The Legacy of Coercive Cotton Cultivation in Colonial Mozambique

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Abstract

We examine the long-term impact of forced labor on individual risk preferences and economic decisions. For that, we focus on a policy of coercive cotton cultivation enforced in colonial Mozambique between 1926 and 1961. We combine archival information about the boundaries of historical cotton concessions with survey data collected specifically for this study. By employing a regression discontinuity design to compare individuals living in areas inside and outside the historical cotton concessions, we document significant disparities in risk aversion and agricultural patterns between communities. Our findings indicate that individuals subjected to the colonial cotton regime exhibit higher risk aversion, are more likely to sell their agricultural produce, adopt technology, and save. These findings are predominantly driven by individuals who recall the coercive cotton cultivation in their communities, particularly women who bore the brunt of the colonial cotton regime. This paper underscores the enduring impact of colonial agricultural policies on risk and economic behavior, providing insights into the challenges post-colonial societies face in overcoming historical legacies.

1 Introduction

The relationship between trauma, violence, and their influence on human behavior is a well-documented area of study, highlighting the effects these factors can have on social norms, risk preferences or economic decision making (Callen et al. 2014, Voors et al. 2012). Despite the acknowledgment of these immediate impacts, there remains a significant gap in our understanding of the long-term consequences of such experiences. To cope with this knowledge gap, historical episodes can provide useful natural laboratories.

In this paper we evaluate the long-term impact of European colonial policies in Africa within the agricultural sector, which often involved forced production of cash crops and perpetuation of trauma in the subjected populations (Tadei, Jones and Gibbon 2022). In particular, we explore the enduring impacts of forced labor policies on risk preferences and investment decisions, focusing on a coercive cotton cultivation program enforced between 1926 and 1961 in colonial Mozambique. Under this regime, vast regions of the country were designated as cotton concession areas, with control subsequently handed over to private concessionary companies. Supported by local colonial authorities, these companies coerced rural households within the concession areas to grow cotton, which they then purchased at government-fixed prices. This regime, characterized by its coercive enforcement mechanisms, not only dictated the livelihoods of farmers within cotton concession areas but also had profound implications for food security, economic independence, and gender roles within society. By coercing farmers to dedicate their lands to cotton over food or more profitable cash crops, the colonial policy disrupted traditional agricultural practices and livelihood strategies, setting the stage for a complex legacy that continues to influence Mozambican society. Among all, women bore the brunt of this regime, as they constituted the majority of rural farmers in these areas due to the migration of men to work in South African mines.

To identify the causal effects of being exposed to the regime of coercive cotton cultivation, we employ a spatial regression discontinuity design, comparing individuals living in areas inside and outside the boundaries of the historical cotton concessions. We combine the spatial information from historical concessions with new survey data of 2,000 individuals that we collected specifically for this study, and which covers rural villages outside and inside cotton concessions. Our identification strategy is grounded in the arguably arbitrary delineation of cotton concessions boundaries, where concession companies aimed to include as much land as possible within the concession system, regardless of the agronomic suitability of the region. Within this framework, we examine the long-term implications of this coercive labor regime on a range of outcomes, including risk aversion, agricultural decisions and economic practices.

We find that the exposure to cotton concessions shaped individuals risk preferences, agricultural and economic decisions, particularly in areas where cotton production was relatively more suitable and enforced for longer periods. In those areas, individuals who were historically exposed to cotton concessions are 12.0 percentage points (pp) more likely to be risk-averse, relatively to people living outside the concessions. In what concerns farming decisions, individuals exposed to cotton concessions are more likely to sell their crop output. Although the access to formal credit by individuals in our study sample is almost non-existent, the probability of participating in communal savings programs (ROSCA) increased among individuals living inside former cotton concessions. We test the robustness of these results against the inclusion of different controls, RD polynomials, or bandwidths. We find that despite slight changes in the magnitude of coefficients, the interpretation of the results remains unchanged. Interestingly, we also measure the impact of cotton concessions on business ownership, but we find no significant changes. In line with historical accounts that the burden of cotton cultivation lay mostly on women, we find that the main impacts of cotton concessions on all these outcomes are driven by women, whereas no change is observed for men.

The contribution of this paper is threefold. First, we add to existing literature studying the long-term effects of trauma and violence on risk-taking behavior and economic decision-making, thus complementing existing work studying its shorter-term effects (for a general review see Walden and Zhukov 2020, Callen et al. 2014, Voors et al. 2012, Schildberg-Hörisch 2018, Moya 2018). Similarly to the existing findings on short-term effects (Schildberg-Hörisch 2018), our hypothesised casual chain is that trauma generated by historical events such as coercive labor leads to an increase in risk aversion. This persisted over time and has consequences for contemporary economic decision making. Aspects of this chain have been investigated in other contexts. For example, Cameron and Shah (2015) show that recent exposure to natural disaster reduces risk appetite, while Liu (2013) shows that risk averse farmers are less likely to adopt new cotton varieties. More similar to our own analysis, Blouin (2021) document how the experience of forced coffee cultivation cast a long shadow on inter-ethnic trust with adverse implications for agricultural risk management.

Second, this paper contributes to the broader literature studying the long-term consequences of European colonialism on the economic development of the Global South, particularly in what concerns labor exploitation (Nunn 2008, Dell 2010, Bruhn and Gallego 2012). This paper provides evidence that colonial policies not only negatively impacted social norms (Nunn and Wantchekon 2011, Lowes and Montero 2021), but they also altered risk-taking behavior and preferences of the children of victims – a dimension that remains largely understudied.

Third, this paper also contributes to policy discussion of how to mitigate the adverse long-lasting impact of labor exploitation. Our findings may contribute to understanding what are the key features of policy design aimed at mitigating the long-term burden of forced labor on its victims. This is motivated by the United Nations' goal of eradicating forced labor worldwide, despite the year of 2021 witnessed an estimate of 27.6 million people globally enduring forced labor conditions (ILO, 2022) – mostly in agriculture environments. While significant policy efforts focus on the eradication of forced labor, understanding the long-term consequences on the behavior and well-being of its victims and their descendants remains a critical domain.

The remainder of this paper is structured as follows. Section 2 details the historical context of cotton concessions and in what the coercive cotton policy consisted. Next, Section 3 details the research design, including the collection of survey data and summary statistics. This is followed by Section 4 which details the outcomes measured and the regression discontinuity specification used. After, the main results are presented in Section 5. Section 6 concludes the paper.

2 Historical Background

Throughout the twentieth century, concessions granted by European colonial authorities to private companies became widespread across Africa. While having a common economic framework for labor and resource extraction, concessions displayed significant variation in the type of natural resources explored, as well as in their levels of coercive power and use of violence. One of such cases took place between 1926 and 1961, when the Portuguese colonial government enforced a system of coercive cotton cultivation in Mozambique.

This was achieved by establishing cotton zones and subsequently granting concessions to private companies.[1] The lack of data on the cotton suitability of soils, temperature fluctua-

[1]Prior to the implementation of these concessions, cotton production in Mozambique was virtually nonexistent

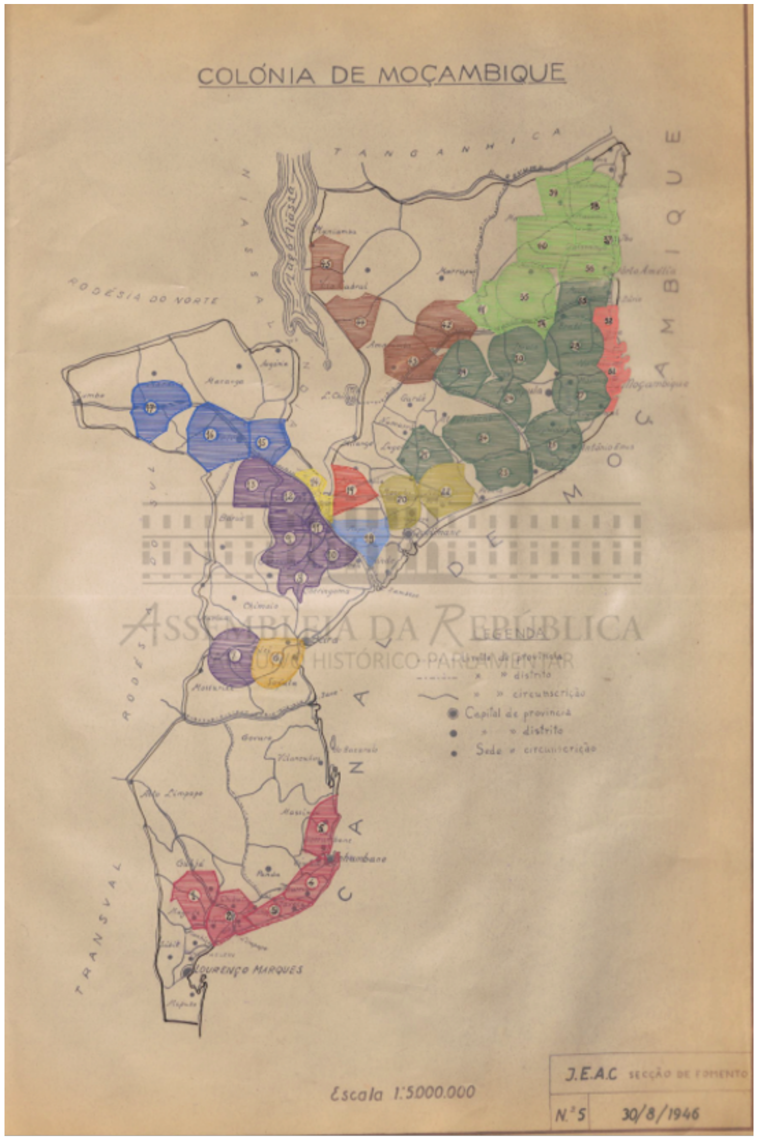

Figure 1: Cotton concessions in colonial Mozambique (1946).

tions, plant diseases and rainfall patterns made the drawing of cotton concessions boundaries somewhat arbitrary. This resulted in significant portions of the designated cotton zones being unsuitable for cultivation (Isaacman 1995). Consistent with this approach, concession boundaries were defined using a mix of prominent geographic features and administrative limits (J.E.A.C. 1946). Figure 1 provides the map of Mozambique with the cotton concessions in 1946, used to define the cotton concession borders (J.E.A.C. 1946).

The intervention of colonial authorities had two main objectives. First, maximize the number of farmers coerced to produce cotton. This included making sure that everyone legally

(Pitcher 1991).

obliged to produced cotton did so, such as male elders between 55 and 65 years old, women in late stages of pregnancy, or mothers with young babies (Isaacman 1992a). The second objective was to maximize the hours per day devoted to produce cotton.

Within the concession zones, cotton seeds were distributed by colonial concessionary companies and they were to be planted on local farmers' plots. After, farmers were required to sell their cotton production to concessionary companies at government-fixed prices – which were substantially below the international standard.[2] The labor regime was highly controlled, with colonial authorities dictating plot sizes and locations and a fixed work schedule that farmers had to follow. This included fixed mandatory dates by which cotton planting, reseed and harvesting had to be completed; and the number of times cotton had to be weeded (Isaacman 1992b; 1995).

