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ABSTRACT

Strategic Fertility Behaviour, Early Childhood Human Capital Investments and Gender Roles in Albania*

Preferences for male children in Albania are shown to have persisted through nearly half a century of communist rule, and twenty five years of economic transition. Substantial contemporary birth masculinisation is concentrated amongst higher order births. Fertility falls strongly when a firstborn child is male. Still, there is only mixed evidence that parents invest more in young boys than girls, or that women's status increases with the birth of a son. Earlier male births reduce women's midlife employment but do not appear to affect say in household resource allocation. Women in their forties who bore sons at younger ages are considerably more accepting of spousal violence.

JEL Classification: O12, I31, J7

Keywords: old-age security, demographic and health surveys (DHS), 1918 Albanian census, son preference, patrilocality, sex information technology, communism, resource allocation, household violence

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1 Introduction

Many recent studies have related the contemporary deficit of Asian females to cultures of son preference (see, for example, Duflo (2012), Pande, Li, Kim, and Das Gupta (2017) and Giuliano (2018)). Son preference is also common to countries in the Balkan region and much of the Former Soviet Union (Grogan (2013)). When a woman marries in Albania, the standard congratulatory wish is still *"May you give birth to a boy"*. Old-age security motives may be important to explaining such traditions. The existence of historical census and fertility history data for Albania facilitates an investigation of the impacts of male firstborns on fertility, labour supply, household decisionmaking and views of household violence.

When the Austro-Hungarian Empire occupied Albania in 1916, marriage customs included dowry. New brides joined their husband's natal residence, and marriages were arranged between families (Mihačević (1911), Hemming, Kera, and Pandelejmoni (2001), Gruber and Pichler (2002), Hemming, Kera, and Papa-Pandelejmoni (2012)). During the nearly half a century of communist rule which began in 1945, government policies increased non-agricultural employment prospects. In the mid-1960s, President Enver Hoxha launched a policy of Cultural, Hope and Ideological Revolution, with the goal of boosting the educational attainment of women. Yet communist rule and economic transition does not appear to have greatly increased the economic status of women. In January 2014, the Human Rights Commissioner of the Council of Europe condemned the widespread practise of sex-selective abortion in Balkan and Former Soviet Union countries, including Albania (Council of Europe (2014)).

The contemporary deficit of girls in Albania is well-documented. The 2001 Albanian census shows a sex ratio at birth (SRB) above 110 per 100 girls in six out of 36 districts, Rhethet, Sarandë, Delvineë, Kucovë, Tropojë and Kukës (INSTAT (2001)). Sex-selective abortion may already have peaked and now be declining. According to the 2011 census, the under-5 sex ratio was 109 boys per 100 girls, while the ratio for children aged 5-9 was 119. As shown in the map of Figure 1, the under-5 ratio of boys to girls also differed substantially across prefectures in the Albania 2011 census. This ratio was far more perturbed in the mountainous north of the country and near the international borders with Montenegro, Macedonia and Kosovo (INSTAT (2011)). This finding is consistent with an ethnographic record describing this region as more isolated, tribal and traditional than

other parts of the country (see, for example, Whitaker (1976), Shryock (1988) and Elsie (2015)). Guilmoto (2009) and Guilmoto, Gjonca, Tahsini, Jasini, and Voko (2012) find that sex imbalances are common across socio-economic groups. In Kosovo, where a large fraction of the population is ethnic Albanian, the under-5 sex ratio in 2009 was 116 males for every 100 females (Ministry of Public Administration of Republic of Kosovo (2009)).

Evidence from other environments with strong son preference suggests that incentives to influence the sex of children increase as fertility declines (see, for example, Das Gupta and Bhat (1997) and Basu (1999) for India, Park and Cho (1995) for South Korea, and Edlund and Lee (2009)). Between 1945 and 1990, Albanian fertility fell from six to three children per woman (Falkingham and Gjonça (2001)). The fertility decline of the late communist period is widely attributed to betterment of women's education, improvements in female labour force participation, and substantial reductions in child mortality (see, for example, Kent (2010), Gjonça, Aassve, and Mencarini (2008) and Falkingham and Gjonça (2001)). The total fertility rate declined even further to about 1.6 by the late 2000's (Kent (2010)). The steep downwards fertility trend after 1990 was common to all post-communist countries, but was relatively pronounced in Albania.

Empirical studies of historical sex imbalances have largely focused on explaining the economic conditions associated with female infanticide. Tambiah (1973) find that very high boy-girl ratios are associated with higher social castes in India. Das Gupta (1987) demonstrate that higher sex ratios are positively associated with women's education. Sen (1985) and Murthi, Guio, and Drèze (1995) find that higher boy-girl ratios are associated with greater household prosperity in India. Qian (2008) shows that the relative incomes of mothers and fathers have very important effects on the survival probabilities of female children in China. The current child sex imbalance in India is attributed by Carranza (2014) partly to the suitability of different soil textures for ploughing. Since it is primarily men who operate heavy ploughs, women's value as agricultural workers is low in places suitable for heavy ploughing. Here we focus instead on old-age security motives and patrilocality.

The fertility history information contained in the DHS 2009 data permits an analysis of the impact of male firstborns on fertility, employment and the status of women in Albanian households. This survey contains complete fertility histories from women aged 15 to 49. Questions are also posed about participation by parents in early childhood

educative activities including counting, naming, reading, playing games, and singing. For all children under age 5, interviewers measure height and weight. These measures permit investigation of some aspects of discrimination in the allocation of resources amongst young boys and girls.

The 2009 Albanian Demographic and Health Survey (DHS) data suggest that son preference existed around the time that private property rights were re-instated and labour markets liberalised. A crude way of measuring son preference is to examine differences in completed fertility by the sex of the firstborn child. This ratio is normal for women aged 40 to 49 in the DHS, who were 22 to 31 in 1990, 105 to 100. Almost-completed fertility was 2.7 for those whose firstborn was male, but 3.1 for those whose firstborn was female. This large difference suggests the continued strength of son preference in Albania in the initial period of post-communist transition, when sex-selective abortion was not yet widely available.

This paper examines the causal impact of male firstborns on women's status in contemporary Albania. The paper proceeds as follows. In Section 2, the historical and contemporary Albanian data is introduced, and summary statistics are presented. In Section 3, differences in early childhood investments in boys and girls are examined. The causal impact of bearing a son relatively early on women's fertility, employment, say in household decisions, and views of household violence is quantified. Section 4 presents the conclusions. Recent trends in economic conditions and contemporary migration patterns in Albania are further discussed in Appendix A.

2 Summary statistics

The extent to which social norms about the relative value of the sexes preceded 46 years of communism can be gauged using information about under-5 sex ratios, literacy, household size, and religious affiliation. The 1918 Albanian census data compiled in Kaser, Gruber, Gentiana, and Pandelejmoni (2016) provide an opportunity to examine the persistence of values through a political regime which enacted many policies ostensibly aimed at increasing the relative productive value of females. The census was undertaken by Austro-Hungarian administrators on March 1st 1918. When these administrators were forced to depart Albania later in the same year, some of the data was destroyed. Surviving data

was brought to Vienna and digitised, with the support of the new interwar Albanian government.

Samples were drawn by Kaser, Gruber, Gentiana, and Pandelejmoni (2016) as follows. Amongst "ordinary" places, including all urban populations, the universe of observations was included. A 10% sample of "extraordinary" places was drawn from the surviving data. When sample weights are employed, the resulting sample is representative of areas of Albania under Austro-Hungarian rule in 1918. The data contained in the 2016 release comprise 138 792 complete individual observations from contemporary northern and central Albania. Gruber *et. al* employ this and all other available censuses from Central and Eastern Europe during this period to compare the extent of patriarchy. Albania is found to be the most patriarchal.

The under-5 sex ratio is strongly masculinised in the 1918 data, 0.55, and statistically different at the 1% level from the biological norm. Missing girls in 1918 certainly do not reflect the use of sex information technology. This masculinisation may be the result of discrimination in the allocation of nutritional and health resources, or of selective infanticide. Gruber and Szołysek (2014) suggest that under-reporting of female children may also be an important reason for their low census numbers. Census respondents may not have considered girl children in their reports to enumerators. Consistent with this interpretation, there are less missing girls under age 5 where an adult member is more educated, as proxied by literacy status (fraction male is 0.547 (0.004) versus 0.488 (0.018)). There are similar amounts of missing girls under age 5 in the more tribal North (Pukë and Shkodër) as in more southerly regions, where villages were more isolated.

2.1 Patrilocality, communism and old-age security

Amongst anthropologists and biological scientists, the advent of sedentary agriculture is associated with household formation rules favouring men. A post-marital residence pattern of women moving into their new husband's natal household is known as patrilocality. Patrilocal rules favour men in inheritance (Boserup (1970), Goody and Buckley (1973)). The bearing of a son has important economic consequences for women who reside with in-laws. With the birth of a first son, women may resolve uncertainty about the timing of their own retirement from home production tasks and paid labour. In the Albanian case, they may benefit from migrant remittances at younger ages.

The DHS data are suggestive of old age security motives for bearing sons. Women are better off in middle age if their firstborn was male. About 35% of women aged 40-49 with male firstborns reside in households with cars or trucks, versus 31% of those whose firstborn was female. About 14% of women in this age group with male firstborns reside in households possessing motorcycles or scooters, versus 10% in households with female firstborns. In both cases these differences are statistically significant at the 10% level. Women in this age group with firstborn males have a mean of 0.52 non co-resident sons versus 0.22 for those whose firstborn was female. The DHS does not collect location information about non-resident children, but aggregate statistics suggest that most migrants are young, male and resident outside of Albania (see, for example, Mai (2005), King (2005), Sikor (2009) and Papadopoulos (2011)). These findings are consistent with Mueller (1976) and Lee (2000), who show that the direction of intergenerational transfers is from prime-age workers towards the old in agricultural-intensive societies.

A rough measure of the extent of patrilocality in a country is the fraction of married women who reside with their in-laws. For the older generation, co-residence with a married son and his wife may ensure nursing help in sickness, a share of the adult son's income, and the completion of housework by the daughter-in law. One way of measuring the extent of patrilocality in the DHS surveys is to examine the fraction of married women aged 15 to 30 who reside with their father-in-law as household head. Amongst countries included in the fifth round of DHS surveys, Albania ranks second only to Armenia in the prevalence of patrilocal residence. This ranking is shown in Table 1. About 64% of married women age 15 to 30 reside with fathers-in-law. In contrast, only 3% of such women reside with their natal families.

As predicted by Boserup (1970), post-marital residence rules are correlated with the relative earnings potential of women. This is consistent with Table 1. The simple correlation between national employment rates of women 15 to 49 and the patrilocality index is -0.49. Across countries, greater employment options of women are negatively associated with the presence of patrilocality. Post-marital residence patterns in Albania seem to support the notion that bearing sons may still be important for a woman's old-age security. A dearth of female employment possibilities may re-enforce the need for adult sons to provide financial support.

More patrilocal countries are also those for which the sex of the firstborn has the

greatest impact on fertility. Figure 2 plots a graph relating the patrilocality index to differences in completed childbearing amongst women whose firstborns were female versus male. For women aged 40-49, country-level differences in numbers of children born to women with female versus male firstborns are plotted on the Y axis, and the patrilocality index on the X axis. The slope of the line fitted with ordinary least squares is 0.374, and is highly statistically significant (P-value= 0.003 with robust standard errors). In contrast, there is no strong relationship between the matrilocality index and this difference. A similar regression yields a coefficient on the matrilocality index of 0.10 with a P-value of 0.867. Even amongst the countries of the DHS surveys, Albania is an outlier. Given the level of patrilocal residence, differences in total births caused by the sex of the firstborn are relatively great.

Differences in fertility by the sex of the firstborn are also strongly associated with female employment rate differences across countries. A simple regression explaining these differences as a function of female employment rates yields a coefficient of -0.183 with a P-value of 0.048. Figure 3 plots this relationship across countries. Again, Albania is an outlier. Given the prevailing level of female employment, differences in fertility by the sex of the firstborn are particularly great.

Masculinisation of Albanian sex ratios at younger ages has been accompanied by feminisation at older ages. In Figure 4, the age-specific male female ratios are plotted using the available census data spanning 1979-2011. The biological norm for the sex ratio at birth (105 to 100) is also plotted. For 1979-2001, data are available only in the age categories under 15, 15-64 and 65 plus (INSTAT (2014)). Still, some observations can be made. During autarkic communism and before sex information technology, in 1979, sex ratios at birth were slightly masculinised. However, there were considerably more women than men in middle and old age even during this period. The effects of the massive migration of adult males from Albania in the post-communist period are also apparent. In the most recent census data, from 2011, females make up a much larger fraction of the resident adult population than in any of the previous censuses.

