

Jakiela, Pamela; Ozier, Owen

**Working Paper**

## The Impact of Violence on Individual Risk Preferences: Evidence from a Natural Experiment

IZA Discussion Papers, No. 9870

**Provided in Cooperation with:**

IZA – Institute of Labor Economics

*Suggested Citation:* Jakiela, Pamela; Ozier, Owen (2016) : The Impact of Violence on Individual Risk Preferences: Evidence from a Natural Experiment, IZA Discussion Papers, No. 9870, Institute for the Study of Labor (IZA), Bonn

This Version is available at:

<https://hdl.handle.net/10419/141629>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

IZA DP No. 9870

**The Impact of Violence on Individual Risk Preferences:  
Evidence from a Natural Experiment**

Pamela Jakiela  
Owen Ozier

April 2016

# **The Impact of Violence on Individual Risk Preferences: Evidence from a Natural Experiment**

**Pamela Jakiela**

*University of Maryland  
and IZA*

**Owen Ozier**

*World Bank*

Discussion Paper No. 9870

April 2016

IZA

P.O. Box 7240  
53072 Bonn  
Germany

Phone: +49-228-3894-0

Fax: +49-228-3894-180

E-mail: [iza@iza.org](mailto:iza@iza.org)

Any opinions expressed here are those of the author(s) and not those of IZA. Research published in this series may include views on policy, but the institute itself takes no institutional policy positions. The IZA research network is committed to the IZA Guiding Principles of Research Integrity.

The Institute for the Study of Labor (IZA) in Bonn is a local and virtual international research center and a place of communication between science, politics and business. IZA is an independent nonprofit organization supported by Deutsche Post Foundation. The center is associated with the University of Bonn and offers a stimulating research environment through its international network, workshops and conferences, data service, project support, research visits and doctoral program. IZA engages in (i) original and internationally competitive research in all fields of labor economics, (ii) development of policy concepts, and (iii) dissemination of research results and concepts to the interested public.

IZA Discussion Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be available directly from the author.

## ABSTRACT

### **The Impact of Violence on Individual Risk Preferences: Evidence from a Natural Experiment\***

We estimate the impact of Kenya's post-election crisis on individual risk preferences. The crisis interrupted a longitudinal survey of more than five thousand Kenyan youth, creating plausibly exogenous variation in exposure to civil conflict by the time of the survey. We measure individual risk preferences using hypothetical lottery choice questions which we validate by showing that they predict migration and entrepreneurship in the cross-section. Our results indicate that the post-election violence sharply increased individual risk aversion. Immediately after the crisis, the fraction of subjects displaying extreme risk aversion increased by more than 80 percent. Findings remain robust when we use an IV estimation strategy that exploits random assignment of respondents to waves of surveying. Our results suggest that the crisis also impacted trust, social capital, and beliefs about the economy, though it did not have any detectable negative impacts on job prospects or wages.

JEL Classification: C91, C93, D01, D74, D81

Keywords: risk preferences, civil conflict, natural experiment

Corresponding author:

Pamela Jakiela  
Department of Agricultural and Resource Economics  
University of Maryland  
2200 Symons Hall  
College Park, MD 20742  
USA  
E-mail: [pjakiela@umd.edu](mailto:pjakiela@umd.edu)

---

\* We are grateful to the staff at IPA-Kenya for their assistance and support, and to Michael Callen, Pascaline Dupas, Marcel Fafchamps, Jonas Hjort, Diego Garrido Martin, Ted Miguel, Anja Sautmann, Waly Wane, and numerous conference and seminar participants for helpful comments. All errors are our own. The findings, interpretations and conclusions expressed in this paper are entirely those of the authors, and do not necessarily represent the views of the World Bank, its Executive Directors, or the governments of the countries they represent.

# 1 Introduction

Armed conflict is a source of untold human suffering. Since 1989, more than one million people have been killed in civil and interstate conflicts (Pettersson and Wallensteen 2015). The majority of these episodes are civil wars in low- and middle-income countries; because the scourge of war falls disproportionately on the poorest nations, armed conflict also perpetuates disparities in human and economic development among the living.

The short-term costs of civil conflict are obvious: in addition to the lives lost, violence damages or destroys physical capital and deters investment. There is also evidence that war and violence limit the accumulation of human capital (Blattman and Annan 2010) and erode trust (Nunn and Wantchekon 2011). This has led some scholars to refer to civil war as “development in reverse” (Collier, Elliott, Hegre, Hoeffler, Reynal-Querol, and Sambanis 2003). Yet, though the short-term human and economic costs of conflict are indisputable, many conflict-affected countries — Rwanda and Uganda, for example — have experienced extremely rapid growth in the wake of civil war, and a number of recent papers have challenged the notion that conflict leads to slower growth and development over the long-term (cf. Miguel and Roland 2011). In fact, several studies have found that exposure to civil conflict increases political engagement (Bellows and Miguel 2009, Blattman 2009), enhances cooperation and pro-sociality (Voors, Nillesen, Verwimp, Bulte, Lensink, and Van Soest 2012, Bauer, Cassar, Chytilová, and Henrich 2013), and makes people more willing to bear profitable risks (Voors, Nillesen, Verwimp, Bulte, Lensink, and Van Soest 2012, Callen, Isaqzadeh, Long, and Sprenger 2014).

These studies share a common empirical approach. First, they take seriously the idea that exposure to conflict is endogenous, and employ a variety of strategies designed to isolate plausibly exogenous variation in victimization and involvement in violence. Second, given their focus on within-conflict variation in exposure and victimization, these papers empirically frame civilians who lived through civil war but were not victimized (or were less exposed to violence) as a comparison group. This strategy enhances the credibility of the estimated treatment effects, but has an obvious drawback: this approach can generate credible estimates of the marginal impact of greater conflict victimization or exposure, but cannot be used to assess the overall impact of conflict unless one

assumes that violence has no impact on the relatively less victimized. If everyone who lives through a period of conflict — regardless of their victim status — is affected, estimates of the marginal impact of greater conflict exposure may present a biased assessment of the overall social cost of violence. Moreover, since civil conflict typically involves a contest for control of a state government, some increase in political and economic uncertainty almost always arises; empirical approaches that frame less exposed citizens as the comparison group cannot capture the impacts of these macro-level shocks. Thus, to capture the overall impacts of civil conflict on society, an alternative empirical approach is required.

In this paper, we estimate the impact of a specific episode of civil conflict, Kenya’s post-election crisis, on the risk preferences of a broad sample of young adults who lived through it. The post-election crisis was a months-long period of protests, rioting, and ethnic violence that began immediately after a disputed presidential election. The election, in which Raila Odinga challenged incumbent Mwai Kibaki, took place on December 27, 2007. Amidst allegations of electoral fraud by observers, and after three days of uncertainty following the national polls, the incumbent president was both declared the winner and sworn into office on December 30, 2007. Ethnic tensions rose, and rioting ensued. The following two months of civil conflict left more than a thousand people dead and hundreds of thousands more internally displaced. The crisis largely ended when, on February 28, 2008, the two candidates signed a power-sharing agreement.<sup>1</sup>

We estimate the impact of Kenya’s post-election violence on individual risk preferences, which we measure using lottery choice questions embedded in a longitudinal survey. The Kenyan Life Panel Survey (hereafter KLPS2) is a survey of more than 5,000 young adults who were enrolled in rural primary schools in 1998. The second round of the survey was administered between August of 2007 and December of 2009. 1,180 respondents (23.3 percent) were interviewed prior to the crisis, while the remainder were surveyed after experiencing the period of civil conflict. Thus, Kenya’s post-election violence interacted with the timing of the survey to create a natural experiment in exposure to conflict.

We employ two complementary identification strategies to estimate the impact of the crisis on

---

<sup>1</sup> This description of Kenya’s 2007-2008 post-election crisis draws upon several sources: World Bank (2006), World Bank (2008), World Bank (2009), World Bank (2010a), World Bank (2010b), World Bank (2011), World Bank (2012), Van Praag (2010), Waki (2008), Hjort (2014), McCrummen (2007), BBC (2008a), and BBC (2008b).

risk aversion. First, we estimate the impact of the crisis in straightforward linear and nonlinear frameworks, using several strategies to control for any time trends or seasonal shocks. Second, we exploit the fact that survey respondents were randomly assigned to one of two waves of interviews; Kenya’s election crisis interrupted the first wave of surveys, allowing us to instrument for being surveyed after experiencing the crisis using the randomly-assigned survey waves. Both approaches yield similar results: we find that Kenya’s post-election crisis had a large and significant positive impact on individual risk aversion. Specifically, the crisis led to an 11 percentage point increase in the likelihood that a subject always chose the safest, lowest expected value alternative (i.e. lottery) available — this effect constitutes more than an 80 percent increase in the rate of extreme risk aversion. We also observe a 5.7 percentage point (or roughly 26 percent) decrease in the fraction of subjects who are classified as either risk neutral or risk loving. Such substantial impacts highlight an important channel through which civil conflict might affect growth and development: increased risk aversion might lead individuals in post-conflict settings to avoid high-risk, high-return activities (e.g. entrepreneurship) that contribute to economic growth.