Cotton production also came at the cost of traditional crops and food security. The initial land preparation for cotton started in September of each year with the planting of seeds. Throughout the agricultural cycle, weeding had to be done between three and four times, reducing the possibility of planting different food crops. Harvesting had to be done in the months of June and July, with farmers devoting the subsequent weeks carrying the cotton they produced to the concessionary company markets. This calendar for producing cotton overlapped with other traditional crops, creating a production bottleneck in which farmers were unable to produce traditional crops, such as sorghum or corn. Therefore, food shortages were not uncommon (Isaacman 1992b).[3]

In addition to government officials, concessionary companies also relied on local traditional leaders to enforce production. Leaders' refusal to oversee production was met with violence, and they faced possible replacement by individuals more sympathetic to the colonial regime (Isaacman 1985). Infractions or the inability to meet production targets was punished with *palmatória* or a *chamboco*, which respectively consisted of being beaten by a wooden paddle-like instrument or a whip made from rhinoceros hide (Guimarães 2021).

In addition to physical abuse, the colonial system also devised different mechanisms and incentives to increase cotton production. One of the strategies consisted of imposing heavy

[2]The production of cotton in Portuguese colonies was part of a larger neo-mercantilist economic model. Colonies produced cotton and exported it to mainland Portugal. There, textile industries manufactured clothing that was then sold to the colonies, which were forced to purchase Portuguese-made products (Guimarães 2021).

[3]Only in August farmers were free to produce crops different from cotton. By that time, manioc was the crop most often chosen to cope with the production bottleneck generated by cotton production. Despite its low nutritional value, manioc was not labor intensive and it could be harvested after cotton (Isaacman 1992b).

taxes on local farmers. This included increases in the *hut tax* – a lump-sum tax per dwelling – that would make the production of any other crop financially unfeasible, leaving cotton as the only remaining option (Guimarães 2021). Colonial authorities also complemented the hut tax by forbidding the production of any other crop that could compete with cotton, often deliberately destroying these other alternatives (Isaacman 1992a).

Despite the violence, social unrest, and significant food shortages generated by the cotton regime, the objective of maximizing profitability led the colonial authorities to also invest in increasing the productivity of Mozambican farmers through improving scientific knowledge and adoption of agriculture technology (Guimarães 2021). For that, the colonial authorities created the *Fundo do Algodão* (Cotton Fund) which developed infrastructure providing local farmers with water supply and agricultural hydraulics; and the provision of financial credits to the purchase of cattle and agricultural tools and machinery.

Throughout Mozambique, cotton production fell disproportionately to women. This was particularly true in southern Mozambique (the research site of this study), where most males in working age were migrated to neighboring South Africa. The regime of coercive cotton production formally ended as late as 1961, following an uprising in Angola that led to widespread international criticism of Portugal's colonial policy, and heralded the beginning of the struggle for liberation of Portuguese colonies.

3 Research Design

To examine the long-term implications of coercive cotton production, we leveraged the quasi-experimental spatial variation of the arbitrarily defined borders of cotton concessions. The core of this study combined archival data to define the boundaries of the cotton cotton concessions with survey and experimental data collected along these boundaries (Cattaneo, Titiunik, and Vazquez-Bare 2019). Throughout our analysis, we aggregated villages from a two-dimensional spatial measure to an uni-dimensional distance measure from the closest concession boundary.

Our study sample included 200 villages equally distributed on each side of the cutoff. These villages were randomly chosen using the Mozambique Census of 2007 (INE, 2007) – the latest available census –, comprising the provinces of Maputo, Gaza, and Inhambane, where the cotton concession Algodoeira do Sul do Save operated. We restricted the villages eligible to be sampled in our study by imposing two additional conditions. First, villages had to be located

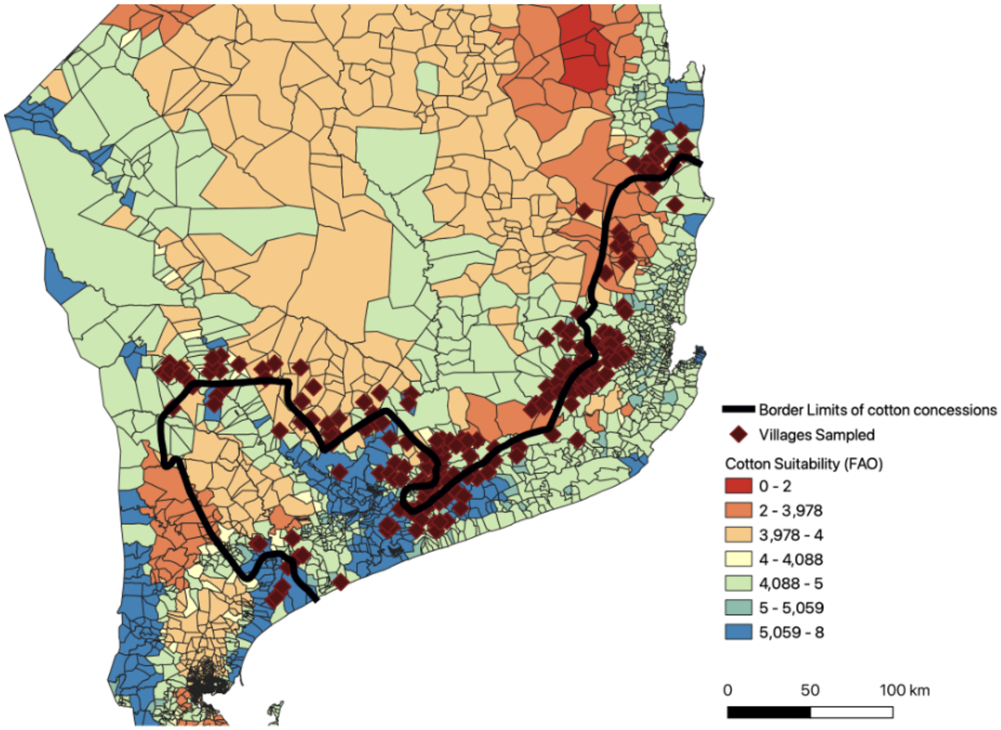

Figure 2: The distribution of villages sampled and cotton suitability.

within 20 kilometers of the cotton border (inside and outside). Second, villages at the 10 percent tail of the population distribution were excluded. We further stratified villages within 5 kilometers segments from the border, and sampled villages randomly drawn within those segments. The number of villages selected from each segment was defined according to the total number of villages in each segment, according to the 2007 Mozambique Census. Our final sample of villages comprised 100 villages inside and 100 villages outside the cotton border (See Figure 2). We focused our analysis in the provinces of Maputo, Gaza and Inhambane, as these are regions that were historically subjected to the coercive cotton regime but where the cultivation of cotton was almost non-existent before the regime as well as today.[4]

Figure 2 illustrates the geographical boundaries of each village, as delineated by the Mozambique Census of 2007. These areas are represented by polygons, each one colored to reflect the suitability for cotton cultivation. The suitability measure is derived from the Global Agro-Ecological Zones (GAEZ) database, assembled by the Food and Agriculture Organization (Fischer et al. 2021). In particular, we employ the suitability class, which assesses crop suitability combining agro-climatic potential yields with soil and terrain evaluation outcomes, and groups

[4]In contrary to the north of Mozambique, where the cotton suitability of soils if higher and cotton is still cultivated today.

results into 8 aggregate classes, ranging from 1 - Very high suitability to 8 - Not suitable. The average cotton suitability class for the villages in our sample varies from 3 to 6.94, indicating the highest to lowest potential for cotton growth. The average suitability score for cotton cultivation across the sampled villages is 4.72.

	Distance from border			All
	<5Km	<10 Km	15Km	Villages
	(1)	(2)	(3)	(4)
Cotton Concession	0.242	0.083	0.091	0.091
	(0.158)	(0.133)	(0.116)	(0.109)
Obs. Outside	32	57	80	100
Obs. Inside	29	57	78	100

OLS estimates. The dependent variable in Columns (1) to (4) is the cotton suitability index. Columns (1), (2) and (3) include villages within 5Km, 10Km and 15Km from the cotton concessions borders, respectively. Column (4) includes all villages. The main explanatory variable is a binary variable measuring whether respondents live within the area of a colonial cotton concession. All specifications used include a RD polynomial of degree 1. No controls are included. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 1: Differences of cotton suitability at the concession border.

Table 1 provides RD estimates of the cotton suitability around the concession boundaries, using villages as units of observation. The estimates presented in this table suggest that the villages sampled outside and inside the cotton concessions, conditional on their distance to the concession boundaries, do not show any significant difference in cotton suitability. This correlation supports the historical accounts referring that concession borders were drawn somewhat arbitrarily, and without fully considering cotton suitability.

To the full extent of our knowledge there is no dis-aggregated data available that allows us to evaluate the correlation between cotton suitability and actual cotton production during the colonial period (the best information available comes from the Statistical Yearbooks of Mozambique, and it is aggregated at the Admin-1 level). However, in our survey (further detailed in Section 3.1) we measured the recollection of individuals and village leaders of whether cotton was produced in their villages during the colonial period. Out of the 200 leaders that we surveyed, 81 lived in villages of high cotton suitability (below the median suitability class of 5). Out of these, 64 reported that there was cultivation of cotton in the village during the colonial period. These numbers contrast with the areas of low cotton suitability (118 villages),

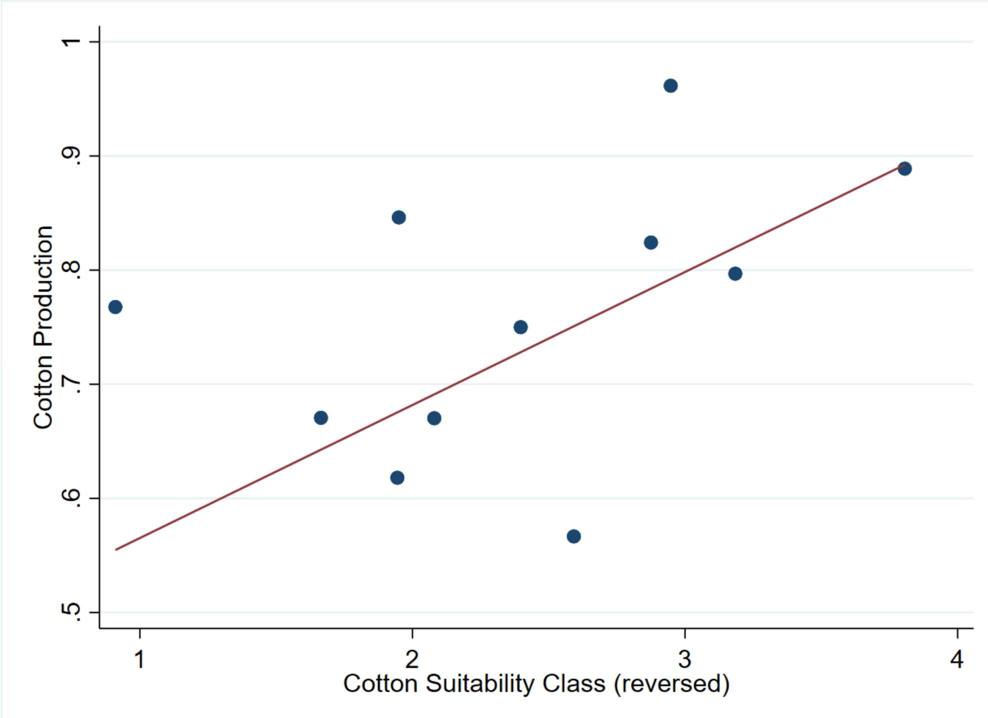

Figure 3: Bin-scatter of cotton production (self reported by individuals) and the cotton suitability index.

in which 86 leaders report that cotton cultivation existed during the colonial period.[5] Only 0.1% of our study sample of 2,000 individuals reports producing cotton today.

