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ISLAMIC LAW AND INVESTMENTS IN CHILDREN: EVIDENCE FROM THE SHARIA INTRODUCTION IN NIGERIA

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Islamic Law and Investments in Children: Evidence from the Sharia Introduction in Nigeria

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Abstract

Islamic law lays down detailed rules regulating children's upbringing. This study examines the effect of such rules on investments in children by analysing the introduction of Sharia law in northern Nigeria. Difference-in-differences and triple-differences estimates across time, administrative areas and religions show increases in the duration of breastfeeding and child survival. Geospatial discontinuities further show effects for Muslims but not Christians living close to the border. Evidence also shows that these effects concur with a rise in women's birth rates. Moreover, findings suggest increases in gender gaps; young boys benefit more than girls and adult women's intra-household bargaining power decreases.

JEL Classifications: O15, J12, J13
Keywords: Breastfeeding, Infant Survival, Islam, Nigeria

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1 Introduction

Sharia law, Islam's legal system, is applied to varying degrees in around 40 countries. Economists acknowledge that religious rules or customs can influence individual or collective behaviour significantly (Iannaccone, 1998; Iyer, 2016). Empirical evidence further points to strong relationships between religion and outcomes related to children such as fertility (Iyer, 2002; Norris and Inglehart, 2004) or health (Bhalotra et al., 2010) in particular. Yet, there is little evidence on the causal impact of religious law on parental decisions.

This study estimates the effect of Islamic law on investments in children by exploiting a natural experiment. In 2000, the 12 northern states of Nigeria introduced Sharia law (Sharia states) for their Muslim citizens; the other 24 states maintained secular legislation (non-Sharia states) - see figure 1a. Sharia law contains very precise provisions codifying the safeguarding of children. Parents found to have violated these *child protection* laws are subject to strict penalties, such as large fines, prison sentences or corporal punishment. I focus on these rules and estimate their effect on two indicators for investments in children: the duration of breastfeeding and child survival. In the second part of the paper, I investigate the effect of Sharia on family welfare more broadly. The Nigerian setting has various unique features, which help to identify the causal effect of Islamic laws. The sudden introduction of Sharia for Muslims provides unique temporal, geographical and religious variation in laws that in many other settings stay in place for a long time. Moreover, the application of Islamic law among treatment states varies with the precise wording of child protection legislation as well as by exposure to Islamic police. Finally, state borders provide discontinuities in the application of Sharia in space and time (figure 1b).

I use a triple-differences framework that compares—over time—Muslims in Sharia states (the treated) to Muslims in non-Sharia states and then juxtaposes these differences with changes for Christians across the same regions. Estimates from the 2003 Nigerian Demographic Health Survey (DHS) show that, for Muslims, the duration of breastfeeding increases by around 1.8 months (around 15% of the pre-treatment average). The estimates also indicate a decrease of around 8 percentage points in the likelihood that a child dies within the first year of life (around 50% of the pre-treatment average). I reject the hypothesis that the estimates are the same as for the Christian sample, for which I find no effects. I also use detailed information on children's birthdate and examine the exact timing of behavioural changes in an event study framework. For Muslim children, the event study estimates show remarkably parallel trends in the years before the Sharia. Outcomes change *only* after the introduction of the Sharia. By contrast, the behaviour of Christians does not change. Moreover, evidence from law reports shows that effects on breastfeeding and child survival

concur with a marked increase in law enforcement and judgements regarding children thus suggesting that changes in behaviour are caused by changes in laws.[1]

To address the concern that the triple-differences estimates are confounded by social, political or religious changes occurring in Sharia states, I exploit variation in the application of Islamic law within the treatment states arising from two distinct factors. First, I analyse the precise wording of the laws introduced by each individual state to group the Sharia states into *high penalty* states, where child protection laws are precisely codified and penalties are strict, and *low penalty* states, where wordings are more lax and punishments considerably more moderate. The estimates show considerably larger effects in *high penalty* than in *low penalty* states. Second, enforcement of Sharia was the official and sole remit of hisbah officers, a newly created cadre with the explicit task of enforcing Islamic law. I approximate exposure to hisbah patrols—and thus effectiveness of law enforcement—by geographical proximity to law enforcement facilities. Before the Sharia, outcomes for individuals living in proximity to or at some distance from law enforcement facilities show parallel trends. Once the Sharia is introduced, however, changes are significantly stronger for children living within walking distance of law enforcement facilities. Using proximity to mosques as a placebo, I find no differences. The advantage of these specifications is that whilst all Muslims in Sharia states are likely to experience the same socio-political forces, their exposure to Islamic law varies.

An additional identification strategy focuses on the discontinuous change in the application of Islamic child protection laws, which occurs in space and in time at the border to *high penalty* states. Using their GPS coordinates and exact dates of birth I select children according to whether i) they live either side of the geographical border to *high penalty* states and ii) they are born around the time of the Sharia introduction. Comparisons over time for Muslim children show effects in line with the estimates for the whole country. The results are highly robust to different distances to the border, time intervals around the year 2000 and functional forms. By contrast, the same estimates using the Christian sample show no effects. Focusing on individuals living adjacent to the border and born just a few years apart allows me to compare the behaviour of individuals living in a similar environment, some of whom become exposed to Islamic law and others not. In Africa, the geographical environment has been argued to be an important determinant of, for instance, general culture and language (Murdock, 1959), attitudes (Nunn et al., 2015) and economic performance (Michalopoulos and Papaioannou, 2014). Moreover, Afrobarometer data from the border region show that the Sharia's introduction did not change two proxies for exposure to Islamic values, which may confound the estimates: mosque membership and self-identification with Islam.

[1] I use four measures: the number of incarcerations, the number of court adjournments and the quantity of court judgements regarding abandoned children and judgements regarding the defilement of minors.

After presenting the main estimates, I address three identification concerns: i) incidences of social pressures or civil unrest, ii) state-specific, secular policies, and iii) migration flows.

Since Sharia regulates many different aspects of Muslim life, I examine its effect on two aspects of family welfare. First, I investigate the interplay between breastfeeding and fertility choices. Aside from child protection laws, the Sharia contains broader provisions, which are likely to promote large families. Accordingly, I find significant increases in the yearly probability of a woman giving birth. Whilst effects are strongest for childless individuals, I also find an increase for women breastfeeding at the time of the Sharia, albeit much smaller in size. This last finding stands in contrast with studies highlighting the negative relationship between breastfeeding and fertility (Jayachandran and Kuziemko, 2011). I investigate this apparent contradiction by estimating the effect of Sharia on birth intervals. For women giving birth after weaning children off the breast, I find an increase of around 2 months, corresponding roughly to the effect of Sharia on breastfeeding. Taken together, these findings suggest that women breastfeeding at the time of the Sharia increase the duration of breastfeeding and subsequently attempt to conceive another child almost immediately.

I also examine whether the introduction of Sharia changed gender differences in welfare and find that it widened gender gaps in breastfeeding and child survival. Effects of Sharia are strongest for boys, whereas changes for girls are much less pronounced. Moreover, when considering adult women, I find that Sharia decreased various measures for the bargaining power of women relative to men, such as, for instance, age at marriage and self-reported control over finances. Moreover, Sharia increased home work for women thus potentially also increasing time spent with children.

These results aim to further our understanding of how exposure to religious laws affects parental decisions. Research increasingly indicates that religion interrelates with socioeconomic outcomes such as economic productivity (Andersen et al., 2017), happiness and economic growth (Campante and Yanagizawa-Drott, 2015), insurance (Dehejia et al., 2007), women's rights (Meyersson, 2014), attitudes (Clingingsmith et al., 2009; Guiso et al., 2003), public goods (Berman and Laitin, 2008) and coping mechanisms (Binzel and Carvalho, forthcoming). This paper complements these studies by highlighting a hitherto scarcely documented determinant of child welfare for the world's fastest growing religion.[2] In fact, in a recent overview article Iyer (2016) highlights the links between religion and demography as being an under-researched topic by economists. Moreover, the role of child protection legislations highlighted in this paper speaks to the growing knowledge base on the protection of children (see Doyle and Aizer, 2018; for a review). By linking Islamic laws to child outcomes, this analysis also relates to studies documenting the social (La Ferrara et al., 2012; Bassi and

[2]For estimates, see Pew Research Center, 2011.

Rasul, 2014) and historical (Dell, 2010) influences on reproductive behaviour and children's outcomes. The analysis is also relevant to studies pertaining to the trade-off between child quantity and quality (Black et al., 2005; Qian, 2009; Jensen, 2012).

The next section outlines the introduction of the Sharia in Nigeria and presents the data. Section 3 lays out the empirical strategy; the results are presented in section 4. Section 5 discusses identification issues. Section 6 provides evidence on Sharia's effect on family welfare and section 7 concludes.

2 Background and Data

2.1 The introduction and enforcement of Sharia law in Nigeria

To introduce Sharia law, the 12 northern states (Sharia states) implemented Islamic *criminal* law, which contains detailed *child protection* legislations. As a result of this policy, children's rights in Sharia states were protected by secular law before 2000 and by Islamic criminal law thereafter. The remaining states (non-Sharia states) experienced no change, figure 1a.

2.1.1 The introduction of the Sharia in northern Nigeria

In 1999, Nigeria established its fourth republic, which granted considerable autonomy to each of its 36 states. In 2000, 12 states[3] introduced Islamic *criminal* law by enacting Sharia Penal Code (SPC) (Ostien, 2011b). The SPC is based on the Maliki school, which is also the foundation of Sharia laws in many other countries in North and Western Africa. Sharia criminal law covers a variety of aspects such as, for instance, homicide, breach of trust, criminal intimidation or forgery. In line with the Nigerian constitution, Sharia law applied to Muslims only and Christians were exempt.[4] A comprehensive analysis by Oxford University shows that many concerns regarding the creation of an Islamic state or the application of harsh punishments remain largely unfounded.[5] In the majority of cases, Sharia law was not forced upon Christians, states remained secular, the Sharia courts worked to the satisfaction of the general population and harsh punishments were almost never carried out.[6]

The Sharia introduction was a top down political process, which started in Zamfara state, in the very northwest of the country, by its governor Ahmed Sani. On October 27^{th}, 1999,

[3]The states adopting the Sharia are Bauchi, Borno, Gombe, Jigawa, Kaduna, Kano, Katsina, Kebbi, Niger, Sokoto, Yobe and Zamfara state.

[4]The Sharia introducing states argued that because the Sharia only applied to Muslims, forbidding to implement it would violate Muslims' constitutionally protected religious freedom.

[5]See `https://www.qeh.ox.ac.uk/content/exploring-15-years-sharia-implementation-northern-nigeria`.

[6]Moreover, the federal government also retained monopoly over state security and police. The northern states must thus rely on the central police force.

Sani declared the adoption of Sharia laws for his state, Zamfara, which was adopted on 27^{th} of January, 2000. Sani encouraged other states with a Muslim majority to follow suit and within a short time, the 11 other northern states did so. Overall, the Sharia introduction was driven predominantly by state governors or state assemblies (see Boer, 2007).[7]

Evidence based on news reports and public prints in panel a of figure 2 shows that the number of Islamic judgements—including judgements related to family matters—increased considerably after 2000 (Weimann, 2007; 2010).[8] Since not all Islamic criminal cases were reported by news outlets or NGOs, the real number of cases is likely to be substantially higher (see section 4.3 for more details). Moreover, data collected by Ostien (2011b) shows a marked increase in the number of judges from 1992 to 2008 in Sharia states (see figure 2b).[9]

The only Islamic regulations applied in northern Nigeria before 2000 were Islamic family law. Nevertheless, these provisions had no effect on young children's rights for two reasons. First and most importantly, child protection legislation in the Sharia falls under *criminal* law and not family legislation. Family law as practiced in northern Nigeria pre-2000 essentially focused only on marriage, divorce and inheritance. Before 2000, no Islamic criminal law was implemented anywhere in Nigeria whatsoever (Ostien, 2007). Second, before 2000 Islamic family law judgements were not final and could be overturned by secular courts. Secular judgements, by contrast, could not be changed by religious courts (Ostien, 2007).

2.1.2 Laws regarding the family and children - before and after 2000

Reports by the Oxford Department for International Development suggests that Sharia law delivered efficient access to justice.[10] Women were the major beneficiaries with over 70 percent of complaints heard by courts made by women, the vast majority regarding issues related to children and marriage. The fast, non-technical workings of Sharia courts were very popular with high satisfaction ratings by women between 52 to 89 percent (Tabiu and Bello, 2016).

Secular laws protecting children: Secular laws were in force in Sharia states before 2000 and were applied in non-Sharia states throughout. According to this set of rules, parents would lose custody if they abandoned or neglected their children (see Uzodike, 1990; for more details). For instance, in Williams v Williams the court decided that the care of

[7]For instance, in Bauchi the Sharia bill was read by the House of Assembly for approval (see Boer, 2007).

[8]The author uses sources such as articles from print media, mainly from Nigeria but also from international sources. Other sources include the United Nations Integrated Regional Information Networks and reports from NGOs working in the region, e.g. BAOBAB for Women's Human Rights and Human Rights Watch.

[9]Unfortunately, the only two years for which data are available are 1992 and 2008.

[10]Available under `https://www.qeh.ox.ac.uk/content/exploring-15-years-sharia-implementation-northern-nig` accessed February 2020

the mother was superior to the one of the father. However, no party was punished. Instead, custody was transferred to the mother.[11] If the neglect results in harm, parents are liable to 1 year of imprisonment. In fact, NGO reports suggest that before the introduction of the Sharia national policies had no significant impact on families and children.[12]

Islamic laws protecting children: The Sharia Penal Code introduced in Sharia states in 2000 classifies neglect of and misbehaviour towards children as *qisa* or related offences. This implies that retaliation is a permissible form of punishment (see Ostien, 2011b). Laws protecting the welfare of children can roughly be grouped into three categories: abandonment, neglect and harm of young children (see appendix A for a schematic outline).

Child abandonment is defined as exposing a child under the age of 15 or leaving her in a place with the intention of abandoning her. Any parent found guilty of abandoning a child is liable to be incarcerated for a term of up to three years and to up to 40 lashes.

Children below the age of 15, have the right to be looked after, protected, fed and clothed.[13] The punishment for neglecting children consists of imprisonment of up to one year, a fine or both. If the neglect of parents causes the health of the child to suffer, the punishment increases to up to five years imprisonment and a payment of diya (of value 100 camels, 1,000 gold dinars).[14] Sons and daughters should be treated equally.[15]

The SPC also codifies obligations of children towards their parents. After reaching adulthood, when parents are unable to sustain themselves, children are required to maintain their parents. Offenders are liable to up to two years imprisonment and caning of up to 50 lashes.[16]

2.2 Data, Sample and Measurements

This study employs data drawn from the 2003 round of the Demographic Health Survey (DHS) for Nigeria, a nationally representative survey of Nigerian households. Panel a of appendix B shows the location of the clusters. The DHS is part of the Demographic and Health Surveys series and collects extensive information on health, nutrition and complete birth histories of interviewed women. The 2003 DHS interviewed 7,620 women aged 15-49.[17]

[11] See Theresa Temitayo Williams v Rasheed Ahmet Williams SC 171/1985 in All Nigeria Law Reports, 1987. The Nigerian law firm Yusuf Ali & Co provides more examples.

[12] see `http://www.crin.org/en/docs/resources/treaties/crc.13/Nigeria_CWL_NGO_Report.pdf`.

