Colonial origins and fertility: can the market overcome history?

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Abstract

Can market incentives overcome the long-term impact of historical institutions? We address this question by focusing on the role of colonial reproductive laws in shaping fertility behavior in Africa. Exploiting the arbitrary division of ancestral ethnic homelands and the resulting discontinuity in institutions across the British-French colonial borders, we find that women in former British areas are more likely to delay sexual debut and marriage, and that they have fewer children. However, these effects disappear in areas with exogenously high market access, where the opportunity cost of childbearing appears to be high irrespective of colonizer identity. They are only present in areas with low market access, where economic opportunities are scarcer. This heterogeneous impact of colonial origins remarkably extends to various measures of local economic development and household welfare. Examining causal mechanisms, we find that the fertility effect of colonial origins is directly linked to colonial reproductive laws and their impact on the use of modern methods of birth control. We rule out the impact of British colonization on income and women's human capital as the primary channels through which its fertility effect operates. By uncovering novel findings on the heterogeneous nature of the colonial origins of comparative fertility behavior and economic development, our analysis implies that appropriately designed economic incentives can overcome the bonds of historical determinism.

Keywords: Fertility, Colonial Origins, Colonial Reproductive Laws, Market Access, Economic Development, Human Capital, Historical Determinism, Africa.

JEL Classification: I12, J13, J15, J16, O15.

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1 Introduction

Over the past two centuries, the world experienced a gradual breakout from long-standing Malthusian dynamics, in which income growth was offset by population growth. Economic growth theory explaining this remarkable escape has emphasized the essential role of human capital in lowering fertility and inducing a transition from stagnation to sustained economic growth (Galor (2011)). At the global level, fertility has declined significantly since the 1960s, from five children per woman to fewer than half of this number in 2016 (World Bank (2016)). However, in the developing world where fertility has also more than halved over the past half century, there is significant variation across countries in the magnitude and the timing of this decline, with fertility remaining very high in certain societies, in spite of an impressive rise in female education and a steep decline in mortality rates. It is implied by the existing literature that this latter variation is likely to reflect initial differences in geographical factors, historical accidents, cultural factors, and institutional endowments (Galor (2011)). Yet, there has been no empirical exploration of the link between historical political institutions and reproductive behavior, especially in contexts of high fertility rates. What is more, we know very little about whether policy interventions can mitigate the long-term impact of history.

In this paper, we address this important gap by studying the causal effect of colonial origins on fertility in sub-Saharan Africa and documenting the nature of the mechanisms governing this effect. Central to our study is the analysis of important heterogeneity in this effect by market access. By market access, we mean access or proximity to major centers of production of tradable goods and services in an economy. Market access therefore increases labor force participation, which in turn increases the opportunity cost of childbearing. If the market effect dominates the colonial effect on fertility, one should expect the latter effect to be smaller in areas with higher market access. This latter analysis directly addresses a concern raised in policy circles about the importance of the research agenda documenting the long-term economic impact of historical events for policymaking. The argument usually advanced is that, since history cannot be changed, such research is unlikely to inspire the design of policies.[1] Departing from this paradigm, our analysis implies that appropriately designed economic incentives can break the bonds of historical determinism. Indeed, contrasting the two major colonial powers in Africa, namely the British and the French, we document economically significant average effects of colonial origins on fertility behavior and local economic development; however, we find that these effects completely disappear in areas with high market access, proving that exogenous access to economic opportunities is able to mitigate the long-term consequences of differential colonial legacies.

[1] See Banerjee and Duflo (2014) for a review of the literature contrasting the different views on the extent to which history is ultimately deterministic.

Our conceptual framework supports that differences in fertility behavior across African countries can be *directly* linked to differences in colonial population policies. In 1920, France adopted a pronatalist law that was subsequently extended to its colonies. This law prohibited any propaganda on contraceptive use or directed against having children, and severely repressed abortion (Latham (2002), Garenne (2017)). While this law was revoked in France in 1967, it remained in effect in all former French colonies in Africa. The French pronatalist law contrasted with the more liberal culture of reproductive rights in Great Britain (Oliver (1995), Caldwell and Sai (2007), Beach and Hanlon (2019)). Although it is not until the late 1950s that this liberal culture was introduced to their former colonies, it is the case that these colonies were the first in Africa to implement family planning programs (Oliver (1995), Caldwell and Sai (2007)).

Our framework also acknowledges a possible *indirect* role of colonial rules in shaping fertility, but this mechanism is secondary and it has conflicting predictions. The bulk of the literature contrasting the British and the French colonial rules argues that the British governance style outperformed the French approach in fostering human capital accumulation and the protection of local political structures and property rights (La Porta et al. (1998); Acemoglu et al. (2001); Lee and Schultz (2012); Dupraz (2017)). Consequently, British colonization was more conducive to economic development, thought to lower fertility.[2] By contrast, recent studies focusing on the legal systems governing marital property rights demonstrate that the common law system inherited from the British colonial power exhibits less secure marital property rights, therefore decreasing female bargaining power within the household, when compared to the French civil law system (Anderson (2018)). To the extent that female bargaining power negatively affects fertility (Doepke and Tertilt (2018)), this argument seems to imply that fertility should be higher in former British colonies. It follows from these conflicting arguments that the impact of British (vs. French) colonization on fertility behavior is theoretically ambiguous. This question is therefore best answered empirically. We address this question and show, in addition, that colonial origins interact with market incentives to shape long-term fertility outcomes in sub-Saharan Africa.

Sub-Saharan Africa is an ideal setting for our analysis. It is the only region of the world where the demographic transition is still in its early stages. Despite an impressive increase in female education and a significant decline in mortality rates, fertility in this region remains very high, with an average rate of 4.8 children per woman in 2016, which is twice as high as the world average of 2.4 children per woman (World Bank (2016)).

[2] There are two reasons why this channel may be theoretically less important than our primary mechanism. First, it has been empirically challenging to prove that economic development lowers fertility. Second, it follows from the large literature documenting the positive effect of lower fertility (induced by contraceptive use) on female economic empowerment and child quality (see Ananat and Hungerman (2012), Myers (2017)) that, in the African context, female human capital and labor participation are partly the result of colonial population policies directly affecting fertility.

This high level of fertility, however, masks significant variation across and within African countries, as the demographic transition process is much more advanced in certain parts of the continent than in others.[3] The increasing divergence in fertility rates between former British and French colonies in recent decades is evidence of this fact. These countries experienced growing fertility rates during their transition to independence and in parts of the 1970s (see Figure 1-*a*). During those years, fertility rates were slightly lower in former French colonies. However, by the end of the 1970s, the gap had reversed and fertility rates started to decrease more rapidly in former British colonies. Indeed, the fertility gap between former British and French colonies more than tripled between 1975 and 2016 (Figure 1-*c*). Quite remarkably, there is a parallel between these differing trends in fertility and trends in income per capita. Figure 1-*b* shows that former French and British colonies had comparable level of economic development during the independence years, but former British colonies experienced a radical take-off in the mid 80s and have grown much faster than former French colonies. The latter have basically stagnated since 1960 (see Bergh and Fink (2018)). Importantly, as Figure 1-*c* shows, the reversal of the fertility gap between former British and French colonies started more two decades before the per capita income gap became visible. This fact clearly implies that the income gap could not explain the fertility gap.

The aforementioned trends obviously suggest a relationship between colonial institutions, fertility, and income. However, the extent to which these correlations can be considered causal is not at all clear, as one cannot rule out the possibility that unobserved factors are driving these relationships. It is possible that the British and the French colonized countries that were initially very different in terms of their natural and cultural endowments, and that these initial differences subsequently translated into differences in fertility behavior. In investigating how colonial origins affect fertility, we give this endogeneity issue a serious consideration. We address this concern by exploiting the natural experiment that led to the arbitrary division of historical ethnic homelands across colonial borders during the "Scramble for Africa".

Combining individual-level data on women aged 20 to 49 years old from Demographic and Health Surveys (DHS) with data on historical ethnic homelands from Murdock's Ethnographic Map of Africa and geographic data from several sources (see Section 4), we implement a spatial Regression Discontinuity Design (RDD) with ethnic homeland fixed effects to estimate the causal effect of British (versus French) colonization on reproductive behavior. This identification strategy accounts for culture and other unobserved ethnicity-related factors that may affect fertility and that could potentially bias our estimates. In addition, by only comparing observations that are close enough to the border, our strategy accounts for natural endowments, initial differences in economic development and other

[3] For example, in 2015, the fertility rate was 2.4 children per woman in South Africa, 3.2 in Lesotho, and 7.2 in Niger (World Development Indicator, 2019).

hard-to-account-for unobserved geographical factors. Reassuringly, we do not find a wide range of geographical factors and natural endowments (e.g. elevation, soil suitability for agriculture, and natural resources) to vary across the colonial border.

We find that, on average, women in former British colonies have significantly fewer children than their counterparts in former French colonies. This finding is consistent with the effect of British colonization on other reproductive outcomes that we analyze. Indeed, women in former British colonies are more likely to initiate sexual activity at older ages and to delay childbearing, and they are less likely to engage in child marriage (that is, being married before 18 years old). Importantly, these findings are robust to controlling for religion and all the aforementioned geographic factors and natural endowments.

Our findings are also robust to controlling for *spillover effects* at the border. This latter control is important because it takes into account the fact that certain families that were close enough to the arbitrary colonial border were themselves split across countries. Because these families are likely to maintain ties with individuals living across the border and even cross the border to reside temporarily on the other side, this is likely to attenuate the fertility effect of British colonization owing to these individuals being doubly treated. We address this issue by estimating the effect of colonial origins on two subsamples: the sample of natives and the sample of natives living beyond 5km from the British-French border. These latter analysis show that women in former British colonies have on average $0.3-0.6$ fewer children than their counterparts in former French colonies. In the context of fertility, this gap is large. In fact, the differential trends in fertility presented in Figure 1-*a* suggest that closing a gap of such magnitude might take several decades.

Central to our study is the analysis of how colonial origins interact with market access to shape fertility behavior. Indeed, we show that the average effect of British colonization masks important heterogeneity that depends on proximity to the sea coast, taken as a measure of historical and contemporaneous market access.[4] During the pre-industrial era, territories close to the coast were more accessible and attractive for early Europeans engaged in trade, mainly because of their proximity to European markets and the presence of natural harbors and capes amenable to docking ships. Consequently, European merchants settled in large numbers along the African coastline, quickly forming centers of commercial activity. Moreover, the potential for faster economic development generated by the existence of pre-colonial trade posts in areas close to the coast provided incentives for greater colonial investments in these areas compared to the hinterland (Huillery (2009), Okoye and Pongou (2017), Ricart-Huguet (2018)). Therefore, with greater access to global markets, and subsequently more economic opportunities, coastal areas (relative to the hinterland) were more likely to be similarly developed regardless of the identity of the colonizer. This was less likely to be the case in the hinterland where economic opportunities were more likely to be endogenous to colonial institutions.

[4] This analysis is possible because distance to sea is orthogonal to British colonization in our sample.

As a preliminary to our analysis, we show that these patterns have persisted to the present day. First, we show that coastal areas are much more developed today than the hinterland, and that women in those areas enjoy greater economic empowerment, implying a higher opportunity cost of childbearing. Second, we estimate the effect of British colonization on local economic development and female labor participation in the coastal areas and in the hinterland separately. In particular, we find that British colonization has a positive and significant effect on light density in areas far from the coast, but this effect disappears in coastal areas.[5] Reassuringly, we find similar results when using indicators of households welfare (child nutrition and child death) and female occupation and earnings, the latter measuring the opportunity cost of childbearing. These findings imply that across the British-French colonial border, areas closer to the coast are similarly developed. They also imply that the opportunity of having a child is not only higher in coastal areas compared to the hinterland, but it is equally high in these areas irrespective of the colonizer's identity.

Now analyzing the heterogeneous effect of colonial origins on reproductive outcomes, we find that British colonization has little effect on these outcomes in coastal areas. The fertility effect of British colonization is only present in the hinterland. These findings imply that the fertility effect of colonial origins does not persist when the opportunity cost of having a child is sufficiently high. From a policy perspective, our analysis suggests that even if history is immutable, its long-term effects can be modified through appropriately designed policy interventions that generate economic opportunities for women.[6]

Finally, we test the *direct* mechanism through which colonial origins affect reproductive outcomes in Africa. We show that British colonization has a strongly positive effect on the use of modern contraceptive methods, and that this effect is much greater in areas far from the sea. We also explore the *indirect* and secondary mechanism supported by our conceptual framework. This mechanism builds on the theoretical literature on the short-term drivers of fertility and demographic transition (Becker (1960), Mincer (1963), Becker and Lewis (1973), Galor and Weil (1996), Strulik (2017), Doepke and Tertilt (2018)). Following this literature, we consider three additional channels: (a) female education; (b) female economic empowerment; and (c) child quality (measured by child mortality and anthropometric indicators). We do not find strong evidence for this indirect mechanism. First, we find that British colonization has a larger effect on female education in areas close to the sea, in contrast to its heterogeneous effect on fertility. This clearly suggests

[5]Light density has been used to measure local economic development in several papers including Min (2008), Chen and Nordhaus (2011), Henderson et al. (2012), Pinkovskiy (2013), Michalopoulos and Papaioannou (2013, 2014).

[6]Importantly, these findings are novel and are of independent interest to studies of the long-term effect of colonial origins on economic development (Acemoglu et al. (2001), Michalopoulos and Papaioannou (2014)). Indeed, our study is the first to highlight the heterogeneous nature of the colonial origins of comparative economic development, and to show that the long-term impact of history can vary depending on exogenous market access.

that education is not the primary channel through which colonial origins operate. Second, we argue that the effect of British colonization on female economic empowerment does not explain its effect on fertility behavior in areas far from the sea for two reasons. The first reason is that the fertility gap between these colonies preceded the income gap (Figure 1-*c*). The second reason is that the effect of colonial origins on fertility in areas far from the sea persists even after controlling for household income (and/or female education). Finally, we find that the effect of colonial origins on measures of child quality is stronger in the hinterland, consistent with their heterogeneous effect on fertility. However, their effect on under-five mortality is weak and inconsistent. The analysis, therefore, suggests that the indirect mechanism is not the primary channel through which colonial origins affect fertility behavior in areas far from the sea. The findings are more supportive of our direct mechanism. The latter implies that the fertility effect of colonial origins is directly linked to colonial reproductive laws and their impact on the use of modern methods of birth control.

2 Contribution to the Literature

Our paper asks a new question. It explores the broad and important question of whether economic policies can mitigate the long-term impacts of history, even though history itself is immutable. We focus on colonial reproductive laws as a historical fact, but it is evident this question is generalizable to other historical facts such as the slave trade, colonial property rights institutions, and so on. Our main finding that market incentives can mitigate the long-term impacts of colonial origins implies that appropriately designed economic policies can overcome the bonds of historical determinism. Obviously, this finding can also be viewed as a contribution to the recurrent and often uneasy debate over the range of policy actions that can be undertaken to repair the damages of bad historical shocks.

Besides asking a new question, our study has three other contributions. First, our work nurtures the current debate on variation in the pace of demographic transition in Africa (see Bongaarts and Casterline (2013) and the references therein). While the extent literature explains this phenomenon by focusing on cross-country differences in the short-term determinants of fertility (such as female labor participation, education, child quality, etc.), we contribute to this debate by showing that deep-rooted political institutional factors matter, and that these factors matter primarily in areas with low market access.

Second, we focus on colonial reproductive laws, a feature of colonial institutions that has received no attention in the literature. To the extent that fertility affects economic development (Bloom et al. (2009)), our paper can be viewed as documenting a novel mechanism through which colonial origins have had a persistent impact on economic development in Africa. In this sense, it enriches the broad literature on the historical origins of comparative economic development (Acemoglu et al. (2001), La Porta et al. (2008), Nunn (2008), Alesina et al. (2011), Nunn and Wantchekon (2011), Okoye and Pongou (2014, 2017), Wantchekon et al. (2015), Michalopoulos and Papaioannou (2013), Alesina, Giuliano, and Nunn (2013), Acemoglu et al. (2014), Cogneau and Moradi (2014), Fenske and Kala (2017), Dupraz (2017), Anderson (2018); see also Michalopoulos and Papaioannou (2018) for a comprehensive literature review). However, our paper distinguishes itself from this literature in that we answer a completely different question. In doing so, our analysis is the first to highlight the heterogeneous nature of the colonial origins of comparative fertility behavior and economic development in Africa, a finding that has significant policy relevance.

Finally, our paper contributes to the nascent literature that investigates heterogeneity in the long-term effects of history. Using data from Nigeria, Okoye et al. (2019) show that colonial railroads have short-term and long-term impacts on several measures of local economic development. They analyze heterogeneity in the effect of colonial railroads, finding that its effect is only present in areas with low pre-railway access to the coast. In the same vein, in a study that investigates the role of national institutions for subnational development, Michalopoulos and Papaioannou (2014) show that the explanatory power of national institutions on regional economic development was only visible in areas close to the capital centers. Our paper clearly differs from the aforementioned studies in its scope, analysis, and policy implications.

The rest of this paper unfolds as follows. Section 3 describes our conceptual framework. Section 4 describes the data. Section 5 presents our empirical strategy. Our findings are presented in Sections 6 and 7. Section 8 discusses the mechanisms driving the fertility effects of colonial origins, and Section 9 concludes.

3 Conceptual Framework

In this section, we present our conceptual framework, which highlights the possible theoretical channels through which colonial origins may affect reproductive behavior. This framework is summarized in Figure 2. It features two types of channels. The first and primary channel is a *direct* mechanism supported by differences in colonial population policies. The second channel is a class of *indirect* mechanisms which we view as secondary. These latter mechanisms include the protection of marital property rights, the protection of economic property rights, administrative rules, and education policies. We argue that these channels affect proximate determinants of fertility behavior such as contraceptive use (our *direct* mechanism), household income, female education and economic empowerment, and child quality. In the next section, we first recall the theoretical literature on these proximate determinants, and then show how they could be affected by the aforementioned colonial institutions.

3.1 Literature on the Drivers of Fertility Behavior

Following the pioneering work of Becker (1960), the literature has emphasized child quality, female labor participation, education, and access to modern methods of birth control as the underlying factors of fertility decisions within the household (Mincer (1963), Becker and Lewis (1973), Galor and Weil (1996), Strulik (2017), Doepke and Tertilt (2018)). Becker's framework assumes that parents derived utility from both the quantity and the quality of their children, viewed as normal goods and treated similarly as other consumption goods. A key insight from this model is the child quantity-quality trade-off theory, whereby an increased demand for child quality lowers the demand for child quantity. Moreover, Becker's theory implies that a high level of income induces parents to demand fewer, higher quality children, because of an increase in the opportunity cost of raising children.[7]

The quantity-quality trade-off theory has been extended in several directions, uncovering new insights. An important literature emphasizes the role of female relative wages and education in explaining fertility (Mincer (1963), Schultz (1981), Galor and Weil (1996), and Galor and Weil (2000)). Galor and Weil (1996) show that a rise in the relative wage of women due to technological progress increases the opportunity cost of childbearing more than a rise in family income. This in turn enables women to substitute out of childbearing into the labor market, thereby reducing their demand for children. Similarly, Galor and Weil (2000) show that as the return to investment in education rises following technological progress, the opportunity cost of raising children rises as well, lowering fertility. Subsequent studies show that the role of female education in lowering fertility is mediated by delays in marriage and in onset of childbearing, and by a more effective use of modern methods of birth control (see Bongaarts (2010)).

Recent studies explicitly incorporate contraceptive use into economic models of fertility (Bhattacharya and Chakraborty (2017), Strulik (2017)). A key insight from these models is that, as income rises, households spend more on contraceptive methods, which allow them to experience utility from sexual activity without a proportional increase in the number of children. Contraceptive use is therefore seen as another factor that mediates the theoretically negative relationship between income and fertility (see also Becker (1960)).