Figure 4 plots the bin-scatter of cotton production during the colonial period (a binary variable) and the cotton suitability score at the village level. We find a negative and significant correlation of -0.07. As the cotton suitability class is defined such that lower values indicate higher suitability, this negative correlation implies that leaders in villages with higher cotton suitability are more likely to report cotton production during the colonial period.

We also asked leaders for how long coercive cotton production was imposed in their villages, and the possible answers were presented in a closed list ranging between 1 and more than 10 years. In Figure 5 we show a bin-scatter that correlate the time that coercive cotton production lasted to the chiefs, with the cotton suitability class. We find a negative and significant correlation between the duration of cotton production and the cotton suitability class, suggesting that longer periods of forced cotton production were imposed in areas that were relatively more suitable for cotton cultivation. A potential explanation for the evidence presented - aligned with the discussion in Section 2 - is that colonial authorities initially defined

[5] There is one village missing the leader survey, thus explaining that the sum of leaders in areas of low and high suitability is 199.

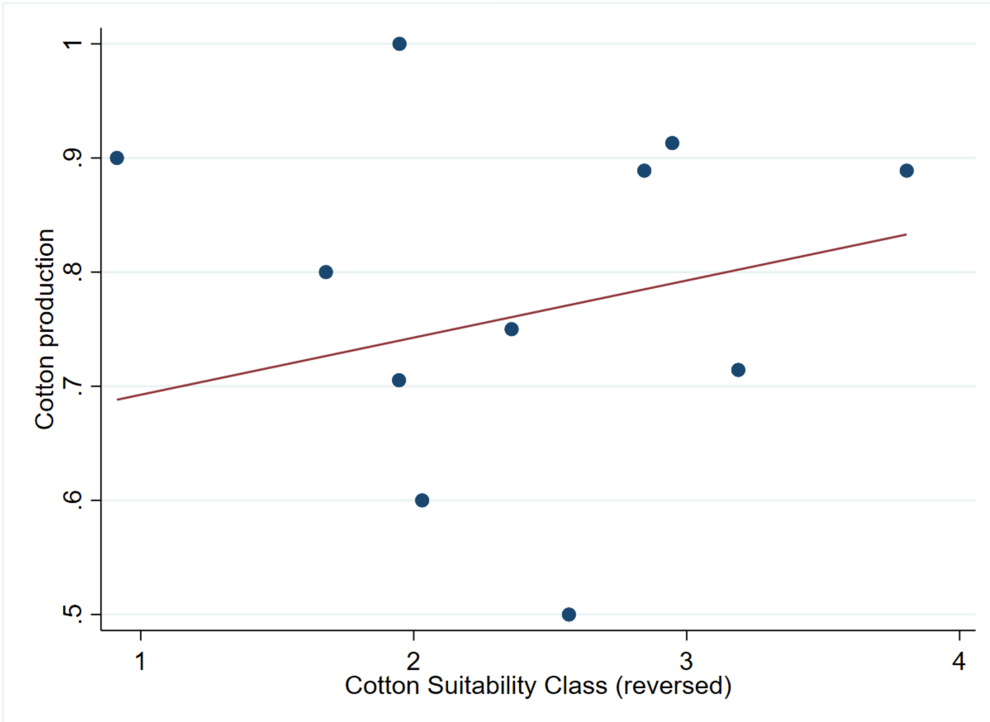

Figure 4: Bin-scatter of cotton production (self reported by leaders) and the cotton suitability index.

cotton production areas without precise scientific knowledge of local cotton suitability. However, once the regime was underway, the least suitable areas may have been gradually phased out from production, leaving in areas where cotton production was relatively more suitable.

3.1 Survey design

Within each village, we randomly selected 10 households to participate in the study, totaling 2,000 individuals, which were sampled using a random walk procedure. Study participants were stratified based on gender, with an even split in each village of males and females. To mitigate potential bias from individuals whose families originated from other parts of the country, we restricted our sampled households to respondents whose mother was a native of the village. Households received a 60 MZN ($\approx USD0.94$) for participating in study activities.

In addition to the household survey, we also surveyed the village leader (the highest government-appointed representative at the village-level) and we conducted a community survey with village elders. Both surveys covered basic demographics, household assets, and village history.

The household data collection was divided into a survey module and experimental measures (risk game), which were both conducted at respondents' houses. The survey module in-

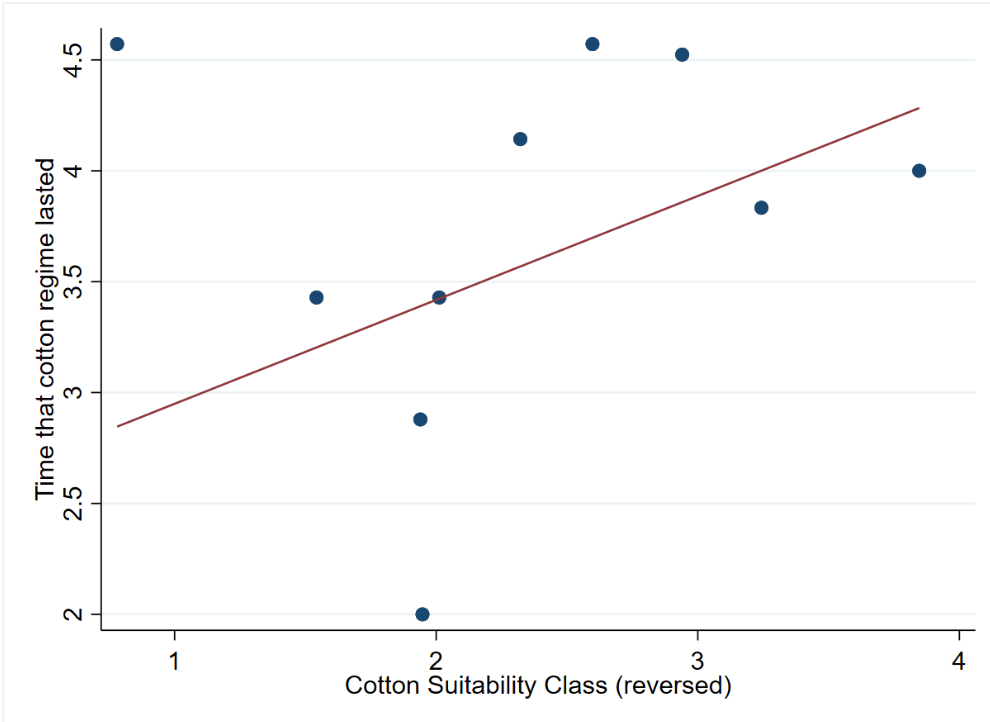

Figure 5: Bin-scatter of cotton production (self reported by leaders) and the cotton suitability class.

cluded standard questions on demographics, investments, household assets, and consumption, as well as a module on family history, agriculture and business patterns and civic participation.

4 Empirical Strategy

4.1 Outcomes

	Observations		Mean		Standard	p value
	Outside	Inside	Outside	Inside	error	
			Risk behavior			
Risk averse	998	1000	.774	.791	.018	.373
Risk neutral	998	1000	.137	.118	.015	.221
Risk lover	998	1000	.089	.091	.013	.887

Table 2: Summary of risk behavior outcomes.

4.1.1 Agriculture and business decisions

Being forced to produce cotton may have led to the inherited aversion to risky agriculture and business decisions. Thus, we hypothesize that exposure to cotton concessions led to decreased risk-taking in agriculture and business practices.

	Observations		Mean		Standard	p value
	Outside	Inside	Outside	Inside	error	
Farming and business ownership						
Farming is main occupation	999	1000	.799	.843	.017	.01
Does subsistence farming	999	1000	.787	.769	.018	.339
Does commercial farming	999	1000	.207	.227	.018	.284
Intended to sell crop production last year	999	1000	.166	.164	.017	.896
Fraction of crops to be sold last year	999	1000	.061	.06	.007	.942
Index of farming technology adoption	963	978	.271	.274	.009	.719
Business owner	999	1000	.127	.119	.015	.581

Table 3: Summary statistics of farming and business outcomes.

With this purpose, we used survey data to construct multiple outcomes. On the agricultural side, we constructed a binary variable taking value 1 when respondents' main occupation is farming, and 0 for any other occupation.

Next, we also focus on how exposure to coercive cotton production may have changed respondents' bias towards selling their crops. For that, we constructed a variable capturing the whether respondents intended to sell at least one crop that they produced during the last campaign before data collection (2011-2022).

In an additional dimension, during the operation of cotton concessions, the colonial government invested significantly in transferring scientific knowledge to local farmers. This consisted in the use of better quality seeds, fertilizers or tools (Guimaraes, 2021). We hypothesize that exposure to cotton concessions increased the adoption of farming technology. For that we constructed an index measuring the adoption of different farming technology (seeds, fertilizer, pesticides, specialized advisory, plow, tractors). This index varies between 0 and 1, where higher values correspond to a greater farming technology adoption.

We are also interested in understanding how exposure to cotton concessions affected respondents' pattern of savings. Under the hypothesis that risk aversion increased, we also expected that concessions led to relatively more savings among exposed individuals. In our survey, we accounted for savings in two ways. The first one used a question asking whether respondents' have ever requested a loan from a financial institutions. Not surprisingly, only a small percentage of individuals (4.75% of the sample) had ever requested a loan, and 2.6% of individuals reported that their loan request was denied. In addition, we documented respondents' involvement in communal saving schemes akin to the Rotating Savings and Credit Association (ROSCA), locally known in Mozambique as *Xitique*. These schemes are widely used in low and middle-income countries, where access to formal financial institutions is often inaccessible to most people. This type of communal savings program consists of each participating individual contributing to a common pot of money for a given time period. At the end of the period, one participating individual receives the sum of all contributions. The scheme repeats and the winner rotates among all participating individuals. In our survey, 687 respondents (34.37%) reported participating in community savings. We constructed a binary variable based on this information, which takes value 1 if respondents participate in community savings and 0 otherwise.

Finally, in line with the hypothesized changes in risk preferences, we also measured if exposure to cotton concessions also affected respondents' household business investment. We constructed a binary variable taking value 1 if anyone at the respondents' household are business owners and 0 otherwise. The activities considered as businesses ranged from informal street selling, basic services, restaurants, or shops to formal enterprises such as manufacturing or small-scale industry. It is important to note that our study sample was designed to primarily include rural farmers. Therefore, it is unsurprising that the percentage of respondents owning at least one business was 12.7% outside cotton concessions and 11.9% inside.

4.1.2 Risk preferences

Farmers exposed to cotton concessions were forced to produce cotton in unsuitable environments and often to the detriment of their food production, bearing the entire risk of cotton cultivation. Though the literature presents mixed results on risk-taking response to traumatic experiences (Callen et al. 2014, Kim and Lee 2014, Voors et al. 2012), we hypothesize that coercive cotton production increased risk aversion inside cotton concessions, according to the definition of risk aversion used by Arrow et al. (1965) and Pratt (1978). Our hypothesis is based on existing research suggesting that labor market frictions – which includes forced labor – can increase risk aversion (Swanson 2020)

In our study, we measured risk aversion with a risk game. The game took the form of an incentivized ordered lottery choice based on the approach of Eckel and Grossman (2002). In this activity, respondents were asked to choose one of six lotteries, in which each lottery had a 50 percent probability of receiving a high or a low payoff. The first lottery was a safe payment with equally high and low payoffs. With each additional lottery, the expected return of each lottery increased linearly, except for the sixth and last lottery options. The expected return between lottery 5 and 6 remained the same, but there was an increase in the payoff standard deviation. We follow the expected utility theory and classify respondents according to their risk preferences. Risk-averse individuals are more likely to select one of the less risky gambles with lower returns, such as gambles 1–4. Conversely, risk-neutral individuals prefer gambles 5 or 6. Moreover, individuals who choose gamble 6 over gamble 5, despite its higher risk, could be reasonably described as having a preference for risk. Table 2 presents the summary statistics of survey respondents' risk preferences. Outside and inside the cotton concessions, 77.4% and 79.1% of respondents are risk averse. 13.7% and 11.8% are risk neutral, while 8.9% and 9.1% are risk lovers, respectively. There are no observable statistical differences in risk preferences between respondents outside and inside cotton concessions.