[13] *Whoever having the charge or care of a child under the age of fifteen years or being in a position of authority over him wilfully ill-treats or neglects him in such a way as to cause him unnecessary suffering, or denies him access to education shall be punished*, Ostien 2011b.

[14] Or or 12,000 silver dirhams (Ostien 2011b).

[15] Whenever a child was born among them, Aisha would not ask if it were a boy or a girl. Instead she would ask, "Is the child healthy (and without defect)?" If she was told, "Yes," she would say, All praise is for Allah, Lord of All the Worlds (Narrated by Aisha from Saheeh Al-Bukhari).

[16] These are the same offences as the *idle person* offences outlined above, (Ostien, 2011b).

[17] The data are publicly available at `measuredhs.com`.

Panel A of table 1 reports the summary statistics. Around half of interviewed women, 47 percent, are Muslim, 61 percent of women have completed primary education and the average number of children at the time of the survey is 2.6.

For the whole of Nigeria (column 1), the average duration of breastfeeding for children born before the introduction of the Sharia is 16.4 months. This number is lower than for the median of Sub-Saharan countries covered by the DHS, 20.7 months. In the sample 13.5% of children die within the first year.[18] The descriptive evidence in columns 2 and 3 of table 1 also suggests considerable differences between states that introduced the Sharia and states that did not. On average, women in Sharia states are predominantly Muslim, poorer, show lower educational attainment and higher fertility. Child survival is also lower in the north. Women in Sharia states breastfeed for longer, on average, than in the south: 17.2 months compared to 15.6. *High* and *low* penalty states appear more similar (columns 4 and 5).

3 Estimation framework

This paper establishes a causal effect of Sharia law on two dependent variables i) the number of months a child is breastfed for and ii) a dummy for whether a child died in the first year of life. I start by estimating various difference-in-differences specifications, which compare outcomes over time, states and religions. Thereafter, I exploit variation in the application of Islamic laws within the 12 Sharia states arising from two factors: state-specific child protection laws and exposure to Islamic law enforcement officers. Finally, I use the discontinuous change in legislations, which occurs in space and in time at state borders.

3.1 Difference-in-differences and triple-differences estimators

Difference-in-differences using three control groups: The first model is a difference-in-differences specification, which compares—over time—Muslims in Sharia states (i.e. the treatment group) to individuals living in non-Sharia states. I estimate the following model

$$y_{ist} = \gamma_s sharia_s \times post_t + X_{ist}\beta_{dd} + \phi_s + \tau_t + \epsilon_{ist} \tag{1}$$

where y_{ist} denotes outcome y for individual i in year t in state s, $sharia_s = 1$ if individual i resides in a state that introduced the Sharia and $post_t = 1$ if individual i was born at a time, which exposes him or her to the Sharia (depending on the outcome, typically from

[18] This is often referred to as *infant mortality*.

1999 onwards). Furthermore, X_{ist} consists of time-varying covariates for the individual[19]; ϕ_s and τ_t are state and year specific unobservable characteristics (so called state or year fixed effects). Since they were exempt, I drop Christians in Sharia states. The reference group in this specification consists of all individuals in non-Sharia states.

By comparing individuals living in two different areas of the country over time, the specification in equation 1 differences out time-invariant differences between Muslims in Sharia states and individuals in non-Sharia states. However, if there are any time-varying differences between Muslims and Christians, the coefficient γ_s would attribute these to the introduction of the Sharia. To address this possibility, I re-estimate equation 1 using a second control group: Muslims in non-Sharia states.

The third specification compares Muslims and Christians living in Sharia states over time. For this, I estimate a specification similar to equation 1 with an interaction between the post dummy and an indicator variable taking the value 1 if child i is Muslim ($muslim_i \times post_t$). I estimate this specification for individuals residing in states that introduced the Sharia only; the reference group consists of Christians living in Sharia states.

By comparing the behaviour of Muslims and Christians in Sharia states over time, the third specification differences out time-invariant differences between individuals belonging to these two religions in Sharia states. This specification, thus, addresses many concerns regarding unobserved factors in Sharia states. Nevertheless, there are reasons to believe that Christians living in Sharia states did not remain unaffected by the changes in 2000 and are thus not a good control group. The introduction of the Sharia, for instance, was accompanied by worsening inter-religious relations as well as by an increased number of clashes between Muslims and Christians.[20]

Triple differences estimator: To investigate whether Christians in Sharia states changed their behaviour as a response to the Sharia introduction, I carry out a placebo check. For this, I re-estimate the difference-in-differences specification in equation 1 comparing Christians in Sharia and non-Sharia states. If religious tensions in Sharia states indeed led to behavioural changes for Christians, the magnitude of the estimated coefficient γ_s would be large and statistically significant. To test whether the coefficients are statistically different between the Christian and Muslim sub-samples, I pool all observations in a triple difference framework

[19]Covariates include education, rural dummy, mother's age, latitude and longitude and dummies for child's year of birth and gender.

[20]`https://www.pri.org/stories/2014-03-10/roots-nigerias-religious-and-ethnic-conflict`. Accessed May 2017.

and estimate the following equation

$$\begin{aligned} y_{ist} = \gamma_m muslim_i &+ \gamma_{sp} sharia_s \times post_t + \gamma_{mp} muslim_i \times post_t + \gamma_{sm} sharia_s \times muslim_i \\ &+ \gamma_{smp} sharia_s \times muslim_i \times post_t + X_{ist}\beta_{dd} + \phi_s + \tau_t + \epsilon_{ist} \end{aligned} \tag{2}$$

where $sharia_s \times muslim_i \times post_t$ is the triple interaction between individual i residing in a state that introduced the Sharia ($sharia_s$), him or her being muslim ($muslim_i$) and being born at a point in time that exposed her to the Sharia ($post_t$). The identifying assumption in the triple differences framework relies on the absence of time varying differences between individuals in Sharia and non-Sharia states, which affect Muslims and Christians differently.

Event study estimates: I investigate whether breastfeeding and infant mortality grow at different rates for Muslims in Sharia states—perhaps due to differences in preferences regarding children—by estimating a number of event studies. For this, I exploit the exact timing of the Sharia introduction and estimate whether changes in breastfeeding or child survival occurred at the same time as the policy change. Grouping children into 6 month birth cohorts I re-estimate equation 1 substituting the $post_t$ dummy with indicator variables for these cohorts. This model is estimated for Muslims and Christians separately. If the Sharia indeed affected investments in children, one would expect Muslims in Sharia states to change their behaviour (relative to Muslims in non-Sharia states) *only after* the Sharia has been introduced. Before the Sharia, by contrast, the time trends of both groups should be parallel. Outcomes for Christians, in turn, should remain unaffected. I also statistically test for parallel trends, by choosing children too old to be affected by the Sharia and interact the treatment dummy ($sharia_i$) with a linear time trend for the child's month of birth.

3.2 Heterogeneity in Islamic laws and Sharia's enforcement

The identifying assumption of the triple-differences framework in equation 2 is that—after accounting for unobservable state and time characteristics—there are no time varying factors between Sharia and non-Sharia states, which affect Muslims and Christians differently and which occur simultaneously with the Sharia introduction. This assumption would be violated, if, for instance, the Sharia introduction reflects the Islamisation of the northern states. If the northern states had already been shifting towards Islam, individuals could have used the increased freedom of expression granted by the fourth republic to adopt more overt Muslim practices. Alternatively, the Sharia could have increased the salience of Islam and its values, which could have altered individual preferences (Bassi and Rasul, 2014).

To address these concerns, I note that—for Muslims in Sharia states—the application of

Islamic laws varies by two factors. First, the exact wording of laws regarding children varies from one Sharia state to the next. Second, the effectiveness of law enforcement varies with the presence of hisba officers (civil servants specifically tasked with implementing Sharia). The advantage of these two specifications is that Muslims across Sharia states are likely to be subject to similar socio-political forces; their exposure to Islamic law, however, varies.

i) Exploiting inter-state heterogeneity in child protection laws: Whilst all 12 northern states introduced the Sharia, the exact wording of child protection policies varies considerably from one state to the next. Crucially, four states specify markedly laxer child protection laws. These states also codify significantly reduced penalties for parents found to have harmed their children.[21] For example, Kaduna decriminalised child abandonment. In Sokoto corporal punishment for this crime is abolished and the prison sentence decreased from three years to one. Jigawa and Kebbi, in turn, decreased penalties for the harming of children. Both states abolish the prohibitively high diyah and Jigawa also decreases the prison sentence from five to three years (see Ostien, 2011b). I define these 4 states as *low penalty* and the remaining 8 as *high penalty* states.

If factors such as the salience of Islam or pressures due to Islamisation were driving behaviour, one would expect effects in both high and low penalty to be of similar size. Any difference between the two sets of states, by contrast, is likely to be the result of differences in child protection laws. I test for this by estimating

$$y_{ist} = \gamma_h high_s \times post_t + \gamma_l low_s \times post_t + X_{ist}\beta_{dd} + \phi_s + \tau_t + \epsilon_{ist} \tag{3}$$

where $low_s = 1$ and $high_s = 1$ if individual i resides in low or high penalty states respectively. The control group consists of individuals in non-Sharia states and I drop Christians in Sharia states. In this estimation, γ_h and γ_l indicate differences between Muslims living in high and low penalty Sharia states on the one hand and the rest of the country on the other.

A possible concern is that high penalty states introduce stricter child protection laws because of underlying preferences, which also cause trends in child outcomes to diverge over time. I explore this possibility by testing for parallel trends between high and low penalty states and the rest of the country.

ii) Exposure to hisbah patrols: When the northern states introduced Sharia, they assigned responsibility of enforcing the newly established laws to hisbah officers (Ostien, 2007). This new cadre of civil servants was the first point of contact between citizens and the jus-

[21] These are Jigawa, Kaduna, Kebbi and Sokoto.

tice system and, as such, hisbah officers would work alongside and together with the federal police (Adamu, 2008). Hisbah officers patrol the streets and can be approached by anyone with a complaint (Mustapha and Mustapha, 2016). The issue would then be forwarded to the Sharia courts. Both legally and practically, hisbah officers are a key institution for implementing Sharia and a major determinant of the efficacy of law enforcement (Ostien, 2011a). Hisbah patrols were particularly important for safeguarding women's rights (Nazir, 2007). However, due to limited funds, the coverage of hisbah officers remained irregular.[22]

I approximate exposure to hisbah patrols—and thus effectiveness of law enforcement—by the geographical location of law enforcement facilities. For this, I digitised the geographic coordinates of hisbah stations, police sites and other law enforcement facilities in the 12 Sharia states.[23] See map in appendix B. Overlaying this with the GPS coordinates of survey respondents I then calculate the distance between interviewees and the closest law enforcement facility and compare behaviour at different distances.

To identify individuals with likely exposure to hisba patrols, I group individuals in Sharia states into two groups: individuals living within 30 minutes walk of the closest law enforcement facility ($close_i$=1) and individuals living further than 30 minutes walk (far_i=1).[24] Around a quarter of respondents live within 30 minutes walk from the closest law enforcement facility. The results are stable to using different cut-offs. I then compare the behaviour of these two groups over time to the rest of Nigeria by interacting the two aforementioned dummy variables with the $post_t$ indicator ($close_i \times post_t$ and $far_i \times post_t$) and a specification similar to the one outlined equation 3. Since they did not introduce child-protection laws, I drop low-penalty states from this estimation. I also test for the difference between these two interactions by using a triple-differences specification similar to equation 2.[25]

One concern with this approach is that proximity to law enforcement facilities may capture factors other than exposure to hisbah patrols, such as general rural/urban differences, for instance. I address this concern in three ways. First, I estimate this specification for urban areas only. Second, I carry out a placebo treatment distinguishing behaviour by the distance to the closest Islamic centre, typically a mosque or an Islamic social club, rather than the closest law enforcement facility. See map in appendix B.[26] If rural/urban differences

[22]Early fears that the hisbah would become a paramilitary organisation have remained widely unrealised (Mustapha and Mustapha, 2016).

[23]I combined data from the Geo-Referenced Infrastructure and Demographic Data for Development, GRID3, programme (available at `https://grid-nigeria.org`) with data from Oak Ridge Laboratory (available `nga.geopode.world`).

[24]I define 30 minutes walking as 2.75km, in line with most walking speeds reported around 3.4 miles per hour. The results are stable to different cut-offs.

[25]Since I do not have information on law enforcement facilities in non-Sharia states, this specification cannot control for the $close_i \times sharia_s$ interaction.

[26]To calculate the distance between each individual and the closest Mosque, I overlay the GPS coordinates

are confounding the estimates, one would expect the distance to Islamic centres to affect the estimates. Using proximity to Islamic centres has an additional advantage. If the Sharia affects behaviour by increasing the salience of Islam or by changing incentives to signal one's adherence to Islamic customs, rather than through its laws, its effect should be particularly strong for individuals living in close proximity to Islamic centres.

Third, I plot behaviour of individuals living less and more than 30 minutes walk from the closest law enforcement facility over time against individuals in non-Sharia states in an event study framework. If proximity to law enforcement facilities affects exposure to Islamic law, one would expect parallel trends for both groups before the Sharia's introduction. After its implementation, changes in behaviour should be more pronounced for individuals living closer to law enforcement facilities. Proximity to mosques, by contrast, should not matter.

3.3 Geospatial discontinuities in Islamic child protection laws

An additional identification strategy exploits the discontinuous change in exposure to Islamic child protection laws that occurs in both space and in time at the border between some Nigerian states. Individuals in *high penalty* states (dark grey in figure 1a) experience drastic changes in their exposure to child protection laws: from lay legislations before 2000 to strict Islamic criminal child protection laws thereafter. In adjacent states no such change occurs. In non-Sharia states (white in figure 1a), laws do not change at all. In *low penalty* states (light grey in figure 1a), Islamic laws are introduced but child protection legislation is much laxer than in *high penalty* states.

In this setting, I zoom in and select children according to two criteria: i) they live geographically close to the *high penalty* border (red in figure 1b) and ii) they are born in the years just before and after the Sharia introduction. By focusing on this specific sample, I can compare—over time—children born into a similar geographical environment within a relatively short time from one another. For this, I estimate the following specification

$$y_{ist} = \gamma_b high_s \times post_t + X_{ist}\beta_{dd} + f(location_i) + \sum_{\sigma=1}^{10} segment_\sigma + \phi_s + \tau_t + \epsilon_{ist} \qquad (4)$$

where $f(location_i)$ is a low-order polynomial for the geographical location of individual i. I report different specifications for $f(location_i)$. I partition the border separating *high penalty* from other states into 10 roughly equal segments and control for time-invariant, unobservable heterogeneity along these by including a dummy for each as $\sum_{\sigma=1}^{10} segment_\sigma$.

of DHS respondents with information on all Mosques in the northern states drawn from the Geo-Referenced Infrastructure and Demographic Data for Development (GRID3) programme.

Also, $high_s = 1$ if individual i resides in a state that introduced strict child protection laws (a *high penalty* state). The remaining variables are defined as above. This specification is similar to *differences-in-discontinuities* estimators employed recently (Grembi et al., 2016). Appendix E re-creates this estimator with a full set of interactions.

When estimating equation 4, I use different bandwidths for both space and for time. First, I use the GPS coordinates of respondents to identify children living at different distances from the border. Second, I use the birthdays of children to select individuals born at different intervals around the year of the Sharia introduction. Since *high penalty* states share boundaries with both *low penalty* and non-Sharia states (see figure 1a), I use two control groups: i) non-Sharia and *low penalty* states and ii) *low penalty* states only (see appendix B for a map of this border). As before, I focus on Muslims and use Christians as a placebo.

