little concern about their children's needs. If they want to be paid back in the future, they have to give them money first, whatever their situation is. These fixed assistances are equivalent of investments in human capital, as attested by the positive effect of education. This is an interesting strategy, in an intertemporal perspective. More educated children will have higher incomes throughout their life cycle, and will have more money to pay their parents back²⁰. Conversely, punctual payments better fit in an altruistic framework in which, according to their level of wealth, parents try to adjust their gifts to the need of their offspring.

The quality of the data available allows us to carry on the analysis of the heterogeneity of familial transfers. With regard to occasional gifts, three types of solidarity can be distinguished: those rewarding school results, those designed to buy the child's attention, and those that are more likely to answer children's needs (even if the survey does not provide any information about this last point). Thus, the distinction between regular and irregular allowances turns out to be unsatisfactory because the latter come under various motives (altruism, exchange, endogenous altruism). In order to find differences in behavior between families, individual equations have been estimated for these three forms of gifts. The analysis being limited to transfer decisions, a trivariate Probit model has been estimated. This technique allows to obtain efficient estimators, and to take residual correlation between the various choices into account²¹. Econometric results, reported in table 8, reveal the diversity of family profiles according to the type of transfer used.

First, the financial gifts awarded in response to children's needs are described. They are relatively more frequent when parents are single, divorced or widowed. The total number of children exerts a negative effect on the transfer probability: the more numerous they are, the more difficult it will be for parents to share their scarce resources to finance their offspring's needs. Transfers are more usual when the head of the household is highly educated (at the 5% level). It shows that it is not a matter of human capital investment. These gifts are mainly provided by executives and independents. Furthermore, income plays an important positive part on transfers' probability. This one increases whatever the level of income is (introduced non linearly in the regression). This variable's coefficient is 0.153 (with a t-value of 4.69): a higher intensity than that observed for occasional gifts taken as a whole. This sort of transfer is the best matching with altruistic motivations.

²⁰ But the benefit might be limited if parents prefer time assistance from their children. Rich children have less time available to help their parents when they are old.

²¹ Residuals associated to each equation are assumed to follow a trivariate normal law. The estimation has been performed with a numerical simulation method using the GHK simulator for the multivariate normal cumulative density function.

Results are very different in the case of money/services exchange (Cox, 1987). For the first time, this kind of behavior can be directly identified²². The divergences are particularly obvious for the number of children, and the parents' education and earnings. So, parents are more likely to buy their children's attention when the family reaches a certain size (whereas the effect is negative for more altruistic gifts). The effect of the number of children is not linear: parents with an only child and parents with several children do not behave in the same way. Only the latter are able to organize a sort of competition between their children. Parents might as well threaten lazy children to suppress pocket money, and give more to children showing more cooperation (Bernheim *et alii*, 1985).

The effect of parental education effect is not significant, suggesting that this type of exchange is not related to a transfer of human capital. The purchase of attention is much more frequent among independents and in a lesser extent among farmers and executives. And last but not least, none of the income variables are significant. Introduced under a logarithmic form, the income coefficient is very weak (0.037, with a t-value of 0.86). Services payments are thus not motivated by altruistic considerations, but by a real desire of exchange²³.

The last case deals with transfers designed to reward school results. Resorting to these kinds of incitement is characteristic of a subpopulation that differs from both previous ones. This type of gift, which is relatively rare among divorced parents, diminishes with the number of children, perhaps because of a quality effect: parents tend to favor the most successful children. Besides, with a large family, this rewarding system can easily become expensive. Parent's level of education is not relevant regarding this type of aid, which cannot be considered as capital transfer. The income effect is highly non linear. Parents earning over 240 000 francs (the highest quintile) are much more likely to use school rewards²⁴. Preference formation is thus only spread in well-off social classes, in which the children's professional destiny and social fulfillment are of great concern.

In addition, the survey provides further information on incitement resorting. Parents were asked whether they often, sometimes or never use television as a way to reward or sanction school results. An ordered probit model has been estimated, to characterize households using this type of control over children (see table 9). The results are not much different from those observed for school rewards. This practice rises with the number of children. Television is likely to be considered as a collective sanction/reward, given its characteristic of public good within a household. The greater the number of children, the more difficult it is to reserve it for some of them. Unlike regular allowances, television cannot be considered as an education investment, and the parents' level of schooling tends to be negatively associated with it. Earnings tend to influence the use of television in a positive way. This is not surprising. It is much cheaper for parents to control their children's actions through television than through financial assistance.

