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ABSTRACT

Fostering, Child Welfare, and Ethnic Cultural Values*

This article examines the effects of fostering on children's labour supply and schooling in host families in Niger. The focus is on the causal role of ethnic inherited cultural values and behaviours in perpetuating fostering. In particular, at the ethnic group level, we rely on the inherited level of community integration, the situation of frequent interethnic violence, and an indicator of great importance attributed to foster parents. We specify a simultaneous equations model with three outcomes for children (school attendance, hours of market work and hours of domestic work) and a treatment variable (fostering). The results show that foster children are more likely to attend school and to have longer hours of domestic work than biological children. Importantly, we find evidence of a schooling fostering for boys and a domestic fostering for girls. We provide heterogeneous effects for different samples and test the robustness of the results to different empirical specifications. All in all, ethnic inherited values and behaviours are found to have an important causal effect on children's welfare.

JEL Classification: J13, J22, O12, C34

Keywords: child fostering, culture, child labour, domestic work, schooling, Niger

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1 Introduction

Upbringing children by people other than their biological parents, known as child fostering, is a frequent phenomenon in West Africa.¹ Ethnographic and historical studies provide evidence of a geographical widespread, outside the West African frontiers, of such a traditional community arrangement based on child relocation.² However child fostering in West African countries reveals some cultural specific features which make it interesting to study. First, the importance of kinship in West African society must be emphasized.³ Children do not only belong to their biological parents but they rather belong to a lineage or kinship group. Child fostering is sometimes a means to strengthen these ties and ensure maximum survival of the group ([Isiugo-Abanihe, 1985](#)). Second, the scarcity of individual land property rights and the one-season agricultural practices in West Africa encourage fostering ([Serra, 2009](#)). Third, the social status of women in Sub-saharan Africa is largely dependent on her success in reproduction and her large progeny. Child fostering can thus help to offset demographic imbalances ([Akresh, 2009](#); [Vandermeersch, 2002](#)). Fourth, child fostering is seen as an investment in human capital ([Akresh, 2009](#)).⁴ These factors combined with deeply rooted cultural traditions and social norms enable perpetuating child fostering. According to [Zimmerman \(2003\)](#), fostering is an intuitive response to market imperfections and features of the institutional environment.

The household non-traditional kinship arrangements through fostering affect the behaviour of family members, children and adults, in both sending and host families. These arrangements embed social, emotional and economic relationships and thus constitute a very powerful mechanism to enforce informal transactions. The economic literature gives motivates to children fostering the households' willingness to labour sharing of domestic chores or market work ([Ainsworth, 1996](#)), risk sharing ([Akresh, 2009](#)) or resource pooling for children education ([Ainsworth, 1996](#); [Akresh, 2009](#); [Lloyd and Blanc, 1996](#)). Thus fostering-in may affect decisions concerning childbearing, childcare and rearing, the education of children and the labour supply of both children and adult women within the host family. Moreover, the intrinsic qualities of generosity and altruism of the household head may have an important role in explaining fostering. As mentioned by [Cox and Fafchamps \(2007\)](#), altruism is found to be stronger among genetically related individuals. [Foster and Rosenzweig \(2001\)](#), using data from rural South Asia, find that having a long history of giving transfers increases the household's propensity to make an ad-

¹The Demographic and Health Surveys (DHS) reports from 14 West African countries over the 2005-2014 period show that the share of households with at least one foster child under 18 ranges from 15.1% in Cap Verde to 37.5% in Sierra Leone.

²See, for instance, [Bodenhorn \(2000\)](#) for Alaska, [Leinaweaver \(2007\)](#) for Peru, [Walmsley \(2008\)](#) for Ecuador, [Goody \(1996\)](#) for China, and [Doyle Jr \(2007\)](#) for the US.

³Most fostering in West Africa takes place within the kinship framework in order to strengthen family ties ([Okore, 1977](#)). However, the literature recognizes other forms of fostering ([Okunola and Ikuomola, 2010](#)): (i) the crisis fostering experienced to improve survival chances; (ii) the apprentice fostering aiming at strengthening social ties and skill acquisition; (iii) the educational fostering to acquire formal education; (iv) the domestic fostering to render assistance and help foster parents. Failure to obtain, at a time in a survey, information on the reasons a child is fostered-out by biological parents and the child's welfare within the host family, makes further the inclusion of education, domestic labour and market labour crucial to assess the child's welfare.

⁴Fostering one's own children includes informal forms of human capital such as developing the moral character of difficult children to allow them acquiring better discipline ([Goody, 1982](#); [Silk, 1987](#)).

ditional transfer. Thus when households care about each other, they stand to gain more from self-enforcing mutual insurance arrangements than they would otherwise, and this increases the scope for cooperation. [Becker \(1981\)](#) presents the postulate of a “taste for own children” according to which parents prefer own children because they have genes in common and people are able to observe some characteristics of own children at birth or during infancy. Similarly, the higher familiarity and degree of altruism among members of the same family explains why children of siblings and other relatives are more frequently fostered than children of strangers.

This article examines fostering, children’s labour supply and schooling in an empirical novel way and draws on two main literatures. The first literature examines the welfare of foster versus biological children in host families. Using data from South Africa, [Zimmerman \(2003\)](#) shows that fostering facilitates investment in children’s human capital and reduces the risk of not attending school for foster children with respect to the situation where they stay with their biological families. He shows limited evidence, observable only for girls, to support the need for domestic labour from fostering-in. [Cichello \(2003\)](#) uses panel data from the KwaZulu-Natal Income Dynamics Study (KIDS) and examines the impact of child fostering on educational investments. He finds that children fostered to close relatives do not suffer from lower enrollment in schools compared to biological children but for those fostered to distant or non-relatives he finds a non long term negative impact on their human capital accumulation. [Serra \(2009\)](#) proposes a theoretical framework to study welfare, such as nutrition, health, schooling, and work of foster children. By allowing for positive externalities of fostering and asymmetric motives for fostering-in (labour) and fostering-out (human capital), her theoretical model predicts that school-age children fostered to a better-off household improve their human capital. The model contributes to explaining why some households may foster in and out simultaneously and finds that fostering may secure benefits to the child, his parents, and the foster parents which represents a Pareto improving institution. According to [Serra \(2009\)](#), fostering provides better educational prospects to children whose options would be very limited otherwise. [Kana et al. \(2010\)](#) develop a theoretical model based on [Serra \(2009\)](#) which aims to exploring the effects of informal child fostering arrangements on the welfare of the children involved. The innovative feature of their model is the inclusion of a child’s nutrition status as a determinant of the child’s school performance. They found, in a context where [Hamilton \(1963\)](#)’s rule applies, that placing children under the care of non-parents need not make these children worse off. [Marazyan \(2011\)](#) finds evidence of a positive effect of the sibship extension to additional foster children in Indonesia on children’s school enrolment. She argues that, given that grandchildren fostering is associated with positive transfers from biological to host parents, this effect is due to a release of liquidity constraints in the host household or to the uncommon preferences of host grandparents. [Beck et al. \(2015\)](#) describe the selection into fostering of households and children in Senegal and examine the impact of fostering on the welfare of children measured through their school enrolment, market and domestic work. The results suggest that, on average, education and labour outcomes of foster children are similar to those of their host siblings. In particular,

foster girls do not seem to be overloaded with domestic tasks compared to their host sisters.