Focusing on children born close to each other in both space and time has a number of advantages. Individuals living in geographical proximity to one another are likely to exposed to similar social norms (Alesina et al., 2013), land rights (Fenske, 2013), diversity (Michalopoulos, 2012), disease environment (Alsan, 2015) and history (Nunn, 2008). Moreover, children born a few years apart are likely to be exposed to similar socio-economic and political forces. By comparing behaviour over time, the specification in equation 4 can difference out at least some of these confounding factors.

One such possible confounding factor is that the Sharia changed behaviour by increasing Islam's salience or by changing parental preferences. To test for this possibility, I select individuals living in states either side of the *high penalty* border and compare two proxies for exposure to Islam or preferences (mosque membership[27] and identification with Islam[28]) across the 1999 and 2003 rounds of the the Afrobarometer survey.[29] I use difference-in-differences specifications and find no significant effects; see Appendix C.

4 The Sharia's effect on breastfeeding and mortality

The results suggest that the Sharia introduction increased the duration of breastfeeding, decreased infant mortality and had a marked effect on judgements regarding children.

[27]The exact question is *Could you tell me whether you are an active member, inactive member or not a member of a church or mosque or religious organisation?*

[28]The exact question is *Besides being Nigerian, which group do you feel you belong to first and foremost?*

[29]Afrobarometer surveys are conducted in more than 30 African countries and collect information on attitudes towards social, religious, political and economic topics as well as on experiences of crime and violence. Surveys are available under `http://www.afrobarometer.org/`.

4.1 Breastfeeding estimates

The dependent variable is the duration a child is breastfed for, measured in months.[30] The DHS reports information on the duration of breastfeeding for children born in the 5 years prior to the interview. Due to censoring, I consider only children aged at least 20 months at time of interview (the results are robust to different cut-offs). The *post* dummy takes the value 1 if the child is born after June 1999 since children born before the Sharia are breastfed until after its introduction (again, the results are robust to different definitions of the *post* dummy). The resulting sample consists of 3,540 children born 1998 to 2001. I also estimate a duration analysis model where the *post* dummy takes the value 1 if the month-observation is after January 2000. The results are stable and available upon request. For Muslims in Sharia states, the mean in the pre-period is 17.2 months.

Difference-in-differences and triple-differences estimates: Columns 1 and 2 of panel A of table 2 compare Muslims in Sharia states to individuals in non-Sharia states. The point estimate is around 1.2 months, corresponding to 7 percent of the pre-treatment mean. Comparing Muslims to Christians in Sharia states (column 3) and to Muslims in non-Sharia states (column 4) renders very similar effects. The placebo treatment in column 5 that compares Christians in Sharia and non-Sharia states shows no effect. Column 6 combines the estimates of columns 4 and 5 in a triple differences specification and gives an increase of around 2 months.

Event study estimates: To investigate the exact timing of behavioural changes, I group children into 6 month birth cohorts and re-estimate equation 1 substituting $post_t$ with dummies for each of these cohorts. Since the 2003 DHS only collects information on children born 1998 and before, I add individuals interviewed under the 1999 DHS for the event study estimates. Panel A of figure 3 shows a parallel time trend for Muslims in Sharia and non-Sharia states. After the Sharia's introduction, the duration of breastfeeding increases almost immediately. The coefficients are jointly highly significant with a p-value of 0.003. Panel B of figure 3 carries out a placebo comparing Christians in Sharia and non-Sharia states and shows no significant changes (p-value 0.191).

Child protection laws and proximity to law enforcement facilities: Column 7 of panel A in table 2 shows that the increase in breastfeeding is concentrated amongst *high penalty* states. Moreover, columns 1 and 3 of panel A in table 3 show that increases in breastfeeding are stronger for individuals living within 30 minutes walk of the closest law enforcement facility. These differences are statistically significant (columns 2 and 4). These differences hold for the urban sub-sample (columns 5 and 6). By contrast, the distance

[30] If a child is not breastfed, the dependent variable is coded as 0.

to the closest Islamic centre, does not change the impact of the Sharia (column 7). The difference for individuals living more or less than 30 minutes walk is small, 0.2 months, and not statistically significant.

Geospatial estimates: Panel a of table 4 compares the behaviour of Muslims either side of the *high penalty* border over time. I use three different geographic distances: individuals living 100km, 75km and 50km either side of the border.[31] In columns 1, 2 and 3 I compare Muslims in *high penalty* states to Muslims in *low penalty* and in non-Sharia states on the other. The estimates are stable across the different bandwidths and of a similar order of magnitude to the ones presented in table 2, around 1.9 months. Columns 4, 5 and 6 narrow the time window around the introduction of the Sharia and consider children born June 1998 to December 2000. The estimates remain similar. In columns 7, 8 and 9 I select Muslims in Sharia states only and compare across *high* and *low* penalty states. Again, the estimates remain very similar. Finally, in columns 10, 11 and 12 I carry out a placebo test comparing Christians either side of the border and find no effect. Appendix E re-estimates these specifications using different specifications for $f(location)$. Among these, it re-creates *differences-in-discontinuities* estimates used recently (see Grembi et al., 2016; as an example). The results remain robust.

Panels a and b of figure 5 illustrate the results graphically. Following the approach by Dell et al. (forthcoming), these are three-dimensional versions of two-dimensional regression discontinuity figures. The x- and y-axis denote longitude and latitude respectively. The *high penalty* border is shown in red and the areas represent 50km bands around the boundary. The colour (the third dimension) denotes the mean outcome variable, where darker shades correspond to higher values. In the pre-period (panel a) no significant differences are apparent, which increase considerably in the post period (panel b).

4.2 Infant mortality estimates

The dependent variable takes the value 1 if a child is reported to have died within the first year of its life—defined as infant mortality—and 0 otherwise. This definition fits well with child protection laws of the Sharia, which focus on very young children and has been analysed in a variety of different contexts, even for high-income countries (Chen et al., 2016; for instance). The DHS reports the age at death of each child ever born to a woman. Due to censoring, I select children aged at least 14 months at the time of interview. The results are stable to different cut-offs. The *post* dummy takes the value 1 if the child is born after January 1999 since these children are potentially still alive at the time of the Sharia introduction. The

[31] Since the DHS randomly displaces the GPS coordinates of some individuals by up to 5km, I do not include clusters within 5km of the border.

results are stable to different definitions of the *post* dummy. The sample consists of 9,065 children born 1994-2002. For Muslims in Sharia states, the mean in the pre-period is 0.154.

Difference-in-differences and triple-differences estimates: Columns 1 and 2 of panel B in table 2 compare Muslims in Sharia states to children in non-Sharia states and show a decrease of 4 percentage points corresponding to around 25% of the pre-treatment mean. A comparison of Muslims to Christians in Sharia states (column 3) and Muslims in non-Sharia states (column 4) shows slightly larger estimates, 5 and 8 percentage points respectively. The placebo in column 5 using the Christians sample, by contrast, shows no effect of the Sharia, which is equally precisely estimated. The triple differences estimates in column 6 indicate a decrease of around 10 percentage points.

Event study estimates: The conditional event study estimates shown in panels c and d of figure 3 show that before 1999, Muslims in Sharia and non-Sharia states exhibit remarkably parallel trends. For children born after 1999, the trends diverge markedly. The coefficients are jointly significant with a p-value of 0.001. By contrast, the placebo treatment using Christians shows no discernible pattern with an insignificant p-value of 0.380.

Child protection laws and proximity to law enforcement facilities: Finally, the estimates in column 7 of panel B in table 2 show that the decrease in mortality was substantially larger in *high penalty* than in *low penalty* states. As before, panel B in table 3 shows that decreases are significantly more pronounced for individuals living close to law enforcement facilities, even for the urban sample (columns 1 to 6). By contrast, decreases in mortality are almost identical for individuals living within or more than 30 minutes from the closest Islamic centre.

Figure 4 shows the exact timing of changes in infant mortality by distance to the closest law enforcement facility (panel a) and Islamic centre (panel b). Before the Sharia's introduction, mortality rates of Muslims living within 30 minutes walking distance (solid lines) and further than 30 minutes walk (dashed lines) from the closest law enforcement facility show parallel trends to Muslims in non-Sharia states. Time trends are also parallel for distance to the nearest Islamic centre. After the Sharia's implementation, the drop in mortality rates is considerably steeper for Muslims living within 30 minutes walking distance to the nearest law enforcement facility than for individuals living further away. The difference in changes between the two groups is statistically significant with p=0.001. Effects for Muslims living within or more than 30 minutes walk from the nearest Islamic centre do not differ. This difference is not statistically different (p=0.996).

Geospatial estimates: As before, panel b of table 4 compares Muslims at three distances (100km, 75km and 50km) either side of the *high penalty* state border. The parameter estimates comparing Muslims in *high penalty* states to Muslims in both *low penalty* and in

non-Sharia states (columns 1, 2 and 3) show a decrease of 4 to 6 percentage points. Narrowing the time window to children born July 1995 to December 2000 (columns 4, 5 and 6) or comparing Muslims in *high* and *low* penalty states only (columns 7, 8 and 9) gives very similar results. The placebo treatment using Christians (columns 10, 11 and 12) shows no effects. As before, appendix E uses different functional forms and re-creates the *differences-in-discontinuity* estimates. The results remain robust. Panel c of figure 5 shows no significant differences in infant mortality rates for children living close to the *high penalty* border and born before the Sharia's introduction. Panel d shows a marked decrease in mortality rates for children in *high penalty* born after the Sharia's introduction.

4.3 Enforcement of Islamic laws

Data from the Nigerian Department of Justice (National Bureau of Statistics, various years) show that the Sharia increased the number of judgements regarding children, suggesting that changes in behaviour are caused by changes in laws. I digitised information on four aspects of law enforcement for the years around 2000 and compare Sharia and non-Sharia states using a difference-in-differences framework similar to the one in equation 1.[32]

Column 1 of table 5 indicates that the Sharia increased the number of prisoners by around 15% (compared to the pre-treatment average). Since all legally binding judgements are based on the Koran, all new incarcerations are the result of *Islamic criminal* judgements. Column 2 shows that the number of adjournments decreased by around 100% of the pre-2000 mean. Adjournments are commonly interpreted as an inefficiency of the judicial system. Hence the results suggest that the Sharia caused courts to decrease delays and pass more judgements.

Crucially for this analysis, the Sharia states are found to have strongly enforced judgements regarding children. Column 3 of table 5 reports the number of instances a court ruled for a child to be considered as abandoned. The estimates suggest an increase of 5 judgements per state per year, corresponding to 50% of the pre-2000 mean. Column 4 shows the number of instances that courts ruled for child defilement. The estimates suggest an increase of 6 judgments per state per year, which is more than 90% of the pre-treatment mean.

4.4 Robustness

I carry out a number of robustness checks. In a first instance, appendix D investigates the robustness of the estimates by dropping children at different time intervals before and after the Sharia introduction, dropping children Zamfara state, where the Sharia introduction was

[32] I used the Annual Abstract of Statistics for Nigeria (1998-2006), which reports number of judgements of various offences.

initiated and also by dropping northern states with a significant Shia minority.[33] The results remain robust throughout. Moreover, in appendix F, I formally test for parallel trends in the pre-period for a number of control groups. For this, I interact a linear timetrend with the treatment dummy. Throughout all control groups the estimates are small in size and not statistically significant. Finally, appendix C uses Afrobarometer data to investigate whether the introduction of the Sharia increased exposure to Islam. Estimates from *high penalty* and their adjacent states suggest no impact on two proxies: mosque membership and identification with Islam. These results suggest that religious exposure or the salience of Islam are unlikely to be the major drivers behind changes in breastfeeding and mortality.

5 Identification issues

The causal interpretation of the triple-differences estimates relies on the assumption that—after accounting for unobservable state and time characteristics—there are no time varying factors specific to Sharia states, which affect Muslims and Christians differently and which occur at the same time as the Sharia introduction. This section brings new data to the analysis and examines three factors, which may violate this assumption: i) social tensions or violence, ii) state-specific, lay policies and iii) migration patterns.

Pressures to act in accordance with Islam and social tensions: Although the Boko Haram insurgency started well after the time window considered here, in 2009, it is possible that the introduction of the Sharia led to social pressure, civil unrest or even conflict. To investigate this possibility I use Armed Conflict Location and Event (ACLED) data to construct a panel, which sums incidences of violence for each Nigerian state in each year. I then compare incidences over time in Sharia and non-Sharia states.

The results in table 6 suggest no effect of the Sharia on violent conflict. These findings hold for different types of violence (columns 1 and 4), for *high* and *low penalty* states (columns 2 and 4) and for the border regions (columns 3 and 6). Appendix G reports means for the years between 1997 and 2009 and shows no differences in the incidences of violence in Sharia states. After 2009, the Boko Haram insurgency began and violence spiked in the north.

Unrelated, state-specific policies I also investigate whether Sharia and non-Sharia states introduced lay, state-specific policies, which may confound the effect of the Sharia on parental investments. I find no effect of Sharia on various measurements for state interventions.

[33] These are Kano, Katsina, Kaduna and Sokoto.

I use expenditure by state governments as a proxy for state-specific polices. For this, I digitised information on local government finances from Annual Reports of the Central Bank of Nigeria (Nigerian Central Bank, various years) for the years 1996 to 1998 and 2001 to 2003.[34] The resulting dataset is a panel where each state provides 6 observations, one for each year between 1996 to 1998 and 2001 to 2003.

I compare Sharia and non-Sharia states in a difference-in-differences framework. Panel A of table 7 shows that the Sharia had no significant impact on recurrent, capital or total state expenditures. Moreover, appendix H shows that the time trend in total expenditures is parallel throughout the observation window.

I also investigate changes in health care facilities, which are important determinants of child health (see Bütikofer et al., 2019; for an example). Data from the Ministry of Health various years for the years 1991 and 2004 show that the number of health facilities per inhabitant did not change significantly across Sharia and non Sharia states (see appendix I).

Migration A further concern is that the introduction of the Sharia induced some individuals to migrate in or out of the 12 Sharia states. Using past migration histories contained in the DHS, I estimate the effect of the Sharia on the probability of respondents migrating. For each respondent, I construct a panel consisting of 7 observations, one for each year between 1997 and 2003. The dependent variable takes the value 1 if individual i migrated in that particular year. Panel B of table 7 uses the same specifications as in the main estimates and finds no significant impact on whether or not respondents migrated. Moreover, the event study estimates reported in appendix H show that the time trends across Sharia and non-Sharia states appear to be parallel.

To further asses the importance of migration, I re-estimate the effect of Sharia dropping individuals, who migrated after the introduction of the Sharia. Appendix D shows that the impact of Sharia is robust to the exclusion of migrants.

In addition to the above, I use the Migration and Remittances Household Surveys (MHS) carried out by the World Bank in 2009/10 to investigate intra-state migration patterns.[35] Using information on migration histories, I construct a panel where each household contributes three observations (one for the years 1990-95, 1995-99 and 2000-05) and find no effect (see panel C of table 7). The MHS also inquires about the reasons for migration. As

[34]State expenditures are divided into two: recurrent expenditures and capital expenditures. Recurrent expenditures consist of payments of civil servant salaries, pensions or payment of utility bills for public buildings. Capital expenditures refer to payments related to capital projects. I adjust nominal expenditures using the CPI as reported by the Central Bank of Nigeria. To this, I add the population information outlined above (National Bureau of Statistics, various years).