If parents living in couple are distinguished, the mother's activity plays a positive role on this phenomenon. This might be the sign of the greater influence within the couple's decisions, according to the collective approach of households' behaviors (Chiappori, 1992).

²² In order to test this exchange model, Cox and Rank (1992) estimate a financial transfer equation and introduce in the regression variables corresponding to services and attention given by children. A positive effect of children's services can be explained by exchange motivations as well as two-sided altruism within generations (see Cox, 1996).

²³ This lack of significance is surprising regarding theoretical predictions of the exchange model (Cox, 1987). We would expect richer parents to be more often tempted to purchase their children's attention.

²⁴ If income is introduced under a logarithmic form, the variable's coefficient is very weak (0.084) and significant at the 10% level (the t-value is 1.87).

Nevertheless, the survey data does only provide information about the total amount of income of the household, does not allow to go any further in this way.

An interesting issue has not been treated yet, that is the degree of efficiency of family incitements. It would be interesting to have more information about the children who benefit from them. Do they do better than the others? The survey gives some detailed elements about the children's school path, and an assessment of their school success, which could help to answer this question. Unfortunately, some difficulties arise due to endogeneity and causality issues. The child can be rewarded because he works hard, but he might as well work hard with the intention to get a reward. Some pieces of information might be obtained through a comparison of children's paths coming from the same family, with a fixed effect procedure.

5 Conclusion

This paper addressed the issue of financial transfers' motivations from parents to children. These *inter vivos* gifts involve considerable amounts of money. Information about the reasons why parents give money to their children is considerably important for the economic policy. In case of dynastic altruism, state intervention through a public provided transfers program is totally inefficient. Parents adjust private transfers in response to income variations due to the public intervention. Conversely, in case of exchange, parental transfers can amplify redistributive action of the State (crowding-in effect). In the present context, many European countries face the question of how to finance retirement pensions (pay-as-you-go *versus* funded system). If parents are forced to spare money for their old years, they could be induced to lower their contribution towards children. A public policy would then have no other alternative than to intervene in order to maintain optimal education investments.

The contribution of our study is twofold. The first one deals with the type of transfer analyzed. To our knowledge, it is the first time that motives underlying the gift of pocket money have been explored. Working on young children allows to take into account, in a beckerian perspective, the mechanisms of incitement and of preferences shaping within a family. The second one stems from the disaggregation of transfers' theoretical hypotheses. Instead of assuming that only one motive exists for all the families, various motivations are identified, such as altruism, exchange and preferences shaping.

Empirical results obtained on French data reveal the relevance of this approach. The analysis of the various modes of payment shows that regular allowances are linked to human capital investments whereas irregular transfers are designed to meet the children's needs, and fall within the scope of altruistic considerations. Yet, some of these latter gifts are means of payment of services, and others come to reward children for their results at school. This diversity of family motivations is considerable. On the one hand, it vouches for the fact that the theoretical hypotheses voiced by economists up to now are fully justified. On the other, it explains why empirical works focused on families taken as a whole have not been able to produce consensual results validating one or the other theoretical motive.

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Appendix. Testing the unitary difference in transfer-income derivatives

For the presentation, let us consider the following form $T(X, \beta) = X'\alpha + \varepsilon$ for the amount transfer equation, where X is the vector of regressors including both parents' and child's incomes, α the vector of parameters, β the degree of parental altruism, and ε a random variable normally distributed. Assuming that all parents have the same utility function, ε is the only source of unobserved heterogeneity within the families. With the additional hypothesis that $E(\varepsilon_p | X) = 0$, the model could for example be estimated using a maximum likelihood Tobit estimation. However, it seems reasonable to assume that the degree of altruistic feelings towards children varies from one parent to another.

Let $\beta^*(X)$ be the set of values of β such that $T(X, \beta) > 0$ and $f(\beta)$ be the density of β . In this subset of the population $\beta^*(X)$, parents always make positive transfers to their children. The conditional expectation function $\bar{T}(X) \equiv E[T(X, \beta) | X, T > 0]$ is defined with respect to this self-selected population, the size of which is given by $P(\beta) = \int_{\beta^*} f(\beta) d\beta$:

$$\bar{T}(X) = \int_{\beta^*} T(X, \beta) \frac{f(\beta)}{P(\beta)} d\beta$$

As this conditional expectation function $\bar{T}(X)$ can be estimated given that T and X are both observable, the test of the unitary difference is based on its derivatives. Nevertheless, the income derivatives of $\bar{T}(X)$ need to be corrected because of selection in the subsample $\beta^*(X)$. The definition of $\bar{T}(X)$ leads, after calculations, to the following expectation for each transfer-income derivative (see Altonji *et alii*, 1997, p. 1129-1130):

$$E\left[\frac{\partial T}{\partial X_i} | X, T > 0\right] = \frac{\partial \bar{T}(X)}{\partial X_i} + \frac{\partial P(X)}{\partial X_i} \frac{\bar{T}(X)}{P(X)}$$