2.2 Birth masculinisation in Albania

Abortion and contraception became widely available in Albania only following the end of communism. Beginning in 1993, state-run health centres began providing contraceptives

without charge. Abortion was previously only permitted under restricted medical circumstances. Following the collapse of communism, and legalisation, the official abortion rate rose to a high of 367.8 per 1000 live births in 1992, before falling to 50.5 per 1000 live births in 2012 (Johnston (2014)). However, aggregate statistics alone cannot help identify whether or not increases in sex-selective abortion are the cause of the apparently growing skewness in the boy-girl sex ratio across recent cohorts. The reasons for abortion may have changed substantially across years. It is also likely that any sex-selective abortion is largely hidden from official statistics.

While there is usually a distinction to be drawn between ultrasound use for sex selection and regular pre-natal check-ups, in countries with strong economic reasons to value boys highly, this is less clear-cut. According to the final report of the Albania Reproductive Health Survey undertaken by the US Centers for Disease Control (2002), which surveyed 5697 women between the ages of 15 and 44 in Albania, private prenatal clinics including ultrasound services were readily available in Tirana in 2002. Amongst respondents in this survey, 77% of women who gave birth between 1997 and 2002 had at least one ultrasound examination. The report suggests that ultrasound use rates were relatively high amongst urban women, higher socio-economic status women, and amongst those having their first pregnancy. These characteristics were also positively associated with the probability of having an ultrasound test before fourteen weeks of pregnancy. Women who used private clinics for their prenatal care were found to be more likely to use ultrasound relatively early in their pregnancies.

The implied sex ratios from the DHS birth history module can be compared to those from the Vital Statistics registry of the Albanian statistical agency INSTAT. Figure 5 shows that sex ratios at birth were considerably above the biological norm in the Vital Statistics spanning 1999 to 2016. The DHS-calculated ratios are much more volatile, likely due to sample sizes. However, these too, suggest masculinisation of sex ratios at birth in the early 2000s.

Regional differences in masculinisation of higher order births are less evident in the DHS fertility history data than in the 2011 census (Figure 1). The DHS records all births and whether or not children were born live, or died subsequently. Four regions are distinguished: Mountain, Central, Coast and Tirana. As shown in Table 2, the socioeconomic characteristics of households differ substantially between the Mountain region, where sex

ratios were most masculinised in the 2011 census, and other regions of the country. In the mountain region, households are significantly larger and contain more children under age 5. Women are less likely to have completed at least nine years of schooling, or to be currently employed. The patrilocality index score for the Mountain region is 0.68 versus 0.60 in the Central, Coast and Tirana. This is consistent with Gruber (2011), who describes regional differences in kinship, marriage and son preference in Albania in the early 1900s. These data features also suggest that the advent of sex selection might have distinct consequences across regions.

Regional heterogeneity in masculinisation is not, however, apparent in the 2009 DHS. The masculinisation of higher order births in the early 2000s was common across regions. From 1985-1998, sex ratios of both first and higher order births were indistinguishable from the biological norm in both the Mountain and other regions. After 1998, sex ratios of higher order births became significantly masculinised in all regions. The DHS sample is perhaps not large enough to capture such regional heterogeneity.

There are also large differences in the living circumstances and employment rates of married women who have completed at least nine years of education and those who have completed less than this. The rate of patrilocal residence amongst married women aged 15-30 is 0.63 for women with less than 9 years of schooling, and 0.55 for those with more. Amongst these subsamples, employment rates are 9% and 39%, respectively. Women with less than 9 years of schooling live in larger households (5.8 versus 4.8 members for married under 30s, on average). They have more co-resident children under age 5 (1.09 versus 0.70).

The relationship between educational attainment and masculinisation of higher order births may depend on several factors. Women with different educational attainment potentially have very different costs and benefits of bearing sons versus daughters. Those with more education will generally have fewer children. This means that, *ceteris paribus*, more educated women may be incentivised to access sex information technology and abortion at lower parities than the less-educated. Women with greater education may also reside closer to medical clinics, and be less financially constrained. However, there are also reasons why educated women might be relatively little incentivised to engage in sex selection. More educated women may have relatively little need for the financial support of adult sons later in their lives, because of their relatively great earnings capacities. One way of examining the heterogeneity in incentives to bear sons across women with greater and

lesser labour market opportunities will be to compare the impacts of a male firstborn on a range of different economic outcomes.

The data are consistent with the existence of competing incentives to access prenatal sex information technology and abortion for higher order births. There are no substantive differences across education groups in the nature of masculinisation. Sex ratios of first-borns remained normal both across years and by educational attainment. At parities of three and higher, masculinisation is evident for both women with less than nine years of education and those with more. The evidence for this is presented and discussed in more detail in Data Appendix A. In the next section, several key aspects of son preference are examined in multivariate frameworks.

3 Estimation

The DHS data can be employed to investigate whether different treatment is given to young boys and girls in the allocation of nutritional and health resources, or instructive attention from parents. The conditional correlation between the sex of a child under 5 and early childhood outcomes can be assessed. The outcomes reported in the DHS include those considered important for success as adults by physicians and social psychologists can be assessed (see, for example, Almond and Currie (2009)). Several potential confounding factors can be taken into account.

Three common anthropometric measures, height-for-age, weight for height and weight-for-age can be employed to measure the relative health and nutritional status of female children. Measurements of height and weight are taken for all children under age 60 months in the DHS. Vaccination information is also included. Measles is one of the few early childhood vaccinations which is less than universally undertaken in Albania. After a massive vaccination campaign in the early 2000s, levels of coverage wained. In early 2018, an outbreak caused the deaths of at least 4 infants in the country (see, for example, Balkaninsight (2018)).

The sex-specific National Center for Health Statistics child growth charts are employed to assess anthropometric outcomes. Stunting is defined, using the definition of the World Health Organization, as having height-for-age of two standard deviations or more below the median for a child's age and sex. Wasting and underweight are similarly defined with

respect to the standardised child growth charts. Wasting refers to particularly low weight for height and underweight to low weight-for-age. The data suggest that any anthropometric effects might be concentrated on second and higher-order births, the birth orders for which sex ratios now indicate a dearth of girls. About 13% of children aged under 60 months are stunted in the 2009 Albania DHS, 5% are wasted and 5% are underweight. Standard deviations (Z-scores) of -6 or less are recoded as missing, as these are likely the result of mis-measurement. A child would not have survived had these been the true scores, and so one of age, height or weight was likely misreported (see World Health Organization (2006)).

The equations to be estimated take the form:

$$\begin{aligned} OUTCOME_{ir} &= \beta_0 + \beta_1 * FEMALE_{ir} + \beta_2 * BDAT_{ir} + \beta_2 * BDAT * FEMALE_{ir} \\ &\quad + \beta_4 * HHSIZE_{ir} + \beta_5 * HHU5_{ir} + \beta_6 * SRU5_{ir} + \mu_r \\ &\quad + \beta_7 * RURAL_{ir} + \sum_{q=1}^{5} \delta_q * WEALTH_{ir} + \epsilon_{ir} \end{aligned}$$

For individual i in region r, outcomes are explained as a function of a child's sex ($FEMALE$), month of birth ($BDAT$), the interaction between these two, household size, the number of children under age 5, the sex ratio of children under age 5, $RURAL$, and regional fixed effects. The preferred specifications include controls for household wealth quintile ($WEALTH_{ir}$), as defined by the DHS.

Using analogous specifications, the following early childhood educative interactions with parents are assessed: "Named, counted, or drew with child in previous week", "Sang, told stories or read book with child in previous week" and "Played or went outside with child in previous week". The latter specifications are estimated separately for mothers and fathers. All specifications are estimated separately for firstborns and higher order births, and for children born to mothers with less than 9 years of schooling and those with more. The mean values of each dependent variable are reported beneath each specification.

Samuelson (1985), Goodkind (1996) and Davies and Zhang (1987) provide reasons why females might experience less post-natal discrimination as prenatal sex selection increases. Still, there are several reasons for examining the presence of differential treatment of boys and girls but paying relatively little attention to trends. Children in the estimation sample

were born during 2004-2009. It is unclear from the vital statistics and DHS data whether or not there was any real trend in birth masculinisation during this period. Even if this were the case, trends in substitution from postnatal to prenatal discrimination were not likely big enough to be measurable in survey data. As well, DHS interviews took place during a 7 month period spanning 2008 and 2009 (36 and 64% of observations, respectively). This means that age and birth date are not synonymous. Regression controls for date of birth thus confound age and potential secular trends. With one round of the DHS this hypothesis cannot feasibly be tested.

3.0.1 Health and nutrition

The results do not clearly suggest that son preference in Albania results in less nutritional and health resources for girls than boys. No sex differences in the incidence of stunting or wasting are found, either for firstborn children or those of higher birth order. Results are also not systematically different across children born to women with more or less education, or amongst firstborn children and those of higher birth orders. Results are shown in Panels A and B of Table 3.

There are some differences across groups in the conditional association between sex and underweight. Girl children born to more educated women are about 6% more likely to be underweight if they are not firstborn than are boys, *ceteris paribus* (Table 3, Panel C). The incidence of underweight is less than 3% in this group. Neither for higher order births to less educated women nor for firstborns is a conditional difference across the sexes in the incidence of underweight found.

Amongst firstborn children, there are no statistically significant sex differences in the conditional probability of having had a measles vaccination. However, firstborn girls born to women with less than 9 years of schooling are about 10-11% less likely to be vaccinated against measles than boys. Such a sex difference is not apparent amongst higher order births to more educated women, although vaccination rates for this group are surprisingly low (Table 3, Panel D).

Overall, the health and nutrition results do not clearly suggest that males receive preferential health and nutrition resources. As with the masculinisation of sex ratios, any distinctions are more apparent at higher birth orders.

3.0.2 Human capital investments

An extensive array of questions were posed to parents about the types of educational interactions they had undertaken with their children under age 5 in the week preceding the DHS interview.

Generally, mothers are more likely to have engaged in these educative activities than are fathers. Levels of interaction with firstborns are slightly greater than with children of higher birth orders. Sample means for each of the variables and regression results are presented in Table 4, separately for mothers and fathers.

In contrast with the health and nutrition findings, all sex differences in the available human capital measures are concentrated amongst first births. Firstborn girls of more educated mothers are about 24-27% less likely to have had their mother "name, count or draw" with them in the week prior to the interview than are boys, *ceteris paribus*. These girls are also relatively unlikely to have had their father engage with them in these activities. No sex differences are found for children of less educated women, or for children of higher birth orders, in this outcome. For other types of parental interaction with young children, such as "singing, telling stories or reading" or "going outside, playing", no differences are found in how parents interact with children of different sexes.

Together these findings underline the difficulties in detecting son preference in survey data, and in interpreting sex dummies in such regression specifications. Many of these difficulties were previously outlined by Deaton (1989) using household consumption data, and by Haughton and Haughton (1998) for Vietnam. When sex differences across children are found, these should not be interpreted as causal evidence of son preference. The needs of boys and girls at a given age may differ systematically, even after conditioning on an extensive range of household controls. Much about differential treatment of young boys and girls may be difficult to measure in surveys, or only become evident in very large samples. Nevertheless, the fertility history data of the DHS does permit causal impacts of a child's sex on several aspects of women's wellbeing to be identified.

3.1 Sex of the firstborn and higher order births in the DHS

At each parity, an outcome variable can be defined as the probability of bearing a male child of a given birth order by the date of the DHS interview. The probability of having a

higher order birth can be described as a function of the sex of prior births plus controls. These controls comprise: a linear term in a woman's age, dummies for rural and region, and dummies for DHS household wealth quintile. Results of such an investigation are presented in Panel A of Table 5. For each outcome, mean values of regression coefficients are presented below each specification. A male firstborn reduces the probability of a second birth by about 3% for women with less than nine years of schooling but does not affect the probability of a second birth for those with more.

At parities beyond two, the sex of existing children has larger impacts on fertility decisions. This is because women are closer to desired completed fertility. Third births are less likely, *ceteris paribus*, when the sex of either of the first two children is male. The effect of the sex of previous children becomes much more apparent when considering probabilities of third and higher order births. Boys of all parities appear to substantially reduce the probability of third or higher order births, both amongst more and less educated women.

While the sex of firstborn children is likely unaffected by the prevalence of sex information technology in Albania, this does not hold for all births. Guilmoto, Gjonca, Tahsini, Jasini, and Voko (2012) find that sex-selective abortion is generally performed on women who have already born two or three girls, in both private and public clinics, after the third month of pregnancy. The sex of second and higher order births is thus potentially endogenous.

The probability of male higher order births can be examined as a function of the sex of the firstborn. This is done in Panel B of Table 5. Controls for age, region, rural and household wealth quintile are included. A male firstborn reduces the probability of any male higher order birth by about 12% for women with less than nine years of schooling, and by about 15% for those with at least this amount. A male firstborn does not impact the probability of a male secondborn, but does strongly reduce the probability that of a male a third or fourthborn. This appears to be a key feature of son preference, and is consistent with the findings of Lee (2008) for South Korea.

Total fertility to date is also importantly impacted by the sex of the firstborn. In Panel C of Table 5, women of both education levels are shown to have fewer children at a given age if their firstborn was male.