[35]The data are publicly available under `http://microdata.worldbank.org/index.php/catalog/402/related_materials`.

appendix J shows, no respondent reported Sharia law.

6 Household decisions and female welfare

Sharia law regulates many different aspects of Muslim life. Consequently, it is possible that Islamic laws have more far reaching impacts on decisions taken by household and the welfare of its members. For the sake of conciseness I focus on two aspects, which are of particular interest to economists: the interplays between investments in children and fertility choices on the one hand and the welfare of girls and women on the other.

6.1 Interplays between investments in children and fertility choices

Islamic law can also affect parental choices by changing the demand for children. The Sharia contains numerous provisions altering the costs of and returns to children. For example, the SPC requires children to maintain their parents in old age and specifies severe punishments for neglecting one's family (see section 2.1.2) thus increasing incentives to bear children. Moreover, the Sharia can increase the incentive to bear children in other, less direct ways. Izugbara and Ezeh (2010) provide qualitative evidence that women use high fertility rates as an insurance against divorce or their husband marrying other women.[36] Burnham (1987), moreover, points out that the resources allocated to each wife in a polygynous marriage are proportional to the number of her children. Alternatively, the Sharia could affect fertility the position of women and their rights (see Allen, 2015; Godefroy, forthcoming; for examples).

To investigate Sharia's effect on fertility, I use the complete birth histories of the 2003 DHS to construct a panel where every woman contributes 7 observations, one for each year between 1997 and 2003. The dependent variable takes the value 1 if woman i gave birth in year t[37] and I select women aged between 17 and 40 at the time of interview.[38] I then estimate difference-in-differences models similar to the ones outlined in equation 1. The sample consists of 5,118 women and before the Sharia's introduction on average 17% of women give birth every year.

[36]Because children remain in the custody of the father after divorce, a large number of children is likely to increase the cost of dissolving marriages for the husband. Moreover, numerous children may make it unaffordable for men to take on other wives.

[37]Because the DHS interviews women March to August 2003, I use detailed information on the duration of current pregnancies and code the dependent variable as equal to 1 in the year 2003 if woman i is pregnant at the time of the interview and due to give birth before 2004. Further, I estimate the Sharia's impact on abortions and find no effect. The estimates are available upon request

[38]I include relatively young women in the analysis because teenage pregnancies are relatively common in Nigeria. In fact, 11% of women aged 15 have started childbearing and in the North West 55% of 15-19 year olds have had at least one child or a currently pregnant (National Population Commission, 1999).

The results in columns 1 to 3 of table 8 show increases between 6 and 8 percentage points. In column 4, I estimate whether the impact of the Sharia on fertility varies by the number of children born before its introduction. For this, I estimate a triple-differences framework where I interact the $sharia_s \times post_t$ interaction with $nochild_i$, a dummy equal to 1 if woman i did not give birth to any child before the Sharia.[39] The estimates show that the increase in fertility is 7 percentage points larger for childless women. Nevertheless, the effect on women with children, denoted by the $sharia_s \times post_t$ interaction, remains large, 3 percentage points, and statistically significant.

To investigate interactions between breastfeeding and fertility, I estimate whether the effect of Sharia differs by whether or not the woman was breastfeeding at the time of the Sharia introduction. Using breastfeeding histories, I define a dummy $breastfeeding_i$=1 if woman i was breastfeeding at the time of the Sharia introduction (between 1999 and 2001). Column 5 of table 8 shows that birth rates increase by around 6 percentage points more for women, who were not breastfeeding around the time of the Sharia introduction. However, as before, Sharia also increases birth rates of women, who were breastfeeding at the Sharia's introduction (the coefficient on $sharia_s \times post_t$), by around 4 percentage points.

Previous evidence has pointed to negative associations between breastfeeding and fertility (Jayachandran and Kuziemko, 2011). Column 7 addresses this apparent contraction by investigating Sharia's effect on the exact timing of births. I select the sample of children born between 1998 and 2001 with at least one younger sibling and estimate the effect on succeeding birth intervals, defined as the time in months between births. The estimates show an increase of around 2 months. This suggests that Muslim women in Sharia states, who opt to have another child after the Sharia, wait around 2 months longer. This length is comparable to the Sharia's effect on breastfeeding (see table 2) suggesting that women combine increases in breastfeeding with raising their fertility.

6.2 Sharia's effect on gender gaps

Gender differences in the impact of the Sharia: Although the Sharia explicitly states that boys and girls should be treated equally, other aspects of Islamic laws may introduce gender differences in the returns parents associate with their children. For example, in Islamic marriage rules, brides move with the husbands after marriage. Any assistance to her birth family might be vetoed by her husband and in practice women often take care of their parents in law. Consequently, sons commonly are the main caretakers of their parents. Gender gaps have been highlighted in other low-income countries (Barcellos et al., 2014).

[39] I also control for the relevant double interactions $sharia_s \times nochild_i$, $nochild_i \times post_t$ and $sharia_s \times post_t$.

Panel B of table 8 examines the effect of Sharia by the gender of the child. The results suggest that improvements are strongest for boys whereas for girls outcomes hardly change. One possible explanation is that parents respond to higher expected returns to sons by investing more resources in young boys.

Bargaining power within the household: Sharia law assigns different roles to husband and wife, which may affect intra-household bargaining power. Verse 34 of the Surah an-Nisa, for instance, states that *men are in charge of women* and that *righteous women are devoutly obedient* (Koran, 4:34). Although there are many different translations of this verse (and many others) and its meaning is fiercely debated, parts of the Koran are explicit about gender roles. Islamic marriage rules can also increase husbands' bargaining power in more indirect ways by, for instance, allowing polygamy or making divorce easier for the husband, who retains children's custody (Izugbara and Ezeh, 2010).

This section investigates the Sharia's impact on two commonly used sets of proxies for bargaining power: marital status and women's work. Past research has pointed out that a woman's marital circumstances can affect her autonomy (Abadian, 1996). The analysis here selects women, who married between 1997 and 2003 and estimates the impact of the Sharia by comparing women who married before and after 2000.[40] The specification is analogous to the one outlined in equation 1; the control group consists of individuals residing in non Sharia states, irrespective of religion. The parameters of the difference-in-differences specification are reported in panel a of figure 6.[41] The estimates suggest a positive and significant impact on polygamy and on the age difference between husband and wife and a negative impact on age at marriage, significant at the 10% level.

Female labour force participation is commonly viewed to be an important determinant of her status in the household (Rahman and Rao, 2004). The analysis on women's work compares the work status of women across the 1999 and 2003 rounds of the DHS in a difference-in-differences framework.[42]

[40] I drop women, who married more than once. For these individuals it is not possible to determine the exact year of marriage.

[41] The dependent variables are a dummy for whether the wife is part of a polygamous union (row 1), the wife's age at marriage (row 2), the age difference between husband and wife (row 3) and a dummy for whether the husband reports higher educational attainments than his wife (row 4). Circles denote point estimates and horizontal bars the 95% confidence intervals.

[42] The two rounds of the DHS are two repeated cross sections. The dependent variables are binary indicators for whether the woman is currently working (row 1), she is working from home (row 2) or away from home (row 3) and whether she works for herself or someone in the family (row 4) or for someone outside of the household (row 5). The variables in rows 2 to 5 are unconditional on woman's work. The dependent variable in row 6 takes the value 1 if the woman can decide by herself what to do with her earnings (conditional on working and being paid in cash).

The estimates reported in panel b of figure 6 suggest that the introduction of the Sharia was accompanied by a large increase in female labour supply, around 30 percentage points. The estimates in rows 2 to 5, however, show that this increase stems almost exclusively from more women working from their own homes and for herself or someone in the family. This is likely to increase time spent at home, which could be used to care for children (see Guryan et al., 2008; for a review). Moreover, Anderson and Eswaran (2009) argue that a woman's labour force participation only increases her bargaining power if she works outside of the home. Consequently, this increased labour force participation is unlikely to increase female agency. Accordingly, the estimates in row 6 show decreases in decision making autonomy regarding women's income.

7 Conclusion

The evidence presented in this paper suggests that the introduction of Islamic laws in northern Nigeria led to marked increases in both the duration of breastfeeding and infant survival. The results also suggest that the Sharia increased fertility and lowered female autonomy. These findings may be of interest to policy makers in as far as they shed further light on how exactly parents in low income countries make decisions regarding their children. The results regarding breastfeeding, in particular, illustrate how changes in the religious environment can influence parental behaviour. The sheer size of the Sharia's effect on child welfare illustrates the importance of religious and cultural factors in determining how parents treat their children. This insight is important for anyone interested in designing policies aimed at improving child welfare. The results presented in this paper may also serve as an invitation to involve religious leaders in family related policies. Collaborating with Islamic organisations may avoid problems such as the ones witnessed during the resistance to the polio vaccine.

Finally, although these findings pertain to one particular case study, there are reasons to believe that the results may also be relevant to other contexts. The Islamic laws introduced in Nigeria are based on the Maliki school (Ostien, 2007). Sharia laws in the majority of countries in North and Western Africa are based on the same doctrine and thus likely to have common aspects. In any case, this paper has argued that the Sharia increases breastfeeding and infant survival by specifying precisely how children should be protected and which punishments can be expected in case of neglect or abandonment. This importance of child welfare is a central feature of many Islamic societies around the world irrespective of their history or geographical location.

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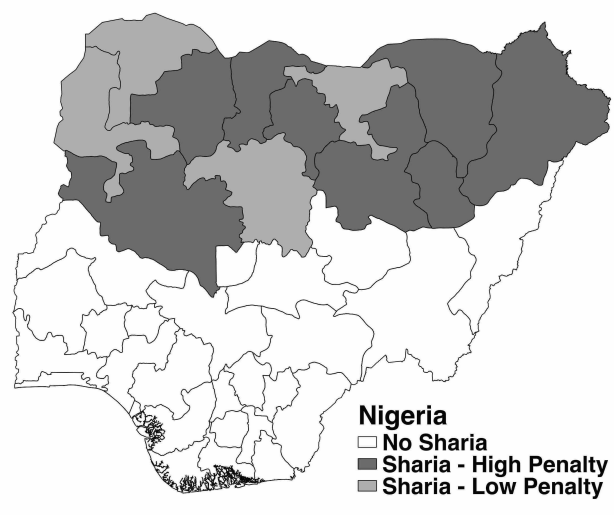
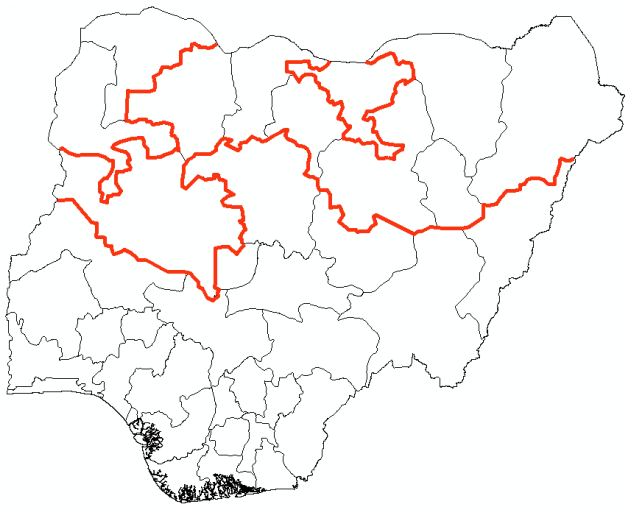
Figures

Figure 1: Nigeria - administrative borders

(a) Sharia and non Sharia states



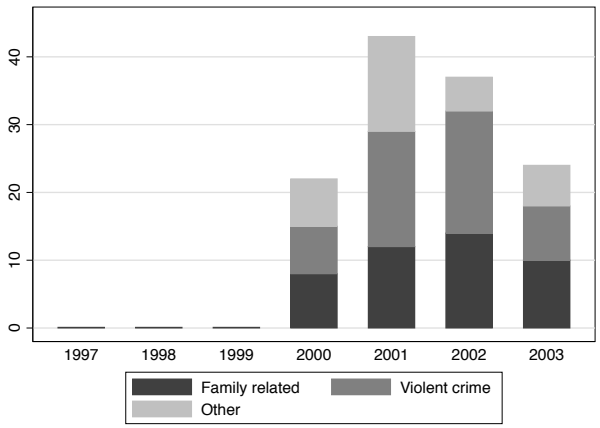
(b) High penalty state border



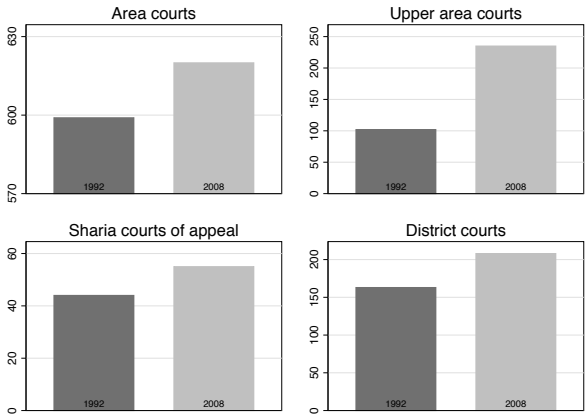
Notes: Maps report information on Nigeria's administrative areas; Panel a shows the 36 states of Nigeria; states adopting the Sharia (the Sharia states) are in grey; *low penalty states* are in light grey, these are Jigawa, Kaduna, Kebbi and Sokoto: *high penalty states* are in dark grey, these are Bauchi, Borno, Gombe, Kano, Katsina, Niger, Yobe and Zamfara; Panel b shows the border separating *high penalty* states, i.e. states that introduced strict child protection legislation shown in grey, from other states;

Figure 2: Legislative aspects of the Sharia introduction

(a) Number of Sharia criminal judgements by year



(b) Number of judges by court type

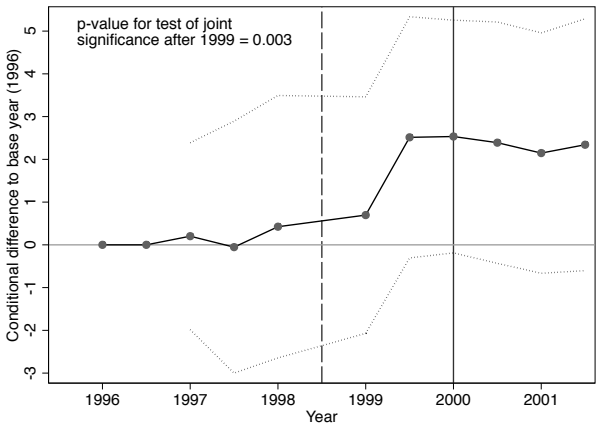


Notes: Figures report legislative information on introduction of Sharia. Panel a: figure reports number of Islamic criminal judgements in Sharia states for the years 1998 to 2003; information is drawn from Weimann (2007; 2010), who uses sources such as as articles from print media; Panel b: figure reports number of judges employed in area courts, upper area courts, Sharia courts of appeal and district courts in Sharia states for the years 1992 and 2008; information is drawn from Ostien (2011b).

