Customary Norms, Inheritance, and Human Capital:

Evidence from a Reform of the Matrilineal System in Ghana*

Eliana La Ferrara
Bocconi University and IGIER

Annamaria Milazzo
Bocconi University

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Abstract

This paper explores the effects of different descent rules on human capital accumulation. In a context where parents are constrained in the possibility of passing land on to their children (e.g., because it is considered property of the extended family, or clan), investment in their children's human capital might not be optimal. We focus on matrilineal inheritance rules and exploit a policy experiment in Ghana, the introduction of the 1985 Intestate Succession Law. The Law introduced minimum quotas for the land that fathers can devolve on their children through intestacy, substantially reducing the share going to the matriclan. In our setting, the Law allowed parents to move closer to the unconstrained optimum. We find evidence that, compared to the other patrilineal ethnic groups in Ghana (unaffected by the Law), children in matrilineal groups exposed to the reform received significantly less education. This effect is specific to males for whom the matrilineal constraint was binding, while there is no effect for females. This evidence suggests that before the reform matrilineal groups in Ghana invested more in their children's education to substitute for land inheritance and more generally that traditional norms are important in determining the intergenerational accumulation of property and human capital investments.

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1 Introduction

Parental investment in human capital has been shown to have important consequences for children's well being and is a crucial input into their social mobility prospects. Available evidence mostly comes from industrialized countries, where parents are generally free to pass their wealth on to their offspring according to their will. In many developing countries, however, bequests respond not only to parental decisions, but to a series of claims by extended family and lineages that are enforced through customary norms. The presence of these norms is a potential source of distortions in parents' allocation decisions, the extent of which is not yet fully understood (e.g., Platteau (2000), Pande and Udry (2006)).

This paper exploits a policy change introduced by the Government of Ghana, the Intestate Succession Law, 1985 (PNDCL 111), which radically changed the inheritance transmission rules followed by matrilineal groups in the country (notably, the Akan)[1]. According to customary matrilineal practices, Akan fathers could not devolve their land to their sons, but only to their sisters' sons or other eligible males of their own maternal kin. Akan mothers were instead free to pass their property on to their daughters. This traditional inheritance mode can be viewed as a constraint, which we refer to as the "matrilineal constraint", on the amount of land that can be passed on to a man's offspring. This constraint generates a distortion in the amount of human capital investment chosen by the parent, leading to an allocation where the mix of human and physical capital is different from the unconstrained optimum.

We formalize this intuition presenting a simple model where a parent has to allocate his income between own consumption, education of a daughter and education of a son, and where education and land enter the children's income-generating function. The matrilineal constraint is represented by an exogenous cap on the amount of land that the son can inherit. We show that a binding matrilineal constraint leads to a higher than optimal investment in education of the son, to compensate for the lower amount of land. The Intestate Succession Law introduced minimum quotas for the land that fathers should devolve on their sons, virtually reducing the claims of the matriclan to a small fraction of the land. This Law can thus be interpreted as a relaxation of the matrilineal constraint, leading to a higher amount of land devolved on sons. In our model this leads to a decrease in education

[1]The Intestate Succession Law, 1985 (PNDCL 111), now officially the Intestate Succession Act, 1985 (PNDCL 111) in the new edition of the Laws of Ghana, Vol V, p. 1951.

investment for sons, and an ambiguous effect on daughters' education. In the context of Ghana, where not all ethnic groups are matrilineal, this simple theoretical framework implies that after the passage of the Law we should expect relatively lower levels of investment in education for groups that were previously subject to the matrilineal constraint (i.e., the Akan), but not for other groups. Furthermore, because the customary norm implied restrictions on inheritance that were most binding for boys, we expect the reform to affect boys' human capital more than girls'.

We test the above predictions using five rounds of data from the Ghana Living Standards Survey (GLSS). To analyze the impact of the reform on investment in education, we restrict the sample to individuals aged 20 to 50. Then we compare educational outcomes of those who have been exposed to the reform to those whose education should not have been affected by the Law according to their age the year in which the reform was passed. Our empirical strategy is thus a difference in difference strategy akin to the one used by Duflo (2001): we exploit differences across cohorts and ethnic groups separately for males and females.

Our results can be summarized as follows. Akan males exposed to the reform experienced a one-year reduction in the number of years of education completed compared to non-Akan males in the same cohort. Considering that the average years of education of Akan males pre-reform were 8.6, this represents a 12 percent reduction in education for this group compared to non-Akan males. We show that there was a parallel trend in education for Akan and non-Akan men before the passage of the Law, but the trend for Akan men slowed down for those Akan cohorts exposed to the reform. The same does not hold for Akan women: the (positive) difference between their education levels and those of non-Akan women is constant before and after the reform. We also find that Akan men affected by the reform have a 10 percentage points lower probability of completing secondary school or higher level, while the change in the probability of completion of secondary school for women is null.

Consistent with the results on completion, we find a negative effect on attendance during secondary school (but also a smaller effect during primary school) for children in later survey rounds, i.e. when the reform has been fully internalized by the parents. Interestingly, the negative effect on attendance is attenuated for boys who have more siblings. Although we cannot make any causal claim, this is consistent with the fact that their paternal land should be shared among more heirs, leading to lower land per child, hence lower disinvestment in education.

We show that our results are robust to different definitions of the thresh-

old for treatment, to excluding from the sample northern regions where Akan are in very low numbers, to considering the effects for the subsample of cocoa-growing villages among which Akans are highly represented, and for the subsample of households in which at least one member had a government job. This allows us to make sure that our results are not driven by omitted time-varying factors that are specific to the regions where the Akan are spatially concentrated, or to changes in returns to education due to fluctuations in cocoa production or to cuts in public employment following the structural adjustment program started in 1986.

To sum up, we therefore uncover significant and sizable effects of customary norms that constrain bequest allocation on the accumulation of human capital, effects that differ across genders and that may account for part of the education gender gap.

This paper is related to several strands of the literature. A first body of literature looks at the economic consequences of social norms, kinship systems and inheritance rules, modeling household behavior as a rational response to traditional customs (e.g., La Ferrara (2003), La Ferrara (2007), Goetghebuer and Platteau (2010), Mobarak et al. (2009), Quisumbing et al. (2001), Quisumbing and Otsuka (2001), Lambert, Ravallion, and van de Walle (2011)). Using a controlled experiment, Gneezy, Leonard and List (2009) analyze the determinants of gender differences in competition: they show that differences between societies with distinct kinship systems and customary rules (the matrilineal Khasi and patriarchal Maasai) correlate with economically relevant behaviors such as the inclination toward competitiveness. Compared to this literature, our paper is the first to exploit a policy change that constitutes an exogenous shock to the strength of the customary norm. This allows us to make some progress toward establishing a causal link going from social constraints to economic choices.

A second strand of the literature explains the presence of different social norms regarding the transmission of property from parents to children as a rational response to different economic environments (e.g., Botticini and Siow (2003), Platteau and Baland (2001)). In this paper we take the existence of matrilineal customs as given and study the effects of an exogenous shift in these customs operated through legislation.

Thirdly, our paper relates to the literature on the constraints generated by extended families ties. In particular, this literature suggests that family networks, mainly in the African context, limit the possibility of undertaking profitable economic opportunities and create incentives for hiding income due to informal risk-sharing arrangements (Baland, Guirkinger and Mali,

2011, and Jakiela, and Ozier, 2011).

Finally, our paper also speaks to the literature on land rights security and investment in agriculture (e.g., Besley (1995), Goldstein and Udry (2008), and Hornbeck (2010)). By showing that control over the inter-generational transmission of land affects parental investment in human capital, we show that policies for the individualization of land rights have far reaching consequences that go well beyond changes in agricultural investment and productivity.

The remainder of the paper is organized as follows. Section 2 briefly reviews some basic notions on matrilineal and patrilineal descent principles taken from the anthropological literature and gives some background on the Intestate Succession Law. In section 3 we present a simple model that serves as a guide for our empirical analysis. Section 4 introduces our empirical strategy and Section 5 a descriptive analysis of the data. Section 6 contains our main econometric results and robustness checks, and Section 7 concludes.

2 Matrilineal inheritance and the Intestate Succession Law

Kinship systems form the basis for social organization in many developing countries. Kinship is usually built around a unilineal descent group in which kin membership is transmitted from one generation to the next only through ancestors of one gender. In patrilineal societies only males can pass kin membership on to their offspring and children are considered to be part of their father's kin group. In matrilineal societies instead, only females can pass kin membership on to their offspring and children are part of their mother's kin group.

The principle of matrilineal descent is illustrated in figure 1. Following the notation in social anthropology, triangles indicate males, circles females, vertical links indicate a descent bond, horizontal ones a codescent bond, and the sign "=" stands for a marriage relationship. The colored symbols indicate members of the same matrikin. The top part of the diagram indicates a couple, and the first of the three generations represented in the diagram. Following the descent bonds (vertical lines), it is easy to see how descent is traced only through females from a founding female ancestor. In particular, if we consider the eldest man in the diagram, indicated as "$head_0$", we see that his children belong to his wife's kin group, not his. When we look at figure 1 from the point of view of the male symbol referred to as "$head_1$", we see again that his children do not belong to his kin group, and that the

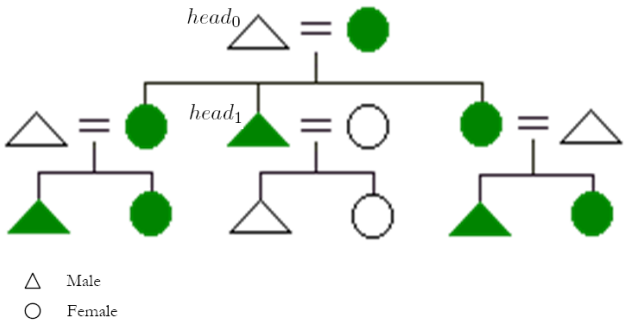

Figure 1: Matrilineal descent

members of his maternal kin are the children of his sisters. The relationship between father and child in matrilineal societies is thus somewhat weaker than in patrilineal ones, and some of the responsibilities generally assigned to fathers are instead taken on by the mother's brother. Importantly for our study, though, among the matrilineal Akan of Ghana the father remains responsible for food and education expenditures of his children.[2]

The matrilineal and patrilineal systems involve important differences not only in terms of social organization, but also for the intergenerational transmission of property. A general principle common to both is that rights to inheritance are usually gender-linked: males-to-males and females-to-females. In patrilineal systems a man's property is transmitted to his children (typically the sons), while in matrilineal systems the man's children do not belong to his kin group and are not entitled to inherit his property. The man's property is instead transferred to males members of his matrikin, the preferred order of inheritance being: the man's uterine brother, the son of a uterine sister, and the son of the deceased's mother's sister.[3] The woman's property instead is typically passed on to the daughters in both matrilineal and patrilineal societies.

Among the matrilineal Akan of Ghana, children have the customary obligation to work on the father's land before moving out of the parents' home to go work on the uncle's land. This can generate tensions between

[2]For extensive studies on matrilineal traditions in Ghana, see among others Fortes (1950) and Okali (1983).

[3]The matrilineal inheritance principle applies to inherited property, which belongs to the matrikin, and to self-acquired property in case of a man's death intestate. According to Akan customary norms, a man could dispose of his self-acquired property through inter-vivos gifts, sales or by writing a will before death, but this practice could only entail a limited portion of land and required formal approval by the matrikin.

members of the nuclear family and the matriclan over the rights to inherit the father's land. On the other hand, "fathers are expected to set up their male children in life (...) Today, setting up a child in life includes providing a western type of education and/or apprenticeship" (Awusabo-Asare (1990), p.7). Duncan (2010) reports qualitative evidence of the growing importance of a mutual understanding between husband and wife in favor of educating children as an acceptable substitute for land. This evidence corroborates our theoretical prediction that Akan fathers traditionally considered education as a substitute for land inheritance for their sons.

On June 14 1985 the Intestate Succession Law (PNDCL 111) was promulgated by the Government of Ghana.[4] The main innovation brought by the Law was the specific protection granted to members of the nuclear family (as opposed to the extended family) in the distribution of the man's self-acquired property on his death intestate. The Law states that, after the house and household chattels are devolved entirely to the spouse and children, the residue of a man's intestate property has to be distributed as follows: nine-sixteenth to children, three-sixteenth to surviving spouse, one-eighth to surviving parents and the remaining one-eighth, in the case of the matrilineal Akan, to the matrikin. [5] [6] The Law applies to all property which a deceased could have but did not dispose of through will (Woodman, 1985).[7] Prior to the passage of the Law, this property was automatically

[4]The Intestate Succession Law was introduced two years after Ghana launched the Economic Recovery Program in 1983.

[5]The interpretation section of the PNDCL 111 provides a definition for household chattels, which includes jewelery, clothes, furniture and furnishings, refrigerator, television, radiogram, other electrical and electronic appliances, kitchen and laundry equipment, simple agricultural equipment, hunting equipment, books, motor vehicles other than vehicles used wholly for commercial purposes, and household livestock.

[6]At the time of the passage of the Law, there was some debate regarding the application of the Law to any type of marriage, including marriages celebrated under customary law (which are the most common form of marriage in Ghana). The Customary Marriage and Divorce (Registration) Law, 1985 (PNDCL 112) states that the 1985 Law on intestate succession applies also to all customary marriages, as long as they have been registered. Woodman (1985) states that following the PNDCL 112 Law "all customary marriages are required to be registered, but it seems likely that unregistered marriages will continue to be valid for the purpose of the Intestate Succession Law "(p. 123). In 1991, the PNDCL 112 was amended by the Customary Marriage and Divorce (Registration) (Amendment) Law, 1991 (PNDCL 263) to solve this applicability issue. The amended Law states that the Intestate Succession Law applies also in cases "where a court or tribunal is satisfied by oral or documentary evidence before it that a customary law marriage had been validly contracted between a deceased and surviving spouse."(Fenrich and Higgings, 2001, p. 293).