The second literature sustains the potential influence of cultural and social values on kinship arrangements through fostering. Recent economic literature presents evidence of the historical origins of cultural differences and of a persistent component of cultural and social values.⁵ Putnam (2000) analyses trends in social capital in the United States and shows that the levels of social capital of both US immigrants and their ancestors at home countries are perfectly correlated. Algan and Cahuc (2010) use inherited family values as an instrument for family values in the source country of US immigrants. Fernández (2007) and Fernández and Fogli (2009) use attitudes toward women’s work and fertility from the country of ancestry as cultural proxies to study the work and fertility behaviour of second-generation American women. Guiso et al. (2008) develop a theoretical framework to analyse the determinants of investment in social capital and conclude that social capital can be measured, accumulated and transmitted. Nunn and Wantchekon (2011) combine contemporary household survey data with historic data on slave shipments by ethnic group and show that individuals whose ancestors suffered the slave trade have lower levels of trust in neighbors, relatives and local government. Tabellini (2010) uses data from regions of Europe and finds that culture, measured by indicators of individual values and beliefs such as trust and respect for others, affects economic development. In a recent study, Nollenberger et al. (2016) use math test scores of second-generation immigrants to analyse the effect of gender-related culture on the math gender gap. They conclude on the importance of the transmission of cultural beliefs on the role of women in society in explaining the math gender-gap. The use of cultural and social values in economic studies in developing countries remains relatively scarce because of data issues, and the few existing studies concentrate on health outcomes.⁶ Fostering as a family arrangement is likely to be rooted in the long run and transmitted along generations. However it has not been related, to our knowledge, to cultural and social values in the economic analysis.

This article contributes to the literature by evaluating the cultural determinants of fostering-in and by providing a simultaneous equations to jointly determine the impact of fostering on children’s market labour, domestic work and school attendance. The data we use are drawn from the the National Survey on Household Living Conditions and Agriculture (ECVM/A) administered in Niger in 2011. The data allow identifying the foster-in status of children and give information on children’s school attendance and hours spent in market and domestic work. In order to deal with the endogeneity of fostering, we rely on inherited values for each ethnic group. To this end, we use data from the cross-cultural historically-based ethnic group sample compiled by Murdock and White (1969). In particular, we use inherited levels of community integration, and indicators for frequent interethnic violence and for great importance of foster parents. Niger is a good case study because the country reveals a relatively high share of about 20% of foster children (DHS, 2012). In 2013, in spite of the improvement in school enrolment over the decade, the gross primary and secondary school enrolment in Niger of 72% and 18%

⁵See Fernández (2011) for a review of the literature.

⁶See, e.g., Hollard and Sene (2016).

respectively remains far behind the average of Sub-Saharan African countries.⁷ Furthermore, child work is widespread in Niger. In fact, 54% and 29% of Nigerien children aged 5-11 and 12-14, respectively, are engaged in market work (DHS, 2012)..

The remainder of this article is organised as follows. In the next section, we present the estimation strategy. The data and sample selection are described in section 3. Section 4 discusses the results and final section concludes.

2 Empirical Strategy

2.1 Basic Specification

This article appreciates the cultural heritage of fostering and aims to detecting potential discrimination in schooling and labour supply between foster and biological children in host families. In particular, we consider three different outcomes for children: school attendance, the number of hours spent working in the market, and the number of hours spent performing domestic tasks. To this end, we specify a simultaneous four equations model with the previously mentioned outcomes and a treatment variable, i.e. fostering. This modelling strategy relies on the interdependence of children’s labour supply and school attendance behaviours (Rosati and Rossi, 2003), and on the possible existence of unobservable variables that affect the three main outcomes and the probability of being fostered.

Modelling jointly the children’s market labour, domestic work and school attendance further contributes to the empirical literature on child labour where market and domestic labour supply as well as school attendance have never been estimated allowing for correlation between explanatory variables and disturbances in estimation of behavioral equations.⁸ Since we do not observe fostering-out families we are not able to estimate the counterfactual labour supply and school attendance of fostered-in children in their biological families that would be necessary to properly evaluate the impact of fostering on child’s welfare.

Fostering decision is treated as endogenous for the following reasons. At the household level there may exist some unobservable factors influencing simultaneously the decision to foster-in and the decision to send children to school, in absence of any data on the biological family of fostered-in children. If the foster parents motivation is market or domestic labour supply, fostering is clearly endogenous with respect to children labour supply. Unobserved child-level characteristics could also influence both decision to be fostered and any of the three outcomes analysed. For instance a good student may have more probability to be fostered and to be sent to school because of higher expected returns to schooling of both biological and foster families. Additionally the “good” child may feel in debt with the host family for their education provision and decides to supply more time for household production, comparing to biological

⁷Source: World Bank. We note, that for 2011, the year of the survey we use in our empirical analysis, these rates were, respectively, 68.9% and 14.7%.

⁸Zapata et al. (2011) and Emerson and Souza (2008) use a bivariate probability model to model child labour and schooling without considering the continuous nature of labour supply and hours devoted to domestic tasks.

children. As suggested in [Goody \(1982\)](#) and [Zimmerman \(2003\)](#), the “difficult” child can be also a good candidate for fostering to receive discipline by the host family. In this case bad behaviour at home may be correlated with school drop out representing an unobservable factor in our analysis. Foster children may also decide to work in the market in order to improve their bargaining status with respect to children living with their biological parents.

We allow thus children’s school attendance, hours of market work and hours of domestic work to depend on fostering status, child level and household level characteristics. Since our dependent variables are binary or continuous variables with corner solutions, the specification is a nonlinear simultaneous equations model ([Amemiya, 1979](#); [Lee, 1982](#); [Nelson and Olson, 1978](#)) where fostering decision is the endogenous regressor. The three main equations are specified as a Probit model (for school attendance) and Tobit models (for hours spent on domestic tasks and hours spent on paid work). Consistent estimation of parameters in the three main equations are achieved under the assumption that a matrix of instrument \mathbf{Z}_i for fostering exists and that satisfies $E[\mathbf{u}_i \mathbf{Z}_i] = \mathbf{0}$ ([Brundy and Jorgenson, 1971](#); [Manski et al., 1981](#)).

Let s_i denote school attendance, d_i domestic labour supply, and m_i market labour supply of the child i ($i = 1, \dots, N$). The dummy f_i identifies whether the child is foster or biological. We allow children’s school attendance, hours of market work and hours of domestic work to depend on fostering status f_i , child level (\mathbf{C}_i) and household level (\mathbf{H}_i) characteristics, and error terms (u_i, e_i, v_i). The identification of the fostering coefficients rely on the presence of a vector \mathbf{Z}_i of exclusion restrictions in the fostering equation.

$$s_i^* = \alpha + \beta_f f_i + \beta'_C \mathbf{C}_i + \beta'_H \mathbf{H}_i + u_i \quad (1.a)$$

$$d_i^* = \beta + \beta_f f_i + \beta'_C \mathbf{C}_i + \beta'_H \mathbf{H}_i + e_i \quad (1.b)$$

$$m_i^* = \gamma + \beta_f f_i + \beta'_C \mathbf{C}_i + \beta'_H \mathbf{H}_i + v_i \quad (1.c)$$

$$f_i^* = \zeta + \beta'_Z \mathbf{Z}_i + \beta'_C \mathbf{C}_i + \beta'_H \mathbf{H}_i + w_i \quad (1.d)$$

$$s_i = 1 \quad \text{if } s_i^* > 0 \quad (2.a)$$

$$= 0 \quad \text{otherwise;}$$

$$d_i = d_i^* \quad \text{if } d_i^* > 0 \quad (2.b)$$

$$= 0 \quad \text{otherwise;}$$

$$m_i = m_i^* \quad \text{if } m_i^* > 0 \quad (2.c)$$

$$= 0 \quad \text{otherwise;}$$

$$f_i = 1 \quad \text{if } f_i^* > 0 \quad (2.d)$$

$$= 0 \quad \text{otherwise}$$

Coefficients are estimated with a non-linear full-information maximum likelihood estimator

(Amemiya, 1985) that allows also for non-zero correlations between error terms in the child's labour supply, school attendance and fostering equations.