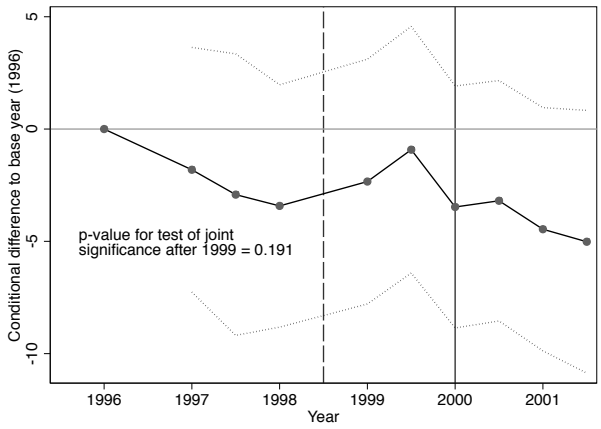
Figure 3: Breastfeeding and infant mortality over time in Sharia and non-Sharia states

Duration of breastfeeding

(a) Treatment group: Muslims

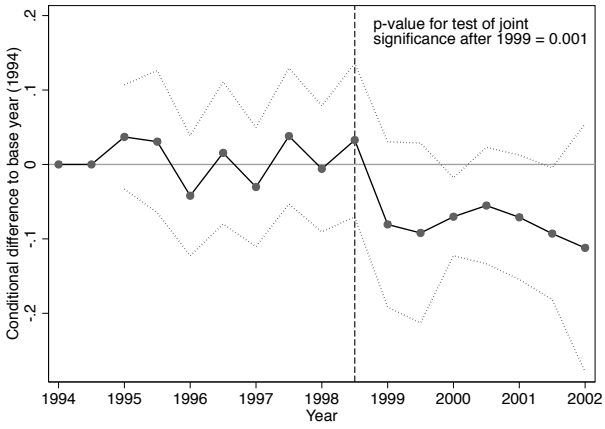


(b) Placebo: Christians

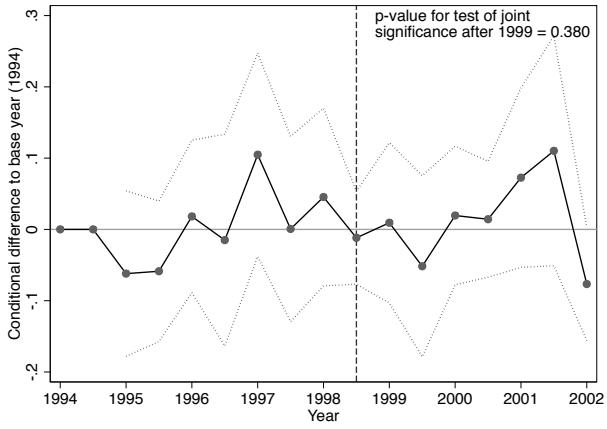


Infant mortality

(c) Treatment group: Muslims



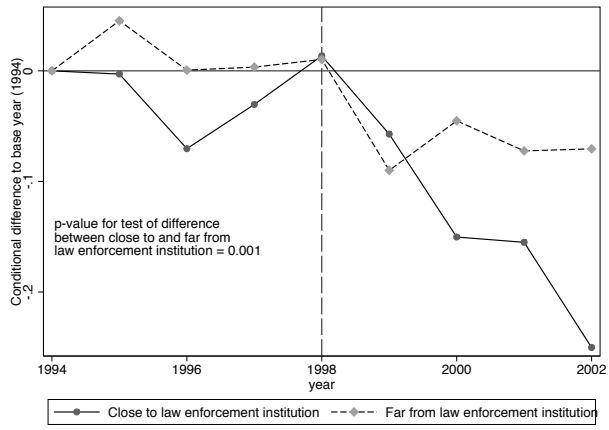
(d) Placebo: Christians



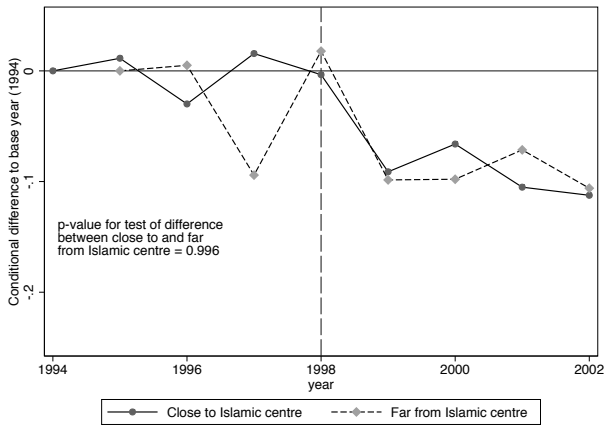
Notes: Figure shows conditional differences in breastfeeding and infant mortality between Sharia and non-Sharia states over time; circles denote point estimates for interaction between *Sharia* (a dummy taking value 1 if individual i resides in state that introduced Sharia laws) on the one hand and child's year of birth (grouped in 6-month intervals) on the other; 95% confidence intervals are denoted as dashed lines; all parameters are OLS and include state dummies; covariates include education, rural dummy, mother's age, latitude and longitude and dummies for child's year of birth and gender; standard errors are clustered at the state level; each child contributes 1 observation; panel a: dependent variable is the number of months a child is breastfed for; sample consists of Muslim children born 1996 to 2001 drawn from 1999 and 2003 DHS; panel b: dependent variable is the number of months a child is breastfed for; sample consists of Christian children born 1996 to 2001 drawn from 1999 and 2003 DHS; panel c: dependent variable takes value 1 if child dies within first year; sample consists of Muslim children born 1994 to 2002 and at least 14 months before the interview drawn from 2003 DHS; panel d: dependent variable takes value 1 if child dies within first year; sample consists of Christian children born 1994 to 2002 and at least 14 months before the interview drawn from 2003 DHS.

Figure 4: Infant mortality over time by distance to law enforcement and religious facilities

(a) By distance to closest law enforcement facility



(b) By distance to closest Islamic centre

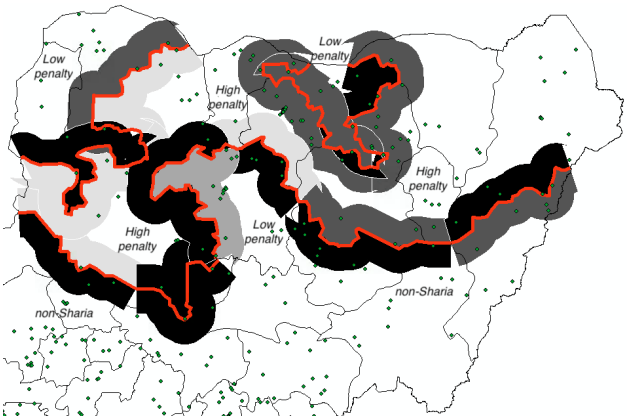


Notes: Figure shows conditional differences in infant mortality between *high penalty* and non-Sharia states by distance between child and closest law enforcement facility (panel a) or Islamic centre (panel b); dependent variable takes value 1 if child dies within first year; all parameters are OLS and include state dummies; covariates include education, rural dummy, mother's age, latitude and longitude and dummies for child's year of birth and gender; sample consists of Muslim children born 1994 to 2002 and at least 14 months before the interview drawn from 2003 DHS; Christians in Sharia states and Muslims in low penalty states are omitted; standard errors are clustered at the state level; panel a: circles denote point estimates for interaction between child's year of birth and a dummy taking the value 1 if individual i resides in high penalty state *and within* 2.75km (30 minutes walk) from the closest law enforcement facility (denoted as "close to law enforcement facility"); diamonds denote point estimates for interaction between child's year of birth and a dummy taking the value 1 if individual i resides in high penalty state *and outside* of 2.75km (30 minutes walk) from the closest law enforcement facility (denoted as "far from law enforcement facility"); panel b: circles denote point estimates for interaction between child's year of birth and a dummy taking the value 1 if individual i resides in high penalty state *and within* 2.75km (30 minutes walk) from the closest Islamic centre (denoted as "close to Islamic centre"); diamonds denote point estimates for interaction between child's year of birth and a dummy taking the value 1 if individual i resides in state high penalty state *and outside* of 2.75km (30 minutes walk) from the closest Islamic centre (denoted as "far from Islamic centre").

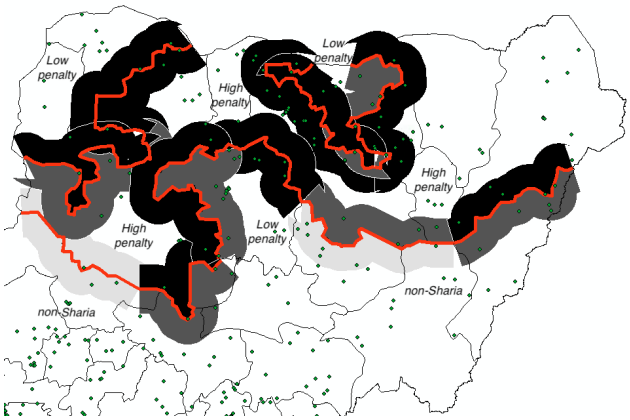
Figure 5: Geospatial differences at the *high penalty* border

Duration of breastfeeding

(a) Pre-period: Born before middle of 1999

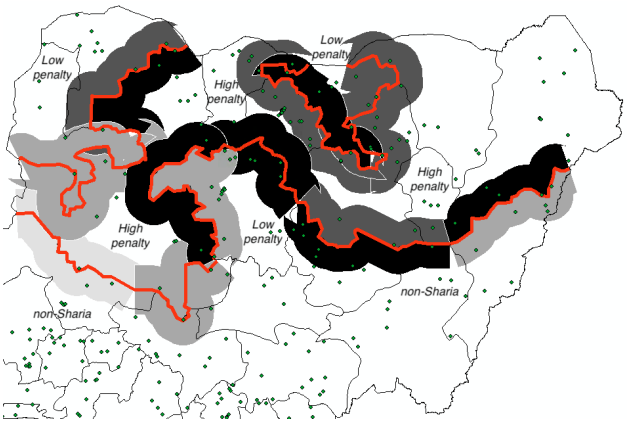


(b) Post-period: Born after middle of 1999

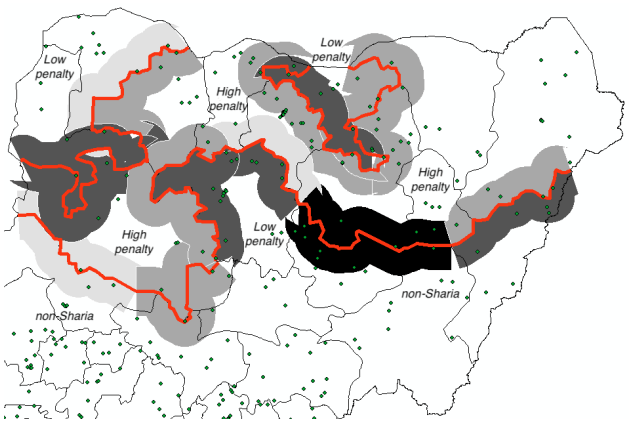


Infant mortality

(c) Pre-period: Born 1994-1998



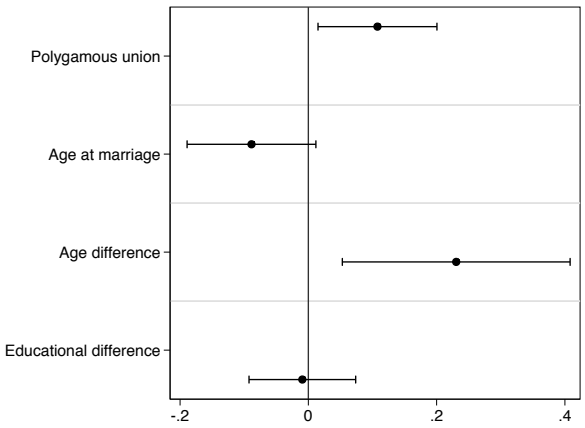
(d) Post-period: Born 1999-2002



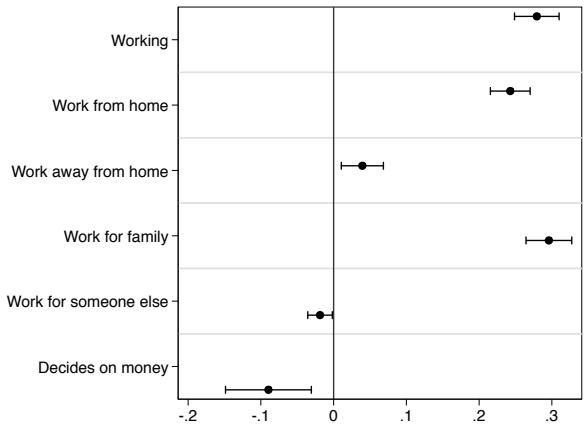
Notes: Figures report means of months of breastfeeding and infant mortality for children living within 50km of a border to a *high penalty* state; state border is denoted in red; clusters of respondents are denoted in green; colour of area denotes the value of the mean values of the dependent variable; darker colours denote higher values; panel a: dependent variable is the number of months a child is breastfed for; sample consists of Muslim children born 1997 to middle of 1999 (i.e. the pre period) drawn from 2003 DHS; panel b: dependent variable is the number of months a child is breastfed for; sample consists of Muslim children born middle of 1999 to 2001 (i.e. the post period) drawn from 2003 DHS; panel c: dependent variable takes value 1 if child dies within first year; sample consists of Muslim children born 1994 to middle of 1998 (i.e. the pre period) drawn from 2003 DHS; panel d: dependent variable takes value 1 if child dies within first year; sample consists of Muslim children born 1999 to 2002 and at least 14 months prior to the interview (i.e. the post period) drawn from 2003 DHS.

Figure 6: Effect of Sharia on proxies for intra-household bargaining power

(a) Marital status



(b) Women's work



Notes: Figure reports effect of Sharia on marriage patterns and female labour force participation; symbols represent point estimates for difference-in-differences parameters on $post_t \times sharia_s$ interaction in equation 1; $sharia_s$ dummy takes value 1 if respondent currently resides in state that introduced (or will introduce) Sharia; circles denote point estimates, horizontal lines denote 95% confidence intervals; parameter estimates reported are from ordinary least squares models; panel a: sample consists of women aged 15 to 49, who married once between 1997 and 2003, drawn from 2003 DHS; $post_t = 1$ if woman married in 2000 or later; dependent variables are the following: a dummy for woman being part of a polygamous union (row 1), woman's age at marriage (row 2), age difference between husband and wife (row 3) and dummy for whether husband is more educated than wife (row 4), covariates include education, religion, rural dummy, married dummy and dummies for respondent's birth cohort; standard errors are clustered at the state level; panel b: sample consists of women aged 15 to 49 drawn from 1999 and 2003 DHS; $post_t = 1$ if woman is drawn from 2003 DHS; dependent variables are the following: a dummy for woman currently working (row 1), a dummy for woman currently working from home, unconditional on work status (row 2), a dummy for woman currently working away from home, unconditional on work status (row 3), a dummy for woman currently working for herself or family member, unconditional on work status (row 4), a dummy for woman currently working for someone not in her family, unconditional on work status (row 5), a dummy for woman deciding herself what to do with her earnings, conditional on her working and earning money (row 6); covariates include education, religion, rural dummy, married dummy and dummies for respondent's birth cohort.