3.2 Employment, bargaining power and gender roles

The exogeneity of the sex of the firstborn in the DHS samples can be exploited to examine causal effects of the earlier bearing of a son on life outcomes of women at different ages. The sex of the firstborn is exogenous, so the age of a women at the time of this first birth can also be considered so. In fact, the data support this assumption: Ages at first birth are statistically equivalent for women who bear males and females, at 23.1 years. The sex of a firstborn child is unperturbed in the DHS, so this is perhaps unsurprisingly. The mean age at first birth of a boy amongst those whose firstborns were female is 27.1 years. Only 17% of mothers in the sample have no male progeny.

The simple OLS regressions to be estimated take the form:

$$\begin{aligned} OUTCOME_{ir} &= \beta_0 + \beta_1 FBMALE_{ir} + \sum_{g=1}^{3} \gamma_g AGEGP_{ir} \\ &\quad + \sum_{g=1}^{3} \delta_g FBMALE * AGEGP_{ir} + \mu_r + \cdots + \epsilon_i \end{aligned}$$

Outcomes to be examined relate to current employment, say in the allocation of household resources and views about the acceptability of husband-wife violence as punishment for transgressions. For the latter two sets of outcomes, all available questions from the DHS are employed (see Data Appendix A). Three age group dummies are defined: under 30, 30-39 and 40 plus.

The coefficients of interest are those of the $FBMALE$ dummy, $\widehat{\beta_1}$, which is considered exogenous, and the interactions between this variable and age group, δ_g's. Other controls include: total number of children born, household size, number of children under age 5, region, rural, and household wealth quintile. Estimation is undertaken separately for women with less than nine years of education and those with more. Further robustness exercises are presented in Data Appendix A.

3.2.1 Employment

Participation varies substantially by age, as evidenced by the large and statistically significant age group dummies (Table 6). Women with more education have greater work propensities. Women work more as their children age.

Differences in employment propensities between women with male and female firstborn children are not present amongst the youngest two age groups. The coefficient for the males firstborn variable is never statistically significant (Panel A). Only for women aged 40 and older do we find an important impact on employment. In the preferred specification of column (6), a full set of interactions between the sex of the firstborn and all covariates (wealth, household size, total children, region, rural) is included. Relative to the reference group of women under age 30 with female firstborns, women aged 40-49 are about 8-14% less likely to be employed if their first child was male.

For women with at least nine years of schooling, results differ substantially. These results are presented in Panel B. Work propensities increase with age. The coefficients on the age 40 plus times male firstborn interaction are negative and of similar magnitudes to those for women with less education. However, in no specification are the associated coefficients statistically significant at the 10% level.

3.2.2 Say in household resource allocation

For the five types of household resource allocation questions posed in the DHS, regressions identical to the preferred specification for employment are estimated.The dependent variable takes the value one if the respondent reports that she has some say in decisions about each of the following: Own healthcare, ... visits to friends, large household purchases, everyday purchases and how to spend money. The precise questions posed, and potential responses, are listed in Data Appendix B. Two results are presented in Table 7: One with the full set of interactions between a male firstborn and all other covariates, and one with additional controls for current employment plus the male firstborn interaction.

For women with less than nine years of schooling, the coefficient for male firstborn is never statistically significant. Interaction terms between age group and sex of the firstborn are also generally not statistically significant, either in specifications with or without controls for current work. This also holds for more educated women. One exception is that more educated women aged 30-40 with a male firstborn are 12-13% more likely to have some say in the purchase of large household items compared to the reference group. This impact is statistically significant at the 5% level in the preferred specification (Table 7, Panel B, column (4)). By the time a woman reaches her forties, however, even this impact has disappeared. Taken together, the results for these resource control outcomes

do not suggest that a woman's status in the household increases as a result of having a male firstborn, or because of eventual labour supply impacts this child may induce. These results differ from those relating the sex of firstborns to bargaining power in other contexts. In China, women with male firstborns have more bargaining power in household decisions (Li and Wu (2011)). This is also the case in India (see, for example, Das Gupta, Jiang, Bohua, Zhenming, Chung, and Hwa-Ok (2003)).

3.2.3 Views of household violence

The DHS also includes five questions about the acceptability to women of violence from husbands to wives in five hypothetical situations. These are: Wife goes out without asking permission, wife argues with husband, wife refuses sex, wife neglects the kids and wife burns the food. The dependent variables take the value one if a woman agrees that violence is acceptable in each situation and zero otherwise. Identical specifications to those for resource allocation are presented in Table 8. Means of the dependent variable are presented below each regression specification.

For neither women with less than nine years of schooling nor for those with more does bearing a male child earlier in life diminish a respondent's view of the acceptability of spousal violence. Results vary little across specifications with and without controls for current work status and the interaction with the sex of the firstborn. The coefficient of the dummy for a male firstborn is generally not statistically significant. The one exception is for the response of relatively educated women to the DHS question about the justifiability of spousal violence in the case of a wife refusing sex. In both presented specifications, women are about 19% more likely to respond that violence is justified if their firstborn child was male, albeit from the low base level of 4%.

Given that earlier male births were found to significantly impact the labour supply of less educated women in their forties, impacts on views of violence might also be most strong at these ages. This group is 9-10% more likely to report that violence is acceptable if a wife argues with her husband if their firstborn was male (Panel A columns (3) and (4)). As well, women in both their thirties and forties with less education and male firstborns are about 15% more likely to report that violence is acceptable when a wife neglects the children, *ceteris paribus*.

Amongst women with more education, the perceived acceptability of violence when

a woman goes out without permission varies substantially by the sex of the firstborn. Women in their forties are about 14% more likely to report that violence is acceptable in this case if their firstborn was male (Panel B columns (1) and (2)). No such impacts are found for women in their thirties. This suggests that the earlier birth of a male to a woman impacts her views of the acceptability of violence when a first son is a young adult.

4 Conclusions

This paper employs data from the available censuses and the 2009 DHS to examine son preference in contemporary Albania. Despite a recent history of agricultural collectivisation and state-sponsored old age pensions under communism, the importance of sons to fertility behaviour has remained strong. Both in 1918 and 2009, under-5 sex ratios suggest a dearth of female children. In the early 2000s, these sex ratios were comparable with those in China, Vietnam, India, and several post-communist countries of the Former Soviet Union. Masculinisation is heavily concentrated amongst higher order births while sex ratios of firstborns remain normal.

Son preference is difficult to detect in data on early childhood investments. Even when detected, the importance of differences is difficult to ascertain. Anthropometric scores for children under age 5 suggest little differences in access to health and nutrition amongst boys and girls. This is true both for firstborns and for higher-order births. Measles vaccination rates for girls do, however, suggest some discrimination. The DHS data also provide evidence that fathers and mothers are both more likely to spend time naming, counting or drawing with male firstborns than with female.

The DHS data provide suggestive evidence of an old-age security motive son preference. The employment propensities of women aged 40 and 49 with less than 9 years of schooling are substantially lowered by having a male firstborn. This suggests that women who bear sons earlier begin to receive transfers from working adult sons at earlier ages. The effect is likely most apparent amongst women with relatively little education, perhaps because labour market opportunities are poorer for this group. Because of low earnings potential, they are more reliant on transfers from adult sons in middle age.

Albanian women who bear sons at younger ages do not measurably improve their

agency. A male firstborn does not appear to improve a woman's say in any of the five resource allocation categories defined in the DHS. Women with a male firstborn become more accepting of spousal violence, particularly in their forties. Sons may promote old-age security but not women's agency.

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Table 1: Patrilocality Index Ranking

	Fraction of married women,15-30, who live with their father in law	Fraction of married women,15-30, who live with their father	Employment rate of women, 15-49
1. Armenia, 2005	0.705	0.055	0.133
2. Albania, 2008-09	**0.635**	**0.026**	**0.211**
3. Azerbaijan, 2006	0.577	0.040	0.114
4. Pakistan, 2006-07	0.379	0.062	0.247
5. Nepal, 2006	0.369	0.074	0.690
6. Swaziland, 2006-07	0.335	0.049	0.396
7. India, 2005-06	0.322	0.103	0.294
8. Turkey, 2003	0.245	0.030	0.270
9. Ukraine, 2007	0.191	0.237	0.640
10. Egypt, 2008	0.187	0.049	0.123
11. Bangladesh, 2007	0.176	0.126	0.265
12. Moldova, 2005	0.164	0.165	0.421
13. Niger, 2006	0.132	0.028	0.390
14. Zimbabwe, 2005-06	0.129	0.052	0.354
15. Philippines, 2008	0.120	0.144	0.393
16. Indonesia, 2007	0.108	0.212	0.452
17. Guinea, 2005	0.091	0.058	0.853
18. Kenya, 2008-09	0.082	0.019	0.601
19. Honduras, 2005	0.073	0.073	0.333
20. Jordan, 2007	0.070	0.050	0.115
21. Cambodia, 2005	0.069	0.198	0.592
22. Peru, 2004-08	0.066	0.138	0.598
23. Sierra Leone, 2008	0.064	0.085	0.765
24. Liberia, 2007	0.061	0.084	0.641
25. Benin, 2006	0.056	0.037	0.265
26. Colombia, 2005	0.051	0.096	0.438
27. Haïti, 2005-06	0.049	0.146	0.498
28. Madagascar, 2008-09	0.049	0.035	0.913
29. Congo (Brazzaville), 2005	0.046	0.045	0.664
30. Bolivia, 2008	0.043	0.066	0.607
31. Dominican Republic, 2007	0.041	0.117	0.352
32. Congo (DR), 2007	0.041	0.055	0.732
33. Uganda, 2006	0.037	0.020	0.877
34. Namibia, 2006-07	0.036	0.049	0.445
35. Ethiopia, 2005	0.028	0.019	0.232
36. Nigeria, 2008	0.027	0.027	0.653
37. Ghana, 2008	0.025	0.061	0.870
38. Mali, 2006	0.023	0.029	0.626
39. Zambia, 2007	0.016	0.044	0.500
40. Rwanda, 2005	0.003	0.007	0.717

Source: DHS V surveys. Sample weights employed.

Table 2: Regional heterogeneity in sex ratios and family structures in Albania

	Socio-economic characteristics				**Fraction of male births**			
	House-hold size	Number children <5 in house-hold	Mother < 9 yrs of school	Currently Employed	firstborns 1985-1998	firstborns 1998-2009	higher order births 1985-1998	higher order births 1998-2009
Coast, Central and Tirana								
	4.9313	0.3955	0.5997	0.3569	0.5071	0.5063	0.5017	0.5361
	(0.018)	(0.008)	(0.005)	(0.005)	(0.010)	(0.017)	(0.009)	(0.012)
No.	8222	8222	8222	8222	2498	868	3111	1745
Mountain								
	5.4603	0.5010	0.7066	0.2311	0.5036	0.4871	0.5208	0.5276
	(0.026)	(0.011)	(0.007)	(0.006)	(0.015)	(0.026)	(0.011)	(0.015)
No.	4544	4544	4544	4544	1076	375	1922	1171
P-value t-test of equality								
	0.000	0.000	0.000	0.000	0.901	0.684	0.355	0.749

Sample weights employed. Data is from the fertility history information contained in the Albania DHS 2009.

Table 3: Health outcomes of children under age 5

	First Births				Higher-order births			
Mother's ed.:	< 9 yrs schooling		≥ 9 yrs schooling		< 9 yrs schooling		≥ 9 yrs schooling	
Wealth controls:	no	yes	no	yes	no	yes	no	yes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Stunted								
female	0.0137	0.0184	0.1144	0.1149	-0.0817	-0.0918	0.1483	0.1171
	(0.066)	(0.066)	(0.088)	(0.088)	(0.055)	(0.054)	(0.087)	(0.082)
female*b.month	-0.0015	-0.0015	-0.0019	-0.0018	0.0031*	0.0030*	-0.0032	-0.0023
	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)
month of birth	0.0019	0.0018	0.0015	0.0013	-0.0008	-0.0008	0.0018	0.0015
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)
R^2	0.052	0.080	0.038	0.050	0.023	0.048	0.052	0.066
No. obs.	297	297	210	210	698	698	373	373
Dep var mean	0.0907		0.0913		0.1604		0.1340	
	(0.017)		(0.020)		(0.014)		(0.018)	
Panel B: Wasted								
female	0.1061	0.0949	-0.0237	-0.0250	-0.0495	-0.0476	-0.1231	-0.1245
	(0.085)	(0.079)	(0.060)	(0.058)	(0.039)	(0.038)	(0.129)	(0.125)
female*b.month	-0.0023	-0.0022	0.0006	0.0005	0.0012	0.0012	0.0017	0.0018
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.003)	(0.003)
month of birth	0.0011	0.0010	0.0030*	0.0033**	-0.0002	-0.0002	-0.0018	-0.0018
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)
R^2	0.046	0.115	0.059	0.071	0.024	0.028	0.098	0.105
No. obs.	297	297	210	210	698	698	373	373
Dep var mean	0.0562		0.0815		0.0454		0.0525	
	(0.013)		(0.019)		(0.008)		(0.012)	
Panel C: Underweight								
female	-0.0784	-0.0874	0.0501	0.0391	-0.0491	-0.0484	0.0645**	0.0728**
	(0.064)	(0.065)	(0.064)	(0.062)	(0.044)	(0.045)	(0.025)	(0.032)
female*b.month	0.0015	0.0017	-0.0018	-0.0018	0.0012	0.0012	-0.0022**	-0.0023**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
month of birth	-0.0004	-0.0006	0.0019	0.0022*	-0.0010	-0.0010	0.0013	0.0013
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
R^2	0.026	0.032	0.035	0.055	0.023	0.032	0.037	0.055
No. obs.	297	297	210	210	698	698	373	373
Dep var mean	0.0553		0.0675		0.0571		0.0261	
	(0.013)		(0.017)		(0.009)		(0.008)	
Panel D: Child is vaccinated against measles								
female	-0.0235	-0.0271	-0.0815	-0.0749	-0.1045**	-0.1086**	-0.0590	-0.0295
	(0.065)	(0.067)	(0.060)	(0.064)	(0.044)	(0.044)	(0.057)	(0.059)
female*b.month	0.0009	0.0010	0.0028	0.0025	0.0051**	0.0051**	0.0021	0.0013
	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
month of birth	-0.0146***	-0.0145***	-0.0211***	-0.0207***	-0.0168***	-0.0168***	-0.0143***	-0.0141***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)
R^2	0.396	0.399	0.592	0.596	0.480	0.482	0.438	0.451
No. obs.	294	294	208	208	695	695	372	372
Dep var mean	0.8450		0.7399		0.8136		0.8576	
	(0.021)		(0.030)		(0.015)		(0.018)	

Estimation is by OLS. *** significant at 1% level,, ** significant at 5% level, * significant at 10% level. Sample weights employed. Standard errors are clustered at the household level. Data is from the DHS 2009 survey. Children under 60 months of age are included. All estimation controls for household size, number of children under age 5 in the household, sex ratio of children under 5, region, rural and year.