One important question is whether the observed changes in risk preferences are the direct result of the conflict. Alternatively, the crisis may have lowered real incomes — for example, by driving up prices or reducing employment; if that were the case, we might erroneously attribute to the post-election crisis the impact of the resulting economic shock. In fact, while we find that the post-election crisis had a significant negative impact on *beliefs* about the economy, it did not negatively impact the wages or job prospects of the young adults in our survey — instead, we find a modest positive impact on the likelihood of employment. In addition, though prices increased during the crisis, our results are robust to the inclusion of the inflation rate as a control variable, suggesting that observed effects are not driven by price changes. Thus, our results do not seem to be driven by purely economic phenomena such as changes in wages or prices. In our exploration of the mechanisms at work, we find that the crisis damaged the fabric of Kenyan society (even though the areas that we study were not the most directly affected): the crisis led to significant declines in participation in community groups and generalized trust, particularly the extent to which respondents trust members of other ethnic groups. Thus, the post-election violence appears to have impacted Kenyan society through several channels, but our results suggest that

it primarily (and directly) affected individual values, beliefs, and preferences — observed effects cannot be explained by changes in prices and wages.

The key strength of our study is that we are able to estimate the impact of civil conflict on the risk preferences of a population, as opposed to the specific (marginal) effect of being victimized or more exposed to violence. Very few KLPS2 respondents were themselves victims of violence during the unrest. Like all Kenyans, they experienced a period of acute anxiety about the political and economic future of their country; moreover, more than three quarters of respondents were temporarily deprived of basic necessities because it was not safe to visit markets or other public places during the crisis. However, less than 4 percent indicated that anyone in their household was physically assaulted during the crisis period. Thus, KLPS2 respondents experienced the conflict, but were not, by and large, among the most impacted Kenyans; they therefore provide an important window into the impacts of civil conflicts on the preferences of non-victims.

Our results differ from several recent studies. For example, Voors, Nillesen, Verwimp, Bulte, Lensink, and Van Soest (2012) find that greater exposure to violence leads to an increase in risk-seeking behavior, while Callen, Isaqzadeh, Long, and Sprenger (2014) find that priming subjects with recollections of violent events increases their risk tolerance in situations involving only uncertainty (but also increases their certainty premia). However, these differing results can be reconciled by the difference in estimands, for example, if those who narrowly escape being exposed to violence or victimized become more risk averse, or the political uncertainty inherent in civil conflict makes everyone more risk averse. Our aim in this paper is to estimate the overall impact of violence on the population; doing so, we may not find the same effect.<sup>2</sup> Understanding these overall impacts is of critical importance as we seek to characterize the ways that conflict may change a country's overall growth trajectory.

This paper contributes to several strands of literature. First, most obviously, we add to the evidence on the impacts of conflict. As discussed above, this literature has expanded rapidly

---

<sup>2</sup>It is important to note that the population we study is not representative of Kenya as a whole; it is, however, broadly representative of the population of young people from one particular region — and, as such, provides a window into the impacts of conflict on society. As we discuss further below, our data come from a follow-up survey of a health intervention that was implemented in all the public primary schools in a specific rural district; as such, the population is broadly representative of the sample of individuals enrolled in government schools in that area at the time of the intervention.



in recent years as increasingly high-quality micro data from post-conflict settings has become available.<sup>3</sup> Second, we contribute to a growing body of evidence that individual preferences, one of the key determinants of individual behavior in all economic domains, are not as immutable as has long been assumed (cf. Stigler and Becker 1977); instead, individual preferences appear to be shaped by life experiences. For example, Malmendier and Nagel (2011) and Fisman, Jakiela, and Kariv (2015) show that exposure to economic downturns makes people more risk averse and more efficiency-focused, respectively; while Eckel, El-Gamal, and Wilson (2009), Cameron and Shah (2013), and Hanaoka, Shigeoka, and Watanabe (2015) estimate the impact of natural disasters on individual risk preferences (and arrive at different conclusions). As discussed above, several papers (cf. Voors, Nillesen, Verwimp, Bulte, Lensink, and Van Soest 2012) have estimated the impact of conflict on the preferences of those most affected, but, to our knowledge, no work to date has estimated the impact of civil conflict on the risk preferences of the general population. Interestingly, however, our results resonate with recent work by Brown, Montalva, Thomas, and Velsquez (2015), who find that spikes in drug-related violence increase risk aversion among those not directly involved.

Finally, our study contributes to the growing body of evidence documenting the validity and predictive power of laboratory and lab-style measures of individual preferences. Though some scholars have questioned whether individual decisions in choice experiments predicts behavior outside of the lab (cf. Levitt and List 2007, Voors, Turley, Kontoleon, Bulte, and List 2012), numerous studies document the explanatory power of experimental measures of risk, time, and social preferences. For example, Liu (2013) and Liu and Huang (2013) show that experimental measures of risk preferences predict the crop choice and investment decisions of Chinese farmers. In the domain of time preferences, Meier and Sprenger (2012) show that experimental measures of patience predict creditworthiness. Fisman, Jakiela, and Kariv (2014) show that experimental measures of equality-efficiency tradeoffs predict the voting behavior of adult Americans, while Fisman, Jakiela, Kariv, and Markovits (2015) show that the same measure predicts the post-graduation career choices of law students. Jing (2015) shows that experimental measures of fair-mindedness predict medical

---

<sup>3</sup>Humphreys and Weinstein (2006), Bellows and Miguel (2009), and Blattman and Annan (2010) are prominent examples. See Blattman and Miguel (2010) for discussion.

students' choices regarding field of specialization. To date, the majority of work linking choices in decision experiments to behavior outside the lab has used incentivized measures of individual preferences, but there are notable exceptions (cf. Ashraf, Karlan, and Yin 2006). Existing evidence suggests the use of incentives shifts individual responses toward greater risk aversion (cf. Camerer and Hogarth 1999, Holt and Laury 2002), leading many to question the broad applicability of hypothetical approaches to risk preference elicitation. We contribute to this literature by demonstrating that hypothetical measures of risk preferences, interpreted as an ordinal index of risk tolerance, predict real world behaviors in an internally consistent way. In particular, our measure of risk preferences is associated with real-world behaviors that involve risk: migration and entrepreneurship.

The rest of this paper is organized as follows. In Section 2, we describe the KLPS2 data collection effort and Kenya's post-election crisis. In Section 3, we describe our measure of risk preferences and assess the extent to which our hypothetical lottery choice questions predict behaviors likely to depend on risk aversion. In Section 4, we explain our analytic approach and present our main results. Section 5 concludes.

## 2 Research Design

### 2.1 The Kenyan Life Panel Survey

We measure the risk preferences of a large and heterogeneous sample of young Kenyans by embedding a series of non-incentivized decision problems in the second round of the Kenyan Life Panel Survey (KLPS2), which was administered to more than 5,000 individuals who were enrolled in primary schools in Kenya's Western Province in the late 1990s.<sup>4</sup> KLPS2 was administered in person, through one-on-one interviews, between August of 2007 and December of 2009. The survey covers a broad range of topics including educational attainment, labor market and entrepreneurial activities, household composition, migration, and fertility.

---

<sup>4</sup>KLPS2 was a long-term follow-up of the Primary School Deworming Project (PSDP) that was implemented in Busia District, in Kenya's Western Province, between 1998 and 2001. All KLPS2 respondents were enrolled in public primary schools in the project area in 1998. See Miguel and Kremer (2004) for discussion of the PSDP and Baird, Blattman, Casaburi, Evans, Hamory, Kremer, Miguel, Ozier, Siegel, Wafula, and Yeh (2007) for a description of the KLPS data collection effort.

Our subject pool includes 5,049 Kenyan youths aged 14 to 31. Summary statistics characterizing our sample are reported in the Online Appendix. 49.0 percent of subjects are female. As of 2007, subjects had completed an average of 8.5 years of schooling; 69.6 percent had completed primary school, and 14.4 percent had completed secondary school. 23.2 percent of subjects were still enrolled in school at the time that they were surveyed.