The error terms are drawn from a multivariate normal distribution with zero mean and a 4x4 covariance matrix.

$$\begin{matrix}
 & s_i & d_i & m_i & f_i \\
 s_i & \left[\begin{array}{cccc}
 \sigma_1^2 & \sigma_1\sigma_2\rho_{1,2} & \sigma_1\sigma_3\rho_{1,3} & \sigma_1\sigma_4\rho_{1,4} \\
 & \sigma_2^2 & \sigma_2\sigma_3\rho_{2,3} & \sigma_2\sigma_4\rho_{2,4} \\
 & & \sigma_3^2 & \sigma_3\sigma_4\rho_{3,4} \\
 & & & \sigma_4^2
 \end{array} \right. \\
 d_i \\
 m_i \\
 f_i
 \end{matrix}$$

where $Var[u_i] = \sigma_1^2 = 1$, $Var[e_i] = \sigma_2^2$, $Var[v_i] = \sigma_3^2$ and $Var[w_i] = \sigma_4^2 = 1$. The covariance between two error terms is presented by $\sigma_k\sigma_l\rho_{k,l}$ where $\rho_{k,l}$ indicates the correlation coefficients for any $k \neq l$ and $k, l \in \{1, \dots, 4\}$.

Correlation among the error terms is allowed between time-use equations, between school attendance and labour supply models and between fostering and all the other equations. By letting the covariance matrix be unrestricted and estimating all its elements, the model allow for the simultaneity of children's time allocation choices and fostering decision. Correlations of the errors of the time-use equations, schooling and fostering may reflect unobserved heterogeneity at child and household level that may influence probability of fostering-in, child labour supply and the amount of child house work.

2.2 Selection into Market Work

In the equations (1.a - 1.d) labour supply for market and domestic work are both modelled by means of a Tobit specification however it is well known that when selectivity bias is at work and there is high correlation between the error terms of the selection and the outcome equation, labour supply should be estimated with Heckman (1979)'s selection model. The Heckman selection model consists of two equations, the outcome equation and the selection equation. The dependent variable of the outcome equation is observed only when the dependent variable of the selection equation is positive. In our framework, the main dependent variable is the weekly hours labour performed by foster and biological children while the dependent variable of the selection equation is a variable that takes 1 when hours are positive and 0 otherwise. There is reason to believe that the correlation between the error terms of the selection equation and the labour supply equation is significant especially due to the fact that the number of censored observations is large in child labour analysis. In our general sample 36% of children participate to the labour force and 52% report positive values of hours spent in domestic activities, although the participation rates vary substantially by sub-sample (Table 1). As to market work, girls (both foster and biological) are those with the lowest percentages, while almost half (45%) of the biological boys does some market related activity. For this reason we also model labour supply

Table 1: Summary Statistics

	Biological Children						Foster Children			
	Total		Boys		Girls		Boys		Girls	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Male	0.516	0.500								
Dummy for foster child	0.102	0.303					0.091	0.288	0.115	0.319
Dummy for foster child (not relative)	0.003	0.051					0.021	0.144	0.026	0.160
Outcome variables										
School attendance	0.459	0.498	0.466	0.499	0.445	0.497	0.494	0.501	0.488	0.500
Dummy for Market Work	0.369	0.483	0.451	0.498	0.294	0.456	0.388	0.488	0.243	0.429
Dummy for Domestic Work	0.520	0.499	0.455	0.498	0.573	0.494	0.507	0.500	0.673	0.469
Hours of Market Work (conditional)	38.48	19.09	41.73	18.38	33.80	18.77	41.52	21.29	27.40	16.31
Hours of Domestic Work (conditional)	6.575	8.592	3.934	5.519	8.677	10.115	3.837	4.489	9.606	9.300
Household characteristics										
Age in years	9.681	3.757	9.711	3.824	9.389	3.618	10.56	3.933	10.81	3.733
Number of foster children	0.464	1.122	0.178	0.583	0.210	0.644	2.875	1.743	2.528	1.697
Number of girls aged 0-4	0.816	0.927	0.806	0.911	0.904	0.963	0.449	0.675	0.573	0.848
Number of girls aged 4-11	1.261	1.126	0.957	1.025	1.643	1.143	0.838	0.983	1.267	1.010
Number of girls aged 11-14	0.448	0.664	0.347	0.592	0.560	0.713	0.332	0.634	0.543	0.716
Number of girls aged 14-17	0.286	0.555	0.210	0.481	0.348	0.599	0.245	0.542	0.480	0.667
Number of boys aged 0-4	0.822	0.961	0.914	0.987	0.807	0.967	0.546	0.723	0.431	0.688
Number of boys aged 4-11	1.298	1.171	1.657	1.177	0.980	1.074	1.301	1.043	0.739	1.010
Number of boys aged 11-14	0.451	0.650	0.555	0.695	0.347	0.584	0.574	0.683	0.277	0.546
Number of boys aged 14-17	0.393	0.629	0.468	0.667	0.308	0.564	0.548	0.748	0.277	0.542
HH size	9.021	3.905	9.126	3.888	9.160	3.879	8.200	3.746	7.872	4.098
Dummy for any polygamous marriage in HH	0.317	0.465	0.335	0.472	0.329	0.470	0.195	0.397	0.190	0.393
Nuclear HH	0.569	0.495	0.583	0.493	0.589	0.492	0.431	0.496	0.437	0.497
Female-headed HH	0.119	0.324	0.091	0.287	0.081	0.283	0.379	0.486	0.354	0.479
Head age in years	49.04	12.09	48.39	11.53	48.28	11.55	54.26	15.35	55.33	14.07
Average years of education of female HH members	1.216	2.636	1.123	2.545	1.177	2.575	1.765	3.223	1.764	3.084
Employment ratio at HH level	0.763	0.286	0.774	0.281	0.765	0.285	0.729	0.304	0.702	0.317
Female-headed HH	0.312	0.463	0.305	0.461	0.319	0.466	0.332	0.471	0.296	0.457
Rural	0.623	0.485	0.663	0.473	0.622	0.485	0.447	0.498	0.466	0.499
Dwelling ownership	0.831	0.375	0.852	0.355	0.822	0.383	0.786	0.411	0.763	0.426
Ln head labour income	10.91	4.470	10.93	4.395	11.11	4.323	10.20	5.118	9.951	5.281
Ln non labour income	0.531	2.536	0.456	2.360	0.466	2.394	0.987	3.364	1.217	3.686
Transfers	35.88	215.5	29.76	165.8	32.56	208.3	96.56	493.4	56.98	219.0
Observations	8443		3961		3613		398		471	

decisions with two equations that separately represent the decision to work and how many hours to spend in the market or in domestic activities. Thus we now consider market and domestic work participation equations in addition to the hours of work already specified in the equations system (1.a - 1.d). The estimation of this alternative specification result in a significant selection effect for market work but not for domestic work. Accordingly, our preferred specification does not include a selection equation for domestic work⁹ and the system of equations is:

⁹We do not include domestic participation equation in order to avoid efficiency loss since the selection equation was not correlated with the outcome equation in any sample. Results of the model with the two Heckman selections are available upon request.

$$s_i^* = \alpha + \beta_f f_i + \beta'_C \mathbf{C}_i + \beta'_H \mathbf{H}_i + u_i \quad (3.c)$$

$$d_i^* = \beta + \beta_f f_i + \beta'_C \mathbf{C}_i + \beta'_H \mathbf{H}_i + e_i \quad (3.d)$$

$$l_i^* = \eta + \beta_f f_i + \beta'_C \mathbf{C}_i + \beta'_H \mathbf{H}_i + \beta'_K \mathbf{K}_i + \epsilon_i \quad (3.e)$$

$$m_i^* = \gamma + \beta_f f_i + \beta'_C \mathbf{C}_i + \beta'_H \mathbf{H}_i + v_i \quad (3.f)$$

$$f_i^* = \zeta + \beta'_Z \mathbf{Z}_i + \beta'_C \mathbf{C}_i + \beta'_H \mathbf{H}_i + w_i \quad (3.g)$$

$$s_i = 1 \quad \text{if } s_i^* > 0 \quad (4.a)$$

$$= 0 \quad \text{otherwise;}$$

$$d_i = d_i^* \quad \text{if } d_i^* > 0 \quad (4.b)$$

$$= 0 \quad \text{otherwise;}$$

$$l_i = 1 \quad \text{if } l_i^* > 0 \quad (4.c)$$

$$= 0 \quad \text{otherwise;}$$

$$m_i = m_i^* \mathbf{1} \quad \text{if } l_i = 1 \quad (4.d)$$

$$= - \quad \text{if } l_i = 0;$$

$$f_i = 1 \quad \text{if } f_i^* > 0 \quad (4.e)$$

$$= 0 \quad \text{otherwise}$$

Equation 3.e is the selection equation into market labour, where the latent variable l_i^* is related to vectors of explanatory variables. \mathbf{K}_i is a vector of variables which appears only in the selection equation and are referred to as exclusion restriction serving to identify the parameters of the model. The error term of the selection equation is allowed to be correlated with the error terms of the remaining equations. The latent variable m_i^* is only observed if the selection indicator l_i is equal to one.