Table 4: Parental inputs to early the childhood education of children under age 5

	First Births				Higher-order births			
Mother's ed.:	< 9 yrs schooling		≥ 9 yrs schooling		< 9 yrs schooling		≥ 9 yrs schooling	
Wealth controls:	no	yes	no	yes	no	yes	no	yes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Mother								
Named, counted, or drew with child in previous week								
female	-0.1426	-0.1493	-0.2736***	-0.2421***	0.1032	0.1273	0.0572	0.0670
	(0.101)	(0.091)	(0.080)	(0.081)	(0.087)	(0.078)	(0.131)	(0.118)
female*b.month	0.0034	0.0039	0.0085**	0.0082**	-0.0029	-0.0031	-0.0015	-0.0025
	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.004)	(0.004)
month of birth	-0.0139***	-0.0139***	-0.0145***	-0.0147***	-0.0035*	-0.0035*	-0.0066**	-0.0061**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
R^2	0.232	0.270	0.313	0.333	0.131	0.197	0.205	0.255
No. obs.	297	297	210	210	698	698	373	373
Dep var mean	0.4605		0.6640		0.3894		0.5662	
	(0.028)		(0.032)		(0.018)		(0.025)	
Sang, told stories or read book with child in previous week								
female	0.0633	0.0471	0.0173	0.0238	-0.0011	0.0182	0.0326	0.0089
	(0.105)	(0.100)	(0.077)	(0.080)	(0.049)	(0.040)	(0.064)	(0.066)
female*b.month	-0.0012	-0.0008	-0.0010	-0.0012	0.0006	0.0005	-0.0008	-0.0002
	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
month of birth	-0.0044	-0.0045	-0.0005	-0.0004	0.0009	0.0009	-0.0005	-0.0006
	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
R^2	0.115	0.151	0.117	0.119	0.095	0.158	0.094	0.119
No. obs.	297	297	210	210	698	698	373	373
Dep var mean	0.8152		0.9192		0.8047		0.9070	
	(0.022)		(0.019)		(0.015)		(0.015)	
Played or went outside with child in previous week								
female	0.0419	0.0401	-0.0525	-0.0752	-0.0252	-0.0094	0.0461	0.0274
	(0.060)	(0.063)	(0.051)	(0.059)	(0.080)	(0.078)	(0.071)	(0.068)
female*b.month	0.0006	0.0008	0.0027	0.0032	0.0010	0.0009	-0.0015	-0.0013
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
month of birth	-0.0044*	-0.0043*	-0.0061***	-0.0069***	0.0008	0.0008	-0.0000	0.0001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)
R^2	0.086	0.125	0.128	0.155	0.088	0.121	0.068	0.095
No. obs.	297	297	210	210	698	698	373	373
Dep var mean	0.8428		0.9077		0.8071		0.8753	
	(0.021)		(0.020)		(0.015)		(0.017)	
Panel B: Father								
Named, counted, or drew with child in previous week								
female	-0.2029	-0.2007	-0.3745***	-0.3369***	0.0272	0.0321	0.1175	0.1279
	(0.135)	(0.135)	(0.113)	(0.109)	(0.070)	(0.069)	(0.141)	(0.148)
female*b.month	0.0047	0.0047	0.0084***	0.0079***	-0.0011	-0.0013	-0.0024	-0.0030
	(0.004)	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)	(0.004)	(0.004)
month of birth	-0.0074***	-0.0073***	-0.0128***	-0.0129***	-0.0031***	-0.0031***	-0.0025	-0.0022
	(0.002)	(0.002)	(0.002)	(0.003)	(0.001)	(0.001)	(0.003)	(0.003)
R^2	0.164	0.178	0.258	0.286	0.110	0.131	0.080	0.107
No. obs.	297	297	210	210	698	698	373	373
Dep var mean	0.1794		0.3416		0.1268		0.2822	
	(0.022)		(0.032)		(0.012)		(0.023)	
Sang, told stories or read book with child in previous week								
female	0.0131	-0.0156	0.0059	0.0245	0.1380	0.1513	0.1252	0.1044
	(0.090)	(0.097)	(0.110)	(0.106)	(0.090)	(0.092)	(0.110)	(0.104)
female*b.month	-0.0011	-0.0003	-0.0034	-0.0042	-0.0044	-0.0046*	-0.0047*	-0.0045**
	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)
month of birth	-0.0007	-0.0011	-0.0056	-0.0042	-0.0006	-0.0006	-0.0022	-0.0020
	(0.002)	(0.002)	(0.004)	(0.004)	(0.001)	(0.001)	(0.002)	(0.002)
R^2	0.097	0.134	0.147	0.179	0.059	0.082	0.093	0.138
No. obs.	297	297	210	210	698	698	373	373
Dep var mean	0.2666		0.4976		0.2714		0.4591	
	(0.025)		(0.034)		(0.017)		(0.025)	
Played or went outside with child in previous week								
female	-0.1341	-0.1504	-0.0978	-0.0914	0.1451	0.1549	0.0402	0.0422
	(0.153)	(0.155)	(0.122)	(0.131)	(0.113)	(0.120)	(0.094)	(0.093)
female*b.month	0.0037	0.0044	0.0021	0.0014	-0.0038	-0.0037	-0.0037	-0.0041
	(0.005)	(0.005)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
month of birth	-0.0031	-0.0036	-0.0096**	-0.0085**	-0.0007	-0.0007	0.0025	0.0028
	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
R^2	0.087	0.118	0.200	0.251	0.081	0.093	0.111	0.123
No. obs.	297	297	210	210	698	698	373	373
Dep var mean	0.4778		0.6849		0.4359		0.6079	
	(0.029)		(0.032)		(0.019)		(0.025)	

Estimation is by OLS. *** significant at 1% level, ** significant at 5% level, * significant at 10% level. Sample weights employed. Standard errors are clustered at the household level. Data is from the DHS 2009 survey. Children under 60 months of age are included. All estimation controls for household size, number of children under age 5 in the household, sex ratio of children under 5, region, rural and year.

Table 5: Sex of first-born child and subsequent fertility and employment of Albanian women aged 15-49

	< 9 yrs schooling		≥ 9 yrs schooling	
Wealth controls	no	yes	no	yes
	(1)	(2)	(3)	(4)
Panel A: Probability of any higher order births by interview				
Second birth				
first-born a boy	-0.0347**	-0.0348**	-0.0082	-0.0081
	(0.014)	(0.014)	(0.017)	(0.017)
R^2	0.18	0.18	0.13	0.14
No. obs.	2578	2578	2239	2239
Dep var mean	0.8694		0.8480	
	(0.007)		(0.008)	
Third birth				
first-born a boy	-0.1312***	-0.1342***	-0.1421***	-0.1453***
	(0.023)	(0.023)	(0.027)	(0.026)
second born a boy	-0.1461***	-0.1453***	-0.1500***	-0.1482***
	(0.023)	(0.023)	(0.026)	(0.026)
R^2	0.16	0.17	0.15	0.16
No. obs.	2253	2253	1902	1902
Dep var mean	0.5362		0.3305	
	(0.010)		(0.010)	
Fourth or higher order birth				
first-born a boy	-0.1181***	-0.1183***	-0.0765*	-0.0823**
	(0.029)	(0.028)	(0.041)	(0.040)
second born a boy	-0.0795***	-0.0826***	-0.0814**	-0.0944**
	(0.029)	(0.029)	(0.040)	(0.040)
third born a boy	-0.1713***	-0.1651***	-0.0896**	-0.0901**
	(0.029)	(0.029)	(0.043)	(0.042)
R^2	0.15	0.16	0.06	0.08
No. obs.	1462	1462	786	786
Dep var mean	0.2177		0.0853	
	(0.008)		(0.006)	
Panel B: Male birth by DHS interview				
Any higher order birth				
firstborn a boy	-0.1161***	-0.1172***	-0.1455***	-0.1469***
	(0.021)	(0.021)	(0.028)	(0.028)
No. obs.	2253	2253	1902	1902
Dep var mean	0.6650		0.5406	
	(0.009)		(0.011)	
Second-born				
firstborn a boy	0.0017	0.0013	-0.0325	-0.0321
	(0.025)	(0.025)	(0.029)	(0.029)
No. obs.	2253	2253	1902	1902
Dep var mean	0.4463		0.4040	
	(0.010)		(0.010)	
Third-born				
firstborn a boy	-0.0812***	-0.0825***	-0.0926***	-0.0946***
	(0.023)	(0.023)	(0.023)	(0.023)
No. obs.	2253	2253	1902	1902
Dep var mean	0.2941		0.1736	
	(0.009)		(0.008)	
Fourth-born				
firstborn a boy	-0.0761***	-0.0772***	-0.0575***	-0.0584***
	(0.016)	(0.016)	(0.016)	(0.016)
No. obs.	2253	2253	1902	1902
Dep var mean	0.1119		0.0546	
	(0.006)		(0.005)	
Panel C: Total children born				
first born a boy	-0.3263***	-0.3320***	-0.2246***	-0.2303***
	(0.052)	(0.052)	(0.043)	(0.043)
No. obs.	2253	2253	1902	1902
Dep var mean	2.7754		2.2933	
	(0.026)		(0.019)	

[a] Conditional on total number of children born. All estimation is by OLS. Robust standard errors.*** significant at 1% level, ** significant at 5% level, * at 10% level. Sample weights employed. Women with at least one child are included in the sample. Controls for age, region (Central, Mountain, Coastal, urban Tirana) and rural included in all specifications.

