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Demand for Insurance and Within-Kin-Group Marriage: Evidence from a Western African Country

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Demand for Insurance and Within-Kin-Group Marriage: Evidence from a Western African Country

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Abstract

In this paper, we examine how the adverse effect of an income shock is managed by parents depending on whether their child has recently married within the kin group (endogamously) or outside the kin group (exogamously). In this respect, we exploit individual level panel data on consumption, monetary and non-monetary transfers collected in Senegal in 2006/2007 and in 2011/2012. Using illness shocks as measures of negative income shocks, we find that parents whose daughter has married endogamously between the two waves of the interview smooth better their consumption than parents whose daughters has married exogamously during the same time interval. We show in addition that this smoothing effect is achieved not through increased *monetary* transfers from the kin group, but through increased *non-monetary* ones. This suggests that marrying a daughter to a member of the kin group may be a mean for parents to improve the efficiency of the kin group as a mutual insurance group. This result extends the literature on the consequences of market imperfections, in particular on the insurance market, on individuals' decisions, with a focus on marriage related decisions.

***JEL* Classification:** O12, J12, I12 I32
Keywords: Marriages, Risk-coping, Sub-Saharan Africa.

Résumé

Dans cet article, nous nous interrogeons sur la façon dont les effets négatifs d'une maladie nouvelle des parents sont atténuées ou non selon qu'un enfant s'est récemment marié à un membre au sein de la parenté (mariage endogame) ou à un membre à l'extérieur de ce groupe (mariage exogame). Dans cet objectif, nous exploitons des données de panel relatives à la consommation alimentaire et non-alimentaire, aux transferts monétaires et non-monétaires d'individus, collectées au Sénégal en 2006/2007 et en 2011/2012. Selon nos résultats, les parents dont la fille s'est mariée en endogame entre les deux vagues d'enquête lissent mieux leur consommation que les parents dont la fille s'est mariée en exogame sur le même intervalle de temps. Ce meilleur lissage semble être obtenu par une plus grande capacité à ajuster la composition par âge du ménage, plus que par la réception de davantage de transferts monétaires des membres de la parenté. Le confiage des enfants est peut être rendu plus facile au sein du réseau familial renforcé par un mariage endogame. Nos résultats peuvent suggérer que marier une fille à un membre du groupe de parenté est un moyen pour les parents d'améliorer son efficacité en tant que groupe d'assurance mutuelle par un renforcement des liens. Ils viennent ainsi compléter les résultats de la littérature sur l'importance du groupe de parenté comme moyen d'assurance dans les contextes marqués par des imperfections sur le marché de l'assurance.

Classification ***JEL*** **:** O12, J12, I12 I32
Mots-clés**:** Mariages, Gestion des risques, Afrique sub-saharienne.

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1 Introduction

Interactions between market failures and some of the institutional features of land, credit and labor markets in developing countries have been well-studied by the economic literature (Braverman and Stiglitz (1982), Eswaran and Kotwal (1985), Coate and Ravallion (1993), Besley et al. (1993)). Relatively less is known about the role of market failures in shaping individuals' decision regarding their marriage and of their heirs' one. Although arranged marriage has gradually given way to love-based marriage by over the past millennium, it remains prevalent in many parts of the world (Rubio, 2013). In the context of rural India, it has notably been shown that parents marry their child to a spouse located purposely distant from their own place to better cope with the adverse effects of exogenous and locally-covariate income shocks (Rosenzweig and Stark, 1987). In this paper, we wonder the extent to which within kin-group-marriages, we observe in West Africa, can also be explained by parents' demand for insurance.

Preference for within-kin-group marriage has been reported for many societies of West Africa by anthropological and medical studies (Bittles, 2012). But figures at larger scales are scarce and characteristics of such an arrangement have been seldom studied for the sub-region. In contrast, with a prevalence rate varying between 40% (Yemen) to 58% (Saudi Arabia), the practice of within-kin-group marriage has been widely analyzed for societies in the Middle East and in Northern Africa. [1] Involving generally two direct cousins, its consequences on children's health have raised most of the attention. In Senegal, the context studied here, the practice of within-kin-group marriages is also widespread (according to our data, nationally representative, half of women have married a man who is a member of their extended family), but are more likely to involve distant cousins, potentially to limit health-related risks.

We hypothesize that parents' demand for insurance is one important motive for marrying a child within the kin group in Senegal. Indeed, in contexts where mutual insurance within the kin group is an important source of insurance, individuals might need to regularly demonstrate their commitment to the kin group to ensure the group's efficiency, in particular, to ensure they will receive the requested transfers from kin members whenever they are hit by a negative (non-correlated within the kin group) shock. Marrying a child to a member of the kin group could

[1] See for instance Al-Awadi et al. (1985), Al-Gazali et al. (1997),Jaber et al. (1997), Bittles (2002), Bener and Alali (2006).

be one signal for such a commitment. In sub-saharan Africa, traditional systems of mutual help operate mostly within the extended family network (Baland et al., 2016). The long-lasting and inter-linked nature of family relationships provide a first set of incentives to enforce informal insurance (Coate and Ravallion, 1993). In addition, the presence of altruism within the family is expected to reinforce mutual help. Yet, in many contexts, the insurance provided by the family appears incomplete (De Weerdt et al., 2014), opening the question of strategies adopted to improve the family's efficiency as an insurance provider.

Given our hypothesis, we expect that having a child married within the kin group (thereafter endogamously) helps parents to better cope with the adverse effect of an income shock (non-correlated within the kin group) compared to having a child married outside the kin group (thereafter exogamously) through increased transfers (monetary and/or non-monetary) from members of the kin group. We test this prediction using nationally representative individual panel data, from the survey 'Pauvrete et Structure Familiale' (thereafter, PSF), collected in Senegal in 2006/2007 and in 2011/2012 (de Vreyer et al., 2008). These data are particularly suited for our objective as, in addition to providing detailed information on the practice of endogamy in marriage for a West African country, they enable to control for two categories of confounding factors : (1) the role of parents' socioeconomic status and parents' network size in explaining both the probability that parents will marry a child endogamously and parents' ability to smooth shocks; (2) and, the role of distance since, from our data, marrying a child endogamously is positively associated with marrying a child distant.

Using illness shocks as measures of negative income shocks, as predicted, we find that parents whose daughter has married endogamously between the two waves of the interview smooth better their consumption than parents whose daughters has married exogamously during the same time interval. This is especially true for mothers. We show in addition that this smoothing effect is achieved, not through increased monetary transfers from members of the kin group, but through a higher decrease of the ratio of children. One reason could be that child fostering is easier to organize within kin groups reinforced by endogamous unions.

This paper relates to two strands of the economic literature. A first one is about determinants of marriage characteristics in developing countries, and specifically about determinants of consanguineous marriage. Exploiting features of the marriage market in Bangladesh, Joshi et al.

(2009) suggest that consanguinity and dowry payments should be substitutes in a context where parents' of both the groom and of the bride are expected to invest in their child's marriage but where the patrilocality norm leads the bride's parents to potentially free-ride. Yet, using data from Bangladesh, Mobarak et al. (2013) show that consanguineous marriages decrease following a positive wealth shock, and suggest that consanguineous marriage is a mean to smooth dowry payments over time (and after marriage) for liquidity constrained households. A second one is relative to how demand for insurance shapes individuals' economic decisions, beyond marrital arrangements, in contexts characterized by only nascent formal insurance schemes (see Dercon (2002) for a summary). It also echoes to a more recent literature that discusses the benefits of alternative social groups, and notably religious groups, in managing risks. [2]

This paper makes also two major contributions to the empirical literature on marriage in Western Africa. First, it provides detailed information on the current practice of endogamy in marriage using nationally representative data. Second, it is the first paper to evaluate the link between parents' demand for endogamous marriage and parents' demand for insurance for the sub-continent.

The remainder proceeds as follows. Section 2 describes the survey and the data. Sections 3 and 4 present respectively the empirical model and the results relative to consumption. Section 5 investigates potential channels. Section 6 provides some robustness checks. Section 7 concludes.

2 Data and Descriptive Statistics

2.1 The PSF survey

We use data from the PSF Survey collected in 2006 and in 2011 (de Vreyer et al. (2008)). The first wave is constituted of 1750 households randomly drawn from 150 census districts, and 14 450 individuals. The second wave includes 3022 households and 28 376 individuals.[3] These original data are particularly suited for our objectives as, in addition to providing information on some determinants of endogamous marriages, they allow us to test whether parents are better

[2] See for instance Chen (2010) for an application in the context of Indonesia, and Dehejia et al. (2007) in the context of US.

[3] In 2011-2012, 84% of individuals were found and re-interviewed. As regard the 16% of indivuals who have not been found : a quarter died and 15% migrated internationally.

insured with respect to consumption, and the role of monetary and non-monetary transfers from members of the kin group as a smoothing mechanism.

Endogamy In both waves, each individual currently married is asked whether his/her spouse is from the same family or not. [4] If the precise link between the two spouses is not collected, it seems that endogamous marriages in Senegal occur most frequently between cousins whose paternal grand-mother on one side and whose maternal grand-mother on the other side are/were co-spouses (evidence below).

Consumption and Transfers The PSF survey collects information on food and non-food expenditures, with the possibility to exclude health-related ones, at the level of the household. The recall period is one year. It also provide information on transfers sent and received by all the individuals in a household during the year before each interview: their frequency, their amount, information on the recipient (if a transfer is sent) or on the sender (if a transfer is received) which enable to identify transfers sent to/received from members of the kin group. For our objective, we use different measures relative to transfers received from the kin group measured at the household level, per capita whenever relevant.

2.2 The sample

As described in table 1, we count 329 parents who have married at least one coresiding child in 2006, aged between 11 and 35 years old for a daughter and between 18 and 45 years old for a son for the first time between the first wave of the interview and the year preceeding the second wave. [5] We observe 41 parents who have married more than one child in the time interval: 20 who have married both a daughter and a son, 14 parents who have married more than one daughter (and no son), 6 parents who have married more than one son (and no daughter). [6] Therefore, the number of parents who have married at least one daughter (respectively one son)

[4]In 2011, the question asks in addition whether the spouse comes from the mother's line or from the father's one. We do not exploit this information here (notably because of sample size issue).

[5]Note that we exclude from the sample marriages that occured the last year before the interview to ensure that illness shocks the year preceeding the second interview we will investigate below happened after the children's marriage.

[6]We removed observations whose baseline household consumption per capita is outside the range mean +/− 3 standard deviations (computed at the whole sample level). This amounts to 19 observations. We removed also observations when consumption or transfers at the household level are missing for one or the two periods. This amounts to 60 observations.

Table 1: Number of Observations - Parents of All Children

Parents (329)	of Daughters (200)	Only 1 (186)	Endogamous(102)
			Exogamous(76)
		Many (14)	Endogamous(2)
			Exogamous(4)
			Both(3)
	of Sons (109)	Only 1 (103)	Endogamous(55)
			Exogamous(48)
		Many (6)	Endogamous(3)
			Exogamous(2)
			Both(2)
	of Both (20)		Endogamous(7)
			Exogamous(9)
			Both(4)

Note: They are some parents for whom we don't have the information on the type of marriage of the daughters. It explains why for parents who have married many daughters, the three possible cases don't sum 14.

equals 220 (respectively 129). The proportion of parents whose child has married endogamously equals 54.6%.

2.3 Correlates of endogamous marriages

2.3.1 Parents's level

To document the practice of endogamous marriages, we first estimate in logit the probability for a parent to marry a child endogamously (each parent is one observation). If a parent has married more than one child during the time interval, the outcome variable takes the value 1 if at least one child has married within the family and zero otherwise. Different specifications are estimated to account progressively for the different factors that could affect the decision to marry a child endogamously. All factors are described in tables 12, 13, 14. [7] There are all determined in baseline, that is there are all determined before the child's marriage to limit bias due to reverse causality.