2.3 Identification

As previously mentioned, we specify a joint model of the treatment (fostering-in) and three outcomes and estimate the model by FIML. The FIML estimation requires no exclusion restrictions but only a variation in the set of exogenous regressors to avoid identification problems. This identification strategy is usually referred to as the identification by functional form. However, it is common practice to rely on exclusion restrictions to improve identification (Jones, 2007). To this end, we focus on cultural traditions and social norms that enable preserving and perpetuating child fostering in West Africa. In particular, we aim at using variables that affect current child's fostering status but has no direct effect on children's present-day school attendance nor on their domestic working hours and market labor supply. We consider a vector of exclusion

restriction variables \mathbf{Z}_i drawn from the Standard Cross-Cultural Sample (SCCS) by [Murdock and White \(1969\)](#), designed to map the territory of ethnic groups before the establishment of current borders.

It is likely that current cultural values and behaviours are rooted in long-term history and inherited along the ethnic lines.¹⁰ For the purpose of our analysis, these values and behaviours are proxied by three main variables. For each ethnic group, we consider the inherited level of community integration, the existence of permanent interethnic violence, and the situation according to which foster parents are the principal category of non-parental agent. These variables are considered to only affect children’s outcomes via the child’s fostering-in status. We argue that for each member of a given ethnic group, these values are inherited from his/her ethnic group ancestors and has no direct impact on the labour supply nor on the current school attendance of biological versus foster children.

The empirical analysis is based on data from the National Survey on Household Living Conditions and Agriculture (ECVM/A) administered in Niger in 2011. We match former ([Murdock and White, 1969](#)) and current ethnic groups (2011 ECVM/A) within Niger. This combination of datasets gives a final sample study composed of five ethnic groups.¹¹ We thus delimit five historical ethnic territories that correspond to the Djema, Haoussa, Peul, Touareg and Toukou ethnic groups from the 2011 ECVM/A and we use the level of community integration (on a scale of one to four) of each ethnic group of host families in our estimations.¹² We further use indicators of frequent interethnic violence and of foster parents being the principal category of non-parental agent. We reduce our sample to observations of children who live in households belonging to the five major ethnic groups.

Inherited levels of community integration, the indicator of frequent interethnic violence and the indicator of foster parents being the principal category of non-parental agent are assumed to affect a household’s current decision to foster-in but to be uncorrelated with our dependent variables, namely school attendance, hours of domestic work and hours of market work. We argue that individuals whose ancestors experienced high levels of community integration, frequent interethnic violence, and great importance for foster parents, have higher probabilities to perpetuate fostering. First, we consider that high levels of community integration affect child-fostering positively given that families from the same community will be tempted to encourage this practice in order to maintain good integration within the community. Indeed, [Okore \(1977\)](#) argues that most fostering in West Africa takes place within the kinship framework in order to strengthen family ties. Second, the incidence of interethnic violence plays a determinant role in explaining levels of trust and tolerance ([Laurence, 2009](#)). Thus a long history of widespread interethnic violence that leads to ethnic conflicts is assumed to foster cohesion within the ethnic group ([Rohner et al., 2013](#)) and to affect positively fostering children within one’s own ethnic

¹⁰[Numn and Wantchekon \(2011\)](#) show evidence of such a correlation between levels of trust.

¹¹This sample selection is driven by the fact that Arab (0.55%), Gourmantché (0.29%) and Kanouri (8.44%) ethnic groups are not found in the ethnographic data set.

¹²For the aim of the applied analysis for Niger, the integration level was rescaled from the original scales of one to six.

group. Indeed, when people are part of a small ethnic group in presence of ethnic violence then levels of interethnic trust are clearly small. In this context, families are likely to rely on families belonging to the same ethnic group and to develop intraethnic social capital. People thus make use of children’s fostering, which becomes strongly embedded in the population and persist along generations. The persistence of such a phenomenon is partly related to the fact that foster children, once they get better opportunities in life, are able to reciprocate with help for the family mainly in fostering other children (family or community related) later on. Third, we argue that the inherited great importance, for girls and boys, of foster parents is transmitted from ancestors and has a persistent component that makes fostering perpetuate through generations.

3 Data and Summary Statistics

3.1 Data and Sample Selection

The study carried out in this article is based on data from the National Survey on Household Living Conditions and Agriculture (ECVM/A) administered in Niger in 2011 by the National Institute of Statistics, with technical and financial support from the World Bank. Niger is a West African country, with a population of 17.6 million people, predominantly Muslim (80% of the population) and made up of over mostly seven ethnic groups, the largest being Haoussa (53.1%) followed by Djema (21.2%), Touareg (11%), Peul (6.5%), Kanuri (5.9%), Gurma (0.8%) and Toukou (0.4%). The country has the highest total fertility rate (TFR) of any country in the world, averaging close to 7 children per woman in 2016, a figure related to persistent practice of early marriage and childbearing. According to the World Bank, in 2011 poverty rate was 48.9% and enrolment rate in primary school was 66.4%.¹³

The ECVM/A includes socio-demographic characteristics of household members, education and health, employment information, non labour income, ownership of assets, household expenditure, inter-households transfers, negative shocks and relative coping strategies and food security. It is fully appropriate for the scope of the analysis since it allows to identify foster children and to observe child schooling, labour status and children’s labour supply. A total of 3,968 households were interviewed, amounting to a national representative sample of 25,125 individuals.

We drop observations of children living in households where the head is under 18 years old. After controlling for missing values and dropping orphans of both parents, we are left with a sample of 8,443 children aged 5-17 who live in 2,709 households. Table 1 reports summary statistics on the whole sample and by child gender. A foster child is defined as an usual resident younger than 18 years old who lives without any of his/her biological parent although one of them at least is alive. No data about the biological families of foster children are available. Foster children represent 10.3% of the sample, 11.5% among girls and 9.1% among boys. Within the

¹³World Development Indicators 2011 and CIA World Factbook

subsamples of foster and biological children, the girls count respectively for 54.3% and 47.8%. In the study sample, the majority of foster children are related to the household head.¹⁴

3.2 Summary Statistics

The article looks at the impact of fostering on three different outcomes: school attendance (s_i), domestic labour supply (d_i), and market labour supply (m_i). The survey provides information about education and school attendance for all individuals aged 4 years and more. We thus use children's school attendance during the year of the survey, i.e. 2010-2011, to compute the dummy s_i .¹⁵ The statistics indicate that 45.5% of children in the sample are attending school in 2010-2011 and show that boys are slightly more likely to attend school than girls for both biological and foster children. Moreover, foster boys (girls) are more (less) likely to attend school than their biological counterparts (see Table 1). The survey further reports principal employment activities for individuals aged 5 years old and more. In particular, we use the number of declared working hours per day and the number of declared working days per week to calculate the weekly labour supply of children employed in the labour market (m_i). We also use information on children's time use to calculate the weekly hours of domestic work for children. In particular, the survey provides minutes per day and days during the past seven days collecting firework, fetching water, cooking, doing the laundry, ironing clothes, cleaning and shopping for the household. This allows us to calculate the weekly hours spent by each child in domestic tasks.