## **2.2 Kenya's Post-Election Crisis**

The 2008 post-election crisis was a period of violence and political instability following the Kenyan presidential election of December 27, 2007. The two leading candidates in the election were Raila Odinga (the son of Kenya's first vice president), and the incumbent president, Mwai Kibaki (himself a former vice president). For several months preceding the election, opinion polls placed the opposition candidate, Odinga, ahead of Kibaki (World Bank 2008, Munene and Otieno 2007). As election day neared, the polling gap between Odinga and Kibaki narrowed to what, in some polls, appeared to be a statistical dead heat (World Bank 2008, Agina 2007, Otieno 2007, Standard Team 2007). At the time of the elections, both international observers and members of the opposition made allegations of electoral irregularities; however, after a few days, Kibaki was declared the winner and sworn into office (World Bank 2008, Waki 2008, McCrummen 2007, BBC News 2007). Opposition supporters organized protests; rioting and violent clashes with police ensued, and the violence soon escalated and took on a strong ethnic dimension (World Bank 2008, World Bank 2010b, Van Praag 2010, Waki 2008, BBC News 2007). By the time Kibaki and Odinga signed a power-sharing agreement at the end of February, 2008, more than one thousand people had been killed, and hundreds of thousands had been internally displaced (World Bank 2008, World Bank 2009, World Bank 2010a, World Bank 2012, BBC 2008a, BBC 2008b).

As discussed above, all KLPS2 respondents were residing in Busia District, in Kenya's Western Province near the Ugandan border, in 1998; 73 percent were still living in Busia District at the time of the KLPS2 survey, and many others happened to be there during the post-election crisis (because they had returned to their family homes to celebrate the Christmas holiday or to vote). As a result, most were spared the worst of the post-election violence: though protests, riots, and assaults took place throughout Kenya, the most affected areas were Rift Valley Province and the more urban

districts across the country. According to the official report of the Commission of Inquiry on Post Election Violence, only 98 of the 1,133 conflict deaths occurred in Western Province (Waki 2008). The majority of conflict deaths in Western Province occurred in districts that bordered Rift Valley Province; only 9 deaths were documented in Busia District (Waki 2008). In addition, most KLPS2 respondents (95.5 percent) are members of the Luhya ethnic group, the majority ethnic group in Western Province; as such, they were somewhat less likely to be singled out as clearly aligned with either the incumbent Mwai Kibaki (a member of a different ethnic group) or the opposition candidate Raila Odinga (a member of a third group).<sup>5,6</sup> Thus, though KLPS2 survey respondents lived through the crisis, both their physical locations and their ethnic identities helped to shield most of them from the worst of the violence.

This pattern is borne out in the data. The second wave of the survey included questions on exposure to violence during the post-election crisis; it documents the fact that very few respondents were, themselves, the victims of physical attacks.<sup>7</sup> 71.7 percent of KLPS2 Wave 2 respondents said that they were “very worried” about their own safety and the safety of their family members during the crisis, while 76.3 percent indicated that the crisis prevented them from going to local markets to obtain basic necessities. However, only 3.7 percent indicated that someone in their household was physically assaulted during the crisis. Similarly low numbers of respondents had property stolen (5.8 percent) or burned (2.1 percent). Thus, though many of KLPS2 respondents feared for their safety during the crisis — and were directly affected because businesses and markets were closed and people were confined to their homes during periods of rioting and insecurity — relatively few were, themselves, victims of violence. Our estimates should therefore be seen as both a lower bound on the impact of civil conflict on risk preferences, and a natural complement to studies which estimate the impact of violence on those individuals and households who were most victimized.

---

<sup>5</sup>Western Province was an opposition stronghold, and Raila Odinga received 64.6 percent of the votes cast there in the presidential election; thus, individuals perceived as likely supporters of the incumbent were the most at risk.

<sup>6</sup>We thank the World Bank’s Kenya Country Office for guidance on wording.

<sup>7</sup>As discussed above, KLPS2 respondents were randomly assigned to one of two waves of surveying. The post-election violence interrupted the first wave of surveying. The additional survey were included only in Wave 2, so responses can be seen as representative of the entire respondent population.

### 3 Measuring Risk Preferences

We elicit risk preferences by confronting survey respondents with a series of hypothetical decision problems; each decision was a choice between two or three lotteries involving two equally likely potential payoffs. The sequence of decision problems was designed to start with choices that were extremely simple and to build slowly toward more complicated choice problems. For example, the first decision problem involved a choice between a degenerate lottery which paid 100 Kenyan shillings with certainty and a lottery involving a 50 percent chance of receiving 100 shillings and a 50 percent chance of receiving 120 shillings.<sup>8</sup> In contrast, the final decision problem was a choice between three non-degenerate lotteries.

This sequencing of choice problems from least to most complex served two purposes. First, the gradual increase in complexity was intended to help address the concern that respondents might not exert sufficient cognitive effort (for example, to calculate expected payoffs) when facing non-incentivized choice problems.<sup>9</sup> Respondents first considered options that could be evaluated with minimal cognitive effort, easing into the process of evaluating the expected utility of financial lotteries. Second, we wished to maximize the level of comprehension by subjects with low levels of numeracy. For this reason, we also limited each decision problem to a maximum of three lottery options, included only three easily understood probabilities (0, 0.5, and 1), and only considered lotteries over financial gains (rather than losses).<sup>10</sup> Our experimental instructions do not assume any familiarity with probabilities, averages, or expected values; lotteries are explained in terms of payoffs and uncertain but equally likely events.

When administering our experiment, survey enumerators began by presenting two practice decision problems which introduced the structure of the lottery choice questions to the respondent.<sup>11</sup>

---

<sup>8</sup>The average US dollar value of 100 Kenyan shillings was 1.36 over the period during which the KLPS2 survey was in the field, from August 2007 to December 2009.

<sup>9</sup>There is some debate about the extent to which non-incentivized lottery choice questions correctly measure individual risk preferences. See Camerer (1995) for an overview, and Binswanger (1980) and Holt and Laury (2002) for seminal contributions. Existing evidence suggests that financial incentives induce greater risk aversion (Camerer and Hogarth 1999). Embedding non-incentivized decision problems in surveys has nonetheless proven successful in a number of field settings in developing countries, when conducting incentivized experiments at scale is not feasible (cf. Callen, Isaqzadeh, Long, and Sprenger 2014).

<sup>10</sup>Our risk preference elicitation method builds on those of Binswanger (1980), Eckel and Grossman (2008), Barr and Genicot (2008), Tanaka, Camerer, and Nguyen (2010), and Liu (2013), among others, but differs in its exclusive focus on extremely simple lottery structures and limited choice sets.

<sup>11</sup>Complete experimental instructions including images of the cards depicting lottery choice questions are included

The first practice problem contained only degenerate lotteries — the respondent was asked to choose between 100 Kenyan shillings and 150 shillings; the second practice problem introduced the (non-degenerate) lottery concept in a setting with a clear “correct” answer: one lottery first-order stochastically dominated the other, and both involved risk. Enumerators asked respondents to choose between the lotteries presented in the practice decision problems, and then followed a script which made sure that each respondent fully understood the nature of the choices they were facing.

After completing the practice decision problems, each subject made six choices between lotteries which differed in riskiness. Each choice was presented on a laminated card which depicted either two or three options. Like the practice problems, the first question (described above) provided a test of monotonicity, allowing us to identify subjects who are either not expected utility maximizers (cf. Andreoni and Sprenger 2010) or who simply could not grasp the nature of the choice problems. The second decision problem offered an extremely simple test of risk preferences, and one which should have been easily understood by almost all subjects: subjects were asked whether they preferred to receive 100 shillings with certainty, or a lottery that paid 0 and 400 shillings with equal probability. The remaining four decision problems presented lottery choices of increasing complexity. Without any functional form assumptions (but assuming subjects are maximizing a well-defined utility function), these decisions can be used to classify subjects into risk preference categories: risk loving, risk neutral, moderately risk averse, and most risk averse (always choosing the lotteries with the lowest expected value and payoff spread). If we assume that consistent preferences can be represented by a utility function of the constant relative risk aversion (CRRA) form, the risk cards were calibrated to distinguish a wide range of coefficients in the neighborhood of 1.<sup>12</sup> The payouts for the lotteries in all the choice problems included in our experiment are described in the Online Appendix.

---

in the Online Appendix.

<sup>12</sup>The CRRA utility function takes the form:  $u(x) = x^{1-\rho}/(1-\rho)$  where  $\rho$  indicates the level of risk aversion. Higher values of  $\rho$  indicate greater risk aversion. When  $\rho = 0$ , the agent is risk neutral; the indifference curves represented by the CRRA utility function approach log utility as  $\rho$  approaches 1. Even if relative risk aversion is not constant, constant relative risk aversion is a reasonable approximation over the relatively small range of payoffs considered in our experiment. The CRRA form is also used in this setting in Jakiela and Ozier (2016).