Tables

Table 1: Summary Statistics

	(1)	(2)	(3)	(4)	(5)
Sample	Whole Nigeria	Sharia states	non-Sharia states	High penalty states	Low penalty states
	Panel A: Maternal characteristics				
Children born (before 2000)	2.6	3.2	2.1	3.3	2.9
Percent Muslim	47	88	20	90	85
Percent with primary education	61	30	81	32	26
Wealth quintile	3.1	2.7	3.3	2.8	2.5
	Panel B: Investments in children				
Born before middle of 1999					
Months of breastfeeding	16.4	17.2	15.6	16.6	18.6
Born before 1999					
Infant mortality	0.135	0.154	0.115	0.156	0.148
Women	7,620	3,065	4,555	2,132	933

Notes: Table reports summary statistics by location of residence; all figures are drawn from the 2003 round of the Nigerian DHS; column 1 refers to the whole of Nigeria, column 2 to states that introduced the Sharia, column 3 to states that did not introduce the Sharia, column 4 refers to states that introduced the Sharia and strict child protection legislation (i.e. *high penalty states*), column 5 refers to states that introduced the Sharia and relatively loose child protection legislation (i.e. *low penalty states*); months of breastfeeding are based on children born between 1998 and 1999 (i.e. the pre period); infant mortality is defined as the proportion of children dying within the first year of life, numbers are based on children born between 1994 and 1998 (i.e. the pre period).

Table 2: Effect of Sharia on duration of breastfeeding and infant mortality

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Estimator	Diff-in -diff	Diff-in -diff	Diff-in -diff	Diff-in -diff	Placebo	Triple diff	Diff-in -diff
Treatment group	Muslims in Sharia	Muslims in Sharia	Muslims in Sharia	Muslims in Sharia	Christians in Sharia	Muslims in Sharia	Muslims in Sharia
Control group	Everyone in non-Sharia	Everyone in non-Sharia	Christians in Sharia	Muslims in non-Sharia	Christians in non-Sharia	Christians in non-Sharia	Everyone in non-Sharia
	Panel A: Dependent variable: Months of breastfeeding						
Post*Sharia	1.216 * *	1.239***		1.785 * *	−0.723	−0.383	
	(0.448)	(0.449)		(0.814)	(0.765)	(0.777)	
Post*Muslim			1.671 * *				
			(0.695)				
Post*Sharia*Muslim						2.183*	
						(1.247)	
Post*High penalty							1.622***
							(0.454)
Post*Low penalty							0.178
							(0.489)
Children	3,540	3,537	1,957	2,208	1,444	3,719	3,537
	Panel B: Dependent variable: Infant mortality indicator						
Post*Sharia	−0.041***	−0.044***		−0.083***	0.013	0.019	
	(0.013)	(0.013)		(0.021)	(0.017)	(0.018)	
Post*Muslim			−0.051 * *				
			(0.017)				
Post*Sharia*Muslim						−0.102***	
						(0.028)	
Post*High penalty							−0.049***
							(0.014)
Post*Low penalty							−0.030*
							(0.016)
Children	8,644	8,634	4,801	5,382	3,683	9,065	8,634
Sample:	Whole Nigeria	Whole Nigeria	Sharia states	Muslims	Christians	Whole Nigeria	Whole Nigeria

Notes: Table reports estimates for the effect of the Sharia on duration of breastfeeding and infant mortality; *Sharia* is a dummy taking value 1 if individual i resides in state that introduced Sharia laws; *Muslim* is a dummy taking value 1 if individual i is Muslim; *Low penalty* is a dummy taking value 1 if state introduced Sharia laws with low penalties for child protection laws (Jigawa, Kaduna, Kebbi and Sokoto); *High penalty* is a dummy taking value 1 if state introduced Sharia laws with high penalties for child protection laws (remaining Sharia states); the samples are: columns 1, 2 and 7: the whole of Nigeria excluding Christians in Sharia states, column 3 : states that introduced the Sharia only; column 4: Muslims; column 5: Christians; column 6: whole of Nigeria; all parameters are OLS estimates based 2003 DHS; all regressions include state dummies; standard errors are reported in parentheses and are clustered at the state level; covariates include education, rural dummy, mother's age, latitude and longitude and dummies for child's year of birth and gender; each child contributes 1 observation; ***, **, and * indicate significance at the 1%, 5% and 10% levels. Panel A: dependent variable is the number of months children are breastfed; *Post* dummy takes value 1 if child is born after June 1999; sample: children born between 1998 and 2001. Panel B: dependent variable takes value 1 if child died within first year of life; *Post* dummy takes value 1 if child is born in year 1999 or after; sample: children born between 1994 and 2003 and born at least 14 months before interview.

Table 3: Effect of Sharia by distance to law enforcement facilities and Islamic centres

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Estimator	Diff-in -diff	Triple diff	Diff-in -diff	Triple diff	Diff-in -diff	Triple diff	Diff-in -diff	Triple diff
Treatment group	Muslims in High penalty states							
Control group	Everyone in non-Sharia	Everyone in non-Sharia	Muslims in non-Sharia	Muslims in non-Sharia	Everyone in non-Sharia	Everyone in non-Sharia	Everyone in non-Sharia	Everyone in non-Sharia
Sample	All	All	All	All	Urban only	Urban only	All	All
	Panel A: Dependent variable: Months of breastfeeding							
Post*High & close to hisbah	3.044***		3.590***		2.555***			
	(0.639)		(0.960)		(0.568)			
Post*High & far from hisbah	1.262**		1.765**		0.512			
	(0.513)		(0.834)		(1.119)			
Post*High *close to hisbah		1.782***		1.825***		2.043*		
		(0.599)		(0.581)		(1.131)		
Post*High & close to mosque							1.563***	
							(0.530)	
Post*High & far from mosque							1.768***	
							(0.612)	
Post*High *close to mosque								−0.219
								(0.709)
Children	3,049	3,049	1,720	1,720	1,157	1,157	3,049	3,049
	Panel B: Dependent variable: Infant mortality indicator							
Post*High & close to hisbah	−0.077***		−0.114***		−0.077**			
	(0.022)		(0.029)		(0.035)			
Post*High & far from hisbah	−0.041***		−0.080***		−0.018			
	(0.014)		(0.022)		(0.017)			
Post*High *close to husbah		−0.035**		−0.034*		−0.059*		
		(0.017)		(0.019)		(0.034)		
Post*High & close to mosque							−0.048***	
							(0.016)	
Post*High & far from mosque							−0.051**	
							(0.025)	
Post*High *close to mosque								0.004
								(0.028)
Children	7,419	7,419	4,167	4,167	2,761	2,761	4,167	4,167

Notes: Table reports estimates for the effect of the Sharia on duration of breastfeeding and infant mortality by distance to nearest law enforcement facility and Islamic centre; *High & close to hisbah* is a dummy taking value 1 if individual i resides in a high penalty state *and within* 2.75km (30 minutes walk) of nearest law enforcement facility; *High & far from hisbah* is a dummy taking value 1 if individual i resides in a high penalty state *and outside* of 2.75km (30 minutes walk) nearest law enforcement facility; *High * close to hisbah* is the interaction between a dummy for individual i living in a high penalty state and a dummy for the individual living within 2.75km (30 minutes walk) of nearest law enforcement facility; *High & close to mosque* is a dummy taking value 1 if individual i resides in a high penalty state *and within* 2.75km (30 minutes walk) of nearest Islamic centre; *High & far from mosque* is a dummy taking value 1 if individual i resides in a high penalty state *an outside* of 2.75km (30 minutes walk) nearest Islamic centre; *High * close to mosque* is the interaction between a dummy for individual i living in a high penalty state and a dummy for the individual living within 2.75km (30 minutes walk) of nearest Islamic centre; sample consists of Muslim children in high penalty states and all children in non-Sharia states in 1, 2, 5, 6, 7 and 8 and Muslim children in non-Sharia states in columns 3 and 4; Muslims in low penalty states are omitted; all parameters are OLS estimates based 2003 DHS; all regressions include state dummies; standard errors are reported in parentheses and are clustered at the state level; covariates include education, rural dummy, mother's age, latitude and longitude and dummies for child's year of birth and gender; ***, **, and * indicate significance at the 1%, 5% and 10% levels. Panel A: dependent variable is the number of months children are breastfed; *Post* dummy takes value 1 if child is born after June 1999; sample: children born between 1998 and 2001. Panel B: dependent variable takes value 1 if child died within first year of life; *Post* dummy takes value 1 if child is born in year 1999 or after; sample: children born between 1994 and 2003 and born at least 14 months before interview.

Table 4: Geospatial differences in breastfeeding and mortality at the *high penalty* border

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Estimator	Treatment vs control			Treatment vs control			Treatment vs control			Placebo		
Treatment group	Muslims in high penalty states			Muslims in high penalty states			Muslims in high penalty states			Christians in high penalty states		
Control group	Muslims in low penalty and non-Sharia states			Muslims in low penalty and non-Sharia states			Muslims in low penalty states			Christians in low penalty and non-Sharia states		
	Panel A: Dependent variable: Months of breastfeeding											
High Penalty*Post	1.755***	2.069**	1.921***	1.628**	2.226**	1.863**	1.662***	1.867**	1.815**	0.171	0.403	−0.094
	(0.560)	(0.758)	(0.621)	(0.676)	(0.870)	(0.704)	(0.440)	(0.651)	(0.603)	(1.900)	(2.041)	(2.510)
Children	1,634	1,373	1,171	1,227	1,025	872	1,437	1,236	1,093	339	297	226
Children's birthdates	January 1998 - December 2001			June 1998 - December 2000			January 1998 - December 2001			January 1998 - December 2001		
	Panel B: Dependent variable: Infant mortality indicator											
High Penalty*Post	−0.062***	−0.060***	−0.041**	−0.052**	−0.055**	−0.043*	−0.031**	−0.032**	−0.027***	−0.026	0.001	−0.008
	(0.020)	(0.019)	(0.015)	(0.024)	(0.024)	(0.022)	(0.012)	(0.012)	(0.008)	(0.044)	(0.035)	(0.037)
Children	3,985	3,290	2,794	2,651	2,177	1,851	3,537	2,991	2,619	795	706	530
Children's birthdates	January 1994 - June 2002			July 1995 - December 2000			January 1994 - June 2002			January 1994 - June 2002		
Distance to border:	≤100km	≤75km	≤50km	≤100km	≤75km	≤50km	≤100km	≤75km	≤50km	≤100km	≤75km	≤50km

Notes: Table reports estimates for the effect of the Sharia on duration of breastfeeding and infant mortality for individuals living close to the *high penalty* states border; *High penalty* is a dummy taking value 1 if state introduced Sharia laws with high penalties for child protection laws (Bauchi, Borno, Gombe, Kano, Katsina, Niger, Yobe and Zamfara); all regressions control for latitude, longitude and dummies for 10 segments of the border; the samples are: columns 1, 2, 3, 4, 5 and 6: Muslims living in *high penalty*, *low penalty* and non-Sharia states; columns 7, 8 and 9: Muslims living in *high penalty* and *low penalty* states (i.e. in Sharia states only); columns 10, 11 and 12: Christians living in *high penalty, low penalty* and non-Sharia states; distance to border is defined as the areal distance between the individual's GPS coordinate and the closest point on the border to a *high penalty* state; the distances are defined as follows columns 1, 4 and 7: 100km, columns 2, 5 and 8: 75km, columns 3, 6 and 9: 50km, all parameters are OLS estimates based 2003 DHS; all regressions include state dummies; standard errors are reported in parentheses and are clustered at the state level; covariates include education, rural dummy, mother's age, latitude and longitude and dummies for child's year of birth and gender; each child contributes 1 observation; Panel A: dependent variable is the number of months children are breastfed; *Post* dummy takes value 1 if child is born after June 1999; sample: children born between January 1998 and December 2001 in columns 1, 2, 3, 7, 8, 9, 10, 11 and 12 and children born between June 1998 and December 2000 in columns 4, 5 and 6. Panel B: dependent variable takes value 1 if child died within first year of life; *Post* dummy takes value 1 if child is born in year 1999 or after; sample: children born between January 1994 and June 2002 (born at least 14 months before interview) in columns 1, 2, 3, 7, 8, 9, 10, 11 and 12 and children born between July 1995 and December 2000 in columns 4, 5 and 6.

Table 5: Effect of Sharia on law enforcement

	(1)	(2)	(3)	(4)
	Dependent variables: number of:			
	Prison inmates	Adjournments by courts	Judgements on abandoned children	Judgements on child defilement
Mean in pre-period	1340	910	9.9	6.8
Post*Sharia	196.8∗	$-1,018.1$∗	$5.39**$	$6.40**$
	(111.1)	(587.6)	(1.84)	(2.37)
States	36	37	11	12
R squared	0.236	0.321	0.256	0.739
Year dummies	yes	yes	yes	yes
State dummies	yes	yes	yes	yes
Population controls	yes	yes	yes	yes

Notes: Table reports effect of Sharia on law enforcement; parameter estimates reported are from ordinary least squares model; dependent variable in column 1 is the number of prison inmates, in column 2 the number of cases adjourned at the instance of court, in column 3 the number of times courts judged a child to be abandoned, in column 4 the number of times courts judged a minor to be defiled; years in column 1 are 1995 to 2006, years in column 2 are 1995 to 2004, years in columns 3 and 4 are 1996 to 1998 and 2002 to 2003; *Post* is a dummy taking value 1 if t $\geq$ 2000; *Sharia* is a dummy taking value 1 if state s introduced Sharia; regressions control for year and state fixed effects as well as state population and its square; standard errors are clustered at state level; ***, **, and * indicate significance at the 1%, 5% and 10% levels; all information was digitised from various reports of the National Abstract of Nigeria; estimates of population by state was digitised from various National Abstracts of Statistics; both documents are published by the government of Nigeria.

Table 6: Importance of confounding factors: effect of Sharia on social unrest

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variables	Incidences of any type of violence			Incidences of violence against civilians		
Mean in pre-period	4.79		2.06	1.29		0.67
Post*Sharia	1.769		−0.846	−0.235		−1.928
	(1.355)		(4.233)	(0.433)		(2.070)
Post*High penalty		2.205			−0.110	
		(1.457)			(0.464)	
Post*Low penalty		0.952			−0.469	
		(1.296)			(0.468)	
Sample	Whole Nigeria	Border states	Whole Nigeria	Border states	Whole Nigeria	Border states

Notes: Table reports effect of Sharia on incidences of violence; *Sharia* is a dummy taking value 1 if state s introduced Sharia; parameter estimates reported are from ordinary least squares model; dependent variable in columns 1, 2 and 3 is the number of incidences of any type of violence per state per year; dependent variable in columns 4, 5 and 6 is the number of incidences of violence against civilians per state per year; years 1997 to 2004; *Post* is a dummy taking value 1 if year $\geq$ 2000; *Low penalty* is a dummy taking value 1 if state introduced Sharia laws but with low penalties for child protection laws (Jigawa, Kaduna, Kebbi and Sokoto); *High penalty* is a dummy taking value 1 if state introduced Sharia laws but with high penalties for child protection laws (remaining Sharia states); *Border states* are states that are adjacent to Sharia border; data are drawn from ACLED data base.