In a first specification, we investigate the link between the probability that a parent marries a child endogamously and her education level, as a first proxy for her access to alternative (to the kin group) insurance means. A second specification includes indicators of the household's living conditions (whether the household is located in a rural or in a urban area ; the household

[7] Mean test difference are computed robust to heteroscedasticity.

food and non-food consumption level) as additional proxies for access to alternative insurance means, but at the household level. We also control for the number of parents present. The third specification adds indicators of the household and of the parents' embeddeness in the kin group (whether a parent had a fostering experience during childhood; whether the household is a net receiver of monetary transfers from the kin group) to measure the link between the probability to marry a child endogamously and proxies for household/parents' preference for mutual insurance within the kin group. In a fourth model, we attempt to measure the stock of potential spouses available in the kin group for a child. We do so by including the parent's number of siblings of opposite sex (number of brothers for mothers, number of sisters for fathers, distinguishing whether the siblings are of same parents, of same father only, of same mother only). All models include as controls dummies to indicate one's ethnic group and one's geographical location in baseline.

Results are presented in table 2. The probability to marry a child endogamously is negatively correlated with having formal schooling and level of non-food consumption in log but is positively correlated with living in a rural area and with the number of siblings of opposite sex *and*, interestingly, of same father only. All these effects remain, except the one of consumption, on the sub-sample of mothers (last column). [8]

The fact that mothers' number of brothers *of same father only* has a positive effect of a child's probability to marry endogamously suggests that endogamous marriages in Senegal occur most frequently between cousins whose paternal grand-mother on one side and whose maternal grand-mother on the other side are/were co-spouses. This is consistent with informal talks about the 'preferred' nephew/niece with whom marry one's child. Such a choice may help maximising the mixing of the genetic capital while enabling marriage within the kin group. This also suggests a link between polygyny of a grand-father and endogamy of his grand-children.

[8]The sample being of sufficient size, we re-estimate all the above specifications on the sub-sample of parents whose daughter has married in the time period of interest. Then, for parents *of daughters* with more than one *daughter* married over the time interval, we define the dummy indicating if a *daughter* has married endogamously to equal one if one *daughter* at least has married endogamously. Results are presented in table 15 in the appendix. In tables 16, 17 and 18 in the appendix we describe the variables on this sub-sample (mean test differences are computed robust to heteroscedasticity). Results are similar to those obtained for the whole sample of parents, except we loose the positive effect of the parents' sibship composition. For the sub-sample of mothers (last column), in addition to the positive effect of the number of brothers of same father only on the probability that a daughter will marry endogamously, we note a negative effect of the number of brothers of parents. On this sub-sample, we also find that the probability to marry a daughter endogamously is positively associated with belonging to a household who is a net receiver of transfers from the kin group.

Table 2: Logit Model Predicting Endogamous Marriage: Sample of Parents of Children

	(1)	(2)	(3)	(4)	(4) on mothers only
has a French/Arab education	-1.66 (0.38)***	-0.91 (0.44)**	-0.94 (0.43)**	-1.07 (0.42)**	-1.71 (0.73)**
has a Koranic education	-0.46 (0.30)	-0.31 (0.40)	-0.36 (0.42)	-0.39 (0.42)	-0.00 (0.47)
N. of parents in baseline		0.57 (0.42)	0.56 (0.43)	0.52 (0.44)	0.48 (0.49)
household food consumption level per capita (in log)		0.07 (0.28)	0.06 (0.28)	0.11 (0.28)	0.02 (0.31)
household non-food consumption level per capita (in log)		-0.57 (0.24)**	-0.56 (0.24)**	-0.57 (0.24)**	-0.43 (0.29)
place of residence (rural=1)		1.89 (0.51)***	1.85 (0.51)***	1.89 (0.50)***	1.88 (0.49)***
log(net transfers from/to kin by hh pcap in 2006)			0.02 (0.03)	0.02 (0.03)	0.05 (0.04)
has ever been fostered during childhood			-0.34 (0.48)	-0.28 (0.47)	-0.79 (0.69)
N. brothers (resp. sisters) same parents of mother (resp. father)				-0.13 (0.09)	-0.11 (0.12)
N. brothers (resp. sisters) same father only of mother (resp. father)				0.16 (0.07)**	0.20 (0.10)**
N. brothers (resp. sisters) same mother only of mother (resp. father)				0.06 (0.23)	-0.13 (0.30)
Constant	0.51 (0.33)	4.61 (3.48)	5.30 (3.66)	4.95 (3.66)	5.32 (4.08)
N	315	315	315	309	185
chi2	22.01	71.86	73.22	75.59	50.31
r2_p	0.08	0.30	0.30	0.30	0.33

Note: ethnic groups and geographic areas controlled for. * p<0.10, ** p<0.05, *** p<0.01.

2.3.2 Children's level

In tables 3 and 4 , we further describe the characteristics of endogamous and exogamous marriages, for daughters and sons respectively. [9] For daughters, marrying endogamously is positively associated with moving to another disctrict ('arrondissement'). This pattern is confirmed by a second measure available on a lower number of observations: distance to origin household in km. [10] For daughters, marrying endogamously is also positively associated with receiving a gift from the husband at marriage, but conditional on receiving one, negatively associated to its value (in thousands of fcfa). The level of the brideprice given by the husband's family to the bride's family is similar between the two groups. [11] It is also positively associated with bringing a 'bagage' (the set of kitchen ustensils, clothes, etc. brought when joining her new household), but conditional on bringing one, negatively associated to its value (in thousands of fcfa). Finally, it is positively associated with coresidence with in-laws, and negatively associated with marrying up (in terms of education). For sons, marrying endogamously is negatively associated with gifts of higher monetary value (in thousands of fcfa). Sons who have married endogamously are also less likely to coreside with the spouse. Both daughters and sons marry younger when they marry endogamously.

2.4 Change of parents' level of consumption by type of marriage

In table 5 , we describe the evolution of parents' household consumption per capita across time and depending on the type of marriage arranged for the child. The unit observation is the couple of parents (or equivalently the baseline household): in baseline, two coresiding parents have the same consumption level per capita; in follow-up, this will be again the case, unless they belong to two different households. But very of them are in this situation. [12] As above, for couple of parents with more than one child married over the time interval, we define the

[9] The sample of children corresponds to the children who have married in the time period of interest and who were coresiding with at least one of their parents in baseline. Results remain qualitatively similar if the sample of children is reduced to the children of our parent sample. Mean test differences are computed robust to heteroscedasticity.

[10] The PSF data are geocoded, enabling the computation of distance between the household in baseline and in the follow-up. This finding recalls the patterns of marriages found by Rosenzweig and Stark (1987) in Shirarpur, one ICRISAT village of South India interviewed. In this village: around 82% of marriages involved partners who were also relatives.

[11] Brideprice dominates payments made at the occasion of marriages. We observe very few transfers from the bride's family to the groom's one.

[12] 3 couples were coresiding in 2006 but not in 2011 and were interviewed in different households. There are 11 parents coresiding with a spouse in baseline, whose spouse could not be found in follow-up.

Table 3: Characteristics of daughters' marriage

	N Exo	mean	N Endo	mean	pvalue
r1	141	141.00	126	126.00	267.00
Age at first marriage	131	23.40	122	19.59	0.00
Moved to another district	140	0.15	125	0.24	0.07
Distance in km	120	20.98	116	50.22	0.01
Hypergamie (education)	129	0.37	122	0.24	0.02
Coreside with spouse	141	0.53	126	0.58	0.44
Coreside with mother or father	141	0.29	126	0.25	0.50
Coreside with in-laws	121	0.28	116	0.47	0.00
Is not the first-rank spouse	140	0.14	124	0.18	0.36
Received a gift	133	0.65	118	0.77	0.03
Her family received a brideprice	135	0.79	115	0.74	0.40
A bagage/trousseau has been brought	134	0.44	116	0.57	0.04
Her family gave a contribution to the in-laws	134	0.04	117	0.15	0.01
Deflated amount of the gift (in thousands fcfa)	86	149.15	91	108.31	0.07
Deflated amount of the brideprice (in thousands fcfa)	106	195.16	85	169.45	0.24
Deflated amount of the bagage (in thousands fcfa)	59	120.21	66	88.09	0.05

Table 4: Characteristics of sons' marriage

	N Exo	mean	N Endo	mean	pvalue
r1	93	93.00	111	111.00	204.00
Age at first marriage	90	30.28	104	27.99	0.01
Moved to another district	93	0.13	110	0.14	0.88
Distance in km	89	17.26	108	21.42	0.67
Hypergamie (education)	81	0.17	101	0.17	0.94
Coreside with spouse	89	0.78	111	0.67	0.09
Coreside with mother or father	93	0.67	111	0.61	0.43
Gave a gift to the wife	84	0.68	103	0.67	0.90
Gave a brideprice to the wife's family	83	0.83	102	0.82	0.89
A bagage/trousseau has been brought	82	0.67	101	0.54	0.08
His family received a contribution from his in-laws	84	0.02	102	0.07	0.14
Deflated amount of the gift (in thousands fcfa)	57	184.44	69	91.95	0.00
Deflated amount of the brideprice (in thousands fcfa)	69	236.49	84	238.29	0.97
Deflated amount of the bagage (in thousands fcfa)	55	116.45	55	94.17	0.29

dummy indicating if a child has married endogamously to equal one if one child at least has married endogamously.

In terms of food consumption, we observe a small decrease over time for parents whose child has married endogamously, and an increase for parents whose child has married exogamously. But accounting for the difference in baseline, the double difference is not significant. In terms of non-food consumption (health expenditures being excluded), whereas parents whose child has married endogamously consume a similar amount over time, parents whose child has married exogamously consume less. But, once again, accounting for the difference in baseline, the double difference is not significant. That being said, the question of whether, in face of a shock, endogamy helps the consumption smoothing remains open and is investigated below. [13]

Table 5: Measures of consumption of parents depending of the type of marriage of the child

Variables	Exogamous Marriage	Endogamous Marriage	Diff. in mean	Double diff.
Food exp. of the household in 2006	177492.65	133907.67	43584.97**	
			(0.05)	
Food exp. of the household in 2011	198454.93	129928.64	68526.29**	
			(0.04)	
Double difference				-24941.31
				(0.49)
Non Food exp. of the household in 2006	261378.92	87262.72	174116.20***	
			(0.00)	
Non Food exp. of the household in 2011	216191.43	87403.72	128787.71***	
			(0.00)	
Double difference				45328.49
				(0.38)
Number of observation	91	105	202	202

Note: Standard errors of double difference are clustered at the origin household level. Significance levels are denoted as follows: * p<0.10, ** p<0.05, *** p<0.01.

2.5 Illness shocks by year

We use illness shocks as measures for negative income shocks. Since the recall period of transfers and consumption data is one year, illness shocks are identified over the same time period. Precisely, our indicator for an illness shock equals one if the parent i declares to have a chronic

[13] In table 19 in the appendix , we redo the analysis for parents of daughters. Then, for parents *of daughters* with more than one *daughter* married over the time interval, we define the dummy indicating if a *daughter* has married endogamously to equal one if one *daughter* at least has married endogamously. The food consumption of both types of parents increases over time. But accounting for the difference in baseline, the double-difference is not significant. Inversely, the non-food consumption of both types of parents decreases over time. But, once again, accounting for the difference in baseline, the double difference is not significant.

illness that has started the year preceeding the interview or to have been ill for another reason during the year preceeding the interview.