[7]The practice of disposing of individually owned property by will seems to be rare

devolved to the kin group and allocated to individual members following customary rules. As mentioned above, the need for a law regulating intestate succession especially for matrilineal groups became more pressing given the conflicting interests between the nuclear family and the matriclan over the rights to inheritance. Duncan (2010) documents that the growing role of cocoa farming in the rural economy together with the customary obligation placed on women to assist their husbands in their economic pursuits intensified the use of conjugal labor giving rise to the "conjugal unit" as the major unit of production and consumption. The Law was introduced by the government to reflect changes in society and give more importance to the nuclear family.[8] It represented a radical change in the ways property was transmitted across generations in matrilineal groups, giving fathers greater control over the amount of physical capital their children would inherit. We argue below that this allowed fathers to choose an allocation of human capital closer to the one they would have chosen in the absence of the (customary) matrilineal constraint.

One final consideration relates to women's vs. men's land rights. According to customary principles, women could already pass their land on to daughters before the reform. Obviously, in a context where women do not own land or have weak rights over it, this may translate into few bequests. Qualitative evidence from Ghana suggests that often "male kin play the land-allocating role in both matrilineal and patrilineal societies: secure access rights for women therefore depend on the nature of their relationships with male relatives"(Duncan (2010), p. 302). The law on intestate succession in principle allowed fathers' property to be transmitted both to sons and to daughters, but in practice inheritance rights have remained gender-linked, with male property being (the bulk of land property) being passed on to male heirs. This means that empirically we expect to see most of the effects of the reform to be on male children, and to a lesser extent on female children.

among Ghanaians as "many view drafting a will as inviting death "(Fenrich, and Higgins, 2001, page 293).

[8]The PNDCL 111 was amended by the Intestate Succession (Amendment) Law, 1991 (PNDCL 264) to further protect spouse and children from ejection from the matrimonial home before the distribution of the estate and prescribe punishment for those who deprive a person entitled to inherit from his portion of the estate. The Childrens Act, 1998 (Act 560) amended PNDCL 111 mainly providing that "where there is a child who is a minor undergoing educational training, reasonable provision shall be made for the child before distribution.".

3 Theoretical framework

In this section we propose a simple theoretical framework to highlight the effects of the reform of matrilineal inheritance on human capital investment. The model is very stylized and serves as a motivation for our empirical strategy.

3.1 Allocation with and without matrilineal norms

Consider an environment where an altruistic parent has two children, a son and a daughter, and allocates resources between own consumption and investment in education of the son (E^s) and of the daughter (E^d). We assume that there is no saving technology so all income is either consumed or invested in children's human capital. Throughout the analysis, we use superscripts p, s and d to denote parent, son and daughter, respectively.

The parent is endowed with an exogenous amount of land L. Consistent with the evidence described in the previous paragraph, we assume that land inheritance is gender-linked, i.e. land is controlled by the male parent who can pass it on to his son upon his death (or to other male kin members depending on the specific inheritance rule). The amount of land that the son inherits is denoted by $L^s \leq L$. Importantly, the share of parental land that can be transferred to the son depends on the prevailing social norm.

The daughter's rights are instead very weak and limited to the use of the land controlled by the husband or other male relatives. Accordingly, we denote the amount of land that can be used by the daughter as L^d. [9]

First, we derive the optimal allocation in the absence of claims by the matrikin, i.e. the unconstrained optimum. In this case, land is entirely devolved on to the son, eg. $L^s = L$. Second, we model the matrilineal constraint as an upper bound on the amount of land the parent can transfer to the son, eg. $L^s = \overline{L^s} < L$. Third, we model the Intestate Succession Law as an increase in the upper bound of the land the parent can transfer to the child and show that the equilibrium allocation is closer to the one

[9] Both L^s and L^d are dictated by traditional inheritance norms and can be considered as the *expected* (by the parent) amount of land that children will own or use in the future. In particular, L^d is uncertain for the parent in both matrilineal and patrilineal groups as it depends on whether the daughter will marry to a male who controls land or not. Instead, the level of uncertainty regarding L^s is different in the two ethnic groups. It is considered certain by the parent in patrilineal groups since the father will pass his own land on to his son, but uncertain in matrilineal groups where land rights are allocated by members of the wife's matrikin. In the model we explore the implications of a reduction of this uncertainty brought by the 1985 Law on investments in human capital.

he would have chosen in absence of the matrilineal constraint. We then conduct some comparative statics to determine how the optimal allocation changes by varying the exogenous amount of land for the child (consistently with the change in the matrilineal rule).

The child's preferences are represented by the utility function $U^i = u(C^i)$, with $u'(\cdot) > 0$, $u''(\cdot) < 0$, with i=son, daughter. The variable C^i denotes the child's consumption, which is equal to the child's income due to the absence of savings. Income, in turn, depends on the child's endowment of physical and human capital, i.e. $C^i = Y^i(E^i, L^i)$. As previously noted, L^s is the fraction of father's land going to his son, and L^d is the land that can be used by the daughter. We assume that each child's income depends positively on each of its arguments, $Y^i_E(\cdot) > 0$, $Y^i_L(\cdot) > 0$, and that there are decreasing marginal returns.

The parent's utility depends on own, son and daughter's consumption (or income): $V^p = v\left(C^p; Y^s(E^s, L^s); Y^d(E^d, L^d)\right)$, with partial derivatives $v_{C^p}(\cdot) > 0$, $v_{Y^s}(\cdot) > 0$, $v_{Y^d}(\cdot) > 0$, $v_{C^p,C^p}(\cdot) < 0$, $v_{Y^s,Y^s}(\cdot) < 0$, and $v_{Y^d,Y^d}(\cdot) < 0$. Moreover, we assume that $v_{C^p,Y^s}(\cdot) = v_{C^p,Y^d}(\cdot) = 0$, which is a common separability assumption between parental consumption and child income in models on intrahousehold allocations with parental altruism (Behrman 1997).

The parent's income, Y^p, is taken as exogenous. This income has to be allocated between the parent's own consumption C^p, and expenditure on son's and daughter's education, $p_{E_s}E^s$ and $p_{E_d}E^d$, respectively. The price of education, p_E, is assumed to differ across genders.

Let us start by considering an equilibrium in which no matrilineal constraint exists, where the parent's exogenous land endowment $L > 0$ is automatically passed to the child upon the parent's death. The amount of land inherited by the child is thus $L^s = L$, which can be considered also the endowment of the child.

The parent's optimization problem can thus be written as:

$$\max_{C^p,E^s,E^d} v\left(C^p; Y^s(E^s, L^s); Y^d(E^d, L^d)\right)$$

$$\text{s.t.} \quad Y^p = C^p + p_{E_d}E^d + p_{E_s}E^s$$

After substituting the budget constraint into the parent's utility, we

derive the following first order conditions:

$$E^s: \quad v_{Y^s}\left(C^p; Y^s(\cdot); Y^d(\cdot)\right)\frac{\partial Y^s(\cdot)}{\partial E^s} - p_{E_s} v_{C^p}\left(C^p; Y^s(\cdot); Y^d(\cdot)\right) = 0 \tag{1}$$

$$E^d: \quad v_{Y^d}\left(C^p; Y^s(\cdot); Y^d(\cdot)\right)\frac{\partial Y^d(\cdot)}{\partial E^d} - p_{E_d} v_{C^p}\left(C^p; Y^s(\cdot); Y^d(\cdot)\right) = 0 \tag{2}$$

Taking the ratio of (1) and (2), we obtain the following equilibrium condition:

$$\frac{v_{Y^s}(\cdot)}{v_{Y^d}(\cdot)} = \frac{p_{E_s}}{p_{E_d}}\frac{\partial Y^d(E^d, L^d)/\partial E^d}{\partial Y^s(E^s, L^s)/\partial E^s} \tag{3}$$

This condition states that the ratio of resources invested in son and daughter's education reflects differences in returns to education across genders. Let us assume that the conditions for the existence of an interior solution are satisfied and focus on this case. We refer to this as the 'unconstrained' solution, and we denote the equilibrium values of the above problem as C^{p*}, $E^{s*} > 0$, $E^{d*} > 0$ (with $L^s = L$).

As discussed above, according to traditional matrilineal principles (i.e. pre-reform), there is no systematic transfer of land rights from a man to his son upon the man's death. Inter-vivos gifts from parent to child are allowed provided that the matriclan formally approves, and in any case can entail only a limited portion of the man's land, while the rest goes to the matriclan. In terms of the model, the matrilineal constraint can therefore be represented as an upper bound on the amount of land that the parent can pass on to his son:[10]

$$L^s = \overline{L_1^s} < L$$

The Intestate Succession Law of 1985 included a provision that a given fraction of the property should go to the man's children and substantially decreased the share going to the matriclan. In our framework this reform can be modeled as an increase in the upper bound of the land that can be allocated to the son, e.g. to $\overline{L_2^s} \in (\overline{L_1^s}, L)$.

[10] We assume that the parent derives no utility from land going to other kin members upon his death.

We now derive the sign of the change in the optimal amount of E^{s*} implied by an exogenous change of L^s. To do this, we differentiate the first order conditions and the budget constraint with respect to L^s. The sign of $\frac{\partial E^s}{\partial L^s}$ is unambiguously negative if the following sufficient (not necessary) conditions hold: $\frac{\partial^2 Y^s}{\partial E^s \partial L^s} \leq 0$, which indicates that the returns to education are non-increasing in the amount of land, and $v_{Y^s,Y^d}(\cdot) = 0$, meaning that there are no complementarities between son and daughter's consumption.[11]

Under the assumptions made on the child's production function and the parent's utility function, the equilibrium allocation with the matrilineal constraint implies a higher amount of education for the son compared to the unconstrained case: $E_1^{s*} > E^{s*}$, (with $L^s = \overline{L_1^s}$). This equilibrium represents a situation in which parents 'overinvest' in their children's education because they are restrained in the amount of physical capital they can devolve on them. It is now easy to see that the reform of matrilineal inheritance would lead to a decrease in schooling investment for the son (compared to the pre-reform situation). The corresponding equilibrium allocation will involve a lower level of education, $E_2^{s*} < E_1^{s*}$ (with $L^s = \overline{L_2^s} > \overline{L_1^s}$). In other words, the effect of the reform is to bring the parent closer to his unconstrained optimal allocation.

The effect of the reform on daughters' education ($\frac{\partial E^d}{\partial L^s}$) is ambiguous: it may be positive due to a relaxation in the household's budget constraint, but this depends on the shape of the utility function.[12] Whether the effect of the reform on girls is zero or not is ultimately an empirical question, but under realistic assumptions the main effect of the reform should be seen on boys, as before and after the reform males were the main recipients of land bequests.

3.2 Discussion

The above framework is extremely stylized and involves a set of simplifying assumptions. However, it has the advantage of capturing the essential workings of the reform in the most parsimonious way. In this section we briefly discuss alternative modeling assumptions and the effects they may

[11] We are not aware of any evidence explicitly testing the former assumption, although Kingdon and Soderbom (2008) show that returns to education in the agricultural sector in Ghana are very low. The second restriction is common to many models of intra-household allocation that look at gender differentials across children, e.g. Behrman (1988).

[12] Depending on the parent's preferences for own consumption and investments in children's education, the additional resources made available by the reduction in E^s can be reallocated differently. Therefore, the effect on daughter's education is ambiguous.

have on our results. While our simple model is static, one could extend it to a dynamic setting using an overlapping generations framework in which each individual lives for two periods. In such a setting, an individual's income (and consumption) would depend on his/her stock of human and physical capital, and each generation of parents would choose optimal amounts of investment in education.[13] This problem would have a recursive structure, and the equilibrium without matrilineal constraint would entail a lower level of education compared to the 'constrained' equilibrium, similar to the static model.

Another simplifying assumption of our setting is that children can only inherit land from their parents. We know that in real matrilineal systems males inherit lineage land from their maternal uncles, and this may be cause of concern because the reform of matrilineal inheritance should affect uncles' behavior as well as parents'. We can explore the implications of a richer model, one in which each generation can inherit both from the father and from the uncle, in a qualitative way. Consider first a setting where each young individual has exactly one parent and one uncle, and where the uncle has one child of his own. Assume also that the amount of land owned by the parent and the uncle is the same. In this setting the matrilineal reform would have no effect on equilibrium allocations, because the increase in the land that a parent can pass on to his child after the reform would perfectly compensate the decrease in the land received by the uncle (who, in turn, is devolving more land to his own child).

In a realistic model of the matrilineal system, however, it may be preferable for children to inherit their own father's land rather than their uncle's for several reasons. First, this may be due to land-specific investments made by the children while working for their father, quality and quantity of the father's and uncle's land, or to the security of property rights. Bruce and Migot-Adholla (1994), for example, argue that rights are better enforceable when the land is inherited from the father than when it is allocated by the matrikin. Second, one should capture the fact that, even if the child has a maternal uncle (which obviously depends on the realized sibling composition of the child's mother), fathers do not have full control over the land the child will inherit. This may lead the father to invest more in his son's education to compensate for the uncertain amount of physical capital the child will be endowed with in the future. Indeed, the fact that the customary matrilineal

[13] In the static model, we have assumed that the parent's income does not depend on human capital, as this is equivalent to assuming that it depends on an exogenous (predetermined) level of human capital.

norm would lead to impoverishment of those children who had no maternal uncles was one of the motivations for the Ghanaian legal reform that we examine. A way to capture this in the model would be to assume that each child has a probability $p < 1$ to inherit the uncle's land. In this case the reform would still have a negative impact on education investment, which is what we test in the data. Ideally, we would like to have data on the composition of the entire extended family (notably, the existence of a maternal uncle) and on land owned by each member. This information is not available in the GLSS, nor in the DHS surveys. Hence we cannot control for inheritance received by the uncle, nor assess the extent of substitutability between father's and uncle's land.