Table 7: Importance of confounding factors: state specific policies and migration

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: State-specific policies					
Dependent variable	Recurrent p.c. exp.	Capital p.c. exp.	Total p.c. exp.			
Mean in pre-period	304	134	438			
Post*Sharia	−7.85	−6.95	−51.53			
	(93.0)	(66.2)	(146.6)			
States	30	30	30			
	Panel B: Dependent variable: Indicator for migration - DHS					
Treatment group	Muslims Sharia	Muslims Sharia	Muslims Sharia	Christians Sharia	Muslims Sharia	Muslims high pen.
Control group	Everyone non-Sharia	Christians Sharia	Muslims non-Sharia	Christians non-Sharia	Everyone non-Sharia	Muslims low pen. ≤50km
Post*Sharia	−0.000		0.005	0.004		
	(0.004)		(0.006)	(0.009)		
Post*Muslim		−0.006				
		(0.009)				
Post*High penalty					0.001	0.007
					(0.005)	(0.006)
Post*Low penalty					−0.004	
					(0.005)	
Women	7,247	3,061	3601	4,011	7,247	1,759
	Panel C: Dependent variable: One household member migrated - MHS					
Mean in pre-period	0.085	0.085				
Post*Sharia	−0.007	−0.019				
	(0.012)	(0.017)				
Households	6,465	2469				

Notes: Panel A: dependent variable in column 1 is recurrent in column 2 capital and in column 3 total real per capita expenditure; sample consists of 30 states of Nigeria, no information was available for Bayelsa, Ebonyi, Ekiti, Gombe, Nassarawa and Zamfara; each state contributes 6 observations for years 1996 - 1998 and 2001 - 2003; local governmental expenditures were digitised from reports of the Central Bank of Nigeria and deflated using CPI from the Central Bank of Nigeria (various years); estimates of population by state was digitised from various National Abstracts of Statistics; Panel B: dependent variable is indicator taking value 1 if woman i moved to current residence in year t; sample consists of women aged between 15 and 49 drawn from 2003 Nigerian DHS; each woman contributes 7 observations, one for each year between 1997 and 2003; column 1 compares Muslims in Sharia states to individuals in non-Sharia states, column 2 compares Muslims in Sharia states to Christians in Sharia states, column 3 compares Muslims in Sharia states to Muslims in non-Sharia states, column 4 compares Christians in Sharia and non-Sharia states, column 5 compares Muslims in low and high penalty states to individuals non-Sharia states, column 6 compares Muslims in high penalty states to individuals low penalty and non-Sharia states living within 50km of the border, covariates include education, religion, rural dummy, number of children and year of birth. Panel C: data used drawn from Migration and Remittances Household Surveys for Nigeria; each household contributes 3 observations, one for the years 1990-95, 1995-99 and 2000-05; dependent variable takes value 1 if household reports that one member migrated in that specific time interval within Nigeria; controls include age and gender of household head and whether household has bank account.

Table 8: Effect of Sharia on birth rates and timing of births

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Fertility behaviour					
Treatment group	Muslims in Sharia	Muslims in Sharia	Muslims in Sharia	Muslims in Sharia	Muslims in Sharia	Muslims in Sharia
Control group	Everyone in non-Sharia	Christians in Sharia	Muslims in non-Sharia	Everyone in non-Sharia	Everyone in non-Sharia	Everyone in non-Sharia
Sample:	Whole Nigeria	Whole Nigeria	Sharia states	Sharia states	No kids pre-1997	Kids born 1998-2001
Dependent variable	Birth indicator					Birth Interval
Post*Sharia	0.055***		0.051***	0.033***	0.036***	2.162 * *
	(0.008)		(0.010)	(0.011)	(0.011)	(0.834)
Post*Muslim		0.084***				
		(0.010)				
Post*Sharia*No Children				0.073***		
				(0.014)		
Post*Sharia*Breasfteeding					0.062***	
					(0.014)	
Women	5,375	2,277	2,679	5,375	5,375	-
Children						2,441
	Panel B: Gender differences					
Treatment group	Muslims in Sharia states					
Control group	Everyone in non-Sharia states					
Sample:	Boys	Girls	Boys	Girls		
Dependent variable	Months breastfeeding		Infant mortality			
Post*Sharia	1.436 * *	1.044	−0.056 * *	−0.036*		
	(0.693)	(0.763)	(0.021)	(0.021)		
Children	1,785	1,752	4,407	4,227		

Notes: Table reports estimates for the effect of the Sharia on fertility; ***, **, and * indicate significance at the 1%, 5% and 10% levels; all estimates are based 2003 DHS for Nigeria and are derived from ordinary least squares models; Panel A: each woman contributes 7 observations, one for each year between 1997 and 2003; dependent variable takes value 1 if woman i gives birth in year t; *Post* is a dummy taking value 1 if t > 2000; *sharia* is a dummy taking value 1 if individual i resides in state that introduced Sharia laws; *Muslim* is a dummy taking value 1 if individual i is Muslim; *No Children* is a dummy taking value 1 if individual i did not have children in 1997; *Breasfteeding* is a dummy taking value 1 if individual i reports to have breastfed between 1999 and 2000; sample consists of women aged between 17 and 40 at time of interview; covariates include education, rural dummy, mother's age, latitude and longitude and dummies for child's year of birth and gender; covariates include education, religion, rural dummy, number of children and year of birth. the samples are defined as follows: columns 1, 3, 4, 5 and 6: the whole of Nigeria excluding Christians in Sharia states, column 2 : states that introduced the Sharia only. Panel B: dependent variable is the number of months children are breastfed, sample consists of children born between 1998 and 2001, and *Post* dummy takes value 1 if child is born after June 1999 in columns 1 and 2; dependent variable takes value 1 if child died within first year of life, sample: children born between 1994 and 2003 and born at least 14 months before interview, and *Post* dummy takes value 1 if child is born in year 1999 or after in columns 3 and 4; sample consists of boys in columns 1 and 3 and girls in columns 2 and 4.

Appendices

A Additional details about the Sharia in Nigeria

The table below lays out the changes in child protection laws induced by the Sharia outlined in section 2.1.2.

Offence	(1) **Punishment**	(2)
	Secular law	**Sharia ciminal law**
Foundation	English common law	Koran and hadiths
Application	Northern states: $\leq$ 1999 Southern states: throughout	Northern states: $\geq$ 2000 Southern states: never
1. Child abandonment	Loss of custody of child	3 years imprisonment + 40 lashes
2. Child neglect		
In general	Loss of custody of child	1 year imprisonment + fine (unspecified amount)
If resulting in harm	1 year inprisonment	5 years imprisonment + fine of 100 camels ($\approx$ USD13,700 - 54,800)

Notes: Nothern states are Bauchi, Borno, Gombe, Jigawa, Kaduna, Kano, Katsina, Kebbi, Niger, Sokoto, Yobe and Zamfara state; southern states are all remaining states; sources for punishments in column 1: Uzodike (1990) source for punishments in column 2: Sharia Penal Code reported by Ostien (2011)

Further aspects of Sharia law that may be of interest are:

- Islam encourages marriage and sees it as an integral part of life.[43] Whilst married, the husband is obliged to maintain his wife to the same standard of her native family. The punishments for neglecting to maintain one's family are codified as *Ta'azir* offences. Individuals who are able to but choose not to maintain their family (including wife) are classified as an *idle person*. This offence is punishable with imprisonment of up to one year and liable to caning of up to twenty lashes. The punishments for re-offenders are a prison sentence of up to two years and up to 50 lashes.[44]

- Sharia law does not specify any number of children a couple should have. Islam, however, places a high value on children[45] and views them as a significant part of marriage.[46] Abortions, moreover, are forbidden.[47] The specified punishment are a fine (*ghurrah*) of 5 camels, 50 gold dinars or 600 silver dirhams and/or lashes and/or an imprisonment of up to three years.[48]

- Although under Sharia law both sons and daughters are equally responsible for their parents, Islamic marriage rules imply that sons are more likely to maintain their parents than daughters. After marriage, a woman leaves her parental family to move with her husband's and requires his permission before transferring any resources to her parents. The daughter's husband may thus veto her sustaining her parents. Moreover, a married woman is integrated in the family of her husband and takes over many caring duties for her in-laws.

- Islamic inheritance rules are multifaceted and are laid out only shortly. After the death of the husband, the wife inherits a quarter of his property if she is childless. After funeral expenses and any remaining debts have been settled. If the couple had children, the wife receives an eight. Most of the remaining estate is divided amongst the children of the deceased. When allocating inheritance, male sons receive twice the share of females.*Allah commands you regarding your children. For the male a share equivalent to that of two females*, Koran (4:11).

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[43] *And marry those among you who are single and those who are fit among your male slaves and your female slaves; if they are needy, Allah will make them free from want out of His grace; and Allah is Ample-giving, Knowing.* (Surah an-Nur, 24:32).

[44] Ostien, 2011b; §376.

[45] For instance: *O my Lord! Grant me from You, a good offspring.* (Koran 3:38).

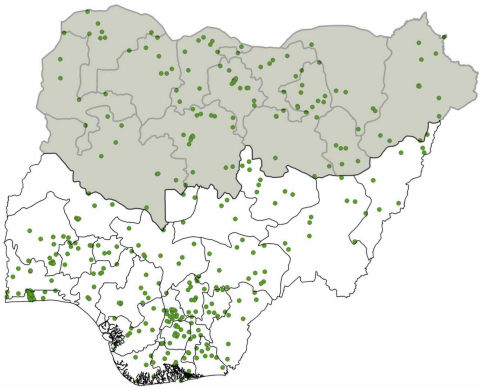
[46] For instance: *We indeed sent messengers before you (O Muhammad), and We assigned them wives and children* (Koran 13:38).

[47] *Whoever voluntarily causes a woman with child to miscarry, shall, if such miscarriage be not caused in good faith for the purpose of saving the life of the woman, be punished*, Ostien 2011b; SPC §206.

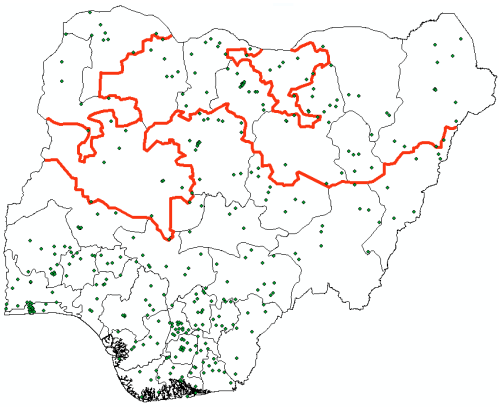
[48] Ostien, 2011b; §209.

B Additional maps

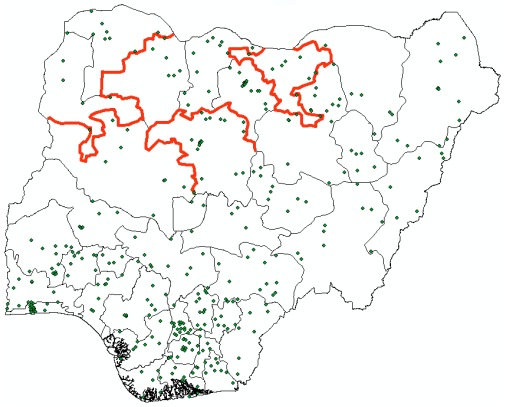
(a) Clusters of 2003 DHS



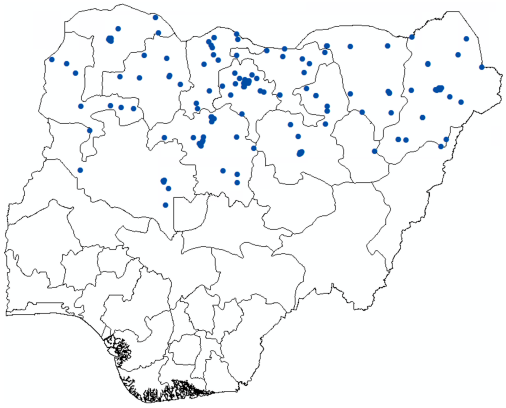
(b) High penalty border



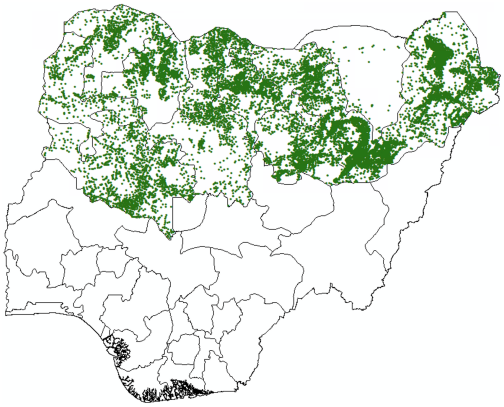
(c) High penalty border for Sharia only



(d) Law enforcement facilities in Sharia states



(e) Islamic centres in Sharia states



Notes: Maps report location of clusters used by the 2003 Nigerian Demographic Health Survey; Panel a all clusters of 2003 Nigerian DHS; Panel b clusters of 2003 Nigerian DHS and border between *high penalty* and other states; Panel c clusters of 2003 Nigerian DHS and border between *high penalty* and *low penalty* states. Panel d shows the geographical locations of law enforcement facilities such as hisbah stations and police stations, information drawn from Panel e shows the geographical locations of Mosques and other Islamic centres in Nigeria, information drawn from GRID3 project.

C Attitudes and behaviour commonly associated with Islam

	(1)	(2)	(3)	(4)
Dependent variable	Member of a mosque	Identifies as Muslim	Member of a mosque	Identifies as Muslim
Round of Afrobarometer	1999 & 2003		1999	
High Penalty*Post	0.090	−0.169		
	(0.082)	(0.166)		
State Av. of Muslims			0.511***	0.180 **
			(0.151)	(0.091)
Observations	2,101	2,086	1,287	1,287
Sample	Border states		Sharia states	
Religion	Muslims			
Controls	yes	yes	yes	yes

Notes: Table reports effect of Sharia on Mosque attendance and religious identification; dependent variable in columns 1 and 3 is a dummy taking value 1 if respondent is an active or inactive member of a mosque; in columns 2 and 4 is a dummy taking value 1 if respondent identifies (apart from being Nigerian) as Muslim; *High penalty* is a dummy taking value 1 if state introduced Sharia laws but with high penalties for child protection laws; *State Av. of Muslims* is the proportion of respondents for each state reporting they are Muslim; sample consists of Muslims only; sample in columns 1 and 2 is from 1999 and 2003 rounds of Afrobarometer and Muslims living in border states only; border states are states are adjacent to the *high penalty* border; sample in columns 3 and 4 is from 1999 round of Afrobarometer and Muslims living in Sharia states only; covariates include education, religion, rural dummy, married dummy and dummies for respondent's birth cohort.

D Effect of Sharia on duration of breastfeeding and infant mortality - Robustness

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Dependent variable: Months of breastfeeding					
Post*High penalty	1.633 * *	1.574 * *	1.582 * *	1.591***	1.771***	1.511***
	(0.708)	(0.705)	(0.746)	(0.465)	(0.508)	(0.533)
Post*Low penalty	0.374	0.300	0.466	0.176	0.119	0.495
	(0.767)	(0.764)	(0.743)	(0.489)	(0.765)	(0.483)
Children	3,098	2,844	2,336	3,434	2,823	3,098
Sample:	Born 1.99-02	Born 1.99-6.01	Born 1.99-1.01	No Zamfara	No Shia	No Migrants
	Panel B: Dependent variable: Neonatal mortality indicator					
Post*High penalty	−0.054***	−0.030 * *	−0.030*	−0.054***	−0.060***	−0.053***
	(0.013)	(0.015)	(0.016)	(0.013)	(0.017)	(0.012)
Post*Low penalty	−0.041 * *	−0.020	−0.027	−0.047***	−0.069***	−0.055***
	(0.016)	(0.019)	(0.026)	(0.014)	(0.012)	(0.013)
Children	7,954	5,888	4,703	9,792	8,083	8,934
Sample:	Born 1995-2002	Born 1996-2001	Born 6.96-6.00	No Zamfara	No Shia	No Migrants

Notes: Table reports estimates for the effect of the Sharia on duration of breastfeeding and infant mortality; all estimates are based 2003 DHS for Nigeria and are derived from ordinary least squares models; *Low penalty* is a dummy taking value 1 if state introduced Sharia laws but with low penalties for child protection laws (Jigawa, Kaduna, Kebbi and Sokoto); *High penalty* is a dummy taking value 1 if state introduced Sharia laws but with high penalties for child protection laws (remaining Sharia states); all regressions include state dummies; standard errors are reported in parentheses and are clustered at the state level; covariates include education, rural dummy, mother's year of birth and dummies for child's year of birth, gender and birth order. ***, **, and * indicate significance at the 1%, 5% and 10% levels. Panel A: dependent variable is the number of months children are breastfed; *Post* is a dummy taking value 1 if child is born after June 1999; sample consists of children born between 1998 and 2001; each child contributes 1 observation; sample in columns 1, 2 and 3 are children born between January 1999 and 2002, January 1999 and June 2001 and January 1999 and January 2002, respectively; sample in column 4 excludes individuals in Zamfara state; sample in column 5 excludes individuals in Kano, Katsina, Kaduna and Sokoto states, which have a Shia minority; sample in column 5 excludes individuals, who migrated after the Sharia introduction; Panel B: dependent variable takes value 1 if child died within first year of life; *Post* is a dummy taking value 1 if child is born in year 1999 or after; sample consists of children born between 1994 and 2002 and aged at least 14 months at interview; each child contributes 1 observation; sample in columns 1, 2 and 3 are children born between 1995 and 2002, 1996 and 2001 and June 1996 and June 2001, respectively; sample in column 4 excludes individuals in Zamfara state; sample in column 5 excludes individuals in Kano, Katsina, Kaduna and Sokoto states, which have a Shia minority; sample in column 5 excludes individuals, who migrated after the Sharia introduction.

