The economic consequences of mutual help in extended families

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Abstract

In the absence of well-developed markets for credit and insurance, extended families play a major role as a traditional systems of mutual help. However these arrangements also involve important inefficiencies. As stressed by Kennedy (1988) and Platteau (1991), the taxation implicit in family transfers has large disincentive effects, in particular on effort and investment. In this paper, we use first hand data from Western Cameroon to explore this question. We find that the large majority of transfers follow a given pattern whereby elder siblings support their younger siblings in the early stages of their lives who in turn reciprocate by supporting their elder siblings when they have children. We interpret this pattern as a generalized system of informal credit within the extended family. We then explore the implications of this pattern on labour market outcomes and find evidence for strong negative effects. Moreover this pattern implies that younger siblings tend to be net donors at the time at which their own children are growing up which has consequences for fertility and education outcomes. As expected, we find that younger siblings have fewer children who also tend to be less educated.

JEL classification numbers: O1, O17, D13

1 Introduction

In the absence of well-developed markets for credit and insurance, interpersonal transfers for risk-sharing, informal credit and redistributive purposes are of primary importance (Cox and Fafchamps, 2007, Barr et. al., 2008). In sub-saharan Africa traditional systems of mutual help operate mostly within the extended family network. Families provide an appropriate framework to enforce such informal agreements (Coate and Ravaillon, 1993) and promote collective action (Carter and Castillo, 2002). In addition, altruistic preferences between siblings facilitate these solidarity arrangements (Alesina and Guiliano, 2010).

Despite their positive role, these arrangements also involve important inefficiencies. As stressed by Kennedy (1988) and Platteau (1991), the taxation implicit in the redistributive system implies large disincentive effects, in particular on effort and investment (see also Lewis, 1955). As theoretically argued by Alger and Weibull (2010), even when these arrangements are solely motivated by altruism, moral hazard remains pervasive. A recent empirical literature investigates this issue and show that individuals develop sophisticated and costly strategies in order to hide income and avoid their obligations (Baland et al., 2011, Dupas and Robinson 2011, Jakiela and Ozier, 2012).[1]

Some authors have also highlighted the consequences of family taxation on educational outcomes and expenditure patterns (DiFalco and Bulte, 2011, 2012) and the structure of family firms (Alby and Auriol, 2010). A major shortcoming of this literature is that actual transfers are used to measure potential redistributive pressure. This leads to severe endogeneity biases, in particular because these estimations ignore the potential for reverse causality and the real effects of avoidance strategies. An interesting experiment avoiding these limitations has been run among the tailors' community in Burkina Faso. By varying the channel through which these tailors are informed about a new work opportunity, Hadnes et al. (2013) show that expected family obligations reduce entrepreneurial activity and productivity (see also Grimm et al, 2013).

In this paper we use first hand data from Western Cameroon to investigate the determinants of realized transfers and identify exogenous measures of potential pressures. We find that the large

[1] As reported by one of our respondents, "Here we hide money a lot. I hide money from my brothers and my husband. When they know I have money, they come with new demands".

majority of transfers are directed towards the direct siblings and their children. As the demand for transfers originates from younger siblings and the children of elder siblings, transfers are distributed asymmetrically across the extended family. More precisely, elder siblings give help to their younger siblings who reciprocate at a later stage by supporting them when they have children. We interpret this pattern as a generalized system of reciprocal credit within extended families.

We then explore the implications of this pattern for employment choices as well as for fertility and education outcomes. Our measure of family pressure takes into account the asymmetrical nature of obligations within the extended family and relies on a non-trivial combination of birth order and family size. We show that family pressures have strong and systematic effects on these outcomes. In particular, we highlight the existence of moral hazard problems in labour decisions. Potential recipients of family support reduce their labor participation and their working time. For instance, the presence of an older sibling reduces the propensity to work of a younger sibling by 7 percentage points, his working time by 6.4 percent and his total income by 23 percent. The children of these older siblings partially outweigh these effects, which is consistent with the temporal structure of the transfers. Additionnally, as this structure favor younger siblings and the children of elder siblings, we further show that these individuals are systematically more educated. Since younger siblings have to reciprocate at the time they have children themselves, they also tend to have less children.

2 Survey and data

We collected first hand data in the city of Bafoussam, the capital of the West region of Cameroon. The population is essentially from the Bamileke ethnic group. This group is well known for its economic dynamism and dominates the economic life of the country controlling more than half of the registered firms (while accounting for a third of the total population) (INS, 2008, Warnier, 1993, Yana, 1997,). Bamileke distinguish themselves as entrepreneurs who encourage individual success and accumulation. They are also significantly more educated than the rest of the population. The nuclear family constitutes their basic social unit, although strong social and economic ties link

members of the same extended family (Yana, 1997).

We selected a random sample of 315 households and administered 548 individual questionnaires separately to each spouse (in the absence of the other spouse).[2] The questionnaire included a complete description of the extended family of the respondent over three generations: the parents and their siblings, the respondent's siblings and their children. This exhaustive listing was used to elicit in a systematic way all transfers between the respondent and his extended family. More precisely, we collected information on all transfers made over the past two months as well as on educational transfers (in numbers of years of school fee paid) over the life time of the respondent. We also collected detailed information on income generating activities and saving strategies.

As shown in Table 12, individuals in our sample have on average 3.4 full siblings and 7.7 nephews. Adding parents, half siblings and their children, the average enlarged family size is 17.5. Respondents are well educated, with an average of 8.0 years of education. Most of them are of working age (90% are above 25) and 76% have an income generating activity. Thirty-one percent of them have a regular wage income and 63% an independent activity. They work an average of 34.4 hours per week, earning an average of 32 260 CFA (46 euros) per week, half of which originate from independent occupations.

As commonly observed in the African context, budgets are separate between spouses (Goldstein, 1999, Duflo and Udry, 2004). Allocation decisions are largely an individual matter and spouses ignore each others income and expenditure. For example, in cross-reporting their spouse income, 35% of respondents do not know its amount while 38% over or underestimate it by more than 30%. Joint ownership of assets is rare, for example only 4% of bank accounts and 7% of houses are jointly owned.

[2]In the analysis, we exclude 25 individuals who do not have direct siblings.

3 The pattern of transfers within the extended family

The vast majority of our respondents make transfers. Over the past two months, 60% of them sent a least one transfer outside their households and 30% received at least one. The amounts involved are relatively large as the total transfers sent out represent 20% of their income. Our respondents are largely net donors as the net amounts transferred account for 10% of their income.

Several factors can explain that net transfers are positive in our sample. Despite the care taken in collecting the information, it is possible that respondent under-report the amounts received as recall biases are classically more important for amounts received than for amounts given. More importantly, the positive net outflow can be explained by the urban nature of our sample. Many of our respondents are born in the countryside and migrated to the city. Their probable higher socio-economic status makes them more likely to be net donors. Finally, by restricting our attention to household heads and their spouses, we exclude dependent elderly and younger adults benefitting from education transfers.

In this paper, we essentially focus on intra-family transfers made between direct siblings (and their children).[3] Four reasons justify this particular focus. First they represent the large majority of transfers. For instance, in net amounts, they account for 75% of all transfers made by the respondent. In contrast, transfers to the older generation are relatively small and those to half siblings are essentially negligible. The spouse family plays a minor role as it represents only 6% of the amounts transferred out by our respondents.[4] Second the intrinsic symmetry of the relationships within the same generation enables us on the basis of a cross-section to characterize the structure of the transfers. Third, while almost all respondents (95%) have full siblings alive, only 32% still have both parents alive and 47% have half siblings. Fourth, while our questionnaire included a systematic listing of all flows between siblings by enumerating each sibling separately, transfers to more distant relatives were elicited in a more traditional but less reliable manner.[5] Finally, where appropriate, we also tested the robustness of our analysis by extending our definition of transfers

[3] We therefore exclude respondents who do not report siblings alive.