3.3 Testable predictions

Despite its simplicity, our basic theoretical framework has several interesting implications. To frame these implications in the context of the empirical analysis that we conduct for Ghana, we refer to a group that follows matrilineal descent principles (Akan) and a group that does not (non-Akan). We further distinguish, within the Akan group, between a population that according to customary norms could not inherit paternal property but that acquires this right after the passage of the reform (male children) and a population that cannot own land, which is unchanged after the reform (female children).

Prediction 1: Ceteris paribus, after the reform Akan parents should invest relatively less in their sons' education compared to non-Akan parents. Prediction 1 is the key one for our paper, and will be tested through a difference-in-difference estimation strategy. To assess the plausibility of the identification assumption, we shall look at pre-reform trends for Akan and non-Akan.

Prediction 2: The effects are ambiguous for daughters. Under plausible assumptions we expect either an increase in education or no change when we look at the difference between Akan and non-Akan females after the reform compared to before.

Prediction 3: Prediction 1 should apply to landed households, for which the reform actually changes the budget set, and not to landless ones.

Our stylized model also has implications related to the levels of human capital investments in the pre-reform equilibrium allocations. In particular, there should be differences in the pre-reform education levels across ethnic

groups and genders, but we only view this as a consistency check since unobserved characteristics other than the matrilineal inheritance norm may be driving these initial gaps. Our key identification strategy relies on changes in allocations before and after the reform across different groups, as highlighted in the above predictions.

4 Empirical strategy

4.1 Years of schooling and completion

To study the impact of the reform on investment in education, we compare educational outcomes for two age groups: those aged 0–17 (the most exposed to the reform) and those older than 18 (whose education should not have been affected by the Law) when the law on intestate succession was passed in 1985. We restrict the sample to individuals 20 to 50 in each survey round.[14] The group of children aged 0–17 includes children that are in primary school or have to enroll in primary, children in junior secondary/middle school, and those who are completing senior secondary school. In Ghana children normally enroll in primary school when they are 6 and complete it when they are 11.[15] As far as secondary education is concerned, Ghana embarked on a reform of the education system in 1987 that essentially reduced the duration of pre-university education (White, 2004).[16]

4.1.1 Basic specification

Our basic estimation strategy exploits differences across cohorts and ethnic groups. In a first step, we analyze the impact of the Law separately for males and females. The basic difference-in-difference regressions is as follows:

[14] We also conduct a robustness check with the sample of older individuals aged 25–50 (this age restriction ensures they have completed formal schooling and avoid the problem of censoring) and find that results are very similar to the ones obtained with the sample of individuals aged 20–50.

[15] Even though the minimum age required to start primary is six, late enrollment is not uncommon as there are many children starting primary at 7 or 8 (White, 2005). This obviously also affects all successive education levels. In terms of our empirical strategy, this would lead to an underestimation of the effect on education because also individuals in the 18–30 age bracket would be partly treated. Because of this choice, our estimates can be considered conservative.

[16] Before the 1987 education reform, the school system was structured as a 6+4+7 system: 6-year primary, 4-year middle, 5-year secondary plus 2 years in preparation for entering tertiary education. The reform replaced the 6+4+7 with a 6+3+3 system with 6-year primary, 3-year junior secondary and 3-year senior secondary.

$$y_{itkrv} = \beta_1(A_i \cdot P_{it}) + \beta_2 A_i + \beta_3 X_{itkrv} + \beta_3(X_{itkrv} \cdot P_{it}) + \beta_4 C_v + \\ + \alpha_r + \mu_k + \nu_t + \gamma_r \cdot t + \epsilon_{itkrv} \quad (4)$$

where $y_{i,t,k,r,v}$ is number of years of schooling or the highest level completed of an individual i, born in year t, and observed in survey year k, in region r, and in village v. A_i denotes individuals belonging to the Akan ethnic group. α_r, μ_k, and ν_t are region, wave, and birth year fixed effects, respectively. Since Akan are spatially concentrated in the Southern and Western part of Ghana and grow different types of crops than the non-Akan, we also include is a set of height dummies, denoted with C_v, for the major crop grown at the village level (among which: cocoa, cassava, maize, yam, millet or corn, tomato, plantains, rice).[17]

We also include a region specific linear time trend, $\gamma_r \cdot t$, to capture region and cohort-specific effects that may be correlated with the error term, e.g. variation across regions and over time in the supply of education. $X_{i,t,k,r,v}$ is a set of individual and household-level covariates observed at the time of each survey including: age and age squared, age of the household head, household size, a principal component index of durable goods owned by the household, a dummy for female headed households, parental education, and religion of the head.[18]

The variable $P_{i,t}$ indicates the post-reform period, which is constructed based on the individual's age when the Law was passed in 1985. We use two alternative definitions of $P_{i,t}$ which take into account the structure of the education system. The first definition is a dummy equal to one if the individual was born in 1968 or after (aged 17 or younger in 1985). Since those born in 1968 belong the first cohort being affected for the completion of secondary school, we can define this cutoff as "treated by the end of secondary". The second cutoff birth year is 1974. Strictly speaking, children born in 1974 were completing the last year of primary school in 1985 (aged 11 or younger in 1985). Accordingly, we define this cutoff as "treated by the end of primary". For these children, the Law not only affected the

[17] This information is retrieved from the rural community questionnaire. In particular, the survey asks the respondents for the village the following question: "what are the major crops grown by the people of this community?". Up to 9 crops can be named. Unfortunately, from wave3 onward its not possible to know the ranking of the crops. Thus, each dummy is equal to one if the specific crop is among the ones mentioned in the community questionnaire as being among the major grown in the village. Finally, among all crops, the first 8 most mentioned were considered.

[18] The durable goods that enter our principal component index are: radio, tape-player, television, sewing machine, refrigerator, air conditioner, bicycle, motor cycle, and car.

decision of completing a given level of education, but also of enrolling in secondary school. We expect that educational outcomes should be most affected for children who were at an earlier stage of education when the Law was passed. We also include the interaction between each of the observable characteristics in $X_{i,t,k,r,v}$ and $P_{i,t}$ to take into account the possibility that the effect of the $X_{i,t,k,r,v}$ has changed over time and that this might correlate with the error term.

In regression (4), our coefficient of interest is β_1, the coefficient of the interaction term between A_i and $P_{i,t}$. In line with our theoretical predictions we expect $\beta_1 < 0$, i.e., compared to non-Akan males of the same age, Akan males exposed to the reform should have significantly less years of schooling. The same should not hold (or should hold to a lesser extent) for females.

The regressions for years of education are estimated with simple OLS. To estimate the impact on highest grade completed we instead use a non-linear model for more than two discrete outcomes. This is because, as illustrated in more detail in the next sections, highest grade completed is a categorical dependent variable for the different educational levels completed.[19] The model used for the estimation is the multinomial logit.[20]

Our identification strategy assumes that, conditional on the controls we include, changes in education outcomes for Akan and non-Akan males would have been the same in the absence of the reform. Below we discuss the plausibility of this assumption examining pre-trends and conducting some falsification tests.

4.1.2 Cohort-specific effects

The specification (4) allows us to compare educational outcomes across ethnicities for two broad age groups: those ages 0-11 and those older than 18 when the Law was passed in 1985. We can go further in understanding when the reduction of investment in education started and evolved by estimating year-by-year differences as follows.

[19] Importantly, the highest level completed is *not* computed from the number of years of schooling completed, but from the actual level declared in the survey. This allows us to understand at which level changes in education decisions occurred independently of the education reform.

[20] Even though the categories defined in our variable are ordered from the lowest to the highest level completed, we chose a model for nominal outcomes (as opposed to ordered outcomes) because the Brant test provides evidence that the parallel regression assumption has been violated.

$$y_{itkrv} = \sum_{l=1960}^{1985} \beta_{1,l}(I_l \cdot A_i) + \beta_2 A_i + \beta_3 X_{itkrv} + \alpha_r + \mu_k + \nu_t + \gamma_r \cdot t + \epsilon_{itkrv} \quad (5)$$

where I_l is a birth-year dummy, and all the other variables are defined as in (4). We do not include the dummies for the major crops grown at the village level, nor the interactions between the observables and the post-reform period because of the small sample size at each bin. The omitted group is formed by individuals born from 1937 and 1959 (which represent about 34 percent of all individuals in our sample).[21] Our coefficients of interest are the $\beta_{1,l}$ that estimate the year by year difference in education across ethnicities compared to the control group of those born before 1960.[22] We expect the $\beta_{1,l}$ to be equal to zero for $l < 1968$ and become negative after 1968. If the reform mainly affected the decision to enroll in secondary school (while those who were already in secondary school in 1985 completed that level regardless of the Law), then we expect the effect to become negative and significant for the individuals born in 1974 or after (who were in primary school in 1985).

4.2 Current attendance rates

After having estimated the impact of the reform on our measures of "accumulated human capital", we turn to the analysis of the effects on current attendance rates.[23] In order to do this, we select individuals aged 6 to 17 from each of the five rounds of the GLSS, and compare attendance rates for those observed if the first two waves (GLSS 1987/88 and 1988/89) to those observed in later rounds of the survey (GLSS 1991/92, 1998/99 and 2005/2006).[24] Since the first two waves were carried out already after the passage of the Law in June 1985, the treatment is not very accurate. Ideally, we would like to have information on attendance rates before 1985, but this is data is not available in GLSS. However, it is likely that it took some

[21] Given our age restriction on the sample of individuals 20 to 50, the oldest individuals are in fact those aged 50 in the first wave of the GLSS in 1987.

[22] Mean bin size in the period 1960-85 is 560 individuals.

[23] The definition of attendance rates used in this paper, the same used by White (2005), is the fraction of children who are supposed to be enrolled in a particular school level for their age who are currently in school. For example, for primary school age children, it is the fraction of the number of children aged 6–11 currently in school. Therefore, this is an age-based measure not specifically related to the actual level attended.

[24] For the analysis of attendance rates, we restrict the sample to children of the household head.

time before the reform was fully operative, so we can consider that parents internalized the effects of the reform more in rounds 3 to 5 of the GLSS. If the reform led to an sudden reduction in attendance levels in 1985, which is somewhat unlikely, our results would *underestimate* the true effect.

We use a probit model to estimate the probability of being currently in school in the post reform period for individuals belonging to the Akan versus non-Akan ethnic group. We run a regression similar to (4), where $edu_{i,t,k,r,v}$ is a dummy variable equal to one if the individual is currently in school and zero otherwise. P_{it} is defined as a dummy equal to one if the individual was observed in GLSS wave 3, 4 or 5, and zero otherwise. We also estimate interaction terms with each individual survey round to show that the effect is gradual and not dependent on the particular cutoff. We include wave fixed effects but not birth year fixed effects. All the other control variables are the same as in (4). We also run a separate regression for primary and secondary age school children (eg, aged 6–11 and 12-17, respectively). We expect to find a smaller effect on attendance of Akan boys aged 6–11, while a significant reduction for those in the 12–17 cohort ($\beta_1 < 0$). This is mainly because Akan males had very high primary school completion rates already in the pre-reform period. If primary school is considered by the Akan as the basic or necessary education level a male should complete, the effect should be mainly at higher levels than primary.

5 The data: a descriptive analysis

The theoretical predictions illustrated in the previous sections will be tested using individual-level data from all five rounds of the Ghana Living Standard Survey: GLSS1 (1987/88), GLSS2 (1988/89), GLSS3 (1991/92), GLSS4 (1998/99), and GLSS5 (2005/06).[25] Because matrilineal inheritance norms essentially apply to the allocation of land, we restrict our attention to the rural subsample of the GLSS.

We analyze the effects of the Intestate Succession Law on two main educational outcomes: the "stock of schooling" (eg., number of years of education and highest grade completed), and current attendance rates. For the part of the analysis of the impact on accumulated schooling we focus on individuals aged 20 to 50, and test the theoretical predictions first using the full sample and then using the sample of individuals whose father is/was a farmer. Having a father farmer is a proxy for whether the father owned

[25] Approximately half of the sample of the GLSS1 was re-interviewed in the following round. We only use the non-overlapping households from the GLSS2.

land at the time when his children (who are the individuals included in our sample) were of school age. This variable is preferred to the one that can be derived from the question "Does any member of the household own any land?" for two reasons. First, since this information refers to land owned by the household at the time of the survey, we do not know whether this land was already owned at the time when the individual was in school. Second, if the father of the individual is not a household member, there is no question asked about land ownership of the father. However, while having a father who was a farmer is a 'lagged' proxy for land ownership (which is what we need for our analysis), it is a very imperfect proxy: being a farmer does not necessarily mean owing land.

In the second part of the empirical analysis, when we consider current attendance rates of younger cohorts (aged 6 to 17), we present evidence for the full sample and also for the subsample of landed households, defined as households who answer "yes" to the above question. In this case the contemporaneous land ownership status of the household is the appropriate measure because the population under study is that of individuals aged 18 or younger, most of whom are still living with their father in the interviewed household.

For the first part of the analysis on accumulated human capital, we use all five rounds of GLSS and restrict the sample to individuals aged 20–50 in rural areas. The restricted sample includes 22,178 individuals. Summary statistics for the main variables of interest are shown in panel A of Table 1. Summary statistics for the other variables used in the regressions as well as a breakdown by ethnicity and gender are shown in appendix table A.8.

The percentage of Akans (mostly Asante and Fanti) in our rural sample is 42 percent.[26] The other (patrilineal, and classified as non-Akan) groups are the Ewe, Mole Dagbani, Ga-Dangme and others. Inter-ethnic marriages among Akans and non-Akans tend to be rare, especially in rural areas. In the 2003 Ghana DHS survey the percentage of unions in which the household head and his/her spouse belong to different ethnic groups is 7.2 percent of all unions, while it is 5.7 percent in rural areas.[27] The age at first marriage

[26] In GLSS1-3 the criterion according to which an individual is classified as Akan is the language of the household head. In GLSS 4 and GLSS 5 Akan is instead defined according to the ethnicity of the household head, due to changes in the questionnaire. The percentages are similar across rounds.