[7] Galor and Moav (2002) incorporate technological progress into Becker's framework, uncovering a new quantity-quality theory. In their theory, parents substitute quality for quantity in response to technological progress that increases the returns to child quality.

3.2 British vs. French Colonial Institutions

In this section, we highlight several key aspects of colonial institutions that may affect fertility behavior through its proximate determinants documented in the previous section. These determinants are: contraceptive use, household income, female education and economic empowerment, and child quality.

3.2.1 Primary Mechanism: Colonial Population Policies and Reproductive Health Laws

Following World War I, Great Britain and France adopted very different population policies that were extended to their colonies and translated into differing culture of contraceptive use in these former colonies.

France adopted a pronatalist population policy in the early 1920s. In order to raise fertility and allow the country to regain the numerical superiority that it had in the centuries before the demographic deficit caused by World War I, on July 31, 1920, France passed a law that severely repressed abortion and that prohibited any propaganda on contraceptive use or directed against having children (Latham (2002), Garenne (2017)).[8] As part of French civil law, the application of the 1920 pronatalist law was extended to the French colonies. Despite subsequent amendments to the 1920 law and its repeal in December 28, 1967 in the metropole (*Loi Neuwirth*), with great liberalization of reproductive health laws, this pronatalist law remained in application in all former French colonies in Africa after their independence. In fact, in many francophone African countries, it was not until the 1980s and 1990s that this law was revoked, and reforms authorizing information and awareness campaigns on family planning were gradually introduced.

France's pronatalist laws contrasted with the liberal culture of reproductive rights in Great Britain. Indeed, the influence of Malthusianism alongside the emergence of a national conversation about family planning following the famous *Bradlaugh-Besant* trial that took place in England in 1877, democratized ideas of birth control in England and in societies with strong cultural ties to Great Britain. In fact, the *Bradlaugh-Besant* trial, named after two secular activists, Annie Besant and Charles Bradlaught, who were prosecuted for publishing a book providing elementary contraceptive information (see Appendix Figure A1), brought substantial attention to a subject highly controversial in Victorian Society. The central debate during this trial focused on the contemporary widespread argument that family size should be an optimal conscious choice. Despite the guilty verdict, the publicity surrounding the trial, inside and outside England (particularly in British colonies Beach and Hanlon (2019)), radically increased the demand for

[8] The pronatalist law of 1920 was reinforced by a law called the *"Code de la Famille"* introduced by the French government in July 30, 1939. This law gave more entitlements to adults with children, including cash incentives to mothers who stayed at home to care for children, subsidized holidays, better maternity leaves, and a lump sum transfer to parents with a third child.

information about contraception. Following the trial, the sales of books and pamphlets on family planning and contraception increased and in the subsequent years, England experienced a sharp decline in fertility. Beach and Hanlon (2019) demonstrate that the changing societal norms about family planning and contraception induced by this trial partly explained the sharp declined in fertility beginning in 1870s in England. Moreover, they show that the consequence of this trial resonates also in countries with strong cultural ties with England. In particular they associate the fertility decline in South Africa and English Canada (two British colonies) to the shift in societal norms surrounding family planning. More practical contraceptive information appeared beginning in 1921 with the establishment of clinics promoting birth control primarily in London. In addition, after World War II, the rising awareness of the world demographic problem intensified British efforts to control population growth through the development and dissemination of modern methods of contraception.

The British policies of population control, however, were not exported to their African colonies until the late 50s. Among African countries, Kenya was a pioneer in adopting family planning policies. Modern contraception was introduced in this country in 1957, and the first clinics offering modern methods of birth control appeared in 1960. The adoption of family planning policies in other former British colonies accelerated after their independence. For instance, in Ghana, interest in population control was materialized right after the independence with the creation in 1961 of "Family Advice Center" wish were specialized centers providing resources for family planning (Oliver (1995), Caldwell and Sai (2007)). During this period, as already mentioned, former French colonies were still under the 1920 pronatalist law. It was not until the World Population Conference held in Bucharest in 1974 that attitudes toward family planning began to change in these countries. This conference was a turning point essentially because it reunited representatives of 139 member states who drafted the "World Population Plan of Action", in which principles and directives for population policy and action were formulated. Beginning in 1980, certain former French colonies revoked the 1920 law, and by 1990 almost all of these former colonies had revoked it.

It follows that former British colonies introduced family planning policies much earlier than former French colonies. Moreover, studies have found even at present that these latter countries have more restrictive reproductive health laws than the former countries (Finlay and Erin (2017)). Exploiting an index of changes in reproductive health laws in sub-Saharan Africa (see Finlay et al. (2012)), Finlay and Erin (2017) also show that the effect of liberalization of reproductive health laws on contraceptive use among women is much greater in former British colonies than in former French colonies.

3.2.2 Secondary Mechanism: Colonial Rules

Legal Marital Laws. The degree of protection of marital property rights differs markedly under the French civil law and the British common law (Anderson (2018)). Under the common law and the underlying separate marital property regime, housewives have no rights to any of the marital property upon the marriage dissolving by either divorce or death. As a result, whereas separate ownership of property might imply benefits for female entrepreneurs through the protection of their own productive assets upon divorce, this marital property law has pernicious consequences for most women, in particular for those working on farms, because it does not recognize non-monetary contributions within the household. In contrast, the community marital property regime that characterizes the civil law system is associated with a stronger protection of marital property rights. In fact, a central feature of this marital regime is the joint ownership of marital property. It implies an equal division of property between the spouses in the case of marriage dissolution.

Some consequences of these differences have been documented in the literature. Anderson (2018) analyzes the effect of legal origins on HIV status in Africa. She finds that women under the common law regime are more likely to be infected with HIV than their counterparts under the civil law regime, but no effect is found among men. She argues that the community property regime (and thus the French civil law system) leads to empowerment of married women by increasing their bargaining power within the household. This translates into increasing use of protective contraception, thus lowering the risk of HIV.

Economic Property Rights. A number of studies focusing on the differences in the legal system inherited from colonization to explain cross-country variation in economic development have stressed the superiority of the common law system in two major legal outcomes: (i) the legal protection of private investors vis-à-vis the state; and (ii) the extent of judicial independence (La Porta et al. (1998), LaPorta et al. (1999), Beck et al. (2003)). In this literature it is claimed that by fostering greater independence of the judicial system and offering lighter government ownership and stronger legal protection of investors, the common law system limits the extent of expropriation and promotes contract enforcement and secured property rights. This is in sharp contrast with the French civil law system characterized by government ownership and regulation, which discourages investment and impedes economic development. Consistent with these theoretical propositions, many empirical studies show that the common law system is associated with more secure property rights, higher quality of government, greater political freedom, and better financial development in the present-day (La Porta et al. (1998), Djankov et al. (2002), Glaeser and Shleifer (2002)). This is consistent with Appendix Figure A2, which compares former British and French colonies in terms of different measures of contemporary institutional quality. Indeed, we see that former British colonies significantly outperform former French colonies in terms of the protection of property rights, level of democracy, bureaucracy quality, and quality of the business environment.

Colonial Administrative Rules and Education Policies. Historians of European expansion in former colonies have compared the British policy of indirect rule to the French policy of direct rule, arguing most of the time that the former was more conducive to economic growth and human capital accumulation (Crowder (1964), Bertocchi and Canova (2002), Iyer (2010)). Whereas French direct rule was highly centralized and based on the idea of assimilating colonial territories, British indirect rule was much more decentralized and dedicated to preserving local traditions and practices through collaboration with traditional chiefs. This difference contributed to the empowerment and legitimization of local governments in former British (vs. French) colonies, thereby building strong local political structures more complementary to economic growth and public goods provision.

A last difference between the British and the French colonization that is likely to influence fertility through its main proximate determinants is related to educational policies. In order to satisfy the increasing demand for educated administrative workforce within former colonies, both the British and the French colonial governments developed a dual system of private and public schools, although with a different intensity. Unlike the French, the British relied heavily on mission societies to provide and diffuse education. This may have contributed to generating a British advantage in educational outcomes. This advantage was especially stronger for women in former British colonies given that Protestant missions prioritized female education and were more present in the British colonial empire, as opposed to the Catholic missions more present among the French (Nunn (2011)).

The aforementioned British-French differences have persisted to the present-day, as illustrated in the descriptive analysis of Appendix Figures A3-*a* and A3-*b*. These figures show that former British colonies invest more in health and education than former French colonies. In addition, Appendix Figure A3-*c* shows that female in former French colonies are more likely to have no education compared to their counterparts in former British colonies. These figures are consistent with empirical studies showing higher level of household wealth, educational attainment, and greater provision of local public goods in former British areas (Dupraz (2017), Lee and Schultz (2012)). Further, analyzing historical archives on colonial public investments, Dupraz (2017) attributes the advantage in educational outcomes among anglophone to higher public investments in education in former British colonies than in former French colonies.

3.3 Linking Colonial Origins to Fertility: A Theoretically Ambiguous Relationship

It follows that colonial origins have a theoretically ambiguous effect on reproductive outcomes. To the extent that colonial population policies have had persistent effect on present-day reproductive culture and contraceptive use, one should expect women in the former British colonies to delay marriage and initiation of sexual relationships, and to have fewer children compared to their counterparts in the former French colonies. Similarly, if, as argued above, other British colonial institutions including the protection of economic property rights laws, administrative rules, and educations policies positively affect the other drivers of fertility (household income, female education, female economic empowerment, and child quality) the same effect should be expected. At the same time, if the civil law system empowers women and increases their relative bargaining power in the household, one should expect the opposite effects. It appears, therefore, that the theoretical relationship between colonial origins and reproductive behavior is not unambiguous. This indeed justifies the empirical analysis to follow.

4 Data and Descriptive Statistics

We examine the impact of British (vs French) colonization on several reproductive outcomes including the number of children born to a woman, the onset of childbearing, marriage timing, and sexual behavior. For this purpose (see Section 5 below), we matched individual-level information on reproductive behavior from Demographic and Health Surveys with georeferenced data on historical ethnic homelands and geographical data in Africa. In this section, we describe these datasets and how we match them. We also describe how we measure geographic and location variables exploited in this paper.

4.1 Individual-level Data

Information on reproductive behavior and socioeconomic and demographic characteristics is drawn from Demographic and Health Surveys (DHS). These surveys are conducted every five years since 1986 in most African countries. Each DHS survey [9], interviews a nationally representative sample of women aged 15 to 49 years old and men aged 15 to 59 years old. DHS surveys gather detailed information on a host of demographic, health, and socio-economic characteristics of women and men. For the purpose of the analysis below, we match observations from each country with information about the identity of the colonizer who administered the country the longest during the colonial era.

[9]Information from DHS surveys are generally recorded at different levels. The analysis in this paper relies mainly on the Individual Recode (IR) files, the Household Recode (HR) files, and the Child Recode (CR) files.

In this paper, we only analyze DHS surveys collected from sub-Saharan African countries colonized by either Great Britain or France. Among these countries, due to our identification strategy (described in Section 5), we select only former British (French) colonies that share border with a former French (British) colony. We further restrict the analysis to DHS surveys with GPS information and to women aged 20-49 years old, whose migration status is known. This leaves us with a sample of $34,405$ women living in 10 countries, among which 7 countries are former French colonies and 3 countries are former British colonies.[10] The first panel of Appendix Table A1 provides summary statistics on the main outcomes of interest as well as on individual socioeconomic and demographic variables used in the empirical analysis.

4.2 Ethnicity-level Data

To effectively circumscribe the causal impact of British (vs French) colonization on fertility behavior, we control for ethnic homeland fixed effects in our empirical strategy. Ethnic homeland fixed effects ensure that our estimated effect is not biased by ethnic-specific characteristics such as culture or norms surrounding gender and fertility. In fact, it is possible that former British and French colonies have different pre-colonial characteristics that also determine reproductive behavior. By controlling for ethnic homeland fixed effects, we also address this potential source of endogeneity. We also control for religious affiliation, given the fact that Protestant missions were more likely to be present in British colonies whereas French colonies had more Catholic missions (Nunn (2011)). Controlling for religion is also important because Islam, which predates European missionary activities in Africa, is more present in certain countries than in others.

We collect data on the location coordinates of historical ethnic homelands by relying on George Peter Murdock's Ethnographic Map of Africa (1959). This map portrays the spatial distribution of 826 ethnic areas across Africa at the time of colonization. Following a similar approach as in Michalopoulos and Papaioannou (2013, 2014, 2016), we overlay contemporary national boundaries of Africa on Murdock's map to identify historical ethnic homelands that are split across former colonies (Figure 3-*a*). Figure 3-*b* shows the same map but only retains the subset of former British and French colonies for which both DHS and geographic data are available.

4.3 Geographic Variables

Using GPS information from the DHS, we augment the individual-level data with geographic information measured at a very fine level. Following Michalopoulos and Pa-

[10]Former French colonies are: Benin, Burkina Faso, Cameroon, Ivory Coast, Guinea, Niger, and Togo. Former British colonies are: Ghana, Nigeria, and Sierra Leone. In a robustness analysis we exclude Cameroon and Togo, whose first colonizer was Germany; this does not affect our main conclusions.

paioannou (2013), we divide Africa into pixel units of $12km \times 12km$. For each pixel, we rely on various sources (see Section A7) to collect information on the following measures of geographic and natural endowments: elevation, soil suitability for agriculture, area under water (rivers, lakes, streams), natural resources, distance from the centroid of a pixel to the sea coast, and distance from the centroid of a pixel to the national border. Panel B in Appendix Table A1 shows some descriptive statistics for these variables. To implement the spatial RDD analysis (see Section 5), we define the running variable as the nearest distance from the centroid of a pixel to the British-French border. In Section 5, we show that these geographic variables do not vary across the British-French border, which is reassuring as it implies that within each ethnic homeland, areas that were colonized by the British are comparable to areas that were colonized by the French with respect to measures of local economic development in the precolonial era. Nevertheless, we also show regression results that control for these variables. Importantly, controlling for these variables in addition to ethnic homeland fixed effects, largely account for pre-colonial events such as the slave trade, given that the number of slaves exported from each area was primarily a function of the distance to the coastline and some of the aforementioned geographic variables.

5 Identification Strategy: Regression Discontinuity Design

We estimate the causal effect of colonial origins on reproductive outcomes using a spatial Regression Discontinuity Design (RDD) with ethnic homeland fixed effects. A central feature of this identification strategy is to exploit within-ethnic homeland variation across individuals residing close to the British-French border. We have a baseline strategy that consists of applying this methodology to the whole sample. However, this strategy is likely to suffer from spillover effects at the border, leading to an attenuation bias. We address this concern using a second strategy that consist of restricting the analysis either to natives or to natives that live at least 5km to the border on each side. Throughout, results from these identifications strategies are contrasted with those obtained from the Ordinary Least Squares regressions.

5.1 Baseline Strategy

Our baseline strategy is expressed as follows:

$$Y_{ipcet} = \alpha + \beta British_c + f(BD_{pce}) + \delta_e + \gamma_t + \sigma_a + \theta_r + Z'_{pce}\mu + \varepsilon_{ipcet} \quad (1)$$

where Y_{ipcet} is the outcome of interest for an individual i born at time t, living in country c, ethnic homeland e, and pixel p. The variable $\mathsf{British}_c$ is equal to one if the country was colonized by Great Britain and zero if it was colonized by France. Our coefficient of interest here is β. This coefficient gives the local average effect of British colonization on reproductive behavior. δ_e, γ_t, σ_a, and θ_r are ethnic homeland fixed effects, year of birth fixed effects, age fixed effects, and religion fixed effects, respectively. Z'_{pce} is a vector of location controls (distance from the centroid of pixel p to the sea coast and distance from the centroid of pixel p to the nearest national border) and geographic controls (area under water, elevation, soil suitability for agriculture, pixel area, and natural resources), all measured at the pixel level.

Lastly, the function $f(BD_{pce})$ represents a second-order RD polynomial of the distance from the centroid of each pixel to the British-French border. Yet, for robustness checks and to account for the multidimensional nature of the cut-off in a spatial RDD (Dell (2010)), we also show that our results are robust to two other specifications where we consider different parametric functions of $f(BD_{cep})$: (i) a third-order RD polynomial of the distance from the centroid of each pixel to the British-French border; and (ii) a cubic polynomial in latitude and longitude of a pixel.

For inference purposes, we follow the method of Cameron et al. (2011) and cluster standard errors along both the country and ethnic-family dimensions.[11] As pointed by Cameron et al. (2011) the double-clustering enables to account for spatial correlation and other arbitrary correlation within each dimension.

We exploit the empirical specification in equation (1) to estimate the average effect of British (vs. French) colonization on reproductive behavior (Section 6). In addition, in Section 7 we use the same specification to estimate the heterogeneous impact of British colonization by market access.

5.2 Addressing Spillover Effects

A potential threat to our identification strategy comes from the fact that *spillover effects* induced by migration from other regions and by migration across the British-French border could possibly bias our results. Indeed, using the current place of residence to identify the ethnic homeland of an individual, as we do in the baseline model, has potential flaws. First, if areas close to the border attract individuals from other regions and cultures of the country, then including those individuals in the analysis could bias our baseline estimates, as they do not properly control for culture. We address this issue by restricting the analysis to natives only. The latter are individuals who never lived elsewhere than their place of birth. They have therefore only been subjected to the cultural influence of the ethnic homeland in which they were born.

[11] Murdock (1959) identifies more that 800 pre-colonial ethnic groups across Africa and assigns them into 96 ethnolinguistic families.

Second, in a context where ineffective border controls have been shown to drive irregular and circular migrations (Lohrmann (1989), Adepoju (2008)), it is most likely that, at a certain point in their lifetime, some people might have migrated from the British side to the French side of the border and vice-versa. Indeed, due to the arbitrary division of ethnic homelands across colonial borders, many families that were very close to the border were split between different countries. These individuals who maintain ties across the border are likely to cross the border to reside temporarily on the other side. They are therefore likely to be treated doubly, by both the British and the French colonial legacies, leading to an attenuation bias. To assuage this migration issue at the border, we perform the analysis on the subset of natives, but excluding individuals inside pixels that fall within 5km of each side of the border. This approach is similar to an RDD estimation where we assume that the British-French border that divides the ethnic homeland is thick by 10km. Michalopoulos and Papaioannou (2013) follow a similar approach in a study of the role of pre-colonial ethnic institutions on contemporary African development. This approach addresses the spillover issues in the baseline model.

5.3 Validity of the Identification Strategy

There are many challenges associated with spatial RDD. In our setup that compares individuals' reproductive behavior within the homeland of the same ethnicity in adjacent countries with different colonial origins, the validity of the identification strategy requires that observations are close-to-randomly assigned into treatment and control groups across the border. That is, the border between former British and French colonies within the homeland of the same ethnicity should not be influenced by local circumstances such as existing political or institutional factors that themselves are potentially important determinants of reproductive behavior. Indeed, historians and social scientists concerned with the European expansion and colonization in Africa provide ample evidence of the randomness of African borders. They argue that at the time of the scramble for Africa in the 1880s, Europeans had in most cases, drawn the African borders without or with extremely limited knowledge of local conditions (see for instance Michalopoulos and Papaioannou (2015, 2013) for a review of historical arguments supporting the arbitrary drawing of African borders). Thus, the incidental nature of this historical event ensures that the border between countries with different colonial origins is locally random.

Another key identification assumption in the RDD setup requires that the relevant determinants of the outcome of interest, besides the treatment, should vary smoothly at the border. It implies, therefore, in our specific case, that ethnic areas across the border should be similar across all relevant factors of reproductive behavior, with the exception of the identity of the colonizer. We assess the plausibility of this assumption by examining the relationship between colonial origins and a set of observable characteristics that may independently affect reproductive behavior. Using an RDD approach similar to our main specification (equation (1)), we estimate the effect of British colonization on various geographic, ecological, and natural resource variables (dependent variables) that are likely to shape reproductive outcomes. Results are displayed in Table 1. We find no effect of British colonization on any of these outcomes. Since these outcome variables are also important determinants of initial economic development our results also imply that, within ethnic homelands, areas colonized by the British were similar to those colonized by the French in terms of precolonial economic development.