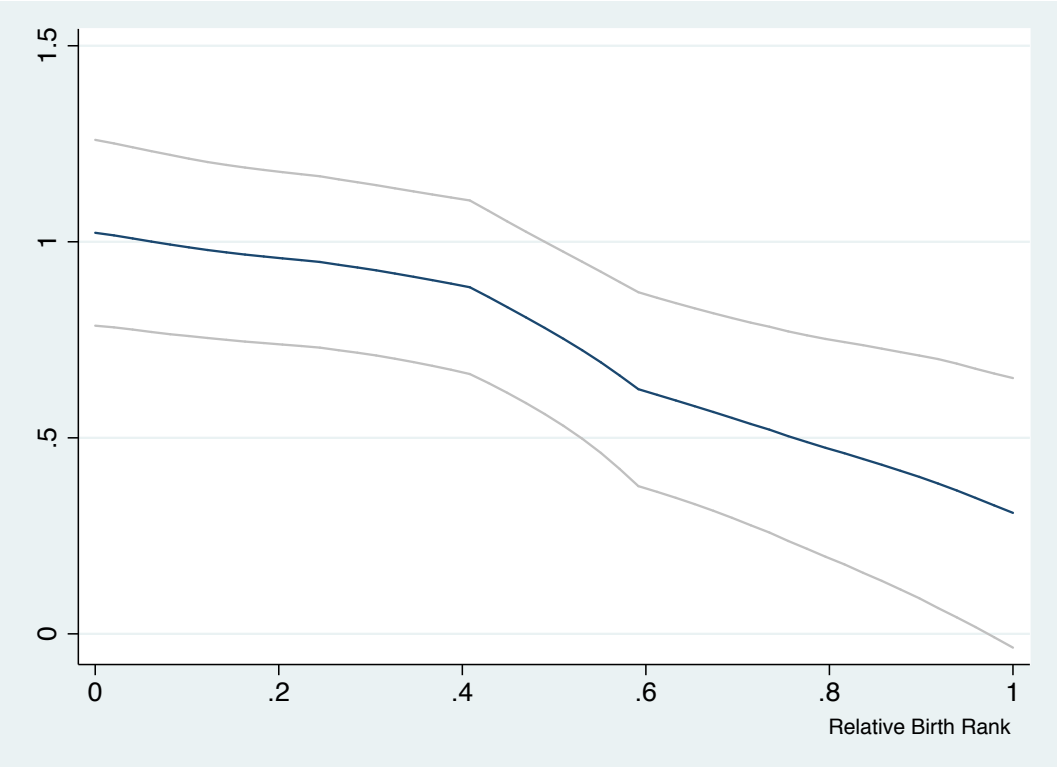
[4] This is consistent with the logic of separate budgets.

[5] Specifically, for the latter, the respondent was invited to list the transfers made over the last two months, along with the identity of the relevant person.

to include all the transfers reported by the respondent.[6]

To investigate intra-family transfers, birth-order clearly provides an exogenous source of variation. Figure 1 below presents the net transfers (in log) as a function of relative birth rank.[7] Transfers are weakly decreasing in birth rank, even though the difference between an eldest and a youngest sibling is hardly significant.

Figure 1: Net transfers as a function of relative birth rank with the 90% confidence interval (kernel regression)



A clearer pattern however emerges when we break down transfers by type of siblings and nephews. In Table 1, we report the average amount transferred by the respondent to different categories of relatives. The vast majority of transfers are made to younger siblings and the children

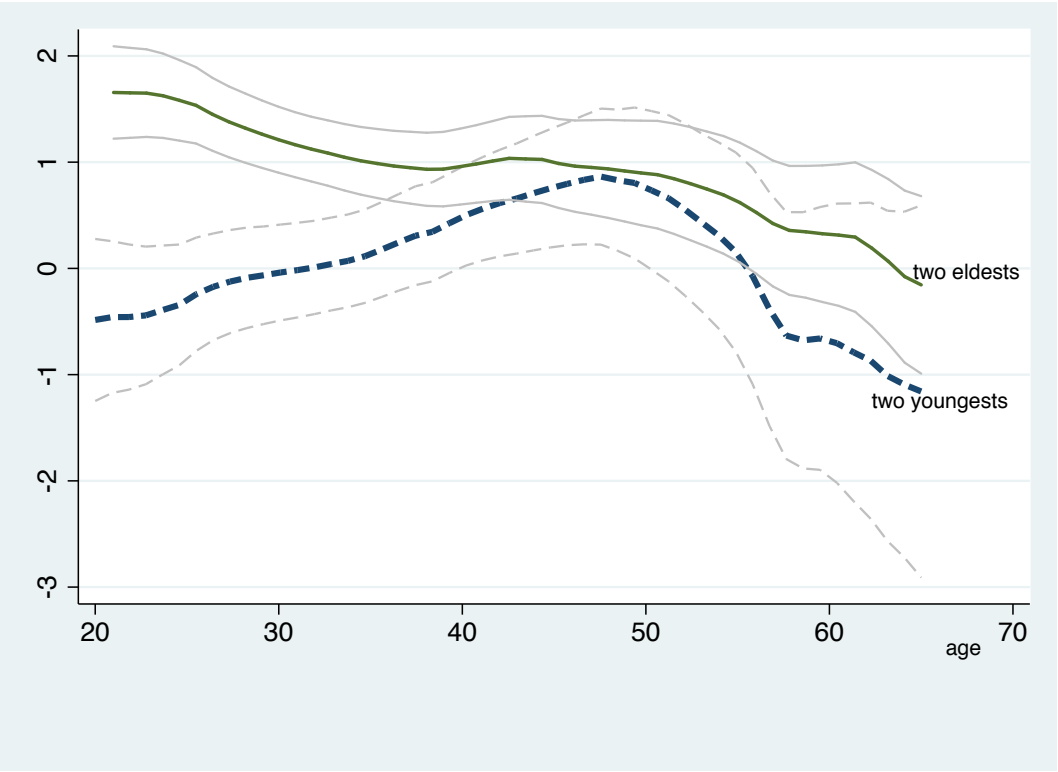
[6]Note however that the analysis of extra-family transfers is subject to severe endogeneity biases in particular because the size of the network is now a decision variable.

[7]Our measure of relative birth rank is equal to $\frac{R-1}{n-1}$ where R is the absolute birth rank and $n > 1$ is the number of siblings. This measure takes value 0 for the eldest and 1 for the youngest sibling.

of elder siblings. On average respondents transfer three times more to younger siblings than to older siblings (16.9 versus 4.9) and four times more to the children of older siblings than to the children of younger ones (8.5 versus 1.9). The net transfers follow a similar pattern. Overall transfers to younger siblings and the children of older siblings represent 95% of the net amounts transferred. As a consequence, the pattern of transfers evolves over the life cycle of the family. More specifically, when young, older siblings transfer to younger siblings. Later, the flow of transfers is reversed and younger siblings transfer to their older siblings and their children. Figure 2 and 3 isolate the two eldest and the two youngest siblings respectively and plot the net transfers they made to their siblings (and their children) as a function of age (using a kernel smoothing function). Depending on birth order, transfers follow strikingly different patterns during one's life. Between 20 and 50, eldest siblings tend to transfer less, while younger siblings transfer more with age. Beyond 50, transfers are decreasing with age for all respondents.

Figure 2 also indicates that, over their lifecyle, elder siblings tend to transfer net positive amount while the direct transfers of younger siblings never fully compensate the amounts they received earlier. In our sample, the two eldest siblings transfered on average 24.3 thousands of CFA over the past two months which is substantially larger than the net amount of 15.3 thousands of CFA transfered on average by the two youngest (recall that our respondents are on average net donors). We suspect however that over the lifecycle these transfers are balanced as older are more likely to have received support from the previous generation. We do not have complete information about historical monetary flows, but as detailed below, we have the full historical record of school years paid by the extended family. Again comparing the two eldest and the two youngest siblings, it turns out that an elder sibling receives 1.6 more years of education paid by the previous generation. In turn, he finances 2.1 years of education for his two youngest siblings who then pay a total of 0.8 years of education of his children. Overall these transfers therefore appear roughly balanced over the entire lifecycle.

Figure 2: Net transfers by age for respondents among the two eldests or two youngests in their family with 90% confidence intervals (kernel regression)



4 The determinants of transfers

We now provide an econometric analysis of intra-family transfers. This analysis may be carried out at different levels. First we explore the transfers taking place between a respondent and a particular sibling. We thus generate for each respondent as many observations as the number of siblings he has, which provides us with a total of 2181 observations. By comparing a respondent with each of his siblings, we are able to isolate the effects of individual variations in birth order and number of children using an extended family fixed effect. The latter controls for all the unvarying extended family characteristics, such as the characteristics of the parents and the respondent as well as the

number and the average characteristics of his siblings (age, gender, education, income,...). The variables used are described in detail in Tables 12 to 14.

The main variables of interest are whether the sibling is older or younger than the respondent, the number of the sibling's children and the number of the respondent's children. To allow the effect of these children to differ according to birth order, we interact the children variable with the sibling's and the respondent's relative positions. As a result, our baseline specification uses four variables related to one's position in the family: whether the sibling is younger than the respondent (younger sib), his number of children if he is younger (kids younger sib) or older (kids older sib) and the respondent's number of children if the sibling is younger (kids * younger sib). This last variable allows the effect of a respondent's children to depend on his relative position in the family and thereby to mirror the asymmetric pattern of transfers towards nephews. Note that the respondent's number of children is absorbed by the extended family fixed effect. We also provide estimates using an alternative measure of one's position in the family, as defined by the relative birth rank. The corresponding specification includes the sibling's number of children (kids sib), the difference in relative birth rank between the sibling and the respondent (diff RBR), its interaction with the sibling's number of children (kids sib * diff RBR) and with the respondent's number of children (kids * diff RBR).[8]

In addition to these family variables, we control for three characteristics of the sibling: his age, his gender and whether he is the successor of his father. Regarding age, once we control for birth order and include family fixed effects, a sibling's birth rank and his age are highly collinear. We therefore use age categories instead of age to control for the effect of life cycle. Specifically, we define four sibling's age intervals (less than 35, 35-45, 45-55 and more than 55) . The variable sib sex controls for the sibling's gender. Finally, in this region, one of the son, usually the eldest, is designated as the "héritier" of his father. This son is then traditionally in charge of family affairs and receives a larger share of inheritance, particularly in rural areas. The variable successor represents