Table 6: The sex of firstborn children and employment propensities of women

Dependent variable: Currently employed						
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: < than 9 years of schooling						
first born a boy	0.0230	0.0208	0.0252	0.0246	0.0210	-0.0009
	(0.027)	(0.027)	(0.029)	(0.029)	(0.028)	(0.162)
30≤ age <40	0.1753***	0.1938***	0.1844***	0.1830***	0.1805***	0.1976***
	(0.032)	(0.031)	(0.032)	(0.032)	(0.033)	(0.032)
age≥40	0.2216***	0.2511***	0.2266***	0.2243***	0.2228***	0.2533***
	(0.031)	(0.026)	(0.032)	(0.033)	(0.033)	(0.046)
30≤ age <40*(male firstborn)	-0.0241	-0.0280	-0.0333	-0.0323	-0.0249	-0.0546
	(0.048)	(0.047)	(0.046)	(0.046)	(0.045)	(0.043)
age≥40*(male firstborn)	-0.0842*	-0.0897*	-0.0895*	-0.0877*	-0.0837*	-0.1406**
	(0.046)	(0.046)	(0.048)	(0.047)	(0.047)	(0.065)
constant	0.0898***	0.1228***	0.2035***	0.2252***	0.1862***	0.2181***
	(0.021)	(0.027)	(0.044)	(0.051)	(0.051)	(0.065)
R^2	0.030	0.033	0.046	0.046	0.048	0.051
No. obs.	2578	2578	2578	2578	2578	2578
Panel B: ≥ 9 years of schooling						
first born a boy	0.0865	0.0870	0.0875	0.0875	0.0726	0.0860
	(0.091)	(0.091)	(0.089)	(0.089)	(0.088)	(0.171)
30≤ age <40	0.1255**	0.1904***	0.1880**	0.1880**	0.1829**	0.1759***
	(0.058)	(0.062)	(0.067)	(0.067)	(0.066)	(0.062)
age≥40	0.2236***	0.3130***	0.2970***	0.2970***	0.2837***	0.2800***
	(0.069)	(0.071)	(0.077)	(0.077)	(0.076)	(0.072)
30≤ age <40*(male firstborn)	-0.0601	-0.0732	-0.0765	-0.0765	-0.0530	-0.0495
	(0.084)	(0.085)	(0.084)	(0.084)	(0.085)	(0.091)
age≥40*(male firstborn)	-0.1163	-0.1432	-0.1370	-0.1370	-0.1136	-0.1105
	(0.100)	(0.103)	(0.100)	(0.100)	(0.097)	(0.101)
constant	0.3531***	0.4717***	0.4636***	0.4636***	0.2611**	0.1789
	(0.055)	(0.062)	(0.076)	(0.076)	(0.101)	(0.166)
R^2	0.013	0.030	0.043	0.043	0.064	0.070
No. obs.	2239	2239	2239	2239	2239	2239
Other controls:						
total kids	no	yes	yes	yes	yes	yes
region	no	no	yes	yes	yes	yes
rural	no	no	no	yes	yes	yes
hhld size, wealth	no	no	no	no	yes	yes
full interacs. [a]	no	no	no	no	no	yes

Estimation is by OLS. *** significant at 1% level,, ** significant at 5% level, * significant at 10% level. Sample weights employed. Standard errors are clustered at the household level. [a] Interactions between male firstborn and total kids, rural, region, household size and household wealth wealth quintile dummies. Data is from the DHS 2009 survey. All women with at least one child are included in estimation.

Table 7: The sex of firstborn children and women's say in household decisionmaking

	Own healthcare		**Large household purchases**		**Household purchases for daily needs**		**Visits to family or relatives**		**What to do with money**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: < than 9 years of schooling										
first born a boy	-0.0080	-0.0098	-0.0591	-0.0468	-0.1001	-0.0938	-0.0428	-0.0219	-0.0966	-0.0826
	(0.102)	(0.106)	(0.147)	(0.150)	(0.137)	(0.138)	(0.110)	(0.113)	(0.132)	(0.135)
30≤ age <40	0.0436	0.0373	0.1371**	0.1211**	0.1628***	0.1477***	0.1626***	0.1514***	0.0723	0.0584
	(0.040)	(0.040)	(0.052)	(0.052)	(0.041)	(0.042)	(0.048)	(0.047)	(0.059)	(0.057)
age≥40	0.0868	0.0788	0.1342*	0.1137*	0.1958***	0.1765***	0.1924**	0.1781**	0.1301*	0.1123
	(0.058)	(0.058)	(0.065)	(0.063)	(0.058)	(0.059)	(0.068)	(0.067)	(0.069)	(0.067)
30≤ age <40*(male firstborn)	-0.0585	-0.0578	-0.0177	-0.0062	0.0023	0.0101	-0.1205*	-0.1053	-0.0249	-0.0130
	(0.048)	(0.046)	(0.066)	(0.063)	(0.045)	(0.045)	(0.064)	(0.062)	(0.069)	(0.069)
age≥40*(male firstborn)	-0.0934	-0.0897	-0.0518	-0.0348	-0.0427	-0.0292	-0.1264	-0.1090	-0.0737	-0.0574
	(0.064)	(0.064)	(0.075)	(0.076)	(0.068)	(0.069)	(0.086)	(0.085)	(0.086)	(0.084)
R^2	0.035	0.036	0.048	0.051	0.068	0.072	0.060	0.062	0.039	0.041
No. obs.	2578	2578	2578	2578	2578	2578	2578	2578	2578	2578
Dep var mean	0.7657		0.5711		0.7569		0.7131		0.5998	
	(0.008)		(0.010)		(0.008)		(0.009)		(0.010)	
Panel B: ≥ 9 years of schooling										
first born a boy	0.1092	0.1044	0.0084	0.0162	0.1533	0.1527	0.0659	0.0795	0.0652	0.0699
	(0.124)	(0.128)	(0.138)	(0.141)	(0.132)	(0.137)	(0.131)	(0.128)	(0.162)	(0.160)
30≤ age <40	0.0222	0.0201	0.0350	0.0302	0.1515**	0.1507**	0.0296	0.0260	0.1222**	0.1129**
	(0.037)	(0.037)	(0.064)	(0.058)	(0.061)	(0.061)	(0.047)	(0.046)	(0.045)	(0.044)
age≥40	0.0006	-0.0028	0.0522	0.0445	0.1341**	0.1328**	0.0287	0.0230	0.1283***	0.1134***
	(0.042)	(0.042)	(0.073)	(0.065)	(0.062)	(0.061)	(0.045)	(0.045)	(0.036)	(0.039)
30≤ age <40*(male firstborn)	0.0250	0.0242	0.1201*	0.1252**	-0.0072	-0.0070	0.0426	0.0492	-0.0504	-0.0444
	(0.056)	(0.055)	(0.060)	(0.057)	(0.061)	(0.060)	(0.063)	(0.062)	(0.055)	(0.053)
age≥40*(male firstborn)	0.0197	0.0192	0.0168	0.0248	-0.0300	-0.0296	0.0176	0.0274	-0.1260**	-0.1156**
	(0.053)	(0.050)	(0.068)	(0.063)	(0.067)	(0.066)	(0.063)	(0.064)	(0.054)	(0.053)
constant	0.6474***	0.6453***	0.6136***	0.6087***	0.5599***	0.5591***	0.6843***	0.6807***	0.5898***	0.5803***
	(0.099)	(0.098)	(0.141)	(0.147)	(0.127)	(0.127)	(0.104)	(0.104)	(0.126)	(0.125)
R^2	0.030	0.031	0.040	0.040	0.045	0.045	0.040	0.041	0.037	0.040
No. obs.	2239	2239	2239	2239	2239	2239	2239	2239	2239	2239
Dep var mean	0.8830		0.7593		0.8668		0.8605		0.7815	
	(0.007)		(0.009)		(0.007)		(0.007)		(0.009)	
Other controls:										
current work + interacs. [a]	no	yes	no	yes	no	yes	no	yes	no	yes

Estimation is by OLS. All estimation controls for total children born, region, rural, household size and household wealth quintile, and a full set of interactions with the male firstborn dummy.*** significant at 1% lev at 5% level, * significant at 10% level. Sample weights employed. Standard errors are clustered at the household level. There are 450 sampling clusters defined in the data. [a] Interactions between male firstborn region, rural and wealth quintile. Data is from the DHS 2009 survey. All women with at least one child are included in estimation.

Table 8: Women's views of the conditions under which the beating of a wife by the husband is justified

	Goes out without permission		**Argues with husband**		**Refuses sex**		**Neglects children**		**Burns food**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: < than 9 years of schooling										
first born a boy	0.0164	-0.0037	-0.0688	-0.0795	-0.0380	-0.0344	-0.0733	-0.0758	0.0559	0.0496
	(0.121)	(0.122)	(0.097)	(0.099)	(0.090)	(0.097)	(0.140)	(0.141)	(0.097)	(0.100)
30≤ age <40	-0.0346	-0.0261	-0.0537	-0.0497	-0.0362	-0.0430*	-0.0924	-0.0909	-0.0157	-0.0156
	(0.037)	(0.036)	(0.036)	(0.036)	(0.024)	(0.022)	(0.054)	(0.054)	(0.021)	(0.021)
age≥40	-0.1121**	-0.1013**	-0.0733*	-0.0682*	-0.0768**	-0.0855**	-0.1309**	-0.1289**	-0.0237	-0.0236
	(0.042)	(0.041)	(0.035)	(0.036)	(0.034)	(0.033)	(0.054)	(0.051)	(0.024)	(0.024)
30≤ age <40*(male firstborn)	0.0220	0.0080	0.0735	0.0662	0.0248	0.0288	0.1553**	0.1534**	0.0130	0.0093
	(0.057)	(0.056)	(0.045)	(0.047)	(0.042)	(0.040)	(0.067)	(0.069)	(0.027)	(0.027)
age≥40*(male firstborn)	0.1108	0.0957	0.1034*	0.0957*	0.0676	0.0740	0.1588*	0.1566*	0.0266	0.0237
	(0.070)	(0.070)	(0.053)	(0.054)	(0.049)	(0.048)	(0.086)	(0.086)	(0.032)	(0.032)
R^2	0.048	0.050	0.048	0.048	0.030	0.031	0.042	0.042	0.039	0.040
No. obs.	2578	2578	2578	2578	2578	2578	2578	2578	2578	2578
Dep var mean	0.2974		0.1941		0.1504		0.3261		0.0717	
	(0.009)		(0.008)		(0.007)		(0.009)		(0.005)	
Panel B: ≥ 9 years of schooling										
first born a boy	-0.1618*	-0.1619	0.1116	0.1146	0.1872*	0.1929*	0.0006	-0.0042	-0.0459	-0.0428
	(0.093)	(0.097)	(0.067)	(0.067)	(0.093)	(0.094)	(0.073)	(0.070)	(0.039)	(0.038)
30≤ age <40	-0.0702	-0.0632	0.0227	0.0252	0.0302	0.0338*	0.0313	0.0389	-0.0071	-0.0066
	(0.045)	(0.046)	(0.026)	(0.027)	(0.018)	(0.018)	(0.040)	(0.039)	(0.018)	(0.017)
age≥40	-0.0878*	-0.0765	-0.0120	-0.0080	0.0138	0.0195	-0.0141	-0.0019	-0.0228	-0.0221
	(0.045)	(0.047)	(0.032)	(0.031)	(0.023)	(0.025)	(0.033)	(0.033)	(0.014)	(0.013)
30≤ age <40*(male firstborn)	0.0862	0.0829	-0.0452	-0.0453	-0.0568*	-0.0564*	-0.0511	-0.0563	-0.0039	-0.0030
	(0.053)	(0.054)	(0.030)	(0.031)	(0.030)	(0.030)	(0.061)	(0.061)	(0.025)	(0.025)
age≥40*(male firstborn)	0.1449**	0.1387**	-0.0059	-0.0066	-0.0026	-0.0029	0.0180	0.0090	0.0154	0.0165
	(0.055)	(0.056)	(0.040)	(0.039)	(0.027)	(0.028)	(0.059)	(0.060)	(0.022)	(0.022)
constant	0.0260	0.0332	-0.0140	-0.0115	-0.0472	-0.0435	0.1507*	0.1585**	0.0422	0.0427
	(0.086)	(0.086)	(0.079)	(0.080)	(0.081)	(0.080)	(0.073)	(0.073)	(0.042)	(0.042)
R^2	0.084	0.087	0.061	0.062	0.053	0.057	0.068	0.071	0.039	0.040
No. obs.	2239	2239	2239	2239	2239	2239	2239	2239	2239	2239
Dep var mean	0.1116		0.0620		0.0436		0.1402		0.0151	
	(0.007)		(0.005)		(0.004)		(0.007)		(0.003)	
Other controls:										
current work + interacs. [a]	no	yes	no	yes	no	yes	no	yes	no	yes

Estimation is by OLS. All estimation controls for total children born, region, rural, household size and household wealth quintile, and a full set of interactions with the male firstborn dummy. *** significant at 1% lev at 5% level, * significant at 10% level. Sample weights employed. Standard errors are clustered at the household level. There are 450 sampling clusters defined in the data. [a] Interactions between male firstborn region, rural and wealth quintile. Data is from the DHS 2009 survey. All women with at least one child are included in estimation.