Measured as above, illness shocks appear to be quite frequent. According to table 6, more than 50% of parents have suffered from an illness shock each year preceeding the interview. For each year, this proportion is comparable for parents whether they have married a child endogamously or exogamously between the two waves of interview. [14]

Table 6: Illness shocks

Variables	Endogamous Marriage	Exogamous Marriage	Diff.
Illness shock in 2006	0.52	0.56	0.04
			(0.53)
Illness shock in 2011	0.51	0.52	0.01
			(0.86)
Number of observation	167	129	296

Note: Mean test difference is robust to heteroscedasticity. Significance levels are denoted as follows: * p<0.10, ** p<0.05, *** p<0.01.

3 The Empirical Model

3.1 Consumption equation

We mirror the model estimated by Gertler and Gruber (2002); Gertler, Levine, and Moretti (2006, 2009); Jack and Suri (2014)), and estimate on our parent sample:

$$C_{h,t} = \alpha_0 + \beta_1 Illness_{i,h,t} + \beta_2 Endo_{h,t} + \beta_3 Endo_{h,t} * Illness_{i,h,t} + \beta_4 T + \pi_i + \varepsilon_{i,h,t} \quad (1)$$

Our two main outcomes are the amount of food and non-food consumption (health expenditures excluded) measured at the household level per capita. The unit of observation is a parent i. $Illness_{i,h,t}$ is a dummy that equals one each year if the parent i declares an illness shock that year and zero otherwise. $Endo_{h,t}$ is a dummy tht equals one if the parent has a child who has married endamously between the first interview and a year before the second interview and zero otherwise (it is always zero in baseline for all parents). Note that for a parent with

[14]The sample corresponds to parents for whom the illness shock status for both periods and the type of marriage made by the child are all known. Mean test differences are computed robust to heteroscedasticity.

more than one child married over the time interval, $Endo_{h,t}$ equals one if at least one child has married endogamously. π_i accounts for individual fixed effects and T for time trends specific to geographic areas[15], and to living in a rural area. $\varepsilon_{i,h,t}$ is the error term. The model is estimated in OLS with standard errors clustered at the origin household level.

The coefficient β_3 on the interaction $\Delta Endo_h Illness_{i,h}$ is identified thanks to individuals affected by an illness shock in both periods and to individuals affected by an illness shock only in second period. Thus, our interpretation of β_3 is '*how the effect of becoming ill (eventually, once again) on consumption is different across having a child married endogamously or exogamously ?* '. [16] This is our coefficient of interest. If β_3 =0, then there is no differential effect of having married a child endogamously relative to exogasmouly on a parent's ability to smooth her illness shock. If β_3 >0 (respectively, β_3 <0), a parent whose child has married endogamously smooth better (respectively, worse).

3.2 Mechanisms

Using a similar specification, we can also assess the mechanisms by which a child's endogamous marriage helps her parent to smooth her health shock, in particular the role of monetary transfers received from members of the kin group (probability to receive / frequency per capita / amount per capita / net amount per capita computed at the household level) and the role of non-monetary transfers (changes in household size and composition we detail below).

3.3 Identification threats

3.3.1 Confounding factors

From the section 2 , we know that endogamy is correlated with characteristics that may help parents smooth risk. Notably, a parent is less likely to marry a child endogamously if she lives in a rural location, or if she has some formal education. The smoothing effect of endogamy

[15] The geographic areas are as follows: (a) the West which includes the region of Dakar and Thies, (b) Kolda, (c) Kaolack, and (d) all other regions (Casamance, Matam, Tambacounda, Dagana, Saint Louis, Diourbel)

[16] This interpretation comes from re-writting the model in simple difference:

$$\Delta C_h = \alpha_1 + \beta_1 \Delta Illness_{i,h} + \beta_2 \Delta Endo_h + \beta_3 \Delta Endo_h Illness_{i,h} + \\ + \Delta\varepsilon_{i,h} \quad (2)$$

By doing so, we also highlight the following: $\Delta Illness_{i,h}$ can take 3 values : $-1, 0, 1$ (parents who are healthy in $t = 1$ while ill in $t = 0$, parents who keep the same health status –good or bad – , parents who have become ill in $t = 1$ while they were healthy in $t = 0$ respectively). Thus, we cannot interpret the coefficient on $Illness_{i,h}$

could be under-estimated if households in rural location or parents with no formal education have less alternatives to attenuate negative effects of shocks. In contrast, a parent is more likely to marry a child endogamously if she has more siblings of opposite sex and of same father only. Then, the smoothing effect of endogamy could be over-estimated if the number of siblings of opposite sex and of same father only is positively correlated with the kin group size[17], that is with the size of the mutual insurance network. In addition, at daughters' level, endogamy is negatively associated with distance. Then, the smoothing effect of endogamy on the consumption of daughters' parents might be under-estimated if distance increases the cost of transfers, makes more difficult to organize members' in/out migration or makes difficult to enforce the mutual insurance system with the in-laws.

To limit bias from confounding factors, we adopt the following strategy: we add as controls the above mentionned characteristics correlated with $Endo_{h,t}$ (absorbed by the fixed effect if the characteristic is fixed over time) and the interaction of these characteristics with the illness shock measure. In other words, we estimate the following model:

$$\begin{aligned} C_{i,h,t} = \alpha'_0 + \beta'_1 Illness_{i,h,t} + \beta'_2 Endo_{h,t} + \beta'_3 Endo_{h,t} * Illness_{i,h,t} + \beta'_4 T \\ + \beta_5 OutDistrict_{h,t} * Illness_{i,h,t} + \beta_6 OutDistrict_{h,t} \\ + \beta_7 Rural_h * Illness_{i,h,t} + \beta_8 FormalEdu_i * Illness_{i,h,t} + \beta_9 NSibOppSexSameFa_i * Illness_{i,h,t} \\ + \pi_i + \varepsilon'_{i,h,t} \end{aligned} \tag{3}$$

We add the controls in a sequential manner to check the way the coefficient of interest, the coefficient on the interaction between $Endo_{h,t} * Illness_{i,h,t}$, varies with the control added. $OutDistrict_{h,t} * Illness_{i,h,t}$ captures the interaction between distance and choc. Since distance is available for fewer observations, we replace this information by whether the child has married and moved to another district. [18] [19]

[17]This is likely to be the case since the number of siblings of same father only is correlated with having a polygynous father.

[18]Note that for a parent with more than one child who has married during the time interval, $OutDistrict_{h,t}$ measures whether a child has married and moved outside a locality.

[19]Following the same reasonning as the one that led to interpret β'_3, β_5 is the differential effect of having a child married in another district on parents' ability to smooth illness shocks. In contrast, β_7 and β_8 and β_9 cannot be interpreted as, with $Ruralh$, $FormalEduc_i$, and $NSibOppSexSameFa_i$ are fixed, the effect of parents becoming healthier is not cancelled out and their interaction with the illness shock can be either null, negative or positive.

The inclusion of $OutDistrict_{h,t} * Illness_{i,h,t}$ in the model is particularly relevant for the sub-sample of parents of daughters. The model is thus estimated on the sample of whole parents and on the sub-sample of parents of daughters.

We estimate an additional specification which controls for the interaction between the dummy indicating whether a child will marry endogamously or not with the shock dummy. That is, we estimate :

$$\begin{aligned}
C_{i,h,t} = \alpha'_0 + \beta'_1 Illness_{i,h,t} + \beta'_2 Endo_{h,t} + \beta'_3 Endo_{h,t} * Illness_{i,h,t} + \beta'_4 T \\
+\beta_5 OutDistrict_{h,t} * Illness_{i,h,t} + \beta_6 OutDistrict_{h,t} \\
+\beta_7 Rural_h * Illness_{i,h,t} + \beta_8 FormalEdu_i * Illness_{i,h,t} + \beta_9 NSibOppSexSameFa_i * Illness_{i,h,t} \\
+\beta_{10} Endo_h * Illness_{i,h,t} \\
+\pi_i + \varepsilon'_{i,h,t}
\end{aligned} \tag{4}$$

The rational for estimating this model is to control for any factor that could drive both the fact that a child will marry endogamously and an initially different ability to smooth illness shocks (driven by any characteristics not already accounted for).

In a final specification, we control in addition for household level time varying characteristics: the number of household members, whether the child lives with the parent.

3.3.2 On the exogenity of illness shocks

Last, one might worry about the fact that illness shocks are not exogenous. We believe this is an issue of limited scope in our case. Indeed, investigating the correlations between declaring an illness shock and various characteristics in baseline in tables 20 in the appendix, we show that parents who declare an illness shock do not differ from parents who do not. [20]

In addition, we show that the probability to declare an illness shock each year, estimated as a linear probability model with individual fixed effects, is uncorrelated to time-varying household level demographic characteristics (see table 22 in the appendix).

All these conclusions hold on the sub-sample of parents of daughters (see tables 21 and 23

[20]The sample is defined as follows: parents for whom the illness shock status for both periods and information on the type of marriage arranged for their child are all known.

in the appendix).

4 Results on consumption

4.1 Parents of all children

We do not find any significant differential effect of having a child married endogamously relative to exogamously on parents' ability to smooth food and non-food consumption, neither in the baseline specification (tables 25 and 24 in the appendix), nor in the specifications controlling for the interactions between the above mentionned correlates of endogamy with the illness shock (in tables 25 and 24 the control $OutDistrict_{h,t} * Illness_{i,h,t}$ is added, and in tables 27 and 26, the controls $Rural_h * Illness_{i,h,t}$, $FormalEdu_i * Illness_{i,h,t}$ and $NSibOppSexSameFa_i * Illness_{i,h,t}$ and $Endo_h * Illness_{i,h,t}$ are sequentially added). This is not the case when focusing on parents of daughters.

4.2 Parents of daughters

For parents of daughters, the baseline model is estimated in table 7 for non-food consumption, and in table 9 for food consumption.

On non-food consumption, consistent with our hypothesis, the estimated coefficient on the interaction between $Endo_{ht} * Illness_{i,h,t}$ is significantly positive once we account for a measure of distance (column 3). The coefficient on $OutDistrict_{h,t} * Illness_{i,h,t}$ is itself significantly negative, which suggests that marrying and moving outside the district alters parents' ability to smooth illness shocks (see below for a test for the mechanism).

According to results shown in table 8, the smoothing effect of endogamy on non-food consumption remains robust to controlling for potential confounding factors and for time varying characteristics, although the significance level decreases. As expected, the size of the coefficient decreases with controlling for $NSibOppSexSameFa_i * Illness_{i,h,t}$.

All these patterns remain true, and gain significance, on the sub-sample of mothers. A focus on this sub-sample is justified by the fact that the number of siblings of opposite sex and of same father is expected to be an important confounding factor on this sample especially. Indeed, this characteristic has a positive effect on the probability to marry a daughter endogamously for mothers, not for all parents (see table 15 in the appendix). On this sub-sample, $NSibOppSexSameFa_i * Illness_{i,h,t}$ has a significant effect and, as expected, its inclusion decreases the size of the coefficient of interest.