E Additional Geospatial estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Treatment group	Muslims in high penalty states								
Control group	Muslims in low penalty and in non-Sharia states								
	Panel A: Dependent variable: Months of breastfeeding								
High Penalty*Post	1.757***	2.053 * *	1.870***	1.770***	2.054 * *	1.843***	1.141*	1.649 * *	1.849 * *
	(0.563)	(0.767)	(0.623)	(0.562)	(0.779)	(0.626)	(0.582)	(0.732)	(0.808)
Children	1,634	1,373	1,171	1,634	1,373	1,171	1,634	1,373	1,171
	Panel B: Dependent variable: Infant mortality indicator								
High Penalty*Post	−0.062***	−0.059***	−0.041 * *	−0.062***	−0.060***	−0.042 * *	−0.080***	−0.091***	−0.074***
	(0.020)	(0.019)	(0.015)	(0.020)	(0.019)	(0.015)	(0.023)	(0.025)	(0.023)
Children	3,985	3,290	2,794	3,985	3,290	2,794	3,985	3,290	2,794
Specification for f(location)	*longitude + latitude +distance to border*			*longitude + latitude +distance to border +longitude² + latitude² +distance to border²*			*longitude + latitude +post × (longitude + latitude)*		
Distance to border:	≤100km	≤75km	≤50km	≤100km	≤75km	≤50km	≤100km	≤75km	≤50km

Notes: Table reports estimates for the effect of the Sharia on duration of breastfeeding and infant mortality for individuals living close to the *high penalty* states border; *High penalty* is a dummy taking value 1 if state introduced Sharia laws with high penalties for child protection laws (Bauchi, Borno, Gombe, Kano, Katsina, Niger, Yobe and Zamfara); all regressions control for latitude, longitude, dummies for 10 segments of the border, distance to border and its square; the samples are: columns 1, 2 and 3: Muslims living in *high penalty*, *low penalty* and non-Sharia states; columns 4, 5 and 6: Muslims living in *high penalty* and *low penalty* states; columns 7, 8 and 9: Christians living in *high penalty, low penalty* and non-Sharia states; distance to border is defined as the areal distance between the individual's GPS coordinate and the closest point on the border to a *high penalty* state; the distances are defined as follows columns 1, 4 and 7: 100km, columns 2, 5 and 8: 75km, columns 3, 6 and 9: 50km, regressions control for location ($f(location)$) as follows columns 1-3: respondent's latitude, longitude and distance to *high penalty* border; columns 4-6: respondent's latitude, longitude and distance to *high penalty* border and their square; columns 7-9: respondent's latitude and longitude and their interaction with the post dummy; all parameters are OLS estimates based 2003 DHS; all regressions include state dummies; standard errors are reported in parentheses and are clustered at the state level; covariates include education, rural dummy, mother's age, latitude and longitude and dummies for child's year of birth and gender; each child contributes 1 observation; ***, **, and * indicate significance at the 1%, 5% and 10% levels. Panel A: dependent variable is the number of months children are breastfed; *Post* dummy takes value 1 if child is born after June 1999; sample: children born between 1998 and 2001. Panel B: dependent variable takes value 1 if child died within first year of life; *Post* dummy takes value 1 if child is born in year 1999 or after; sample: children born between 1994 and 2003 and born at least 14 months before interview.

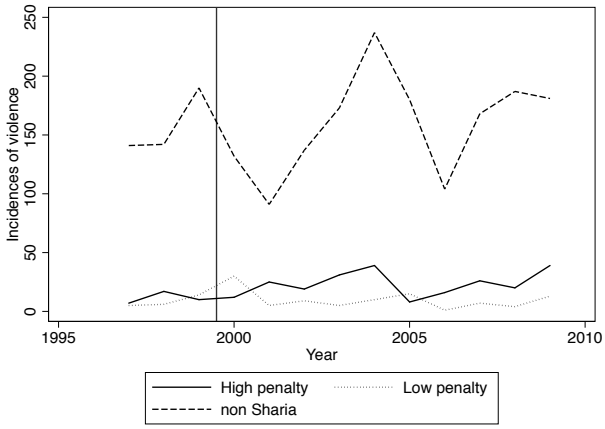
F Testing for parallel trends

	(1)	(2)	(3)	(4)
Treatment group	Muslims in Sharia	Muslims in Sharia	Christians in Sharia	Muslims in Sharia
Control group	Everyone in non-Sharia	Muslim in non-Sharia	Christians in non-Sharia	Everyone in non-Sharia
	Panel A: Months of breastfeeding			
Sharia*Timetrend	0.004	0.027	−0.045	
	(0.027)	(0.050)	(0.058)	
High Penalty*Timetrend				−0.018
				(0.031)
Low penalty*Timetrend				0.060
				(0.037)
Children	1,956	1,147	882	1,956
	Panel B: Infant indicator			
Sharia*Timetrend	−0.00014	−0.00003	0.00119	
	(0.00060)	(0.00094)	(0.00071)	
High Penalty*Timetrend				−0.00016
				(0.00073)
Low penalty*Timetrend				−0.00008
				(0.00055)
Children	5,038	3,132	2,168	5,038

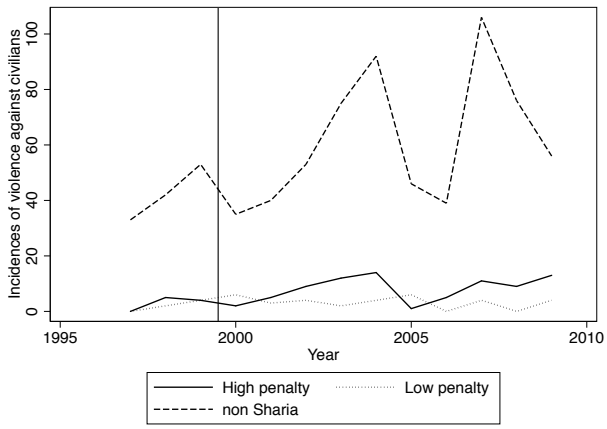
Notes: Table tests for parallel trends before the introduction of the Sharia for duration of breastfeeding and infant mortality; all estimates are derived from ordinary least squares models; *Sharia* is a dummy taking value 1 if individual i resides in state that introduced Sharia laws; *Timetrend* is a continuous variable for the child's month of birth; *Low penalty* is a dummy taking value 1 if state introduced Sharia laws but with low penalties for child protection laws (Jigawa, Kaduna, Kebbi and Sokoto); *High penalty* is a dummy taking value 1 if state introduced Sharia laws but with high penalties for child protection laws (the remaining Sharia states); the samples are defined as follows: columns 1 and 4: the whole of Nigeria excluding Christians in Sharia states, column 2: Muslims, column 3: Christians, all parameters are OLS estimates based 2003 DHS; all regressions include state dummies; standard errors are reported in parentheses and are clustered at the state level; covariates include education, rural dummy, mother's age, latitude and longitude and dummies for child's year of birth and gender; each child contributes 1 observation; ***, **, and * indicate significance at the 1%, 5% and 10% levels. Panel A: dependent variable is the number of months children are breastfed; sample consists of children born between 1996 and June 1999, i.e. the pre period, drawn from 1999 and 2003 DHS; Panel B: dependent variable takes value 1 if child died within first life of life; sample consists of children born between 1994 and 1998, i.e. the pre-period, drawn from 2003 DHS.

G Incidences of violence

Any violence



Violence against civilians

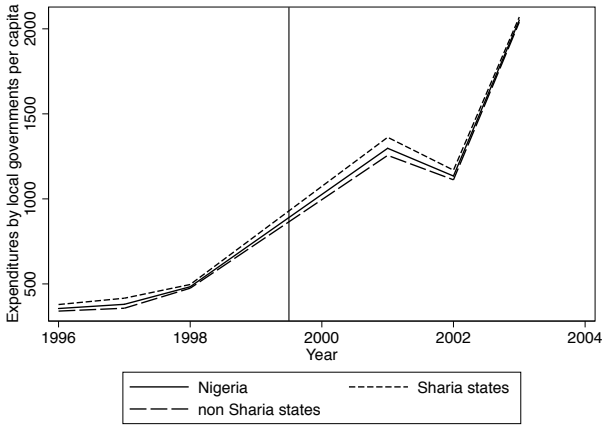


Notes: Figures show incidences of violence between 1997 and 2009; *Low penalty* is a dummy taking value 1 if state introduced Sharia laws but with low penalties for child protection laws (Jigawa, Kaduna, Kebbi and Sokoto); *High penalty* is a dummy taking value 1 if state introduced Sharia laws but with high penalties for child protection laws (remaining Sharia states); data are drawn from ACLED data base.

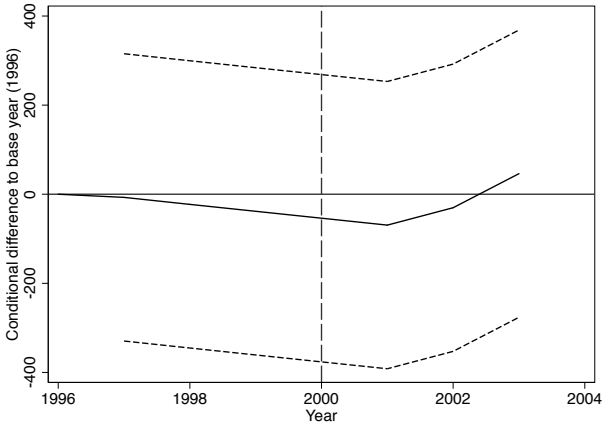
H Event studies for state expenditures and migration

Expenditures of states

(a) Means

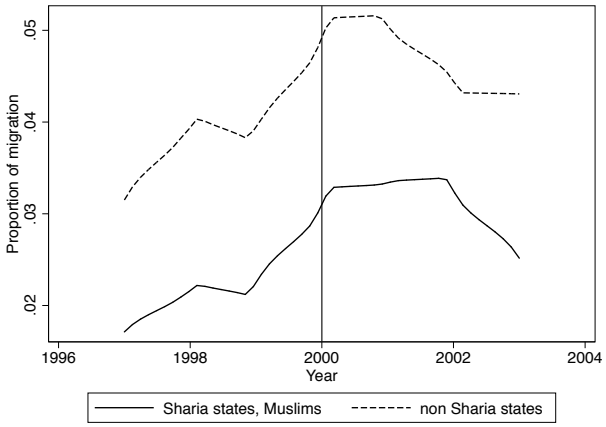


(b) Conditional differences

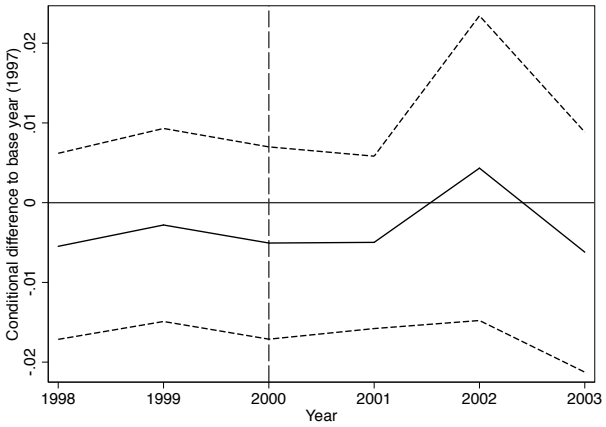


Migration

(c) Means

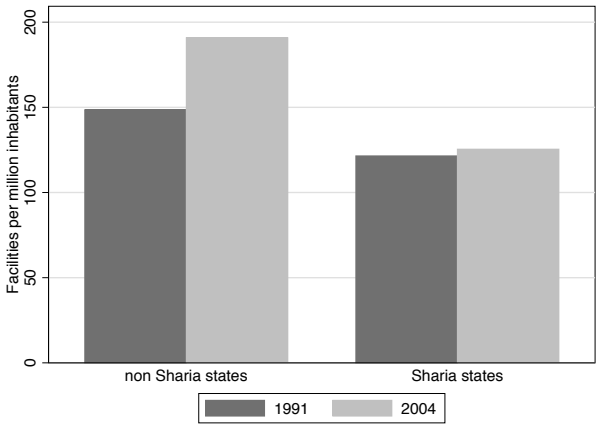


(d) Conditional differences



Notes: Panels a and b: variables reported are means of real expenditure by local governments per inhabitants for years 1996 to 2003; panel a shows means over time, panel b conditional difference (solid line) along with 95% confidence intervals; each state contributes 6 observations, one for each year between 1996 and 1998 and 2001 and 2003; information has been digitised from Annual Report of the Central Bank of Nigeria (various years) for data on state expenditures and Annual Abstract of Statistics for Nigeria (various years) for population of estimates for states; nominal expenditures have been deflated using Consumer Price Indexes from the Central Bank of Nigeria (various years); Panels c and d: Figure shows unconditional and conditional migration estimates over time for Sharia and non Sharia states; dependent variable is indicator taking value 1 if woman i moved to current residence in year t; panel c shows polynomially smoothed means of migration indicator by year, panel d conditional difference (solid line) along with 95% confidence intervals; sample consists of women aged between 15 and 49 at the time of interview drawn from 2003 Nigerian DHS; each woman contributes 7 observations, one for each year between 1997 and 2003; individuals in Sharia states are all Muslim, individuals in non Sharia states are selected irrespective of religion.

I Health facilities in Sharia and non Sharia states



Notes: Figure reports number of health facilities per million inhabitants in Sharia and non Sharia states; information has been digitised from National Abstract of Statistics for Nigeria Reports (various years).

J Self-reported reasons for migration

Notes: Figure shows self reported primary reason for migration for individuals migrating before and after 2000; sample consists of individuals, who migrated from their major residence; data are drawn from Migration Household Survey (2010); respondents in panel a reported education as their main reason for migration; respondents in panel b reported employment related issues as their main reason for migration; respondents in panel c reported marital issues as their main reason for migration; respondents in panel d reported family related issues as their main reason for migration; respondents in panel e reported conflict as their main reason for migration.