Based on the data from the risk game, we constructed an outcome variable measuring risk aversion. This is a binary variable taking value 1 if respondents are risk averse (according to the game) and 0 if they are risk neutral or lover.

Our use of a risk game to capture risk aversion relies on the narrow bracketing assumption, consisting of individuals' decisions in the game being made in isolation and not being influenced by other external factors such as financial constraints. In the case the narrow bracketing assumption does not hold, our risk game does not capture risk aversion, but how external shocks affect individuals' risk preferences (Dean and Sautmann 2021).

In order to evaluate this possibility, we checked how our risk aversion measure correlates with the outcome variables detailed in Section 4.1.1, in addition to income levels and the number of crops produced per household member. We followed the methodology proposed by (Verschoor, D'Exelle, and Perez-Viana 2016).

Our findings are presented in Appendix A, and they show significant negative correlation between our measure of risk aversion and the number of crops produced – driven by individuals living in areas of high cotton suitability. We do not observe any other significant correlation in these areas. We interpret these results as individuals preferring to minimize their risk by diversifying their crop production in areas of high cotton suitability. We cannot rule out that financial constraints may confound our measure of risk aversion. However, we do not observe a significant correlation with household income in areas of high cotton suitability.

In areas of low cotton suitability, we observe only a significant positive correlation between our measure of risk aversion and household income (all other correlations are not significant). These findings suggest that financial constraints may affect our measure of risk aversion, thus violating the narrow bracketing assumption. In this scenario, our measure of risk aversion, when measuring individuals in areas of high cotton suitability, may be capturing a bundle of risk aversion and financial constraints.

4.2 Econometric Specification

In our baseline specification we employ a sharp spatial regression discontinuity using the arbitrarily defined borders of cotton concessions to examine the causal effects of coercive cotton production. The running variable is defined as the distance from each sampled village to the nearest point on the cotton concession border. We follow the previous literature that employs spatial regression discontinuity (Ambrus, Field, and Gonzalez 2020, Dell 2010, Jones et al. 2022, Michalopoulos and Papaioannou 2014, Lowes and Montero 2021, Michalopoulos and Papaioannou 2013; 2016, Becker et al. 2016). The specification to be used is presented in Equation 1.

$$y_{i,v} = \alpha + \beta \text{Cotton}_v + f(\text{geographic location}_v) + \partial \text{X}_i + \delta C_v + \varepsilon_{i,v} \tag{1}$$

Where $y_{i,v}$ represents the outcome of interest for individual i in village v. $Cotton_{i,v}$ is an indicator variable, equal to one if the village v is inside a cotton zone and zero otherwise. $f(\text{geographic location}_v)$ is the regression discontinuity polynomial, which controls for smooth functions of geographic location. Following Gelman and Imbens (2019), our preferred specification employs a local linear polynomial. The vectors X_i and C_v contain observed individual-level and village-level characteristics, respectively. The error term is clustered at the village level.

We also compute p-values adjusted for multiple hypothesis testing, using the Romano-Wolf procedure (Romano and Wolf 2005a;b; 2016). This approach is useful in improving the reliability of statistical inferences especially when numerous hypotheses are being tested simultaneously. The intuition behind the Romano-Wolf procedure lies in its capacity to control the family-wise error rate (FWER), ensuring that the probability of making one or more false discoveries (Type I error) is kept below a predetermined significance level. Mechanically, the procedure iteratively adjusts p-values through a bootstrapping process that accounts for the interdependence among test statistics.

5 Results

Table 4 presents the RD estimates of the effect of cotton concessions on respondents' risk preferences, farming, savings and business decisions. Panel A includes the entire study sample and it documents an average positive but statistically insignificant impact on risk aversion or agricultural patterns. We find similar results on savings decisions and business ownership, which are not statistically significant at conventional levels.

These results mask substantial heterogeneity according to cotton suitability. Panels B and C show the RD estimates when the sample is split between respondents living in villages where cotton suitability is high or low, respectively. Starting with the respondents living in areas of high cotton suitability (Panel B), in Column (1) it is possible to observe that exposure to the cotton concessions increased risk aversion by 12.0 percentage points (5% significance level). The results in Column (2) show that respondents in cotton concession areas were 13.8 percentage points more likely to sell their crop production. Respondents inside cotton concessions are also 14.4 percentage points more likely to participate in *Xitique* – a popular savings scheme identical to ROSCAS. All estimates presented in columns (1) to (5) have p-values adjusted for multiple hypothesis testing that range between 0.01 and 0.05.

The effect of cotton concessions of business ownership remains close to zero, we interpret that despite cotton concessions having affected risk preferences and farming decisions, they do not seem to have alter behavior related to business entrepreneurship.

Differently from the zones of high cotton suitability, we observe no statistically significant effects for individuals living in areas of low cotton suitability. In fact, in areas of low cotton suitability the effects on risk aversion, farmer status, technology adoption and savings follow the same positive direction as the effects estimated for areas of high cotton suitability. The exceptions are output selling suggesting that in villages inside the concession areas and with low cotton suitability individuals are less likely to sell their crops output. A potential explanation for the fact that results are driven by areas of higher cotton suitability is that the regime may have been more actively enforced in areas where cotton production turned out to be relatively more viable. This aligns with our findings of a significant correlation between cotton suitability and both recollections of forced cotton production and the reported duration of the regime, indicating that areas with very low suitability might have been abandoned or excluded from cotton cultivation over time. Overall, Table 4 highlights that cotton concessions significantly affected the risk aversion of respondents living in areas of relatively higher cotton suitability, as well as their farming decisions. For the remaining of this section we will focus on the respondents living in areas of higher cotton suitability.

Finally, we also test the hypothesis whether the effects estimated in areas of low and high cotton suitability are statistically different from each other. The p-values resulting from testing this hypothesis for each outcome suggest that effect of cotton concessions on risk aversion or participating into community saving groups is not statistically different across high and low suitability areas (p-values of 0.130 and 0.140 respectively). The effects of cotton concessions on selling crop output seems to be greater in areas of high suitability (as suggested by the pvalue of 0.009).

5.1 Heterogeneity by gender

As previously described, the coercive plantation of cotton during the colonial period ended up affecting mostly women. In this section we explore the heterogeneous effects of cotton concessions on both women and men, with the results presented in Table 5. In Panel A we present the results using both women and men (identical to Table 4 Panel B, or Table 8 Panel A). The effects on the women and men samples are presented in Panels B and C, respectively. It is possible to observe that the effects on all outcomes related to risk aversion and farming are driven by female respondents. Cotton concessions increase the probability of women being risk averse by 24.6 percentage points – corresponding to a 12.6 percentage points increase relatively to estimate for the entire sample (Panel A) – and the statistical significance increases to 1%. Women in areas exposed to cotton concessions are also more likely to produce at least one crop destined to be sold, with the effect maintaining the same level of statistical significance (1%), and to participate into community saving groups, with the level of significance increasing to 5%. Notably, women living within former cotton concession areas are more likely have an active role in household economic decisions compared to their counterparts outside.

5.2 The role of memories of coercive cotton cultivation

The coercive cotton regime was abolished in 1961. All individuals aged 62 or younger, which constitute approximately 76% of our sample, were born after the termination of this regime. Therefore, any influence that the cotton regime had on the behavior of these individuals must have been exerted through an indirect mechanism.[6]

This section explores the role of memories as a conduit for transmitting the experiences of coercive cotton cultivation to individuals born after the cessation of the cotton regime. The analysis, as presented in Table 6, is confined to men and women who affirmed the existence of coercive cotton cultivation in their village or reported that their relatives were compelled to cultivate cotton during the colonial era.[7] Our approach relies on the assumption that there is a positive correlation between the transmission of the effects of coercive cotton cultivation and individual memories of such coercion having existed.

The findings from Panel B indicate that the effects delineated in Tables 4 and 5 are primarily driven by women who self-report that their relatives were subjected to forced cotton cultivation. Despite the reduced number of observations, the coefficients exhibit an increase in both magnitude and precision relative to Table 5, with the exception of risk aversion, which exhibits a slight decrease in magnitude and is now significant only at the 5% level, and selling crop output, which is now larger in magnitude but significant at the 5% level.

Panel C highlights that outcomes did not significantly change among men who self-reported the existence of coercive cotton cultivation in their villages. These results align with the notion of a gendered cross-generational cultural transmission of the impacts of coercive cotton cultivation. In Table 29, we further scrutinize individuals who did not report any recollection of their relatives being forced to cultivate cotton during the colonial era, and we do not observe any systematic effects. This observation strengthens the proposed mechanism of transmission through individual self-reported memories.

We next devise an alternative metric for memories, utilizing data sourced from village leaders. This approach is motivated by the observation that self-reported memories from villagers and leaders are not perfectly correlated ($\rho = 0.52$), a difference that is statistically significant

[6] In Table 30 we restrict the sample used to individuals 62 years old or younger. Our findings only differ slightly from the main results presented in Table 4, and our interpretation is not affected.

[7] The study sample was limited to individuals whose ancestors resided in the same village. Consequently, when individuals were queried about whether their relatives were forced to cultivate cotton, this question implicitly refers to the same village.

at the 1% level. This implies that recollections within the same villages exhibit variation. The outcomes of this analysis are displayed in Table 7. Panels A and B indicate that the impact of cotton concessions remains predominantly influenced by women in villages where the chief reported the existence of coercive cotton. However, the estimated coefficients are considerably smaller and lack precision. We interpret these results as an indication that individual memories serve as the primary channel of transmission, rather than the collective memory of the chief. In other words, the individual's memory of coercive cotton's existence in a village has a greater influence on the transmission of the effects of cotton concessions, irrespective of the actual presence of coercive cotton.

5.3 Robustness: exclusion of individual and geographical controls

In this section, we examine the robustness of the effects of cotton concessions on respondents residing in regions with higher cotton suitability (Table 4, Panel B), by excluding individual and geographic controls. The findings are presented in Table 8.

In Panel A we observe the effects when individual and geographic controls are included, thus corresponding to the results previously described in Table 4. In Panel B we exclude individual controls for age and gender.[8] The results show that effects of cotton concessions remain fairly stable in magnitude and statistical significance, relatively to the estimates with individual and geographic controls presented in Panel A.

The results with no individual and geographical controls are presented in Panel C. The results show an overall increase in the magnitude and significance of the coefficients related to risk aversion and farming (columns (1) to (5)).

5.4 Robustness: Quadratic RD polynomial

This section explores how the inclusion of a quadratic RD polynomial, as opposed to the polynomial of degree 1 used in Tables 4, 8, 5. The results are presented in Table 9. Panel A uses the entire study sample (regardless of suitability for cotton production) and does not include any individual or geographic controls. It shows that the magnitude of all coefficients oscillates comparison to the baseline results presented in Table 4, although remaining statis-

[8]We do not account for other individual characteristics such as religion, ethnicity, educational attainment, or occupation, as they could potentially be correlated with the presence of cotton concessions, making them "bad controls".

tical insignificant. The exception is doing community savings (Column (5)) which becomes statistical significant at the 10% level.