We observe high participation rates for both activities and, as observed in previous studies on different countries, boys are more likely to work in the market, especially when they are biological (45.1%) and girls in domestic tasks especially when they are foster (67.3%). Even if biological boys are more likely to participate in the labor market than foster boys, once they enter the labour market, they supply the same amount of hours per week. The results are different for the subsample of girls. In fact, participation in the labor market is higher for biological than foster girls and biological girls are also more likely to supply longer market working hours. Foster boys are asked to contribute more to domestic activities. Girls, foster and biological, seems to bear the burden of household chores; however for foster girls the incidence of domestic work is higher and the amount of weekly hours is quite relevant (9.6 hours per week). In equations systems (1.a - 1.d) and (3.c - 3.g) there are two sets of control variables: child's individual characteristics and household characteristics. Basic child level variables (\mathbf{C}_i) are age, age squared, and sex. Following Fafchamps and Wahba (2006), relative birth order among boys and relative birth order among girls are also included. The idea behind the inclusion of these variables is that birth order affects relative welfare weights among boys and girls of the same household leading to an increase (decrease) of workload (or probability of school attendance).

¹⁴Only 0.26% of foster children are non-related to the household head (see Table 1).

¹⁵Children are also asked to declare time spent studying but unfortunately there were too many missing values and zeros in this variable to include it in the estimations.

As to household characteristics (\mathbf{H}_i), the specification includes education related variables, variables related to the household head and his spouse, household composition, variables on economic status and rural residence. Zimmerman (2003) finds that family's preferences for education are important predictors for fostering-in since human capital investment is the main reason for foster out and households with high level of education have more probability to host foster children. However, we cannot use family education variables to instrument fostering since they are also good predictors for the outcomes, so we keep them as controls in the specification. Ability of the head to write (31% of our sample) and average years of education of female adults (1.2 on average) are included in vector \mathbf{H}_i . The traditional nature of the family is captured by the age of the household head (ranging from 18 to 95 years old) and by a dummy for families with a polygamous marriage (31.7%). The sample is characterized by high prevalence of complex families with high level of heterogeneity in household composition, only 56% of children lives in nuclear families and the household size ranges from 2 to 30 members (being the median household size of 8 members). For this reason a set of detailed variables on household composition are included in vector \mathbf{H}_i in particular we specify number of children by different ages and gender and the presence of a woman older than 59 years in the household. The family SES is proxied by the share of employed adults, the log of labour income of the household head, the log of family non labour income and the net amount of inter-households transfers. For the last variable we compute the difference between incoming and outgoing monetary transfers.¹⁶ 62% of children live in households based in rural area where all the employed household members work in agricultural activities.

The exclusion restrictions used in the Heckman selection procedure (vector \mathbf{K}_i in Equation 3.f) are, as established in the labour supply literature, proxies for the family wealth and in particular a dummy indicating dwelling ownership (83%) and the number of rooms of the dwelling. As to the exclusion restrictions for the fostering equations (vector \mathbf{Z}_i in Equations 1.d and 3.g) we consider the level of community integration, the situation of permanent interethnic violence and the information on whether foster parents are the principal category of non-parental agent imputed in the sample by ethnographical sources (Murdock and White, 1969). The level of community integration level ranges from 1 to 4 and is on average 2.963. The 43.5% and 36.2% of children belong to ethnic groups who experienced violent interethnic violence and for whom foster parents have great importance, respectively.

4 Estimation Results

In what follows, we present the results of the simultaneous equations model designed to jointly determine the impact of fostering on children's market labour supply, domestic work and school attendance. We specify two different models. In the first model (Equations 1.a-1.d), the system is composed by two Tobit models (for market and domestic labour supply) and two Probit

¹⁶This variable averages at 34,000 CFA francs (around 70 USD), ranging from 3,892.80 to 18,041.82 USD.

models (for school attendance and the endogenous fostering variable). In the second model (Equations 3.c-3.g), the market labour supply is also modelled with an Heckman selection equation for market labour supply. In Section 4.1 we present estimations of the two models in the whole sample (Tables 2 and 3). Section 4.2 instead explores the potential heterogeneity in the effect of fostering status by child gender and age (Table 4) and by household composition (Table 5). Section 4.3 analyses the robustness of the results to the inclusion of instrumental variables related to historical regional prosperity in the fostering equation.

4.1 Child Fostering, Schooling and Children’s Labour Supply

Table 2 presents the results of the FILM estimation of the four Equations (1.a-1.d) system that models child fostering status as endogenous variables. The estimations here are performed in the most general sample, that includes all children younger than 18 years old for whom the information on school attendance and labour supplies are provided from the data.

Fostering children are here observed in the host families. Among family characteristics that increase the probability of having a foster child there are age and gender of the household head. Fostering increases with the age of the head and in female headed households. It also increases with the presence of an old woman in the household. These results suggest that the likelihood of hosting foster children is higher in older families with possibly stronger traditional values. Instead having an higher number of biological young boys seems to reduce the propensity to foster-in in line with the idea that fostering-in decision maybe related to family demography (Akresh, 2009). Additionally, consistently with the fact that the main motivation for fostering-out would be educational opportunities (Akresh, 2009; Lloyd and Blanc, 1996), fosterage is more probable among urban communities.

The cultural determinants of fostering-in are the exclusion restrictions that improve the identification of the impact of fostering on the child’s human capital development. Estimations from the most general sample show first a relevant role of interethnic violence, consistently with previous findings suggesting that interethnic conflict appears to strengthen within-ethnic group ties (Rohner et al., 2013) and kinship-based norms (Cassar et al., 2013). Fostering appears to be confirmed as an institution that reinforces traditional kinship ties since foster children, later in life, are able to reciprocate with help for the family, mainly by fostering other children or making monetary or in-kind inter-household transfers. Also the importance attributed to non parental agency within the ethnic groups contributes significantly to the child probability of being fostered-in. On the contrary the level of community integration is only a significant predictor of fostering in few sub-samples. These three instruments together work remarkably well and consistently along different samples as exclusion restrictions. Since not formal tests are available in this context, we test the validity of these exclusion restrictions in the following way. We estimate a system of simultaneous equations only for the three outcomes in a sample of households not engaged in fostering. In this estimation the exclusion restrictions have no direct impact on the outcomes so we are confident to believe that their potential impact on the

outcome analyzed is only through fostering status. The significant correlation between the error terms of the fostering equation and all the other equations due to the existence of unobservable factors influencing at the same time probability of being fostered and schooling, market work and domestic work decisions (see Table 2) shows the importance of treating fostering as endogenous variable.

As to the impact of fostering our estimations seems to confirm predictions by [Serra \(2009\)](#) that describes fostering as a Pareto improving institution providing better educational prospects to children whose options would be very limited otherwise. Fostering parents are compensated with an additional help to perform domestic tasks. The foster status gives children more probabilities to attend school (see Table 2) however foster children are required to supply more hours of domestic activities. As to child labour foster children are not treated differently respect to biological ones. This results on fostering are in line with the theoretical predictions in [Serra \(2009\)](#) and with the scarce previous evidence on motives and consequences of fostering for child welfare ([Zimmerman, 2003](#)). Interesting this results are at distance the majority of previous studies looking at the effect on children's schooling of raising without biological parents ([Yamano et al., 2006](#)). However, they are in line with some other studies that claim on the important role of the altruism of co-resident relatives, especially female household members ([Ardington and Leibbrandt, 2010](#); [Mangiavacchi et al., 2018](#)).

The significant effect of fostering on children's activities is robust to the inclusion of a number of child and household characteristics. Age is non linearly positively related to all the outcomes related. As in [Fafchamps and Wahba \(2006\)](#), first-born girls are slightly less likely to attend school and being child labourer while they help more in domestic chores, while for boys birth order increases significantly the amount of hours spent working in the market. Turning to household variables, head's literacy and the human capital of female household member are important determinant of school attendance. Interestingly head education has a non significant impact on child labour while the education of female household members prevent child labour both in market and within the household, as consistently found in previous studies on child labour ([Edmonds, 2007](#)). Table 2 does not give evidence of competition for education among siblings: school attendance is not related to the number of siblings. However, child contribution to household chores is observed in households with small children especially boys, this suggests that children are asked to assist their parents in child care provision by substituting them in housework and, to a lesser extent (significant only at 10 percent) in market work ([Fafchamps and Wahba, 2006](#)). The household socio-economic status (measured with share of employed among working age members and log of earnings by the household head) is an important determinant of school attendance and market work however has a non significant impact on the amount of domestic work. Local labor market and school supply conditions are probably captured by the rural residence dummy that significantly reduces school attendance and increases labour supply, and, to a lesser extend, hours spent in domestic activities.