[27] The percentages obtained when using the other rounds of the Ghana DHS surveys (1993, 1998, and 2008) and the fourth and fifth round of GLSS (it is not possible to use the earlier waves for this purpose because only the language/ethnicity of the head is known, and not that of all household members) are similar.

Table 1: Summary statistics

Panel A. Sample of individuals aged 20 to 50

	Full sample		Males				Females			
			Akan		non-Akan		Akan		non-Akan	
	mean	s.dev.	mean	s.dev.	mean	s.dev.	mean	s.dev.	mean	s.dev.
akan	0.42	(0.49)	-	-	-	-	-	-	-	-
education years	4.82	(4.98)	8.60	(4.17)	4.92	(5.22)	5.01	(4.51)	2.36	(4.00)
primary or higher	0.47	(0.50)	0.83	(0.38)	0.47	(0.50)	0.52	(0.50)	0.23	(0.42)
middle/junior sec. or higher	0.34	(0.47)	0.67	(0.47)	0.35	(0.48)	0.32	(0.47)	0.14	(0.35)
sec./senior sec. or higher	0.05	(0.22)	0.11	(0.31)	0.08	(0.27)	0.03	(0.16)	0.02	(0.14)
father farmer	0.79	(0.41)	0.72	(0.45)	0.84	(0.37)	0.72	(0.45)	0.85	(0.36)
land (at the hh level)	0.58	(0.49)	0.60	(0.49)	0.55	(0.5)0	0.61	(0.49)	0.57	(0.49)

Panel B.1. Sample of individuals aged 6 to 11

	Full sample		Males				Females			
			Akan		non-Akan		Akan		non-Akan	
	mean	s.dev.	mean	s.dev.	mean	s.dev.	mean	s.dev.	mean	s.dev.
akan	0.41	(0.49)	-	-	-	-	-	-	-	-
currently in school	0.73	(0.44)	0.88	(0.33)	0.65	(0.48)	0.86	(0.35)	0.61	(0.49)
education years	0.74	(1.28)	0.94	(1.39)	0.63	(1.16)	0.94	(1.44)	0.58	(1.15)
land (at hh level)	0.59	(0.49)	0.63	(0.48)	0.57	(0.50)	0.64	(0.48)	0.56	(0.49)

Panel B.2. Sample of individuals aged 12 to 17

	Full sample		Males				Females			
			Akan		non-Akan		Akan		non-Akan	
	mean	s.dev.	mean	s.dev.	mean	s.dev.	mean	s.dev.	mean	s.dev.
akan	0.44	(0.50)	-	-	-	-	-	-	-	-
currently in school	0.68	(0.47)	0.83	(0.38)	0.62	(0.49)	0.75	(0.43)	0.56	(0.50)
education years	3.91	(3.23)	5.02	(3.00)	3.24	(3.20)	4.82	(3.06)	2.94	(3.12)
land (at hh level)	0.63	(0.48)	0.69	(0.46)	0.61	(0.49)	0.67	(0.47)	0.57	(0.50)

Rural sample. Pooled GLSS1-5. Using survey weights.

is similar across ethnic groups: in the rural sample of the 2003 Ghana DHS the median age at which females got first married is 18, while it is 23 for males, both for Akans and not.[28] Average years of education in the sample is equal to 4.82, which varies widely across ethnicity and gender. Akans males in our sample have on average 8.60 years of education, compared to 4.92 for non-Akan males. For females, the corresponding figures for Akan and non-Akan are 5.01 and 2.36, respectively. Consistently, a higher fraction of Akan have attained primary or higher levels of education.[29]

As far as our proxy for land ownership is concerned, we see that 79 percent of the individuals in our sample have a father who is/was a farmer: this percentage is higher among the non-Akan (84 and 85 percent for males

[28]The median age at first marriage is somewhat constant across the waves of the DHS surveys (1993, 1998, 2003 and 2008) for both ethnic groups.

[29]We constructed the variables years of education and attainment rates using data on highest grade and level completed.

and females, respectively) than among the Akan (72 percent).

The remaining part of Table 1 shows the summary statistics for the sample of younger cohorts used in the second part of the analysis. Panels B.1 and B.2 refer to the sample of individuals aged 6–11 and 12–17, respectively. More descriptive statistics for the whole sample of those aged 6 to 17 are shown in appendix table A.10. Attendance rates for Akan and non-Akan boys of primary school age are 88 and 65 percent, respectively. The percentage of girls going to school is lower than that of boys by 2 to 4 percentage points in both ethnic groups. In panel B.1 we see that the gap in attendance rates between Akans and non-Akans boys aged 12 to 17 is slightly lower than that among younger cohorts. Finally, we see that about 59 to 69 percent of individuals live in a household in which at least one member owns land. The fraction of those owning land is similar in all groups, somewhat higher for Akans.

6 Results

6.1 Years of education and completion rates

Table 2 shows the simple difference-in-difference estimates of the effect of the Intestate Law on years of schooling. We consider mean years of education for four different age groups: 0–11, 12–17, 18–25 and 26–30. We expect that the 1985 Law affected parental educational decisions for children of primary or secondary school-age, but not for those older than 18 who had already completed secondary school in 1985. Each panel in the table reports education estimates separately for Akan and non-Akan individuals (columns), in different age brackets when the reform was implemented (rows), and by gender (leftmost versus rightmost part of the table). For example, in panel (a) we see that Akan males who were aged 0 to 11 in 1985 on average completed 8.57 years of education, while non-Akan males in the same cohort completed 5.74. On the other hand, for the older cohort who was 18 to 25 years old when the reform was passed, completed years of education average 8.86 for Akan males and 5.11 for non Akan males. Our diff-in-diff estimate of the effect of the reform is thus -0.92 with a standard error of 0.31, indicating that the reform induced Akan parents to give on average 0.92 less years of education to their male children compared non-Akan children in the same age group. When we repeat a similar exercise for females (rightmost part of Panel a), we find no statistically significant effect of the reform (if anything, the effect is in the opposite direction). In panel (b) of table 2 we estimate the effect of the reform on a group of children who were in

Table 2: Simple difference-in-difference estimates of the effect of the Intestate Law on years of education, by gender. Dependent variable is number of years of education. Sample of individuals aged 0–30 in 1985 (N=17848)

	Males			Females		
	Akan	non-Akan	diff	Akan	non-Akan	diff
Panel a. Pre-school and primary school age versus control						
0 to 11 years in 1985	8.57	5.74	2.82	6.39	3.33	3.06
se	(0.146)	(0.146)	(0.260)	(0.167)	(0.130)	(0.266)
18 to 25 years in 1985	8.86	5.11	3.74	5.17	2.38	2.80
se	(0.157)	(0.225)	(0.271)	(0.155)	(0.148)	(0.216)
difference	-0.29	0.63	-0.92	1.21	0.95	0.26
se	(0.216)	(0.259)	(0.314)	(0.20)	(0.228)	(0.303)
Panel b. Secondary school age versus control						
12 to 17 years in 1985	8.82	5.16	3.66	5.89	2.74	3.15
se	(0.191)	(0.198)	(0.313)	(0.220)	(0.139)	(0.287)
18 to 25 years in 1985	8.86	5.11	3.74	5.17	2.38	2.80
se	(0.157)	(0.225)	(0.271)	(0.155)	(0.148)	(0.216)
difference	-0.04	0.04	-0.08	0.71	0.36	0.35
se	(0.220)	(0.278)	(0.356)	(0.242)	(0.197)	(0.303)
Panel c. Placebo						
18 to 25 years in 1985	8.86	5.11	3.74	5.17	2.38	2.80
se	(0.157)	(0.225)	(0.271)	(0.155)	(0.148)	(0.216)
26 to 30 years in 1985	8.79	5.14	3.64	4.89	1.92	2.97
se	(0.244)	(0.263)	(0.329)	(0.190)	(0.151)	(0.241)
difference	0.07	-0.03	0.10	0.29	0.46	-0.17
se	(0.265)	(0.276)	(0.391)	(0.209)	(0.157)	(0.267)

OLS estimates. Pooled GLSS1-5. Robust standard errors are adjusted for clustering at the village level. Sample of all individuals aged 0–30 in 1985. Using survey weights.

secondary school age when the reform was implemented (i.e., who were 12 to 17 years old in 1985), keeping as control group cohorts who were 18 to 24 in the same year. We find no effect of the reform on Akan males and females. This might suggest that individuals who were already enrolled in secondary school when the reform was introduced continued going to school and completed that level. Thus, the effect of the reform seems to be mainly concentrated on those who were at an earlier stage of their education and had to decide whether to enroll in secondary.

Finally, in panel (c) of table 2 we conduct a falsification test, comparing individuals aged 18 to 25 in 1985 to individuals aged 26 to 30. Neither group should be affected according to our theory, hence if we found a significant difference in the same direction when comparing these two groups this would suggest that our effects may be spurious. As can be seen in panel (c), no significant difference emerges when we conduct this placebo test, which increases our confidence in our identification strategy.

As a robustness test, we repeated the same exercise on the subsample of individuals whose father is (or was) a farmer. According to our theory, we should expect a greater impact on education for individuals whose father owned land at the time when they made educational choices for their children. The results are reported in Appendix table A.1 and table A.2. The estimated effects in table A.1 are consistent with those in table 2, are higher in size in panel a and b. We also find a positive statistical effect for females aged 0-11. As expected, in table A.2 we do not find any significant effect for the sample of individuals whose father is/was not a farmer.

We expect that the 1985 Law should have affected parental educational decisions for children of primary or secondary school-age, but not for those older than 18 who had already completed secondary school in 1985. Moreover, the negative effect on education should be stronger the younger individuals were when the Law was introduced. The results of the estimation of regression (4) are shown in table 3. We run separate regressions for males (columns 1 and 2) and females (columns 3 and 4) using the full sample and the two birth year cutoffs: $post68$ and $post74$. We expect to find a negative and significant coefficient for the interaction term $akan^{*}post$ for males, but no effect (or a smaller effect) for females. The negative effect should be stronger for individuals born in 1974 and after because their decision of enrolling (not just completing, as for those born in 1968 or after) in secondary school was affected. Thus, $akan^{*}post74$ should be bigger in absolute terms than $akan^{*}post68$.

Table 3 confirms the descriptive evidence that individuals belonging to

Table 3: Effect of the Intestate Law on years of education, by gender. Dependent variable is number of years of education.

	Males		Females	
	(1)	(2)	(3)	(4)
akan*post68	-0.753***		-0.091	
	(0.263)		(0.227)	
akan*post74		-0.936***		-0.300
		(0.280)		(0.267)
akan	1.605***	1.526***	0.981***	0.999***
	(0.191)	(0.181)	(0.163)	(0.154)
durables	0.902***	0.926***	0.738***	0.751***
	(0.084)	(0.081)	(0.072)	(0.064)
hh size	-0.052**	-0.072***	-0.037***	-0.049***
	(0.022)	(0.020)	(0.013)	(0.013)
female head	0.187	0.183	1.075***	0.947***
	(0.355)	(0.310)	(0.163)	(0.139)
mother eduyrs	0.113**	0.113***	0.224***	0.194***
	(0.045)	(0.033)	(0.030)	(0.024)
father eduyrs	0.170***	0.160***	0.197***	0.186***
	(0.024)	(0.020)	(0.020)	(0.015)
age head	0.023***	0.019***	-0.010**	-0.007*
	(0.008)	(0.006)	(0.004)	(0.004)
age	-0.016	-0.016	-0.061	-0.053
	(0.066)	(0.066)	(0.048)	(0.048)
age squared	-0.001	-0.001	-0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Birth year FEs	Yes	Yes	Yes	Yes
Region FEs	Yes	Yes	Yes	Yes
Region*birthyr	Yes	Yes	Yes	Yes
Wave FEs	Yes	Yes	Yes	Yes
Community crops	Yes	Yes	Yes	Yes
Observables*post	Yes	Yes	Yes	Yes
Observations	8364	8364	10312	10312
R-squared	0.390	0.392	0.369	0.371

OLS estimates. Pooled GLSS1-5. Robust standard errors adjusted for clustering at the village level in parentheses. Sample of individuals 20-50. ***, **, and * indicate significance at 1%, 5% and 10% levels. Using survey weights. Each regression also includes dummies for religion of the head of the household.

the Akan group have an initial education advantage. This advantage ranges from 1.5 to 1.6 additional years of schooling for males and approximately one year for females. In column 1 of table 3 the coefficient of $akan^{*}post68$ is equal to -0.75 and is significant at the one percent level. This means that, compared to non-Akan males, ceteris paribus Akan males exposed to the reform (born in 1968 or after, thus aged 0-17 in 1985) experienced a 0.75-year reduction in the number of years of completed education. As expected, the coefficient of $akan^{*}post74$ is bigger and equal to -0.94. Columns 3 and 4 of table 3 show the estimates for females. As expected, after the reform, there is no significant change in years of education for Akan females with respect to non-Akan females in the same cohorts (the coefficients on $akan^{*}post$ are -0.09 and -0.30, none of them significant). Among the other regressors, we see that both mother and father's education are strong predictors of educational outcomes of their children.

In table 4 we estimate the effect of the Law on the sample of individuals whose father is/was a farmer and not. The negative effect on education for Akan males should be stronger for those with a father farmer, which is our proxy for land ownership of fathers at the time when individuals were in school, and no effect should be found for the subsample of individuals whose father is/was not a farmer. In column (1) and (3) table 4 we see that the coefficient of both the interaction terms $akan^{*}post68$ and $akan^{*}post74$ are bigger in magnitude when restricting the sample to those with father farmer: the corresponding reduction is 0.81 and 1.16 years of schooling respectively, significant at the one percent level. Columns (2) and (4) in table 4 show that for the subsample of individuals whose father is/was not a farmer the coefficients of the interaction term are not significant, which is consistent with our theoretical prediction that the reform affected educational decisions only for fathers who owned land. Again, we do not find any significant effect for females.