Hence, the underlying econometric methodology is a flexible parametric approach. Instead of assuming a specific linear form of the transfer equation, a flexible form is considered. For the estimation, various specifications are used to allow for flexibility. First, an estimation of the parameters of the function $\bar{T}(X)$ is made using a least-squares regression on the subsample in which parents make positive transfers to their children. The probability transfer is estimated by considering the standard normal distribution function and by estimating a Probit regression. Then, using the various estimates, the expected transfer income derivative following equation (X) is corrected. Finally, standard errors for the income-transfers expectations are derived through a bootstrap procedure using 500 bootstrap replications. Note that the derivatives are evaluated at the mean of the original sample.

Table 1. Incidence and magnitude of parental allowances to children

| Allowances | % of recipients | Mean amount (Standard deviation) | Mean amount/recipient. (Standard deviation) |
|-------------------------------|-----------------|-------------------------------------|--|
| Pocket money | 74.0 | 2258 (5340) | 3060 (6017) |
| Regular allowance | 45.0 | 1577 (4558) | 3531 (6295) |
| Irregular allowance | 53.4 | 637 (1905) | 1266 (2531) |
| Service payment | 9.78 | 28 (202) | 286 (586) |
| School achievements reward | 9.63 | 45 (505) | 470 (1566) |

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Tableau 2. Mean of the sample

| Respondent's characteristics | All respondents | No allowance receipt | Allowance receipt | |
|------------------------------------|--------------------|-------------------------|-------------------|--------|
| | | | % | Amount |
| <i>Parents' characteristics</i> | | | | |
| <i>Marital status</i> | | | | |
| Single | 0.052 | 0.057 | 0.050 | 2332 |
| Married | 0.833 | 0.858 | 0.825 | 3323 |
| Widowed | 0.026 | 0.021 | 0.028 | 4389 |
| Divorced | 0.088 | 0.064 | 0.096 | 3711 |
| <i>Age</i> | | | | |
| 35 and under | 0.127 | 0.186 | 0.107 | 2751 |
| 36-40 | 0.220 | 0.285 | 0.199 | 2313 |
| 41-45 | 0.280 | 0.271 | 0.283 | 5938 |
| 46-50 | 0.180 | 0.119 | 0.200 | 7219 |
| Over 50 | 0.193 | 0.140 | 0.210 | 7592 |
| <i>Number of children</i> | | | | |
| 1 | 0.177 | 0.162 | 0.183 | 3800 |
| 2 | 0.447 | 0.438 | 0.450 | 3469 |
| 3 | 0.230 | 0.241 | 0.226 | 3217 |
| 4 or more | 0.146 | 0.159 | 0.142 | 2547 |
| <i>Schooling</i> | | | | |
| No qualification | 0.206 | 0.257 | 0.189 | 2293 |
| Complete primary school | 0.142 | 0.132 | 0.145 | 3107 |
| Secondary school (first cycle) | 0.381 | 0.404 | 0.374 | 3067 |
| High School diploma | 0.093 | 0.078 | 0.097 | 3976 |
| Higher education | 0.179 | 0.128 | 0.195 | 4681 |
| <i>Social status</i> | | | | |
| Farmer | 0.032 | 0.048 | 0.026 | 2492 |
| Independent | 0.105 | 0.094 | 0.109 | 3860 |
| Senior executive, professional | 0.164 | 0.105 | 0.183 | 4909 |
| Junior executive | 0.223 | 0.194 | 0.232 | 4137 |
| White collar employee | 0.135 | 0.128 | 0.137 | 3850 |
| Blue collar worker | 0.342 | 0.431 | 0.313 | 2045 |
| <i>Household's income per year</i> | | | | |
| Less than 100 000 francs | 0.210 | 0.263 | 0.194 | 2615 |
| 100 000 to 135 000 francs | 0.205 | 0.232 | 0.197 | 2517 |
| 135 000 to 175 000 francs | 0.191 | 0.209 | 0.185 | 2579 |
| 175 000 to 240 000 francs | 0.193 | 0.176 | 0.197 | 3541 |
| More than 240 000 francs | 0.201 | 0.121 | 0.227 | 5034 |