In the last column under the panel of mothers, the value of the coefficient of interest suggests that the ratio of non-food consumption is higher of 69% for a mother who has became (eventually again) ill but whose daughter has married endogamously. [21]

Table 7: Non food consumption (health expenditures excluded) Parents of Daughters

	All Sample			Mothers	
	(1)	(2)	(3)	(1)	(2)
Endo_it	0.19 (0.18)	0.00 (0.21)	-0.02 (0.22)	-0.09 (0.22)	-0.15 (0.23)
Illness_it	0.00 (0.09)	-0.12 (0.14)	-0.10 (0.14)	-0.21 (0.17)	-0.23 (0.17)
Endo_it*Illness_it		0.36 (0.25)	0.53 (0.25)**	0.50 (0.31)+	0.76 (0.30)**
OutDistrict_ht			-0.01 (0.22)		0.08 (0.29)
OutDistrict_ht*Illness_it			-0.67 (0.33)**		-0.95 (0.46)**
Constant	11.12 (0.07)***	11.18 (0.08)***	11.17 (0.08)***	11.30 (0.10)***	11.31 (0.10)***
T*region_06 FE	Yes	Yes	Yes	Yes	Yes
Average	11	11	11	11	11
Average difference	-0.09	-0.09	-0.09	-0.03	-0.03
N	184	184	184	111	111
R	0.11	0.12	0.16	0.12	0.17
F	2.59	2.84	2.82	2.13	2.53

Note: Standard errors are clustered at the level of origin household. Significance levels are denoted as follows: + p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

[21] These findings remain if we replace the binary measure of distance by the continuous measure available however for fewer observations. Results not shown but available upon request.

Table 8: Non food consumption (health expenditures excluded) Parents of Daughters

	All Sample				Mothers			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Endo_it	-0.01 (0.23)	0.02 (0.23)	0.04 (0.23)	0.04 (0.22)	-0.13 (0.24)	-0.09 (0.24)	-0.12 (0.25)	-0.08 (0.24)
Illness_it	-0.18 (0.21)	-0.28 (0.23)	-0.33 (0.26)	-0.30 (0.25)	-0.13 (0.23)	-0.26 (0.23)	-0.20 (0.22)	-0.13 (0.25)
Endo_it*Illness_it	0.53 (0.26)**	0.50 (0.26)*	0.45 (0.30)+	0.43 (0.29)+	0.73 (0.30)**	0.68 (0.30)**	0.73 (0.35)**	0.69 (0.34)**
OutDistrict_ht	-0.01 (0.22)	-0.02 (0.21)	-0.01 (0.21)	0.04 (0.22)	0.08 (0.29)	0.05 (0.26)	0.05 (0.26)	0.05 (0.26)
OutDistrict_ht*Illness_it	-0.67 (0.33)**	-0.65 (0.34)*	-0.65 (0.33)*	-0.69 (0.32)**	-0.94 (0.47)**	-0.91 (0.45)**	-0.93 (0.45)**	-0.93 (0.46)**
Rural_i*Illness_it	0.10 (0.21)	0.11 (0.22)	0.07 (0.21)	0.07 (0.22)	-0.08 (0.25)	-0.26 (0.25)	-0.22 (0.24)	-0.24 (0.26)
FormalEdu_i*Illness_it	0.07 (0.33)	0.05 (0.33)	0.09 (0.33)	0.11 (0.31)	-0.25 (0.51)	-0.37 (0.50)	-0.43 (0.51)	-0.48 (0.51)
NSibOppSexSameFa_i*Illness_it		0.09 (0.06)	0.09 (0.06)	0.07 (0.06)		0.21 (0.08)***	0.21 (0.08)***	0.20 (0.08)**
Endo_i*Illness_it			0.14 (0.23)	0.15 (0.24)			-0.15 (0.26)	-0.17 (0.27)
Child in the Household				0.23 (0.24)				0.10 (0.23)
Number of ind. in the hh				0.02 (0.02)				0.02 (0.02)
Constant	11.18 (0.08)***	11.16 (0.08)***	11.15 (0.09)***	10.74 (0.34)***	11.30 (0.09)***	11.23 (0.10)***	11.23 (0.10)***	10.90 (0.33)***
T*region_06 FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average	11	11	11	11	11	11	11	11
Average difference	-0.09	-0.09	-0.09	-0.08	-0.03	-0.03	-0.03	-0.00
N	184	184	184	184	111	111	111	111
R	0.16	0.16	0.16	0.17	0.17	0.20	0.20	0.21
F	2.40	2.37	2.31	3.06	2.07	2.64	2.53	2.56

Note: Standard errors are clustered at the level of origin household. Significance levels are denoted as follows: + p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

On food consumption, the coefficient of interest is also positive. Its significance level varies with the sub-sample (see tables 9 and 10). On this outcome however, the bias we correct when we introduce $OutDistrict_{h,t} * Illness_{i,h,t}$ and $NSibOppSexSameFa_i * Illness_{i,h,t}$ are not of the expected signs.

Table 9: Food consumption Parents of Daughters

	All Sample			Mothers	
	(1)	(2)	(3)	(1)	(2)
Endo_it	0.10 (0.18)	-0.07 (0.20)	-0.05 (0.20)	0.02 (0.23)	0.02 (0.22)
Illness_it	0.07 (0.11)	-0.04 (0.12)	-0.04 (0.12)	-0.07 (0.17)	-0.07 (0.17)
Endo_it*Illness_it		0.32 (0.17)*	0.29 (0.18)+	0.24 (0.23)	0.23 (0.23)
OutDistrict_ht			-0.05 (0.27)		0.05 (0.26)
OutDistrict_ht*Illness_it			0.10 (0.30)		0.03 (0.32)
Constant	11.56 (0.08)***	11.62 (0.08)***	11.62 (0.09)***	11.66 (0.13)***	11.66 (0.13)***
T*region_06 FE	Yes	Yes	Yes	Yes	Yes
Average	11	11	11	11	11
Average difference	-0.39	-0.39	-0.39	-0.68	-0.68
N	184	184	184	111	111
R	0.02	0.02	0.02	-0.00	-0.01
F	1.07	1.21	1.03	0.94	0.77

Note: Standard errors are clustered at the level of origin household. Significance levels are denoted as follows: + p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

Table 10: Food consumption Parents of Daughters

	All Sample				Mothers			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Endo_it	-0.07 (0.19)	-0.10 (0.19)	-0.11 (0.20)	-0.29 (0.17)*	0.02 (0.22)	0.01 (0.22)	0.00 (0.23)	-0.22 (0.17)
Illness_it	0.10 (0.18)	0.22 (0.20)	0.24 (0.23)	0.22 (0.21)	0.40 (0.30)	0.44 (0.30)	0.45 (0.35)	0.50 (0.28)*
Endo_it*Illness_it	0.30 (0.18)+	0.33 (0.18)*	0.35 (0.20)*	0.38 (0.16)**	0.22 (0.23)	0.23 (0.22)	0.25 (0.24)	0.29 (0.20)+
OutDistrict_ht	-0.05 (0.27)	-0.04 (0.27)	-0.04 (0.27)	-0.12 (0.25)	-0.01 (0.27)	0.00 (0.27)	0.00 (0.27)	-0.13 (0.23)
OutDistrict_ht*Illness_it	0.11 (0.30)	0.08 (0.30)	0.08 (0.30)	0.10 (0.27)	0.07 (0.32)	0.06 (0.32)	0.06 (0.32)	0.03 (0.28)
Rural_i*Illness_it	-0.18 (0.21)	-0.20 (0.20)	-0.18 (0.20)	-0.23 (0.19)	-0.57 (0.32)*	-0.52 (0.33)+	-0.51 (0.33)+	-0.66 (0.27)**
FormalEdu_i*Illness_it	-0.16 (0.27)	-0.13 (0.26)	-0.15 (0.26)	-0.10 (0.25)	-0.64 (0.44)	-0.60 (0.43)	-0.62 (0.46)	-0.57 (0.42)
NSibOppSexSameFa_i*Illness_it		-0.10 (0.06)*	-0.10 (0.06)*	-0.08 (0.06)		-0.06 (0.09)	-0.06 (0.09)	-0.03 (0.10)
Endo_i*Illness_it			-0.06 (0.25)	-0.06 (0.24)			-0.03 (0.32)	0.01 (0.31)
Child in the Household				-0.10 (0.14)				-0.18 (0.16)
Number of ind. in the hh				-0.04 (0.01)***				-0.04 (0.01)***
Constant	11.61 (0.09)***	11.63 (0.09)***	11.63 (0.09)***	12.23 (0.18)***	11.61 (0.13)***	11.63 (0.13)***	11.63 (0.13)***	12.21 (0.20)***
T*region_06 FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average	11	11	11	12	11	11	11	12
Average difference	-0.39	-0.39	-0.39	-0.19	-0.68	-0.68	-0.68	-0.00
N	184	184	184	184	111	111	111	111
R	0.01	0.02	0.01	0.20	-0.01	-0.01	-0.02	0.20
F	1.06	1.16	1.09	3.10	1.12	1.06	0.98	3.08

Note: Standard errors are clustered at the level of origin household. Significance levels are denoted as follows: + p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

5 Testing for channels

5.1 Channels through which daughters' endogamous union affects smoothing

In this subsection, we investigate the channels through which a daughter's endogamous marriage helps her parents (and notably her mother) smoothing an illness shock. Monetary and non-monetary transfers in the form of adjustments of the household size and composition are subsequently analyzed.

5.1.1 Monetary transfers

In table 28 (respectively, table 29), parents (respectively, mothers) whose daughter has married endogamously do not receive significantly more transfers from their kin group in face of an illness shock. However, the coefficients on the net amount of transfers received are positive. [22]

5.1.2 Non-monetary transfers

Visits from members of the kin group during the year preceeding the interview could be an important channel through which endogamy improves the smoothing of parents' non-food consumption. However, this information is not available in the survey. Alternatively, we test whether an increased flexibility of household size and composition is one. To do so, we define the following measures as outcomes of interest: the number of individuals in the household (controlling for the presence of the daughter), the ratio of children in the household (the daughter being excluded), on the ratio of workers in the household (the parents and the daughter being excluded) [23]. Results are shown in tables 32 and 33 in the appendix). On the sub-sample of mothers, we do find a significant (at 15%) negative effect on the ratio of children.

5.2 Addionnal results: channels through which daughters' distant union affects smoothing

In table 28, we find that $OutDistrict_{h,t} * Illness_{i,h,t}$ has no significant effect on different measures of transfers received. However, according to table 32, it has a (almost) significant

[22] This result hold if we consider all transfers (from the kin group and from non-kin members). See tables 30 and 31 in the appendix.

[23] We control also for the age mean of the other individuals present in the household, excluding the parents and the daughter, for this last estimation.

negative effect on the ratio of workers in household. Since we find that distance alters parents' ability to smooth non-food consumption, this could be because of a lower increase of the ratio of workers in their household following an illness shock. These conlusions hold when focusing on the sub-sample of mothers (tables 29 and 33).

6 Robustness Analysis: Alternative definition of income shock

Our results on mothers hold if we define the illness shock in the following way: as a dummy taking the value 1 if the individual has been ill and if her health expenditures were higher than the median of health expenditures of individuals who have been ill (in the whole sample).

According to table 11, 30% of parents have suffered from an illness shock each year preceeding the interview. For 2006, this proportion is comparable for parents whether they have married a child endogamously or exogamously between the two waves of interview, but it is not the case for 2011: parents whose child has married outside the family have been more often hit by a shock in average. [24]

Table 11: Illness shocks

Variables	Endogamous Marriage	Exogamous Marriage	Diff.
Expensive illness shock in 2006	0.29	0.36	0.07
			(0.21)
Expensive llness shock in 2006	0.28	0.42	0.14**
			(0.01)
Number of observation	167	129	296

Note: Mean test difference is robust to heteroscedasticity. Significance levels are denoted as follows: * p<0.10, ** p<0.05, *** p<0.01.

The significance level decreases however in the specification with time-varying controls (see tables 34 and 35 in the appendix). Concerning food consumption, our results hold (see tables 36 and 37 in the appendix).