6 Average Effect of Colonial Origins

We now examine empirically the causal relationship between colonial origins and reproductive outcomes by exploiting variation within ethnic groups partitioned between former British and French colonies. Before turning to the main empirical findings, we first provide a graphical illustration of the RD estimates of the British effect on fertility and other reproductive outcomes.

6.1 Graphical Illustration

Figures 4 and 5 provide a visual illustration of the RD design, where the running variable is defined as the geodesic distance (in kilometers) from the centroid of each pixel to the nearest British-French border. The vertical line in these graphs marks the British-French border (the cut-off at zero). Each graph plots, for individuals within 5km bins, the average value of the outcome of interest, conditional on the colonial origin, ethnic homeland fixed effects, age, and year of birth fixed effects. The two-dimensional curve overlaid on each scatter plot shows the predicted outcome for a regression that includes a linear polynomial in the running variable, fitted separately using raw data from former British colonies (where distance takes on positive values) and raw data from former French colonies (where distance takes on negative values). Following our preferred empirical identification strategy which accounts for *spillover* issues at the border, we plot the RD graphs using the sample of natives.

In Figure 4 we focus on the number of children ever born. The RD graphs for the other outcomes are displayed in Figure 5. Figure 4-*a* shows that at the border, women in former British colonies have slightly less children than their counterparts in former French colonies. A similar jump a the border is observed when we consider the other outcomes of interest in this paper. Indeed, in Figures 5-*a* and 5-*g*, we observe a lower probability of onset of childbearing before age 18 and child marriage (that is marriage before age 18), respectively, amongst females living on the British side of the border. Figure 5-*d* shows that women in former British colonies are slightly more likely to delay initiation of sexual activity. We observe a similar pattern on the RD graphs where we consider the whole sample containing both natives and non natives (Figures A4 and A5).

6.2 Fertility Behavior

In this section, we discuss the RD estimates of the average effect of British (vs. French) colonization on the number of children born to a woman. We start by presenting the baseline results from an estimation of equation (1), where Y_{icept} is the total number of children ever born for a randomly selected woman i. Then, we present results that address *spillover effects* at the border.

6.2.1 Baseline Results

The baseline estimates of the effect of British colonization on fertility measured by the number of children ever born are presented in *Panels A* and *B* of Table 2. In each column of this table, we control for ethnic homeland fixed effects, age fixed effects, year of birth fixed effects and religion fixed effects. Below the estimates, we report robust standard errors, adjusted for double-clustering at the country and the ethno-linguistic family level. We begin by reporting in the first column within-ethnicity Ordinary Least Squares (OLS) estimates which account for idiosyncratic country- and ethnicity-specific characteristics that are likely to confound the results. We find that the within-ethnic homeland estimate is negative and statistically significant. Females in former British colonies have on average 0.4 fewer children.

In order to address the concern that some hard-to-account-for or unobservable factors such as geographic and ecological factors, are likely to drive the OLS results, we implement an RDD approach using four different bandwidths. Specifically, we restrict the sample to pixels within 60km, 100km, 150km, and 200km from each side of the British-French border.[12] Results are displayed in columns (2)-(5). The empirical specification in each of these columns includes a second-order RD polynomial in distance from the centroid of a pixel to the nearest British-French border. The RD estimates reveal that women in former British colonies have significantly fewer children than their counterparts in former French colonies. The fertility effect of British colonization is not only significant, but it is also economically meaningful. The British effect on fertility ranges from -0.33 to -0.45, representing a decline in fertility of about 8 to 11% of the average number of children per woman in the sample.

The British impact on fertility barely changes (*Panel B*) when we augment the specification with a rich set of geographic and location controls including measures of area under water, elevation, soil suitability for agriculture, area of the pixel, natural resources,

[12]In Figure 6 we show results for a larger set of bandwidths.

and distance to the national border. The coefficient on British colonization remains precisely estimated in all specifications. Moreover, the size of each coefficient is similar to the estimate obtained where we do not add control for geographical factors, which reflect the fact that there is no discontinuity in these factors at the border. The next section presents estimates that address the issue of *spillover* at the border.

6.2.2 Addressing Spillover Effects at the Border

In Section 5, we argued that spillover effects induced by migration could bias our estimates of the true effect of British colonization on reproductive behavior. Following our identification strategy, we address this issue in two different ways.

First, we estimate equation 1 on the subset of natives. Natives are individuals who never lived elsewhere than their place of birth since they were born. They have therefore been subjected only to the culture of their ancestral ethnic homeland. The conditional and unconditional estimates are displayed in *Panels C* and *D* of Table 2, respectively. Compared to the baseline results in *Panels A* and *B*, the negative effects of British colonization on fertility reported in *Panels C* and *D* are quantitatively larger and more precisely estimated. In the most restrictive specification in column (2) of *Panel C*, when we limit our attention to areas within 60km of the British-French border, the coefficient on the dummy for British colonization is negative (-0.39) and statistically significant. The coefficient increases in absolute term (up to -0.52) and retains its statistical significance as we increase the bandwidth. Turning on to Panel D, when we control for geographic characteristics, we see that the coefficient on the British colonization dummy is in the range -0.38 - -0.44, quite similar to the estimates in *Panel C*. Across all specifications, the results show that native women in former British colonies have significantly fewer children than their counterparts in former French colonies.

Second, in *Panels E* and *F* of Table 2, we perform estimation on the subset of natives, but excluding individuals in pixels that fall within 5km of each side of the border. Individuals within 5km of the border are more likely to cross the border and maintain (family) links on the other side.[13] As we already argued, they are therefore likely to be doubly treated, and including them in the sample is likely to bias our estimates downward. Excluding these individuals strengthens our findings that women in former British colonies have significantly fewer children than their counterparts in former French colonies. Indeed, the British effect in all specifications is larger (in the range -0.46 - -0.61) and significant at the conventional level, while the standard errors become tighter. Here also, controlling for geographic characteristics does not affect the results.

Our analysis is robust to a set of other specifications. Following the empirical literature on RDD, we investigate the sensitivity of our results to alternative specifications including

[13] In results not shown, we exclude individuals within higher distances (e.g., 15km) of the border, and we find qualitatively similar results.

higher-order RD polynomial and semiparametric RD approaches (Dell (2010)). Results are reported in Appendix tables A2-A5. These tables show that the uncovered negative link between British colonization and fertility remains globally intact. We also show that our results are robust to a specification that excludes Cameroon and Togo whose first colonizer was Germany (Table A7).[14]

6.3 Other Reproductive Outcomes

In this section, we analyze the effect of British colonization on other reproductive outcomes. These outcomes include the likelihood of childbearing, the timing of becoming sexually active, and age of marriage. In addition to be interesting in their own rights, these variables are viewed as proximate determinants of fertility. It follows, therefore, that analyzing them reveals the proximate mechanism through which colonial origins affect fertility. Results from this analysis are presented in Table 3. The first three panels show estimates from a regression where we consider the whole sample of women (baseline specification). Estimates from other specifications where we restrict the analysis to natives and natives not living in pixels within 5km of the border are displayed in *Panels D - I* . Each panel of this table reports results from estimating our baseline equation (1), where Y_{icept} is (1) the probability that a randomly selected woman has had her first child before age 18(*Panels A*, D, and G); (2) a woman's age at first sexual intercourse (*Panel B*, E, and H); and (3) the probability to marry before age 18 (*Panel C*, F, and I). In each column of Table 3 we control for the same set of variables as in Table 2 in addition of controlling for geographic and location variables.

Analyzing the RDD results in columns (2)-(5) of Table 3, we find that on average, women in former British colonies are significantly less likely to have their first child before age 18 compared to their counterparts in former French colonies (*Panel A*). Controlling for spillover effects at the border (*Panels D* and *G*), slightly raises the coefficient on British colonization. In *Panel B* of Table 3, we focus on the British impact on the timing of first sexual intercourse. This impact is positive and statistically significant at the conventional level. The results show that women in former British areas are more likely to delay initiation of sexual activity compared to women in former French areas. Turning to the impact of British colonization on marriage timing, we find that the risk of child marriage (that is marriage before age 18) is significantly lower for female in former British colonies relative women in former French colonies (see *Panel C* in Table 3). These findings are quite consistent across specifications that use different bandwidths, or control for several confounders including spillover at the border. Moreover, all these results are robust to controlling for a higher-order RD polynomial and an RD polynomial in latitude and longitude of the pixel (Appendix tables A2-A5).

[14] In analyses not reported here, we find similar results when we exclude Cameroon and Togo separately

7 Heterogeneous Effects of Colonial Origins by Market Access

The findings uncovered so far demonstrate that deep-rooted political institutions have persistent effects on fertility and other reproductive outcomes. However, the extent to which such institutions interact with exogenous economic forces to determine outcomes has not been widely studied. In this section, we address this gap by studying how the effect of British colonization varies with market access. By generating income-earning opportunities outside of the household, market access is likely to increase the opportunity cost of having a child. If the prevalence of such opportunities is sufficiently high, it is likely to attenuate the fertility effect of colonial origins. If this hypothesis is validated empirically it will have important policy implications because it shows that appropriately designed economic interventions can break the bounds of historical determinism.

In what follows, market access is measured by proximity to the coast. We will show that coastal areas are more developed than the hinterland irrespective of colonial origins, and that these areas are similarly developed across the British-French colonial borders. We will then study the heterogeneous effect of British colonization, by estimating this effect separately in areas close to the coast and in areas farther inland. We find that this effect is only present in the latter areas, which shows that in coastal areas the high opportunity cost of having a child nullifies the effect of colonial origins on fertility outcomes.

7.1 Proximity to the Sea: An Exogenous Determinant of Market Access

Studies examining the historical origins of the contemporary divergence in economic development across countries and regions in Africa have sometimes compared coastal areas to the hinterland, with the former being economically wealthier than the latter. This literature provides two main explanations for the persistent economic preeminence of coastal areas relative to the hinterland in former African colonies. The first explanation is the initial geographical endowment of coastal areas. In a pre-industrial context where mobility and economic activity are largely influenced by geographical conditions (Diamond (2005)), early Europeans engaged in the trade mainly landed in Africa where coastal geography was favorable. That is, where coastal areas featured the presence of natural harbors[15] and capes amenable to docking ships (Ricart-Huguet (2018), Huillery

[15]For instance, in the East and Western African coast, the Portuguese and later the French first established trade ports in the natural harbor of the Senegal River and the Cape which later became the cities of Saint-Louis and Dakar in Senegal. Similarly, the British landed in the natural harbor of Tagrin Bay in Freetown and Cape Coast in Ghana.

(2009)). This geographical advantage drove massive European settlements in territories close to the coast which, therefore, became centers of transatlantic trade activities during the pre-colonial era, at the expense of the hinterland. This spatial concentration of economic activity is consistent with the literature suggesting that due to low transportation costs and an extended scope of the market, industrialization is expected to almost always proceed first upon the coast before extending to the hinterland of a country (Smith (1977)).

In addition, in a study theorizing the creation of industrial hubs, Krugman (1991) emphasizes the role of transportation costs in the location decision of manufacturing firms in order to explain the coexistence of an âindustrialized coreâ and a âagricultural peripheryâ within a country. One could argue that the commercial activities along the Western and Eastern coast of Africa during the transatlantic trade therefore contributed to these areas offering more economic opportunities and becoming richer. The empirical results in Table 4 support these theoretical arguments. Indeed, using a fixed effects model, we find a highly significant negative association between distance to the sea and several measures of local economic development, including light density, an indicator for whether the respondent is engaged in activities requiring high skills, an indicator for whether the respondent receives cash earnings, and an index for asset holdings.[16] To the extent that the latter measures constitute good proxies for the costs of childbearing, results from Table 4 imply that the opportunity cost of having a child effectively decreases with distance to sea. Put another way, the opportunity cost of having a child is higher close to the sea compared to in the hinterland.

A second explanation for the persistence of the economic advantage of coastal areas emphasized the role of colonial investments for current development outcomes. A growing literature demonstrates the importance of colonial investments in explaining contemporary regional inequalities in development (Ricart-Huguet (2018) and Huillery (2009)). Exploiting large historical datasets, Ricart-Huguet (2018) provides empirical evidence on the unequal spatial distribution of colonial investments (in infrastructure, health, and education) in both the British and French empires. Analyzing investment inequality within colonial states, this study shows that districts closer to the sea received more colonial investments than those farther away. A conclusion that one could draw from this study is that all colonial powers prioritized coastal areas in their allocation of colonial resources, therefore inducing more economic development opportunities in these areas.

It follows from these arguments that coastal areas were more likely to be similarly developed regardless of the identity of the colonizer. This is also the case because European colonizer mostly settled and ruled their colonies from areas (generally colonial capitals) that were close to the sea (Michalopoulos and Papaioannou (2014)). However,

[16] The asset index takes value 1 if the respondent is living in a household holding at least one of the following assets: radio, television, refrigerator, bicycle, motorcycle, and car.

the situation was different in the hinterland, primarily due to differences in governance style. For instance, unlike French colonization, British colonization was more effective at promoting collaboration with local chiefs. To the extent that such a decentralized form of governance is conducive to local economic development (Crowder (1964), Bertocchi and Canova (2002), Iyer (2010), Lee and Schultz (2012)), this implies that the British advantage in economic development should be stronger in areas far from the sea. Therefore, if the opportunity cost of having a child is sufficiently high, so as to dominate the direct effect of colonial origins on reproductive outcomes, we should not expect to see any effect of British colonization on these outcomes in coastal areas. This effect should be more pronounced in areas far from the sea, where market access is lower and economic opportunities scarcer.

7.2 Colonial Origins, Proximity to the Sea, and Light Density

In this section, we test the hypothesis that the British advantage in terms of local economic opportunities is less pronounced in coastal areas compared to areas that are far from the coast. Following the literature on the lasting impact of colonization, we used the median distance to the sea as a cut-off that splits the sample into pixels falling above and below this median value.[17] Then, in each subsample we compare local economic opportunities, as proxied by light density, across former British and French colonies within the same ethnic homeland.

Formally, we use the following RDD specification separately for observations above and below the median distance from the coast:

$$Y_{pce} = \alpha + \beta British_c + f(BD_{pce}) + \delta_e + Z'_{pce}\mu + +\varepsilon_{pce} \quad (2)$$

Equation (2) is similar to our main specification in equation (1), except for the following changes. First, our unit of observation is the pixel. Second, our outcome of interest is now either a dummy for whether the pixel is lit or not;[18] or a variable equal to ln(0.01 + Mean of light density in the pixel).[19] Results are reported in Table 5. Similar to our main specification, we present the results for different bandwidths of the spatial RDD. Even-numbered columns report results for the subsample of pixels close to the sea (below

[17]For instance, Michalopoulos and Papaioannou (2014) exploit the median distance to the capital city to examine heterogeneity in the relationship between national institutions and subnational development in Africa. Similarly, Okoye and Pongou (2017) use the median distance to ports to assess the heterogeneous impacts of colonial railways in Nigeria.

[18]This variable takes the value 1 if the average light density in the pixel is strictly greater than zero and takes the value 0 otherwise.

[19]Because light density is equal to zero in more than 50% of the sample we used a logarithmic transformation of the continuous measure of light density, following the same approach as in Michalopoulos and Papaioannou (2013).

the median distance to the coast), while odd-numbered columns display estimates for pixels that are far from the sea (above the median distance to the coast).

Regardless of how we define the outcome variable (*Panels A* and *B*), we find significant and large differences in light density between former British and French colonies only in areas far from the sea. In these areas, British colonization has a positive effect on light density, and thus local economic opportunities. Close to the sea, however, the effect of British colonization on light density is economically small and is not statistically significant. The finding is qualitatively the same when we consider different bandwidths of the spatial RDD or when we augment the specification with a rich set of geographic and location controls (*Panels C* and *D*). Results from Table 5 are thus consistent with our hypothesis, as they imply that coastal areas are similarly developed across colonial borders and areas far from the sea are more developed on the British side compared to the French side. This evidence is also strengthened by the non-significant association between the identity of the colonizer and the proximity to the sea coast (column (7) in Table 1), which ensures that our measure for economic opportunities (distance to the sea) is truly exogenous to the identity of the colonizer. Moreover, using other measures of economic development and household welfare such as child mortality and nutrition we show that the British advantage in these outcomes only appears in areas far from the coast (see Table 10).

7.3 Heterogeneous Effects of British Colonization on Reproductive Behavior

Having established that in areas closer to the sea, there are no systematic differences in economic opportunities across former British and French colonies, we can now examine the heterogeneous effects of British colonization on reproductive behavior by proximity to the sea, our measure of market access. To do so, we implement the RDD specification in equation (2), separately for observations falling in the pixels that are close and far from the sea. Results are displayed in Tables 6 and 7. As in the previous section, even-numbered columns show estimates for the subsample of pixels close to the sea, whereas in odd-numbered columns we report the effect of British colonization on reproductive behavior for pixels far from the coast. Figures 4-*b* and 4-*c* illustrate graphically the results from this analysis when we focus on the number of children ever born. In Figure 4-*b*, we restrict the analysis to observations close to the coast, while in Figure 4-*c*, we restrict the analysis to observations that are far from the sea. The graphs clearly show that the jump at the border is larger and only present when we consider areas far from the coast. A similar pattern is observed for the other outcomes (second and third rows in Figure 5).

Fertility. Table 6 shows estimates of the heterogeneous impact of British colonization on the total number of children born to a woman at the survey. Each panel of this table presents estimates from three regressions that differ on whether and how they address the issue of spillover effects at the border. Consistent with the RD graphs and the theory, women in former British colonies have significantly fewer children than their counterparts in former French colonies only in areas far from the sea coast. In areas close to the coast, the effect is economically small and not significant. These results are consistent across different bandwidths of the spatial RDD. In *Panel A* when we consider the whole sample, the estimated British-French gap in fertility observable in areas far from the sea ranges from -0.45 to -0.51. The effect changes little when we augment the model by controlling for geographic and location controls (*Panel B*). The estimated fertility gap in non-coastal areas is even larger when we account for spillover at the border. In fact, the estimated fertility gap ranges from -0.50 to -0.59 when we restrict the analysis to the sample of natives only (*Panels C* and *D*), and from -0.51 to -0.64 when observations in pixels within 5km of the border are dropped in addition to only focusing on natives (*Panels E* and *F*). In areas close to the coast, the effect of British colonization remains small and is not statistically different from zero.

Other reproductive outcomes. Table 7 shows the heterogeneous impact of British colonization on the other reproductive outcomes analyzed in this paper: the likelihood of childbearing (*panel A*), age at first sexual intercourse (*panel B*), and the likelihood of marriage before 18 (*panel C*). Overall, for each outcome, the effect of British colonization is qualitatively similar to that found for the number of children. In absolute value, this effect is larger and globally significant in areas far from the sea.

Some results are worth highlighting. Whereas the "average" effect of British colonization on the likelihood of childbearing estimated over the whole sample is negative but not statistically significant (Table 3, *panel A*), this effect is now larger and significantly different from zero in areas far from the sea. Concerning the effect of British colonization on the probability of getting married before age 18, it is negative and statistically significant in areas far from the coast. In areas close to the coast, this effect is much smaller and not significant. This result implies that women in former British colonies are more likely to delay marriage, and that this effect is only visible in areas far from the coast. Turning to the timing of first sexual intercourse, even though the coefficient on the British colonization dummy is positive and statistically significant in both areas far and close to the sea, the magnitude of the effect is larger in areas far from the sea. The findings are qualitatively similar when we account for spillover effects at the border (Table 3, *panel D - I*).

Overall, the results show that the effect of British colonization on reproductive outcomes is significantly larger in the hinterland as compared to coastal areas. These findings remarkably mirror the fact that the effect of British colonization on local economic development is only present in areas far from the coast. We can therefore conclude that colonial origins have little effect on reproductive outcomes when the opportunity cost of having a child is sufficiently high. In the next section, we document micro-founded mechanisms of the fertility impact of British colonization, which are mechanisms operating at the individual level.