In Panel B the sample used is restricted only to respondents living in areas of high suitability for cotton production, and no individual or geographical controls are included. It is possible to observe that the coefficients of risk aversion, selling crop output and doing community savings, relatively to the results in Table 4, increase in magnitude to 0.209, 0.324 and 0.382, respectively, maintaining statistical significance at least at the 10% level). The coefficients of adopting technology decreases in magnitude, while business ownership maintains a coefficient close to zero (and largely imprecise).

Panel C includes only respondents living in areas of low cotton suitability and, identically to Panels A and B, it does not include any controls. The magnitude of the coefficients estimated oscillates relatively to the specification using a first degree polynomial, with the exception of selling crop output (Column (3)). In the case of this outcome variable, its coefficient shows a 21.2 percentage points decrease in the likelihood of selling crop output (significant at the 5% level). This effect contrasts to its analogous in Column (3) of Panel B. More precisely, exposure to cotton concessions seem to have generated a non-linear and heterogeneous relationship with selling crop output. Respondents in areas of high suitability for cotton production are associated with more crop commercialization, while the opposite happens in areas of low suitability for cotton production.

Panels D and E restrict the analysis only to respondents living in areas of high suitability for cotton production. In the former panel, only individual controls are included, while in the latter geographical controls are also added. The interpretation of Panels D and E is identical to the one of Panel B. If anything, the inclusion of controls slightly improves the precision of the coefficients, without substantially altering the point estimates.

Panels F and G also focus on respondents living in areas of low suitability for cotton production, splitting the sample in females and males respectively. Similarly to the results presented in Table 5, it is possible to observe that the effects of cotton concessions are being generated among female respondents. The variables where a there is a positive and significant effect of cotton concessions are risk aversion, selling crop output and doing community savings (columns (1), (3) and (5)). Following the same pattern as in the other Panels of Table 9, adopting farming technology or business ownership seem to be unaffected by business ownership. Interestingly, the inclusion of a quadratic RD polynomial also reveals that males exposed to cotton concessions are also more likely to sell their crop output (34.7 percentage points, which is higher but not statistically different form the effect on females), and to do community savings (35.4 percentage points).

5.5 Robustness: Alternative bandwidths

This section explores whether the main findings presented in Tables 4, 8 and 5 are being driven by respondents further away from concession borders, who may have inherently different characteristics from other individuals on the other side of the border. For that, we replicate the same specification used in Table 4, Panel B (areas of high suitability for cotton production and individual and geographic controls), and we further restrict the analysis to respondents within 5km, 10Km and 15Km from the concession borders (Panels B, C and D, respectively).

Panel B shows that when the sample is restricted to respondents living in areas within 5Km of cotton concession borders, the magnitude of the effect of cotton concessions on selling crop output increases relatively to the baseline estimates of Panel A. The significant 12.0 percentage points increase in risk aversion, displayed in Column (1) of Panel A is no longer observed (the estimated coefficient decreases to approximately zero). This can be related to the smaller sample size being used, mainly relying only on 12 villages outside the concession areas, and 11 inside.

As the sample used in the estimates is further expanded to include individuals living within 10Km of the cotton concessions, we observe that the magnitude of the effects estimated is still larger than those in Panel A. In fact, risk aversion increases by 16.8 percentage points (significant at the 1% level).

In Panel C, as the sample used includes the individuals living within 15Km from the cotton concession borders, the coefficients estimated get closer to the baseline results of Panel A.

	Risk aversion	Sells crop output	Farm technology adoption	Does community savings	Business Ownership	Role in economic decision-making
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Entire sample						
Cotton Concession	0.046	0.006	-0.007	0.054	-0.004	0.006
	(0.043)	(0.047)	(0.021)	(0.054)	(0.028)	(0.089)
Mean (outside concession)	0.775	0.166	0.270	0.321	0.127	-0.007
Adjusted P-value	0.545	1.000	0.990	0.545	1.000	1.000
Obs. Outside	998	999	963	999	999	999
Obs. Inside	1000	1000	978	1000	1000	1000
Panel B. Villages with high cotton suitability						
Cotton Concession	0.120**	0.138***	0.028	0.144*	0.013	0.174
	(0.059)	(0.052)	(0.031)	(0.075)	(0.039)	(0.112)
Mean (outside concession)	0.766	0.146	0.273	0.259	0.133	0.007
Adjusted P-value	0.109	0.020	0.455	0.109	0.683	0.158
Obs. Outside	548	549	535	549	549	549
Obs. Inside	270	270	263	270	270	270
Panel C. Villages with low cotton suitability						
Cotton Concession	-0.004	-0.064	-0.026	-0.001	-0.019	-0.162
	(0.058)	(0.056)	(0.027)	(0.064)	(0.038)	(0.111)
Mean (outside concession)	0.784	0.191	0.267	0.398	0.120	-0.024
Adjusted P-value	0.980	0.426	0.535	0.980	0.891	0.218
Obs. Outside	450	450	428	450	450	450
Obs. Inside	730	730	715	730	730	730
P-value Panel B vs. C	0.130	0.009	0.189	0.140	0.563	0.033

OLS estimates. Standard errors clustered at the village level. Panel A includes the entire study sample. Panels B and C restrict the analysis only to respondents living in areas of high and low suitability for cotton production, respectively. All panels include individual and geographic controls. The dependent variable in Column (1) is measured by the risk game and it is binary, taking value 1 if the respondent is risk averse and 0 when the respondent is risk neutral or lover. In column (2) the dependent variable takes value 1 if respondents' intended to sell at least one of the crops produced in the last campaign prior to data collection (and 0 otherwise). Column (3) uses as dependent variable an index measuring the adoption of farming technology, which ranges between 0 and 1. The dependent variable in Column (4) is binary, taking value 1 if respondents' contribute to a communitary savings scheme (*Xitique*), and 0 otherwise. The dependent variable in Column (6) takes value 1 if respondents own a business, and 0 otherwise. The dependent variable in column (5) is an index that measures the respondent's role, either alone or joint with their partner, in economic decisions within the household (on at least one land plot, on the money obtained by selling agricultural products, on their income, and on large or daily household expenditures). The main explanatory variable is a binary variable measuring whether respondents live within the area of a colonial cotton concession. All specifications used include a RD polynomial of degree 1. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 4: Cotton suitability and the impact of cotton concessions on risk behavior, farming, business, and economic decisions.

	Risk aversion	Sells crop output	Farm technology adoption	Does community savings	Business Ownership	Role in economic decision-making
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Women and men						
Cotton Concession	0.120**	0.138***	0.028	0.144*	0.013	0.174
	(0.059)	(0.052)	(0.031)	(0.075)	(0.039)	(0.112)
Mean (outside concession)	0.766	0.146	0.273	0.259	0.133	0.007
Adjusted P-value	0.050	0.020	0.495	0.069	0.792	0.228
Obs. Outside	548	549	535	549	549	549
Obs. Inside	270	270	263	270	270	270
Panel B. Women						
Cotton Concession	0.246***	0.160***	0.054	0.224**	-0.020	0.436***
	(0.089)	(0.058)	(0.041)	(0.088)	(0.060)	(0.147)
Mean (outside concession)	0.763	0.113	0.252	0.298	0.095	-0.010
Adjusted P-value	0.030	0.030	0.188	0.030	0.614	0.020
Obs. Outside	274	275	268	275	275	275
Obs. Inside	134	134	129	134	134	134
Panel C. Men						
Cotton Concession	-0.011	0.097	-0.001	0.056	0.042	-0.133
	(0.058)	(0.076)	(0.035)	(0.087)	(0.059)	(0.193)
Mean (outside concession)	0.770	0.179	0.294	0.219	0.172	0.023
Adjusted P-value	0.980	0.683	0.980	0.931	0.931	0.931
Obs. Outside	274	274	267	274	274	274
Obs. Inside	136	136	134	136	136	136
P-value Panel A vs. B	0.016	0.512	0.309	0.175	0.460	0.019

OLS estimates. Standard errors clustered at the village level. Panels A and B restrict the analysis only women and men, respectively, living in areas of high suitability for cotton production. All panels include individual and geographic controls. The dependent variable in Column (1) is measured by the risk game and it is binary, taking value 1 if the respondent is risk averse and 0 when the respondent is risk neutral or lover. In column (2) the dependent variable takes value 1 if respondents' intended to sell at least one of the crops produced in the last campaign prior to data collection (and 0 otherwise). Column (3) uses as dependent variable an index measuring the adoption of farming technology, which ranges between 0 and 1. The dependent variable in Column (4) is binary, taking value 1 if respondents' contribute to a communitary savings scheme (*Xitique*), and 0 otherwise. The dependent variable in Column (6) takes value 1 if respondents own a business, and 0 otherwise. The dependent variable in column (5) is an index that measures the respondent's role, either alone or joint with their partner, in economic decisions within the household (on at least one land plot, on the money obtained by selling agricultural products, on their income, and on large or daily household expenditures). The main explanatory variable is a binary variable measuring whether respondents live within the area of a colonial cotton concession. All specifications used include a RD polynomial of degree 1. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 5: Heterogeneous effects between women and men.

	Risk aversion	Sells crop output	Farm technology adoption	Does community savings	Business Ownership	Role in economic decision-making
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Women and men						
Cotton Concession	0.091	0.151***	0.039	0.120	0.037	0.273*
	(0.067)	(0.050)	(0.029)	(0.081)	(0.048)	(0.140)
Mean (outside concession)	0.757	0.146	0.276	0.274	0.128	-0.001
Adjusted P-value	0.386	0.010	0.386	0.386	0.386	0.178
Obs. Outside	404	405	397	405	405	405
Obs. Inside	217	217	212	217	217	217
Panel B. Women						
Cotton Concession	0.207**	0.171**	0.099***	0.292***	0.040	0.551***
	(0.095)	(0.068)	(0.037)	(0.103)	(0.073)	(0.174)
Mean (outside concession)	0.756	0.119	0.256	0.297	0.099	-0.088
Adjusted P-value	0.059	0.050	0.050	0.040	0.455	0.030
Obs. Outside	201	202	197	202	202	202
Obs. Inside	102	102	99	102	102	102
Panel C. Men						
Cotton Concession	-0.020	0.114	-0.014	-0.040	0.025	-0.026
	(0.064)	(0.077)	(0.037)	(0.091)	(0.067)	(0.237)
Mean (outside concession)	0.759	0.172	0.297	0.251	0.158	0.086
Adjusted P-value	1.000	0.594	1.000	1.000	1.000	1.000
Obs. Outside	203	203	200	203	203	203
Obs. Inside	115	115	113	115	115	115
P-value Panel B vs. C 0.051	0.047	0.574	0.032	0.016	0.881	0.051

OLS estimates. Standard errors clustered at the village level. Panel A includes both women and men. Panel A and B restrict the analysis only to women and men, respectively. All panels include only individuals living in areas of high suitability for cotton production. All panels include individual and geographic controls. The dependent variable in Column (1) is measured by the risk game and it is binary, taking value 1 if the respondent is risk averse and 0 when the respondent is risk neutral or lover. In column (2) the dependent variable takes value 1 if respondents' intended to sell at least one of the crops produced in the last campaign prior to data collection (and 0 otherwise). Column (3) uses as dependent variable an index measuring the adoption of farming technology, which ranges between 0 and 1. The dependent variable in Column (4) is binary, taking value 1 if respondents' contribute to a communitary savings scheme (*Xitique*), and 0 otherwise. The dependent variable in Column (6) takes value 1 if respondents own a business, and 0 otherwise. The dependent variable in column (5) is an index that measures the respondent's role, either alone or joint with their partner, in economic decisions within the household (on at least one land plot, on the money obtained by selling agricultural products, on their income, and on large or daily household expenditures). The main explanatory variable is a binary variable measuring whether respondents live within the area of a colonial cotton concession. All specifications used include a RD polynomial of degree 1. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 6: The role of individual recollections of coercive cotton cultivation at the village level.