We next turn to the analysis of cohort-specific effects. Figure 2 shows the results for males using the full sample, and the subsamples of males whose father is/was a farmer and not. The graphs plot the coefficients of the interaction term $akan^{*}birthyear$ (as in regression equation 5) with 95 percent confidence bands. Average years of schooling are displayed along the vertical axis and year of birth along the horizontal axis. According to our theory, we expect to observe a similar trend in education for the cohorts born before 1968 and a reduction of the difference in years of education between Akan and non-Akan males born in 1968 or 1974 onwards. Cohorts born in 1968 or after should have been increasingly affected by the Intestate Law as there was more and more scope for parents to adjust their schooling

Table 4: Effect of the Intestate Law on years of education on the subsamples of individuals with a father farmer and not, by gender. Dependent variable is number of years of education.

	Males				Females			
	father farmer	father not farmer	father farmer	father not farmer	father farmer	father not farmer	father farmer	father not farmer
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
akan*post68	-0.813***	-0.318			-0.089	-0.258		
	(0.297)	(0.604)			(0.263)	(0.576)		
akan*post74			-1.157***	0.010			-0.238	-0.795
			(0.311)	(0.619)			(0.302)	(0.651)
akan	1.759***	0.791*	1.701***	0.685*	1.085***	0.400	1.093***	0.455
	(0.207)	(0.447)	(0.194)	(0.392)	(0.174)	(0.348)	(0.167)	(0.296)
Observations	6720	1464	6720	1464	8497	1735	8497	1735
R-squared	0.382	0.317	0.386	0.315	0.335	0.330	0.335	0.337

OLS estimates. Robust standard errors adjusted for clustering at the village level in parentheses. Sample of individuals 20-50. ***, **, and * indicate significance at 1%, 5% and 10% levels. Using survey weights. Birth year, region, and wave fixed effects included. Major community crops, observables*post, region*birthyr, and dummies for religion of the head of the household included.

investment choices.

Starting from the top, the first panel of figure 2 shows that before 1968 Akan and non-Akan males share a parallel trend: this is an important piece of evidence to support our identification strategy. Furthermore, the gap in years of education between Akan and non-Akan males starts closing for cohorts born after 1968, it remains somewhat constant until birth year 1973, and then it significantly decreases for the cohorts born in 1974 and after. Consistently with our predictions, the middle and bottom panels of figure 2 show that individuals whose father is/was a farmer experienced a sharp decrease in education, while there is no effect for those whose father was not a farmer (even though estimates are much less precise due to small sample size for this subsample). Figure A.1 in the appendix shows the results for females. Contrary to what happens for males, the gap between Akan and non-Akan remains fairly constant between cohorts affected and not affected by the reform. This is consistent with the fact that the Intestate Law effectively relaxed the transmission of property from father to son, while girls kept inheriting their mothers' land which was either nonexistent or "unconstrained" to start with.

Table 5 shows the results for completion rates. Our dependent variable is the highest level of education completed, which has four categories: no education, incomplete primary, completed primary, and secondary or higher. We estimate a multinomial logit model and then compute changes in the

Figure 2: Cohort-specific effects. Coefficients of the interaction term Akan*birth year dummies, males aged 20-50 in all waves, full sample and subsamples.

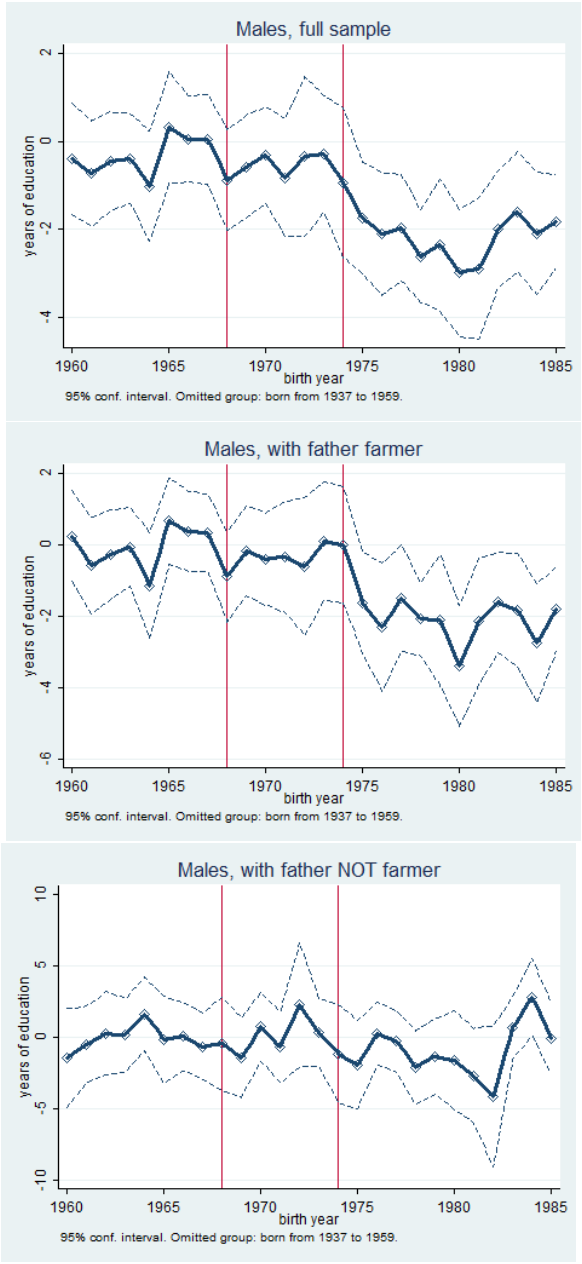

Table 5: Multinomial logit estimates of the effect of the Intestate Succession Law on completion rates, by gender. Dependent variable is the highest level of education completed.

	Males		Females	
	(1)		(2)	
	change	95% CI	change	95% CI
Pr(y=no education)	0.0587	(-0.0560, 0.1734)	0.0209	(-0.0603, 0.1020)
Pr(y=incompl. primary)	0.0433	(-0.0205, 0.1071)	-0.0290	(-0.0631, 0.0051)
Pr(y=compl. primary)	-0.0044	(-0.0620, 0.0531)	0.0179	(-0.0308, 0.0666)
Pr(y=second. or higher)	-0.0976	(-0.1945, -0.0007)	-0.0098	(-0.0517, 0.0320)
Pseudo R^2	0.229		0.214	
No. of obs.	8350		10310	

Multinomial logit estimates. The values reported are the changes in predicted probabilities when the interaction term $akan * post74$ changes from 0 to 1, with all the other independent variables set at their mean value. All regressions include individual controls as in table 3. Changes are reported with 95% confidence intervals by the delta method in parentheses. Pooled GLSS1-5. Standard errors are adjusted for clustering at the village level. Sample of individuals aged 20–50. Region, and wave fixed effects included. Major community crops, observables*post, region*birthyr, and dummies for religion of the head of the household included.

outcomes predicted probabilities when the interaction term $akan^{*}post74$ changes from 0 to 1, and all the other independent variables are set at their mean value. Changes are reported with 95% confidence intervals. Column (1) and (2) show the changes in the predicted probabilities for males and females, respectively. We see that the predicted probability of completing secondary school or higher level is 9.8 percentage points lower for Akans males in the post-reform period, which is significant according to the reported 95% confidence interval. These estimates suggest that the reform affected parental investment on education of sons who had already completed primary school and were enrolled (or deciding whether to enroll) in secondary school. Finally, column (3) and (4) show the results for females. Consistent with the results obtained for years of education, we do not find any significant effect on female's education.

Finally, appendix figure A.2 and figure A.3 show the graphs of the interaction analysis for the probability of completing primary or higher level for males and females, respectively. The results are similar to those found for the number of years of education.

6.2 Attendance and sibling composition

We now analyze the effects of changes in matrilineal inheritance rules on current attendance rates for individuals of primary and secondary school-age. In the previous sections, we used the sample of individuals who had completed their education (aged 20 to 50) and studied the effects on their accumulated human capital. Here we want to understand how the reform affected parental choices regarding their children's current enrollment in school. To do this, we use the sample of all individuals 6 to 17-year-old in each survey round. Then we compare attendance rates of individual observed in wave 1 and 2, our control group, to those surveyed in wave 3, 4, and 5, our treatment group. We expect to find a reduction in attendance rates for Akan males surveyed in the last three rounds of GLSS (those most affected by the reform), compared to non-Akan males. Moreover, the effect should be stronger for individuals in landed households. We also expect that secondary school age individuals (eg., aged 12 to 17) should be the most negatively affected, since the vast majority of Akan males complete at least primary school.

Table 6 shows the results for attendance rates of individuals aged 6 to 17, and separately for individuals of primary (aged 6 to 11) and secondary school-age (aged 12 to 17), by gender. In column (1) we see that the coefficient of our variable of interest, $akan^{*}post$, is negative and highly significant at the 1 percent level. The estimated coefficient is equal to -0.132, which means that the probability of being in school for those between 6 and 17 decreased for Akan males in the post-reform period by 13.2 percentage points. As expected, the reduction in attendance is stronger for Akan males aged 12–17 (compare column (3) and (5)). Column (3) shows that there was a significant decrease in attendance rates for Akan males also at the primary level. This evidence is not necessarily inconsistent with our previous finding that completion rate of primary was not affected: Akan boys might be attending less in the post-reform period but still complete primary. Column (2) shows that there was a reduction in attendance also for Akan females, which is weaker than that for males, but significant at the 5 percent level. The reduction for females is stronger than that for males at the primary level (column (4)).

Table 7 shows the results for the subsample of landed households and not. We focus on the subsample of individuals aged 12–17, where the effect for Akan males is stronger. First of all, it should be noted that Akan males have a strong initial advantage in attendance rates compared to non-Akan males

Table 6: Effect of the Intestate Succession Law on attendance rates, full sample, by gender. Dependent variable is a dummy equal to one if the individual is currently enrolled in school.

	6-17		6-11		12-17	
	Male	Female	Male	Female	Male	Female
	(1)	(2)	(3)	(4)	(5)	(6)
akan*post	-0.132***	-0.104**	-0.112**	-0.129**	-0.140**	-0.091
	(0.042)	(0.045)	(0.050)	(0.056)	(0.064)	(0.072)
akan	0.115***	0.140***	0.089**	0.166***	0.136**	0.133**
	(0.034)	(0.037)	(0.038)	(0.041)	(0.053)	(0.063)
Observations	8021	6777	4453	3948	3568	2829
Pseudo R-squared	0.241	0.261	0.278	0.285	0.222	0.257

Probit estimates, marginal effects reported. Robust standard errors adjusted for clustering at the household level in parentheses. Sample of individuals 6–17. Using survey weights. Region, and wave fixed effects included. Major community crops, observables*post, region*birthyr, log of distances to primary, junior and senior secondary, and dummies for religion of the head of the household included.

that is limited to landed households (by looking at the coefficient of *akan* in column (1) and column (3) for landed households and not, respectively). Moreover, again as expected, the reform had an effect on the probability of being in school only for individuals in households with land. This reduction is equal to 17.5 percentage points. This evidence strongly supports our theoretical setting. In order to see if this reduction was gradual and understand when it occurred, we break down the variable *akan*post* into the four interactions between *akan* and dummies for the four different survey waves (wave 1 is taken as the omitted category). Column (2) shows that the reduction was gradual, starting from wave 3 and becoming stronger and significant in waves 4 and 5. The negative effect of the reform on attendance rates for Akan males is very large for those in households with land. Column (4) shows that there is no effect whatsoever for landless households. Finally, column (5) to (8) report the estimates for females. Column (5) shows that there is a strong negative effect on attendance of females as well, even though the breakdown in column (6) suggests that this evidence is weak. Column (5) and (6) show that there is no effect for females in landless households.

The next exercise is to look at whether there are heterogeneous effects of the reform on attendance rates depending on the number of siblings within

Table 7: Effect of the Intestate Succession Law on attendance rates, secondary school age children, by gender. Dependent variable is a dummy equal to one if the individual is currently enrolled in school.

	Males				Females			
	w/ land		w/o land		w/ land		w/o land	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
akan*post	-0.175**		0.054		-0.231**		0.141	
	(0.080)		(0.123)		(0.093)		(0.171)	
akan*wave2		-0.065		-0.182		0.126		0.118
		(0.102)		(0.305)		(0.094)		(0.179)
akan*wave3		-0.114		0.004		-0.161		0.215*
		(0.109)		(0.171)		(0.117)		(0.115)
akan*wave4		-0.305**		-0.052		-0.203		0.194
		(0.134)		(0.200)		(0.141)		(0.143)
akan*wave5		-0.395***		-0.080		-0.230		0.063
		(0.133)		(0.209)		(0.148)		(0.215)
akan	0.220***	0.281***	-0.088	0.010	0.164**	0.124	-0.086	-0.132
	(0.066)	(0.079)	(0.138)	(0.164)	(0.078)	(0.093)	(0.189)	(0.230)
Observations	2299	2299	1145	1145	1755	1755	984	984
Pseudo R-squared	0.271	0.277	0.206	0.207	0.300	0.301	0.270	0.274

Probit estimates, marginal effects reported. Robust standard errors adjusted for clustering at the household level in parentheses. Sample of individuals 12-17. Using survey weights. Region, and wave fixed effects included. Major community crops, observables*post, region*birthyr, log of distances to primary, junior and senior secondary, and dummies for religion of the head of the household included.

the household.[30] [31] If bequests are to be divided among all children, the higher the number of children, the smaller the fraction going to each of them. We expect that, after the reform, disinvestment in education should be lower for boys who have more siblings. Table 8 shows the results. In column (1) we see that the reduction in attendance is equal to 37 percentage points for Akan males with no siblings. The coefficient on the triple interaction term ($akan^{*}post^{*}\#siblings$) is positive and significant at 1 percent level: it suggests that the negative effect on attendance is attenuated by 5 percentage points for each additional sibling. Columns (2) and (3) show that the effects are stronger for individuals in households with land compared to the full sample, and that there is no effect for landless households. In column (4) to (6) we see that there is no change in attendance for females.