**Table 2: School Attendance, Market and Domestic Weekly Working Hours
- Total Sample -**

	School attendance		Hours of Domestic Work		Hours of Market Work		Foster Child	
Foster child	0.518***	(0.181)	11.800***	(2.133)	11.536	(8.090)		
Age in years	0.907***	(0.030)	4.986***	(0.300)	15.716***	(0.866)	0.013	(0.032)
Squared age	-0.042***	(0.001)	-0.160***	(0.013)	-0.489***	(0.040)	0.000	(0.002)
Girl's relative birth order	-0.247***	(0.056)	2.552***	(0.457)	-10.828***	(1.759)	0.202***	(0.067)
Boy's relative birth order	-0.016	(0.054)	-4.377***	(0.460)	9.714***	(1.596)	0.085	(0.068)
HH head is able to write	0.295***	(0.048)	-0.254	(0.421)	-0.652	(1.762)	-0.009	(0.064)
HH head age	-0.006***	(0.002)	-0.037**	(0.016)	-0.065	(0.072)	0.014***	(0.003)
Household head is female	-0.128*	(0.076)	-1.924***	(0.657)	-10.093***	(2.901)	0.658***	(0.082)
Dummy for whether any polygamous marriage in HH	0.032	(0.051)	-0.687	(0.429)	1.517	(1.796)	-0.076	(0.078)
Employment ratio at HH level	-0.376***	(0.084)	2.081***	(0.639)	53.883***	(3.183)	0.044	(0.106)
Dummy woman aged more than 59 in the hh	0.008	(0.082)	-1.344**	(0.653)	0.292	(2.902)	0.595***	(0.079)
Number of girls aged 0-4	0.019	(0.023)	0.183	(0.200)	-0.832	(0.879)	-0.053	(0.035)
Number of girls aged 5-11	-0.024	(0.022)	0.104	(0.159)	0.084	(0.770)	-0.026	(0.027)
Number of girls aged 12-14	0.011	(0.036)	0.111	(0.272)	-1.344	(1.242)	-0.081*	(0.044)
Number of girls aged 15-17	0.134***	(0.042)	-0.547**	(0.271)	-2.814**	(1.391)	0.060	(0.049)
Number of boys aged 0-4	0.026	(0.024)	0.237	(0.208)	0.308	(0.838)	-0.105***	(0.036)
Number of boys aged 5-11	-0.027	(0.021)	0.300**	(0.152)	1.249*	(0.675)	-0.048*	(0.027)
Number of boys aged 12-14	0.032	(0.039)	-0.805***	(0.272)	0.275	(1.312)	-0.077	(0.048)
Number of boys aged 15-17	0.054	(0.039)	-1.122***	(0.297)	2.593**	(1.284)	0.005	(0.053)
Average years of education of hh female members	0.072***	(0.011)	-0.255***	(0.078)	-2.547***	(0.430)	0.012	(0.010)
Log of labour income of the household head	-0.006	(0.005)	-0.000	(0.039)	-0.832***	(0.179)	0.006	(0.007)
Log of hh annual non labour income	0.015*	(0.009)	-0.068	(0.059)	-0.771*	(0.437)	-0.003	(0.009)
Net amount of transfers received	-0.000	(0.000)	-0.000	(0.001)	0.007**	(0.003)	0.000	(0.000)
Rural area	-0.743***	(0.054)	2.692***	(0.424)	35.675***	(2.144)	-0.230***	(0.074)
Constant	-3.479***	(0.190)	-33.492***	(2.076)	-164.812***	(6.746)	-2.413***	(0.265)
Exclusion restrictions								
Integration							-0.013	(0.054)
Interethnic violence							0.290***	(0.099)
Non-parental agency							0.346***	(0.132)
Error terms correlations								
Hours of Domestic Work	0.051**	(0.023)						
Hours of Market Work	-0.165***	(0.029)	0.099***	(0.024)				
Foster Child	-0.393***	(0.104)	-0.661***	(0.150)	-0.201*	(0.118)		
Observations	8,443		8,443		8,443		8,443	

Notes: (i) Standard errors in parenthesis are clustered at hh level (ii) *** p<0.01, ** p<0.05, * p<0.1

**Table 3: School Attendance, Market and Domestic Weekly Working Hours
- Total Sample with Selection Correction-**

	School attendance		Hours of Domestic Work		Hours of Market Work		Market Work		Foster Child	
Foster child	0.540**	(0.215)	11.509***	(2.737)	-3.461	(8.429)	0.491	(0.348)		
Age in years	0.905***	(0.031)	4.977***	(0.299)	0.148	(0.850)	0.515***	(0.030)	0.012	(0.032)
Squared age	-0.042***	(0.001)	-0.159***	(0.013)	0.041	(0.035)	-0.016***	(0.001)	0.000	(0.002)
Girl's relative birth order	-0.248***	(0.056)	2.562***	(0.460)	-5.482***	(1.178)	-0.286***	(0.060)	0.206***	(0.068)
Boy's relative birth order	-0.017	(0.054)	-4.376***	(0.460)	3.926***	(1.008)	0.292***	(0.059)	0.084	(0.068)
HH head is able to write	0.296***	(0.048)	-0.257	(0.420)	-2.093*	(1.211)	0.045	(0.059)	-0.009	(0.064)
HH head age	-0.006***	(0.002)	-0.036**	(0.017)	0.051	(0.050)	-0.003	(0.003)	0.015***	(0.003)
Household head is female	-0.131*	(0.079)	-1.876***	(0.714)	0.495	(2.213)	-0.397***	(0.101)	0.660***	(0.083)
Dummy for whether any polygamous marriage in HH	0.032	(0.051)	-0.693	(0.428)	-3.648***	(1.196)	0.146**	(0.066)	-0.085	(0.082)
Employment Ratio at HH level	-0.376***	(0.083)	2.065***	(0.639)	-3.992	(2.674)	1.942***	(0.107)	0.037	(0.107)
Dummy woman aged more than 59 in the hh	0.003	(0.084)	-1.297*	(0.712)	-2.942	(2.007)	0.037	(0.109)	0.597***	(0.079)
Number of girls aged 0-4	0.019	(0.023)	0.178	(0.200)	-0.182	(0.596)	-0.020	(0.030)	-0.055	(0.035)
Number of girls aged 5-11	-0.024	(0.022)	0.103	(0.160)	0.612	(0.492)	-0.015	(0.027)	-0.024	(0.028)
Number of girls aged 12-14	0.012	(0.036)	0.112	(0.272)	-1.165	(0.859)	-0.036	(0.046)	-0.081*	(0.045)
Number of girls aged 15-17	0.134***	(0.042)	-0.548**	(0.271)	-2.040**	(0.868)	-0.091*	(0.052)	0.058	(0.049)
Number of boys aged 0-4	0.026	(0.024)	0.235	(0.209)	-0.226	(0.571)	0.016	(0.030)	-0.104***	(0.036)
Number of boys aged 5-11	-0.026	(0.021)	0.299**	(0.152)	0.183	(0.503)	0.017	(0.025)	-0.046*	(0.027)
Number of boys aged 12-14	0.033	(0.039)	-0.809***	(0.273)	-0.526	(0.806)	0.021	(0.047)	-0.079	(0.050)
Number of boys aged 15-17	0.054	(0.039)	-1.123***	(0.296)	-0.114	(0.864)	0.087*	(0.048)	0.004	(0.054)
Average years of education of hh female members	0.071***	(0.011)	-0.254***	(0.078)	-0.363	(0.373)	-0.073***	(0.013)	0.012	(0.010)
Lof og labour income of the household head	-0.006	(0.005)	0.001	(0.039)	-0.205	(0.126)	-0.027***	(0.006)	0.007	(0.007)
Log of hh annual non labour income	0.015*	(0.009)	-0.068	(0.059)	-0.558	(0.370)	-0.024*	(0.014)	-0.003	(0.010)
Net amount of transfers received	-0.000	(0.000)	-0.000	(0.001)	-0.002	(0.005)	0.000**	(0.000)	0.000	(0.000)
Rural area	-0.742***	(0.055)	2.682***	(0.431)	8.590***	(1.878)	0.944***	(0.076)	-0.221***	(0.082)
Dwelling ownership							0.470***	(0.094)		
Rooms number							0.002	(0.017)		
Constant	-3.471***	(0.193)	-33.448***	(2.065)	29.557***	(7.697)	-5.859***	(0.262)	-2.442***	(0.288)
Exclusion restrictions										
Integration									-0.015	(0.055)
Interethnic violence									0.330**	(0.145)
Non-parental agency									0.374**	(0.159)
Error terms correlations										
Hours of Domestic Work	0.052**	(0.023)								
Hours of Market Work	-0.055	(0.035)	-0.008	(0.035)						
Dummy for Market Work	-0.193***	(0.041)	0.122***	(0.033)	0.053	(0.068)				
Foster Child	-0.407***	(0.126)	-0.640***	(0.193)	0.024	(0.229)	-0.267	(0.188)		
Observations	8,443		8,443		8,443		8,443		8,443	