8 Mechanisms

In our conceptual framework, we highlight two types of channels that may link colonial origins to fertility behavior in the African context. The first is a *direct* channel supported by differences in colonial population policies and reproductive health laws. This is our *primary* channel and we expect that through this channel, colonial origins will have a direct impact on the use of modern methods of birth control. The second type is a class of *indirect* and *secondary* channels including: (1) female education; (2) female economic empowerment; and (3) child quality. These indirect channels proceed from the theoretical literature on the drivers of fertility (Mincer (1963), Becker and Lewis (1973), Galor and Weil (1996), Strulik (2017), Doepke and Tertilt (2018)). However, they may be theoretically less important than our primary mechanism because a large empirical literature shows that contraceptive use (our primary mechanism) has a positive effect on women's human capital, labor participation and child quality (health and education) through a reduction in fertility (Ananat and Hungerman (2012), Myers (2017)). Taking advantage of the rich set of information provided in the DHS, we examine each of these channels by investigating the heterogeneous impact of British colonization by market access on their corresponding variables. Specifically, we implement an empirical analysis similar to the heterogeneous analysis conducted in Section 7.[20] If any of the aforementioned variables mediates the heterogeneous effect of British colonization on fertility outcomes, then British colonization should have a greater effect on this mediating variable in areas far from the coast.

Contraceptive Use. Our primary and *direct* mechanism implies that the use of modern (vs. traditional) methods of birth control should be greater in former British areas compared to former French areas. Moreover, the effect of British colonization on contraceptive use should be larger in the hinterland compared to coastal areas, consistent with our findings in Section 7 showing that the opportunity cost of having a child is high in the latter areas regardless of the colonizer's identity. We explore this channel in Table 8. The outcome variable in this table is current use of modern methods of birth control. We define this variable as a binary indicator, which is equal to one if the respondent is using a modern method of birth control, and zero if the respondent is using a traditional method. Traditional methods of birth control include: periodic abstinence, abstinence,

[20]We choose to present the heterogeneous effects of colonial origins on these variables because they provide a more precise and complete view of the possible mechanisms underlying our main results.

withdrawal, standard days method, and other methods. Modern methods include: pill, IUD, injections, diaphragm, condom, female sterilization, male sterilization, lactational amenorrhea, implants/norplant, female condom, and foam/jelly. Table 8 shows that women in former British colonies are significantly more likely to use a modern method of birth control in both coastal areas and the hinterland, and consistent with our predictions, this positive effect of British colonization is economically much larger in the hinterland. This corroborates the notion that economic opportunities induced by proximity to global markets raise the opportunity cost of childbearing, thus triggering a demand of more effective methods of birth controls regardless of colonial origins.[21]

Now we examine the *indirect* channel.

Female Education. Economic growth theory argues that an exogenous increase in the returns to investment in education raises the opportunity cost of childbearing, thereby lowering fertility demand. To test this channel, we define female education as the total number of years of education for each woman in our sample. We use this measure as our dependent variable in equation (2) and report results in Table 9 (*panels A, D and G*). We find that British colonization positively affects female education both in areas close to the sea and areas that are far from the sea. Interestingly, the effect is larger in coastal areas. Note that this is in contrast to the fact that the effect of British colonization on fertility behavior is much stronger in areas far from the coast. These findings clearly imply that education is not the main channel through which British colonization affects fertility in Africa. Moreover, consistent with the literature on the effect of lower fertility induced by an increased use of modern contraception on female economic empowerment, the stronger effect of British colonization on education in areas close to the sea can be the seen as a by-product of the *direct* impact of British colonization on fertility in these areas.

Remark that one could argue that the effect of colonial origins on contraceptive use is mediated by female education. This is unlikely to be the case in our context because if this were the case, British colonization would have a greater effect on contraceptive use in coastal areas compared to the hinterland, mirroring its heterogeneous effect on female education. But this is not what we find. Unlike its effect on education, British colonization has a greater effect on contraceptive use in the hinterland compared to coastal areas, which is consistent with the notion that the latter effect is more direct.

[21] Interestingly, Anderson (2018) finds that women in the British common law system are less likely to use methods of contraception that reduce their likelihood of contracting HIV than their counterparts in the French civil law system. It is important to note that our findings do not contradict the findings from this latter study, as in reality, our results are not directly comparable. *Protective* methods of contraception overlap but do not coincide with modern methods of birth control. For example, IUD, injections, diaphragm, condom, female sterilization, male sterilization, implants/norplant, and foam/jelly are modern methods of birth control but they do not protect against sexually transmitted diseases. Anderson (2018) acknowledges that women in the British common law system are more likely to use some of these methods than their counterparts in the civil law system.

Female Economic Empowerment. Female economic empowerment is another factor likely to mediate the effect of colonial origins on fertility behavior. We define female economic empowerment based on participation of women in the labor market. Taking advantage of the fact that DHS collect information on the respondent's type of occupation, we construct an indicator for female labor participation based on whether the respondent is engaged in activities requiring low skills. Unskilled workers include agricultural and domestic workers. We also construct an alternative indicator of female labor participation based on whether she receives cash earnings for her work. Using each of these variables as a dependent variable in equation (2), we find that women in former British colonies are less likely to participate in unskilled jobs (*panels B, E, and H* in Table 9), and that they are more likely to work in a paid job (*panels C, F, and I* in Table 9). Moreover, we find that these effects are larger in areas far from the sea. In areas close to the sea, the effect of British colonization on the aforementioned measures of female economic empowerment is very small and it is not statistically significant.

Despite the fact that the heterogeneous effect of British colonization on female labor participation is consistent with its heterogeneous effect on fertility, this does not mean that female labor participation mediates the latter effect. This is for two reasons. The first reason is that the fertility gap between former British and French colonies preceded the income gap (Figure 1-*c*), which directly implies that the latter cannot explain the former. Second following a similar approach as in Anderson (2018), we directly control for female education and income (household assets and light density) when estimating the effect of colonial origins on fertility in areas far from the sea. We find that this effect is strongly robust to these controls (Table A6)). Taken together, these findings clearly show that female economic empowerment is not a primary channel through which colonial origins affects fertility. On the contrary, they suggest that higher income in former British colonies is partly a result of they lower fertility, which is consistent with the patterns shown in Figure 1-*c*.

Child Quality. The divergence in reproductive behavior across former British and French colonies could also be the result of the demand for child quality being higher in former British colonies. We test this channel by assessing the long-term impact of colonial origins on a set of variables measuring child quality. These variables are the number of dead children born to a woman, a binary indicator for whether a child died before the age of five years old, and a binary indicator for whether a child is mildly wasted.[22] These variables have been used to measure both child quality and household welfare in a number of studies (Millimet and Wang (2011), Liu (2014), Bhattacharjee and Dasgupta (2016)). Results are reported in Table 10. We find that Anglophone women have significantly fewer dead children relative to their Francophone counterparts, and that this effect is

[22]Mild wasting equals one if the child's weight-for-height is below zero standard deviation from the median weight-for-height of the reference population.

only present in areas far from the sea (*panels A, D, and G*). Similarly, we find that the likelihood of mild wasting is significantly lower for children residing in former British colonies only in areas far from the coast (*panels B, E, and H* of Table 10). Similar effects are found for under-five mortality, but in this latter case, the effects are generally not statistically significant (*panels C, F, and I* of Table 10). These findings are consistent with the fact that the British advantage in local economic development is only visible in areas far from the coast. Consistent with the theoretical literature on the drivers of fertility, they suggest that child quality is perhaps an indirect channel through which British colonization affects fertility in the hinterland. However, following the literature on the effect of contraceptive use on child quality (Ananat and Hungerman (2012)), higher child quality in former British colonies may also be the result of higher use of modern contraception and lower fertility in these colonies.

Overall, the results presented in this section are consistent with the idea that the negative effect of British colonization on fertility outcomes in areas far from the sea operates primarily through its direct effect on modern methods of birth control. The analysis provides little support for the indirect mechanism.

9 Conclusion

The large literature that documents the long-term economic effects of history has overlooked the question of whether these effects can be mitigated by appropriately designed policies. In this paper, we address this important question by studying the long-term effect of colonial reproductive laws on fertility behavior in Africa. Central to our study is the analysis of how this effect varies by exogenous market access, a proxy for the opportunity cost of childbearing.

Implementing a spatial Regression Discontinuity Design with ethnic homeland fixed effects, we find that women in former British colonies have significantly fewer children than their counterparts in former French colonies. They are also more likely to delay sexual debut and marriage. However, these effects disappear in areas with high market access, and are only present in areas with low market access. The analysis therefore suggests that market incentives are likely to mitigate the long-term impact of history.

Examining causal mechanisms, we find that the fertility effect of colonial origins can be directly linked to colonial reproductive laws and their impact on the use of modern methods of birth control. Importantly, we rule out the impact of colonial origins on income and women's human capital as the primary channels through which their fertility effect operates.

Besides uncovering novel findings about the heterogeneous nature of the colonial origins of comparative fertility behavior and economic development in Africa, our study contributes directly to the debate about the nature of policy actions that can be undertaken to repair the damages of bad historical shocks. Taken together, our findings imply that appropriately designed economic incentives can overcome the bonds of historical determinism, even though history itself cannot be changed.

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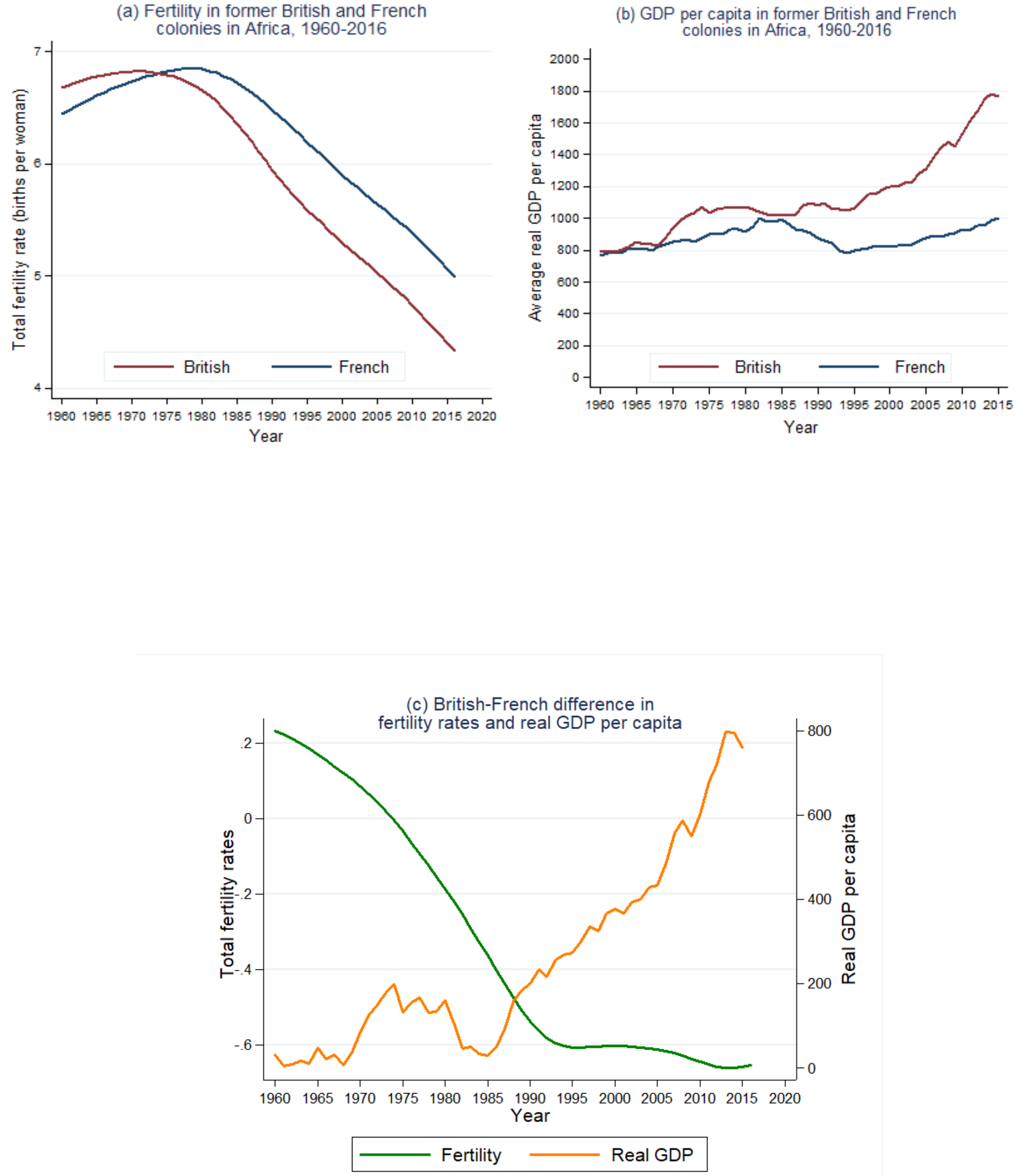
Figure 1



Source: World Development Indicators and Bergh and Fink (2018)

Figure 2: Conceptual Framework

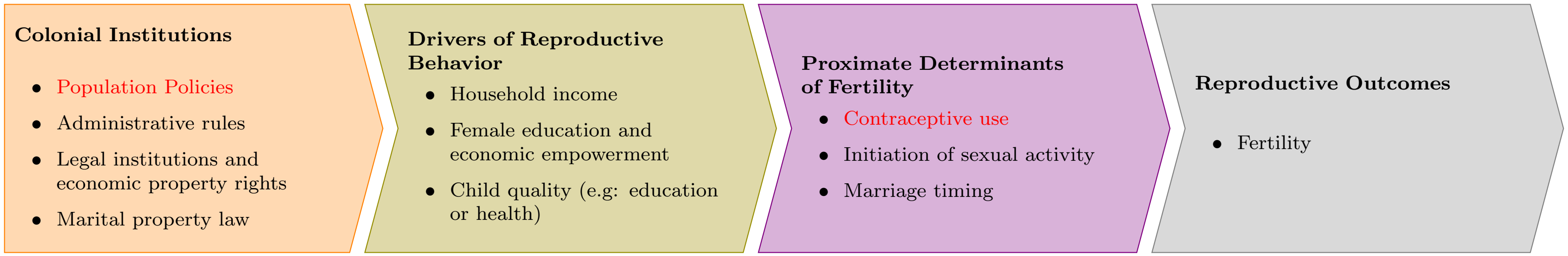


Figure 3

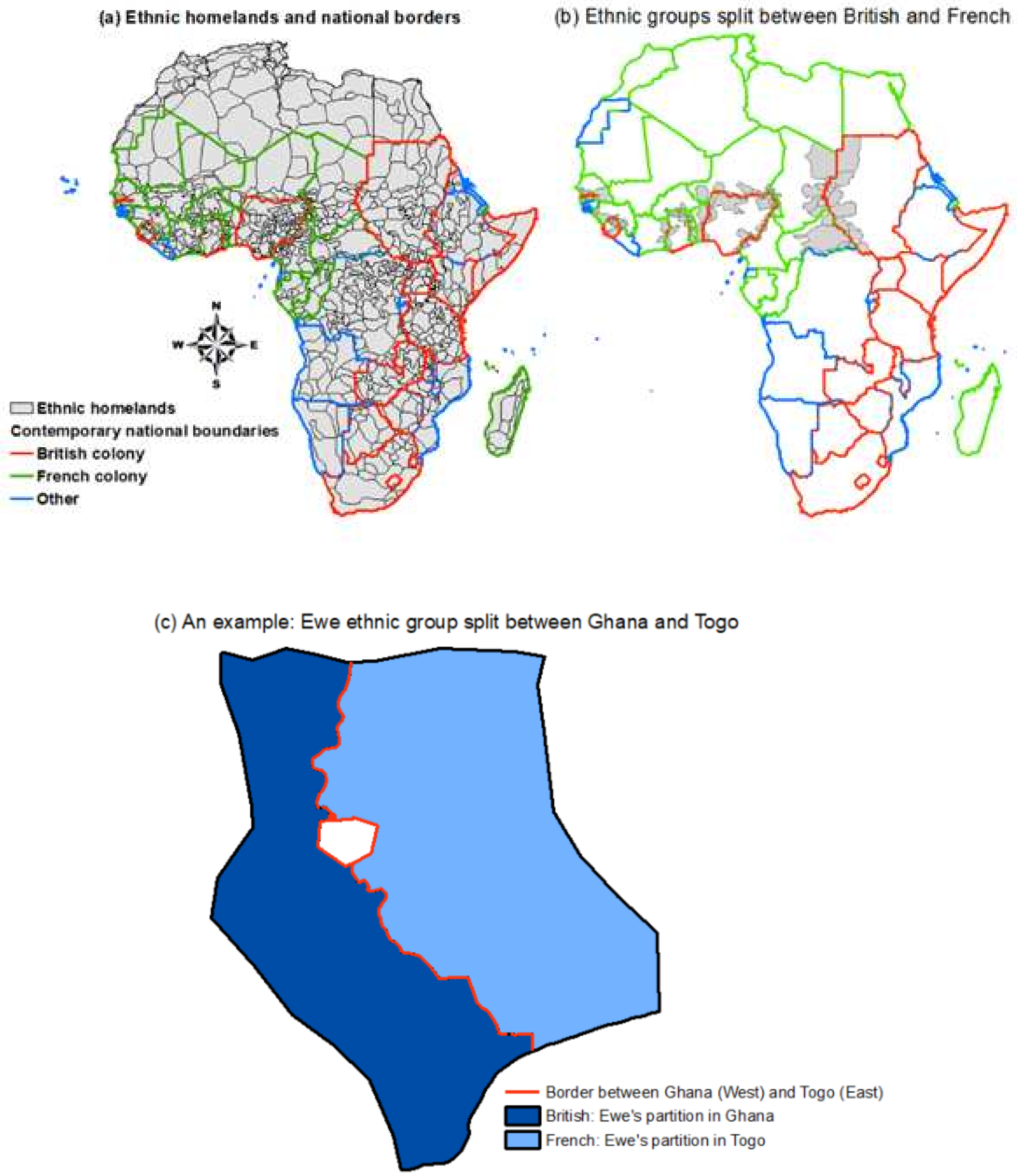

(a) Ethnic homelands and national borders
Ethnic homelands
Contemporary national boundaries
British colony
French colony
Other
(b) Ethnic groups split between British and French
(c) An example: Ewe ethnic group split between Ghana and Togo
Border between Ghana (West) and Togo (East)
British: Ewe's partition in Ghana
French: Ewe's partition in Togo