### 3.1 Individual Choices

Histograms of individual choices in all six decision problems are presented in the Online Appendix. Very few respondents (only 4.14 percent) indicated that they preferred the degenerate lottery which paid 100 Kenyan shillings with certainty to a non-degenerate lottery which paid either 100 or 120 Kenyan shillings, each with probability 0.5. We interpret this as evidence that most subjects understood the nature of the decision problems, at least those that involved relatively simple payoff calculations.<sup>13</sup>

Using data from the other five decision problems allows us to assign respondents to distinct risk preference categories. We classify a subject as **risk neutral** if she always chose the lottery with the highest expected value. We classify a subject as **risk loving** if she made risk neutral choices in all except in the last decision problem, and then chose the lottery which paid 10 and 200 shillings with equal probability over the lottery which paid 70 and 160 shillings with equal probability. We classify those subjects who always opted for the lowest variance, lowest expected value lottery as the **most risk averse**. The three categories most risk averse, risk neutral, and risk loving account for 22.5, 2.4, and 15.7 percent of subjects, respectively.

Offering subjects a series of choices also allows us to test whether individual decisions are consistent with a CRRA utility representation. There are 162 possible combinations of responses to the last 5 lottery choice problems, only 10 of which are consistent with a CRRA utility representation. 44.6 percent of subjects made choices which were consistent with the maximization of a CRRA utility function. If subjects were choosing lotteries at random, only 6.2 percent would make CRRA-consistent choices. However, only 4 percent of subjects made consistent choices that

---

<sup>13</sup>We also asked enumerators to indicate whether they believed that respondents fully understood the lottery choice questions; these responses suggest that 99.6 percent of subjects fully comprehended the choices that they were making. There are, of course, several reasons that subjects who understood the decision problem might prefer a degenerate lottery to a stochastically dominant one involving risk. One possibility is that some respondents have preferences which are not monotonic. Several non-expected utility models of risk preferences suggest that individuals may prefer to avoid increases in payoff variance, even when the higher variance lottery stochastically dominates the lower variance alternative. For example, specifications of the non-linear probability weighting component of prospect theory typically assume sub-additivity (Kahneman and Tversky 1979); the models of risk attitudes proposed by Kösegi and Rabin (2006) and Andreoni and Sprenger (2010) are also consistent with a preference for the risk-free Option A over the stochastically dominant Option B. We interpret the overwhelming tendency to choose the stochastically dominant lottery as evidence against strongly non-monotonic preferences. One plausible interpretation of the observed choice patterns is that respondents have monotonic preferences which they implement with error (Hey and Orme 1994, Loomes 2005, Von Gaudecker, van Soest, and Wengström 2011, Choi, Kariv, Müller, and Silverman 2014).

were not classified as either most risk averse, risk neutral, or risk loving. Figure 1 presents the fraction of respondents falling into each of five different categories: most risk averse, risk neutral, risk loving, other types of consistent choices (suggesting intermediate levels of risk aversion), and inconsistent choices. The figure demonstrates that patterns of choices which are inconsistent with the maximization of a CRRA utility function occur substantially less frequently than we would expect if subjects were selecting lotteries at random, but that only the first three types of consistent behavior (extreme risk aversion, risk neutrality, and risk loving behavior) occur more frequently than random choice would suggest.<sup>14</sup>

### 3.2 Instrument Validity

To address concerns about the validity of hypothetical measures of risk aversion, we test whether individual responses to our hypothetical lottery choice questions explain observed variation in behaviors that we might expect to be driven (at least in part) by risk attitudes. We focus on two such behaviors suggested by the literature: entrepreneurship (Schumpeter 1934, Schumpeter 1939, Skriabikova, Dohmen, and Kriechel 2014) and migration in search of employment (Jaeger, Dohmen, Falk, Huffman, Sunde, and Bonin 2010, Bryan, Chowdhury, and Mobarak 2014). Both of these actions can be seen through the lens of risk tolerance: for an unemployed or underemployed young adult residing in a rural area, operating one's own business and migrating are two high risk but potentially profitable strategies for improving one's long-term income prospects (Filmer and Fox 2014). Both behaviors are also relatively uncommon: only 12.4 percent of KLPS2 respondents were operating their own business at the time of the survey, and only 3.5 percent had ever moved for a job or in search of work.

To explore the association between these risky but potentially profitable activities and responses to our lottery choice questions, we construct a simple index of risk tolerance: a count of the number of times (out of five lottery choice questions) that a subject chose the riskiest and highest expected

---

<sup>14</sup>An important implication of this pattern of responses is that, if we chose to estimate the impact of the post-election crisis on risk preferences measured by CRRA coefficients, our results would be driven by the choice of coefficient for the most extreme groups (for whom we have either an upper or lower bound on the implied CRRA coefficient, but not a finite interval). We therefore chose to focus on the number of times a respondent chose the highest variance, highest expected value lottery as our main outcome variable. This also obviates the need to omit subjects whose choices are not consistent with a CRRA utility representation.



value lottery.<sup>15</sup> This index has two important strengths. First, it obviates the need to impose functional form assumptions on the structure of risk preferences. In the decision problems included in our study, all lotteries involving risk have two equally likely outcomes, and the highest expected value lottery always has the highest variance and the lowest minimum payoff (i.e. the lowest payoff in the bad state),<sup>16</sup> so any parametric restriction that permits an ordering of utility functions in terms of risk aversion would predict that relatively more risk averse individuals will be less likely to choose the highest variance lotteries. Second, constructing a measure of risk aversion that does not rely on functional form assumptions allows us to use data from all subjects, including those whose choices were not perfectly consistent with a specific utility representation.

We estimate probit regressions of indicators for operating one’s own business and having ever migrated seeking work on our index of risk aversion: the number of times (out of five) that a respondent chose the riskiest (highest expected value) lottery. Results are reported in Table 1. In all specifications, the number of times a respondent opted for the riskiest lottery is significantly associated with the likelihood of operating one’s own business or migrating for work. After controlling for gender, education level, age, the month in which the survey took place, and the survey enumerator who administered the lottery choice module, an additional risky choice is associated with a 0.5 percentage point (4.3 percent) increase in the likelihood of operating a business and a 0.2 percentage point (6.7 percent) increase in the likelihood of having ever migrated for work. Given the many factors underlying occupational choices, we interpret these robust associations as clear evidence that our lottery choice measure does predict outcomes associated with risk aversion in the cross-section.

---

<sup>15</sup>Focusing on the number of risky choices allows us to include those subjects whose decisions were not consistent with a CRRA utility representation in our analysis. As discussed in Loomes (2005) and Choi, Kariv, Müller, and Silverman (2014), most subjects implement their choices with error — and we would expect relatively high levels of error in our sample because of the relatively low level of formal schooling attained by our subjects. Importantly, if the likelihood of making consistent choices is associated with risk aversion, omitting the inconsistent subjects could bias our results. However, all of our findings are robust to the omission of the inconsistent types from the analysis.

<sup>16</sup>The one exception to this is that the final lottery choice question included one alternative designed to distinguish between risk loving and risk neutral types. In this choice problem, we classify both the highest expected value lottery and the highest variance lottery as risky, though we obtain similar results if we do not classify the highest expected value lottery as a risky alternative.

## 4 Analysis

### 4.1 Identification Strategies

We exploit the fact that Kenya’s post-election crisis occurred in the middle of the KLPS2 data collection effort to estimate the impact of the violence on risk preferences. The KLPS2 survey was launched in August of 2007, and 1,180 respondents were surveyed in 2007 prior to the elections. The crisis led to a two-month suspension of survey activities, which resumed in March of 2008 and continued through the end of 2009. We employ two complementary identification strategies. First, we estimate the impact of the crisis in a straightforward linear framework, controlling for calendar month fixed effects.<sup>17</sup> In these specifications, we also include enumerator fixed effects and controls for sociodemographic characteristics such as respondent age, educational attainment, and marital status that we expect to change gradually over time as respondents transition to adulthood.<sup>18</sup> Thus, we estimate OLS regressions of the form:

$$Y_{ijm} = \alpha + \beta Post_i + \delta X_i + \eta_j + \lambda_m + \varepsilon_{ijm} \quad (1)$$

where  $Y_{ijm}$  denotes the risk aversion index of respondent  $i$  surveyed by enumerator  $j$  in month  $m$ ,  $Post_i$  is an indicator variable equal to one if respondent  $i$  was surveyed after the post-election crisis,  $\eta_j$  is an enumerator fixed effect,  $\lambda_m$  is a calendar month fixed effect, and  $\varepsilon_{ijm}$  is a conditionally mean-zero error term.<sup>19</sup> We also report OLS specifications that replace the month fixed effects

---

<sup>17</sup>Because the post-election violence occurred after only 5 months of surveying, any seasonal variation in risk preferences — for example, variation across the crop cycle — could confound our estimates of the crisis’ impact; including calendar month fixed effects addresses this concern.