Figure 1: 2011 Census ratios of boys to girls under 5 in Albania, by prefecture

Figure 2: Patrilocality and differences in fertility at age 40-49, DHS. Mean (firstborn female)-mean (firstborn male)

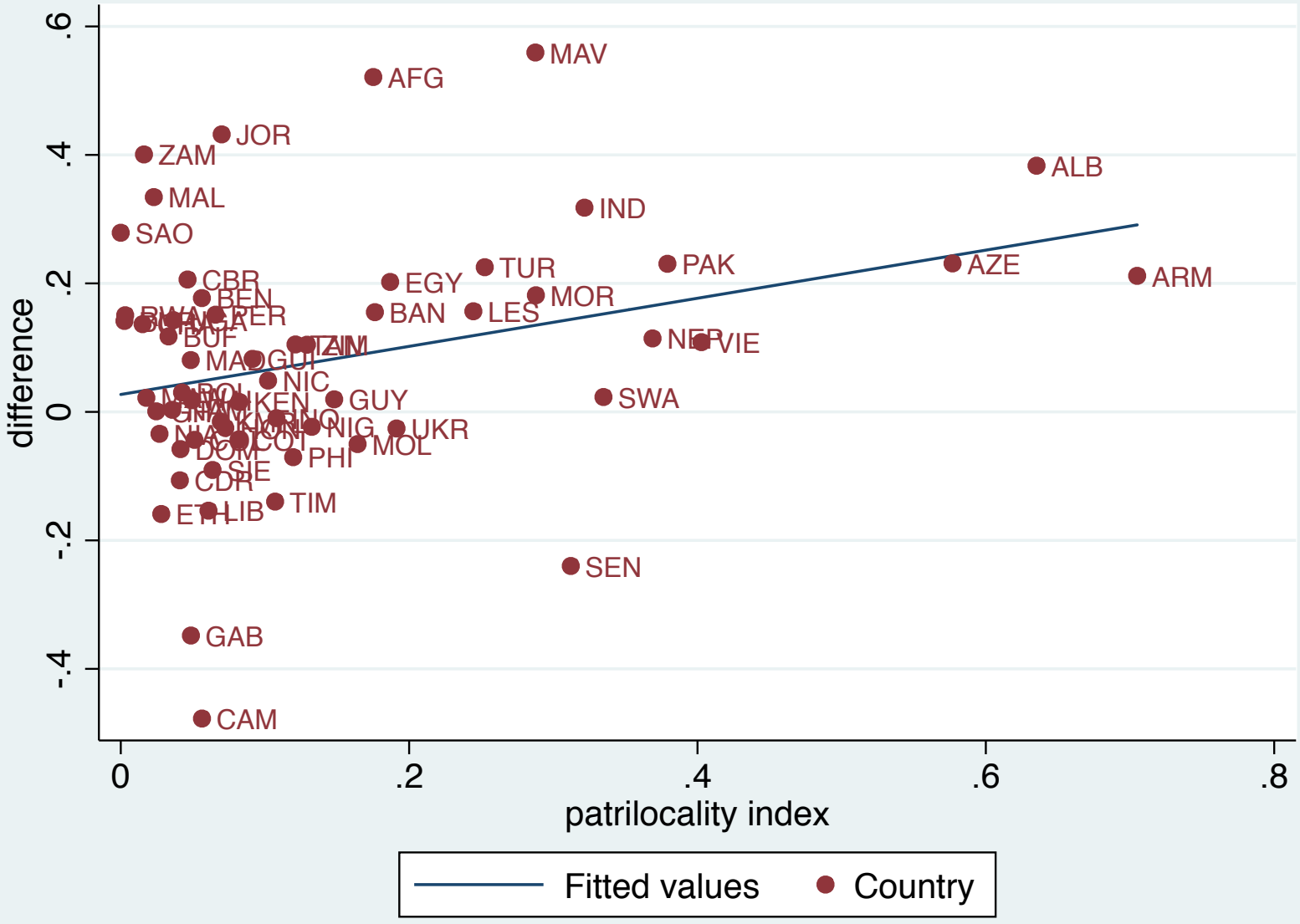


Figure 3: Female employment and differences in fertility at age 40-49, DHS. Mean (first-born female)-mean (firstborn male)

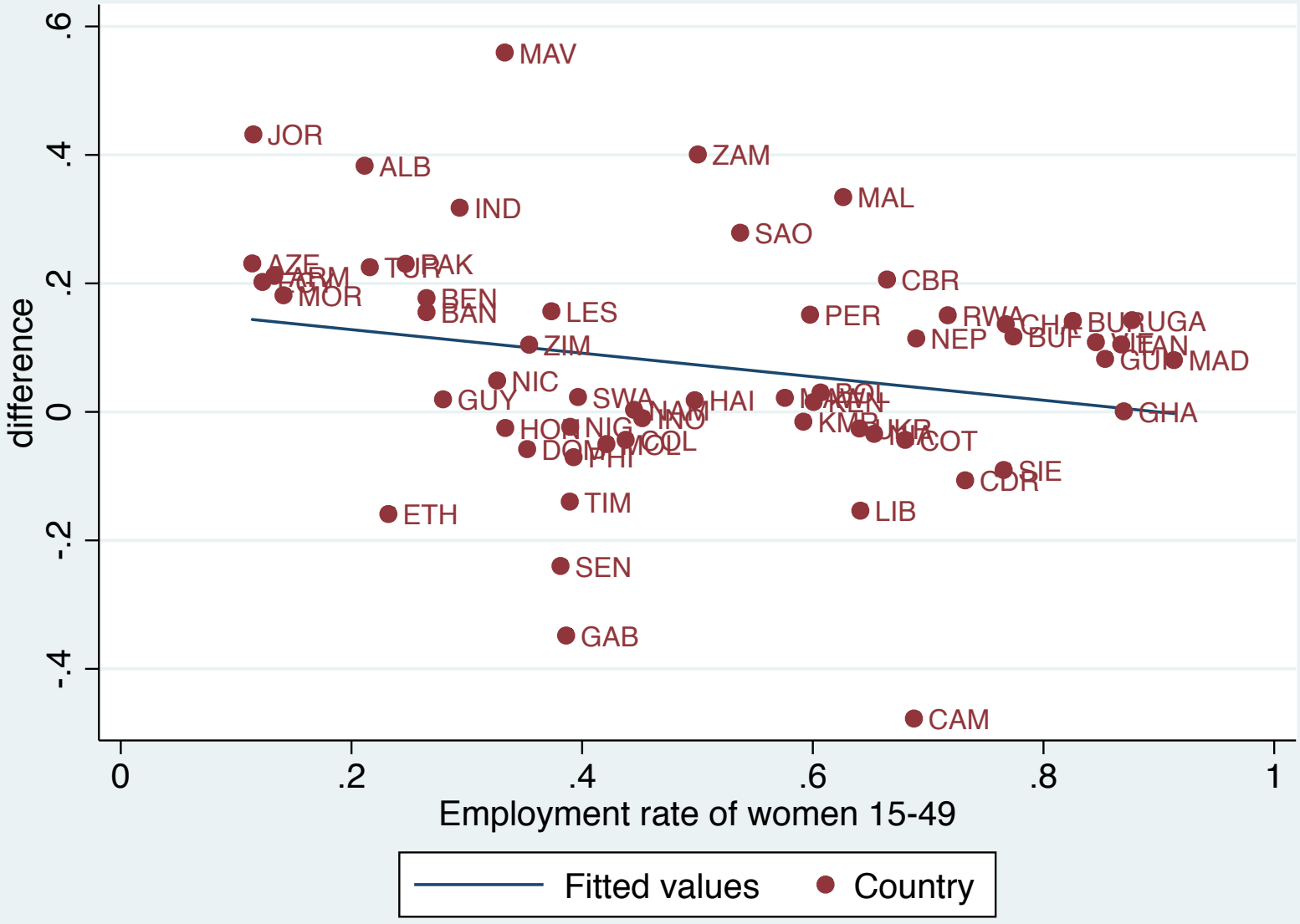
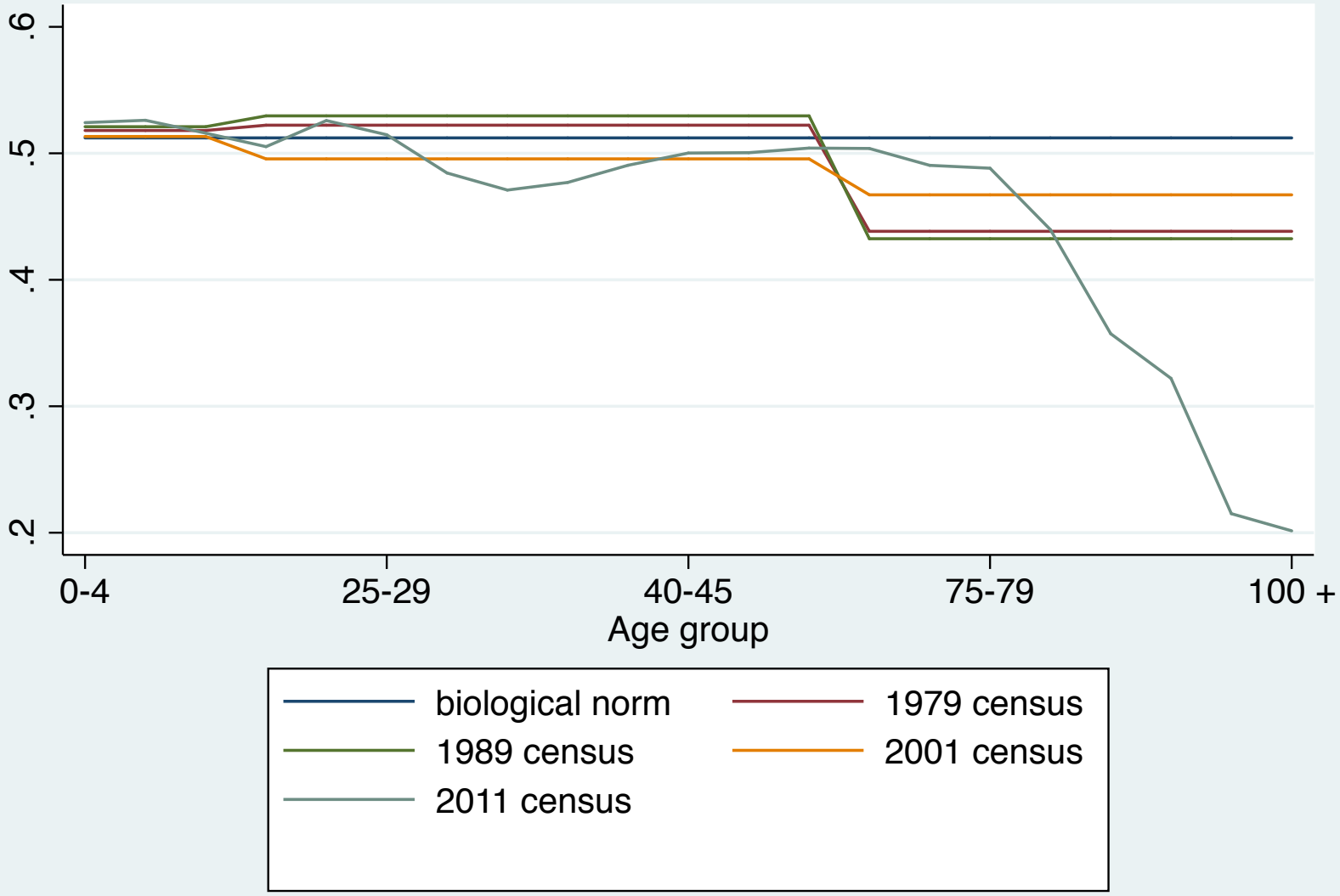
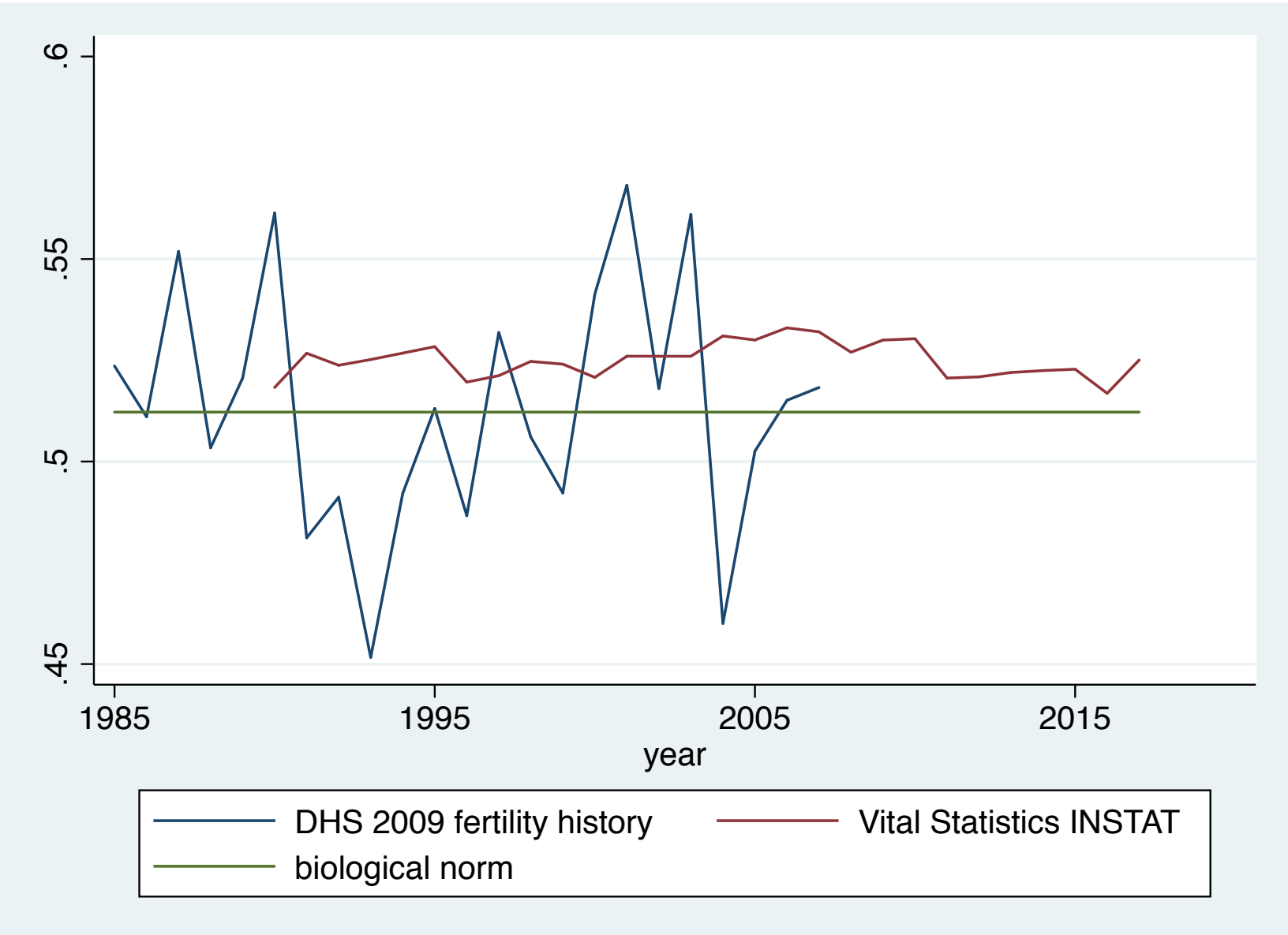


Figure 4: Fraction of males by age group, Albanian censuses 1979-2011



Source: INSTAT (2011).