7 Conclusion

In this paper, we examine how the adverse effect of an illness shock is managed by parents depending on whether their child has recently married within the kin group (endogamously) or

[24]The sample corresponds to parents for whom the illness shock status for both periods and the type of marriage made by the child are all known. Mean test differences are computed robust to heteroscedasticity.

outside the kin group (exogamously). A differential effect is expected if mutual insurance within the kin group is an important source of insurance, and if to increase the group's efficiency, members have to demonstrate their commitment to the group, for instance, by marrying a child to a member of the kin group. In this respect, we exploit individual level panel data on consumption, monetary and non-monetary transfers collected in Senegal in 2006/2007 and in 2011/2012.

We find that parents whose daughter has married endogamously between the two waves of the interview smooth better their consumption than parents whose daughters has married exogamously during the same time interval. This is especially true for mothers. We show in addition that this smoothing effect is achieved not through increased *monetary* transfers from the kin group, but through a higher decrease of the ratio of children. One reason could be that child fostering is easier to organize within kin groups reinforced by endogamous unions.

In Senegal, endogamous marriages are also marriages that lead more often daughters to move distant. We also show that having a daughter who has married outside the origin district decreases parents' ability to smooth an illness shock. Again, this is not due to a decrease of monetary transfers received, but to a lower increase of the ratio of workers in the household. One reason could be that the reallocation of workers is slowed within dispersed kin group.

Our findings contributes to the literature in some important ways. First, market imperfections relative to insurance can also affect marriage arrangements, notably by leading parents to prefer for their children a marriage with a member of the kin group; second, non-monetary transfers, more than monetary ones, are in our setting important channels through which smoothing is acheived within extended households. They also raise questions. In particular, one might wonder why children accept the arrangement desired by their parents, and the conditions under which they accept. These questions are investigated in a companion paper.

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8 Appendix

Table 12: Characteristics of parents

	N Exo	mean Exo	N Endo	mean Endo	mean test(pval)
r1	139	139.00	177	177.00	316.00
has a French/Arab education	139	0.33	177	0.10	0.00
has a Koranic education	139	0.26	177	0.29	0.56
Wolof/Lebou	141	0.38	179	0.52	0.01
Peuhl	141	0.33	179	0.23	0.07
N. of parents in baseline	141	1.68	180	1.82	0.00
household food consumption level per capita (in log)	141	11.81	180	11.48	0.00
household non-food consumption level per capita (in log)	141	11.67	180	10.75	0.00
place of residence (rural=1)	141	0.27	180	0.76	0.00
zone==Dakar	141	0.43	180	0.12	0.00
zone==North	141	0.09	180	0.12	0.28
zone==East	141	0.08	180	0.08	0.99
zone==South	141	0.17	180	0.12	0.23
log(net transfers from/to kin by hh pcap in 2006)	141	-0.01	180	0.85	0.17
has ever been fostered during childhood	141	1.88	180	1.80	0.05

Table 13: Characteristics of siblings of mothers

	N Exo	mean Exo	N Endo	mean Endo	mean test(pval)
r1	88	88.00	102	102.00	190.00
N. brothers of same parents	89	2.03	101	1.86	0.48
N. brothers of same father only	88	1.13	101	1.57	0.10
N. brothers of same mother only	89	0.36	101	0.17	0.12
N. sisters of same parents	89	2.35	101	1.78	0.02
N. sisters of same father only	87	0.92	101	1.09	0.43
N. sisters of same mother only	88	0.19	101	0.34	0.23

Table 14: Characteristics of siblings of fathers

	N Exo	mean Exo	N Endo	mean Endo	mean test(pval)
r1	51	51.00	75	75.00	126.00
N. brothers of same parents	51	1.18	75	1.65	0.06
N. brothers of same father only	51	1.08	75	1.23	0.63
N. brothers of same mother only	51	0.10	75	0.28	0.14
N. sisters of same parents	51	1.41	75	1.32	0.70
N. sisters of same father only	51	0.96	75	1.13	0.58
N. sisters of same mother only	51	0.18	75	0.28	0.31

Table 15: Logit Model Predicting Endogamous Marriage: Sample of Parents of Daughters

	(1)	(2)	(3)	(4)	(4) on mothers only
has a French/Arab education	-2.41 (0.58)***	-1.78 (0.89)**	-1.83 (0.85)**	-2.02 (0.69)***	-3.40 (0.96)***
has a Koranic education	-0.46 (0.40)	-0.51 (0.61)	-0.54 (0.64)	-0.59 (0.64)	0.09 (0.70)
N. of parents in baseline		0.51 (0.54)	0.64 (0.56)	0.59 (0.57)	0.41 (0.64)
household food consumption level per capita (in log)		0.53 (0.36)	0.53 (0.37)	0.55 (0.38)	0.20 (0.39)
household non-food consumption level per capita (in log)		-0.46 (0.28)	-0.50 (0.29)*	-0.49 (0.30)*	-0.24 (0.39)
place of residence (rural=1)		2.58 (0.84)***	2.63 (0.85)***	2.68 (0.81)***	2.29 (0.82)***
log(net transfers from/to kin by hh pcap in 2006)			0.05 (0.04)	0.05 (0.04)	0.07 (0.04)*
has ever been fostered during childhood			-0.32 (0.49)	-0.29 (0.53)	-0.71 (0.71)
N. brothers (resp. sisters) same parents of mother (resp. father)				-0.13 (0.12)	-0.27 (0.16)*
N. brothers (resp. sisters) same father only of mother (resp. father)				0.15 (0.14)	0.37 (0.15)**
N. brothers (resp. sisters) same mother only of mother (resp. father)				-0.01 (0.33)	-0.27 (0.53)
Constant	0.55 (0.39)	-3.00 (4.94)	-2.30 (4.98)	-2.47 (5.04)	0.24 (6.03)
N	207	207	207	203	125
chi2	18.19	34.44	43.35	61.67	49.34
r2_p	0.13	0.37	0.38	0.38	0.39

Note: ethnic groups and geographic areas controlled for. * p<0.10, ** p<0.05, *** p<0.01.

Table 16: Characteristics of parents of daughters

	N Exo	mean Exo	N Endo	mean Endo	mean test(pval)
r1	94	94.00	114	114.00	208.00
has a French/Arab education	94	0.35	114	0.05	0.00
has a Koranic education	94	0.26	114	0.31	0.41
Wolof/Lebou	95	0.39	116	0.53	0.04
Peuhl	95	0.32	116	0.21	0.08
N. of parents in baseline	95	1.71	117	1.85	0.01
household food consumption level per capita (in log)	95	11.69	117	11.51	0.04
household non-food consumption level per capita (in log)	95	11.61	117	10.68	0.00
place of residence (rural=1)	95	0.23	117	0.79	0.00
zone==Dakar	95	0.44	117	0.10	0.00
zone==North	95	0.08	117	0.09	0.80
zone==East	95	0.03	117	0.19	0.00
zone==South	95	0.05	117	0.15	0.01
log(net transfers from/to kin by hh pcap in 2006)	95	0.38	117	1.04	0.39
has ever been fostered during childhood	95	1.87	117	1.79	0.12

Table 17: Parents of daughters: Characteristics of siblings of mothers

	N Exo	mean Exo	N Endo	mean Endo	mean test(pval)
r1	62	62.00	66	66.00	128.00
N. brothers of same parents	62	2.06	66	1.70	0.22
N. brothers of same father only	62	1.08	66	1.70	0.08
N. brothers of same mother only	62	0.50	66	0.17	0.05
N. sisters of same parents	62	2.47	66	1.85	0.05
N. sisters of same father only	62	1.00	66	0.97	0.91
N. sisters of same mother only	62	0.26	66	0.41	0.36

Table 18: Parents of daughters: Characteristics of siblings of fathers

	N Exo	mean Exo	N Endo	mean Endo	mean test(pval)
r1	32	32.00	48	48.00	80.00
N. brothers of same parents	32	1.13	48	1.79	0.04
N. brothers of same father only	32	1.50	48	1.35	0.73
N. brothers of same mother only	32	0.13	48	0.35	0.20
N. sisters of same parents	32	1.28	48	1.48	0.52
N. sisters of same father only	32	1.44	48	0.96	0.28
N. sisters of same mother only	32	0.13	48	0.29	0.17

Table 19: Measures of consumption of parents of daughters depending of the type of marriage of the child

Variables	Exogamous Marriage	Endogamous Marriage	Diff. in mean	Double diff.
Food exp. of the household in 2006	160133.37	127522.85	32610.52	
			(0.10)	
Food exp. of the household in 2011	164726.68	135049.41	29677.27	
			(0.29)	
Double difference				2933.25
				(0.92)
Non Food exp. of the household in 2006	236286.46	85912.92	150373.53***	
			(0.00)	
Non Food exp. of the household in 2011	215012.43	76816.08	138196.35***	
			(0.00)	
Double difference				12177.18
				(0.83)
Number of observation	62	68	136	136

Note: Standard errors of double difference are clustered at the origin household level. Significance levels are denoted as follows: * p<0.10, ** p<0.05, *** p<0.01.

Table 20: Baseline characteristics of parents depending on whether they declare an illness shock or not

Variables	No Shock in 2006	Shock in 2006	Diff.
Rural	0.57	0.51	0.06
			(0.30)
Number of ind. in the household	12.31	11.42	0.89
			(0.18)
Number of parents in the hh	1.80	1.73	0.07
			(0.18)
Number of ind. in the cell	4.15	4.03	0.12
			(0.70)
ln(food cons. of the cell pcap)	11.61	11.66	-0.05
			(0.56)
ln(non-food cons. of the cell pcap)	11.04	11.20	-0.16
			(0.39)
N	137.00	159.00	296.00

Table 21: Baseline characteristics of parents of daughters depending on whether they declare an illness shock or not

Variables	No Shock in 2006	Shock in 2006	Diff.
Rural	0.57	0.50	0.07
			(0.36)
Number of ind. in the household	12.24	11.75	0.49
			(0.56)
Number of parents in the hh	1.80	1.78	0.02
			(0.73)
Number of ind. in the cell	4.30	4.17	0.13
			(0.75)
ln(food cons. of the cell pcap)	11.64	11.60	0.05
			(0.65)
ln(non-food cons. of the cell pcap)	11.12	11.26	-0.14
			(0.46)
N	91.00	101.00	192.00

Table 22: Parents of married children: probability to declare an illness shock estimated as a linear probability model with individual fixed effects

	Health Shock
Endo_it	-0.06 (0.09)
Outside locality	0.06 (0.10)
Number of ind. in the hh	-0.01 (0.01)
hh consumption per capita (health exp. excluded)	0.03 (0.05)
N	295.00
R	0.02
F	1.24

Note: The model includes time trend specific to geographic areas and to rural location.
Standard errors are in parentheses and are clustered at the origin household level.
Significance levels are denoted as follows: * p<0.10, ** p<0.05, *** p<0.01.

Table 23: Parents of married daughters : probability to declare an illness shock estimated as a linear probability model with individual fixed effects

	Health Shock
Endo_it	-0.07 (0.13)
Outside locality	0.05 (0.12)
Number of ind. in the hh	-0.01 (0.01)
hh consumption per capita (health exp. excluded)	0.01 (0.07)
N	191.00
R	0.05
F	1.69

Note: The model includes time trend specific to geographic areas and to rural location.
Standard errors are in parentheses and are clustered at the origin household level.
Significance levels are denoted as follows: * p<0.10, ** p<0.05, *** p<0.01.