<sup>18</sup>With the exception of age, these characteristics might also be impacted by the crisis. To address concerns about the potential for a bad controls problem, we also report specifications that omit all sociodemographic controls.

<sup>19</sup>As discussed above, our main outcome variable is the number of times a respondent chose the riskiest, highest expected value lottery. In principle, it would be possible to use CRRA coefficients implied by an individual’s choices as the outcome variable, but this would require us to exclude from the analysis the 55 percent of subjects whose choices were not consistent with a CRRA utility representation. All our results are similar if we omit from the analysis those subjects whose choices are not consistent with a CRRA utility representation; however, because subjects are somewhat more likely to make consistent choices after the post-election crisis, omitting inconsistent subjects could bias our findings. Moreover, if the CRRA coefficient was used as the dependent variable, our results would be driven by the choice of CRRA values for two groups of subjects: those who always chose the highest expected value (and highest variance) lotteries, and those who always chose the lowest expected value (and lowest variance) lotteries (for whom we have either an upper or lower bound on the implied CRRA coefficient, but not a finite interval). Since these two groups account for more than a third of respondents (and most of our CRRA-consistent respondents), our results would be extremely sensitive to the choice of CRRA coefficients for the extreme cases.

with separate linear time trends for the pre- and post-crisis periods.<sup>20</sup> As a robustness check, we also take a nonlinear approach, and report analogous ordered logit specifications which account for the ordered nature of our outcome variable, the number of times a respondent chose the riskiest, highest expected value lottery.

We also report complementary instrumental variables estimates of the impact of the post-election crisis on individual risk preferences, exploiting the fact that KLPS2 respondents were randomly assigned to one of two waves of surveying. Wave 1 began in August of 2007 and continued through November 2008, while Wave 2 started in November 2008 and concluded in December of 2009. As discussed above, Kenya’s post-election crisis occurred approximately halfway through the first wave of surveys: 1,180 Wave 1 surveys were completed before the crisis, and 1,289 were completed afterward. This enables us to use random assignment to Wave 2 as an instrument for being surveyed after the crisis. Within each wave, participant characteristics may be associated with how quickly an individual was surveyed — for example, subjects who were still residing with their parents in their home villages might have been surveyed earlier because they were easier to locate. However, random assignment to survey wave creates exogenous variation in exposure to civil conflict prior to the survey. Thus, our 2SLS regressions are of the form:

$$Y_{ijm} = \alpha_1 + \beta_1 Post_i + \delta_1 X_i + \eta_{1j} + \lambda_{1m} + \zeta_{1ijm} \quad (2)$$

$$Post_i = \alpha_2 + \gamma_2 Wave2_i + \delta_2 X_i + \eta_{2j} + \lambda_{2m} + \zeta_{2ijm} \quad (3)$$

---

<sup>20</sup>While it is tempting to view our research design as analogous to a regression discontinuity approach, our natural experiment does not create a valid discontinuity. First, because the post-election crisis halted surveying for more than two months, sociodemographic characteristics such as age do jump discontinuously at the moment of the crisis. Second, because the crisis lasted months, the limit-based notion of regression discontinuity is not directly applicable to this setting; a discontinuity would involve choosing a single point in time during the crisis, and at any such point, data from this survey would not be immediately adjacent on both sides. Third, there is some evidence that neither the onset nor the conclusion of the crisis were, in fact, instantaneous and completely unexpected. Though opposition candidate Raila Odinga held a convincing lead in opinion polls several months before the election, incumbent Mwai Kibabki caught up with Odinga in the month prior to the polling date, potentially raising fears that one of the candidates might try to manipulate a close vote. The official report Commission of Inquiry also documents several minor clashes in Rift Valley in late November and early December, most of which appeared be connected to attempts by political candidates to rally support by playing off of underlying ethnic tensions and disagreements over land ownership (Waki 2008). There was also a period of uncertainty in the wake of the crisis, between February 28, 2008, when the power-sharing agreement was signed, and April 12 when — after sometimes tense negotiations between the two political parties — Raila Odinga was sworn in as Prime Minister and the new coalition government officially took power.

where all variables are as before,  $\beta_1$  is the coefficient of interest,  $Wave2_i$  is an indicator variable for the randomized survey timing instrument, and both  $\zeta_{1ijm}$  and  $\zeta_{2ijm}$  are conditionally mean-zero error terms. The variable  $Wave2_i$  takes the value 1 for individuals assigned to be surveyed in Wave 2 (which is entirely post-crisis), and 0 for those assigned to be surveyed in Wave 1 (which includes both pre- and post-crisis observations).

Before proceeding to our IV analysis, we check whether the random assignment of respondents to survey waves generated groups that were comparable in terms of observable characteristics prior to the survey. Because Wave 2 respondents were surveyed approximately one year later than Wave 1 respondents, we would not expect characteristics such as age at the time of the survey to be similar in the two waves — because random assignment sought to create groups that were comparable *ex ante*. To test whether random assignment created groups that were comparable *ex ante*, it is necessary to focus on fixed traits and outcomes that were recorded in the survey for specific points in time. For example, the survey collects detailed information about school participation in each year between 1998 and the moment of the interview; this allows us to generate a variable indicating the number of years of schooling that a respondent had completed at the start of 2007 (before anyone was surveyed), regardless of the year in which a respondent was actually interviewed. Results are reported in the Online Appendix. We find no statistically significant differences between the survey waves in terms of proportion female, age in 2007, proportion born in Busia District, proportion from the local-majority Luhya ethnic group, years of schooling completed by 2007, and the proportion that were married by 2007. Thus, randomization appears to have succeeded in creating groups of respondents that were similar in terms of observable characteristics prior to the survey and the onset of the post-election violence.

## 4.2 Results

We begin with a graphical presentation of our key result: Figure 2 plots the average proportion of hypothetical questions in which the respondent chose the riskiest, highest expected value lottery, as a function of the month and year in which the survey was administered. The figure highlights the marked drop in the tendency to choose risky lotteries after the violence: respondents chose the riskiest lottery an average of 2.6 times in 5 decision problems prior to the post-election violence;

this figure drops to 1.9 times out of 5 after the violence. In fact, the average rate of risky lottery choice is higher in all 5 pre-crisis months than in any of the following 18 months.

#### 4.2.1 OLS Results

We now proceed to estimate the impact of exposure to the post-election crisis on risk preferences by estimating Equation 1. Our dependent variable is the number of times a respondent chose the riskiest, highest expected value lottery (over the course of 5 decision problems). Results are reported in Table 2. In Column 1, we include only the indicator for being surveyed after the post-election crisis. In Column 2, we control for gender, age, education level, and marital status at the time of the survey. We add survey enumerator fixed effects in Column 3, and include controls for both the survey enumerator and respondent demographic characteristics in Column 4. Columns 5 through 8 replicate 1 through 4 but include fixed effects for the month of the year in which the survey took place (to control for any seasonal patterns in responses).

In all eight OLS specifications reported in Table 2, the post-election coefficient is negative and significant at at least the 99 percent confidence level, suggesting that experiencing the crisis lowered the number of risky choices a respondent made by between 0.561 and 0.798 choices. In the pre-crisis period, the average number of risky choices was 2.566 out of five, so the change observed after the crisis represents a dramatic drop in the willingness to bear profitable risk. Adding controls for gender, education level, age, and marital status has almost no impact on the estimated coefficient. In Table 3, we estimate analogous ordered logit specifications which account for the discrete but ordered nature of the outcome, the number of risky choices. Again we find that the indicator for being surveyed after the post-election violence is negative and significant (at at least the 99 percent confidence level) in all specifications. In Table 4, we take an alternative approach to controlling for time effects by including separate linear time trends in the pre- and post-crisis periods. Columns 1 through 4 report OLS specifications, and Columns 5 through 8 report ordered logit results. Again, the indicator for being surveyed in the post-crisis period is negative and significant in all specifications.