Figure 5: Fraction of male births by year, Albania 1990-2017



A Data Appendix

A.1 Economic Conditions:

Post-war communism was initially associated with both large increases in educational attainment and with a decline in the role of religion in daily life. In the early years of Communism, when cooperation with the Soviet Union was strongest, a major modernisation drive was launched. Illiteracy rates declined from perhaps 85% in 1946 to 31% in 1950. Although the country had never had an official religion, ideological competition with religious establishments was physically subverted by the transformation of mosques and churches into gymnasiums and schools (Skendi (1956)). In 1967, President Enver Hoxha's Antireligious Campaign culminated in a declaration that Albania had become the world's first atheistic state. About 15% of DHS 2009 respondents report themselves to be Orthodox, Bektashi, Protestant, or Catholic, and about 84% consider themselves Muslim.

Given the a starting point, Albania was well positioned to be one of Eastern Europe's strong growth performers in the early 1990s. The World Bank (2003) reports mean annualised agricultural growth rates of 5% during first ten years of the transition from communism. Although much of Albania's recent growth has been concentrated outside of rural areas, rural areas have also experienced substantial gains. The rural population was estimated to make up about 54 percent of the total population in 2001, with more than 60 percent of the labour force working in agriculture and ancilliary activities (World Bank (2002)). According to the World Bank (2003), agricultural output accounted for between 55 and 65 % of GDP in Albania in 1999. Albania's economy has always been largely agricultural, although recent industrial growth has been strong. In 1994 GDP grew by 9.4%, in 1995 by 8.9%, and in 1996 by 9.1% (International Monetary Fund (1997)).

As is the case in other Former Soviet Union countries where increasing sex imbalances have been documented, neither men nor women in Albania now have many employment options outside of agriculture. New husbands often migrate to other countries soon after marriage. When economic transition began in 1992, agricultural cooperatives in Albania were disbanded and rapid privatisation of land was undertaken. This initial transformation gave property rights to state farm workers. Initial plots were an average of 1.4 hectares per family. People were expected to create farms out of these small allotments to provide

home production for their families.

Economic isolationism prevented much of the post-1945 modernisation that was then occurring throughout East and Western European countries from reaching Albania (Kera and Pandelejmoni (2008), Bardhoshi (2012)). An organised transition to an open market economy began only in 1992. This followed two years of lawlessness and the eventual collapse of the communist regime. At this time, Albania was by far the poorest of the European communist countries, and had per capita GDP and infant health statistics far below those of Central Europe. UNICEF (2003) reports infant mortality figures of 30.9 for 1992, compared to 17.3 per 1000 live births that year in Poland. Adult mortality figures were, however, more similar to those prevailing in richer European countries, despite the lack of availability of many medicines and technology (Gjonça, Wilson, and Falkingham (1997), Gjonça (2001)).

Despite the collapse of country-wide pyramid investment schemes in 1997, and the Kosovo crisis of March-June 1999, the growth rates recorded in Albania for the 1990s were amongst the highest of all the former communist countries of Eastern Europe. The pyramid scheme was a result of informal deposit-taking institutions promising unreasonably high returns on investments. The Albanian population had had little prior experience of the financial sector. The collapse of these schemes brought many families close to destitution and the country close to civil war (see, for example, Shelley (1998), Korovilas (1999), and Jarvis (2000)). Partly driven by this economic collapse, about one fifth of Albanian-born individuals now reside outside the country (La Cava and Nanetti (2000), Zezza, Carletto, and Davis (2005)). A majority of these migrants are male, and so sex ratios amongst the adult population are relatively feminised. A post-communist revival of the ancient community justice system *Kanun* may be related both to this outmigration and to weakness of state institutions in rural areas (Gruber and Pichler (2002)).

A.2 Migration:

Migration has been a very important component of Albania's post-communist economic transformation. This may be of importance to the relative valuation of boys versus girls (Lerch (2014)). Carletto, Davis, Stampini, Trento, and Zezza (2004) compare data from the 1989 and 2001 population censuses, and find widespread migration from rural to urban areas and from smaller cities to Tirana. Carletto et al. find that, during the 1989-

2001 period the rural population fell by 13% while the urban population increased by 14%. External migration, which spiked during the period of the collapse of communism in 1990, and during the Pyramid Crisis of 1997, was estimated at 600 000 persons in the 1989-2001 period (see Albanian Institute of Statistics (2002)).

In the 2002 Albanian LSMS, income from remittances of family members amounts to an average of 14% of the total disposable income of families. Migration prospects may also have large implications for the potential of sex ratios to self-correct in response to scarcity, especially since a large majority of migrants are male. Male migrants have relatively good earnings prospects compared to their sisters. Since young, single males may search for partners outside of Albania, it is relatively unlikely that income inequality or dowry concerns within Albania are the main mechanism driving the relatively high value of boys. However, as in India, dowry remains an important transaction (see, for example, Hughes (1978), Kostovicova and Prestreshi (2003), Kera and Pandelejmoni (2008)).

Large populations of ethnic Albanians have long resided in both Kosovo and Macedonia. Since the collapse of communism, many more Albanian nationals have migrated to Italy and Greece. In the 2008-2009 DHS, 97% of respondents consider themselves to be ethnic Albanians, with others identifying themselves as Greek, Macedonian, Montenegrin, or Roma. However, religious beliefs are distinct from ethnic identity.

A.3 Regional fertility by sex of firstborn

Son preference persisted in many communist countries despite the lack of property rights, the socialisation of caring roles, the existence of old-age pensions, and large increases in the economic roles of women (see, for example, Kaser (2014)). In China, the one-child policy and limited opportunities for women to earn a living outside of agriculture are strongly associated with the dearth of girls (see, for example Chen, Xie, and Liu (2007), Das Gupta, Jiang, Bohua, Zhenming, Chung, and Hwa-Ok (2003) and Ebenstein and Leung (2010)). In Vietnam, the under-5 sex ratio is closely related to both traditional household formation rules within ethnicities and to the specific geographical conditions in which these ethnicities have traditionally resided (Grogan (2018)). Despite the collectivisation of agriculture in the 1960s, property in Albania is again transferred patrilinealy, as in much of the Balkans (Kaser (1996), Halpern, Kaser, and Wagner (1996), Kaser (2002)).

Post-communist countries generally rank high on the patrilocality index. These coun-

tries also had relatively high compulsory schooling requirements under communism (typically 10 or 11 years). Women's employment was encouraged by policy. However, in the most patrilocal post-communist countries, female labor force participation rates are now very low. The simple correlation between the patrilocality index and the employment rates of women 15 to 49 is -0.57 amongst the post-communist countries of the sample.

Older cohorts of women in several post-communist countries have fertility patterns which suggest continued strong preferences for sons. Differences in completed fertility by the sex of the firstborn cannot be interpreted as causal in contexts where sex ratios are disturbed amongst firstborns. Still, results are suggestive of the extent to which communism did not eliminate son preference.

The almost-completed fertility of women aged 40-49 differs substantially by the sex of the firstborn child in Albania, and in many post-communist and neighbouring South Asian countries for which DHS surveys have been undertaken. These comprise: Armenia, Azerbaijan, Albania, Moldova, Ukraine, India, Pakistan, Bangladesh, Turkey and Nepal. Mean numbers of children born, by the sex of the firstborn are presented in Table 11. The sex ratios amongst firstborn children are also shown. Amongst all post-communist and South Asian countries for which data are available, the difference in mean numbers of children born is greatest in Albania, at 0.38 (column (1) of Panel A). Albanian women aged 40-49 had 0.38 more children on average, if their firstborn was female. The sex ratio of first births was not statistically different from the biological norm for Albanian women in this cohort.

This is the case after nearly 50 years of communism. More industrialised countries of the former Communist block, including Ukraine and Moldova, have much higher rates of women's employment and much lower rates of patrilocality. As well, the incidence of matrilocality (married women residing in their natal households) is higher than that of patrilocality. The patrilocality index helps illustrate the idea that Albania is a relative outlier in the extent of patrilocality.

The apparent preference for sons amongst older Albanian women is shared with women in Armenia and Azerbaijan, other post-communist countries with very high levels of patrilocal co-residence (columns (2) and (3) of Panel A). As well, in Moldova and Ukraine, post-communist countries where there are no apparent differences in fertility by the sex of the firstborn, matrilocal post-marital residence is relatively common (columns (4) and (5) of Panel A). In Moldova, as many married women under 30 reside with their natal

families as with their fathers-in-law. In Ukraine, 24% of married women under 30 reside with their natal families, versus 19% with their in-laws. Sex ratios of firstborns are not biologically normal across all countries included in Table 11.

Results for Turkey and the South Asian countries for which DHS survey data are available also suggest that fertility stopping rules differ by the sex of the firstborn. Panel B of Table 11 illustrates. With the exception of Nepal, where fertility differences are not statistically significant at the 10% level, this oldest cohort of DHS respondents had fewer children when the sex of the firstborn was male. These countries also have very high fractions of married women under 30 residing with in-laws. Together the results of Tables 1 and 11 suggest that old-age security motives for bearing sons are at least as prevalent in Albania and Turkey, both former components of the Ottoman empire, as in South Asian countries without a recent communist past. Albania gained independence from the Ottoman empire in 1912.

A.4 Masculinisation of sex ratios

Researchers have known that masculinised child sex ratios might have large demographic and economic impacts since the mid-1970's (see, for example, Mason and Bennett (1977)). Angrist (2002) shows that high male-female sex ratios have large positive effects on the probability of female marriage, and substantial negative effects on female labour force participation. If girls become so scarce that potential parents perceive female marriage market prospects to be good, the fraction of parents for whom sex-selective abortion of females were optimal would be expected to decline over time, as in Edlund (1999). This model predicts that, with sex-selection technology, women would increasingly be born into poor households. Their bargaining power relative to prospective husbands would fall. Li and Pantano (2014) construct a dynamic programming model of fertility and show that, for the US, birth masculinisation may increase fertility. The explanation is that people who would not have had another child under uncertainty about the sex and preference for variety, will now be willing to do so. In India, widening income inequality within castes, dowries, property rights, and the suitability of land for plough agriculture, is also consistently associated with sex-selective abortion (see, for example, Mutharayappa (1997), Sudha and Rajan (1999), Pande and Astone (2007), Echávarri and Ezcurra (2010) and Rosenblum (2014)).

The masculinisation of higher order, but not first births, is evident in the DHS. In these data, more than 86% of women with at least one child had a subsequent child by the time of the DHS interview. Ratios of males to females under age 5 are presented in Table 12, for each birth order and by educational attainment of the mother. Panel A shows that these ratios are not statistically different from the biological norm for first births. Panels B through D of Table show sex ratios of higher order births. Under each sex ratio, the absolute t-value of a test of the equality of the fraction of males with the biological norm (105 males to 100 males) is reported.

In neither education group are second births more masculinised than the biological norm. Third births are significantly masculinised for less educated women, but not for those with more education. Fourth births are much more masculinised amongst women with at least nine years of schooling. This pattern of masculinisation is consistent with less educated women being more incentivized to access SIT at lower parities.

A.5 Robustness of violence and say results (not intended for publication).

Robustness tests for each of the violence outcomes are presented in Table 9. For each of the five outcomes defined in the DHS, two specifications are presented. The first includes controls for region, rural and a full set of interactions with the sex of the firstborn. The second controls, additionally for total number of children born and the interaction of this variable with the sex of the firstborn. Total children born is considerably reduced by having a male firstborn. This second specification allows investigation of whether or not the fertility reduction is the channel through which the observed violence effects occur. The results do not indicate this to be the case: Coefficients of the interaction term between age 40 plus and male firstborn are hardly altered with the addition of fertility variable and interaction.

Table 9: Women's views of the conditions under which the beating of a wife by the husband is justified. Robustness tests.