[8]Given the extended family fixed effect, we can equivalently use diff RBR or simply the sibling's relative birth rank. The difference between these two variables matters when analyzing the role of sibling's children. This role depends on the sibling's position relative to the respondent, which a simple interaction between kids sib and relative birth rank would fail to capture because what matters is the relative position of the sibling with respect to the respondent. This is what the interaction with diff RBR captures (this interaction is not absorbed by the fixed effect).

this particular status.[9]

Table 2 presents the analysis of all pairwise transfers made by the respondent towards each of his siblings and their children. Columns 1 and 2 correspond to linear regressions of the propensity to have made or received at least one such transfer over the past two months. Columns 3 and 4 correspond to linear regressions of the total amounts given to and received from that sibling over the same period. Column 5 reports the results of a linear regression of the net amount transferred. Columns 6 replicates the same analysis using relative birth ranks. Column 7 and 8 reproduce the results of columns 5 and 6 by using a proxy for fertility. More specifically, as fertility may depend on the structure of the transfers, the use of the actual number of children may yield biased estimates. To address this concern, we replace the number of children in the interaction terms with an indicator of age which takes value one if the individual is older than 35 (m35).[10] This variable is strongly correlated with the number of children with a correlation coefficient equal to 0.54. This specification is presented as a robustness check throughout the paper.[11] All amounts are converted in log.

The results are striking and follow the pattern highlighted above. Respondents are more likely to give to (and less likely to receive from) their younger siblings. The amounts involved are also larger. The impact of a nephew on net transfers is critically dependent on the position of his parent. Transfers are larger if the parent is an older sibling but not if she is a younger sibling. A mirror pattern also holds for the children of the respondent since they increase transfers provided the respondent is older than his sibling. The analysis of net transfers in column (5) summarizes this pattern. The net beneficiaries of intra-family transfers are older siblings with children and younger siblings as long as their older siblings do not have children. The net contributors are older siblings without children and younger siblings with older nephews. The pattern is identical in the alternative specifications based on relative birth ranks and the proxy for fertility. Finally, while

[9] We also run the same analysis excluding respondents who are designated successeurs with no change in the results.

[10] Given that we independently control for age categories, we cannot introduce simultaneously younger sib * m35 and older sib * m35. We drop the former and the latter then captures the additional effect of being more than 35 if the sibling is older than the respondent.

[11] We choose not to conduct instrument variable estimations as the exclusion condition is likely to be violated. Eventhough we typically control for the average age of siblings, we cannot exclude that the structure of transfers would be systematically different for individuals older than 40.

men give on average more transfers, the structure of transfer is identical across gender : separate regressions by gender of the respondent yield very similar results (results not reported).

We then replicate this analysis using a measure of historical transfers. To this end, we collected information over the payment of all educational expenses among siblings (and their children) in the past. To avoid recall biases, this information was recorded in number of years during which those transfers took place. While this measure does not capture the full amount of transfers made over one lifetime, they represent a significant part of total transfers (36% of the amounts transfered by our respondents are reportedly for education purposes). Fifty-eight percent of our respondents have financed at least one year of education for one of their siblings (or nephew) and 9% have received such a transfer. When doing so, our respondents paid an average of 9.1 years of education while direct siblings paid for 8.5 years to our respondents.[12] Table 3 reproduces the specifications adopted in Table 2 on historical transfers. We again find a strong effect of family structure. Columns (3) and (4) show that younger siblings and older siblings with children are again the net beneficiaries of these past transfers.

Third, we also aggregated the current transfers made to each sibling into a measure of the total transfers made by the respondent to his siblings and their children.

We follow the main specification adopted in Table 2 by summing over all siblings of the respondent. For instance the number of younger siblings corresponds to the sum of younger dummies used in the former specification.[13] Table 4 reports the results. In columns (1) to (6) we leave out the interactions between a respondent's own children and the number of older and younger siblings as these variables are very correlated with the number of nephews from younger or older siblings. Column (8) and (9) reveal that these interactions have no significant effects on net transfers. In column (7), we use an alternative definition of net transfers by including all transfers (made to parents, half siblings and other individuals). One possible worry is that inter-sibling transfers may compensate for transfers made to other members of the family in particular elderly parents. We

[12] An important source of education financing comes from uncles and aunts who participated in the education of 14% of our respondents. When doing so, they paid on average 6 years of education.

[13] We do not report a specification in terms of relative birth rank because the interaction between the difference in birth ranks and the siblings' number of children has no corresponding measure at the respondent level. In the following sections we use specifications using relative birth rank when our prediction does not depend on the position of nephews (namely Tables 10 and 11).

already know that transfers between siblings account for the bulk of transfers. We verify here that the identified patterns holds when we include all other transfers. We control for a set of individual and household characteristics, such as gender, age, education, income, number of children. We also control for the spouse income and the spouse family size.

Again, respondents transfer larger net amounts to younger than to older siblings. The effect of nephews is again asymmetrical: children of older siblings increase the amounts transferred while those of younger ones have the opposite effect. One more result is worth emphasizing. The respondent's income has a significant effect both on the propensity to give and on the amount given. This last result suggests that transfers also play a redistribute role within families, as richer individuals tend to transfer more to their siblings.[14] It is interesting to note however that the estimated coefficients imply that transfers are more sensitive to family structure. For instance, column (5) indicates that the overall impact of switching one's position from the youngest to the oldest sibling amounts to a 88% increase in transfers.[15] In comparison, a doubling of income results in a 36% average increase in transfers.

To sum up, younger siblings tend to receive help from their elder siblings and reciprocate by supporting these siblings when they have children. One can interpret the structure of these transfers as a general system of reciprocal credit within the extended family. The norm of family obligations defines the temporal structure of the transfers as a function of birth order. Overall this norm appears to partially balance transfers across siblings. In the absence of commitment problems, this system allows families to overcome credit constraints to finance, for instance, education and can be conceived as second best optimal. Commitment issues may prevail however, as there are no direct incentives for younger siblings to reimburse the amounts received earlier.[16] Moreover, we expect these family obligations to be vulnerable to moral hazard problems. As we show in the next section,

[14]Relatedly we asked respondents to classify their siblings as being richer, or poorer than themselves. A large majority of transfers are directed towards poorer siblings: 74% of siblings receiving a transfer are declared to be poorer than the respondent, while 69% of the siblings who sent a transfer to the respondent are declared richer.

[15]To compute this figure we sum the effects attached to siblings and nephews by multiplying the corresponding coefficients to the average number of siblings and nephews in our sample.

[16]This system can constitute a norm supported by an intergenerational equilibrium in which parents care about the long term welfare of their children. The latter follow the pattern of family obligations as long as their parents do and do not make any transfer otherwise. Thus younger parents choose to fullfill their obligations toward their elder siblings since they expect their children to replicate this welfare improving arrangement.

younger siblings tend to decrease work efforts and to save less when they expect support from their elder siblings.

5 Occupation and income

We now turn to the impact of family obligations on current labour decisions. To investigate this question we assume that expected transfer benefits and obligations are proportional to the actual transfers and therefore can be captured by the family structure. As shown above, birth order and the number of nephews determine whether a respondent is a net donor or recipient. Consider first the situation of a net recipient. Positive transfers reduce his incentives to work as they provide a source of income, which is independent of labor efforts. In addition, he also has incentive to appear poor to attract more transfers. These two effects go in the same direction of lowering labor efforts. In contrast the situation of a net donor is more complex. These transfers can first be understood as a tax on income for which the income and substitution effects go in opposite direction. The net effect on total effort and gross income is usually positive. Additionally the donor may also be tempted to strategically reduce his effort and income to discourage potential demands for transfers. The overall effect for net donors is therefore less clear. Our analysis of transfers identified the receivers and donors as a function of birth order and their children. In the following we therefore use the same specification to analyze labor market participation, working time and income. It is worth noting that an alternative mechanism relating birth order to occupational outcomes is based on the idea that larger family networks provide more social capital. In this respect, we would expect younger siblings to be favored since their older siblings provide more social capital and access to networks. Our results below clearly do not support this hypothesis, as moral hazard effects appear to dominate the effect of social capital.

We first examine labour market participation of respondents and their siblings, defined as whether the individual is engaged in an income earning activity. We also distinguish between regular wage employment and independent occupations. Independent activities include self-employment

activities as well as occasional occupations. We expect incentive effects to be more pronounced for these activities, for which the individual has more control over his own level of effort. The first set of results is based on the sample of respondents and their siblings above 18 (to exclude school age siblings). The main specification in Table 5 follows the analysis of transfers at the respondent level (Table 4) and include extended family fixed effects. As the total number of siblings and nephews is absorbed by the fixed effect, we only report coefficients for the number of older siblings and the number of their children. These coefficients therefore measure the differential effect of having one more older sibling (or one of his children) rather than one younger sibling (or one of his children). We also include the number of own children and its interaction with the number of younger siblings (the other interaction being absorbed by the fixed effect). Additional controls include education, gender and age categories. Column (1) to (3) correspond to the full sample of respondents and their siblings while columns (4) and (5) split the sample between men and women. The last three columns present the alternative specification using *more than 35* as a proxy for fertility. All the results are based on a linear probability model.