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Table 3. Distribution of allowances conditional on the children's characteristics

| Allowance | Pocket money | | Regular | | Irregular | | Service payment | | Reward | |
|--------------------------------|--------------|-----------------------|-----------|-----------------------|-----------|-----------------------|-----------------|-----------------------|-----------|-----------------------|
| | Diffusion | Amount ⁽¹⁾ | Diffusion | Amount ⁽¹⁾ | Diffusion | Amount ⁽¹⁾ | Diffusion | Amount ⁽¹⁾ | Diffusion | Amount ⁽¹⁾ |
| <i>Child's characteristics</i> | | | | | | | | | | |
| Age | | | | | | | | | | |
| 6-9 | 53.2 | 517 | 20.8 | 660 | 40.7 | 333 | 8.0 | 106 | 12.5 | 190 |
| 10-11 | 66.5 | 678 | 31.6 | 747 | 51.9 | 418 | 14.0 | 111 | 14.9 | 262 |
| 12-13 | 76.2 | 1051 | 41.1 | 1213 | 55.6 | 539 | 12.7 | 178 | 13.4 | 226 |
| 14-16 | 81.7 | 1503 | 51.9 | 1516 | 58.6 | 786 | 10.7 | 227 | 9.4 | 450 |
| 17-18 | 88.3 | 2889 | 61.7 | 2830 | 60.2 | 1387 | 11.0 | 668 | 6.4 | 791 |
| 19-20 | 86.3 | 6514 | 64.5 | 6387 | 58.7 | 2666 | 5.8 | 691 | 5.0 | 748 |
| 21-22 | 88.5 | 10833 | 66.6 | 11133 | 64.2 | 3555 | 4.2 | 1042 | 4.2 | 2938 |
| 23 and over | 87.2 | 12900 | 67.1 | 12328 | 67.9 | 4512 | 1.8 | 1167 | 1.2 | 3000 |
| School cycle | | | | | | | | | | |
| Primary school | 59.6 | 616 | 25.3 | 750 | 46.4 | 380 | 10.7 | 116 | 13.2 | 216 |
| Secondary school | 83.0 | 2273 | 54.3 | 2338 | 58.0 | 1098 | 10.7 | 384 | 9.1 | 466 |
| Graduate studies | 88.6 | 11971 | 68.8 | 11718 | 65.2 | 4035 | 2.5 | 1185 | 3.0 | 2600 |
| Sexe | | | | | | | | | | |
| Male | 75.3 | 3447 | 46.9 | 3871 | 55.0 | 1446 | 10.4 | 294 | 9.3 | 549 |
| Female | 76.2 | 3236 | 45.9 | 3862 | 54.9 | 1249 | 8.7 | 328 | 10.0 | 339 |

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(1) Average amount per recipient