Table 24: Food consumption Parents of All

	All Sample			Mothers	
	(1)	(2)	(3)	(1)	(2)
Endo_it	0.11 (0.14)	0.11 (0.15)	0.10 (0.15)	0.11 (0.17)	0.07 (0.18)
Illness_it	0.10 (0.07)	0.10 (0.08)	0.09 (0.08)	0.06 (0.11)	0.06 (0.11)
Endo_it*Illness_it		-0.00 (0.15)	-0.02 (0.16)	0.00 (0.17)	0.03 (0.19)
OutDistrict_ht			0.13 (0.21)		0.25 (0.25)
OutDistrict_ht*Illness_it			0.08 (0.24)		-0.11 (0.28)
Constant	11.56 (0.06)***	11.55 (0.06)***	11.56 (0.06)***	11.61 (0.08)***	11.61 (0.08)***
T*rural_06*region_06 FE	Yes	Yes	Yes	Yes	Yes
Average	12	12	12	12	12
Average difference	-0.29	-0.29	-0.29	-0.49	-0.49
N	285	285	285	168	168
R	0.05	0.05	0.05	0.03	0.02
F	2.61	2.49	2.31	2.88	2.50

Note: Standard errors are clustered at the level of origin household. Significance levels are denoted as follows: + p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

Table 25: Non food consumption (health expenditures excluded) Parents of All

	All Sample			Mothers	
	(1)	(2)	(3)	(1)	(2)
Endo_it	0.23 (0.16)+	0.24 (0.18)	0.26 (0.19)	0.19 (0.20)	0.18 (0.21)
Illness_it	0.03 (0.08)	0.03 (0.11)	0.03 (0.11)	-0.10 (0.14)	-0.09 (0.14)
Endo_it*Illness_it		-0.01 (0.20)	0.00 (0.21)	0.15 (0.25)	0.23 (0.27)
OutDistrict_ht			-0.20 (0.28)		-0.14 (0.30)
OutDistrict_ht*Illness_it			-0.03 (0.38)		-0.32 (0.42)
Constant	11.15 (0.06)***	11.15 (0.07)***	11.15 (0.07)***	11.30 (0.08)***	11.30 (0.08)***
T*rural_06*region_06 FE	Yes	Yes	Yes	Yes	Yes
Average	12	12	12	12	12
Average difference	-0.14	-0.14	-0.14	-0.11	-0.11
N	285	285	285	168	168
R	0.11	0.11	0.12	0.10	0.11
F	2.44	2.25	2.06	2.09	2.00

Note: Standard errors are clustered at the level of origin household. Significance levels are denoted as follows: + p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

Table 26: Food consumption Parents of All

	All Sample				Mothers			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Endo_it	0.09 (0.15)	0.08 (0.15)	0.08 (0.15)	-0.03 (0.13)	0.04 (0.18)	0.04 (0.18)	0.05 (0.19)	-0.14 (0.14)
Illness_it	0.08 (0.14)	0.13 (0.16)	0.12 (0.17)	0.13 (0.15)	0.17 (0.25)	0.17 (0.25)	0.16 (0.27)	0.21 (0.23)
Endo_it*Illness_it	0.01 (0.16)	0.02 (0.16)	0.01 (0.19)	0.05 (0.17)	0.07 (0.19)	0.07 (0.19)	0.05 (0.21)	0.11 (0.20)
OutDistrict_ht	0.12 (0.21)	0.12 (0.21)	0.12 (0.21)	-0.01 (0.20)	0.23 (0.25)	0.23 (0.25)	0.23 (0.25)	0.10 (0.22)
OutDistrict_ht*Illness_it	0.08 (0.24)	0.07 (0.24)	0.07 (0.24)	0.10 (0.22)	-0.09 (0.28)	-0.09 (0.28)	-0.09 (0.29)	-0.10 (0.26)
Rural_i*Illness_it	-0.05 (0.15)	-0.05 (0.15)	-0.06 (0.15)	-0.03 (0.14)	-0.21 (0.25)	-0.21 (0.25)	-0.22 (0.25)	-0.30 (0.21)
FormalEdu_i*Illness_it	0.16 (0.17)	0.17 (0.17)	0.18 (0.16)	0.18 (0.17)	0.06 (0.28)	0.06 (0.28)	0.07 (0.28)	0.06 (0.27)
NSibOppSexSameFa_i*Illness_it		-0.05 (0.04)	-0.05 (0.04)	-0.03 (0.04)	-0.01 (0.06)	-0.01 (0.06)	-0.01 (0.07)	0.02 (0.07)
Endo_i*Illness_it			0.02 (0.17)	-0.08 (0.16)			0.04 (0.20)	-0.05 (0.20)
Child in the Household				-0.11 (0.10)				-0.12 (0.11)
Number of ind. in the hh				-0.04 (0.01)***				-0.04 (0.01)***
Constant	11.56 (0.06)***	11.57 (0.06)***	11.57 (0.06)***	12.19 (0.17)***	11.61 (0.09)***	11.61 (0.09)***	11.60 (0.09)***	12.14 (0.16)***
T*rural_06*region_06 FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average	12	12	12	12	12	12	12	12
Average difference	-0.29	-0.29	-0.29	-0.10	-0.49	-0.49	-0.49	-0.09
N	285	285	285	285	168	168	168	168
R	0.05	0.05	0.05	0.20	0.02	0.02	0.02	0.21
F	2.04	1.98	1.88	3.46	2.12	2.12	2.00	3.52

Note: Standard errors are clustered at the level of origin household. Significance levels are denoted as follows: + p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

Table 27: Non food consumption (health expenditures excluded) Parents of All

	All Sample				Mothers			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Endo_it	0.26 (0.19)	0.28 (0.19)+	0.28 (0.20)	0.28 (0.19)+	0.17 (0.21)	0.17 (0.21)	0.15 (0.22)	0.16 (0.21)
Illness_it	-0.06 (0.16)	-0.15 (0.18)	-0.16 (0.18)	-0.15 (0.18)	-0.35 (0.19)*	-0.35 (0.19)*	-0.30 (0.21)+	-0.26 (0.22)
Endo_it*Illness_it	0.02 (0.21)	0.00 (0.21)	-0.01 (0.25)	-0.02 (0.25)	0.22 (0.26)	0.22 (0.26)	0.27 (0.30)	0.25 (0.30)
OutDistrict_ht	-0.20 (0.28)	-0.20 (0.27)	-0.20 (0.27)	-0.15 (0.30)	-0.10 (0.27)	-0.10 (0.27)	-0.09 (0.27)	-0.09 (0.27)
OutDistrict_ht*Illness_it	-0.04 (0.38)	-0.02 (0.38)	-0.02 (0.37)	-0.02 (0.38)	-0.33 (0.41)	-0.33 (0.41)	-0.35 (0.40)	-0.36 (0.41)
Rural_i*Illness_it	0.08 (0.17)	0.09 (0.18)	0.09 (0.18)	0.06 (0.18)	0.05 (0.21)	0.05 (0.21)	0.07 (0.21)	0.04 (0.22)
FormalEdu_i*Illness_it	0.15 (0.23)	0.14 (0.23)	0.14 (0.22)	0.17 (0.21)	0.06 (0.31)	0.06 (0.31)	0.03 (0.31)	0.01 (0.31)
NSibOppSexSameFa_i*Illness_it		0.09 (0.04)**	0.09 (0.04)**	0.08 (0.04)*	0.17 (0.07)**	0.17 (0.07)**	0.17 (0.07)**	0.17 (0.07)**
Endo_i*Illness_it			0.02 (0.21)	0.05 (0.21)			-0.12 (0.25)	-0.08 (0.25)
Child in the Household				0.14 (0.18)				-0.01 (0.18)
Number of ind. in the hh				0.01 (0.02)				0.02 (0.02)
Constant	11.16 (0.07)***	11.14 (0.07)***	11.14 (0.07)***	10.89 (0.28)***	11.27 (0.08)***	11.27 (0.08)***	11.28 (0.08)***	11.07 (0.25)***
T*rural_06*region_06 FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average	12	12	12	12	12	12	12	12
Average difference	-0.14	-0.14	-0.14	-0.13	-0.11	-0.11	-0.11	-0.09
N	285	285	285	285	168	168	168	168
R	0.11	0.12	0.12	0.12	0.12	0.12	0.12	0.13
F	1.87	1.97	1.85	1.78	2.04	2.04	1.91	1.89

Note: Standard errors are clustered at the level of origin household. Significance levels are denoted as follows: + p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

Table 28: Testing for the mechanisms for Parents of daughters: Transfers from and to kin

	Transfers received from kin by the Household							
	Occurrence		Amount in log		Freq		Net amount in log	
Endo_it	0.26 (0.15)*	0.24 (0.15)+	1.78 (1.53)	1.46 (1.41)	0.89 (7.15)	2.62 (6.73)	-1.98 (1.63)	-2.18 (1.72)
Illness_it	0.10 (0.14)	0.11 (0.15)	1.04 (1.29)	0.99 (1.36)	0.19 (7.45)	2.47 (7.66)	2.24 (1.67)	2.20 (1.69)
Endo_it*Illness_it	-0.09 (0.16)	-0.10 (0.15)	-1.05 (1.57)	-1.01 (1.50)	1.47 (8.03)	-0.04 (7.86)	0.27 (1.88)	0.30 (1.89)
OutDistrict_ht	-0.18 (0.15)	-0.15 (0.15)	-1.60 (1.46)	-1.15 (1.50)	8.02 (9.76)	10.46 (9.90)	0.78 (2.36)	1.04 (2.35)
OutDistrict_ht*Illness_it	0.22 (0.18)	0.20 (0.18)	1.84 (1.65)	1.56 (1.66)	-2.40 (9.25)	-4.30 (8.82)	0.47 (2.72)	0.31 (2.70)
Rural_i*Illness_it	-0.15 (0.15)	-0.16 (0.15)	-1.90 (1.37)	-1.99 (1.37)+	-2.53 (10.00)	-2.48 (9.14)	-2.77 (1.34)**	-2.83 (1.35)**
FormalEdu_i*Illness_it	-0.11 (0.17)	-0.09 (0.18)	-0.89 (1.47)	-0.52 (1.59)	-1.61 (7.02)	-1.66 (6.49)	-1.49 (2.23)	-1.26 (2.38)
NSibOppSexSameFa_i*Illness_it	0.03 (0.04)	0.03 (0.04)	0.46 (0.36)	0.38 (0.36)	-0.93 (1.67)	-2.07 (1.74)	0.34 (0.44)	0.30 (0.43)
Endo_i*Illness_it	-0.01 (0.19)	-0.01 (0.19)	0.13 (1.67)	0.25 (1.68)	2.02 (9.11)	2.31 (8.86)	-1.49 (1.85)	-1.42 (1.86)
Child in the Household		0.12 (0.11)		1.58 (0.97)+		10.60 (5.10)**		0.91 (1.31)
Number of ind. in the hh		0.00 (0.01)		-0.03 (0.09)		1.33 (0.61)**		-0.02 (0.12)
Constant	0.53 (0.06)***	0.40 (0.17)**	-2.09 (0.54)***	-3.32 (1.55)**	9.69 (2.46)***	-17.17 (10.38)+	0.71 (0.56)	0.09 (2.19)
T*region_06 FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average	0.57	0.58	-0.77	-0.77	9.77	9.95	1.63	1.63
N	184	184	184	184	184	184	184	184
R	0.28	0.29	0.33	0.34	0.14	0.20	0.05	0.05
F	3.39	3.24	4.16	4.02	2.87	2.69	1.01	0.92

Note: Standard errors are clustered at the level of origin household. Significance levels are denoted as follows: + p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

Table 29: Testing for the mechanisms for Mothers of daughters: Transfers from and to kin