In Table 9 we explore whether this "attenuation effect" on attendance rates varies according to the age and gender composition of siblings. We expect that the attenuation effect is mainly driven by those who have older siblings. In fact, in relation to the order of inheritance according to traditional matrilineal rules we know that 'if more than one person qualifies to inherit the property of the deceased, age and achievement become other important criteria' (Awusabo-Asare, 1990, p. 7). Moreover, since land is typically controlled (and consequently, inherited) by males, we expect that the number of older *male* siblings should have a positive mitigating effect (in the post-reform period) on attendance for Akan boys. Column (1) and (2) of Table 9 show that the coefficient on the $akan^{*}post^{*}\#oldersiblings$ is positive and significant. This is consistent with our expected result. We also find evidence that it is the number of older brothers that is important in mitigating the fall in attendance for Akan boys (column (3)), again confirming our prediction. Finally, no effect is found on female's attendance (columns (2) and (4)). Although we cannot make any causal claim, this evidence is consistent with the fact that their paternal land should be shared among more heirs, leading to lower land per child, hence lower disinvestment in education.

[30] Unfortunately, we only have information about siblings currently *residing* in the household, and not about those who are living elsewhere. Therefore, we are underestimating the total number of siblings.

[31] The number of siblings is calculated taking into account all biological children of the household head.

Table 8: Effect of the Intestate Succession Law on attendance rates and number of siblings, secondary school age children, by gender. Dependent variable is a dummy equal to one if the individual is currently enrolled in school.

	Males			Females		
	(1)	(2)	(3)	(4)	(5)	(6)
	full sample	with land	without land	full sample	with land	without land
akan*post*# sibling	0.054***	0.076***	0.038	-0.036	-0.045*	0.002
	(0.018)	(0.021)	(0.051)	(0.022)	(0.026)	(0.065)
akan*post	-0.373***	-0.496***	-0.075	0.073	-0.024	0.157
	(0.091)	(0.101)	(0.231)	(0.111)	(0.141)	(0.243)
post*# siblings	-0.015	-0.054**	0.003	0.042*	0.046	0.073
	(0.022)	(0.027)	(0.050)	(0.024)	(0.030)	(0.069)
akan*# siblings	-0.035**	-0.043***	-0.026	0.048**	0.057**	0.020
	(0.015)	(0.016)	(0.049)	(0.019)	(0.022)	(0.063)
# siblings	-0.002	0.001	0.009	-0.034*	-0.040	-0.083
	(0.019)	(0.023)	(0.048)	(0.020)	(0.025)	(0.067)
akan	0.278***	0.399***	0.006	-0.072	-0.078	-0.181
	(0.064)	(0.075)	(0.204)	(0.105)	(0.123)	(0.272)
Observations	3,568	2,299	1,145	2,829	1,755	984
Pseudo R-squared	0.225	0.283	0.207	0.259	0.304	0.272

Probit estimates, marginal effects reported. Robust standard errors adjusted for clustering at the household level in parentheses. Sample of individuals 12-17. Using survey weights. Region, and wave fixed effects included. Major community crops, observables*post, region*birthyr, log of distances to primary, junior and senior secondary, dummies for religion of the head of the household included.

6.3 Robustness checks

We next run several robustness checks. Our first robustness check deals with the fact that the Akan are concentrated in the Southern and Western regions of Ghana. Although all our regressions include region fixed effects and region-specific linear trends, in panel a of Appendix Table A.3 we estimate our years of education regression excluding from the sample the individuals in the northern region. We find that for males the coefficients of the interaction term of our interest are very similar in magnitude to the results in table 3 (-0.684 compared to -0.753 for the 1968 cutoff and -0.847 compared to -0.936 for the 1974 cutoff), and significant at 5 and 1 percent level. As before, we find no significant effect on the subsample of females. We run the same check for the regressions of attendance rates. Panel a of Appendix Table A.4 shows the results for the sample of individuals aged 6 to 17. Compared to the results in table 6, the effect on attendance is smaller

Table 9: Effect of the Intestate Succession Law on attendance rates and number of siblings, secondary school age children, by gender. Dependent variable is a dummy equal to one if the individual is currently enrolled in school.

	Male	Female	Male	Female
	(1)	(2)	(3)	(4)
akan*post	-0.378***	0.088	-0.374***	0.087
	(0.090)	(0.111)	(0.090)	(0.112)
akan	0.275***	-0.086	0.270***	-0.084
	(0.064)	(0.106)	(0.063)	(0.107)
akan*post*# younger siblings	0.019	-0.036		
	(0.020)	(0.027)		
akan*post*# older siblings	0.141***	-0.054		
	(0.035)	(0.041)		
post*# younger siblings	-0.007	0.058**		
	(0.024)	(0.026)		
post*# older siblings	-0.016	0.013		
	(0.028)	(0.032)		
akan*# younger siblings	-0.016	0.050**		
	(0.017)	(0.024)		
akan*# older siblings	-0.073***	0.060*		
	(0.028)	(0.035)		
younger siblings	-0.010	-0.052**		
	(0.021)	(0.023)		
older siblings	0.004	0.000		
	(0.024)	(0.028)		
akan*post*# older sisters			0.077	-0.038
			(0.066)	(0.066)
akan*post*# older brothers			0.178***	-0.064
			(0.046)	(0.060)
akan*post*# younger sisters			0.050	-0.047
			(0.035)	(0.045)
akan*post*# younger brothers			-0.011	-0.022
			(0.031)	(0.043)
Observations	3568	2829	3568	2829
Pseudo R-squared	0.230	0.261	0.233	0.262

Probit estimates, marginal effects reported. Robust standard errors adjusted for clustering at the household level in parentheses. Sample of individuals 12-17. Using survey weights. Region, and wave fixed effects included. Major community crops, observables*post, region*birthyr, log of distances to primary, junior and senior secondary, dummies for religion of the head of the household included.

in magnitude (a 8 percentage points reduction compared to 13.2 for males and 6 percentage points compared to 10.4 for females) but still significant at 1 and 10 percent level for males and females respectively. This evidence confirms that our results are not driven by omitted time-varying factors that are specific to the regions where the Akan are spatially concentrated.

Second, we check whether our results may be confounded by changes in returns to education for Akan compared to non-Akan males due to changes in agricultural production over the period considered. Akan and non-Akan are spatially concentrated in different regions where also different types of crops are grown (see summary statistics for the 8 major crops grown at the village level in table A.8). In order to check whether our results are affected by changes related to the production of a specific crop, we include the interactions between major community crops and the post-reform dummy to account for this possibility. The results are shown in Appendix Table A.3 and Appendix Table A.4 for the regressions for years of education and attendance, respectively. The results are very much consistent with our main results in table 3 and table 6.

One characteristic of Akans is that they are highly represented among cocoa producers. In fact, cocoa is mainly grown in the Southern and Western parts of Ghana, the regions where Akans are concentrated. If returns to education in cocoa farming changed over this period, or if Akans switched into or out of cocoa farming differentially from other groups (and this changed their returns to education), this may generate a pattern of results like the one we find. We thus use the dummy '*cocoa major crop*' to distinguish between villages where cocoa is listed as being one of the major crops (*cocoa major crop*=1), and villages where cocoa is not grown (*cocoa major crop*=0).

In Appendix table A.5 and table A.6 we re-estimate our main regressions for years of education and attendance introducing a triple interaction term *akan*post*cocoa major crop*. If our results were entirely driven by changes in the returns to education associated with cocoa farming, we would expect a negative and significant coefficient on this triple interaction, and an insignificant coefficient on *akan*post*. We find that for the male sample (column 1 of both table A.5 and table A.6) the coefficient on the interaction term of our interest is negative and significant (and close to our benchmark estimates). On the other hand the coefficient on *akan*post*cocoa major crop*, is insignificant. No significant effect is found for females (column 2). Overall, we interpret these findings as evidence that our results are not driven by changes in returns to education for cocoa farmers or by reallocation of Akans in or out of the cocoa sector correlated with the post-reform period.

A third check relates to changes in returns to education due to cuts in public employment following the structural adjustment program (since 1986). Over the period 1987 and 1990 about 47500 civil servants were laid off as part of the Redeployment program (Alderman, Canagarajah, Younger, 1993). Since Akans are relatively more employed in public sector jobs with respect to the non-Akan, the Redeployment program might have lowered investment in secondary education due to reduced access to the public sector jobs. This may constitute a shock specific to Akan in the post-reform period. To check whether this affected our results, we constructed a variable '*any member in government*' which is a dummy equal to one if at least one member of the household works for the government. The idea is to see whether the expectation of lower returns to education, proxied by the presence of a household member with a job in the public sector, is driving the reduction in investments in children's education. Since we have information on the type of employer only for resident members, we can do this check only for the regressions for attendance rates in which we use the sample of younger cohorts (aged 6 to 17) and we know the occupations and the employer for all resident members.

Similarly to our second robustness check, in Appendix table A.7 we re-estimate the attendance attendance regression introducing a triple interaction term *akan*post*any member in government*. In column (1) we see that the coefficient of *akan*post* is negative and statistically significant at 1 percent level (equivalent to a reduction in attendance of 13.6 percentage points for individuals living in households in which none of the members works for the government). The coefficient of the triple interaction *akan*post*any member in government* is instead equal to zero. For females, in column (2) we see that only the coefficient of *akan*post* is negative and significant while there is no additional effect for households with a government employee. These results support our idea that the reduction of investment in education has not been driven by households in which the father or any other member of the household had a job in the public sector.

7 Concluding remarks

This paper has provided some evidence that descent rules have important implications for human capital investment. We exploit the introduction of the 1985 Intestate Succession Law that radically changed traditional inheritance practices among matrilineal groups in Ghana. The Law allowed

fathers to transfer a substantial fraction of their property to their own children, reducing the share going to the matrikin. We interpret this evidence as consistent with the idea that the reform allowed parents to choose an allocation where the mix of human and physical capital was closer to the one they would have chosen in the absence of customary bequest constraints. Our results speak to a growing literature on the economic effects of traditional norms in developing countries and have relevant policy implications. In particular, our paper suggests that the individualization of land rights may have far reaching implications that go beyond agricultural investment and productivity, and affect human capital accumulation in the long run.

A Appendix

Table A.1: Simple difference-in-difference estimates of the effect of the Intestate Law on years of education, by gender. Dependent variable is number of years of education. Sample of individuals aged 0–30 in 1985 with father farmer (N=13935).

	Males			Females		
	Akan	non-Akan	diff	Akan	non-Akan	diff
Panel a. Pre-school and primary school age versus control						
0 to 11 years in 1985	8.26	5.22	3.04	6.17	3.58	3.59
se	(0.149)	(0.163)	(0.282)	(0.202)	(0.210)	(0.273)
18 to 25 years in 1985	8.55	4.48	4.07	4.60	2.69	2.69
se	(0.172)	(0.219)	(0.280)	(0.157)	(0.209)	(0.209)
difference	-0.28	0.74	-1.03	1.57	0.68	0.89
se	(0.216)	(0.269)	(0.345)	(0.236)	(0.204)	(0.31)
Panel b. Secondary school age versus control						
12 to 17 years in 1985	8.37	4.52	3.85	5.08	2.14	2.94
se	(0.196)	(0.212)	(0.324)	(0.231)	(0.143)	(0.285)
18 to 25 years in 1985	8.55	4.48	4.07	4.60	2.69	2.69
se	(0.172)	(0.219)	(0.280)	(0.157)	(0.209)	(0.209)
difference	-0.18	0.04	-0.22	0.49	0.24	0.24
se	(0.252)	(0.274)	(0.381)	(0.266)	(0.195)	(0.318)
Panel c. Placebo						
18 to 25 years in 1985	8.55	4.48	4.07	4.60	1.90	2.69
se	(0.172)	(0.219)	(0.280)	(0.157)	(0.099)	(0.209)
26 to 30 years in 1985	8.18	4.55	3.62	4.52	1.56	2.97
se	(0.205)	(0.269)	(0.328)	(0.217)	(0.137)	(0.254)
difference	0.37	-0.07	0.44	0.06	0.34	-0.28
se	(0.250)	(0.285)	(0.394)	(0.243)	(0.154)	(0.286)

OLS estimates. Pooled GLSS1, GLSS2, GLSS3, GLSS4, and GLSS5. Robust standard errors are adjusted for clustering. Sample of all individuals aged 0–30 in 1985 (from the sample of all individuals aged 20-50 in each survey round). Using survey weights.

Table A.2: Simple difference-in-difference estimates of the effect of the Intestate Law on years of education, by gender. Dependent variable is number of years of education. Sample of individuals aged 0–30 in 1985 with father NOT farmer (N=3622).

	Males			Females		
	Akan	non-Akan	diff	Akan	non-Akan	diff
Panel a. Pre-school and primary school age versus control						
0 to 11 years in 1985	9.16	8.29	0.87	6.74	6.28	0.46
se	(0.271)	(0.331)	(0.428)	(0.273)	(0.398)	(0.522)
18 to 25 years in 1985	9.64	8.13	1.50	6.65	5.05	1.60
se	(0.293)	(0.453)	(0.520)	(0.328)	(0.420)	(0.533)
difference	-0.47	0.16	-0.63	0.09	1.27	-1.13
se	(0.371)	(0.597)	(0.675)	(0.422)	(0.556)	(0.712)
Panel b. Secondary school age versus control						
12 to 17 years in 1985	9.66	7.87	1.79	7.31	5.17	2.14
se	(0.354)	(0.513)	(0.570)	(0.360)	(0.412)	(0.662)
18 to 25 years in 1985	9.64	8.13	1.50	6.65	5.05	1.60
se	(0.293)	(0.453)	(0.520)	(0.328)	(0.420)	(0.533)
difference	-0.02	-0.26	0.28	0.66	0.12	0.54
se	(0.400)	(0.539)	(0.679)	(0.452)	(0.564)	(0.749)
Panel c. Placebo						
18 to 25 years in 1985	9.64	8.13	1.50	6.65	5.05	1.60
se	(0.293)	(0.453)	(0.520)	(0.328)	(0.420)	(0.533)
26 to 30 years in 1985	10.7	9.71	0.99	6.09	4.64	1.45
se	(0.675)	(0.711)	(0.973)	(0.350)	(0.542)	(0.652)
difference	-1.07	-1.58	0.51	0.55	0.41	0.14
se	(0.732)	(0.812)	(1.122)	(0.409)	(0.67)	(0.819)

OLS estimates. Pooled GLSS1, GLSS2, GLSS3, GLSS4, and GLSS5. Robust standard errors are adjusted for clustering. Sample of all individuals aged 0–30 in 1985 (from the sample of all individuals aged 20-50 in each survey round). Using survey weights.