Table 4. Econometric analysis of pocket money allowances

| Respondent's characteristics | Probit | | Heckman selection | | Tobit | |
|------------------------------------|--------|---------|-------------------|---------|----------|---------|
| | coef | t-value | coef | t-value | coef | t-value |
| <i>Constant</i> | -0.165 | -1.76 | 245.26 | 0.79 | -2795.09 | -6.88 |
| <i>Parents' characteristics</i> | | | | | | |
| <i>Marital status</i> | | | | | | |
| Single | 0.195 | 2.287 | 437.29 | 1.56 | 931.77 | 2.60 |
| Married | Ref. | | Ref. | | Ref. | |
| Widowed | 0.029 | 0.224 | -535.54 | -1.33 | -500.23 | -0.99 |
| Divorced | 0.257 | 3.41 | 795.31 | 3.49 | 1255.59 | 4.42 |
| <i>Age</i> | | | | | | |
| 35 and under | Ref. | | Ref. | | Ref. | |
| 36-40 | -0.102 | -1.682 | -317.45 | -1.52 | -495.28 | -1.80 |
| 41-45 | -0.074 | -1.17 | -500.18 | -2.32 | -593.89 | -2.11 |
| 46-50 | 0.075 | 0.99 | -76.61 | -0.31 | 2.28 | 0.01 |
| Over 50 | 0.041 | 0.51 | 359.97 | 1.36 | 454.95 | 1.34 |
| <i>Number of children</i> | | | | | | |
| 1 | Ref. | | Ref. | | Ref. | |
| 2 | -0.060 | -0.947 | -615.46 | -3.13 | -734.82 | -2.97 |
| 3 | -0.137 | -2.029 | -660.69 | -3.11 | -941.23 | -3.51 |
| 4 or more | -0.176 | -2.334 | -1081.01 | -4.47 | -1333.84 | -4.34 |
| <i>Schooling</i> | | | | | | |
| No qualification | Ref. | | Ref. | | Ref. | |
| Complete primary school | 0.078 | 1.232 | -78.16 | -0.37 | 132.62 | 0.50 |
| Secondary school (first cycle) | 0.036 | 0.684 | 108.30 | 0.62 | 98.87 | 0.44 |
| High School diploma | 0.020 | 0.249 | 637.84 | 2.42 | 733.21 | 2.20 |
| Higher education | 0.040 | 0.506 | 240.58 | 0.97 | 288.04 | 0.91 |
| <i>Social status</i> | | | | | | |
| Farmer | -0.218 | -1.838 | 15.63 | 0.04 | -290.48 | -0.54 |
| Independent | 0.152 | 2.093 | 651.18 | 2.81 | 1025.47 | 3.49 |
| Senior executive, professional | 0.196 | 2.439 | 848.47 | 3.42 | 1187.14 | 3.80 |
| Junior executive | 0.129 | 2.255 | 161.89 | 0.88 | 421.69 | 1.78 |
| White collar employee | 0.106 | 1.757 | -19.55 | -0.10 | 239.59 | 0.95 |
| Blue collar worker | Ref. | | Ref. | | Ref. | |
| <i>Household's income per year</i> | | | | | | |
| Less than 100 000 francs | Ref. | | Ref. | | Ref. | |
| 100 000 to 135 000 francs | 0.148 | 2.578 | 378.77 | 1.97 | 713.36 | 2.87 |
| 135 000 to 175 000 francs | 0.147 | 2.468 | 374.09 | 1.88 | 773.99 | 3.01 |
| 175 000 to 240 000 francs | 0.229 | 3.596 | 634.93 | 3.00 | 1202.40 | 4.43 |
| Over 240 000 francs | 0.459 | 6.069 | 1448.47 | 6.13 | 2248.09 | 7.48 |
| <i>Child's characteristics</i> | | | | | | |
| <i>Sex</i> | | | | | | |
| Male | Ref. | | Ref. | | Ref. | |
| Female | 0.049 | 1.326 | -212.84 | -1.81 | -141.64 | -0.95 |
| <i>Age</i> | | | | | | |
| 6-9 | Ref. | | Ref. | | Ref. | |
| 10-12 | 0.402 | 7.626 | 227.11 | 1.22 | 1242.68 | 5.00 |
| 13-15 | 0.784 | 13.388 | 695.15 | 3.53 | 2305.74 | 8.92 |
| 16-18 | 0.955 | 14.758 | 1790.05 | 8.56 | 3680.93 | 13.52 |
| 19 and over | 0.995 | 14.272 | 6771.10 | 30.60 | 8803.33 | 30.83 |
| Mills Ratio | | | 1139.10 | 13.66 | | |
| Number of respondents | 6028 | | 5798 | | 5798 | |
| Number of recipients | 4458 | | | | | |
| Log likelihood | -3120 | | | | -43962 | |

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Table 5. Econometric analysis of regular and irregular allowances