Extended family structure plays an important role in determining labour market outcomes. As expected, the number of elder siblings reduces the propensity to work, particularly with respect to independent activities. The estimates reported in Column (1) suggest for example that being the youngest in a family of 4 decreases the propensity to work by 39% and to engage in independent occupation by 29% compared to the eldest. The number of children of elder siblings partly counteract these effects since younger siblings are then more likely to be net donors. These results are very similar across gender and are robust to the use of the fertility proxy. The mirror effect of own children is not precisely estimated.

At the respondent level, we collected more detailed information about labour market outcome, such as working time (using a weekly time sheet by activity) and income. In Table 6 we analyze the determinants of labour market participation and working time decisions. In the absence of a family fixed effect, we use the same specification as the one used for the analysis of transfers at the respondent level (Table 4). Columns (1), (2) and (6) present the results of a linear probability model of the decision to work. Columns (3), (4), (5) and (7) report marginal effects of tobit regressions

on the total weekly working time, and the time by occupation.[17] The results are strikingly similar to those obtained above. The number of older siblings reduce both the employment decision and the total working time, particularly at the level of independent activities. For instance, moving up by one unit in absolute birth rank (i.e. having one more elder and one less younger sibling) reduces working time by 2.18 hours per week, which corresponds to 6.4 % of total working time. Children of older siblings countervail these effects: the negative effect of an elder sibling is fully compensated when the latter has more than three children (which occurs for 37% of elder siblings in our sample). The specifications using the fertility proxy or the mirror effect of own children do not provide very precise estimates.

In Table 7 we analyze, at the respondent level, labour income and the propensity to save, using the same specifications. Columns (1) to (5) report the marginal effects of tobit regressions on total income and income by occupation (in log). Column (6) to (8) present marginal effect of a quasi-likelihood estimation of the share of expenditure allocated to savings (controlling for total income).[18] We again find that net recipients of the family transfers save and earn less, particularly in independent activities. The effects are important, as the presence of an older siblings reduces earned income by 23% (column (1)) and it takes 4.5 of his children to compensate this effect. The pattern is identical for the propensity to save, an additional older brother reduces the share of savings by 2.2 percentage points and the effect disappears when he has four children. The fertility proxy estimates reflect the same pattern. We interpret this finding as reflecting the precautionary nature of savings: savings are less necessary when one can expect support from his siblings. This last result is at odd with Di Falco and Bulte (2012) who find an overall negative correlation between savings and family pressure. Our result highlights the importance of identifying donors and receivers in a given network given the asymmetry in their behavior.

[17] In the absence of adequate instruments, we could not carry out a Heckman procedure for these labour decisions. We therefore assume that the determinants of these decisions are identical at the extensive and the intensive margin.

[18] Specifically, we use the method proposed by Papke and Wooldridge (1996) to handle fractionnal dependent variables with zeros and ones.

6 Education and fertility

The timing of inter-sibling transfers tends to favor some of their children as the net income available to their parents varies across the lifecycle. Children of older siblings are more likely to receive support from their parents' families, whereas the children of the younger siblings are at a disadvantage. Even if their parents received a large support from their siblings, these transfers occur early in the life of their parents. It is precisely at the time where these children are growing up that their parents have to reciprocate and support the children of their older siblings. As a result, the number of children and their level of education should be influenced by parental birth ranks.

With respect to the education of siblings, we expect younger siblings to be more educated, since they are initially supported by their elder siblings (in the absence of other compensatory mechanisms in favor of the elder). Regarding the education of their children, we can decompose the effect of transfers into an income and a price effect. First, at the time they have children, younger siblings tend to be poorer as they have to transfer income to their older siblings' families. Second, since a large part of these transfers cover educational expenditure, they also decrease the cost of schooling for children of older siblings. Children of older siblings should therefore be more educated than those of younger siblings.

To test these implications, we use two different samples, one consisting of the respondent and his siblings (above 18) and the other of the children (above 18) of the respondents. We focus on two measures of education, the number of years completed and a categorical variable defined over four levels of education: primary, junior high, senior high school and post-secondary education. The categorical variable allows us to account for the non-linear nature of the schooling process as dropping-out is more likely at the end of each education cycle. Table 8 reports the break-down of the sample of respondents and their siblings (above 18) in each of these categories, distinguishing between parents of low (<0.5) and high relative birth ranks. Mothers of lower birth ranks have more educated children. The effect of father birth rank is relatively weaker. Note that parental birth ranks are completely uncorrelated ($\rho = -0.003$), suggesting no matching in birth order in marriage decisions. This allows us to investigate the role of father and mother birth ranks separately when

analyzing joint decisions such as education and fertility.

Table 9 examines the education levels of the respondents and their siblings. Column (1) includes extended family fixed effects and confirms that younger siblings are significantly more educated. Compared to the eldest, the youngest has on average 0.49 years of additional education. In order to investigate the impact of parental birth ranks, we drop the extended family fixed effect in columns (2) to (5), as the characteristics of the parents are invariant across siblings. Controlling for other parental and individual characteristics, mothers of lower birth rank have significantly more educated children. Father birth ranks turn out to be insignificant. Column (3) suggests for example that compared to an eldest mother, having a youngest mother decreases the number of years of education by 0.85. Column (4) reports the raw coefficients and column (5) the marginal effects of having a post secondary education level (compared to a lower level) from an ordered probit model using the categorical variable defined above. Again the maternal birth rank has a significant impact on her children's education.

In table 10 we repeat the analysis at the level of the respondents' children. Since we focus on children above 18 for whom both parents have been surveyed (so that we have complete information about parental characteristics), this final sample has only 151 observations. In addition to the control variables introduced in the above analysis, we also control for parents' incomes and age categories (given the definition of the sample, we have very few young parents and therefore define unique categories for fathers below 55 and for mothers below 45). Columns (1) and (2) correspond to linear regressions for the number of school years completed, columns (3) and (5) report ordered probit coefficients and columns (4) and (6) the marginal effects for post-secondary education level. Again mother birth order has a significant impact on children education. Thus the child of a youngest mother receives on average 2.7 less years of education (column (2)) than the the child of an eldest mother. Correspondingly, the child of a youngest mother has a 0.4 lower probability of reaching post-secondary education than the child of an oldest mother (column (6)). This effect is much larger than for the previous generation analyzed above. This is to be expected since education level increased substantially across generations, allowing for more variation in education outcomes

across children.[19] Father's birth order is signifinant in the specifications including the number of older and younger siblings (columns (1) and (3)), but not when using relative birth rank. The effect of mother's birth rank is more consistent across samples and specifications, which is surprising given the absence of gender differences in transfer behaviors and their implications.

The educational advantage of younger siblings is in line with Tenikue and Verheyden (2012) study of education levels in Cameroon. Their mechanism rely on the fact that the time at which eldest children enter secondary school corresponds to the time that family resource constraints are tightest. While this other mechanism may explain part of the effect of own birth rank, it cannot account for the effect of parental birth rank. Closely related to our analysis, Di Falco and Bulte (2012) investigate the relationship between the size of the family network and educational outcomes and find a strong negative correlation. In contrast with our approach, the size of the network is imperfectly measured as the number of relatives who stayed significantly in the household over the last month. As argued above, this provides at best a partial measure of the transfers made within the extended family.[20]

We find above that the quality (education) of children of younger siblings is lower as they receive relatively less support from the extended family. The question remains as to whether younger siblings also adjust their number of children accordingly. We now investigate fertility decisions on the sample of respondents and their siblings. Table 11 below reports the results obtained from a regression of total number of children on parental characteristics using extended family fixed effects. Column (1) and column (4) take the whole sample of respondent and their siblings using our two definitions of birth rank. Column (2) and (5) report separate results for men and column (3) and (6) for women. The last two columns restrict the sample to those above 45 who have therefore completed their fertility. The effect of birth rank is particularly strong. For instance, column (8) indicates that the youngest sibling has on average 1.4 less children than his eldest sibling. In contrast to the results obtained on education, the effect of birth rank on fertility behavior is remarkably similar for mothers and fathers. This effect does not seem to arise from delayed marriage for younger siblings

[19] Thus parents of the respondents have on average 5.2 years of education, respondents and their siblings 8.9 and the respondents' children (above 18) 11.9.

[20] Moreover the causality between transfers and education is not well established as respondent may choose to invite members of their network to stay in the household at the expense of their own children.

as there is no correlation between birth rank and the age at marriage of our respondents (we do not have the age at marriage for the siblings).[21]

Taken together, our results on education and fertility show that younger siblings are more educated and have fewer children, but the latter tend to be less educated. The combination of these results goes against the conventional quality-quantity trade-off but is consistent with the structure of family transfers described in the earlier section.

7 Conclusion

In this paper, we investigate the pattern of informal transfers taking place within extended families in Cameroon. We show that most of these transfers follow a well-defined sequence, whereby elder siblings finance their younger siblings who reciprocate later when their older siblings have children. We interpret this structure as a system of reciprocal credit within the extended family that serve in part to finance children education, when credit constraints are binding. One's position in the extended family plays an important role in determining intra-family transfers. In comparison, the explanatory role of income, which would correspond to redistributive or risk pooling considerations, appears more limited.