	Transfers received from kin by the Household							
	Occurrence		Amount in log		Freq pc		Net amount in log	
Endo_it	0.20 (0.16)	0.18 (0.15)	1.10 (1.56)	0.94 (1.39)	1.71 (1.71)	2.32 (1.67)	-2.77 (1.70)+	-2.54 (1.70)+
Illness_it	-0.08 (0.17)	-0.06 (0.18)	-0.05 (1.51)	0.03 (1.63)	0.63 (3.05)	1.53 (3.06)	3.67 (2.18)*	4.00 (2.16)*
Endo_it*Illness_it	-0.06 (0.17)	-0.09 (0.17)	-0.36 (1.79)	-0.68 (1.71)	1.51 (2.77)	0.90 (2.65)	2.03 (2.26)	1.73 (2.25)
OutDistrict_ht	-0.02 (0.17)	0.02 (0.17)	-0.07 (1.71)	0.47 (1.71)	2.02 (2.43)	2.28 (2.44)	0.51 (2.26)	0.73 (2.31)
OutDistrict_ht*Illness_it	0.03 (0.19)	0.03 (0.19)	-0.43 (1.96)	-0.38 (1.90)	-5.56 (5.70)	-5.58 (5.50)	-0.30 (2.71)	-0.30 (2.73)
Rural_i*Illness_it	0.08 (0.24)	0.05 (0.24)	0.18 (2.08)	-0.04 (2.09)	-0.89 (3.04)	-1.00 (2.98)	-2.78 (1.96)	-2.84 (1.96)+
FormalEdu_i*Illness_it	0.27 (0.28)	0.33 (0.30)	2.22 (2.26)	2.92 (2.50)	-4.19 (4.31)	-4.81 (4.05)	-1.43 (2.75)	-1.53 (2.93)
NSibOppSexSameFa_i*Illness_it	0.02 (0.06)	0.00 (0.06)	0.21 (0.55)	0.05 (0.56)	-0.37 (0.72)	-0.57 (0.76)	0.50 (0.66)	0.39 (0.68)
Endo_i*Illness_it	-0.08 (0.25)	-0.06 (0.25)	-1.04 (2.27)	-0.72 (2.29)	-2.04 (2.60)	-2.32 (2.61)	-4.19 (2.23)*	-4.24 (2.26)*
Child in the Household		0.25 (0.12)**		2.73 (1.09)**		1.63 (2.47)		1.17 (1.33)
Number of ind. in the hh		0.00 (0.01)		0.01 (0.08)		0.26 (0.15)*		0.10 (0.10)
Constant	0.62 (0.07)***	0.33 (0.17)*	-1.31 (0.61)**	-4.17 (1.56)***	3.82 (1.05)***	-0.98 (3.69)	0.95 (0.69)	-1.48 (1.99)
T*region_06 FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average	0.61	0.63	-0.47	-0.47	2.40	2.47	1.53	1.53
N	111	111	111	111	111	111	111	111
R	0.18	0.22	0.25	0.29	0.14	0.15	0.04	0.04
F	2.22	2.33	3.00	3.31	3.32	3.17	0.95	1.17

Note: Standard errors are clustered at the level of origin household. Significance levels are denoted as follows: + p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

Table 30: Testing for the mechanisms for Parents of daughters: All Transfers

	Transfers received by the Household							
	Occurrence		Amount in log		Freq		Net amount in log	
Endo_it	0.16 (0.15)	0.15 (0.15)	1.31 (1.44)	1.12 (1.32)	0.06 (0.55)	-0.22 (0.61)	-1.42 (1.49)	-1.13 (1.56)
Illness_it	0.06 (0.12)	0.07 (0.13)	0.65 (1.16)	0.60 (1.21)	-0.44 (0.61)	-0.48 (0.68)	1.89 (1.73)	2.01 (1.73)
Endo_it*Illness_it	-0.06 (0.16)	-0.06 (0.16)	-0.83 (1.65)	-0.79 (1.59)	-0.52 (0.71)	-0.49 (0.73)	0.22 (1.96)	0.10 (1.96)
OutDistrict_ht	-0.17 (0.15)	-0.17 (0.15)	-1.44 (1.46)	-1.24 (1.53)	0.70 (1.01)	1.12 (1.02)	1.78 (2.11)	1.66 (2.16)
OutDistrict_ht*Illness_it	0.13 (0.17)	0.12 (0.18)	1.07 (1.63)	0.99 (1.65)	0.88 (0.82)	0.74 (0.79)	-1.36 (2.48)	-1.30 (2.49)
Rural_i*Illness_it	-0.23 (0.14)*	-0.24 (0.14)*	-2.46 (1.26)*	-2.52 (1.25)**	-0.10 (0.76)	-0.20 (0.79)	-3.28 (1.28)**	-3.22 (1.30)**
FormalEdu_i*Illness_it	-0.04 (0.16)	-0.03 (0.17)	-0.60 (1.46)	-0.42 (1.55)	-0.52 (0.63)	-0.22 (0.58)	-1.55 (2.16)	-1.74 (2.17)
NSibOppSexSameFa_i*Illness_it	-0.00 (0.04)	-0.00 (0.04)	0.16 (0.37)	0.14 (0.37)	-0.20 (0.16)	-0.27 (0.17)+	0.26 (0.50)	0.24 (0.50)
Endo_i*Illness_it	0.15 (0.15)	0.15 (0.15)	1.56 (1.42)	1.60 (1.44)	1.51 (0.76)*	1.60 (0.78)**	-0.66 (1.74)	-0.70 (1.73)
Child in the Household		0.02 (0.11)		0.68 (1.13)		1.44 (0.49)***		-0.36 (1.24)
Number of ind. in the hh		0.00 (0.01)		-0.03 (0.10)		-0.02 (0.05)		0.08 (0.11)
Constant	0.60 (0.05)***	0.58 (0.17)***	-1.37 (0.54)**	-1.70 (1.72)	0.04 (0.23)	-1.19 (0.86)	0.48 (0.59)	-0.11 (2.09)
T*region_06 FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average	0.70	0.71	0.23	0.23	0.83	0.83	1.19	1.19
N	184	184	184	184	184	184	184	184
R	0.29	0.30	0.33	0.33	0.46	0.49	0.06	0.06
F	3.45	3.21	4.55	4.18	8.93	8.80	0.98	1.04

Note: Standard errors are clustered at the level of origin household. Significance levels are denoted as follows: + p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

Table 31: Testing for the mechanisms for Mothers of daughters: All Transfers

	Transfers received by the Household							
	Occurrence		Amount in log		Freq pc		Net amount in log	
Endo_it	0.08 (0.15)	0.06 (0.14)	0.70 (1.47)	0.58 (1.34)	0.59 (0.76)	0.53 (0.80)	-2.47 (1.70)	-2.07 (1.75)
Illness_it	-0.16 (0.14)	-0.14 (0.15)	-0.79 (1.33)	-0.78 (1.41)	0.21 (0.96)	0.26 (1.04)	2.48 (2.34)	2.84 (2.32)
Endo_it*Illness_it	-0.02 (0.17)	-0.03 (0.17)	-0.44 (1.76)	-0.63 (1.72)	-0.58 (0.94)	-0.79 (0.95)	1.85 (2.22)	1.67 (2.24)
OutDistrict_ht	-0.03 (0.17)	-0.02 (0.17)	-0.09 (1.74)	0.23 (1.76)	1.26 (1.38)	1.56 (1.39)	1.60 (2.10)	1.56 (2.13)
OutDistrict_ht*Illness_it	0.00 (0.18)	0.00 (0.18)	-0.74 (1.91)	-0.58 (1.89)	-0.30 (1.67)	-0.16 (1.60)	-2.12 (2.44)	-2.13 (2.44)
Rural_i*Illness_it	-0.07 (0.22)	-0.09 (0.21)	-0.76 (1.79)	-0.89 (1.75)	-0.66 (1.15)	-0.77 (1.16)	-3.84 (1.98)*	-3.77 (1.98)*
FormalEdu_i*Illness_it	0.38 (0.26)+	0.41 (0.28)+	2.80 (2.38)	3.25 (2.60)	-1.82 (1.31)	-1.46 (1.30)	0.13 (3.07)	-0.40 (3.15)
NSibOppSexSameFa_i*Illness_it	-0.02 (0.06)	-0.03 (0.06)	-0.14 (0.61)	-0.22 (0.61)	-0.14 (0.26)	-0.22 (0.25)	0.34 (0.76)	0.30 (0.78)
Endo_i*Illness_it	0.16 (0.18)	0.17 (0.18)	1.06 (1.67)	1.26 (1.72)	1.24 (1.01)	1.40 (1.01)	-1.22 (2.26)	-1.47 (2.25)
Child in the Household		0.12 (0.12)		1.58 (1.22)		1.45 (0.66)**		-0.21 (1.40)
Number of ind. in the hh		-0.00 (0.01)		-0.00 (0.09)		0.01 (0.06)		0.12 (0.10)
Constant	0.71 (0.06)***	0.59 (0.17)***	-0.40 (0.61)	-1.98 (1.72)	0.03 (0.32)	-1.60 (0.97)+	0.69 (0.71)	-0.56 (2.07)
T*region_06 FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average	0.69	0.71	0.23	0.23	0.85	0.85	0.97	0.97
N	111	111	111	111	111	111	111	111
R	0.20	0.21	0.25	0.26	0.47	0.50	0.01	0.01
F	2.28	2.12	3.14	2.96	8.32	7.79	0.68	1.04

Note: Standard errors are clustered at the level of origin household. Significance levels are denoted as follows: + p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

Table 32: Testing for the mechanisms for Parents of daughters: Composition of the Household

	Household compo					
	Ratio workers		N. mbr		Ratio children	
Endo_it	-0.02 (0.07)	-0.02 (0.07)	-2.75 (1.94)	-2.81 (1.95)	0.06 (0.04)	0.05 (0.04)
Illness_it	0.11 (0.12)	0.12 (0.11)	-1.62 (1.32)	-1.62 (1.32)	-0.03 (0.06)	-0.03 (0.06)
Endo_it*Illness_it	0.06 (0.10)	0.04 (0.10)	1.14 (2.04)	1.14 (2.02)	-0.03 (0.04)	-0.03 (0.04)
OutDistrict_ht	0.02 (0.08)	0.02 (0.08)	0.25 (1.28)	0.36 (1.33)	-0.02 (0.04)	-0.01 (0.04)
OutDistrict_ht*Illness_it	-0.16 (0.12)	-0.18 (0.11)+	0.01 (1.66)	-0.06 (1.67)	-0.01 (0.05)	-0.02 (0.05)
Rural_i*Illness_it	0.03 (0.09)	0.02 (0.08)	-0.54 (1.24)	-0.55 (1.24)	-0.04 (0.05)	-0.05 (0.05)
FormalEdu_i*Illness_it	-0.10 (0.12)	-0.09 (0.10)	1.67 (1.30)	1.75 (1.35)	0.02 (0.06)	0.03 (0.06)
NSibOppSexSameFa_i*Illness_it	0.01 (0.02)	0.01 (0.02)	0.41 (0.25)+	0.39 (0.27)+	0.00 (0.01)	-0.00 (0.01)
Endo_i*Illness_it	-0.05 (0.09)	-0.04 (0.09)	0.30 (1.38)	0.33 (1.39)	0.08 (0.05)*	0.09 (0.05)*
Age Mean of the other individuals		0.01 (0.01)				
Child in the Household				0.38 (1.08)		0.04 (0.03)
Constant	0.22 (0.02)***	0.11 (0.15)	12.29 (0.53)***	11.92 (1.14)***	0.42 (0.01)***	0.38 (0.04)***
T*region_06 FE	Yes	Yes	Yes	Yes	Yes	Yes
Average	0.28	0.28	10.33	10.33	0.33	0.33
N	184	184	184	184	184	184
R	0.21	0.23	0.09	0.09	0.04	0.05
F	2.91	2.85	1.95	1.80	1.13	1.36