| Variables | Bivariate probit | | | | Bivariate tobit | | | |
|-----------------------------------|-------------------|---------|---------------------|---------|-------------------|---------|---------------------|---------|
| | Regular allowance | | Irregular allowance | | Regular allowance | | Irregular allowance | |
| Respondent's characteristics | coef | t-value | coef | t-value | coef | t-value | coef | t-value |
| <i>Constant</i> | -3,266 | -5,83 | -2.272 | -4.25 | -16139.96 | -4.48 | -6887.74 | -4.51 |
| <i>Parents' characteristics</i> | | | | | | | | |
| <i>Marital status</i> | | | | | | | | |
| Single | 0.207 | 2.52 | 0.109 | 1.41 | 1384.68 | 2.51 | 368.32 | 1.56 |
| Married | Ref. | | Ref. | | Ref. | | Ref. | |
| Widowed | -0.145 | -1.25 | 0.151 | 1.31 | -1279.26 | -1.80 | 0.18 | 0.00 |
| Divorced | 0.252 | 3.99 | 0.125 | 1.99 | 1459.09 | 3.61 | 333.70 | 2.16 |
| Age of reference | -0.027 | -1.27 | -0.021 | -1.14 | -30.71 | -0.22 | 8.75 | 0.16 |
| Age of reference (squared 10e-2) | 0.010 | 1.37 | 0.007 | 0.93 | 0.36 | 0.26 | -0.95 | -0.18 |
| Number of children | -0.024 | -1.72 | -0.035 | -2.49 | -228.07 | -2.49 | -100.54 | -2.54 |
| <i>Schooling</i> | | | | | | | | |
| No qualification | Ref. | | Ref. | | Ref. | | Ref. | |
| Complete primary school | 0.078 | 1.31 | -0.054 | -0.93 | 87.73 | 0.21 | -96.05 | -0.61 |
| Secondary school (first cycle) | 0.029 | 0.59 | 0.007 | 0.15 | -96.35 | -0.27 | -29.89 | -0.21 |
| High School diploma | 0.041 | 0.54 | -0.012 | -0.16 | 751.14 | 1.56 | 26.80 | 0.15 |
| Higher education | 0.142 | 1.98 | -0.101 | -1.46 | 757.25 | 1.75 | -392.33 | -2.25 |
| <i>Social status</i> | | | | | | | | |
| Farmer | -0.268 | -2.19 | -0.048 | -0.43 | -819.19 | -1.09 | 406.52 | 1.65 |
| Independent | 0.183 | 2.81 | 0.072 | 1.13 | 1382.15 | 3.28 | 478.48 | 2.93 |
| Senior executive, professional | 0.394 | 5.66 | 0.153 | 2.27 | 2150.67 | 5.39 | 369.44 | 2.20 |
| Junior executive | 0.157 | 3.01 | 0.142 | 2.79 | 546.20 | 1.54 | 460.82 | 3.46 |
| White collar employee | 0.067 | 1.16 | 0.072 | 1.31 | 373.35 | 0.93 | 159.50 | 0.97 |
| Blue collar worker | Ref. | | Ref. | | Ref. | | Ref. | |
| Household's income (log.) | 0.089 | 3.08 | 0.130 | 4.22 | 774.82 | 4.80 | 458.06 | 5.87 |
| <i>Child's characteristics</i> | | | | | | | | |
| <i>Sex</i> | | | | | | | | |
| Male | Ref. | | Ref. | | Ref. | | Ref. | |
| Female | -0.016 | -0.47 | 0.030 | 0.91 | -55.35 | -0.26 | -77.55 | -0.88 |
| Age | 0.274 | 11.01 | 0.154 | 6.44 | -134.28 | -0.85 | -119.21 | -1.88 |
| Age (squared) | -0.006 | -7.47 | -0.004 | -4.57 | 31.43 | 6.47 | 11.30 | 5.72 |
| Number of respondents | 6028 | | 6028 | | 5633 | | 5633 | |
| Number of recipients | 2692 | | 3194 | | | | | |
| Log likelihood | -7740 | | | | -55662 | | | |
| Disturbance correlation (t-value) | -0.118 (-5.55) | | | | | | | |

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Table 6. Econometric analysis of transfers to students

| Variables | Probit | | Generalized Tobit | |
|---------------------------------|---------------|----------|-------------------|---------|
| | coef | t-value | coef | t-value |
| Constant | 0.636 | 0.53 | 1 066.028 | 0.14 |
| Parents' characteristics | | | | |
| Age | -0.002 | -0.16 | -52.910 | -0.62 |
| Married | -0.339 | -1.36 | -1 537.963 | -1.01 |
| Number of children | -0.088 | -1.35 | -630.632 | -1.32 |
| Education | | | | |
| Primary school | Ref. | | Ref. | |
| Secondary school | -0.307 | -1.34 | 522.446 | 0.36 |
| High school diploma | -0.113 | -0.36 | 918.850 | 0.51 |
| Higher education | -0.367 | -1.32 | 3 056.842 | 1.99** |
| Income (10e-4) | 0.043 | 3.72*** | 144.736 | 2.77*** |
| Child's characteristics | | | | |
| Female | -0.068 | -0.39 | -861.965 | -0.82 |
| Age | 0.047 | 0.82 | 539.050 | 1.59 |
| Income (10e-4) | -0.246 | -4.73*** | 1 092.162 | 2.27** |
| ρ | | | -0.136 | -0.55 |
| Number of observations | 450 | | 397 | |
| Number of recipients | 397 | | 397 | |
| Chi ² (d.f.) | 61.25*** (21) | | | |
| Log likelihood | -4 366.52 | | | |

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Note: Heckman selection model estimated by full maximum likelihood.