We analyze the consequences of this particular transfer structure on labour market outcomes and find evidence of large disincentive effects: for instance, a unit increase in absolute birth rank (i.e one more elder sibling) reduces the propensity to work of a younger sibling by 7 percentage points, his working time by 6.4% and his income by about 23%. The children of these older siblings partially outweigh these effects, which reflects the temporal structure of the transfers. In the long term, this pattern of transfers implies that both younger siblings and the children of older siblings receive more education. Younger siblings also display a lower fertility, which is consistent with the fact that their fertility decisions are made at a time they are supposed to reciprocate towards their elder siblings.

[21] 99% of women in our sample complete their fertility before 45. Male respondents have children later but 85% of them had their last child before 45.

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Table 1: Average amounts transfered by category of relative (standard deviation in brackets)

	Transfers in	Transfers out	Transfers net	# individuals
Older siblings	5.7 (21.5)	4.9 (22.8)	-0.7 (29.9)	1.6
Older siblings' children	0.4 (3.4)	8.5 (66.7)	8.1 (66.8)	4.5
Younger siblings	4.5 (22.8)	16.9 (160.1)	12.4 (161.8)	2.6
Younger siblings' children	0.2 (2.0)	1.9 (8.5)	1.7 (8.8)	3.2

Table 2: Transfers pairwise (extended family fixed effect)

	(1) dummy out	(2) dummy in	(3) log out	(4) log in	(5) log net	(6) log net	(7) log net	(8) log net
younger sib	0.2534***	-0.1125***	0.4096***	-0.3009***	0.7375***		0.6342***	
	(4.40)	(-3.00)	(3.18)	(-3.12)	(4.28)		(5.85)	
kids younger sib	-0.0195**	0.0009	-0.0504**	-0.0051	-0.0468			
	(-2.06)	(0.15)	(-2.09)	(-0.31)	(-1.41)			
kids older sib	0.0238***	0.0020	0.0754***	-0.0063	0.0818**			
	(3.19)	(0.38)	(3.08)	(-0.38)	(2.52)			
m35 older sib							0.4044*	
							(1.96)	
kids * younger sib	-0.0212	0.0171**	-0.0136	0.0495**	-0.0691*			
	(-1.54)	(2.03)	(-0.44)	(2.16)	(-1.72)			
m35 * younger sib							-0.5572**	
							(-2.52)	
diff RBR						1.1099***		1.0676***
						(5.57)		(7.39)
kids sib						0.0173		
						(0.68)		
kids sib * diff RBR						-0.1653***		
						(-3.58)		
m35 sib * diff RBR								-0.9081***
								(-4.32)
kids * diff RBR						-0.0850*		
						(-1.94)		
m35 * diff RBR								-0.5594**
								(-2.55)
sex sib	0.0751***	-0.0062	0.1599***	-0.0069	0.1543**	0.1392*	0.1599**	0.1645**
	(3.66)	(-0.45)	(2.81)	(-0.17)	(2.07)	(1.88)	(2.15)	(2.25)
successeur sib	0.0117	0.0818**	0.0015	0.2333**	-0.2272	-0.2333	-0.2433	-0.2383
	(0.29)	(2.32)	(0.01)	(2.28)	(-1.45)	(-1.50)	(-1.55)	(-1.54)
<35 sib	-0.1729***	-0.0533	-0.3358*	-0.1378	-0.1846	-0.3452	0.1132	0.0123
	(-2.61)	(-0.89)	(-1.84)	(-0.87)	(-0.83)	(-1.22)	(0.43)	(0.04)
35-45 sib	-0.1454***	-0.0211	-0.3963**	-0.0268	-0.3878**	-0.4158*	-0.2543	-0.0874
	(-2.62)	(-0.38)	(-2.47)	(-0.19)	(-2.06)	(-1.82)	(-1.28)	(-0.35)
45-55 sib	-0.0724	-0.0252	-0.1953	-0.0009	-0.1943	-0.1716	-0.1619	-0.0168
	(-1.43)	(-0.53)	(-1.32)	(-0.01)	(-1.19)	(-0.96)	(-0.98)	(-0.09)
Constant	0.2400***	0.1624***	0.5882***	0.4316***	0.1503	0.0835	-0.0247	-0.2241
	(4.37)	(3.04)	(3.68)	(3.03)	(0.77)	(0.38)	(-0.10)	(-0.92)
Observations	2181	2181	2181	2181	2181	2181	2181	2181

t statistics in parentheses; Standard errors clustered at the respondent level; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Historic transfers between siblings (extended family fixed effect)

	(1)	(2)	(3)	(4)	(5)	(6)
	log out	log in	log net	log net	log net	log net
younger sib	0.2888***	-0.0153	0.2987***		0.2170***	
	(3.68)	(-0.45)	(3.47)		(4.88)	
kids younger sib	-0.0223	-0.0133	-0.0090			
	(-1.03)	(-1.26)	(-0.46)			
kids older sib	0.0536***	0.0026	0.0487***			
	(4.08)	(0.33)	(3.13)			
m35 older sib					0.1044	
					(0.96)	
kids * younger sib	-0.0005	0.0110	-0.0105			
	(-0.03)	(0.93)	(-0.44)			
m35 * younger sib					-0.1095	
					(-0.97)	
diff RBR				0.5549***		0.4334***
				(5.53)		(7.18)
kids sib				0.0270*		
				(1.84)		
kids sib * diff RBR				-0.0606**		
				(-2.52)		
m35 sib * diff RBR						-0.2489**
						(-2.41)
kids * diff RBR				-0.0262		
				(-1.03)		
m35 * diff RBR						-0.0540
						(-0.51)
sex sib	0.0563*	0.0031	0.0487	0.0405	0.0601*	0.0622*
	(1.77)	(0.24)	(1.44)	(1.21)	(1.78)	(1.85)
successeur sib	0.0626	0.0349	0.0289	0.0225	0.0254	0.0266
	(1.02)	(0.88)	(0.39)	(0.31)	(0.34)	(0.37)
<35 sib	0.1989*	-0.1384*	0.3151**	0.0836	0.3361**	0.0843
	(1.71)	(-1.78)	(2.29)	(0.57)	(2.07)	(0.52)
35-45 sib	0.1370	-0.1019	0.2177*	0.0801	0.2136*	0.1005
	(1.34)	(-1.49)	(1.83)	(0.64)	(1.70)	(0.75)
45-55 sib	0.2096**	-0.0262	0.2341**	0.1657	0.2216**	0.1708
	(2.18)	(-0.47)	(2.15)	(1.49)	(2.03)	(1.49)
Observations	2181	2181	2181	2181	2181	2181

t statistics in parentheses; Standard errors clustered at the respondent level;

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Transfers for full siblings at the respondent level