	Risk aversion	Sells crop output	Farm technology adoption	Does community savings	Business Ownership	Role in economic decision-making
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Women and men						
Cotton Concession	0.068	0.091	0.010	0.044	0.020	0.210
	(0.067)	(0.057)	(0.030)	(0.072)	(0.048)	(0.132)
Mean (outside concession)	0.759	0.138	0.277	0.276	0.114	-0.004
Adjusted P-value	0.743	0.396	0.881	0.871	0.881	0.396
Obs. Outside	419	420	408	420	420	420
Obs. Inside	210	210	205	210	210	210
Panel B. Women						
Cotton Concession	0.187*	0.097	0.026	0.152*	0.048	0.529***
	(0.099)	(0.068)	(0.046)	(0.091)	(0.070)	(0.166)
Mean (outside concession)	0.767	0.109	0.257	0.308	0.090	-0.073
Adjusted P-value	0.228	0.297	0.673	0.297	0.673	0.020
Obs. Outside	210	211	204	211	211	211
Obs. Inside	104	104	101	104	104	104
Panel C. Men						
Cotton Concession	-0.049	0.069	-0.008	-0.066	-0.012	-0.141
	(0.063)	(0.084)	(0.030)	(0.085)	(0.063)	(0.212)
Mean (outside concession)	0.751	0.167	0.297	0.244	0.139	0.065
Adjusted P-value	0.950	0.950	0.950	0.950	0.950	0.950
Obs. Outside	209	209	204	209	209	209
Obs. Inside	106	106	104	106	106	106
P-value Panel B vs. C	0.044	0.797	0.526	0.081	0.520	0.013

OLS estimates. Standard errors clustered at the village level. Panel A includes both women and men. Panel A and B restrict the analysis only to women and men, respectively. All panels include only individuals living in areas of high suitability for cotton production. All panels include individual and geographic controls. The dependent variable in Column (1) is measured by the risk game and it is binary, taking value 1 if the respondent is risk averse and 0 when the respondent is risk neutral or lover. In column (2) the dependent variable takes value 1 if respondents' intended to sell at least one of the crops produced in the last campaign prior to data collection (and 0 otherwise). Column (3) uses as dependent variable an index measuring the adoption of farming technology, which ranges between 0 and 1. The dependent variable in Column (4) is binary, taking value 1 if respondents' contribute to a communitary savings scheme (*Xitique*), and 0 otherwise. The dependent variable in Column (6) takes value 1 if respondents own a business, and 0 otherwise. The dependent variable in column (5) is an index that measures the respondent's role, either alone or joint with their partner, in economic decisions within the household (on at least one land plot, on the money obtained by selling agricultural products, on their income, and on large or daily household expenditures). The main explanatory variable is a binary variable measuring whether respondents live within the area of a colonial cotton concession. All specifications used include a RD polynomial of degree 1. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 7: The role the chiefs' recollections of coercive cotton cultivation at the village level.

	Risk aversion	Sells crop output	Farm technology adoption	Does community savings	Business Ownership	Role in economic decision-making
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Individual and geographic controls						
Cotton Concession	0.120**	0.138***	0.028	0.144*	0.013	0.174
	(0.059)	(0.052)	(0.031)	(0.075)	(0.039)	(0.112)
Mean (outside concession)	0.766	0.146	0.273	0.259	0.133	0.007
Adjusted P-value	0.109	0.050	0.485	0.119	0.683	0.158
Obs. Outside	548	549	535	549	549	549
Obs. Inside	270	270	263	270	270	270
Panel B. Geographic controls						
Cotton Concession	0.123**	0.138***	0.026	0.142*	0.012	0.176
	(0.058)	(0.053)	(0.031)	(0.075)	(0.039)	(0.117)
Mean (outside concession)	0.766	0.146	0.273	0.259	0.133	0.007
Adjusted P-value	0.069	0.040	0.545	0.119	0.703	0.188
Obs. Outside	548	549	535	549	549	549
Obs. Inside	270	270	263	270	270	270
Panel C. No controls						
Cotton Concession	0.143**	0.170**	0.084**	0.253***	0.008	0.278**
	(0.060)	(0.067)	(0.043)	(0.086)	(0.039)	(0.140)
Mean (outside concession)	0.766	0.146	0.273	0.259	0.133	0.007
Adjusted P-value	0.030	0.020	0.040	0.010	0.752	0.030
Obs. Outside	548	549	535	549	549	549
Obs. Inside	270	270	263	270	270	270
P-value Panel A vs. B	0.976	1.000	0.963	0.985	0.985	0.989
P-value Panel A vs. C	0.784	0.700	0.286	0.340	0.926	0.561

OLS estimates. Standard errors clustered at the village level. All estimates include only respondents living in areas of high suitability for cotton production. Panel A includes individual and geographical controls. Panel B includes geographic controls. Panel C includes no individual nor geographical controls. The dependent variable in Column (1) is measured by the risk game and it is binary, taking value 1 if the respondent is risk averse and 0 when the respondent is risk neutral or lover. In column (2) the dependent variable takes value 1 if respondents' intended to sell at least one of the crops produced in the last campaign prior to data collection (and 0 otherwise). Column (3) uses as dependent variable an index measuring the adoption of farming technology, which ranges between 0 and 1. The dependent variable in Column (4) is binary, taking value 1 if respondents' contribute to a communitary savings scheme (*Xitique*), and 0 otherwise. The dependent variable in Column (6) takes value 1 if respondents own a business, and 0 otherwise. The dependent variable in column (5) is an index that measures the respondent's role, either alone or joint with their partner, in economic decisions within the household (on at least one land plot, on the money obtained by selling agricultural products, on their income, and on large or daily household expenditures). The main explanatory variable is a binary variable measuring whether respondents live within the area of a colonial cotton concession. All specifications used include a RD polynomial of degree 1. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 8: Robustness to the exclusion of individual and geographical controls.

	Risk aversion	Sells crop output	Farm technology adoption	Does community savings	Business Ownership	Role in economic decision-making
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Entire sample & no controls						
Cotton Concession	0.049	-0.056	-0.013	0.157*	-0.046	-0.027
	(0.072)	(0.083)	(0.035)	(0.083)	(0.042)	(0.140)
Panel B. High cotton suitability & no controls						
Cotton Concession	0.209*	0.324***	0.078	0.382***	-0.018	0.431**
	(0.113)	(0.100)	(0.072)	(0.130)	(0.048)	(0.176)
Panel C. Low cotton suitability & no controls						
Cotton Concession	0.005	-0.212**	-0.022	0.126	-0.051	-0.200
	(0.092)	(0.097)	(0.038)	(0.103)	(0.055)	(0.162)
Panel D. High cotton suitability & individual controls						
Cotton Concession	0.209*	0.325***	0.080	0.384***	-0.023	0.440**
	(0.113)	(0.097)	(0.071)	(0.131)	(0.050)	(0.175)
Panel E. High cotton suitability & individual + geographical controls						
Cotton Concession	0.218**	0.283***	0.027	0.298**	0.006	0.343**
	(0.107)	(0.070)	(0.056)	(0.137)	(0.048)	(0.152)
Panel F. High cotton suitability & no controls & women						
Cotton Concession	0.307*	0.297***	0.120	0.415***	0.011	0.420*
	(0.163)	(0.092)	(0.101)	(0.151)	(0.085)	(0.220)
Panel G. High cotton suitability & no controls & men						
Cotton Concession	0.115	0.347**	0.034	0.354**	-0.049	0.460
	(0.114)	(0.156)	(0.062)	(0.165)	(0.108)	(0.330)

OLS estimates. Standard errors clustered at the village level. Panel A includes the entire study sample. Panels B, D, E, F and G restrict the analysis only to respondents living in areas of high suitability for cotton production, while Panel C includes respondents living in areas of low suitability for cotton production. In addition, Panels A, B, C, F and G do not include any controls. Panel D includes individual controls, and Panel E adds geographical controls. Panels F and G also restrict the analysis to women and men, respectively. The dependent variable in Column (1) is measured by the risk game and it is binary, taking value 1 if the respondent is risk averse and 0 when the respondent is risk neutral or lover. In column (2) the dependent variable takes value 1 if respondents' intended to sell at least one of the crops produced in the last campaign prior to data collection (and 0 otherwise). Column (3) uses as dependent variable an index measuring the adoption of farming technology, which ranges between 0 and 1. The dependent variable in Column (4) is binary, taking value 1 if respondents' contribute to a communitary savings scheme (*Xitique*), and 0 otherwise. The dependent variable in Column (6) takes value 1 if respondents own a business, and 0 otherwise. The dependent variable in column (5) is an index that measures the respondent's role, either alone or joint with their partner, in economic decisions within the household (on at least one land plot, on the money obtained by selling agricultural products, on their income, and on large or daily household expenditures). The main explanatory variable is a binary variable measuring whether respondents live within the area of a colonial cotton concession. All specifications used include a quadratic RD polynomial. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 9: Robustness to the inclusion of a quadratic RD polynomial.

	Risk aversion (1)	Sells crop output (2)	Farm technology adoption (3)	Does community savings (4)	Business Ownership (5)	Role in economic decision-making (6)
Panel A. Entire sample						
Cotton Concession	0.120**	0.138***	0.028	0.144*	0.013	0.174
	(0.059)	(0.052)	(0.031)	(0.075)	(0.039)	(0.112)
Obs. Outside	548	549	535	549	549	549
Obs. Inside	270	270	263	270	270	270
Panel B. <5km from concession border						
Cotton Concession	0.069	0.454***	0.035	0.166	0.063	0.246
	(0.143)	(0.060)	(0.068)	(0.173)	(0.074)	(0.190)
Obs. Outside	120	120	116	120	120	120
Obs. Inside	110	110	107	110	110	110
Panel C. <10km from concession border						
Cotton Concession	0.288***	0.267***	-0.034	0.156	-0.034	0.270*
	(0.085)	(0.069)	(0.044)	(0.115)	(0.046)	(0.148)
Obs. Outside	259	260	252	260	260	260
Obs. Inside	190	190	185	190	190	190
Panel D. <15km from concession border						
Cotton Concession	0.166***	0.167***	0.025	0.121	0.004	0.166
	(0.062)	(0.059)	(0.035)	(0.090)	(0.044)	(0.120)
Obs. Outside	418	419	409	419	419	419
Obs. Inside	230	230	224	230	230	230

OLS estimates. Standard errors clustered at the village level. Panel A includes all respondents living in areas of high cotton suitability. Panels B, C and D restrict the analysis to respondents living less than 5Km, 10Km or 15Km away from the cotton concession borders, respectively. All panels include individual and geographic controls. The dependent variable in Column (1) is measured by the risk game and it is binary, taking value 1 if the respondent is risk averse and 0 when the respondent is risk neutral or lover. In column (2) the dependent variable takes value 1 if respondents' intended to sell at least one of the crops produced in the last campaign prior to data collection (and 0 otherwise). Column (3) uses as dependent variable an index measuring the adoption of farming technology, which ranges between 0 and 1. The dependent variable in Column (4) is binary, taking value 1 if respondents' contribute to a communitary savings scheme (*Xitique*), and 0 otherwise. The dependent variable in Column (6) takes value 1 if respondents own a business, and 0 otherwise. The dependent variable in column (5) is an index that measures the respondent's role, either alone or joint with their partner, in economic decisions within the household (on at least one land plot, on the money obtained by selling agricultural products, on their income, and on large or daily household expenditures). The main explanatory variable is a binary variable measuring whether respondents live within the area of a colonial cotton concession. All specifications used include a RD polynomial of degree 1. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 10: Robustness to different bandwidths around the cotton concession borders.