	Goes out without permission		**Argues with husband**		**Refuses sex**		**Neglects children**		**Burns food**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: < than 9 years of schooling										
first born a boy	0.1445*	0.0123	-0.0433	-0.0278	0.0001	0.0140	0.0129	-0.0444	0.0676	0.0073
	(0.076)	(0.069)	(0.041)	(0.046)	(0.060)	(0.042)	(0.075)	(0.053)	(0.047)	(0.028)
30≤ age <40	0.0028	-0.0394	-0.0411	-0.0628	-0.0152	-0.0326	-0.0546	-0.0862	-0.0106	-0.0187
	(0.038)	(0.038)	(0.034)	(0.038)	(0.028)	(0.025)	(0.049)	(0.051)	(0.022)	(0.021)
age≥40	-0.0459	-0.1133***	-0.0543**	-0.0944**	-0.0350	-0.0672**	-0.0599*	-0.1109**	-0.0137	-0.0283
	(0.038)	(0.038)	(0.025)	(0.036)	(0.030)	(0.030)	(0.035)	(0.048)	(0.019)	(0.021)
30≤ age <40*(male firstborn)	0.0198	0.0419	0.0742	0.0887*	0.0270	0.0421	0.1397**	0.1623**	0.0120	0.0146
	(0.057)	(0.054)	(0.048)	(0.048)	(0.042)	(0.038)	(0.056)	(0.061)	(0.028)	(0.028)
age≥40*(male firstborn)	0.0747	0.1084*	0.0868**	0.1142**	0.0517	0.0804*	0.0959	0.1313*	0.0116	0.0174
	(0.055)	(0.060)	(0.040)	(0.048)	(0.040)	(0.041)	(0.058)	(0.074)	(0.022)	(0.028)
R^2	0.012	0.029	0.015	0.030	0.009	0.019	0.010	0.016	0.015	0.025
No. obs.	2578	2578	2578	2578	2578	2578	2578	2578	2578	2578
Dep var mean	0.2974		0.1941		0.1504		0.3261		0.0717	
	(0.009)		(0.008)		(0.007)		(0.009)		(0.005)	
Panel B: ≥ 9 years of schooling										
first born a boy	0.0382	-0.1014*	0.0650	0.0599	0.1010***	0.0294	0.0855	-0.0223	0.0211	0.0182
	(0.053)	(0.052)	(0.039)	(0.037)	(0.028)	(0.024)	(0.061)	(0.054)	(0.029)	(0.021)
30≤ age <40	-0.0141	-0.0764	0.0614*	0.0170	0.0473**	0.0230	0.0501	0.0140	0.0089	-0.0017
	(0.043)	(0.045)	(0.030)	(0.027)	(0.017)	(0.016)	(0.039)	(0.039)	(0.020)	(0.019)
age≥40	-0.0234	-0.1020**	0.0339	-0.0235	0.0312**	0.0024	-0.0025	-0.0478	-0.0043	-0.0158
	(0.044)	(0.045)	(0.032)	(0.030)	(0.013)	(0.014)	(0.033)	(0.034)	(0.019)	(0.017)
30≤ age <40*(male firstborn)	0.0670	0.0901*	-0.0614*	-0.0258	-0.0551**	-0.0409	-0.0291	-0.0220	-0.0183	-0.0060
	(0.053)	(0.052)	(0.035)	(0.034)	(0.021)	(0.027)	(0.060)	(0.065)	(0.025)	(0.025)
age≥40*(male firstborn)	0.1098**	0.1415***	-0.0279	0.0198	0.0030	0.0187	0.0434	0.0540	-0.0024	0.0125
	(0.051)	(0.049)	(0.039)	(0.037)	(0.016)	(0.020)	(0.052)	(0.059)	(0.024)	(0.023)
R^2	0.016	0.063	0.011	0.036	0.015	0.029	0.012	0.028	0.004	0.018
No. obs.	2239	2239	2239	2239	2239	2239	2239	2239	2239	2239
Dep var mean	0.1116		0.0620		0.0436		0.1402		0.0151	
	(0.007)		(0.005)		(0.004)		(0.007)		(0.003)	
Other controls:										
total kids born + interacs	no	yes	no	yes	no	yes	no	yes	no	yes

Estimation is by OLS. All estimation controls for region, rural and a full set of interactions with the male firstborn dummy. *** significant at 1% level, ** significant at 5% level, * significant at 10% level. employed. Standard errors are clustered at the household level. Data is from the DHS 2009 survey. All women with at least one child are included in estimation.

The results of the robustness exercise for say in household decisionmaking mirror those for violence outcomes. Results for specifications with only controls for region, rural-urban and a full set of interactions with the male firstborn dummy are first presented. Then the robustness of this specification to the inclusion of controls for total children born and the interaction with the firstborn male dummy are included. These results concur with those of the main analysis in finding no robust positive impact of bearing a male firstborn on women's say in household decisionmaking after age forty.

Table 10: The sex of firstborn children and women's say in household decisionmaking. Robustness tests.

	Own healthcare		**Large household purchases**		**Household purchases for daily needs**		**Visits to family or relatives**		**What to do with money**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: < than 9 years of schooling										
first born a boy	0.0578	0.0225	0.1120	-0.0317	0.0230	0.0135	-0.0132	0.0227	-0.0043	0.0197
	(0.063)	(0.046)	(0.076)	(0.062)	(0.074)	(0.049)	(0.053)	(0.059)	(0.059)	(0.039)
30≤ age <40	0.0190	0.0487	0.1441***	0.1668***	0.1762***	0.1842***	0.1392***	0.1835***	0.0719	0.1058*
	(0.036)	(0.037)	(0.048)	(0.055)	(0.034)	(0.040)	(0.040)	(0.044)	(0.048)	(0.052)
age≥40	0.0543	0.0987**	0.1660***	0.2049***	0.2265***	0.2434***	0.1601***	0.2315***	0.1542***	0.2076***
	(0.041)	(0.044)	(0.055)	(0.066)	(0.044)	(0.051)	(0.056)	(0.057)	(0.048)	(0.055)
30≤ age <40*(male firstborn)	-0.0569	-0.0808*	-0.0212	-0.0483	-0.0114	-0.0139	-0.1132*	-0.1484**	-0.0405	-0.0633
	(0.041)	(0.043)	(0.066)	(0.071)	(0.040)	(0.044)	(0.058)	(0.062)	(0.057)	(0.064)
age≥40*(male firstborn)	-0.0794	-0.1135**	-0.0391	-0.0845	-0.0427	-0.0494	-0.0939	-0.1485*	-0.0983	-0.1318*
	(0.046)	(0.053)	(0.072)	(0.084)	(0.060)	(0.067)	(0.076)	(0.075)	(0.060)	(0.067)
R^2	0.008	0.021	0.017	0.021	0.041	0.043	0.016	0.030	0.009	0.014
No. obs.	2578	2578	2578	2578	2578	2578	2578	2578	2578	2578
Dep var mean	0.7657		0.5711		0.7569		0.7131		0.5998	
	(0.008)		(0.010)		(0.008)		(0.009)		(0.010)	
Panel B: ≥ 9 years of schooling										
first born a boy	-0.0263	-0.0783	-0.0419	-0.0726	0.0133	-0.0048	-0.0662	-0.0493	0.0509	-0.0411
	(0.058)	(0.050)	(0.057)	(0.077)	(0.065)	(0.070)	(0.071)	(0.077)	(0.058)	(0.065)
30≤ age <40	0.0148	0.0130	0.0256	0.0454	0.1847***	0.1679***	0.0215	0.0303	0.0881*	0.1244***
	(0.041)	(0.040)	(0.060)	(0.062)	(0.059)	(0.058)	(0.050)	(0.046)	(0.044)	(0.042)
age≥40	-0.0056	-0.0156	0.0566	0.0810	0.1868***	0.1635***	0.0252	0.0294	0.0855*	0.1318***
	(0.038)	(0.042)	(0.063)	(0.067)	(0.051)	(0.056)	(0.044)	(0.045)	(0.045)	(0.038)
30≤ age <40*(male firstborn)	0.0363	0.0171	0.1301**	0.1084*	-0.0094	-0.0122	0.0491	0.0306	-0.0187	-0.0645
	(0.056)	(0.056)	(0.062)	(0.058)	(0.063)	(0.060)	(0.075)	(0.070)	(0.059)	(0.064)
age≥40*(male firstborn)	0.0347	0.0172	0.0393	0.0105	-0.0264	-0.0277	0.0280	0.0096	-0.0710	-0.1319**
	(0.052)	(0.057)	(0.066)	(0.070)	(0.069)	(0.072)	(0.081)	(0.078)	(0.057)	(0.059)
R^2	0.002	0.012	0.010	0.013	0.027	0.031	0.005	0.015	0.006	0.016
No. obs.	2239	2239	2239	2239	2239	2239	2239	2239	2239	2239
Dep var mean	0.8830		0.7593		0.8668		0.8605		0.7815	
	(0.007)		(0.009)		(0.007)		(0.007)		(0.009)	
Other controls:										
total children + interacs. [a]	no	yes	no	yes	no	yes	no	yes	no	yes

Estimation is by OLS. All estimation controls for region, rural and a full set of interactions with the male firstborn dummy.*** significant at 1% level,, ** significant at 5% level, * significant at 10% level. employed. Standard errors are clustered at the household level. There are 450 sampling clusters defined in the data. All women with at least one child are included in estimation.

Table 11: Total number of children born to women aged 40-49

Panel A: Post-Communist Countries					
	Albania 2008	**Armenia 2005**	**Azerbaijan 2006**	**Moldova 2005**	**Ukraine 2007**
First Born Boy	2.727	2.599	2.880	2.396	1.805
	(0.035)	(0.032)	(0.040)	(0.034)	(0.027)
First Born Girl	3.110	2.811	3.111	2.466	1.779
	(0.039)	(0.036)	(0.041)	(0.037)	(0.027)
Difference	-0.383	-0.212	-0.231	-0.070	0.026
P-value, |t|-test	0.000	0.000	0.000	0.165	0.500
First Born Boy	0.5080	0.5073	0.5200	0.5281	0.5416
Mean	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
P-value |t|-test	0.705	0.681	0.465	0.163	0.009
Panel B: Turkey and South Asian Countries					
	India 2005/06	**Pakistan 2006/07**	**Bangladesh 2007**	**Turkey 2003**	**Nepal 2006**
First Born Boy	3.982	6.174	4.623	3.617	5.126
	(0.020)	(0.074)	(0.039)	(0.062)	(0.070)
First Born Girl	4.303	6.405	4.779	3.842	5.012
	(0.021)	(0.080)	(0.038)	(0.063)	(0.074)
Difference	-0.321	-0.231	-0.156	-0.225	0.114
P-value, |t|-test	0.000	0.035	0.080	0.016	0.266
First Born Boy	0.5248	0.5403	0.5333	0.5187	0.5291
Mean	(0.003)	(0.010)	(0.011)	(0.011)	(0.011)
P-value |t|-test	0.000	0.005	0.004	0.521	0.866

Notes: Standard errors in parentheses. Sample weights employed. DHS samples from most recent survey undertaken in each country.

Table 12: Sex ratios by birth order in Albania, women aged 15-49

	By Education	
	$<$ 9 yrs school	$\geq$9 yrs school
	(1)	(2)
Firstborn is male		
	0.5018	0.5118
	(0.012)	(0.014)
|t|stat	0.87	0.03
Second-born is male		
	0.5134	0.4764
	(0.013)	(0.015)
|t|stat	0.013	2.39
Third-born is male		
	0.5485	0.5254
	(0.016)	(0.024)
|t|stat	2.27	0.55
Fourth-born is male		
	0.5141	0.6406
	(0.024)	(0.044)
|t|stat	0.075	2.92

Sample means. DHS 2009. Sample weights employed. Robust standard errors in parentheses.

Data Appendix B: Women's Status Questions Posed in the 2009 Albania DHS (not intended for publication)

There are five subjective questions posed about the say of women in household decision-making. Questions are posed about who in the household has final say in the following decision types:
i.) Own health care.
ii.) Large household purchases
iii.) Smaller, day to day purchases
iv.) Visits to family, relatives
v.) What is cooked each day.

For each of these decisions, potential responses are:
1. Respondent alone.
2. Respondent and husband/partner.
3. Respondent and other person.
4. Husband/partner alone.
5. Someone else.
6. Other.

Responses to all five questions are included in the analysis. Women are considered to have some say in each household decision if DHS codes of their answers take the values 1, 2, or 3.

Questions are posed about whether or not a husband's beating of his wife can be justified in five cases:

i.) If she goes out without telling him.
ii.) If she argues with him.
iii.) If she refuses sex with him.
iv.) If she neglects the children.
v.) If she burns the food.

For each of these hypothetical situations, potential responses are:
1. No.
2. Yes.
3. Don't know.

Responses to all five questions are included in the analysis. Women are considered to agree that beating is justified if their response is coded as 1 by DHS interviewers. Direct question about personal experiences of spousal violence are not posed to respondents of the Albania 2009 DHS survey.