Figure A.1: Coefficients of the interaction term Akan*birth year dummies, females aged 20-50 in all waves, full sample and subsamples. Dep. variable: number of years of education.

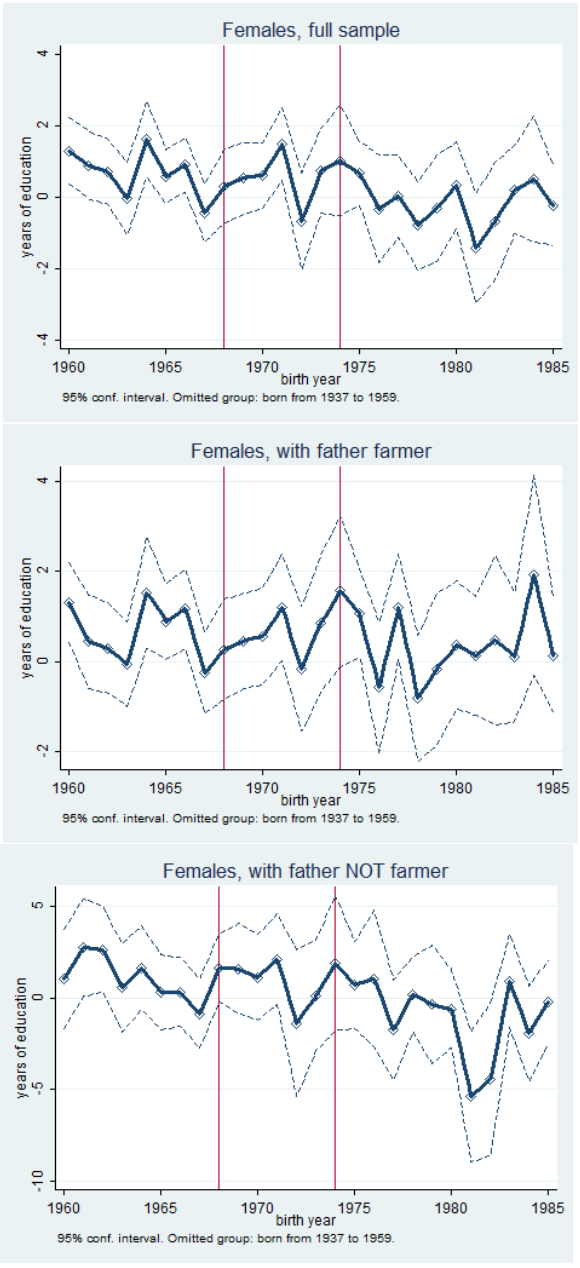

Figure A.2: Coefficients of the interaction term Akan*birth year dummies, males aged 20-50 in all waves, full sample. Dep. variable: completion rate of primary school or higher level. OLS

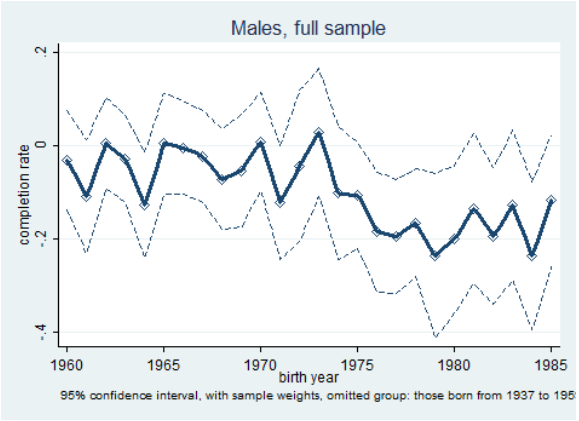

Figure A.3: Coefficients of the interaction term Akan*birth year dummies, females aged 20-50 in all waves, full sample. Dep. variable: completion rate of primary school or higher level. OLS

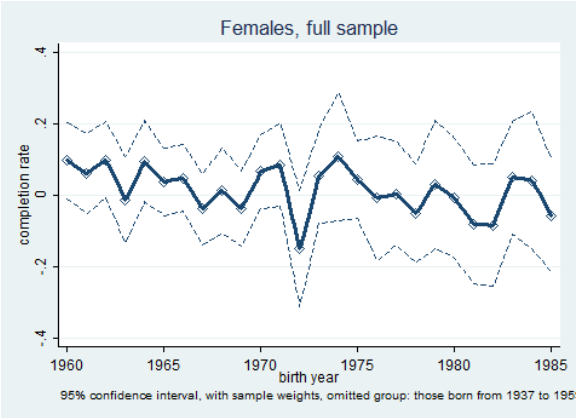

Table A.3: Robustness checks. Years of education regressions.

	Males		Females	
	(1)	(2)	(3)	(4)
Panel a. Excluding northern regions				
akan*post68	-0.684**		-0.024	
	(0.273)		(0.237)	
akan*post74		-0.847***		-0.030
		(0.296)		(0.276)
akan	1.621***	1.542***	0.955***	0.949***
	(0.195)	(0.184)	(0.170)	(0.157)
Observations	5936	5936	7175	7175
R-squared	0.236	0.237	0.281	0.283
Panel c. Including major community crops*post				
akan*post68	-0.696**		-0.042	
	(0.279)		(0.243)	
akan*post74		-0.934***		0.017
		(0.314)		(0.287)
akan	1.585***	1.512***	0.971***	0.949***
	(0.192)	(0.181)	(0.166)	(0.156)
Observations	8364	8364	10312	10312
R-squared	0.390	0.393	0.370	0.373
Panel b. Sample of individuals 25–50				
akan*post68	-0.777**		-0.047	
	(0.351)		(0.279)	
akan*post74		-1.081**		-0.122
		(0.419)		(0.384)
akan	1.666***	1.582***	1.095***	1.081***
	(0.199)	(0.192)	(0.165)	(0.155)
Observations	6506	6506	8403	8403
R-squared	0.406	0.406	0.365	0.366

OLS estimates. Robust standard errors adjusted for clustering at the village level in parentheses. Sample of individuals 20-50. ***, **, and * indicate significance at 1%, 5% and 10% levels. Using survey weights. Birth year, region, and wave fixed effects included. Major community crops, observables*post, region*birthyr, and dummies for religion of the head of the household included.

Table A.4: Robustness checks. Attendance regressions.

	Male	Female
	(1)	(2)
Panel a. Excluding northern regions		
akan*post	-0.080***	-0.063*
	(0.029)	(0.036)
akan	0.086***	0.108***
	(0.028)	(0.033)
Observations	5495	4820
Pseudo R-squared	0.166	0.221
Panel b. Including major community crops*post		
akpost	-0.112**	-0.087*
	(0.045)	(0.049)
akan	0.102***	0.129***
	(0.035)	(0.040)
Observations	8021	6777
Pseudo R-squared	0.244	0.263

Probit estimates, marginal effects reported. Robust standard errors adjusted for clustering at the household level in parentheses. Sample of individuals 6–17. ***, **, and * indicate significance at 1%, 5% and 10% levels. Using survey weights. Region, and wave fixed effects included. Major community crops, observables*post, region*birthyr, and dummies for religion of the head of the household included.

Table A.5: Subsample of cocoa-growing villages. Years of education regressions.

	Male	Female
	(1)	(2)
akan*cocoa major crop*post74	-0.058	-0.131
	(0.562)	(0.502)
akan*post74	-0.945**	-0.055
	(0.379)	(0.392)
cocoa major crop*post74	0.124	-0.421
	(0.446)	(0.378)
akan*cocoa major crop	-0.582*	-0.409
	(0.324)	(0.295)
cocoa major crop	0.093	0.395
	(0.279)	(0.256)
akan	1.848***	1.191***
	(0.250)	(0.208)
Observations	8,364	10,312
R-squared	0.393	0.372

OLS estimates. Robust standard errors adjusted for clustering at the village level in parentheses. Sample of individuals 20–50. Using survey weights.

Table A.6: Subsample of cocoa-growing villages. Dependent variable is a dummy equal to one if the individual is currently enrolled in school.

	Male	Female
	(1)	(2)
akan*cocoa major crop*post	0.087	-0.051
	(0.065)	(0.087)
akan*cocoa major crop	-0.059	0.031
	(0.074)	(0.071)
akan*post	-0.169**	-0.078
	(0.067)	(0.064)
cocoa major crop*post	-0.083	0.022
	(0.054)	(0.060)
akan	0.134**	0.125**
	(0.054)	(0.055)
cocoa major crop	0.079*	-0.004
	(0.044)	(0.055)
Observations	8,021	6,777
Pseudo R-squared	0.242	0.261

Probit estimates, marginal effects reported. Robust standard errors adjusted for clustering at the household level in parentheses. Sample of individuals 6-17. Using survey weights. Region, and wave fixed effects included. Major community crops, observables*post, region*birthyr, log of distances to primary, junior and senior secondary, dummies for religion of the head of the household included.

Table A.7: Subsample of individuals with any household member working for the government. Dependent variable is a dummy equal to one if the individual is currently enrolled in school.

	Male	Female
	(1)	(2)
akan*post*any member in government	-0.002	-0.069
	(0.104)	(0.139)
akan*post	-0.136***	-0.093**
	(0.045)	(0.047)
akan*any member in government	-0.120	0.046
	(0.095)	(0.091)
post*any member in government	0.008	0.118
	(0.074)	(0.072)
akan	0.128***	0.134***
	(0.036)	(0.039)
any member in government	0.125***	-0.043
	(0.034)	(0.084)
Observations	7,882	6,663
Pseudo R-squared	0.246	0.262

Probit estimates, marginal effects reported. Robust standard errors adjusted for clustering at the household level in parentheses. Sample of individuals 6-17. Using survey weights. Region, and wave fixed effects included. Major community crops, observables*post, region*birthyr, log of distances to primary, junior and senior secondary, dummies for religion of the head of the household included.

Table A.8: Summary statistics, sample of individuals aged 20–50.

	All			Male						Female					
				Akan			non-Akan			Akan			non-Akan		
	mean	s.dev.	n	mean	s.dev.	n	mean	s.dev.	n	mean	s.dev.	n	mean	s.dev.	n
akan	0.42	0.49	22178	1.00	0.00	3902	0.00	0.00	5962	1.00	0.00	5088	0.00	0.00	7226
eduyrs	4.82	4.98	22178	8.60	4.17	3902	4.92	5.22	5962	5.01	4.51	5088	2.36	4.00	7226
in school	0.03	0.16	22156	0.04	0.19	3897	0.05	0.22	5958	0.01	0.11	5086	0.01	0.11	7215
no education	0.43	0.49	22158	0.10	0.30	3893	0.44	0.50	5953	0.34	0.47	5088	0.68	0.47	7224
incompl. primary	0.10	0.30	22158	0.07	0.26	3893	0.09	0.29	5953	0.14	0.35	5088	0.09	0.29	7224
primary or higher	0.47	0.50	22158	0.83	0.38	3893	0.47	0.50	5953	0.52	0.50	5088	0.23	0.42	7224
junior sec or higher	0.34	0.47	22158	0.67	0.47	3893	0.35	0.48	5953	0.32	0.47	5088	0.14	0.35	7224
senior sec or higher	0.05	0.22	22158	0.11	0.31	3893	0.08	0.27	5953	0.03	0.16	5088	0.02	0.14	7224
female	0.55	0.50	22178	0.00	0.00	3902	0.00	0.00	5962	1.00	0.00	5088	1.00	0.00	7226
age	33.16	8.91	22178	33.06	8.97	3902	33.08	9.00	5962	33.34	8.95	5088	33.16	8.77	7226
Land (hh)	0.58	0.49	20964	0.60	0.49	3663	0.55	0.50	5703	0.61	0.49	4755	0.57	0.49	6843
hh size	5.88	3.42	22178	5.05	3.00	3902	5.88	3.58	5962	5.42	2.74	5088	6.71	3.77	7226
female head	0.17	0.38	22178	0.10	0.30	3902	0.05	0.23	5962	0.36	0.48	5088	0.16	0.37	7226
age head	42.53	13.03	22178	40.32	12.17	3902	41.54	13.13	5962	42.62	12.80	5088	44.58	13.30	7226
durables	-0.34	1.02	20954	-0.09	1.19	3717	-0.49	0.88	5677	-0.17	1.11	4738	-0.50	0.89	6822
catholic	0.16	0.37	22152	0.16	0.37	3898	0.17	0.37	5955	0.16	0.37	5085	0.15	0.36	7214
protestant	0.16	0.37	22152	0.21	0.40	3898	0.12	0.33	5955	0.22	0.42	5085	0.12	0.32	7214
other christian	0.28	0.45	22152	0.42	0.49	3898	0.19	0.39	5955	0.42	0.49	5085	0.18	0.38	7214
muslim	0.15	0.35	22152	0.06	0.24	3898	0.21	0.41	5955	0.06	0.23	5085	0.21	0.41	7214
animist	0.18	0.38	22152	0.06	0.23	3898	0.25	0.43	5955	0.06	0.24	5085	0.28	0.45	7214
married head	0.75	0.43	22170	0.68	0.47	3901	0.79	0.41	5961	0.66	0.47	5086	0.84	0.37	7222
polygynous head	0.12	0.33	22178	0.03	0.17	3902	0.13	0.34	5962	0.05	0.21	5088	0.23	0.42	7226
farmer (strict def)	0.70	0.46	20192	0.66	0.47	3563	0.76	0.43	5408	0.67	0.47	4704	0.72	0.45	6517
cocoa (hh)	0.23	0.42	19398	0.43	0.50	3272	0.11	0.31	5416	0.39	0.49	4222	0.11	0.31	6488
agric-fish (industry)	0.74	0.44	20084	0.71	0.45	3547	0.82	0.38	5359	0.68	0.47	4684	0.73	0.44	6494
mining (industry)	0.01	0.09	20084	0.02	0.15	3547	0.01	0.08	5359	0.00	0.04	4684	0.00	0.06	6494
manufact (industry)	0.08	0.27	20084	0.06	0.24	3547	0.05	0.21	5359	0.09	0.29	4684	0.10	0.30	6494
utilities (industry)	0.00	0.03	20084	0.00	0.04	3547	0.00	0.04	5359	0.00	0.00	4684	0.00	0.00	6494
construction (industry)	0.01	0.10	20084	0.03	0.17	3547	0.01	0.12	5359	0.00	0.01	4684	0.00	0.05	6494
sales (industry)	0.10	0.30	20084	0.05	0.22	3547	0.03	0.16	5359	0.18	0.38	4684	0.14	0.34	6494
transport (industry)	0.01	0.10	20084	0.03	0.18	3547	0.02	0.12	5359	0.00	0.03	4684	0.00	0.02	6494
financing (industry)	0.00	0.04	20084	0.01	0.08	3547	0.00	0.04	5359	0.00	0.02	4684	0.00	0.02	6494
civil (industry)	0.05	0.21	20084	0.08	0.27	3547	0.06	0.24	5359	0.04	0.19	4684	0.02	0.14	6494
other (industry)	0.02	0.15	20084	0.03	0.16	3547	0.02	0.16	5359	0.03	0.17	4684	0.01	0.12	6494