As an additional set of robustness checks, we consider alternative formulations of the outcome variable in Table 5. In the first column, the outcome variable is an indicator for always choosing the

highest variance, highest expected value lottery option (i.e. behaving in a manner consistent with risk neutral or risk-loving preferences); in the second column, the outcome is an indicator for always choosing the lowest variance, lowest expected value alternative (i.e. behaving in a manner consistent with extreme risk aversion). We find that the post-election violence led to a 5.7 percentage point (26 percent) decrease in the likelihood of making risk neutral or risk loving choices, and an 11 percentage point (82 percent) increase in the probability of always choosing the lowest variance (and lowest expected return) lottery option. Next, we consider each decision problem in isolation. This allows us to test whether the effect that we find is likely to be driven by a change in the preference for certainty, a finding that would be consistent with the results reported in Callen, Isaqzadeh, Long, and Sprenger (2014).<sup>21</sup> We find that the post-election violence led to a significant decrease in the likelihood of choosing higher variance, higher expected value lottery options in each of the five decision problems. The effect is similar in magnitude across the four decision problems that include three lottery alternatives; the estimated effect of violence does not appear to be larger in decision problems that include a degenerate (i.e. risk-free) lottery as one of the alternatives.<sup>22</sup> We interpret this as evidence that the impact of post-election crisis does not only operate through an increased preference for certainty.<sup>23</sup> Moreover, our main result is robust to a wide range of alternative specifications and formulations of the outcome variable.

#### 4.2.2 IV Results

Next, we employ a complementary identification strategy, exploiting the fact that KLPS2 respondents were randomly assigned to one of two waves of surveying to generate instrumental variables estimates of the impact of the post-election violence on measured risk aversion. Two-stage least squares (2SLS) regression results are reported in Table 6. In Panel A, the outcome variable is

---

<sup>21</sup>Callen, Isaqzadeh, Long, and Sprenger (2014) find that Afghan respondents primed to recollect fearful episodes display greater risk aversion when certainty is an option, but greater risk tolerance when no risk-free alternatives are available. They interpret this as evidence that subjects display a preference for certainty not consistent with expected utility maximization; their evidence suggests that violence impacts this preference for certainty.

<sup>22</sup>Decision Problems 2, 3, and 4 include a degenerate lottery that pays 100 Kenyan shillings with certainty, while Decision Problems 5 and 6 include only non-degenerate lotteries (the lowest variance lottery pays 90 and 110 Kenyan shillings with equal probability).

<sup>23</sup>To further probe this issue, we examine the likelihood of choosing the *safest* (i.e. lowest variance, lowest return) lottery alternative in each of the five decision problems. Results are reported in the Online Appendix. We find no evidence that the shift away from high-risk lotteries is stronger in decision problems that included options with purely certain outcomes.

the number of times that a respondent chose the highest variance, highest expected value lottery alternative. In Column 1, we report estimates from a parsimonious specification that includes no covariates (and is therefore free from any possible bad controls problem). Coefficient estimates indicate that the post-election crisis had a large and statistically significant impact on measured risk preferences, reducing the number of times (out of five) that respondents opted for the riskiest, highest expected value lottery by approximately one full question. Again, relative to a mean number of risky choices of about 2.5 in the pre-crisis period, this is an extremely large effect. In Columns 2 through 5, we include controls for include individual demographic characteristics (gender, age, education level, and marital status), the identity of the survey enumerator, and the calendar month in which the interview took place to control for any seasonal patterns in responses). Coefficient estimates are consistently negative and significant. Thus, our 2SLS estimates are consistent with our un-instrumented results: Kenya's post-election crisis appears to have made survey respondents substantially more risk averse.

In Panels B and C of Table 6, we consider two alternative formulations of our dependent variable. In Panel B of Table 6, we estimate the impact of the post-election crisis on the likelihood of making choices consistent with risk neutral or risk loving preferences (by always choosing the highest variance, highest expected value lottery). Coefficient estimates suggest that exposure to the post-election violence decreased the likelihood of being risk neutral or risk loving by between 8.2 and 11.7 percentage points. Since only 21.7 percent of those surveyed prior to the crisis made risk neutral or risk loving choices, our 2SLS estimates suggest that the post-election crisis reduced the likelihood that a respondent was willing to bear profitable risk by more than a third.

Finally, in Panel C of Table 6, we estimate the impact of the crisis on the likelihood of always choosing the lowest variance lottery in an instrumental variables framework. Coefficient estimates suggest that the violence increased the likelihood of extreme risk aversion by between 21.2 and 34.8 percentage points. In the pre-crisis period, only 13.4 percent of respondents displayed this level of extreme risk aversion. Thus, 2SLS estimates suggest that the post-election violence more than doubled the likelihood of being extremely risk averse.

### 4.3 Threats to Identification

Thus far, we have shown that two distinct identification strategies generate similar estimates of the impact of Kenya’s post-election violence on individual risk preferences. An important caveat is that both identification strategies exploit the timing of the crisis, so any other major shock that coincided with the post-election crisis could be driving our results. As is often the case, Kenya’s episode of civil conflict created increased uncertainty about the country’s economic and political future (though it did not, in the end, lead to a change in the head of state). As discussed above, such macroeconomic and political uncertainty is typical of civil strife, and a strength of our estimation strategy is that we capture the overall impacts of conflict on society — but this also means that we cannot, for example, separate the impacts of fear of violence from the impacts of political uncertainty. Nonetheless, to the extent possible, it is important to rule out the possibility that shocks coincident with — but not related to — the post-election crisis could explain our results.

One obvious concern is that the crisis might have triggered a period of high inflation, and that our results are driven by price changes rather than the conflict itself. Figure 3 plots the monthly inflation rate (the percent change in prices relative to the previous month) from 2005 to 2010, using Consumer Price Index (CPI) data produced by the Kenya National Bureau of Statistics.<sup>24</sup> It shows that inflation rates were relatively high during and after the crisis: the CPI increased by more than 2 percent in January, April, and May of 2008. It is likely that these high rates of inflation were at least partly attributable to the crisis itself (though Kenya experienced many other months of high inflation in the years before and after the crisis, as Figure 3 illustrates), and should therefore be viewed as a potential mediating factor rather than a competing explanation of our findings. We test whether inflation alone could explain our empirical results by replicating our main OLS and 2SLS specifications controlling for the inflation rate (results reported in the Online Appendix). All of our results are robust to including the inflation rate as a covariate; we find no evidence that the observed impact of conflict is explained by (only) the price instability created by the crisis.

We also find no evidence of other aggregate shocks — for example, shocks to agricultural

---

<sup>24</sup>Data are available online at [http://www.knbs.or.ke/index.php?option=com\\_phocadownload&view=category&download=14:quarterly-cpi&id=8:consumer-price-indices-cpi&Itemid=562](http://www.knbs.or.ke/index.php?option=com_phocadownload&view=category&download=14:quarterly-cpi&id=8:consumer-price-indices-cpi&Itemid=562).



productivity — that could explain our results. Maize is the main staple crop for subsistence farmers in western Kenya, while sugar cane is the most widely grown cash crop. Data from the FAO statistical database indicate that Kenya’s maize yield per hectare in 2007 was slightly higher than in the two previous years, and overall production levels were comparable.<sup>25</sup> Sugar yields and production levels in 2007 were also comparable to the previous five years. Thus, our results do not seem likely to be driven agricultural or other aggregate shocks that were not associated with the post-election crisis.

Another possible concern, already discussed above, is that our results could be driven by the fact that respondents surveyed after the post-election violence were, on average, older when they were surveyed — because the surveys were conducted over a two year period, and we compare those surveyed before the violence to those surveyed afterward. We attempt to address this issue by directly controlling for age and other factors (e.g. marital status and educational level) likely to change gradually over time as respondents grew up. However, if risk preferences change discretely at some point during the transition to adulthood, it is possible that a critical mass of respondents “aged out” of their youthful, risk-tolerant period around the time of the crisis. Fortunately, our data allow for a clear test of this hypothesis, since the sample includes a broad range of birth years: 37 KLPS2 respondents were born before 1980, while 128 were born after 1990; 93.8 percent of KLPS2 respondents were born between 1982 and 1990, so the variation in age range within the sample is much larger than the average difference in ages (when surveyed) between those surveyed before vs. after the crisis. In Figure 4, we plot the average number of risky lottery choices (out of five) among respondents at each age level, separated into those surveyed before vs. after the post-election crisis. The figure shows that there is no discrete drop in risk tolerance once respondents reach a certain age level; instead, risk aversion appears relatively constant across the age range included in our sample. However, at all age levels, we see lower levels of risk tolerance after the crisis. Thus, our results do not appear to be driven by the fact that those surveyed after the post-election violence were, on average, older at the time that they were surveyed.