Figure 4: Colonial origins and fertility

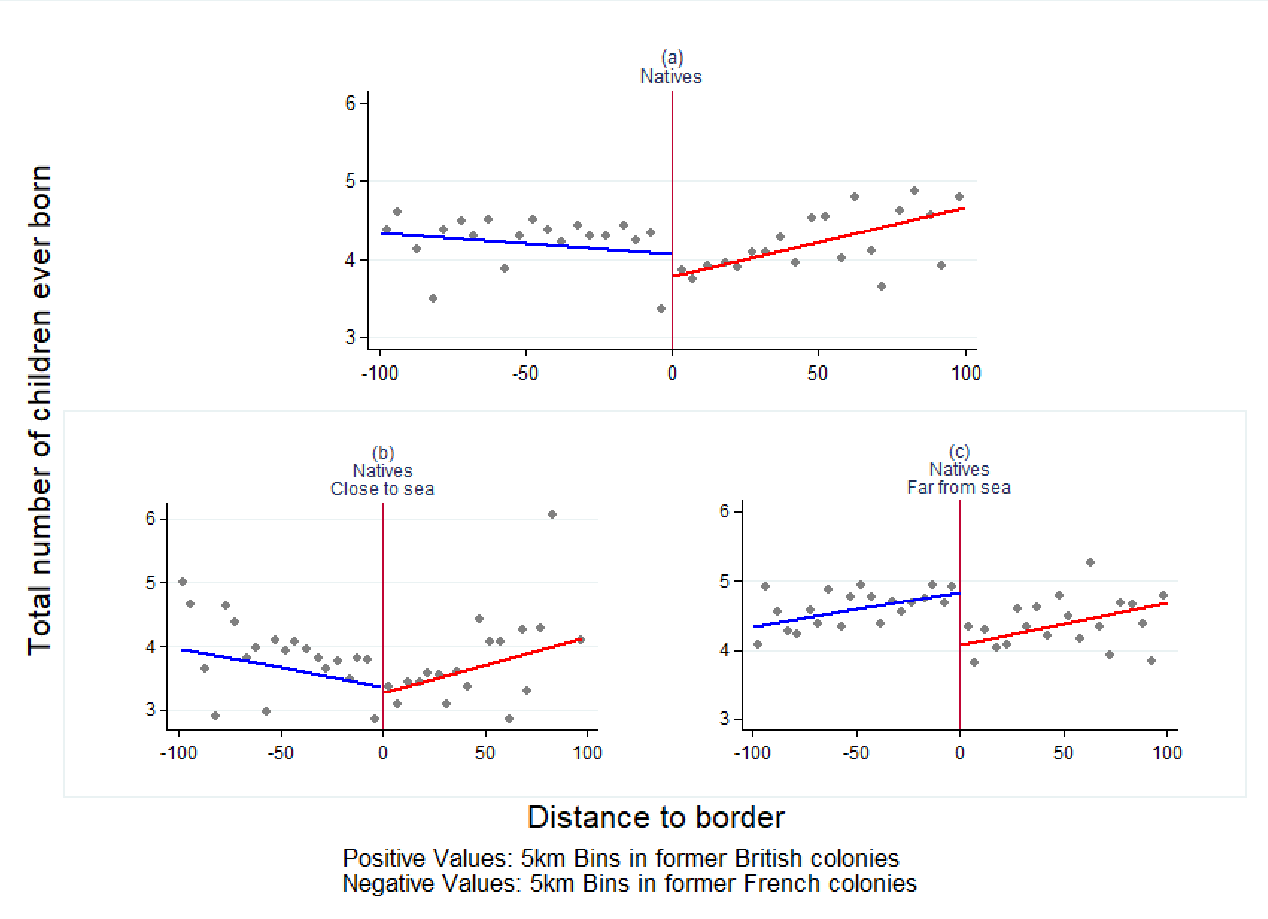


Figure 5: Colonial origins and other outcomes

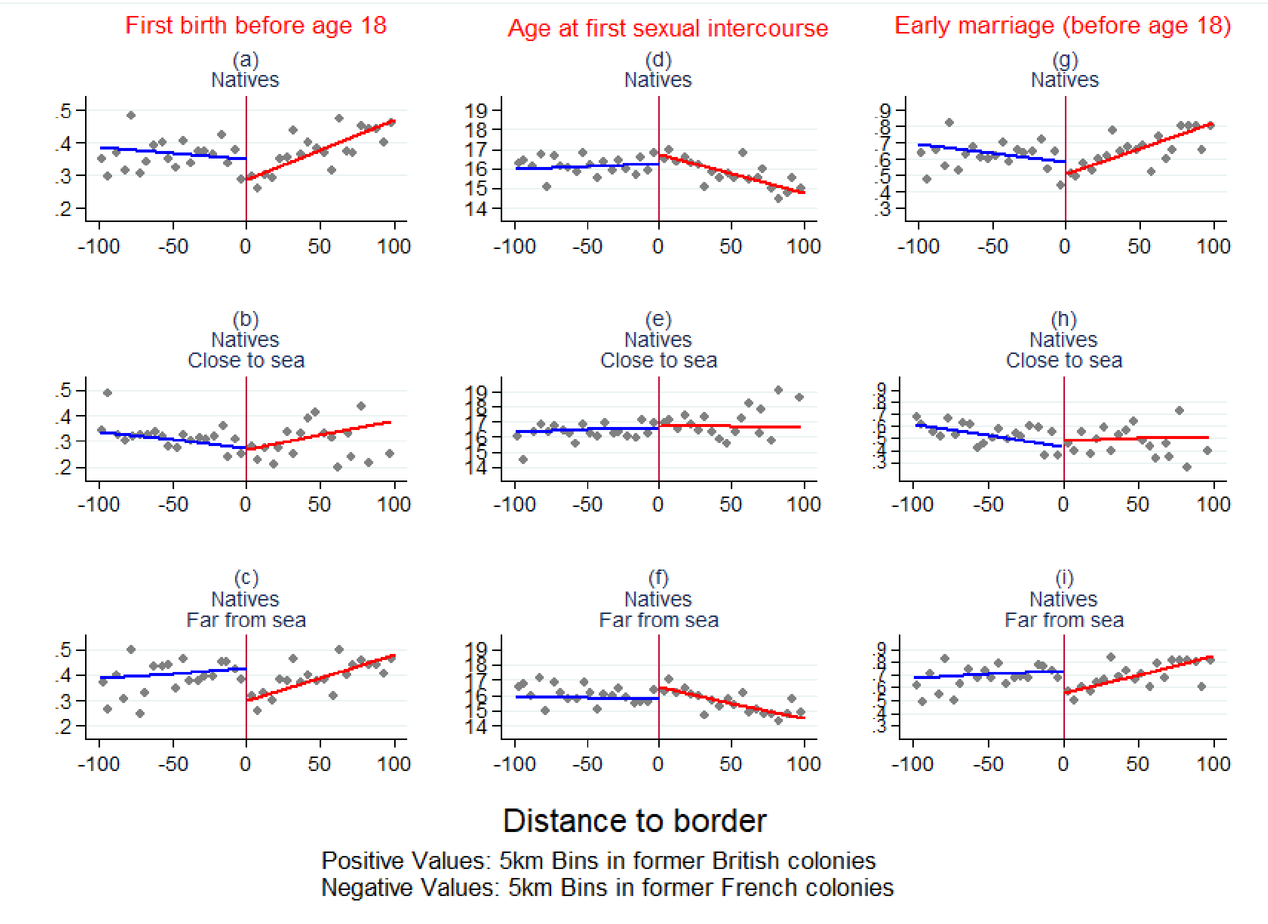


Figure 6: Colonial origins and reproductive behavior: RDD estimates for different bandwidths

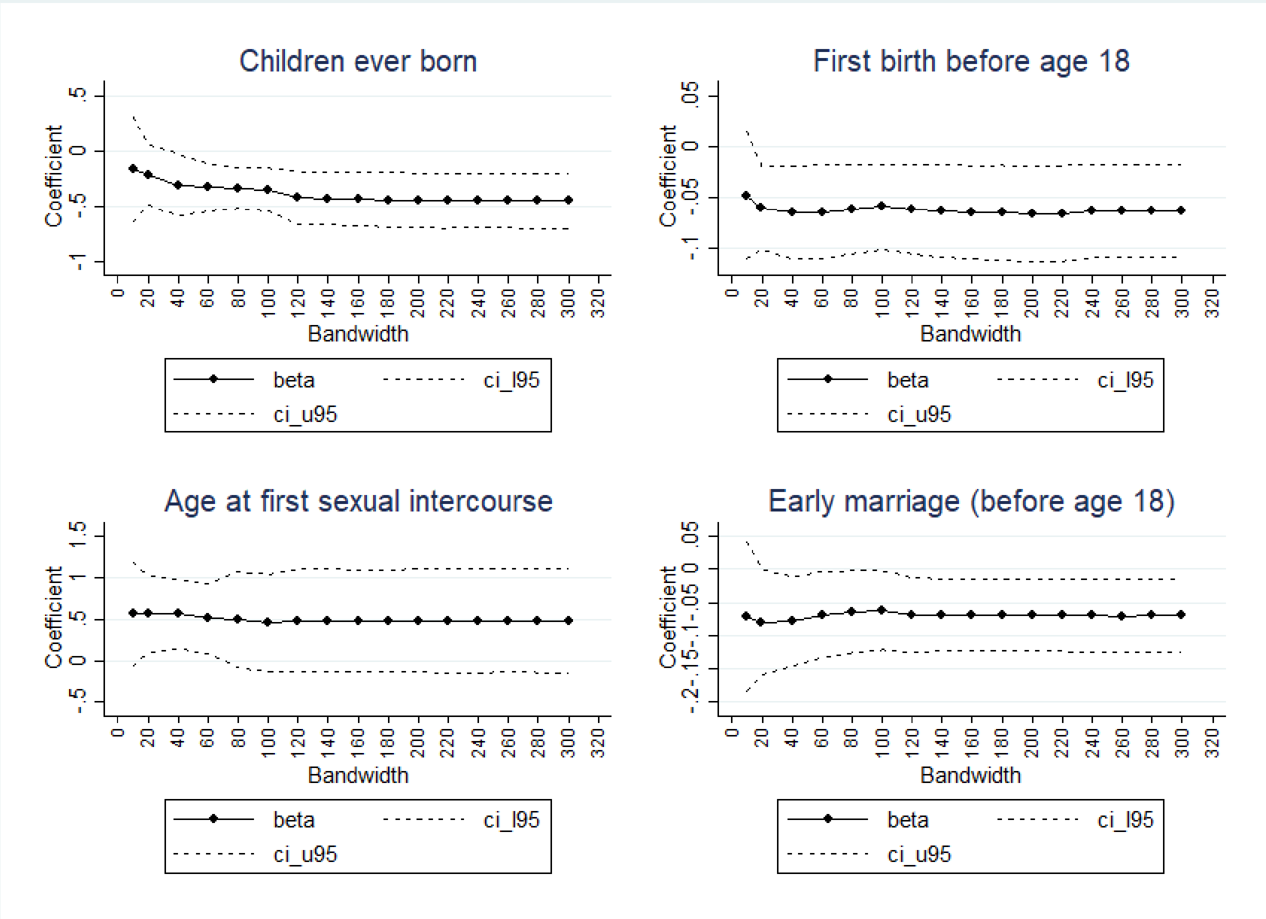


Table 1: Validity of identification design at the pixel level

	Dependent variable is:						
	ln(Mean elevation)	ln(Soil suitability)	ln(Area under water)	ln(Pixel area)	ln(Diamonds)	ln(Dist. to the border)	ln(Dist. to sea)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
British (vs. French)	-10.62	0.03	0.38	-0.03	0.00	-0.03	-0.10
	(14.076)	(0.021)	(0.333)	(0.057)	(0.004)	(0.038)	(0.065)
N	998	980	208	998	998	998	998
Countries	10	10	10	10	10	10	10
Ethnic Families	23	23	23	23	23	23	23
Ethnicity F.E	✓	✓	✓	✓	✓	✓	✓

Note: In each specification, the unit of observation is the pixel. The table reports RDD estimates associating various location and geographical characteristics at the pixel level with the colonial origin. In each specification we restrict the analysis to observations within 60km of the border and we control for a second-order polynomial in the distance from the centroid of each pixel to the ethnic border. Below the estimates, we report in parentheses standard errors clustered both at the country and the ethno-linguistic family levels. Coefficients that are significantly different from zero are denoted by the following system: *$***p<0.01$, $**p<0.05$, $*p<0.1$* .

Table 2: Average effect - Colonial origins and fertility

		RDD - Bandwidth			
	OLS (1)	<60 km of bound. (2)	<100 km of bound. (3)	<150 km of bound. (4)	<200 km of bound. (5)
Dependent variable: Total number of children ever born					
Panel A: Baseline specification					
British (vs. French)	-0.44***	-0.33***	-0.35***	-0.43***	-0.45***
	(0.112)	(0.107)	(0.097)	(0.118)	(0.123)
Observations	34,328	21,617	28,570	31,971	33,231
Panel B: Geographic controls					
British (vs. French)	-0.41***	-0.34***	-0.35***	-0.40***	-0.41***
	(0.077)	(0.109)	(0.081)	(0.078)	(0.081)
Observations	33,665	21,155	27,907	31,308	32,568
Panel C: Natives					
British (vs. French)	-0.51***	-0.39**	-0.44***	-0.51***	-0.52***
	(0.155)	(0.156)	(0.168)	(0.174)	(0.177)
Observations	13,919	8,398	11,313	12,795	13,353
Panel D: Natives + Geographic controls					
British (vs. French)	-0.45***	-0.38**	-0.40***	-0.42***	-0.44***
	(0.141)	(0.166)	(0.154)	(0.135)	(0.140)
Observations	13,687	8,215	11,081	12,563	13,121
Panel E: Natives + Thick border					
British (vs. French)	-0.59***	-0.46***	-0.52***	-0.59***	-0.61***
	(0.102)	(0.116)	(0.128)	(0.119)	(0.120)
Observations	12,600	7,079	9,994	11,476	12,034
Panel F: Natives + Thick border + Geographic controls					
British (vs. French)	-0.53***	-0.49***	-0.48***	-0.51***	-0.52***
	(0.104)	(0.130)	(0.123)	(0.104)	(0.117)
Observations	12,390	6,918	9,784	11,266	11,824
Ethnic homeland FE	✓	✓	✓	✓	✓
Age FE	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓	✓

Note: Specifications in columns (2)-(5) control for a second-order polynomial in the distance from the centroid of each pixel to the nearest national border with different colonial origin. Robust standard errors, adjusted for double-clustering at the country and the ethno-linguistic family level using the approach of Cameron et al. (2011), are in parenthesis. Coefficients that are significantly different from zero are denoted by the following system: ****p<0.01, **p<0.05, *p<0.1.*

Table 3: Average effect - Colonial origins and other reproductive outcomes

	OLS	RDD - Bandwidth			
	OLS (1)	<60 km of bound. (2)	<100 km of bound. (3)	<150 km of bound. (4)	<200 km of bound. (5)
Baseline specification					
Panel A: First birth before age 18					
British (vs. French)	-0.05***	-0.06***	-0.06***	-0.06***	-0.06***
	(0.020)	(0.023)	(0.020)	(0.021)	(0.021)
Observations	30,477	19,098	25,161	28,284	29,474
Panel B: Age at first sexual intercourse					
British (vs. French)	0.47	0.53***	0.46*	0.48*	0.48*
	(0.299)	(0.199)	(0.280)	(0.280)	(0.291)
Observations	28,008	17,066	23,002	25,912	27,088
Panel C: Early marriage (before 18 years old)					
British (vs. French)	-0.06*	-0.07*	-0.06*	-0.06**	-0.06**
	(0.031)	(0.035)	(0.032)	(0.030)	(0.030)
Observations	31,769	19,775	26,168	29,446	30,699
Natives					
Panel D: First birth before age 18					
British (vs. French)	-0.06***	-0.07***	-0.07***	-0.07***	-0.07***
	(0.023)	(0.026)	(0.025)	(0.023)	(0.023)
Observations	12,323	7,357	9,940	11,286	11,813
Panel E: Age at first sexual intercourse					
British (vs. French)	0.38	0.53**	0.43*	0.44*	0.44*
	(0.277)	(0.233)	(0.226)	(0.238)	(0.250)
Observations	11,471	6,832	9,281	10,490	11,011
Panel F: Early marriage (before 18 years old)					
British (vs. French)	-0.06*	-0.07**	-0.06*	-0.06**	-0.06*
	(0.032)	(0.034)	(0.032)	(0.031)	(0.032)
Observations	12,785	7,570	10,271	11,690	12,244
Natives + Thick border					
Panel G: First birth before age 18					
British (vs. French)	-0.08***	-0.09***	-0.09***	-0.08***	-0.08***
	(0.020)	(0.022)	(0.020)	(0.019)	(0.019)
Observations	11,255	6,289	8,872	10,218	10,745
Panel H: Age at first sexual intercourse					
British (vs. French)	0.36	0.56***	0.44*	0.45*	0.44*
	(0.291)	(0.212)	(0.229)	(0.235)	(0.253)
Observations	10,410	5,771	8,220	9,429	9,950
Panel I: Early marriage (before 18 years old)					
British (vs. French)	-0.07**	-0.09***	-0.07**	-0.08**	-0.08**
	(0.031)	(0.032)	(0.031)	(0.030)	(0.030)
Observations	11,666	6,451	9,152	10,571	11,125
Ethnic homeland FE	✓	✓	✓	✓	✓
Age FE	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓	✓
Geographic controls	✓	✓	✓	✓	✓

Note: Specifications in columns (2)-(5) control for a second-order polynomial in the distance from the centroid of each pixel to the nearest national border with different colonial origin. Robust standard errors, adjusted for double-clustering at the country and the ethno-linguistic family level using the approach of Cameron et al. (2011), are in parenthesis. Coefficients that are significantly different from zero are denoted by the following system: ****p<0.01, **p<0.05, *p<0.1.*

Table 4: Distance to sea, local economic development, and the opportunity cost of childbearing

	Light Density (1)	High-skilled workers (2)	Cash earning (3)	Asset (4)
ln(distance to sea)	-1.56***	-0.02***	-0.11***	-0.07***
	(0.228)	(0.006)	(0.033)	(0.014)
Observations	760	31,957	13,507	33,467
Mean dep. var.	-2.84	0.02	0.58	0.73
Ethnic homeland FE	✓	✓	✓	✓
Geographic controls	✓	✓	✓	✓

Note: Robust standard errors, adjusted for double-clustering at the country and the ethno-linguistic family level using the approach of Cameron et al. (2011), are in parenthesis. Coefficients that are significantly different from zero are denoted by the following system: ****p<0.01, **p<0.05, *p<0.1.*

Table 5: Colonial origins and light density

	<60 km of bound.		<100 km of bound.		<150 km of bound.		<200 km of bound.	
	Close (1)	Far (2)	Close (3)	Far (4)	Close (5)	Far (6)	Close (7)	Far (8)
				Panel A: Pixel is lit				
British (vs. French)	0.02	0.16***	0.04	0.15***	0.05	0.15***	0.05	0.16***
	(0.136)	(0.030)	(0.148)	(0.051)	(0.154)	(0.052)	(0.154)	(0.052)
Observations	499	499	645	644	724	723	753	752
				Panel B: Log of light density				
British (vs. French)	0.09	0.65***	0.35	0.64***	0.43	0.65***	0.43	0.68***
	(0.632)	(0.143)	(0.855)	(0.215)	(0.893)	(0.215)	(0.897)	(0.217)
Observations	499	499	645	644	724	723	753	752
Ethnic homeland FE	✓	✓	✓	✓	✓	✓	✓	✓

	<60 km of bound.		<100 km of bound.		<150 km of bound.		<200 km of bound.	
	Close (1)	Far (2)	Close (3)	Far (4)	Close (5)	Far (6)	Close (7)	Far (8)
				Panel A: Pixel is lit				
British (vs. French)	-0.01	0.15***	-0.01	0.13**	-0.02	0.13**	-0.02	0.15**
	(0.152)	(0.042)	(0.139)	(0.058)	(0.139)	(0.058)	(0.138)	(0.057)
Observations	481	499	625	644	704	723	733	752
				Panel B: Log of light density				
British (vs. French)	-0.08	0.64***	-0.03	0.56**	-0.09	0.57**	-0.08	0.64**
	(0.648)	(0.209)	(0.644)	(0.267)	(0.670)	(0.262)	(0.669)	(0.266)
Observations	481	499	625	644	704	723	733	752
Ethnic homeland FE	✓	✓	✓	✓	✓	✓	✓	✓
Geographic controls	✓	✓	✓	✓	✓	✓	✓	✓

Note: In each specification we control for a second-order polynomial in the distance from the centroid of each pixel to the nearest national border with different colonial origin. Robust standard errors, adjusted for double-clustering at the country and the ethno-linguistic family level using the approach of Cameron et al. (2011), are in parenthesis. Coefficients that are significantly different from zero are denoted by the following system: ****p<0.01, **p<0.05, *p<0.1.*

Table 6: Heterogeneity by proximity to the sea coast: colonial origins and fertility