Rural sample of individuals aged 20–50. Pooled GLSS1-5. Using survey weights.
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Table A.9: Summary statistics, sample of individuals aged 20–50. *continued from previous page*

	All			Male						Female					
				Akan			non-Akan			Akan			non-Akan		
	mean	s.dev.	n	mean	s.dev.	n	mean	s.dev.	n	mean	s.dev.	n	mean	s.dev.	n
mother eduyrs	0.89	2.78	22033	1.40	3.30	3871	0.56	2.27	5931	1.34	3.35	5037	0.51	2.19	7194
father eduyrs	2.43	4.64	21693	3.94	5.34	3792	1.54	3.84	5906	3.57	5.27	4875	1.47	3.84	7120
father farmer	0.79	0.41	21857	0.72	0.45	3879	0.84	0.37	5769	0.72	0.45	5055	0.85	0.36	7154
mother farmer	0.80	0.40	21556	0.81	0.40	3839	0.78	0.41	5636	0.82	0.39	4962	0.81	0.40	7119
father sales sector	0.02	0.14	21859	0.03	0.16	3879	0.01	0.12	5769	0.03	0.16	5056	0.02	0.14	7155
mother sales sector	0.15	0.36	21558	0.15	0.35	3839	0.16	0.37	5637	0.14	0.35	4963	0.14	0.35	7119
father clerk	0.02	0.14	21859	0.03	0.18	3879	0.01	0.11	5769	0.03	0.18	5056	0.01	0.11	7155
mother clerk	0.00	0.04	21558	0.00	0.05	3839	0.00	0.03	5637	0.00	0.04	4963	0.00	0.03	7119
father professional	0.04	0.21	21859	0.07	0.26	3879	0.03	0.18	5769	0.06	0.24	5056	0.03	0.17	7155
mother professional	0.01	0.08	21558	0.01	0.09	3839	0.01	0.08	5637	0.01	0.09	4963	0.01	0.07	7119
cocoa major crop	0.37	0.48	20309	0.63	0.48	3511	0.19	0.39	5465	0.62	0.49	4669	0.18	0.38	6664
cassava major crop	0.79	0.40	20309	0.95	0.21	3511	0.68	0.47	5465	0.96	0.20	4669	0.67	0.47	6664
maize major crop	0.88	0.32	20309	0.89	0.31	3511	0.88	0.33	5465	0.90	0.30	4669	0.88	0.33	6664
yam major crop	0.43	0.49	20309	0.33	0.47	3511	0.50	0.50	5465	0.33	0.47	4669	0.49	0.50	6664
millet corn major crop	0.29	0.45	20309	0.02	0.16	3511	0.47	0.50	5465	0.02	0.14	4669	0.49	0.50	6664
tomato major crop	0.37	0.48	20309	0.43	0.50	3511	0.31	0.46	5465	0.43	0.50	4669	0.32	0.47	6664
plantains major crop	0.44	0.50	20309	0.73	0.45	3511	0.25	0.43	5465	0.72	0.45	4669	0.23	0.42	6664
rice major crop	0.33	0.47	20309	0.21	0.41	3511	0.42	0.49	5465	0.20	0.40	4669	0.42	0.49	6664

Rural sample of individuals aged 20–50. Pooled GLSS1-5. Using survey weights.

Table A.10: Summary statistics, sample of individuals aged 6–17.

	All			Male						Female					
				Akan			non-Akan			Akan			non-Akan		
	mean	s.dev.	n	mean	s.dev.	n	mean	s.dev.	n	mean	s.dev.	n	mean	s.dev.	n
akan	0.42	0.49	17413	1.00	0.00	3819	0.00	0.00	5653	1.00	0.00	3269	0.00	0.00	4672
eduyrs	2.10	2.80	17409	2.79	3.04	3819	1.75	2.61	5651	2.63	2.99	3269	1.52	2.45	4670
inschool	0.71	0.45	17375	0.86	0.35	3813	0.64	0.48	5644	0.81	0.39	3258	0.59	0.49	4660
no education	0.39	0.49	17402	0.25	0.43	3814	0.47	0.50	5649	0.28	0.45	3269	0.52	0.50	4670
incompl. primary	0.44	0.50	17402	0.52	0.50	3814	0.40	0.49	5649	0.50	0.50	3269	0.36	0.48	4670
primary or higher	0.17	0.37	17402	0.23	0.42	3814	0.13	0.34	5649	0.23	0.42	3269	0.11	0.32	4670
secondary or higher	0.03	0.18	17402	0.05	0.22	3814	0.03	0.16	5649	0.05	0.21	3269	0.02	0.13	4670
female	0.46	0.50	17413	0.00	0.00	3819	0.00	0.00	5653	1.00	0.00	3269	1.00	0.00	4672
age	10.83	3.37	17413	11.01	3.40	3819	10.88	3.40	5653	10.93	3.37	3269	10.56	3.31	4672
Land (hh)	0.61	0.49	16672	0.66	0.48	3663	0.59	0.49	5410	0.65	0.48	3131	0.56	0.50	4468
hh size	7.32	3.30	17413	6.54	2.49	3819	7.86	3.68	5653	6.66	2.57	3269	7.83	3.68	4672
female head	0.20	0.40	17413	0.28	0.45	3819	0.12	0.33	5653	0.29	0.45	3269	0.14	0.35	4672
age head	46.85	11.42	17413	45.46	10.69	3819	48.24	11.86	5653	45.31	10.69	3269	47.55	11.73	4672
durables	-0.39	1.00	16452	-0.21	1.09	3576	-0.55	0.89	5347	-0.16	1.13	3089	-0.51	0.90	4440
mother eduyrs	2.60	4.06	17390	3.97	4.48	3816	1.59	3.38	5644	3.96	4.46	3264	1.61	3.43	4666
father eduyrs	4.98	5.43	17332	7.33	5.14	3789	3.18	4.88	5630	7.36	5.25	3257	3.35	5.00	4656
catholic	0.15	0.36	17398	0.16	0.36	3818	0.15	0.35	5647	0.16	0.37	3267	0.15	0.36	4666
protestant	0.15	0.36	17398	0.21	0.41	3818	0.11	0.31	5647	0.21	0.41	3267	0.11	0.31	4666
other christian	0.27	0.45	17398	0.42	0.49	3818	0.15	0.36	5647	0.42	0.49	3267	0.18	0.38	4666
muslim	0.14	0.35	17398	0.06	0.24	3818	0.20	0.40	5647	0.07	0.25	3267	0.20	0.40	4666
animist	0.21	0.40	17398	0.06	0.25	3818	0.32	0.47	5647	0.06	0.24	3267	0.29	0.46	4666
married head	0.82	0.38	17403	0.73	0.44	3816	0.88	0.32	5652	0.75	0.44	3267	0.88	0.33	4668
# siblings	3.77	2.51	17413	3.28	2.02	3819	4.12	2.76	5653	3.36	2.06	3269	4.10	2.77	4672
# sisters	1.69	1.47	17413	1.49	1.31	3819	1.79	1.54	5653	1.63	1.37	3269	1.80	1.56	4672
# brothers	2.08	1.74	17413	1.79	1.48	3819	2.33	1.91	5653	1.73	1.42	3269	2.29	1.86	4672
# older siblings	1.63	1.72	17413	1.42	1.43	3819	1.74	1.87	5653	1.45	1.46	3269	1.80	1.90	4672
# younger siblings	2.15	1.83	17413	1.86	1.58	3819	2.38	1.98	5653	1.91	1.58	3269	2.30	1.97	4672
# older sisters	0.67	0.95	17413	0.61	0.86	3819	0.68	1.01	5653	0.67	0.89	3269	0.72	1.01	4672
# younger sisters	1.02	1.14	17413	0.88	1.02	3819	1.11	1.20	5653	0.96	1.08	3269	1.08	1.20	4672
# older brothers	0.95	1.21	17413	0.81	1.03	3819	1.06	1.32	5653	0.78	1.01	3269	1.08	1.32	4672
# younger brothers	1.13	1.23	17413	0.99	1.10	3819	1.27	1.33	5653	0.95	1.05	3269	1.22	1.30	4672

Rural sample of individuals aged 6–17. Pooled GLSS1-5. Using survey weights.

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Table A.11: Summary statistics, sample of individuals aged 6–17. *continued from previous page*

	All			Male						Female					
				Akan			non-Akan			Akan			non-Akan		
	mean	s.dev.	n	mean	s.dev.	n	mean	s.dev.	n	mean	s.dev.	n	mean	s.dev.	n
any member in govmt	0.08	0.27	17134	0.09	0.29	3799	0.07	0.25	5518	0.10	0.30	3248	0.07	0.25	4569
farmer (strict def)	0.82	0.39	5266	0.81	0.39	1003	0.84	0.37	2077	0.75	0.43	798	0.83	0.38	1388
cocoa (hh)	0.24	0.43	15624	0.43	0.50	3327	0.11	0.31	5194	0.44	0.50	2849	0.11	0.31	4254
father farmer	0.73	0.44	16740	0.67	0.47	3756	0.79	0.41	5345	0.66	0.47	3227	0.77	0.42	4412
father farmer	0.73	0.44	16740	0.67	0.47	3756	0.79	0.41	5345	0.66	0.47	3227	0.77	0.42	4412
mother farmer	0.74	0.44	16570	0.72	0.45	3728	0.75	0.43	5286	0.73	0.45	3177	0.74	0.44	4379
father sales	0.02	0.15	16754	0.03	0.17	3757	0.02	0.13	5349	0.04	0.19	3228	0.02	0.14	4420
mother sales	0.14	0.34	16586	0.15	0.36	3728	0.13	0.33	5289	0.15	0.36	3181	0.13	0.34	4388
father clerk	0.02	0.13	16754	0.03	0.16	3757	0.01	0.10	5349	0.03	0.18	3228	0.01	0.11	4420
mother clerk	0.00	0.04	16586	0.00	0.04	3728	0.00	0.04	5289	0.00	0.06	3181	0.00	0.02	4388
father professional	0.06	0.24	16754	0.09	0.28	3757	0.04	0.20	5349	0.08	0.27	3228	0.04	0.20	4420
mother professional	0.02	0.13	16586	0.02	0.14	3728	0.01	0.11	5289	0.02	0.15	3181	0.01	0.12	4388
ln (1+dist prim)	0.21	0.54	16514	0.16	0.43	3643	0.24	0.60	5356	0.15	0.43	3103	0.25	0.63	4412
ln (1+dist jsec)	0.59	0.86	16472	0.39	0.65	3641	0.76	0.96	5331	0.39	0.66	3102	0.73	0.97	4398
ln (1+dist ssec)	1.86	1.06	16300	1.74	1.02	3574	1.94	1.08	5312	1.73	1.02	3040	1.97	1.07	4374
cocoa major crop	0.37	0.48	16054	0.65	0.48	3518	0.17	0.38	5211	0.64	0.48	3008	0.18	0.39	4317
cassava major crop	0.80	0.40	16054	0.97	0.18	3518	0.66	0.47	5211	0.96	0.19	3008	0.69	0.46	4317
maize major crop	0.89	0.32	16054	0.89	0.31	3518	0.88	0.33	5211	0.90	0.31	3008	0.88	0.33	4317
yam major crop	0.42	0.49	16054	0.33	0.47	3518	0.49	0.50	5211	0.34	0.47	3008	0.49	0.50	4317
millet corn major crop	0.30	0.46	16054	0.02	0.15	3518	0.53	0.50	5211	0.02	0.14	3008	0.49	0.50	4317
tomato major crop	0.37	0.48	16054	0.43	0.50	3518	0.32	0.47	5211	0.44	0.50	3008	0.33	0.47	4317
plantains major crop	0.44	0.50	16054	0.73	0.44	3518	0.22	0.41	5211	0.74	0.44	3008	0.23	0.42	4317
rice major crop	0.33	0.47	16054	0.22	0.41	3518	0.42	0.49	5211	0.23	0.42	3008	0.41	0.49	4317

Rural sample of individuals aged 6–17. Pooled GLSS1-5. Using survey weights.

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