	(1) dummy out	(2) dummy in	(3) log out	(4) log in	(5) log net	(6) log net	(7) log total net	(8) log net	(9) log net
nb younger	0.0460***	-0.0326***	0.2175***	-0.1353***	0.3701***	0.3196***	0.2132***	0.4276***	0.3186***
	(3.70)	(-2.82)	(5.01)	(-3.11)	(5.74)	(5.05)	(2.90)	(3.78)	(5.01)
nb older	-0.0196	0.0435*	-0.0866	0.1559**	-0.2365*	-0.0263	-0.0861	-0.1701	-0.0295
	(-0.77)	(1.72)	(-0.91)	(2.13)	(-1.71)	(-0.22)	(-0.59)	(-1.07)	(-0.25)
tot kids younger	-0.0115*	0.0159**	-0.0629**	0.0614***	-0.1210***		-0.0805**	-0.1171***	
	(-1.67)	(2.45)	(-2.44)	(3.02)	(-3.31)		(-2.08)	(-2.96)	
nb younger m35						-0.2927*			-0.2832*
						(-1.96)			(-1.88)
tot kids of older	0.0137*	-0.0025	0.0648**	-0.0188	0.0921**		0.0783*	0.0988**	
	(1.81)	(-0.33)	(2.28)	(-0.86)	(2.29)		(1.85)	(2.41)	
nb older m35						0.0735			0.0475
						(0.49)			(0.28)
kids	-0.0057	0.0054	-0.0381	0.0176	-0.0286		0.0521	0.0332	
	(-0.55)	(0.51)	(-0.85)	(0.51)	(-0.50)		(0.82)	(0.37)	
kids * nb younger								-0.0158	
								(-0.62)	
kids * nb older								-0.0263	
								(-0.85)	
m35 * nb older									0.0652
									(0.37)
sex	0.0103	0.0713	0.1454	0.1372	0.1682	0.1078	-0.5032	0.1761	0.0972
	(0.18)	(1.24)	(0.73)	(0.74)	(0.49)	(0.33)	(-1.55)	(0.51)	(0.29)
successeur	0.0338	0.0691	0.3678	0.1494	0.2673	0.2088	0.1795	0.2853	0.2046
	(0.49)	(0.96)	(1.29)	(0.58)	(0.69)	(0.52)	(0.39)	(0.73)	(0.51)
education	0.0188***	-0.0090	0.0914***	-0.0174	0.0953***	0.1055***	0.0343	0.0951***	0.1042***
	(2.70)	(-1.44)	(3.68)	(-0.82)	(2.64)	(2.84)	(0.97)	(2.63)	(2.81)
log total income	0.0662***	-0.0021	0.3532***	0.0003	0.3575***	0.3685***	0.3134***	0.3594***	0.3687***
	(4.44)	(-0.14)	(6.46)	(0.01)	(4.02)	(4.12)	(3.02)	(4.03)	(4.12)
couple	-0.0261	0.0195	-0.1660	0.1174	-0.1699	-0.1984	-0.1218	-0.2038	-0.2029
	(-0.27)	(0.23)	(-0.48)	(0.46)	(-0.37)	(-0.42)	(-0.23)	(-0.44)	(-0.43)
log spouse income	0.0223	-0.0091	0.1332**	-0.0339	0.1937**	0.2077**	0.0871	0.1920**	0.2105**
	(1.42)	(-0.61)	(2.43)	(-0.67)	(2.02)	(2.20)	(0.87)	(1.99)	(2.21)
spouse family	0.0012	-0.0021	0.0017	-0.0070	0.0080	0.0084	0.0135	0.0090	0.0082
	(0.54)	(-1.04)	(0.23)	(-1.01)	(0.70)	(0.71)	(1.08)	(0.78)	(0.69)
<35	0.1878*	0.0653	0.7069	0.3165	-0.1336	-0.1290	1.4876**	-0.0689	-0.0538
	(1.69)	(0.66)	(1.42)	(0.92)	(-0.26)	(-0.24)	(2.21)	(-0.13)	(-0.10)
35-45	0.1596	0.0950	0.7765	0.4313	-0.0846	-0.1818	1.7896***	0.0121	-0.2025
	(1.61)	(1.09)	(1.58)	(1.26)	(-0.19)	(-0.38)	(2.69)	(0.03)	(-0.42)
45-55	0.0826	0.0528	0.7963	0.2548	0.1323	0.1298	1.9177***	0.1908	0.1125
	(0.83)	(0.63)	(1.46)	(0.73)	(0.28)	(0.27)	(3.15)	(0.40)	(0.24)
Observations	523	523	523	523	523	523	523	523	523

Marginal effects from tobit regressions in columns (3) to (9) ; t statistics in parentheses;
Standard errors clustered at the respondent level; $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Labour market participation of respondents and their siblings (extended family fixed effects)

	(1) Work	(2) Regular wage	(3) Independent	(4) Work men	(5) Work women	(6) Work	(7) Wage	(8) Independent
older	-0.1331***	-0.0359***	-0.0972***	-0.1297***	-0.1263***	-0.1105***	-0.0418***	-0.0687***
	(-8.79)	(-3.50)	(-7.27)	(-5.99)	(-5.09)	(-7.66)	(-4.86)	(-5.26)
tot kids of older	0.0312***	0.0101**	0.0211***	0.0273***	0.0374***			
	(5.40)	(2.15)	(3.61)	(3.07)	(3.84)			
nb older m35						0.0761***	0.0328	0.0434*
						(3.11)	(1.57)	(1.73)
kids	0.0417***	0.0157	0.0260*	0.0806***	0.0194			
	(3.43)	(1.42)	(1.78)	(4.66)	(1.09)			
kids * nb younger	-0.0029	0.0013	-0.0042	-0.0084*	0.0017			
	(-0.81)	(0.46)	(-1.14)	(-1.84)	(0.31)			
m35 * nb younger						-0.0189	-0.0134	-0.0056
						(-0.90)	(-0.83)	(-0.26)
education	0.0083*	0.0374***	-0.0290***	0.0038	0.0175**	0.0078*	0.0367***	-0.0290***
	(1.92)	(9.40)	(-6.17)	(0.53)	(2.09)	(1.76)	(9.07)	(-6.25)
sex	-0.2156***	-0.0917***	-0.1239***			-0.2117***	-0.0845***	-0.1273***
	(-9.09)	(-4.58)	(-4.86)			(-9.02)	(-4.36)	(-5.03)
<35	0.4101***	-0.0382	0.4483***	0.6179***	0.1055	0.3048**	-0.1540	0.4587***
	(3.90)	(-0.44)	(4.10)	(3.74)	(0.65)	(2.58)	(-1.60)	(3.60)
35-45	0.2899***	0.0075	0.2824***	0.4927***	0.0223	0.2786***	-0.0453	0.3239***
	(3.27)	(0.10)	(3.10)	(3.41)	(0.17)	(3.05)	(-0.60)	(3.33)
45-55	0.1023	-0.0066	0.1089	0.2425**	-0.0150	0.1116	-0.0284	0.1400*
	(1.44)	(-0.11)	(1.51)	(1.99)	(-0.15)	(1.58)	(-0.49)	(1.87)
Constant	0.3767***	-0.1967**	0.5734***	0.2279	0.2646*	0.5821***	-0.0209	0.6030***
	(4.12)	(-2.47)	(5.99)	(1.45)	(1.96)	(4.62)	(-0.21)	(4.56)
Observations	1955	1955	1955	1001	954	1955	1955	1955

t statistics in parentheses; Standard errors clustered at the respondent level

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Respondents' labour market participation and working time decisions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Work	Work	Working time	Time regular wage	Time independent	Work	Working time
nb younger	-0.0075	0.0035	-0.2195	0.2929	-0.4997	-0.0079	-0.4999
	(-0.71)	(0.18)	(-0.33)	(0.68)	(-0.70)	(-0.71)	(-0.76)
nb older	-0.0656***	-0.0604**	-2.3877*	1.2754	-4.0963***	-0.0685**	-1.1015
	(-2.91)	(-2.19)	(-1.73)	(1.31)	(-2.90)	(-2.45)	(-0.63)
tot kids of younger	-0.0058	-0.0044	-0.3322	0.0959	-0.2665		
	(-1.09)	(-0.77)	(-0.86)	(0.38)	(-0.70)		
nb younger m35						-0.0155	0.0056
						(-0.64)	(0.00)
tot kids of older	0.0156**	0.0159**	0.9713**	-0.2108	1.2636***		
	(2.48)	(2.51)	(2.30)	(-0.67)	(3.17)		
nb older m35						0.0595**	1.8095
						(1.99)	(0.96)
kids	0.0162	0.0241	0.0196	-0.8025*	0.8069		
	(1.60)	(1.31)	(0.03)	(-1.87)	(1.30)		
kids * nb younger		-0.0031					
		(-0.66)					
kids * nb older		-0.0016					
		(-0.25)					
sex	-0.2688***	-0.2676***	-21.1767***	-4.1442**	-14.7561***	-0.2580***	-21.4386***
	(-6.17)	(-6.15)	(-7.49)	(-2.15)	(-4.72)	(-5.90)	(-7.43)
successeur	0.0014	0.0043	0.3408	0.8003	-0.6545	0.0066	0.4130
	(0.03)	(0.08)	(0.10)	(0.33)	(-0.18)	(0.12)	(0.12)
education	0.0086	0.0087*	-0.3913	1.7946***	-2.6056***	0.0071	-0.4245
	(1.65)	(1.66)	(-1.22)	(8.31)	(-7.28)	(1.39)	(-1.31)
couple	-0.2138***	-0.2143***	-2.2294	-3.8677	1.7339	-0.2013**	-2.5013
	(-2.68)	(-2.63)	(-0.43)	(-0.99)	(0.34)	(-2.53)	(-0.47)
log spouse income	0.0023	0.0023	-0.2768	0.1718	-0.3932	0.0039	-0.2382
	(0.16)	(0.16)	(-0.34)	(0.30)	(-0.44)	(0.28)	(-0.29)
spouse family	0.0006	0.0006	0.0098	-0.0683	0.0399	0.0012	0.0496
	(0.33)	(0.35)	(0.08)	(-0.79)	(0.33)	(0.64)	(0.43)
<35	0.2884***	0.2953***	23.3430***	6.4477	19.0748***	0.2334**	25.1851***
	(2.68)	(2.66)	(3.73)	(1.35)	(2.98)	(2.12)	(4.00)
35-45	0.3759***	0.3858***	29.3388***	15.0134**	18.4485***	0.3224***	30.3795***
	(3.91)	(3.84)	(4.83)	(2.51)	(2.84)	(3.27)	(4.98)
45-55	0.3507***	0.3572***	28.3549***	19.7673***	13.5236**	0.3302***	29.0995***
	(3.69)	(3.68)	(4.55)	(2.66)	(2.04)	(3.50)	(4.73)
Observations	523	523	523	523	523	523	523

Marginal effects; t statistics in parentheses; Standard errors clustered at the household level