	<60 km of bound.		<100 km of bound.		<150 km of bound.		<200 km of bound.	
	Close (1)	Far (2)	Close (3)	Far (4)	Close (5)	Far (6)	Close (7)	Far (8)
Dependent variable: Total number of children ever born								
Panel A: Baseline specification								
British (vs. French)	-0.10	-0.46***	-0.15	-0.45***	-0.24	-0.49***	-0.21	-0.51***
	(0.117)	(0.076)	(0.195)	(0.084)	(0.263)	(0.084)	(0.237)	(0.086)
Observations	9,598	12,019	12,387	16,183	13,855	18,116	14,416	18,815
Panel B: Geographic controls								
British (vs. French)	-0.09	-0.47***	-0.13	-0.42***	-0.17	-0.47***	-0.14	-0.52***
	(0.106)	(0.096)	(0.119)	(0.083)	(0.125)	(0.073)	(0.112)	(0.076)
Observations	9,136	12,019	11,724	16,183	13,192	18,116	13,753	18,815
Panel C: Natives								
British (vs. French)	0.05	-0.52***	-0.06	-0.53***	-0.18	-0.57***	-0.15	-0.59***
	(0.197)	(0.107)	(0.315)	(0.121)	(0.376)	(0.111)	(0.341)	(0.110)
Observations	3,187	5,211	4,179	7,134	4,823	7,972	5,049	8,304
Panel D: Natives + Geographic controls								
British (vs. French)	0.07	-0.55***	-0.01	-0.50***	-0.05	-0.53***	-0.03	-0.58***
	(0.167)	(0.129)	(0.188)	(0.125)	(0.192)	(0.091)	(0.177)	(0.091)
Observations	3,004	5,211	3,947	7,134	4,591	7,972	4,817	8,304
Panel E: Natives + Thick border								
British (vs. French)	-0.09	-0.55***	-0.23	-0.57***	-0.35	-0.62***	-0.32	-0.64***
	(0.249)	(0.111)	(0.343)	(0.104)	(0.357)	(0.084)	(0.322)	(0.080)
Observations	2,355	4,724	3,339	6,655	3,970	7,506	4,193	7,841
Panel F: Natives + Thick border + Geographic controls								
British (vs. French)	-0.09	-0.58***	-0.18	-0.51***	-0.23	-0.55***	-0.18	-0.61***
	(0.247)	(0.139)	(0.226)	(0.133)	(0.232)	(0.077)	(0.232)	(0.076)
Observations	2,194	4,724	3,129	6,655	3,760	7,506	3,983	7,841
Ethnic homeland FE	✓	✓	✓	✓	✓	✓	✓	✓
Age FE	✓	✓	✓	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓	✓	✓	✓	✓

Note: In each specification we control for a second-order polynomial in the distance from the centroid of each pixel to the nearest national border with different colonial origin. Robust standard errors, adjusted for double-clustering at the country and the ethno-linguistic family level using the approach of Cameron et al. (2011), are in parenthesis. Coefficients that are significantly different from zero are denoted by the following system: ****p<0.01, **p<0.05, *p<0.1.*

Table 7: Heterogeneity by proximity to the sea coast: colonial origins and other reproductive outcomes

	<60 km of bound.		<100 km of bound.		<150 km of bound.		<200 km of bound.	
	Close	Far	Close	Far	Close	Far	Close	Far
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Baseline specification								
Panel A: First birth before age 18								
British (vs. French)	-0.02	-0.09***	-0.03	-0.07***	-0.03	-0.08***	-0.02	-0.08***
	(0.032)	(0.016)	(0.029)	(0.015)	(0.029)	(0.015)	(0.026)	(0.016)
Observations	8,011	11,087	10,206	14,955	11,540	16,744	12,042	17,432
Panel B: Age at first sexual intercourse								
British (vs. French)	0.28*	0.80***	0.31*	0.65*	0.31*	0.63*	0.29*	0.62*
	(0.158)	(0.268)	(0.170)	(0.357)	(0.190)	(0.343)	(0.177)	(0.350)
Observations	7,264	9,802	9,580	13,422	10,943	14,969	11,478	15,610
Panel C: Early marriage (before 18 years old)								
British (vs. French)	-0.01	-0.09**	-0.03	-0.07	-0.04	-0.09**	-0.03	-0.09**
	(0.040)	(0.038)	(0.038)	(0.046)	(0.036)	(0.042)	(0.030)	(0.044)
Observations	8,163	11,612	10,479	15,689	11,851	17,595	12,377	18,322
Natives								
Panel D: First birth before age 18								
British (vs. French)	-0.05	-0.10***	-0.06	-0.07***	-0.05	-0.08***	-0.04	-0.08***
	(0.048)	(0.018)	(0.051)	(0.020)	(0.043)	(0.019)	(0.037)	(0.020)
Observations	2,578	4,779	3,383	6,557	3,969	7,317	4,172	7,641
Panel E: Age at first sexual intercourse								
British (vs. French)	0.39*	0.72**	0.38*	0.47	0.36	0.46	0.30	0.49
	(0.215)	(0.300)	(0.214)	(0.343)	(0.224)	(0.366)	(0.200)	(0.366)
Observations	2,541	4,291	3,380	5,901	3,971	6,519	4,180	6,831
Panel F: Early marriage (before 18 years old)								
British (vs. French)	-0.05	-0.09**	-0.08	-0.06	-0.07*	-0.08*	-0.06	-0.08**
	(0.050)	(0.038)	(0.048)	(0.040)	(0.043)	(0.040)	(0.036)	(0.042)
Observations	2,590	4,980	3,429	6,842	4,017	7,673	4,227	8,017
Natives + Thick border								
Panel G: First birth before age 18								
British (vs. French)	-0.07	-0.11***	-0.09	-0.08***	-0.07	-0.09***	-0.05	-0.09***
	(0.060)	(0.020)	(0.054)	(0.023)	(0.042)	(0.022)	(0.040)	(0.023)
Observations	1,949	4,340	2,747	6,125	3,323	6,895	3,523	7,222
Panel H: Age at first sexual intercourse								
British (vs. French)	0.43	0.60***	0.46*	0.35	0.38	0.33	0.28	0.34
	(0.268)	(0.232)	(0.267)	(0.281)	(0.243)	(0.287)	(0.237)	(0.275)
Observations	1,902	3,869	2,733	5,487	3,312	6,117	3,518	6,432
Panel I: Early marriage (before 18 years old)								
British (vs. French)	-0.07	-0.10***	-0.10*	-0.07*	-0.09**	-0.08*	-0.06**	-0.09**
	(0.056)	(0.039)	(0.055)	(0.043)	(0.039)	(0.044)	(0.032)	(0.046)
Observations	1,941	4,510	2,773	6,379	3,348	7,223	3,555	7,570
Ethnic homeland FE	✓	✓	✓	✓	✓	✓	✓	✓
Age FE	✓	✓	✓	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓	✓	✓	✓	✓
Geographic controls	✓	✓	✓	✓	✓	✓	✓	✓

Note: In each specification we control for a second-order polynomial in the distance from the centroid of each pixel to the nearest national border with different colonial origin. Robust standard errors, adjusted for double-clustering at the country and the ethno-linguistic family level using the approach of Cameron et al. (2011), are in parenthesis. Coefficients that are significantly different from zero are denoted by the following system: ****p<0.01, **p<0.05, *p<0.1.*

Table 8: Colonial origins and use of modern methods of birth control

	<60 km of bound.		<100 km of bound.		<150 km of bound.		<200 km of bound.	
	Close (1)	Far (2)	Close (3)	Far (4)	Close (5)	Far (6)	Close (7)	Far (8)
Dependent variable is current use of any modern method of contraception								
Panel A: Baseline specification								
British (vs. French)	0.20***	0.34***	0.23***	0.32***	0.23***	0.39***	0.21***	0.41***
	(0.039)	(0.090)	(0.051)	(0.096)	(0.044)	(0.073)	(0.038)	(0.065)
Observations	2,018	1,216	2,600	1,441	2,881	1,425	2,963	1,388
Mean dep. var.	0.39	0.52	0.45	0.54	0.46	0.56	0.46	0.57
Panel B: Natives								
British (vs. French)	0.14**	0.40**	0.19***	0.34**	0.20***	0.42***	0.17***	0.43***
	(0.055)	(0.163)	(0.070)	(0.168)	(0.078)	(0.100)	(0.066)	(0.097)
Observations	652	496	812	591	935	554	962	546
Mean dep. var.	0.41	0.48	0.46	0.50	0.47	0.52	0.48	0.53
Panel C: Natives + Thick border								
British (vs. French)	0.10*	0.36**	0.16**	0.30	0.20**	0.43***	0.17**	0.44***
	(0.053)	(0.164)	(0.072)	(0.198)	(0.096)	(0.138)	(0.083)	(0.130)
Observations	427	453	583	552	705	516	732	508
Mean dep. var.	0.44	0.47	0.49	0.49	0.50	0.51	0.51	0.52
Ethnic homeland FE	✓	✓	✓	✓	✓	✓	✓	✓
Age FE	✓	✓	✓	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓	✓	✓	✓	✓
Geographic controls	✓	✓	✓	✓	✓	✓	✓	✓

Note: In each specification we control for a second-order polynomial in the distance from the centroid of each pixel to the nearest national border with different colonial origin. Modern methods of contraception include pill, IUD, injections, diaphragm, condom, female sterilization, male sterilization,lactational amenorrhea, implants/norplant, female condom, and foam/jelly. Robust standard errors, adjusted for double-clustering at the country and the ethno-linguistic family level using the approach of Cameron et al. (2011), are in parenthesis. Coefficients that are significantly different from zero are denoted by the following system: ****p<0.01, **p<0.05, *p<0.1.*

Table 9: Colonial origins and female empowerment

	<60 km of bound.		<100 km of bound.		<150 km of bound.		<200 km of bound.	
	Close	Far	Close	Far	Close	Far	Close	Far
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Baseline specification								
Panel A: Female years of education								
British (vs. French)	2.76***	0.75***	2.85***	0.68**	2.81***	0.76**	2.65***	0.93***
	(0.486)	(0.283)	(0.580)	(0.322)	(0.633)	(0.297)	(0.676)	(0.293)
Observations	9,129	12,012	11,716	16,173	13,183	18,106	13,743	18,806
Panel B: Unskilled workers								
British (vs. French)	0.03	-0.16***	0.02	-0.16***	0.04	-0.18***	0.06	-0.19***
	(0.040)	(0.049)	(0.040)	(0.048)	(0.053)	(0.033)	(0.053)	(0.032)
Observations	7,723	11,780	10,296	15,854	11,761	17,771	12,320	18,468
Panel C: Cash earning								
British (vs. French)	-0.26	0.10*	-0.18	0.09*	-0.25*	0.13***	-0.25*	0.14***
	(0.182)	(0.053)	(0.159)	(0.051)	(0.150)	(0.036)	(0.140)	(0.041)
Observations	2,858	4,790	4,567	6,610	5,529	7,154	5,846	7,249
Natives								
Panel D: Female years of education								
British (vs. French)	2.06***	0.71**	2.18***	0.57*	2.19***	0.64**	2.07**	0.81***
	(0.712)	(0.276)	(0.710)	(0.312)	(0.793)	(0.303)	(0.815)	(0.284)
Observations	3,001	5,209	3,943	7,132	4,587	7,969	4,813	8,301
Panel E: Unskilled workers								
British (vs. French)	0.08	-0.17***	0.05	-0.16***	0.08	-0.18***	0.09	-0.19***
	(0.058)	(0.048)	(0.046)	(0.052)	(0.061)	(0.037)	(0.060)	(0.037)
Observations	2,726	5,106	3,667	6,981	4,310	7,817	4,536	8,148
Panel F: Cash earning								
British (vs. French)	-0.28**	0.09	-0.16	0.05	-0.24**	0.08***	-0.25***	0.10***
	(0.122)	(0.065)	(0.122)	(0.076)	(0.114)	(0.026)	(0.079)	(0.025)
Observations	1,278	2,010	1,979	2,643	2,442	2,681	2,590	2,698
Natives + Thick border								
Panel G: Female years of education								
British (vs. French)	2.81***	0.84***	3.06***	0.68*	2.91***	0.76**	2.73***	0.94***
	(0.824)	(0.310)	(0.766)	(0.363)	(0.856)	(0.367)	(0.921)	(0.360)
Observations	2,192	4,722	3,126	6,653	3,757	7,503	3,980	7,838
Panel H: Unskilled workers								
British (vs. French)	0.07	-0.19***	0.02	-0.18***	0.08	-0.21***	0.09	-0.22***
	(0.051)	(0.050)	(0.048)	(0.053)	(0.058)	(0.035)	(0.062)	(0.037)
Observations	2,051	4,626	2,984	6,509	3,614	7,358	3,837	7,692
Panel I: Cash earning								
British (vs. French)	-0.31***	0.08	-0.14	0.04	-0.30**	0.08***	-0.32***	0.09***
	(0.080)	(0.068)	(0.136)	(0.083)	(0.138)	(0.029)	(0.112)	(0.033)
Observations	1,026	1,798	1,720	2,438	2,176	2,483	2,323	2,501
Mean dep. var.	0.49	0.43	0.50	0.52	0.47	0.56	0.48	0.57
Ethnic homeland FE	✓	✓	✓	✓	✓	✓	✓	✓
Age FE	✓	✓	✓	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓	✓	✓	✓	✓
Geographic controls	✓	✓	✓	✓	✓	✓	✓	✓

Note: In each specification we control for a second-order polynomial in the distance from the centroid of each pixel to the nearest national border with different colonial origin. Robust standard errors, adjusted for double-clustering at the country and the ethno-linguistic family level using the approach of Cameron et al. (2011), are in parenthesis. Coefficients that are significantly different from zero are denoted by the following system: ****p<0.01, **p<0.05, *p<0.1.*

Table 10: Colonial origins and child quality

	<60 km of bound.		<100 km of bound.		<150 km of bound.		<200 km of bound.	
	Close (1)	Far (2)	Close (3)	Far (4)	Close (5)	Far (6)	Close (7)	Far (8)
Baseline specification								
Panel A: Dead children								
British (vs. French)	-0.03	-0.22**	-0.06	-0.19**	-0.08	-0.24***	-0.06	-0.28***
	(0.045)	(0.091)	(0.044)	(0.073)	(0.047)	(0.081)	(0.043)	(0.084)
Observations	9,136	12,019	11,724	16,183	13,192	18,116	13,753	18,815
Panel B: Mild wasting								
British (vs. French)	0.06**	-0.11***	0.07***	-0.09***	0.05**	-0.07**	0.04**	-0.07**
	(0.029)	(0.012)	(0.023)	(0.025)	(0.019)	(0.030)	(0.019)	(0.027)
Observations	5,104	7,921	6,656	10,627	7,644	12,211	8,189	12,551
Panel C: Under-five mortality								
British (vs. French)	0.00	-0.03*	-0.01	-0.02*	0.00	-0.03*	0.00	-0.03*
	(0.007)	(0.017)	(0.007)	(0.012)	(0.012)	(0.015)	(0.012)	(0.015)
Observations	27,545	35,981	35,384	48,781	40,239	55,182	42,507	57,424
Natives								
Panel D: Dead children								
British (vs. French)	-0.06	-0.20**	-0.06	-0.15	-0.05	-0.20**	-0.03	-0.22**
	(0.079)	(0.101)	(0.082)	(0.097)	(0.076)	(0.087)	(0.072)	(0.088)
Observations	3,004	5,211	3,947	7,134	4,591	7,972	4,817	8,304
Panel E: Mild wasting								
British (vs. French)	0.05	-0.07***	0.06	-0.07***	0.03	-0.06***	0.03	-0.05**
	(0.043)	(0.021)	(0.038)	(0.017)	(0.023)	(0.021)	(0.022)	(0.021)
Observations	1,651	3,503	2,115	4,794	2,540	5,427	2,759	5,620
Panel F: Under-five mortality								
British (vs. French)	0.00	-0.03	0.00	-0.01	0.02	-0.02	0.02	-0.02
	(0.014)	(0.023)	(0.016)	(0.014)	(0.021)	(0.014)	(0.021)	(0.014)
Observations	9,518	15,880	12,594	22,092	14,725	25,009	15,650	26,208
Natives + Thick border								
Panel G: Dead children								
British (vs. French)	-0.11	-0.19*	-0.12	-0.14*	-0.08	-0.19**	-0.06	-0.22***
	(0.097)	(0.104)	(0.117)	(0.086)	(0.113)	(0.077)	(0.105)	(0.079)
Observations	2,194	4,724	3,129	6,655	3,760	7,506	3,983	7,841
Panel H: Mild wasting								
British (vs. French)	0.08*	-0.05**	0.08*	-0.05**	0.04	-0.04	0.04	-0.04
	(0.049)	(0.027)	(0.045)	(0.024)	(0.027)	(0.027)	(0.026)	(0.026)
Observations	1,336	3,173	1,800	4,464	2,189	5,133	2,407	5,327
Mean dep. var.	0.64	0.75	0.64	0.75	0.64	0.75	0.65	0.75
Panel I: Under-five mortality								
British (vs. French)	-0.02	-0.02	-0.02	-0.01	0.02	-0.01	0.02	-0.01
	(0.014)	(0.027)	(0.019)	(0.016)	(0.032)	(0.016)	(0.032)	(0.015)
Observations	7,675	14,361	10,751	20,573	12,800	23,572	13,723	24,773
Mean dep. var.	0.19	0.27	0.19	0.27	0.20	0.27	0.20	0.27
Ethnic homeland FE	✓	✓	✓	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓	✓	✓	✓	✓
Geographic controls	✓	✓	✓	✓	✓	✓	✓	✓

Note: In each specification we control for a second-order polynomial in the distance from the centroid of each pixel to the nearest national border with different colonial origin, the sex of the child, and fixed effects for child's year of birth. Robust standard errors, adjusted for double-clustering at the country and the ethnolinguistic family level using the approach of Cameron et al. (2011), are in parenthesis. Coefficients that are significantly different from zero are denoted by the following system: ****p<0.01, **p<0.05, *p<0.1.*

Appendix

A1 Colonial Population Laws

Figure A1

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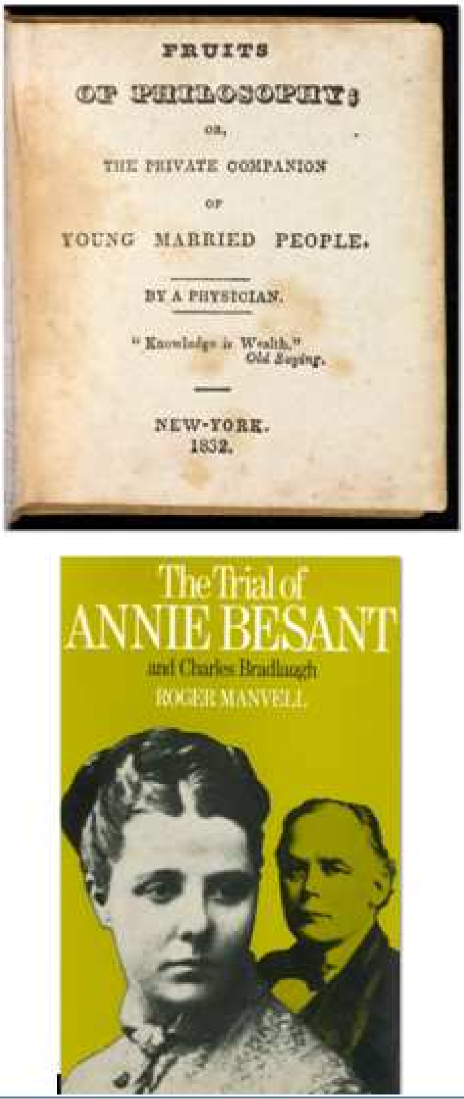
Art. 2. — Sera puni des mêmes peines quiconque aura vendu, mis en vente, ou fait vendre, distribué, ou fait distribuer, de quelque manière que ce soit, des remèdes, substances, instruments ou objets quelconques, sachant qu'ils étaient destinés à commettre le crime d'avortement, lors même que cet avortement n'aurait été ni consommé, ni tenté, et alors même que ces remèdes, substances, instruments ou objets quelconques proposés comme moyens d'avortement efficaces seraient, en réalité, inaptes à les réaliser.