Notes: (i) Standard errors in parenthesis are clustered at hh level (ii) *** p<0.01, ** p<0.05, * p<0.1

In spite of the high number of control variables that we are able to include at household level there exist some unobservable factors influencing labour supply that also affect with the opposite sign school attendance as reflected in the significant negative correlation among errors terms presented at the bottom of Table 2 as also found, for instance, in [Rosati and Rossi \(2003\)](#) and [Emerson and Souza \(2008\)](#). The simultaneous estimation in this contest prevents from the loss of efficiency potentially due to this correlation on unobservable among the three different outcome equations. When we look at the relation between labour and domestic work equations we see that the error terms of the two equations are positively correlated (see error terms correlations in Table 2).

In Table 2 labour supply for market and domestic work are both estimated by means of a Tobit specification. However, there are reason to believe that the correlation between the error terms of the selection equation and the labour supply equation is not equal to zero especially for market work, motivating the use of a [Heckman \(1979\)](#)'s selection procedure. In Table 3 we show estimations of Equations (3.c - 3.g) system where also a selection equation for market work is estimated. A part of the test of the alternative way to model labour supply, it is also relevant to see the impact of the fostering status and all the individual and household child characteristics on the probability to be engaged on child labour. The error terms correlation between market labour supply and the selection equation (participation to labour force) is not significant, showing not reason to opt for this model as preferred specification. Moreover the estimated coefficients of the three equations are consistent with the specification presented in Table 2. Indeed previous works ([Rosati and Rossi, 2003](#)) suggest the importance of looking at the number of hours worked instead of dichotomous household decision to send the child to school or to work, as two different unrelated outcomes. However, disentangling the decision to send children to work and the amount of hours worked (estimations in Table 3) give some interesting insights. Interestingly child age is related to the decision to work but not to how many hours and they same happens for variables related to socio-economic status. And the error terms correlation with schooling equation is now significant only for the selection equations and not for weekly hours of market work. For these reasons we perform all the robustness analysis over the two different specifications.

4.2 The Heterogeneous Effects of Fostering on Child's Welfare

To explore possible heterogenous effects of fostering on schooling and child labour due to sample selection and to further test the robustness of our main analysis we estimate the two different models presented in the systems (1.a) - (1.d) and (3.c) - (3.g) over different sub-samples. In Tables 4 and 5 we report coefficients for fostering on the different outcomes¹⁷.

In Table 4 we consider heterogeneity at child level, related to gender and age. First the sample is split for boys and girls. Results for boys give a similar picture respect to the whole sample. However, when the estimations are restricted to the sample of girls, they show that foster girls

¹⁷Full tables on estimations results are available upon request

**Table 4: School Attendance, Market and Domestic Weekly Working Hours
- Heterogeneity Analysis at Child Level -**

	Boys		Girls		Age 5-14		Age 15-17	
Specification 1								
School Attendance	0.420**	(0.208)	0.479	(0.307)	0.549**	(0.220)	0.647*	(0.389)
Hours of Domestic Work	10.176***	(1.465)	12.504***	(3.678)	10.853***	(2.565)	12.089***	(2.726)
Hours of Market Work	6.466	(8.604)	6.853	(12.009)	5.463	(10.932)	0.266	(7.557)
Specification 2								
School Attendance	0.451**	(0.208)	0.376	(0.287)	0.614***	(0.215)	0.568	(0.417)
Hours of Domestic Work	10.145***	(1.507)	13.040***	(3.209)	9.142**	(4.080)	11.460***	(3.770)
Hours of Market Work	-1.608	(5.728)	4.269	(14.674)	-16.490**	(7.387)	-7.719	(6.274)
Dummy for Market Work	0.390	(0.329)	0.144	(0.595)	0.329	(0.372)	0.313	(0.397)
Observations	4,359		4,084		7,223		1,220	

Notes: (i) Specifications 1 and 2 are the full information maximum likelihood estimations without and with selection correction, respectively; (ii) The vectors of control variables are included in the estimations; (iii) Standard errors are in parentheses and clustered at hh level; (iv) ***p < 0:01, ** p < 0:05, * p < 0:1.

have the same probability to attended school as biological ones, thus while no discrimination is at work, foster girls are not prioritized to access educational opportunities respect to biological girls. Foster girls are still required to do more domestic chores as in the main sample.

It is likely that our results are driven by the early marriage of girls and by the fact that labour of children aged 15-17 in developing countries reveals some economic and cultural aspects that make it well-tolerated with respect to that in developed countries. We thus estimate our model using the sample of children aged 5-14. Results are consistent also using this more restrictive age definition. As to older children, as expected, we find a weaker impact of fostering status on school attendance for children aged 15 to 17 and they still do as much child labour as their biological co-resident children.

The effect of fostering maybe also different depending on household composition especially in relation to domestic and market work hours. Since the literature suggests that polygamous and extended families may behave in a different way in terms of labour supply and fertility (Cox and Fafchamps, 2007; Jacoby, 1995), the model is estimated using alternative samples of children living in monogamous and nuclear families. For instance children living in families with a polygamous couple (30.76% of our sample) may behave in a different way in terms of schooling or labour supply since wives may represent a labour force source and imply a different intrahousehold allocation of time-use and children of different wives may have a different relative importance within the household (Jacoby, 1995).

**Table 5: School Attendance, Market and Domestic Weekly Working Hours
- Heterogeneity Analysis at Household Level -**

	Monogamous HH	Nuclear HH	Agricultural HH	Female-headed HH	Educated-head HH
Specification 1					
School Attendance	0.419** (0.196)	0.585** (0.249)	0.920*** (0.242)	1.019** (0.453)	0.104 (0.236)
Hours of Domestic Work	14.384*** (1.904)	16.084*** (1.784)	10.249** (4.005)	3.763 (17.931)	13.539*** (1.810)
Hours of Market Work	-3.217 (8.226)	-3.635 (8.703)	18.014* (9.568)	-22.030 (32.908)	-6.769 (7.480)
Specification 2					
School Attendance	0.443** (0.217)	0.504** (0.213)	0.977*** (0.261)	n.a	0.094 (0.228)
Hours of Domestic Work	14.248*** (2.267)	16.061*** (1.835)	8.378 (6.824)	n.a	13.509*** (1.831)
Hours of Market Work	-8.428 (8.593)	-1.258 (8.830)	-7.209 (11.360)	n.a	-3.705 (6.796)
Dummy for Market Work	0.085 (0.325)	-0.204 (0.297)	0.734** (0.328)	n.a	-0.279 (0.273)
Observations	5,763	4,814	5,748	996	2,632

Notes: (i) Specifications 1 and 2 are the full information maximum likelihood estimations without and with selection correction, respectively; (ii) Estimates from the subsample of female-headed HH are not available for Specification 2 because of lack of convergence of the simultaneous equations due to reduced number of observation; (iii) The vectors of control variables are included in the estimations; (iv) Standard errors are in parentheses and clustered at hh level; (v) ***p < 0:01, ** p < 0:05, * p < 0:1.