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Income and saving flow

	(1) Income	(2) Income	(3) Wage income	(4) Indep income	(5) Income	(6) Saving prop	(7) Saving prop	(8) Saving prop
nb younger	-0.0266	0.0076	0.0423	-0.0599	-0.0274	-0.0022	0.0078	-0.0011
	(-0.63)	(0.09)	(1.26)	(-1.38)	(-0.63)	(-0.34)	(0.76)	(-0.18)
nb older	-0.2297**	-0.2457**	0.0597	-0.3641***	-0.3051***	-0.0225*	-0.0391**	-0.0415***
	(-2.54)	(-2.09)	(0.83)	(-4.24)	(-2.95)	(-1.82)	(-2.11)	(-2.88)
tot kids of younger	-0.0097	-0.0028	0.0079	-0.0089		0.0032	0.0057*	
	(-0.40)	(-0.11)	(0.42)	(-0.35)		(1.09)	(1.77)	
nb younger m35					0.0038			0.0132
					(0.04)			(1.29)
tot kids of older	0.0510**	0.0478*	-0.0088	0.0913***		0.0066**	0.0051	
	(2.00)	(1.86)	(-0.41)	(4.13)		(2.02)	(1.51)	
nb older m35					0.2810**			0.0456***
					(2.53)			(3.21)
kids	0.0217	0.0295	-0.0440	0.0555		-0.0031	-0.0052	
	(0.49)	(0.33)	(-1.38)	(1.51)		(-0.60)	(-0.54)	
kids * nb younger		-0.0099					-0.0030	
		(-0.49)					(-1.27)	
kids * nb older		0.0093					0.0067*	
		(0.33)					(1.66)	
sex	-1.6001***	-1.5955***	-0.4044**	-0.9202***	-1.5640***	-0.0771***	-0.0746***	-0.0756***
	(-8.89)	(-8.86)	(-2.55)	(-4.81)	(-8.57)	(-2.81)	(-2.83)	(-2.86)
successeur	0.0795	0.0867	-0.0160	-0.0305	0.1176	-0.0199	-0.0192	-0.0111
	(0.35)	(0.39)	(-0.09)	(-0.12)	(0.52)	(-0.65)	(-0.63)	(-0.35)
education	0.1015***	0.1022***	0.1675***	-0.0987***	0.0966***	0.0005	0.0009	-0.0001
	(4.70)	(4.73)	(9.65)	(-4.33)	(4.52)	(0.18)	(0.31)	(-0.02)
couple	-0.7852**	-0.7610**	-0.4660	-0.1340	-0.7385**	-0.0403	-0.0238	-0.0384
	(-2.33)	(-2.25)	(-1.32)	(-0.43)	(-2.18)	(-0.87)	(-0.52)	(-0.87)
log spouse income	0.0972	0.0982	0.0261	0.0220	0.1007	0.0159**	0.0156**	0.0151**
	(1.40)	(1.42)	(0.58)	(0.32)	(1.47)	(2.28)	(2.29)	(2.19)
spouse family	-0.0022	-0.0027	-0.0023	-0.0059	-0.0010	-0.0011	-0.0014	-0.0008
	(-0.31)	(-0.37)	(-0.32)	(-0.87)	(-0.14)	(-1.09)	(-1.34)	(-0.80)
log total income						0.0768***	0.0763***	0.0757***
						(10.04)	(10.14)	(9.86)
<35	1.1155***	1.1136***	0.4739	0.8991***	1.1763***	0.0185	0.0141	0.0597
	(2.96)	(2.95)	(1.18)	(2.64)	(2.70)	(0.39)	(0.30)	(1.13)
35-45	1.6663***	1.6590***	1.1335**	1.0659***	1.6027***	0.0169	0.0062	0.0311
	(4.44)	(4.42)	(2.24)	(2.93)	(3.88)	(0.37)	(0.14)	(0.63)
45-55	1.7741***	1.7712***	1.6475***	0.7375*	1.7495***	0.0217	0.0153	0.0300
	(4.45)	(4.51)	(2.63)	(1.95)	(4.27)	(0.45)	(0.33)	(0.61)
Observations	520	520	520	509	520	520	520	520

Marginal effects; t statistics in parentheses; Standard errors clustered at the household level;
The number of observations drops to 520 in this analysis because in three caseswe cannot compute total expenditure (needed to define savings flow).
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Distribution of respondent and their siblings' education levels^ by parental birth ranks

	Full sample	Mother low RBR	Mother high RBR	Father low RBR	Father high RBR
Primary	23.4%	22.0%	26.0%	22.0%	27.0%
Junior high	32.9%	31.7%	35.3%	33.6%	31.3%
Senior high	30.2%	30.9%	28.7%	29.8%	31.1%
Post secondary	13.5%	15.3%	10.1%	14.6%	10.6%
Total	100%	100%	100%	100%	100%

^ Each category comprises children who did not go beyond that level.

Table 9: Respondents and their siblings' education

	(1) OLS fixed effect	(2) OLS	(3) OLS	(4) Oprobit	(5) Marg (Post secondary)
father's older sib		-0.1179			
		(-1.35)			
father's younger sib		-0.0505			
		(-0.98)			
mother's older sib		-0.1003			
		(-1.21)			
mother's younger sib		0.1484**			
		(2.36)			
father RBR			-0.3973	-0.1572	-0.0302
			(-1.02)	(-1.29)	(-1.27)
mother RBR			-0.8454**	-0.3170***	-0.0608***
			(-2.41)	(-2.72)	(-2.63)
father's sib			-0.0569	-0.0156	-0.0030
			(-1.20)	(-1.00)	(-1.00)
mother's sib			0.0734	0.0208	0.0040
			(1.24)	(1.12)	(1.12)
nb younger		-0.0067			
		(-0.10)			
nb older		0.0682			
		(1.03)			
RBR	0.4922*		0.8085***	0.1969**	0.0378**
	(1.82)		(3.40)	(2.52)	(2.54)
siblings			0.0217	0.0073	0.0014
			(0.36)	(0.34)	(0.34)
father's educ		0.2704***	0.2662***	0.0818***	0.0157***
		(5.57)	(5.56)	(5.37)	(5.30)
mother's educ		0.0890	0.1085*	0.0341*	0.0065*
		(1.46)	(1.82)	(1.86)	(1.86)
sex	-1.0095***	-1.0358***	-1.0402***	-0.2953***	-0.0567***
	(-7.19)	(-6.49)	(-6.47)	(-5.56)	(-5.50)
<35	1.0707*	1.1666**	0.9952**	0.1909	0.0367
	(1.84)	(2.45)	(2.18)	(1.33)	(1.31)
35-45	1.1687**	1.7110***	1.6347***	0.3527**	0.0741**
	(2.23)	(3.63)	(3.59)	(2.45)	(2.20)
45-55	0.9954**	1.3374***	1.2987***	0.2475*	0.0526*
	(2.16)	(2.97)	(2.95)	(1.83)	(1.66)
Observations	2092	2092	2092	2092	2092

Marginal effects; t statistics in parentheses; Standard errors clustered at the respondent level

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10: Respondents' children education

	(1) OLS	(2) OLS	(3) Oprobit	(4) Marg (Post sec)	(5) Oprobit	(6) Marg (Post sec)
father's older sib	-0.682**		-0.292**	-0.111**		
	(-2.14)		(-2.08)	(-2.06)		
father's younger sib	-0.239		-0.0652	-0.0249		
	(-1.25)		(-0.74)	(-0.74)		
mother's older sib	0.0375		0.106	0.0403		
	(0.12)		(0.78)	(0.78)		
mother's younger sib	0.611***		0.337***	0.129***		
	(2.72)		(3.21)	(3.16)		
father RBR		-1.006			-0.443	-0.168
		(-1.22)			(-1.13)	(-1.13)
mother RBR		-2.666***			-1.091**	-0.413***
		(-2.81)			(-2.56)	(-2.60)
father's sib		-0.307*			-0.0904	-0.0342
		(-2.00)			(-1.04)	(-1.04)
mother's sib		0.444***			0.255***	0.0966***
		(3.81)			(4.44)	(4.35)
father <55	0.686	0.734	0.363	0.140	0.355	0.137
	(0.93)	(0.88)	(0.93)	(0.92)	(0.85)	(0.84)
mother <45	-3.355**	-2.254*	-1.676**	-0.429***	-1.053	-0.319**
	(-2.24)	(-1.97)	(-2.05)	(-3.55)	(-1.54)	(-2.12)
mother 45-55	-1.257	-0.676	-0.728	-0.274	-0.443	-0.167
	(-1.51)	(-1.19)	(-1.55)	(-1.59)	(-1.09)	(-1.09)
father's educ	0.0992	0.143	0.000520	0.000198	0.0232	0.00879
	(0.98)	(1.50)	(0.01)	(0.01)	(0.46)	(0.46)
mother's educ	0.113	0.112	0.0593	0.0226	0.0664	0.0251
	(1.13)	(1.09)	(1.21)	(1.21)	(1.24)	(1.24)
father's income	0.00392	0.000437	0.0147**	0.00561**	0.0132**	0.00499**
	(0.75)	(0.07)	(2.37)	(2.23)	(2.23)	(2.11)
mother's income	0.00242	0.00661	0.00386	0.00147	0.00551**	0.00209**
	(0.39)	(0.90)	(1.63)	(1.63)	(2.10)	(2.13)
age	0.0175	0.0850*	0.00696	0.00265	0.0434	0.0164
	(0.24)	(1.72)	(0.21)	(0.21)	(1.38)	(1.37)
sex	-0.209	-0.178	-0.286*	-0.109*	-0.259*	-0.0976*
	(-0.62)	(-0.54)	(-1.78)	(-1.73)	(-1.69)	(-1.67)
nb older	-0.389*		-0.167	-0.0638		
	(-1.96)		(-1.61)	(-1.58)		
nb younger	-0.359**		-0.180**	-0.0685**		
	(-2.27)		(-2.09)	(-2.06)		
siblings		-0.380***			-0.174**	-0.0660**
		(-2.86)			(-2.31)	(-2.28)
RBR		0.654			0.638	0.241
		(0.69)			(0.97)	(0.97)
Observations	151	151	151	151	151	151