6 Conclusion

This paper has examined the long-term impacts of coercive cotton cultivation in colonial Mozambique, focusing on individual risk preferences and economic decision making. We combined historical archival research and contemporary survey data, using a spatial regression discontinuity design to evaluate how the exposure to historical cotton concessions still affects modern day communities.

Our findings reveal a significant relationship between exposure to the historical cotton concessions and heightened risk aversion, particularly in regions where cotton was relatively more suitable and production seem to have been enforced for longer periods. This effect is predominantly observed among women, who bore the brunt of the forced labor regime, highlighting the gendered nature of these historical impacts. The increase in risk aversion among these communities suggests a deep-seated legacy of the coercive cotton cultivation policy, affecting not just economic behaviors but also the social fabric of the affected regions.

Moreover, our analysis suggests that individuals in areas historically subjected to cotton concessions are more likely to report that a significant portion of their production is intended for commercial purposes. This shift towards agricultural production and commercialization, particularly among women, underscores the lasting influence of colonial policies on the economic activities and livelihood strategies of local communities. The robustness of these findings, even after controlling for individual and geographical factors, different bandwidths and different RD polynomials, reinforces the validity of our conclusions.

Our study contributes to the broader literature by highlighting the complex and enduring effects of colonial agricultural policies on risk preferences, economic decisions, and gender dynamics. It underscores the importance of historical context in understanding contemporary economic behaviors and social structures.

In reflecting on the implications of our research, it is clear that the legacy of coercive cotton cultivation in Mozambique continues to shape the lives of its citizens. As policymakers and researchers work towards addressing the challenges faced by post-colonial societies, recognizing and understanding the historical roots of these issues is crucial. Our study not only adds to the academic understanding of the long-term effects of colonialism but also offers insights that are valuable to the ongoing efforts to overcome the historical legacies that continue to influence economic and social behaviors in Mozambique and similar contexts.

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A Robustness of measurement of risk aversion

A.1 All areas

Dependent variable: Fraction of crops to sell	(1)	(2)	(3)	(4)
Risk aversion	-0.019**	-0.018**	-0.015	-0.012
	(0.009)	(0.009)	(0.009)	(0.009)
Savings				0.010
				(0.008)
Agricultural technology adoption				0.199***
				(0.021)
Income				-0.000**
				(0.000)
Number of crops produced / HH size				-0.003
				(0.003)
Business owner				0.032***
				(0.011)
Constant	0.075***	0.049***	0.046	-0.000
	(0.008)	(0.014)	(0.055)	(0.049)
Observations	1998	1998	1998	1940
F-Test P-value	0.039	0.001	0.000	0.000
Individual controls	no	yes	yes	yes
Geographical controls	no	no	yes	yes

OLS estimates. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 11: Correlation between Risk Aversion and Fraction of crops to sell.

Dependent variable: Savings	(1)	(2)	(3)	(4)
Risk aversion	0.009	0.007	0.003	0.005
	(0.026)	(0.026)	(0.026)	(0.026)
Fraction of crops to sell				0.081
				(0.065)
Agricultural technology adoption				0.458***
				(0.061)
Income				0.000
				(0.000)
Number of crops produced / HH size				-0.001
				(0.009)
Business owner				0.149***
				(0.032)
Constant	0.336***	0.325***	0.092	-0.311**
	(0.023)	(0.041)	(0.158)	(0.138)
Observations	1998	1998	1998	1940
F-Test P-value	0.731	0.027	0.000	0.000
Individual controls	no	yes	yes	yes
Geographical controls	no	no	yes	yes

OLS estimates. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 12: Correlation between Risk Aversion and Savings.

Dependent variable: Agricultural technology adoption				
	(1)	(2)	(3)	(4)
Risk aversion	-0.010	-0.004	-0.008	-0.007
	(0.010)	(0.010)	(0.010)	(0.009)
Fraction of crops to sell				0.218***
				(0.023)
Savings				0.062***
				(0.008)
Income				0.000
				(0.000)
Number of crops produced / HH size				0.018***
				(0.003)
Business owner				0.021*
				(0.012)
Constant	0.280***	0.315***	0.551***	0.530***
	(0.009)	(0.016)	(0.052)	(0.049)
Observations	1940	1940	1940	1940
F-Test P-value	0.333	0.000	0.000	0.000
Individual controls	no	yes	yes	yes
Geographical controls	no	no	yes	yes

OLS estimates. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 13: Correlation between Risk Aversion and Agricultural technology adoption.

Dependent variable: Income	(1)	(2)	(3)	(4)
Risk aversion	31.901*	23.941	22.200	20.406
	(17.064)	(17.028)	(16.883)	(17.124)
Fraction of crops to sell				-98.141**
				(43.608)
Savings				22.725
				(15.307)
Agricultural technology adoption				13.137
				(41.745)
Number of crops produced / HH size				-8.320
				(5.762)
Business owner				-59.502***
				(21.869)
Constant	108.551***	0.483	58.325	-59.398
	(15.098)	(26.796)	(103.896)	(92.960)
Observations	1998	1998	1998	1940
F-Test P-value	0.062	0.000	0.000	0.000
Individual controls	no	yes	yes	yes
Geographical controls	no	no	yes	yes

OLS estimates. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 14: Correlation between Risk Aversion and Income.

Dependent variable: Number of crops produced / HH size				
	(1)	(2)	(3)	(4)
Risk aversion	0.176**	0.137**	0.118*	0.144**
	(0.070)	(0.069)	(0.068)	(0.068)
Fraction of crops to sell				-0.146
				(0.173)
Savings				-0.004
				(0.061)
Agricultural technology adoption				0.963***
				(0.164)
Income				-0.000
				(0.000)
Business owner				0.061
				(0.087)
Constant	1.300***	0.693***	-1.765***	-1.253***
	(0.062)	(0.109)	(0.418)	(0.367)
Observations	1998	1998	1998	1940
F-Test P-value	0.012	0.000	0.000	0.000
Individual controls	no	yes	yes	yes
Geographical controls	no	no	yes	yes

OLS estimates. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 15: Correlation between Risk Aversion and Number of crops produced / HH size.

Dependent variable: Business owner	(1)	(2)	(3)	(4)
Risk aversion	-0.013	-0.002	-0.003	0.000
	(0.018)	(0.018)	(0.018)	(0.018)
Fraction of crops to sell				0.125***
				(0.045)
Savings				0.073***
				(0.016)
Agricultural technology adoption				0.077*
				(0.043)
Income				-0.000***
				(0.000)
Number of crops produced / HH size				0.004
				(0.006)
Constant	0.134***	0.254***	0.375***	0.284***
	(0.016)	(0.028)	(0.109)	(0.097)
Observations	1998	1998	1998	1940
F-Test P-value	0.451	0.000	0.000	0.000
Individual controls	no	yes	yes	yes
Geographical controls	no	no	yes	yes

OLS estimates. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 16: Correlation between Risk Aversion and Business owner.

A.2 Areas of high cotton suitability

Dependent variable: Fraction of crops to sell	(1)	(2)	(3)	(4)
Risk aversion	-0.020	-0.020	-0.012	-0.008
	(0.015)	(0.015)	(0.015)	(0.015)
Savings				0.038***
				(0.014)
Agricultural technology adoption				0.232***
				(0.038)
Income				-0.000
				(0.000)
Number of crops produced / HH size				-0.003
				(0.005)
Business owner				0.050***
				(0.018)
Constant	0.079***	0.055**	-0.059	-0.242***
	(0.013)	(0.023)	(0.073)	(0.066)
Observations	818	818	818	797
F-Test P-value	0.175	0.038	0.000	0.000
Individual controls	no	yes	yes	yes
Geographical controls	no	no	yes	yes

OLS estimates. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 17: Correlation between Risk Aversion and Fraction of crops to sell (areas of low cotton suitability.

Dependent variable: Savings	(1)	(2)	(3)	(4)
Risk aversion	-0.023	-0.022	-0.020	-0.022
	(0.038)	(0.038)	(0.038)	(0.037)
Fraction of crops to sell				0.242***
				(0.090)
Agricultural technology adoption				0.580***
				(0.096)
Income				0.000**
				(0.000)
Number of crops produced / HH size				0.025*
				(0.014)
Business owner				0.121***
				(0.047)
Constant	0.306***	0.289***	0.235	-0.015
	(0.034)	(0.059)	(0.189)	(0.170)
Observations	818	818	818	797
F-Test P-value	0.554	0.072	0.008	0.000
Individual controls	no	yes	yes	yes
Geographical controls	no	no	yes	yes

OLS estimates. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 18: Correlation between Risk Aversion and Savings (areas of low cotton suitability.

Dependent variable: Agricultural technology adoption	(1)	(2)	(3)	(4)
Risk aversion	-0.004	-0.000	-0.007	-0.003
	(0.015)	(0.015)	(0.014)	(0.013)
Fraction of crops to sell				0.197***
				(0.032)
Savings				0.077***
				(0.013)
Income				0.000
				(0.000)
Number of crops produced / HH size				0.014***
				(0.005)
Business owner				0.016
				(0.017)
Constant	0.263***	0.300***	0.574***	0.560***
	(0.014)	(0.024)	(0.061)	(0.059)
Observations	797	797	797	797
F-Test P-value	0.808	0.000	0.000	0.000
Individual controls	no	yes	yes	yes
Geographical controls	no	no	yes	yes

OLS estimates. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 19: Correlation between Risk Aversion and Agricultural technology adoption (areas of low cotton suitability.

Dependent variable: Income	(1)	(2)	(3)	(4)
Risk aversion	-1.201	-3.139	-15.087	-14.810
	(25.482)	(25.213)	(24.532)	(25.093)
Fraction of crops to sell				-55.620
				(61.797)
Savings				51.067**
				(24.318)
Agricultural technology adoption				30.193
				(66.966)
Number of crops produced / HH size				-8.812
				(9.372)
Business owner				-41.999
				(31.871)
Constant	123.355***	-28.754	37.899	-59.963
	(22.452)	(39.391)	(121.890)	(115.746)
Observations	818	818	818	797
F-Test P-value	0.962	0.000	0.000	0.000
Individual controls	no	yes	yes	yes
Geographical controls	no	no	yes	yes

OLS estimates. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 20: Correlation between Risk Aversion and Income (areas of low cotton suitability.

Dependent variable: Number of crops produced / HH size				
	(1)	(2)	(3)	(4)
Risk aversion	0.176*	0.153	0.126	0.131
	(0.099)	(0.097)	(0.096)	(0.096)
Fraction of crops to sell				-0.111
				(0.236)
Savings				0.167*
				(0.093)
Agricultural technology adoption				0.728***
				(0.254)
Income				-0.000
				(0.000)
Business owner				-0.042
				(0.122)
Constant	1.122***	0.402***	-0.313	-0.971**
	(0.087)	(0.151)	(0.475)	(0.441)
Observations	818	818	818	797
F-Test P-value	0.076	0.000	0.000	0.000
Individual controls	no	yes	yes	yes
Geographical controls	no	no	yes	yes

OLS estimates. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 21: Correlation between Risk Aversion and Number of crops produced / HH size (areas of low cotton suitability.