Art. 3. — Sera puni d'un mois à six mois de prison et d'une amende de cent francs (100 fr.) à cinq mille francs (5,000 fr.), quiconque, dans un but de propagande anticonceptionnelle, aura, par l'un des moyens spécifiés aux articles 1er et 2, décrit ou divulgué, ou offert de révéler des procédés propres à prévenir la grossesse, ou encore faciliter l'usage de ces procédés.

Les mêmes peines seront applicables à quiconque, par l'un des moyens énoncés à l'article 23 de la loi du 29 juillet 1881, se sera livré à une propagande anticonceptionnelle ou contre la natalité.

(a) French law of 1920

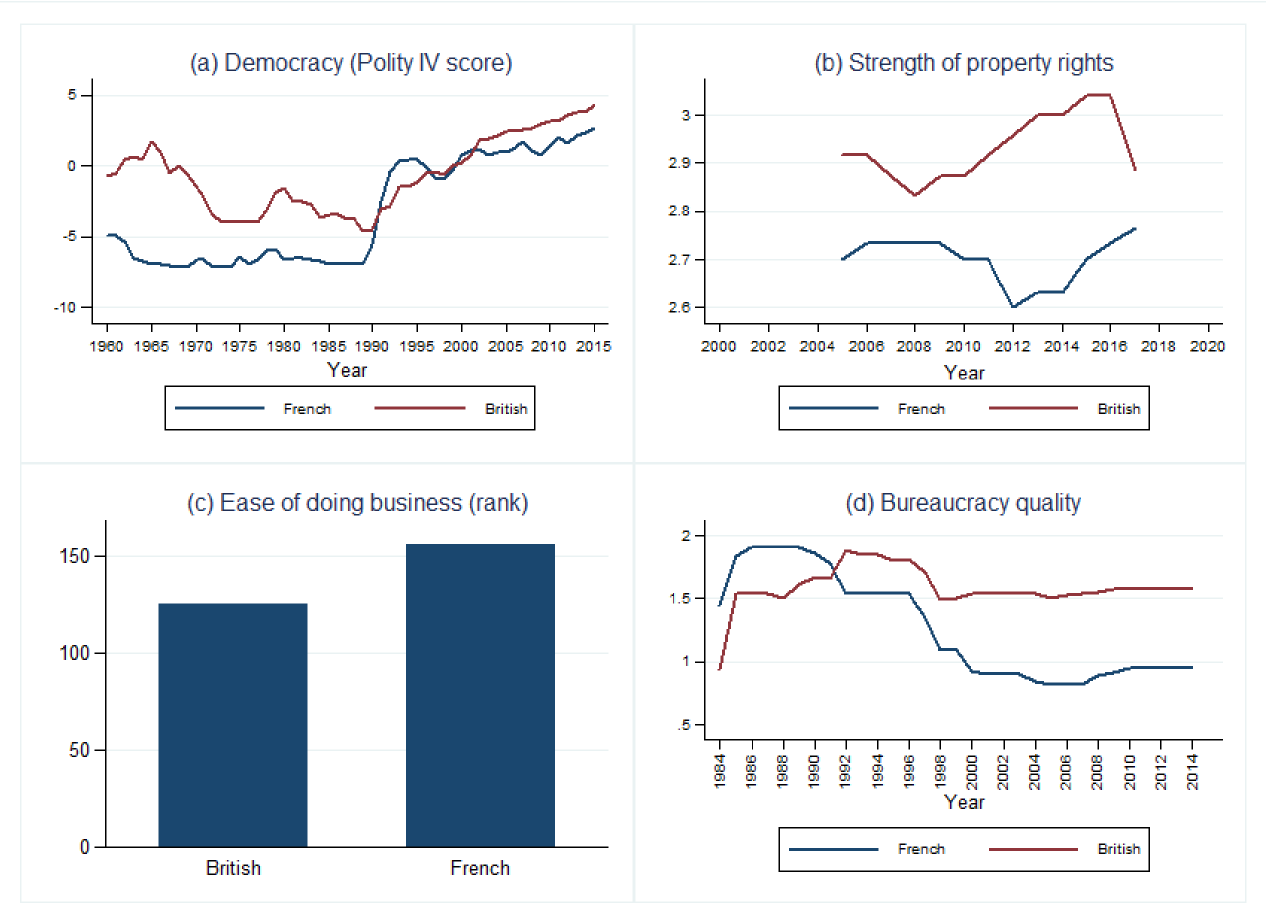


(b) Charles Knowlton's book and the trial of Annie Besant and Charles Bradlaugh

Note: Figure-a displays selected pages of the "Journal Officiel de la République Française" published in 1920, which advertises the major legal official information for the national Government of France and the French Parliament. On the top of Figure-b is an image of the first page of the physician Charles Knowlton's book which contains information about contraception and was published by Annie Besant and Charles Bradlaugh. At the bottom of Figure-b, we display a portrait of the activists Annie Besant and Charles Bradlaugh drawn from the Internet.

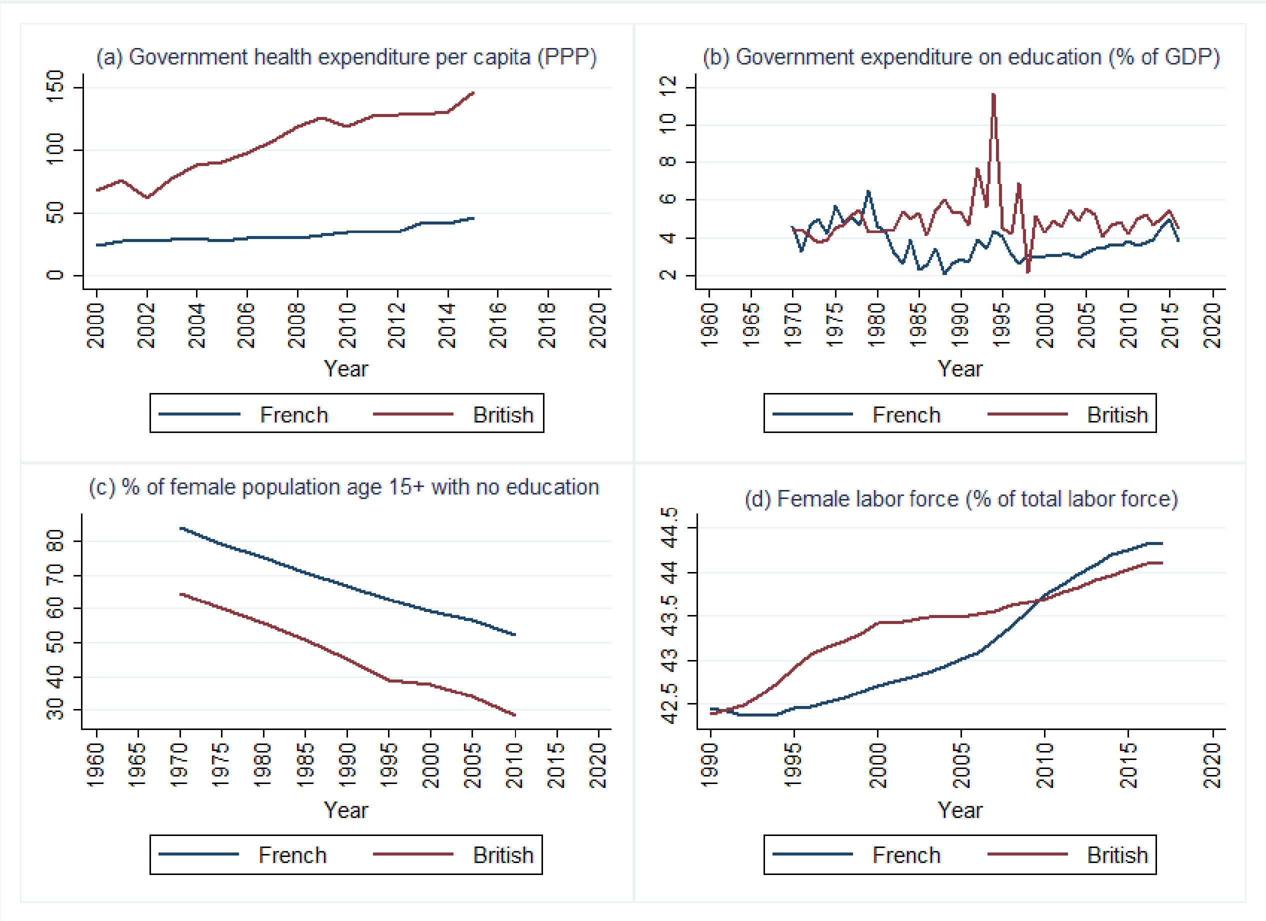
A2 Colonial Origins and Present-day Institutions

Figure A2



Source: Political Risk Services and World Bank (Doing Business)

Figure A3



Source: World Development Indicators

A3 RDD Graphs with Baseline Sample

Figure A4: Colonial origins and fertility with baseline sample

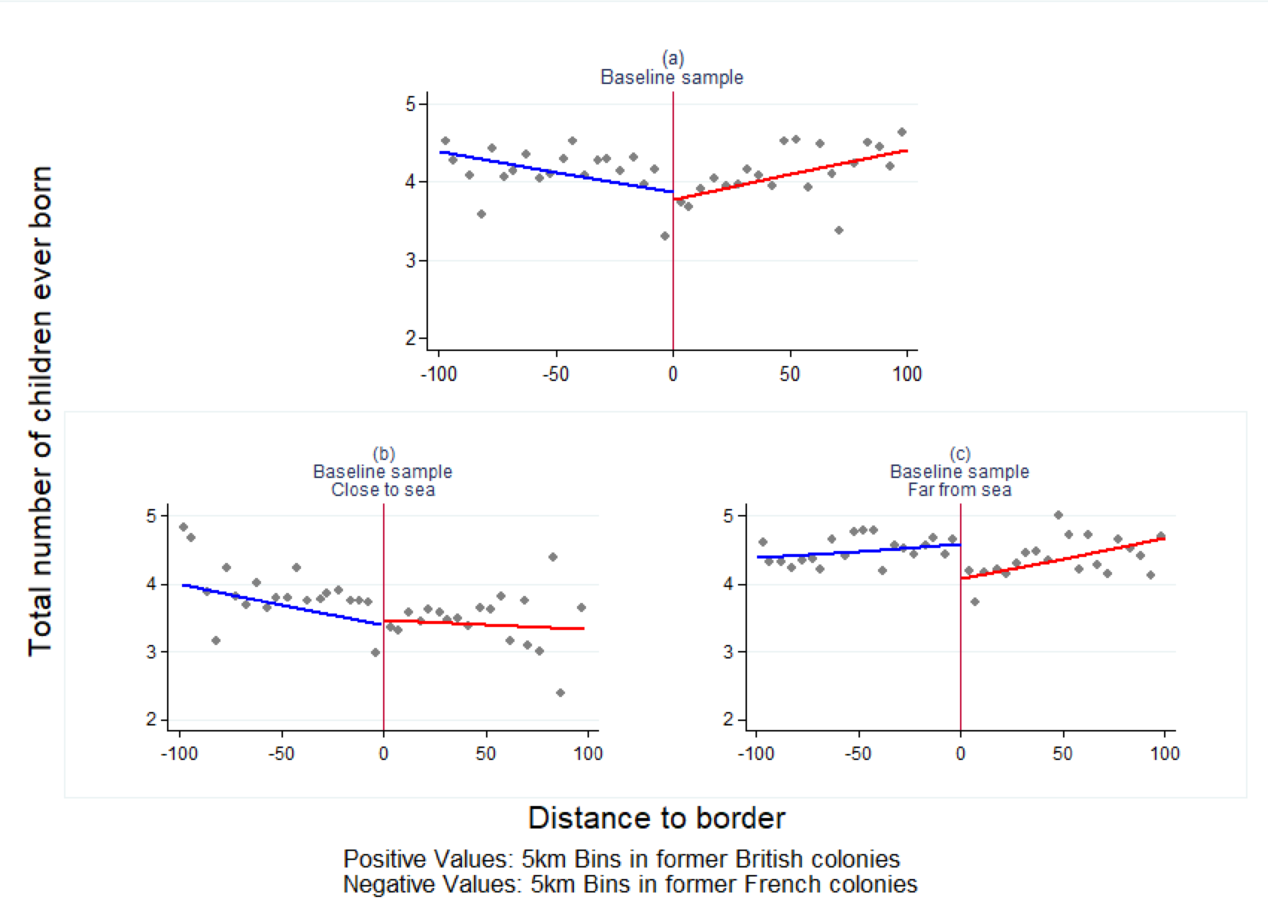
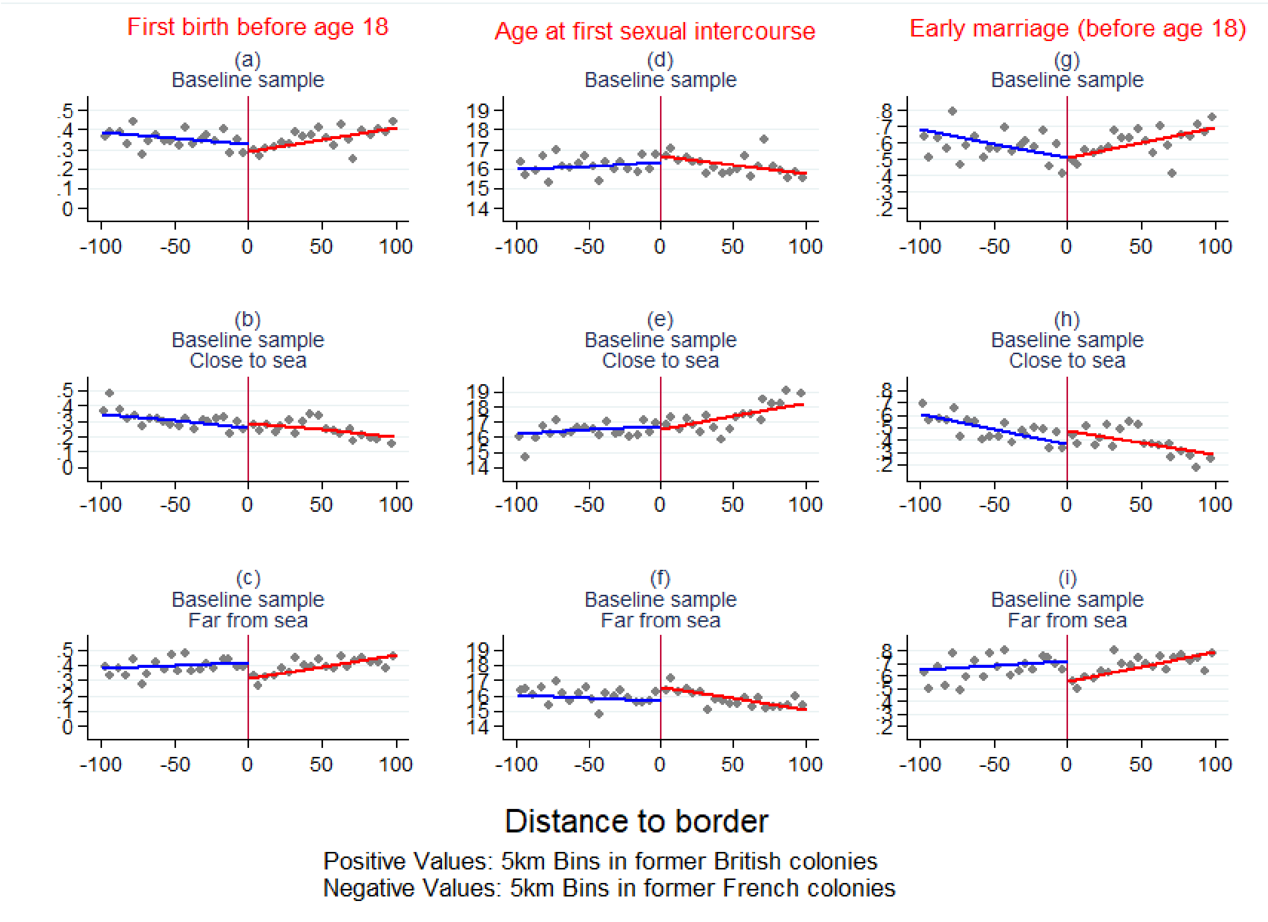


Figure A5: Colonial origins and other outcomes with baseline sample



A4 Summary Statistics

Table A1: Descriptive statistics

	Observations	Means	Sd. dev.
Panel A: Individual-level means			
Children ever born	34,405	4.10	2.90
Age at first sexual intercourse	28,672	16.14	2.96
Early marriage (before age 18)	32,401	0.60	0.49
Age	34,405	31.64	8.21
Year of birth	34,405	1968.35	10.30
Muslim religion	34,328	0.56	0.50
Years of education	34,386	2.09	3.84
Unskilled worker	32,614	0.32	0.47
Cash earning	13,874	0.76	0.43
Respondent had one child dead	34,405	0.44	0.50
Contraceptive use	4,590	0.50	0.50
Mild wasting	22,000	0.70	0.46
Child mortality	104,979	0.23	0.42
Panel B: Pixel-level means			
Pixel is lit	763	0.38	0.49
Population density	763	121.14	318.76
Elevation	763	307.12	195.24
Soil suitability to agriculture	755	0.38	0.23
Area under water	763	6.73	20.46
Distance to the coast	763	487.00	314.12
Distance to the capital	763	471.74	305.64
Distance to the national border	763	46.91	47.00

A5 Robustness Check: Third Order RD Polynomial

Table A2: Robustness check : Third order RD polynomial - Colonial origins and reproductive behavior

	<60 km of bound.		<100 km of bound.		<150 km of bound.		<200 km of bound.	
	Close (1)	Far (2)	Close (3)	Far (4)	Close (5)	Far (6)	Close (7)	Far (8)
Baseline specification								
Panel A: Total number of children ever born								
British (vs. French)	-0.09	-0.47***	-0.14	-0.43***	-0.18	-0.46***	-0.16	-0.52***
	(0.105)	(0.094)	(0.123)	(0.082)	(0.119)	(0.069)	(0.109)	(0.075)
Observations	9,136	12,019	11,724	16,183	13,192	18,116	13,753	18,815
Panel B: First birth before age 18								
British (vs. French)	-0.02	-0.09***	-0.03	-0.07***	-0.03	-0.08***	-0.03	-0.08***
	(0.031)	(0.015)	(0.029)	(0.015)	(0.029)	(0.015)	(0.027)	(0.016)
Observations	8,011	11,087	10,206	14,955	11,540	16,744	12,042	17,432
Panel C: Age at first sexual intercourse								
British (vs. French)	0.27*	0.80***	0.31*	0.66*	0.32*	0.63*	0.31*	0.63*
	(0.148)	(0.266)	(0.167)	(0.353)	(0.185)	(0.346)	(0.175)	(0.353)
Observations	7,264	9,802	9,580	13,422	10,943	14,969	11,478	15,610
Panel D: Early marriage (before 18 years old)								
British (vs. French)	-0.01	-0.09**	-0.03	-0.07*	-0.04	-0.08*	-0.03	-0.09**
	(0.040)	(0.038)	(0.039)	(0.045)	(0.038)	(0.043)	(0.031)	(0.043)
Observations	8,163	11,612	10,479	15,689	11,851	17,595	12,377	18,322
Ethnic homeland FE	✓	✓	✓	✓	✓	✓	✓	✓
Age FE	✓	✓	✓	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓	✓	✓	✓	✓
Geographic controls	✓	✓	✓	✓	✓	✓	✓	✓

Note: In each specification we control for a third-order polynomial in the distance from the centroid of each pixel to the nearest national border with different colonial origin. Robust standard errors, adjusted for double-clustering at the country and the ethno-linguistic family level using the approach of Cameron et al. (2011), are in parenthesis. Coefficients that are significantly different from zero are denoted by the following system: ****p<0.01, **p<0.05, *p<0.1.*