Marginal effects; t statistics in parentheses; Standard errors clustered at the household level;
Father and mother variables correspond to our respondents. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: Respondents and their siblings' fertility (extended family fixed effect)

	(1) All	(2) Men	(3) Women	(4) All	(5) Men	(6) Women	(7) >45	(8) >45
nb older	-0.4042***	-0.3469***	-0.4467***				-0.5496***	
	(-15.99)	(-11.22)	(-12.40)				(-3.63)	
RBR				-1.9196***	-1.6565***	-2.3967***		-1.3657**
				(-13.38)	(-8.14)	(-11.13)		(-2.19)
sex	0.6356***			0.6551***			0.2562	0.2412
	(9.44)			(9.60)			(0.79)	(0.77)
education	-0.0431***	-0.0297	-0.0930***	-0.0306**	-0.0202	-0.0699***	0.0127	0.0064
	(-3.10)	(-1.43)	(-3.60)	(-2.24)	(-0.99)	(-2.71)	(0.31)	(0.16)
<35	-0.5645*	-1.6224***	0.2507	-0.4916	-1.7048***	0.5696		
	(-1.84)	(-3.92)	(0.46)	(-1.47)	(-3.78)	(1.00)		
35-45	0.0490	-0.6350*	0.5045	0.2269	-0.6724*	0.8953		
	(0.17)	(-1.70)	(0.98)	(0.73)	(-1.71)	(1.65)		
455-5	-0.0823	-0.5596*	0.0787	0.0957	-0.5069	0.4128	0.2828	-0.0737
	(-0.31)	(-1.87)	(0.16)	(0.35)	(-1.63)	(0.82)	(0.71)	(-0.19)
constant	3.6757***	4.1588***	4.3198***	3.4198***	4.0986***	3.9150***	4.4267***	4.5542***
	(13.35)	(12.07)	(9.14)	(12.19)	(11.51)	(8.23)	(9.74)	(10.78)
Observations	2736	1359	1377	2736	1359	1377	917	917

t statistics in parentheses; Standard errors clustered at the respondent level

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 12: Descriptive Statistics for the Sample of Respondent (n=523): Demographics, Occupation and Income

Variable name	Definition	Mean	Std Dev
Respondent demographic characteristics			
siblings	number of full siblings	3.38	1.67
nb younger	number of younger siblings	2.57	1.99
nb older	number of older siblings	1.55	1.63
RBR	relative birth rank (0-1)	0.40	0.37
tot kids of younger	total # of children of younger siblings	3.19	4.10
tot kids of older	total # of children of older siblings	4.51	5.27
nb younger m35	number of younger siblings above 35	0.67	1.17
nb older m35	number of older siblings above 35	1.11	1.41
extended family size	# parents, siblings and their kids, half siblings and their kids	17.48	10.64
own kids	number of respondent's children	3.87	2.35
couple	= 1 if the respondent lives with a spouse (coresidence)	0.87	0.34
spouse family	spouse's extended family size	14.94	11.41
sex	=1 if women	0.55	0.50
age	age	39.01	11.26
m35	=1 if respondent above 35	0.58	0.49
l35	=1 if respondent below 35	0.42	0.49
35-45	=1 if respondent between 35 and 45	0.28	0.45
45-55	=1 if respondent between 45 and 55	0.16	0.37
m55	=1 if respondent above 55	0.08	0.27
successeur	=1 if respondent is the designated successeur of his fatther	0.10	0.30
education	number of years of education	8.03	3.40
Occupation and income			
work	=1 if respondent has an income generating activity	0.76	0.43
regular wage	=1 if respondent has a regular wage	0.31	0.46
independent	=1 if the respondent has an independent activity	0.63	0.48
working time	total time worked in the last 7 days (hours)	34.43	24.55
time regular wage	time worked in regular wage activities last 7 days	12.54	20.31
time independent	time worked in independent and occasional last 7 days	21.89	26.80
income	total weakly labour income in 1000 of CFA	32.26	67.56
wage income	weekly wage income in 1000 of CFA	13.57	39.01
indep income	weekly independent income in 1000 of CFA	18.70	58.40
log total income	weekly labour income + pensions + rents (in log)	2.36	1.67
log spouse income	spouse weakly labour income + pensions + rents (in log)	2.11	1.77

Table 13: Descriptive Statistics for the Sample of Respondents (n=523): Transfers and Parents Characteristics

Variable name	Definition	Mean	Std Dev
Transfers			
dummy in	=1 if respondent recieved a transfer from a full sibling	0.30	0.46
dummy out	=1 if respondent gave a transfer to a full sibling	0.60	0.49
amount in	amount recieved from full siblings in 1000 of CFA	10.81	31.97
amount out	amount sent to full siblings in 1000 of CFA	32.36	175.20
amount net	net amount received and sent to full siblings in 1000 of CFA	21.54	178.73
total out	amount sent to relatives (including parents and half siblings)	55.75	188.7
total net	net amount to relatives (including parents and half siblings)	28.44	260.32
Respondent Parents Characteristics			
father RBR	relative birth rank of respondent's father	0.30	0.33
mother RBR	relative birth rank of respondent's mother	0.33	0.32
father's sib	# of siblings of respondent's father	4.31	2.47
mother's sib	# of siblings of respondent's mother	4.46	2.30
father's older sib	# of older siblings of respondent's father	1.16	1.29
father's younger sib	# of younger siblings of respondent's father	3.15	2.40
mother's older sib	# of older siblings of respondent's mother	1.44	1.50
mother's younger sib	# of younger siblings of respondent's mother	3.01	2.18
father's educ	father's number of years of education	3.86	3.85
mother's educ	mother's number of years of education	2.47	3.04

Table 14: Descriptive Statistics for Respondents and their Siblings

Variable name	Definition	Mean	Std Dev
Sibling's characteristics (with respect to the respondent)			
younger sib	=1 if sibling younger than respondent	0.62	0.48
kids younger sib	# of children of sibling if sibling younger	0.78	1.45
kids older sib	# of children of sibling if sibling older	1.10	1.91
diff RBR	difference in relative birth rank of respondent and sibling	0.61	0.28
m35 sib	=1 if sibling above 35	0.46	0.50
l35 sib	=1 if sibling below 35	0.54	0.50
35-45 sib	=1 if sibling's age between 35 and 45	0.25	0.43
45-55 sib	=1 if sibling's age between 45 and 55	0.14	0.35
m55 sib	=1 if sibling above 55	0.06	0.24
sex sib	=1 if sibling is a women	0.49	0.50
successeur sib	=1 if sibling is the designated successeur of his fatther	0.06	0.23
Respondent's and Sibling's characteristics			
nb older	total number of older siblings	2.62	2.03
tot kids older	total number of children of older siblings	6.40	6.14
nb older m35	total number of older siblings above 35	1.36	1.55
kids	kids of the individual considered (respondent or sibling)	2.28	2.26
<35	=1 if individual considered (respondent or sibling) below 35	0.52	0.50
35-45	=1 if individual considered (respondent or sibling) between 35 and 45	0.26	0.44
45-55	=1 if individual considered (respondent or sibling) between 45 and 55	0.15	0.36
Transfers			
dummy in	=1 if respondent made a transfer to the sibling (past 2 months)	0.09	0.30
dummy out	=1 if respondent recieved a transfer from the sibling (past 2 months)	0.25	0.44
amount in	amount received from the sibling (past 2 months) in 1000 of CFA	2.61	14.56
amount out	amount given to the sibling (past 2 months) in 1000 of CFA	7.79	85.31
amount net	net amount transfered to the sibling (past 2 months) in 1000 of CFA	5.18	86.57
hist dummy in	=1 if respondent (or his kids) ever recieved school fees from the sibling	0.02	0.15
hist dummy out	=1 if respondent ever gave school fees to the sibling (or his kids)	0.23	0.42
hist amount in	# years of school fees received from the siblings	0.16	1.39
hist amount out	# years of school fees given to the siblings	1.17	3.56
hist amount net	net # years of school fees transfered to the siblings	1.01	3.77
Education and labour market participation (for those above 18)			
education	years of education of respondents and their siblings	8.99	3.69
work	=1 if sibling or respondent works	0.68	0.47
regular wage	=1 if sibling or respondent has a regular wage	0.23	0.42
independent	=1 if sibling or respondent has an independent activiy	0.47	0.50