Dependent variable: Business owner				
	(1)	(2)	(3)	(4)
Risk aversion	-0.033	-0.030	-0.036	-0.032
	(0.028)	(0.028)	(0.028)	(0.028)
Fraction of crops to sell				0.188***
				(0.069)
Savings				0.071***
				(0.027)
Agricultural technology adoption				0.070
				(0.075)
Income				-0.000
				(0.000)
Number of crops produced / HH size				-0.004
				(0.011)
Constant	0.153***	0.295***	0.629***	0.461***
	(0.025)	(0.043)	(0.138)	(0.129)
Observations	818	818	818	797
F-Test P-value	0.234	0.001	0.000	0.000
Individual controls	no	yes	yes	yes
Geographical controls	no	no	yes	yes

OLS estimates. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 22: Correlation between Risk Aversion and Business owner (areas of low cotton suitability.

A.3 Areas of low cotton suitability

Dependent variable: Fraction of crops to sell				
	(1)	(2)	(3)	(4)
Risk aversion	-0.018	-0.017	-0.015	-0.012
	(0.011)	(0.011)	(0.011)	(0.011)
Savings				-0.007
				(0.010)
Agricultural technology adoption				0.174***
				(0.025)
Income				-0.000**
				(0.000)
Number of crops produced / HH size				-0.001
				(0.004)
Business owner				0.023
				(0.014)
Constant	0.072***	0.044**	0.014	-0.011
	(0.010)	(0.018)	(0.081)	(0.081)
Observations	1180	1180	1180	1143
F-Test P-value	0.121	0.038	0.000	0.000
Individual controls	no	yes	yes	yes
Geographical controls	no	no	yes	yes

OLS estimates. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 23: Correlation between Risk Aversion and Fraction of crops to sell (areas of high cotton suitability.

Dependent variable: Savings	(1)	(2)	(3)	(4)
Risk aversion	0.029	0.026	0.028	0.031
	(0.035)	(0.035)	(0.035)	(0.035)
Fraction of crops to sell				-0.063
				(0.092)
Agricultural technology adoption				0.374***
				(0.079)
Income				0.000
				(0.000)
Number of crops produced / HH size				-0.012
				(0.011)
Business owner				0.178***
				(0.045)
Constant	0.359***	0.367***	0.452*	0.305
	(0.031)	(0.055)	(0.251)	(0.251)
Observations	1180	1180	1180	1143
F-Test P-value	0.403	0.363	0.004	0.000
Individual controls	no	yes	yes	yes
Geographical controls	no	no	yes	yes

OLS estimates. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 24: Correlation between Risk Aversion and Savings (areas of high cotton suitability.

Dependent variable: Agricultural technology adoption	(1)	(2)	(3)	(4)
Risk aversion	-0.015	-0.007	-0.009	-0.010
	(0.014)	(0.014)	(0.013)	(0.013)
Fraction of crops to sell				0.232***
				(0.034)
Savings				0.052***
				(0.011)
Income				-0.000
				(0.000)
Number of crops produced / HH size				0.020***
				(0.004)
Business owner				0.027
				(0.017)
Constant	0.292***	0.330***	0.524***	0.530***
	(0.012)	(0.022)	(0.095)	(0.092)
Observations	1143	1143	1143	1143
F-Test P-value	0.280	0.001	0.000	0.000
Individual controls	no	yes	yes	yes
Geographical controls	no	no	yes	yes

OLS estimates. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 25: Correlation between Risk Aversion and Agricultural technology adoption (areas of high cotton suitability.

Dependent variable: Income	(1)	(2)	(3)	(4)
Risk aversion	55.201**	43.809*	44.639*	43.612*
	(22.870)	(22.965)	(22.846)	(23.082)
Fraction of crops to sell				-122.099**
				(61.436)
Savings				7.949
				(19.851)
Agricultural technology adoption				-3.400
				(53.265)
Number of crops produced / HH size				-9.624
				(7.348)
Business owner				-78.539***
				(29.781)
Constant	97.757***	27.801	-36.669	122.899
	(20.292)	(36.384)	(165.677)	(167.133)
Observations	1180	1180	1180	1143
F-Test P-value	0.016	0.000	0.000	0.000
Individual controls	no	yes	yes	yes
Geographical controls	no	no	yes	yes

OLS estimates. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 26: Correlation between Risk Aversion and Income (areas of high cotton suitability.

Dependent variable: Number of crops produced / HH size				
	(1)	(2)	(3)	(4)
Risk aversion	0.167*	0.130	0.109	0.157*
	(0.096)	(0.096)	(0.094)	(0.094)
Fraction of crops to sell				-0.068
				(0.250)
Savings				-0.088
				(0.080)
Agricultural technology adoption				1.068***
				(0.214)
Income				-0.000
				(0.000)
Business owner				0.101
				(0.121)
Constant	1.430***	0.953***	-2.109***	-3.155***
	(0.085)	(0.152)	(0.682)	(0.672)
Observations	1180	1180	1180	1143
F-Test P-value	0.081	0.001	0.000	0.000
Individual controls	no	yes	yes	yes
Geographical controls	no	no	yes	yes

OLS estimates. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 27: Correlation between Risk Aversion and Number of crops produced / HH size (areas of high cotton suitability.

Dependent variable: Business owner				
	(1)	(2)	(3)	(4)
Risk aversion	0.001	0.020	0.018	0.022
	(0.023)	(0.023)	(0.023)	(0.023)
Fraction of crops to sell				0.098
				(0.061)
Savings				0.079***
				(0.020)
Agricultural technology adoption				0.084
				(0.053)
Income				-0.000***
				(0.000)
Number of crops produced / HH size				0.006
				(0.007)
Constant	0.120***	0.223***	0.087	0.012
	(0.021)	(0.037)	(0.167)	(0.167)
Observations	1180	1180	1180	1143
F-Test P-value	0.964	0.000	0.000	0.000
Individual controls	no	yes	yes	yes
Geographical controls	no	no	yes	yes

OLS estimates. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 28: Correlation between Risk Aversion and Business owner (areas of high cotton suitability.

B Memories of coercive cotton cultivation

	Risk aversion	Farmer	Sells crop output	Farm technology adoption	Does community savings	Business Ownership
	(1)	(2)	(3)	(4)	(5)	(6)
			Females			
Panel A. Reports coercive cotton existed in village						
Cotton Concession	0.205**	0.126***	0.230***	0.147**	0.443***	0.044
	(0.095)	(0.046)	(0.081)	(0.059)	(0.115)	(0.078)
Mean (outside concession)	0.777	0.915	0.167	0.249	0.324	0.078
Adjusted P-value	0.020	0.010	0.010	0.020	0.010	0.396
Obs. Outside	201	202	202	197	202	202
Obs. Inside	102	102	102	99	102	102
Panel B. Does not report coercive cotton existed in village						
Cotton Concession	0.250	0.027	-0.074	-0.067	-0.266	-0.157
	(0.210)	(0.049)	(0.101)	(0.123)	(0.194)	(0.103)
Mean (outside concession)	0.823	0.918	0.095	0.253	0.424	0.089
Adjusted P-value	0.594	0.723	0.723	0.723	0.584	0.584
Obs. Outside	54	54	54	53	54	54
Obs. Inside	20	20	20	18	20	20
P-value Panel A vs. B	0.845	0.145	0.019	0.117	0.002	0.121
			Males			
Panel C. Reports coercive cotton existed in village						
Cotton Concession	0.049	0.068	0.210**	0.068	0.153	-0.015
	(0.073)	(0.103)	(0.107)	(0.046)	(0.121)	(0.067)
Mean (outside concession)	0.757	0.738	0.196	0.294	0.306	0.148
Adjusted P-value	0.812	0.812	0.059	0.238	0.436	0.842
Obs. Outside	203	203	203	200	203	203
Obs. Inside	115	115	115	113	115	115
Panel D. Does not report coercive cotton existed in village						
Cotton Concession	0.078	0.366**	0.074	0.063	0.364**	-0.132
	(0.138)	(0.170)	(0.209)	(0.134)	(0.147)	(0.103)
Mean (outside concession)	0.795	0.590	0.192	0.303	0.256	0.192
Adjusted P-value	0.960	0.386	0.960	0.960	0.386	0.624
Obs. Outside	58	58	58	54	58	58
Obs. Inside	14	14	14	14	14	14
P-value Panel C vs. D	0.854	0.135	0.566	0.972	0.267	0.343

OLS estimates. Standard errors clustered at the village level. Panel A includes the entire study sample. Panels B and C restrict the analysis only to respondents living in areas of low and high suitability for cotton production, respectively. The main explanatory variable is a binary variable measuring whether respondents live within the area of a colonial cotton concession. All specifications used include a RD polynomial of degree 1. No controls are included. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 29: The role of individual recollection of coercive cotton cultivation at the village level.

C Only individuals who were born after the extinction of coercive cotton cultivation

	Risk aversion	Farmer	Sells crop output	Farm technology adoption	Does community savings	Business Ownership
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Entire sample						
Cotton Concession	0.062	0.047	-0.013	0.012	0.102	-0.005
	(0.054)	(0.045)	(0.049)	(0.024)	(0.065)	(0.035)
Mean (outside concession)	0.775	0.799	0.166	0.270	0.321	0.127
Adjusted P-value	0.376	0.376	0.842	0.743	0.099	0.842
Obs. Outside	793	793	793	764	793	793
Obs. Inside	740	740	740	725	740	740
Panel B. Villages with low cotton suitability						
Cotton Concession	0.140**	0.109*	0.161**	0.082**	0.302***	0.009
	(0.071)	(0.061)	(0.073)	(0.041)	(0.110)	(0.052)
Mean (outside concession)	0.766	0.809	0.146	0.273	0.259	0.133
Adjusted P-value	0.040	0.040	0.040	0.040	0.010	0.792
Obs. Outside	440	440	440	428	440	440
Obs. Inside	204	204	204	200	204	204
Panel C. Villages with high cotton suitability						
Cotton Concession	0.021	0.022	-0.084	-0.016	0.033	-0.016
	(0.072)	(0.060)	(0.061)	(0.030)	(0.080)	(0.047)
Mean (outside concession)	0.784	0.787	0.191	0.267	0.398	0.120
Adjusted P-value	0.960	0.960	0.119	0.941	0.960	0.960
Obs. Outside	353	353	353	336	353	353
Obs. Inside	536	536	536	525	536	536
P-value Panel B vs. C	0.240	0.310	0.010	0.054	0.048	0.715

OLS estimates. Standard errors clustered at the village level. Panel A includes all study participants 62 years old or younger. Panels B and C further restrict the analysis only to respondents living in areas of low and high suitability for cotton production, respectively. The dependent variable in Column (1) is measured by the risk game and it is binary, taking value 1 if the respondent is risk averse and 0 when the respondent is risk neutral or lover. Column (2) uses as dependent variable an indicator taking value 1 if respondents' self-reported main occupation is farming. In column (3) the dependent variable takes value 1 if respondents' intended to sell at least one of the crops produced in the last campaign prior to data collection (and 0 otherwise). Column (4) uses as dependent variable an index measuring the adoption of farming technology, which ranges between 0 and 1. The dependent variable in Column (5) is binary, taking value 1 if respondents' contribute to a communitary savings scheme (*Xitique*), and 0 otherwise. The dependent variable in Column (6) takes value 1 if respondents own a business, and 0 otherwise. The main explanatory variable is a binary variable measuring whether respondents live within the area of a colonial cotton concession. All specifications used include a RD polynomial of degree 1. No controls are included. ***, **, and * indicate significance at the 1%, 5%, and 10% critical level.

Table 30: Cotton suitability and the impact of cotton concessions on risk behavior, farming and business decisions (individuals <63 years of age).