Table A3: Robustness check : Third order RD polynomial - Colonial origins and reproductive behavior (Control for spillover at the border)

	<60 km of bound.		<100 km of bound.		<150 km of bound.		<200 km of bound.	
	Close (1)	Far (2)	Close (3)	Far (4)	Close (5)	Far (6)	Close (7)	Far (8)
Natives								
Panel A: Total number of children ever born								
British (vs. French)	0.07	-0.54***	-0.01	-0.50***	-0.06	-0.53***	-0.04	-0.58***
	(0.167)	(0.125)	(0.185)	(0.120)	(0.184)	(0.092)	(0.177)	(0.091)
Observations	3,004	5,211	3,947	7,134	4,591	7,972	4,817	8,304
Panel B: First birth before age 18								
British (vs. French)	-0.05	-0.10***	-0.06	-0.07***	-0.05	-0.08***	-0.04	-0.08***
	(0.049)	(0.018)	(0.050)	(0.021)	(0.044)	(0.019)	(0.039)	(0.020)
Observations	2,578	4,779	3,383	6,557	3,969	7,317	4,172	7,641
Panel C: Age at first sexual intercourse								
British (vs. French)	0.39*	0.72**	0.38*	0.48	0.37*	0.48	0.30	0.48
	(0.218)	(0.302)	(0.207)	(0.340)	(0.219)	(0.359)	(0.196)	(0.365)
Observations	2,541	4,291	3,380	5,901	3,971	6,519	4,180	6,831
Panel D: Early marriage (before 18 years old)								
British (vs. French)	-0.05	-0.09**	-0.08	-0.07*	-0.07*	-0.08*	-0.06*	-0.08**
	(0.050)	(0.038)	(0.049)	(0.039)	(0.043)	(0.040)	(0.036)	(0.040)
Observations	2,590	4,980	3,429	6,842	4,017	7,673	4,227	8,017
Natives + Thick border								
Panel E: Total number of children ever born								
British (vs. French)	-0.08	-0.57***	-0.19	-0.51***	-0.23	-0.56***	-0.18	-0.62***
	(0.219)	(0.139)	(0.224)	(0.130)	(0.226)	(0.077)	(0.235)	(0.075)
Observations	2,194	4,724	3,129	6,655	3,760	7,506	3,983	7,841
Panel F: First birth before age 18								
British (vs. French)	-0.07	-0.11***	-0.09	-0.08***	-0.07	-0.09***	-0.05	-0.09***
	(0.059)	(0.019)	(0.054)	(0.024)	(0.043)	(0.022)	(0.041)	(0.023)
Observations	1,949	4,340	2,747	6,125	3,323	6,895	3,523	7,222
Panel G: Age at first sexual intercourse								
British (vs. French)	0.43	0.59***	0.46*	0.34	0.38	0.33	0.28	0.31
	(0.269)	(0.228)	(0.260)	(0.279)	(0.243)	(0.281)	(0.234)	(0.266)
Observations	1,902	3,869	2,733	5,487	3,312	6,117	3,518	6,432
Panel H: Early marriage (before 18 years old)								
British (vs. French)	-0.07	-0.10***	-0.10*	-0.07*	-0.09**	-0.08*	-0.07**	-0.09**
	(0.056)	(0.038)	(0.055)	(0.042)	(0.042)	(0.042)	(0.034)	(0.042)
Observations	1,941	4,510	2,773	6,379	3,348	7,223	3,555	7,570
Ethnic homeland FE	✓	✓	✓	✓	✓	✓	✓	✓
Age FE	✓	✓	✓	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓	✓	✓	✓	✓
Geographic controls	✓	✓	✓	✓	✓	✓	✓	✓

Note: In each specification we control for a third-order polynomial in the distance from the centroid of each pixel to the nearest national border with different colonial origin. Robust standard errors, adjusted for double-clustering at the country and the ethno-linguistic family level using the approach of Cameron et al. (2011), are in parenthesis. Coefficients that are significantly different from zero are denoted by the following system: ****p<0.01, **p<0.05, *p<0.1.*

A6 Robustness Check: RD Polynomial in Latitude and Longitude

Table A4: Robustness check : RD polynomial in latitude and longitude - Colonial origins and reproductive behavior

	<60 km of bound.		<100 km of bound.		<150 km of bound.		<200 km of bound.	
	Close (1)	Far (2)	Close (3)	Far (4)	Close (5)	Far (6)	Close (7)	Far (8)
Baseline specification								
Panel A: Total number of children ever born								
British (vs. French)	0.06	-0.48***	0.14	-0.42***	0.09	-0.45***	0.01	-0.46***
	(0.145)	(0.117)	(0.110)	(0.102)	(0.098)	(0.097)	(0.097)	(0.101)
Observations	9,136	12,019	11,724	16,183	13,192	18,116	13,753	18,815
Panel B: First birth before age 18								
British (vs. French)	0.00	-0.09***	-0.02	-0.07***	-0.02	-0.08***	-0.03	-0.07***
	(0.022)	(0.017)	(0.027)	(0.015)	(0.027)	(0.016)	(0.025)	(0.015)
Observations	8,011	11,087	10,206	14,955	11,540	16,744	12,042	17,432
Panel C: Age at first sexual intercourse								
British (vs. French)	0.22	0.85***	0.34*	0.64*	0.23	0.59	0.35**	0.54
	(0.157)	(0.267)	(0.181)	(0.385)	(0.150)	(0.402)	(0.172)	(0.440)
Observations	7,264	9,802	9,580	13,422	10,943	14,969	11,478	15,610
Panel D: Early marriage (before 18 years old)								
British (vs. French)	0.03	-0.10***	0.00	-0.07	0.00	-0.07	-0.01	-0.07
	(0.046)	(0.032)	(0.053)	(0.048)	(0.044)	(0.047)	(0.040)	(0.049)
Observations	8,163	11,612	10,479	15,689	11,851	17,595	12,377	18,322
Ethnic homeland FE	✓	✓	✓	✓	✓	✓	✓	✓
Age FE	✓	✓	✓	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓	✓	✓	✓	✓
Geographic controls	✓	✓	✓	✓	✓	✓	✓	✓

Note: In each specification we control for a polynomial in the latitude and longitude of the pixel. Robust standard errors, adjusted for double-clustering at the country and the ethno-linguistic family level using the approach of Cameron et al. (2011), are in parenthesis. Coefficients that are significantly different from zero are denoted by the following system: ****p<0.01, **p<0.05, *p<0.1.*

Table A5: Robustness check : RD polynomial in latitude and longitude - Colonial origins and reproductive behavior (Control for spillover at the border)

	<60 km of bound.		<100 km of bound.		<150 km of bound.		<200 km of bound.	
	Close (1)	Far (2)	Close (3)	Far (4)	Close (5)	Far (6)	Close (7)	Far (8)
Natives								
Panel A: Total number of children ever born								
British (vs. French)	0.20	-0.54***	0.28	-0.51***	0.24*	-0.56***	0.12	-0.58***
	(0.199)	(0.127)	(0.277)	(0.129)	(0.142)	(0.109)	(0.165)	(0.110)
Observations	3,004	5,211	3,947	7,134	4,591	7,972	4,817	8,304
Panel B: First birth before age 18								
British (vs. French)	-0.05	-0.10***	-0.06*	-0.09***	-0.04	-0.10***	-0.03	-0.09***
	(0.051)	(0.021)	(0.033)	(0.022)	(0.027)	(0.019)	(0.032)	(0.017)
Observations	2,578	4,779	3,383	6,557	3,969	7,317	4,172	7,641
Panel C: Age at first sexual intercourse								
British (vs. French)	0.41***	0.71**	0.45***	0.47	0.22	0.46	0.25	0.44
	(0.149)	(0.284)	(0.128)	(0.427)	(0.145)	(0.403)	(0.175)	(0.432)
Observations	2,541	4,291	3,380	5,901	3,971	6,519	4,180	6,831
Panel D: Early marriage (before 18 years old)								
British (vs. French)	-0.02	-0.09***	-0.06	-0.07	-0.03	-0.07	-0.04	-0.06
	(0.079)	(0.028)	(0.064)	(0.041)	(0.040)	(0.044)	(0.036)	(0.045)
Observations	2,590	4,980	3,429	6,842	4,017	7,673	4,227	8,017
Natives + Thick border								
Panel E: Total number of children ever born								
British (vs. French)	0.08	-0.48***	0.25	-0.48***	0.13	-0.55***	0.02	-0.57***
	(0.337)	(0.172)	(0.422)	(0.133)	(0.201)	(0.097)	(0.250)	(0.131)
Observations	2,194	4,724	3,129	6,655	3,760	7,506	3,983	7,841
Panel F: First birth before age 18								
British (vs. French)	-0.10*	-0.11***	-0.10*	-0.09***	-0.06**	-0.10***	-0.04	-0.10***
	(0.050)	(0.020)	(0.055)	(0.028)	(0.029)	(0.027)	(0.034)	(0.026)
Observations	1,949	4,340	2,747	6,125	3,323	6,895	3,523	7,222
Panel G: Age at first sexual intercourse								
British (vs. French)	0.53**	0.68**	0.53**	0.36	0.18	0.31	0.09	0.24
	(0.210)	(0.288)	(0.235)	(0.332)	(0.185)	(0.324)	(0.292)	(0.299)
Observations	1,902	3,869	2,733	5,487	3,312	6,117	3,518	6,432
Panel H: Early marriage (before 18 years old)								
British (vs. French)	-0.05	-0.10***	-0.08	-0.07	-0.05	-0.07	-0.05	-0.06
	(0.085)	(0.029)	(0.077)	(0.045)	(0.041)	(0.047)	(0.034)	(0.044)
Observations	1,941	4,510	2,773	6,379	3,348	7,223	3,555	7,570
Ethnic homeland FE	✓	✓	✓	✓	✓	✓	✓	✓
Age FE	✓	✓	✓	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓	✓	✓	✓	✓
Geographic controls	✓	✓	✓	✓	✓	✓	✓	✓

Note: In each specification we control for a polynomial in the latitude and longitude of the pixel. Robust standard errors, adjusted for double-clustering at the country and the ethno-linguistic family level using the approach of Cameron et al. (2011), are in parenthesis. Coefficients that are significantly different from zero are denoted by the following system: ****p<0.01, **p<0.05, *p<0.1.*

Table A6: Effect of colonial origins on fertility in areas far from sea (Control for education and income)

	<60 km of bound.		<100 km of bound.		<150 km of bound.		<200 km of bound.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable: Total number of children ever born								
Panel A: Baseline specification								
British (vs. French)	-0.37***	-0.37***	-0.38***	-0.37***	-0.42***	-0.40***	-0.44***	-0.42***
	(0.084)	(0.089)	(0.107)	(0.111)	(0.108)	(0.111)	(0.110)	(0.112)
Observations	11,930	12,012	16,060	16,173	17,998	18,106	18,685	18,806
Panel B: Geographic controls								
British (vs. French)	-0.38***	-0.39***	-0.35***	-0.35***	-0.39***	-0.38***	-0.43***	-0.41***
	(0.105)	(0.109)	(0.100)	(0.102)	(0.092)	(0.097)	(0.091)	(0.093)
Observations	11,930	12,012	16,060	16,173	17,998	18,106	18,685	18,806
Panel C: Natives								
British (vs. French)	-0.46***	-0.47***	-0.49***	-0.49***	-0.53***	-0.53***	-0.55***	-0.55***
	(0.114)	(0.124)	(0.134)	(0.143)	(0.129)	(0.137)	(0.132)	(0.137)
Observations	5,187	5,209	7,102	7,132	7,938	7,969	8,264	8,301
Panel D: Natives + Geographic controls								
British (vs. French)	-0.48***	-0.49***	-0.46***	-0.46***	-0.48***	-0.48***	-0.52***	-0.52***
	(0.136)	(0.147)	(0.132)	(0.139)	(0.106)	(0.114)	(0.105)	(0.109)
Observations	5,187	5,209	7,102	7,132	7,938	7,969	8,264	8,301
Panel E: Natives + Thick border								
British (vs. French)	-0.47***	-0.48***	-0.52***	-0.51***	-0.56***	-0.56***	-0.59***	-0.59***
	(0.098)	(0.103)	(0.103)	(0.111)	(0.085)	(0.092)	(0.085)	(0.090)
Observations	4,702	4,722	6,625	6,653	7,474	7,503	7,803	7,838
Panel F: Natives + Thick border + Geographic controls								
British (vs. French)	-0.49***	-0.51***	-0.45***	-0.45***	-0.49***	-0.49***	-0.54***	-0.54***
	(0.132)	(0.136)	(0.123)	(0.126)	(0.070)	(0.076)	(0.067)	(0.072)
Observations	4,702	4,722	6,625	6,653	7,474	7,503	7,803	7,838
Ethnic homeland FE	✓	✓	✓	✓	✓	✓	✓	✓
Age FE	✓	✓	✓	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓	✓	✓	✓	✓
Education control	✓	✓	✓	✓	✓	✓	✓	✓
Asset control	✓		✓		✓		✓	
Light density		✓		✓		✓		✓

Note: In each specification we control for a second-order polynomial in the distance from the centroid of each pixel to the nearest national border with different colonial origin. Robust standard errors, adjusted for double-clustering at the country and the ethno-linguistic family level using the approach of Cameron et al. (2011), are in parenthesis. Coefficients that are significantly different from zero are denoted by the following system: ****p<0.01, **p<0.05, *p<0.1.*

Table A7: Average effect - Colonial origins and fertility (Excluding Cameroon and Togo)

	OLS	RDD - Bandwidth			
	OLS (1)	<60 km of bound. (2)	<100 km of bound. (3)	<150 km of bound. (4)	<200 km of bound. (5)
Dependent variable: Total number of children ever born					
Panel A: Baseline specification					
British (vs. French)	-0.51***	-0.40***	-0.41**	-0.48**	-0.50**
	(0.164)	(0.084)	(0.177)	(0.203)	(0.199)
Observations	28,906	16,336	23,148	26,549	27,809
Panel B: Geographic controls					
British (vs. French)	-0.47***	-0.47***	-0.42***	-0.45***	-0.45***
	(0.132)	(0.097)	(0.100)	(0.105)	(0.130)
Observations	28,243	15,874	22,485	25,886	27,146
Panel C: Natives					
British (vs. French)	-0.58***	-0.46***	-0.51***	-0.57***	-0.59***
	(0.143)	(0.131)	(0.159)	(0.148)	(0.150)
Observations	12,398	6,942	9,792	11,274	11,832
Panel D: Natives + Geographic controls					
British (vs. French)	-0.52***	-0.55***	-0.50***	-0.49***	-0.50***
	(0.154)	(0.143)	(0.151)	(0.133)	(0.143)
Observations	12,166	6,759	9,560	11,042	11,600
Panel E: Natives + Thick border					
British (vs. French)	-0.62***	-0.47***	-0.54***	-0.61***	-0.63***
	(0.133)	(0.145)	(0.162)	(0.148)	(0.149)
Observations	11,578	6,122	8,972	10,454	11,012
Panel F: Natives + Thick border + Geographic controls					
British (vs. French)	-0.56***	-0.57***	-0.51***	-0.53***	-0.53***
	(0.133)	(0.157)	(0.148)	(0.125)	(0.145)
Observations	11,368	5,961	8,762	10,244	10,802
Ethnic homeland FE	✓	✓	✓	✓	✓
Age FE	✓	✓	✓	✓	✓
Year of birth FE	✓	✓	✓	✓	✓
Religion FE	✓	✓	✓	✓	✓

Note: Specifications in columns (2)-(5) control for a second-order polynomial in the distance from the centroid of each pixel to the nearest national border with different colonial origin. Robust standard errors, adjusted for double-clustering at the country and the ethno-linguistic family level using the approach of Cameron et al. (2011), are in parenthesis. Coefficients that are significantly different from zero are denoted by the following system: ****p<0.01, **p<0.05, *p<0.1.*

A7 Data Appendix

Light density at night: Light Density is calculated averaging light density observations across pixels that fall within the unit of analysis. We use the 2013 Nighttime Light (NTL) data (stable lights dataset) from the U.S. Air Forceâs Defense Meteorological Satellite Program/Operational Linescan System (DMSP/OLS). This dataset is made available by the U.S. National Oceanographic and Atmospheric Administration (NOAA). The pixel light (gain) values range from 0 to 63 with being the absence of light. *Available at* https://www.ngdc.noaa.gov/eog/dmsp/downloadV4composites

Population density: Population per sq. km. in 2000. Source: Nelson, Andy, 2004. African Population Database Documentation, UNEP GRID Sioux Falls. *Available at* https://www.arcgis.com/home/item.html?id=9ec46c83ca5c47ebb1a25bd43131b483

Elevation: Average elevation above sea level of each pixel. Source: National Oceanic and Atmospheric Administration (NOAA) and U.S. National Geophysical Data Center, TerrainBase, release 1.0 (CD-ROM), Boulder, Colorado. *Available at* http://nelson.wisc.edu/sage/data-and-models/atlas/data.php?incdataset=Topography

Soil suitability for agriculture: Average land quality for cultivation within each pixel. This index is based on the temperature and soil conditions of each grid cell. Source: Ramankutty, N., J.A. Foley, J. Norman, and K. McSweeney. The global distribution of cultivable lands:current patterns and sensitivity to possible climate change. *Available at* http://nelson.wisc.edu/sage/data-and-models/atlas/data.php?incdataset=Suitability%20for%20Agriculture

Water area: Total area covered by rivers or lakes in sq. km within each pixel. Constructed using the Level 3 of the Global Lakes and Wetlands Database (GLWD) which comprises lakes, reservoirs, rivers, and different wetland types in the form of a global raster map at 30-sec resolution. Source: Lehner, B. and Doell, P. (2004): Development and validation of a global database of lakes, reservoirs and wetlands. Journal of Hydrology 296/1-4: 1-22. *Available at* http://www.arcgis.com/home/item.html?id=1ac6777abcc24ab4a9fe39f27c4cb01f

Distance to the sea coast: The geodesic distance (in kilometers) from the centroid of each pixel to the nearest coastline. Constructed using Africa coastline data. *Available at* http://omap.africanmarineatlas.org/BASE/pages/coastline.htm

Distance to the capital city: The geodesic distance (in kilometers) from the centroid of each pixel to the capital city in the same country. Geographical coordinates for the capital cities were derived from the cShapes dataset. Source: Weidmann, Nils B., Doreen Kuse, and Kristian Skrede Gleditsch. 2010. The Geography of the International System: The CShapes Dataset. International Interactions 36 (1). *Available at* http://nils.weidmann.ws/projects/cshapes.html

Distance to the national border: The geodesic distance to the nearest national border from the centroid of each pixel. Constructed using the border from the digital chart of the world projection *Available at* https://worldmap.harvard.edu/data

Petroleum: Indicator variable that equals one if there is an oil field in the pixel. We use the petroleum Dataset v.1.2 which contains information on all known on-shore oil and gas deposits throughout the world. Source: Lujala, PÃivi; Jan Ketil RÃ¸d Nadia Thieme, 2007. "Fighting over Oil: Introducing A New Dataset", Conflict Management and Peace Science 24(3), 239-256. *Available at* https://www.prio.org/Data/Geographical-and-Resource-Datasets/Petroleum-Dataset/Petroleum-Dataset-v-12/

Diamonds: Indicator variable that equals one if there is a diamond mine in the pixel. We use the Diamonds dataset offers a comprehensive list of all known diamond deposits throughout the world. Source: Gilmore, Elisabeth; Nils Petter Gleditsch, PÃivi Lujala Jan Ketil RÃ¸d, 2005. "Conflict Diamonds: A New Dataset", Conflict Management and Peace Science 22(3): 257â292. *Available at* https://www.prio.org/Data/Geographical-and-Resource-Datasets/Diamond-Resources/