Significant: *** at the 1% level; ** at the 5% level; * at the 10% level.

Table 7. Test of transfers-income derivatives

| Specification | Derivative parents' income | Derivative child's income | Difference in derivatives |
|---------------------------------------|------------------------------------|--------------------------------------|-------------------------------------|
| 1. Linear incomes | | | |
| Uncorrected derivatives | 0.016 (0.006) [0.004;0.027] | 0.098 (0.068) [-0.034;0.231] | -0.083 (0.066) [-0.211;0.046] |
| Corrected derivatives | 0.024 (0.007) [0.011;0.037] | 0.050 (0.070) [-0.087;0.187] | -0.026 (0.068) [-0.159;0.107] |
| 2. Second order polynomial in incomes | | | |
| Uncorrected derivatives | 0.012 (0.009) [-0.006;0.029] | -0.009 (0.074) [-0.154 ;0.136] | 0.020 (0.071) [-0.119 ;0.107] |
| Corrected derivatives | 0.021 (0.009) [0.003;0.040] | -0.047 (0.078) [-0.200;0.0107] | 0.068 (0.075) [-0.079;0.215] |
| 3. Third order polynomial in incomes | | | |
| Uncorrected derivatives | 0.013 (0.009) [-0.004;0.030] | -0.008 (0.074) [-0.153;0.137] | 0.021 (0.071) [-0.118;0.160] |
| Corrected derivatives | 0.019 (0.009) [0.001;0.037] | -0.043 (0.078) [-0.196;0.110] | 0.062 (0.075) [-0.085;0.209] |

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Note: standard error in parentheses, 95% confidence intervals in brackets.

Table 8. Multivariate estimation of irregular transfers' decisions

| Variables | Children's needs | | Services exchange | | School rewards | |
|---------------------------------|------------------|---------|-------------------|---------|--------------------------------|---------|
| | coef. | t-value | coef. | t-value | coef. | t-value |
| Constant | -0,995 | -2,27 | -1,952 | -2,75 | -1,357 | -1,89 |
| <i>Parents' characteristics</i> | | | | | | |
| Marital status | | | | | | |
| Single | 0,152 | 1,85 | 0,181 | 1,75 | 0,111 | 1,07 |
| Married | Ref. | | Ref. | | Ref. | |
| Widowed | 0,192 | 1,62 | 0,115 | 0,72 | -0,005 | -0,03 |
| Divorced | 0,165 | 2,50 | -0,026 | -0,29 | -0,340 | -3,30 |
| Age | -0,018 | -0,93 | -0,045 | -1,33 | -0,013 | -0,41 |
| Age squared (10^{-2}) | | 0,64 | 0,025 | 0,66 | 0,010 | 0,27 |
| Number of children | | | | | | |
| 1 | Ref. | | Ref. | | Ref. | |
| 2 | -0,063 | -1,09 | 0,307 | 3,59 | -0,034 | -0,45 |
| 3 | -0,210 | -3,42 | 0,313 | 3,41 | -0,184 | -2,15 |
| 4 or more | -0,086 | -1,23 | 0,344 | 3,34 | -0,203 | -1,99 |
| Schooling | | | | | | |
| No qualification | Ref. | | Ref. | | Ref. | |
| Complete primary school | -0,005 | -0,09 | 0,049 | 0,60 | -0,022 | -0,25 |
| Secondary school (first cycle) | -0,026 | -0,52 | 0,025 | 0,37 | -0,106 | -1,51 |
| High School diploma | -0,062 | -0,81 | -0,153 | -1,39 | 0,095 | 0,95 |
| Higher education | -0,154 | -2,13 | -0,088 | -0,87 | -0,091 | -0,90 |
| Social status | | | | | | |
| Farmer | -0,007 | -0,06 | 0,282 | 1,85 | -0,324 | -1,62 |
| Independent | 0,002 | 0,03 | 0,340 | 4,06 | 0,006 | 0,06 |
| Senior executive, professional | 0,127 | 1,75 | 0,175 | 1,70 | 0,076 | 0,76 |
| Junior executive | 0,159 | 2,95 | 0,097 | 1,27 | -0,029 | -0,38 |
| White collar employee | 0,040 | 0,70 | 0,023 | 0,29 | 0,218 | 2,85 |
| Blue collar worker | Ref. | | Ref. | | Ref. | |
| Household's income per year | | | | | | |
| Less than 100 000 francs | Ref. | | Ref. | | Ref. | |
| 100 000 to 135 000 francs | 0,091 | 1,65 | 0,035 | 0,45 | -0,018 | -0,22 |
| 135 000 to 175 000 francs | 0,150 | 2,59 | 0,055 | 0,69 | -0,060 | -0,73 |
| 175 000 to 240 000 francs | 0,238 | 3,86 | 0,021 | 0,24 | -0,040 | -0,47 |
| More than 240 000 francs | 0,274 | 3,97 | 0,019 | 0,19 | 0,203 | 2,19 |
| <i>Child's characteristics</i> | | | | | | |
| Female | 0,015 | 0,44 | -0,064 | -1,36 | 0,015 | 0,33 |
| Age | 0,138 | 5,49 | 0,268 | 7,22 | 0,133 | 3,63 |
| Age squared (10^{-2}) | -0,288 | -3,40 | -0,919 | -7,12 | -0,611 | -4,71 |
| Number of recipients | 2604 | | 600 | | 593 | |
| Number of observations | 5671 | | 5671 | | 5671 | |
| Residuals correlation (t-test) | | | 0,413 (14,95) | | 0,305 (10,59) 0,446 (14,07) | |
| Log vraisemblance | | | -7206,81 | | | |