---

<sup>25</sup>Farmers in Kenya typically harvest two maize crops per year, the larger one in July and August and the smaller one in December; a shock impacting the late 2007 harvest would therefore have been coincident with the onset of the post-election violence. The overall maize harvest in 2007 was 2.9 million tons; the average over the previous five years was 2.8 million tons (calculations based on FAO data available online at <http://faostat3.fao.org/home/E>).

## 4.4 Potential Mechanisms

We interpret our results as evidence that civil conflict impacts individual risk preferences. An important question is what (if any) mechanism or mechanisms explain these impacts. One possibility is that the post-election violence was an economic shock, and that young adults expected it to slow growth and reduce job opportunities; if those with higher expected permanent incomes are more willing to bear risk, such a shock might have impacted risk preferences through job prospects. Alternatively, Voors, Nillesen, Verwimp, Bulte, Lensink, and Van Soest (2012) suggest another potential mechanism through which conflict might change preferences and behavior: the social context may change in the wake of violence. Fortunately, the KLPS2 survey collects data on a range of labor market outcomes and social values, allowing us to explicitly test these two potential channels.

We first test the extent to which the post-election crisis was a (negative) labor market shock. In Table 7, we estimate the impact of the crisis on a range of labor market outcomes.<sup>26</sup> We find no evidence that the post-election crisis reduced employment opportunities or income. In the first row of Table 7, we show that the crisis had no impact on the likelihood of reporting any income-generating activity (i.e. either employment or self-employment). The next two rows show that the crisis appears to have weakly increased the likelihood of being employed, but weakly decreased the likelihood of self-employment (though neither effect is significant across the full range of specifications). Looking at monthly income conditional on employment, we again find no evidence of a statistically significant impact — so, the crisis did not lower either the likelihood of being employed or equilibrium wages conditional on employment. Thus, we find no evidence that the post-election crisis had a negative impact on incomes or labor market prospects over the medium-term (though many respondents reported that they were unable to work *during* the crisis); any negative impacts on respondents' wages and income appear to have quickly disappeared after the crisis ended.

Interestingly, however, we find strong evidence that respondents *believed* that the post-election violence lowered average incomes. The KLPS2 survey asks respondents to report their belief about

---

<sup>26</sup>We report 4 specifications in each row of Table 7. Columns 1 and 2 replicate the first two columns of Table 2 — simple OLS specifications with and without demographic controls. In Columns 3 and 4 of Table 7, we replicate the 2SLS specifications (with and without demographic controls) reports in Columns 1 and 2 of Table 6.

the average monthly incomes of four groups of people: primary and secondary school graduates living in Busia, and primary and secondary school graduates living in Nairobi.<sup>27</sup> Importantly, these questions ask about *current* monthly income, so they should not reflect the very short-term impacts of being unable to work during the crisis. Taking the average belief across these four categories, we find that the post-election crisis led to a dramatic decline in perceived income levels. Coefficient estimates suggest that the post-election violence caused more than a 25 percent decline in the perceived average incomes, and the effect is significant across a range of specifications.<sup>28</sup> Thus, our evidence suggests that young people believed that the post-election crisis was a negative income shock, but we find no evidence that this was the case.<sup>29</sup>

The post-election violence also appears to have changed the way KLPS2 respondents evaluate different job opportunities. The survey asks respondents to indicate which of six job attributes are the most important when they search for employment. The results reported in Table 7 show that the post-election crisis increased the likelihood of prioritizing job security (specifically, finding “a safe job, with no risk of closing down or unemployment”) by more than 13 percentage points. The crisis also decreased the likelihood of prioritizing a job that put one close to “friends and relatives” and, to a lesser extent, an “important job that gave [one] a feeling of accomplishment.” Interestingly, the crisis does not appear to have impacted the likelihood of wanting a job that allowed one to work for or with members of one’s own ethnic group.

We do, however, find substantial evidence that the post-election crisis also changed the social fabric of the country, even in areas like Busia District that were less directly impacted than other parts of Kenya. For instance, the crisis appears to have destroyed social capital: we find a consistently significant negative impact of the crisis on the likelihood of being involved in at least one community group. Respondents were also asked to answer the standard World Values Survey question measuring generalized trust: “Generally speaking, do you think that most people can be

---

<sup>27</sup>To economize on space, we take the average across these four categories. In fact, we find that the post-election violence had a significant negative impact on beliefs about the incomes of individuals in all four categories.

<sup>28</sup>Incomes in the table are reported in 2007 US dollars. Throughout the paper, incomes are deflated using the Kenya National Bureau of Statistics’ Consumer Price Index, and then converted to 2007 US dollars using the average exchange rate from August 2007.

<sup>29</sup>It is important to note that our respondents are not a representative sample Kenyan workers, so it is certainly possible that average incomes did decline after the crisis, but that the impacts were strongly concentrated among older workers or (in Nairobi) those from other ethnic groups — in which case, KLPS2 respondents’ beliefs could accurately reflect a change in the average wage that did not impact them.

trusted, or would they try to take advantage of you if they got the chance?” The results reported in Table 7 demonstrate that the post-election crisis had a dramatic impact on generalized trust, cutting the number of respondents who believe people are trustworthy by more than 50 percent. Interestingly, we find that the crisis had a consistently significant negative impact on the extent to which respondents trust members of other ethnic groups; impacts on trust toward members of one’s own ethnic group also decline, but the effects are not consistently significant. Though the overwhelming majority of KLPS2 respondents are from the Luhya ethnic group — so neither the president nor the main opposition candidate was a member of their ethnic group — this decline in trust across ethnic lines is consistent with the general pattern of violence across ethnic lines.

Thus, we find some evidence in support of both proposed mechanisms. First, though the crisis does not appear to have impacted the incomes and job market prospects of KLPS2 respondents, we find suggestive evidence that they believed that it did — it is clear that they believed that average incomes were lower after the violence, and they also shifted toward prioritizing job security over other job attributes. At the same time, we also find that the crisis eroded trust and destroyed social capital. Of course, violence may impact many aspects of society, and it may be impossible to fully distinguish between mechanisms (driving the change in risk preferences) and other outcomes (that were simultaneously affected by the post-election violence). Moreover, as others have noted, the willingness to trust and the willingness to take risks are, from a theoretical perspective, closely related (Karlan 2005, Schechter 2007) — both the observed shift toward prioritizing job security and the observed decline in trust may be partially attributable to the observed increase in risk aversion. Importantly, however, the evidence suggests that the post-election violence did not impact risk preferences primarily through a labor market channel (i.e. through a dramatic drop in income); instead, we find suggestive evidence that the violence changed the social fabric by altering individual preferences, beliefs, and values.

## 5 Conclusion

We measure the impact of Kenya’s post-election violence on individual risk preferences. We find that experiencing the post-election crisis appears to have increased measured risk aversion signifi-

cantly. Point estimates suggest that exposure to the crisis decreased the likelihood of making risk neutral or risk loving choices by 5.7 percentage points (26 percent), and increase the likelihood of always choosing the lowest variance, lowest expected value lottery by 11 percentage points (82 percent). Our results are robust to a range of controls and the use of entirely distinct identification strategies. Thus, the evidence suggests that exposure to the post-election crisis led to a statistically and economically significant decrease in the willingness to take profitable risks.

In relation to existing studies of the determinants of individual preferences, our results corroborate a growing body of evidence that preferences are impacted by major life events such as conflict, disasters, and economic downturns. Identification of the impacts of such major events is always challenging since exogenous variation in exposure to historical shocks is rare. This paper may be unique in the timing of data collection in relation to the event in question: we are aware of no other study of risk preferences with data collection ongoing in the immediate run-up to and aftermath of a major event of this kind.

Existing studies of the impact of conflict on individual preferences estimate the marginal impact of greater exposure to violence, implicitly treating less-exposed survivors as a comparison group. We are able to expand this literature because our identification strategies enable us to measure the effect of civil conflict on the general population. Relatively more conflict-affected individuals may become more pro-social or less risk averse (Bellows and Miguel 2009, Blattman 2009, Voors, Nillesen, Verwimp, Bulte, Lensink, and Van Soest 2012, Callen, Isaqzadeh, Long, and Sprenger 2014), but the overall impact on the population as a whole is a shift toward less willingness to take profitable risks. Moreover, our results suggest that the channel of impact is social and not (primarily) economic, since the probability of engaging in any income-generating activity is not impacted by the violence, but generalized trust and social capital are impacted. Our results therefore suggest that conflict may have long-lasting impacts on economic development through channels such as reduced entrepreneurship. That our findings differ from some earlier studies suggests that the impacts of conflict at the scale of affected individuals and villages may not generalize to the scale of a district, or that of a nation.