Extended families are also different respect to nuclear families in terms of labour supply and intra-household decisions (Cox and Fafchamps, 2007). When these complex families are excluded from estimation, results confirm that fostered-in children have to do more house work than children living with their biological families however they also have better educational opportunities (Table 5).

We also verify whether our results are robust to the use of the sample of agricultural families. These families may hide some particular aspects related to household production that make them more likely to offer child labour (Beegle et al., 2006) or to ask for additional hours of domestic work to compensate for the fact that household members have to work in the fields. At the same time one-season agricultural practices in West Africa are identified as one of reasons that motivate fostering practice (Serra, 2009). Indeed, estimations show a slightly different behavior in terms of child labour supply for this sample selection; foster child have more probability to participate in the labour market and work more intensively than their biological co-residents, suggesting that labour fostering and education fostering co-exist in this more specific sample (Table 5).

Since the literature show substantially different behaviours in terms of child welfare when female members are decision makers (Mangiavacchi et al., 2018), we test the model also in a sub-sample of female headed households representing the 11% of the sample¹⁸ where indeed foster children have not requested to do more hours of domestic chores. On the contrary ability of writing and reading of the household head is not determining any relevant changes in the estimation results. Foster and biological children have the equal chances to be educated.

4.3 The Historical Impact

To satisfy the exclusion restriction condition, the level of community integration and the indicators of interethnic violence and foster parents importance should only affect children's outcome via the child's fostering-in status. This condition is not met if exclusion variables affect education, hours of market labour and hours of domestic labour through other sources, namely local institutions or some historical variables. We have so far argued that cultural and social values have a persistent component and are passed down through generations. However, these values have a variant component and are likely to evolve. The long-term impacts of ethnographic variables may not be solely due to the persistence and transmission of social and cultural norms but also to the development of institutions (Benabou and Tirole, 2006). A potential mechanism underlying the effects we find is the greater historical prosperity (Lowe et al., 2017). Thus we perform some robustness checks to conclude whether the exclusion restriction condition holds. We identify historical variables through which anthropological variables may affect children's outcome. If the effect of fostering-in on children's outcome disappears with the inclusion of these historical variables, we thus conclude that the effects found in the previous estimates are

¹⁸For the sub-sample where the head of female we did not obtain estimated coefficients in the model with four equation for lack of observations.

mostly driven by the omission of these historical variables.

Table 6: Effect of Fostering on School Attendance, Market and Domestic Work - Historical Variables Included -

	School attendance		Hours of Domestic Work		Hours of Market Work		Dummy for Market Work	
Specification 1								
Total sample	0.355**	(0.165)	12.323***	(1.862)	-5.984	(8.768)		
Boys	0.349*	(0.205)	10.124***	(1.419)	-2.968	(5.561)		
Girls	0.290	(0.242)	12.774***	(3.521)	-16.611	(10.504)		
Specification 2								
Total sample	0.493***	(0.189)	11.147***	(2.799)	-7.747	(7.068)	0.692**	(0.289)
Boys	0.402*	(0.207)	9.992***	(1.608)	-2.786	(5.667)	0.659*	(0.381)
Girls	0.344	(0.253)	12.794***	(3.616)	-6.424	(14.285)	0.279	(0.382)

Notes: (i) Specifications 1 and 2 are the full information maximum likelihood estimations without and with selection correction, respectively; (ii) Standard errors are in parentheses; (iii) The parameter estimates of the historical variables, precipitations and indicator of kingdom, are available upon request; (iv) *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

We link historical regional variables referring to the European colonization in Niger, measured at the ethnicity level, with data from 2011, measured at the region level.¹⁹

The political and socio-economic history of Niger provides a good source of variation in these variables at the regional level. The introduction of historical data is in line with the fact that colonial investments introduced important differences among the districts of former French West Africa (Huillery, 2009). To capture regional differences in economic and social development, we use data collected by Huillery (2009, 2011, 2014) for former French West African countries on public finance, pre-colonial and geographical data. The combination of historical data with the 2011 dataset gives a sample with 8 Nigerien regions.

Over the last two decades, a growing economic literature focused on the interaction between colonialism and development.²⁰ After identifying former regions, we match them to the actual 2011 ECVN/A Nigerien regions and generate, at the region level, two main variables. First, we consider colonial economic conditions proxied by rainfalls given the influence of unfavourable weather conditions on agricultural crops. Thus, we make use of data on annual rainfalls defined by the average annual precipitation in the main town of each district from 1915-1975.²¹ Second, in order to capture the pre-colonial economic prosperity and to seize the pre-colonial political and social organization, we introduce in the vector \mathbf{Z}_i an indicator of whether the region was a kingdom at the end of the nineteenth. At the individual level, the average annual precipitation

¹⁹In August 1960, Niger achieved independence from France. The country was colonised between 1922 and 1958. Between 1958 and 1960, Niger remained a semi-autonomous Republic within the French Community.

²⁰See, e.g., Acemoglu et al. (2001), Banerjee and Iyer (2005), Huillery (2009), and Iyer (2010).

²¹Miguel et al. (2004) use data from 41 African countries during 1981-1999. They consider rainfall variation as an instrument for economic growth and find that growth is negatively related to civil conflict.

for 1915-1975 is 467.3. Moreover, five out of eight regions were kingdoms at the end of the nineteenth. In the sample study, 54% of individuals live in regions that were historically kingdoms. As shown in Table 6, the inclusion of these additional controls have a very limited impact. This reinforces our assumption that the levels of community integration, the indicator for frequent interethnic violence, and the indicator for high importance of foster parents are exogenous.

5 Conclusions

Upbringing children by people other than their biological parents, known as child fostering, in West Africa is deeply rooted in the cultural traditions and social norms. Using a survey data set from Niger, we examine the relationship between children's fostering status, school attendance and labour supply. Niger is an extremely poor country where school attendance is particularly low and child labour is very common. Fostering is a widespread phenomenon in Niger where about 20% of children under 15 are fostered (DHS, 2012). Household structure is very complex, with high incidence of polygamous and non nuclear households. In this context, we test whether the household non-traditional kinship arrangements through fostering is beneficial or, on the contrary, there is a discriminatory effect against non biological children.

In order to identify the causal effect of fostering on a child's welfare in host families, we design an empirical novel way focusing on the historical perpetuation of ethnic cultural values and social norms. In particular, we consider three different outcomes for children: school attendance, the number of hours spent working in the market, and the number of hours spent performing domestic tasks, specifying a simultaneous system of four equations that includes also an equation for the treatment variable, i.e. fostering. This empirical modelling strategy relies on the interdependence of children's labour supply and school attendance behaviours, and on the possible existence of unobservable variables that affect the three main outcomes and the probability of being fostered. To obtain consistent estimations of the causal impact of fostering on the three outcomes we use exclusion restrictions that ground on anthropological data. Considering that current cultural values and behaviours are rooted in long-term history and inherited along ethnic lines, for each ethnic group, we use the level of community integration, the situation of permanent interethnic violence and the information on whether foster parents are the principal category of non-parental agent.

The results show that foster children are more likely to attend school and to contribute more to household production compared to biological children. The estimated effects are stronger for boys than for girls and robust to different child age groups. Heterogeneity analysis that reduces household complexity and focus only on monogamous and nuclear families suggest a consistent picture. On the contrary, children fostered to agricultural households are further engaged in market work. In addition, in the sample of female-headed households, foster children are positively discriminated since, compared to biological children, they are more likely to attend school and are equally engaged in market and domestic work. Estimations are robust to the

choice of modelling labour supply with the Heckman selection procedure and to the inclusion of a different set of exclusion restrictions related to regional historical economic prosperity.

In line with previous studies on child labour we confirm the importance of simultaneously modelling school attendance and labour supply since the error terms correlation between these two equations is consistently significant along different specifications and sample selections. On the contrary the decision on the amount of hours spent performing domestic tasks is seldom correlated with the other outcomes.

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