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Note: Trivariate Probit model estimated by ML method using the GHK simulator.

Table 9. Econometric analysis of reward/sanction for school results through television

| Variables | All parents | | Couples | |
|---|-------------|------------|---------|------------|
| | coef. | t-test | coef. | t-test |
| Constant 1 | 2,267 | 5,36 | 2,563 | 5,81 |
| Constant 2 | 1,044 | 2,47 | 1,323 | 3,01 |
| Marital status | | | | |
| Single | -0,059 | -0,79 | | |
| Married | Ref. | | Ref. | |
| Widowed | -0,290 | -1,93 | | |
| Divorced | -0,076 | -1,03 | | |
| Age ⁽²⁾ | 0,043 | 2,16 | 0,052 | 2,51 |
| Age squared (10 ^{e-2}) ⁽²⁾ | -0,081 | -3,58 | -0,091 | -3,87 |
| Number of children | | | | |
| 1 | Ref. | | Ref. | |
| 2 | 0,123 | 2,31 | 0,132 | 2,27 |
| 3 | 0,336 | 5,60 | 0,327 | 4,97 |
| 4 and over | 0,450 | 6,15 | 0,439 | 5,36 |
| Schooling ⁽²⁾ | | | | |
| No qualification | Ref. | | Ref. | |
| Complete primary school | -0,032 | -0,47 | -0,013 | -0,18 |
| Secondary school (first cycle) | -0,079 | -1,46 | -0,106 | -1,86 |
| High School diploma | -0,124 | -1,49 | -0,120 | -1,38 |
| Higher education | -0,228 | -2,80 | -0,249 | -2,87 |
| Social status ⁽²⁾ | | | | |
| Farmer | -0,222 | -1,66 | -0,174 | -1,29 |
| Independent | -0,109 | -1,43 | -0,123 | -1,57 |
| Senior executive, professional | -0,061 | -0,73 | -0,119 | -1,35 |
| Junior executive | -0,029 | -0,50 | -0,057 | -0,94 |
| White collar employee | 0,018 | 0,29 | 0,076 | 1,08 |
| Blue collar worker | Ref. | | Ref. | |
| Active mother | | | 0,019 | 2,32 |
| Household's income per year | | | | |
| Less than 100 000 francs | Ref. | | Ref. | |
| 100 000 to 135 000 francs | 0,040 | 0,67 | 0,069 | 1,04 |
| 135 000 to 175 000 francs | 0,176 | 2,87 | 0,238 | 3,46 |
| 175 000 to 240 000 francs | 0,100 | 1,51 | 0,178 | 2,40 |
| Over 240 000 francs | 0,087 | 1,13 | 0,181 | 2,12 |
| Parents concerned - often | | 189 | | 171 |
| Parents concerned - sometimes | | 1168 | | 1064 |
| Number of observations | | 4802 | | 4265 |
| Chi ² (d.f.) | | 216.8 (21) | | 211.0 (19) |
| Log vraisemblance | | -3,298.4 | | -2,957.7 |

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Note: Ordered Probit model