Note: Standard errors are clustered at the level of origin household. Significance levels are denoted as follows: + p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

Table 33: Testing for the mechanisms for Mothers of daughters: Composition of the household

	Household compo					
	Ratio workers		N. mbr		Ratio children	
Endo_it	0.03 (0.08)	0.03 (0.08)	-2.99 (2.61)	-3.08 (2.60)	0.07 (0.04)+	0.07 (0.04)+
Illness_it	0.19 (0.20)	0.19 (0.19)	-3.07 (2.13)	-3.06 (2.13)	-0.09 (0.10)	-0.09 (0.10)
Endo_it*Illness_it	0.06 (0.12)	0.04 (0.13)	1.59 (2.72)	1.45 (2.66)	-0.08 (0.05)+	-0.09 (0.05)+
OutDistrict_ht	0.08 (0.08)	0.08 (0.08)	0.09 (1.37)	0.33 (1.46)	-0.01 (0.04)	-0.00 (0.04)
OutDistrict_ht*Illness_it	-0.28 (0.15)*	-0.31 (0.14)**	0.15 (2.33)	0.18 (2.39)	-0.05 (0.05)	-0.05 (0.05)
Rural_i*Illness_it	-0.06 (0.14)	-0.06 (0.13)	-0.35 (2.13)	-0.45 (2.07)	0.01 (0.08)	0.00 (0.08)
FormalEdu_i*Illness_it	-0.19 (0.25)	-0.17 (0.21)	4.06 (2.51)+	4.40 (2.54)*	0.11 (0.11)	0.13 (0.11)
NSibOppSexSameFa_i*Illness_it	0.02 (0.02)	0.02 (0.02)	0.44 (0.37)	0.38 (0.42)	-0.01 (0.01)	-0.01 (0.01)
Endo_i*Illness_it	-0.05 (0.13)	-0.05 (0.12)	1.84 (1.98)	1.99 (2.02)	0.14 (0.07)*	0.15 (0.07)**
Age Mean of the other individuals		0.00 (0.01)				
Child in the Household				1.23 (1.36)		0.05 (0.04)
Constant	0.21 (0.04)***	0.13 (0.19)	12.09 (0.81)***	10.86 (1.45)***	0.41 (0.02)***	0.37 (0.04)***
T*region_06 FE	Yes	Yes	Yes	Yes	Yes	Yes
Average	0.29	0.29	10.17	10.17	0.32	0.32
N	111	111	111	111	111	111
R	0.17	0.17	0.08	0.09	0.07	0.08
F	2.96	2.76	1.55	1.47	1.45	1.76

Note: Standard errors are clustered at the level of origin household. Significance levels are denoted as follows: + p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

Table 34: Non food consumption (health expenditures excluded) Parents of Daughters

	All Sample			Mothers	
	(1)	(2)	(3)	(1)	(2)
Endo_it	0.20 (0.18)	0.07 (0.20)	0.16 (0.18)	0.02 (0.23)	0.07 (0.22)
AltIllness_it	0.10 (0.11)	-0.01 (0.15)	-0.02 (0.14)	-0.06 (0.16)	-0.09 (0.16)
Endo_it*AltIllness_it		0.38 (0.26)+	0.34 (0.23)+	0.54 (0.35)+	0.53 (0.35)+
OutDistrict_ht			-0.37 (0.30)		-0.38 (0.34)
OutDistrict_ht*AltIllness_it			0.07 (0.34)		-0.00 (0.42)
Constant	11.09 (0.05)***	11.12 (0.06)***	11.13 (0.06)***	11.20 (0.06)***	11.21 (0.06)***
T*region_06 FE	Yes	Yes	Yes	Yes	Yes
Average	11	11	11	11	11
Average difference	-0.06	-0.06	-0.06	-0.08	-0.08
N	184	184	184	111	111
R	0.12	0.13	0.14	0.12	0.13
F	2.85	2.85	2.47	1.85	1.88

Note: Standard errors are clustered at the level of origin household. Significance levels are denoted as follows: + p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

Table 35: Non food consumption (health expenditures excluded) Parents of Daughters

	All Sample				Mothers			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Endo_it	0.15 (0.19)	0.18 (0.19)	0.17 (0.19)	0.17 (0.17)	0.04 (0.23)	0.07 (0.22)	0.07 (0.23)	0.09 (0.21)
AltIllness_it	-0.02 (0.23)	-0.13 (0.22)	-0.12 (0.22)	-0.13 (0.23)	-0.21 (0.27)	-0.35 (0.26)	-0.34 (0.23)+	-0.30 (0.28)
Endo_it*AltIllness_it	0.38 (0.26)+	0.38 (0.26)+	0.39 (0.32)	0.38 (0.32)	0.59 (0.37)+	0.68 (0.36)*	0.70 (0.48)+	0.66 (0.50)
OutDistrict_ht	-0.37 (0.30)	-0.39 (0.30)	-0.39 (0.31)	-0.35 (0.34)	-0.39 (0.35)	-0.41 (0.34)	-0.41 (0.35)	-0.39 (0.36)
OutDistrict_ht*AltIllness_it	0.07 (0.33)	0.08 (0.34)	0.08 (0.33)	0.06 (0.34)	0.02 (0.42)	-0.08 (0.42)	-0.09 (0.42)	-0.09 (0.45)
Rural_i*AltIllness_it	-0.07 (0.24)	-0.11 (0.23)	-0.11 (0.25)	-0.10 (0.26)	0.05 (0.34)	-0.17 (0.35)	-0.17 (0.36)	-0.20 (0.37)
FormalEdu_i*AltIllness_it	0.11 (0.27)	0.06 (0.28)	0.05 (0.26)	0.06 (0.25)	0.32 (0.37)	0.13 (0.43)	0.11 (0.42)	0.05 (0.46)
NSibOppSexSameFa_i*AltIllness_it		0.10 (0.05)*	0.10 (0.05)*	0.09 (0.05)*		0.18 (0.08)**	0.18 (0.08)**	0.18 (0.08)**
Endo_i*AltIllness_it			-0.02 (0.32)	-0.00 (0.34)			-0.04 (0.41)	-0.04 (0.45)
Child in the Household				0.23 (0.25)				0.18 (0.25)
Number of ind. in the hh				0.02 (0.02)				0.02 (0.02)
Constant	11.13 (0.06)***	11.13 (0.06)***	11.13 (0.06)***	10.72 (0.37)***	11.22 (0.06)***	11.22 (0.06)***	11.23 (0.07)***	10.81 (0.34)***
T*region_06 FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average	11	11	11	11	11	11	11	11
Average difference	-0.06	-0.06	-0.06	-0.05	-0.08	-0.08	-0.08	-0.06
N	184	184	184	184	111	111	111	111
R	0.14	0.15	0.15	0.16	0.13	0.15	0.15	0.17
F	2.10	2.27	2.24	2.82	1.61	2.01	2.11	2.40

Note: Standard errors are clustered at the level of origin household. Significance levels are denoted as follows: + p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

Table 36: Food consumption Parents of Daughters

	All Sample			Mothers	
	(1)	(2)	(3)	(1)	(2)
Endo_it	0.11 (0.18)	-0.02 (0.19)	-0.04 (0.20)	0.04 (0.23)	0.04 (0.23)
AltIllness_it	0.08 (0.10)	-0.02 (0.12)	-0.02 (0.12)	-0.05 (0.15)	-0.04 (0.15)
Endo_it*AltIllness_it		0.38 (0.15)**	0.40 (0.17)**	0.37 (0.23)+	0.36 (0.24)+
OutDistrict_ht			0.06 (0.20)		0.07 (0.21)
OutDistrict_ht*AltIllness_it			-0.05 (0.23)		0.04 (0.34)
Constant	11.57 (0.06)***	11.60 (0.06)***	11.60 (0.06)***	11.64 (0.08)***	11.63 (0.08)***
T*region_06 FE	Yes	Yes	Yes	Yes	Yes
Average	11	11	11	11	11
Average difference	-0.23	-0.23	-0.23	-0.43	-0.43
N	184	184	184	111	111
R	0.02	0.03	0.02	0.00	-0.01
F	1.17	1.72	1.42	1.26	1.01

Note: Standard errors are clustered at the level of origin household. Significance levels are denoted as follows: + p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

Table 37: Food consumption Parents of Daughters

	All Sample				Mothers			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Endo_it	-0.04 (0.19)	-0.05 (0.19)	-0.07 (0.20)	-0.26 (0.17)+	0.02 (0.23)	0.01 (0.23)	0.01 (0.24)	-0.22 (0.18)
AltIllness_it	0.13 (0.18)	0.14 (0.19)	0.21 (0.24)	0.10 (0.22)	0.12 (0.25)	0.17 (0.26)	0.17 (0.32)	0.16 (0.29)
Endo_it*AltIllness_it	0.44 (0.17)**	0.44 (0.17)**	0.50 (0.20)**	0.54 (0.18)***	0.42 (0.24)*	0.40 (0.24)+	0.40 (0.28)+	0.49 (0.25)*
OutDistrict_ht	0.07 (0.21)	0.07 (0.20)	0.07 (0.21)	-0.01 (0.19)	0.06 (0.22)	0.06 (0.21)	0.06 (0.22)	-0.06 (0.19)
OutDistrict_ht*AltIllness_it	-0.09 (0.23)	-0.10 (0.23)	-0.12 (0.24)	-0.09 (0.21)	-0.00 (0.33)	0.03 (0.33)	0.03 (0.34)	-0.00 (0.29)
Rural_i*AltIllness_it	-0.25 (0.21)	-0.24 (0.21)	-0.20 (0.21)	-0.22 (0.20)	-0.30 (0.30)	-0.23 (0.30)	-0.23 (0.30)	-0.29 (0.27)
FormalEdu_i*AltIllness_it	-0.16 (0.27)	-0.15 (0.27)	-0.22 (0.27)	-0.16 (0.25)	-0.16 (0.44)	-0.10 (0.44)	-0.10 (0.48)	-0.03 (0.42)
NSibOppSexSameFa_i*AltIllness_it		-0.01 (0.05)	-0.01 (0.05)	-0.01 (0.05)		-0.05 (0.08)	-0.05 (0.08)	-0.07 (0.07)
Endo_i*AltIllness_it			-0.17 (0.27)	-0.08 (0.25)			-0.01 (0.33)	0.04 (0.31)
Child in the Household				-0.10 (0.15)				-0.19 (0.16)
Number of ind. in the hh				-0.04 (0.01)***				-0.04 (0.01)***
Constant	11.60 (0.06)***	11.60 (0.06)***	11.60 (0.06)***	12.25 (0.17)***	11.62 (0.09)***	11.62 (0.09)***	11.62 (0.09)***	12.28 (0.20)***
T*region_06 FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average	11	11	11	12	11	11	11	12
Average difference	-0.23	-0.23	-0.23	-0.08	-0.43	-0.43	-0.43	-0.06
N	184	184	184	184	111	111	111	111
R	0.02	0.02	0.01	0.20	-0.02	-0.02	-0.02	0.19
F	1.48	1.37	1.30	3.39	0.94	0.89	0.82	2.95

Note: Standard errors are clustered at the level of origin household. Significance levels are denoted as follows: + $p<0.15$, * $p<0.10$, ** $p<0.05$, *** $p<0.01$.