## References

- AGINA, B. (2007): “Raila’s third win,” *The Standard*, Online: <https://web.archive.org/web/20071113172711/http://www.eastandard.net/news/?id=1143976568>, Accessed on July 29, 2015.
- ANDREONI, J., AND C. SPRENGER (2010): “Certain and Uncertain Utility: The Allais Paradox and Five Decision Theory Phenomena,” working paper.
- ASHRAF, N., D. KARLAN, AND W. YIN (2006): “Tying Odysseus to the Mast: Evidence from a Commitment Savings Product in the Philippines,” *Quarterly Journal of Economics*, 121(2), 635–672.
- BAIRD, S., C. BLATTMAN, L. CASABURI, D. K. EVANS, J. HAMORY, M. KREMER, E. MIGUEL, O. OZIER, S. Y. SIEGEL, P. WAFULA, AND E. YEH (2007): “The Kenyan Life Panel Survey (KLPS) Round 1: Survey Data Users Guide,” Discussion paper.
- BARR, A., AND G. GENICOT (2008): “Risk Pooling, Commitment and Information: An Experimental Test,” *Journal of the European Economic Association*, 6(6), 1151–1185.
- BAUER, M., A. CASSAR, J. CHYTILOVÁ, AND J. HENRICH (2013): “War’s Enduring Effects on the Development of Egalitarian Motivations and In-Group Biases,” *Psychological Science*, p. 0956797613493444.
- BBC (2008a): “Deal to end Kenyan crisis agreed,” *BBC News*, Online: <http://news.bbc.co.uk/2/hi/africa/7344816.stm>, Accessed on July 24, 2015.
- (2008b): “Kenya rivals agree to share power,” *BBC News*, Online: <http://news.bbc.co.uk/2/hi/africa/7268903.stm>, Accessed on July 28, 2015.
- BBC NEWS (2007): “Odinga rejects Kenya poll result,” *BBC News*, Online: <http://news.bbc.co.uk/2/hi/africa/7165406.stm>, Accessed on July 29, 2015.
- BELLOWS, J., AND E. MIGUEL (2009): “War and Local Collective Action in Sierra Leone,” *Journal of Public Economics*, 93(11), 1144–1157.
- BINSWANGER, H. P. (1980): “Attitudes toward Risk: Experimental Measurement in Rural India,” *American Journal of Agricultural Economics*, 62(3), 395–407.
- BLATTMAN, C. (2009): “From Violence to Voting: War and Political Participation in Uganda,” *American Political Science Review*, 103(02), 231–247.
- BLATTMAN, C., AND J. ANNAN (2010): “The Consequences of Child Soldiering,” *The Review of Economics and Statistics*, 92(4), 882–898.
- BLATTMAN, C., AND E. MIGUEL (2010): “Civil War,” *Journal of Economic Literature*, 48(1), 3–57.
- BROWN, R., V. MONTALVA, D. THOMAS, AND A. VELSQUEZ (2015): “Impact of Violent Crime on Risk Aversion: Evidence from the Mexican Drug War,” working paper.

- BRYAN, G., S. CHOWDHURY, AND A. M. MOBARAK (2014): “Underinvestment in a Profitable Technology: The Case of Seasonal Migration in Bangladesh,” *Econometrica*, 82(5), 1671–1748.
- CALLEN, M., M. ISAQZADEH, J. D. LONG, AND C. SPRENGER (2014): “Violence and Risk Preference: Experimental Evidence from Afghanistan,” *The American Economic Review*, 104(1), 123–148.
- CAMERER, C. (1995): “Individual Decision Making,” in *The Handbook of Experimental Economics*, ed. by J. Kagel, and A. Roth, pp. 587–673. Princeton University Press, Princeton.
- CAMERER, C. F., AND R. M. HOGARTH (1999): “The Effects of Financial Incentives in Experiments: A Review and Capital-Labor-Production Framework,” *Journal of Risk and Uncertainty*, 19(1-3), 7–42.
- CAMERON, L., AND M. SHAH (2013): “Risk-Taking Behavior in the Wake of Natural Disasters,” NBER Working Paper 19534, National Bureau of Economic Research.
- CHOI, S., S. KARIV, W. MÜLLER, AND D. SILVERMAN (2014): “Who Is (More) Rational?,” *American Economic Review*, 104(6), 1518–1550.
- COLLIER, P., V. ELLIOTT, H. HEGRE, A. HOEFFLER, M. REYNAL-QUEROL, AND N. SAMBANIS (2003): “Breaking the Conflict Trap: Civil War and Development Policy,” .
- ECKEL, C. C., M. A. EL-GAMAL, AND R. K. WILSON (2009): “Risk Loving After the Storm: A Bayesian-Network Study of Hurricane Katrina Evacuees,” *Journal of Economic Behavior & Organization*, 69(2), 110–124.
- ECKEL, C. C., AND P. J. GROSSMAN (2008): “Forecasting risk attitudes: An experimental study using actual and forecast gamble choices,” *Journal of Economic Behavior and Organization*, 68(1), 1–17.
- FILMER, D., AND L. FOX (2014): *Youth Employment in Sub-Saharan Africa*. World Bank Publications.
- FISMAN, R., P. JAKIELA, AND S. KARIV (2014): “The Distributional Preferences of Americans,” NBER working paper no. 20145.
- (2015): “How Did Distributional Preferences Change During the Great Recession?,” *Journal of Public Economics*, 128, 84–95.
- FISMAN, R., P. JAKIELA, S. KARIV, AND D. MARKOVITS (2015): “The Distributional Preferences of an Elite,” *Science*, 349(6254), 1300.
- HANAOKA, C., H. SHIGEOKA, AND Y. WATANABE (2015): “Do Risk Preferences Change? Evidence from Panel Data Before and After the Great East Japan Earthquake,” NBER Working Paper 21400, National Bureau of Economic Research.
- HEY, J. D., AND C. ORME (1994): “Investigating Generalizations of Expected Utility Theory Using Experimental Data,” *Econometrica*, 62(6), 1291–1326.
- HJORT, J. (2014): “Ethnic Divisions and Production in Firms,” *Quarterly Journal of Economics*, 129(4), 1899–1946.

- HOLT, C. A., AND S. K. LAURY (2002): “Risk Aversion and Incentive Effects,” *American Economic Review*, 92(5), 1644–1655.
- HUMPHREYS, M., AND J. M. WEINSTEIN (2006): “Handling and Manhandling Civilians in Civil War,” *American Political Science Review*, 100(3), 429–447.
- JAEGER, D. A., T. DOHMEN, A. FALK, D. HUFFMAN, U. SUNDE, AND H. BONIN (2010): “Direct Evidence on Risk Attitudes and Migration,” *The Review of Economics and Statistics*, 92(3), 684–689.
- JAKIELA, P., AND O. OZIER (2016): “Does Africa Need a Rotten Kin Theorem? Experimental Evidence from Village Economies,” *The Review of Economic Studies*, 83(1), 231–268.
- JING, L. (2015): “Plastic Surgery or Primary Care? Altruistic Preferences and Expected Specialty Choice of U.S. Medical Students,” working paper.
- KAHNEMAN, D., AND A. TVERSKY (1979): “Prospect theory: An analysis of decision under risk,” *Econometrica*, 47(2), 263–291.
- KARLAN, D. S. (2005): “Using Experimental Economics to Measure Social Capital and Predict Financial Decisions,” *American Economic Review*, 95(5), 1688–1699.
- KÓSEGI, B., AND M. RABIN (2006): “A Model of Reference-Dependent Preferences,” *Quarterly Journal of Economics*, 121(4), 1133–1166.
- LEVITT, S. D., AND J. A. LIST (2007): “What Do Laboratory Experiments Measuring Social Preferences Tell Us About the Real World?,” *Journal of Economic Perspectives*, 21(2), 153–174.
- LIU, E. M. (2013): “Time to Change What to Sow: Risk Preferences and Technology Adoption Decisions of Cotton Farmers in China,” *Review of Economics and Statistics*, 95(4), 1386–1403.
- LIU, E. M., AND J. HUANG (2013): “Risk Preferences and Pesticide Use by Cotton Farmers in China,” *Journal of Development Economics*, 103, 202–215.
- LOOMES, G. (2005): “Modelling the Stochastic Component of Behaviour in Experiments: Some Issues for the Interpretation of Data,” *Experimental Economics*, 8(4), 301–323.
- MALMENDIER, U., AND S. NAGEL (2011): “Depression Babies: Do Macroeconomic Experiences Affect Risk-Taking?,” *Quarterly Journal of Economics*, 126(1), 373–416.
- MCCRUMMEN, S. (2007): “Incumbent declared winner in Kenya’s disputed election,” *Washington Post*, Online: [http://www.washingtonpost.com/wp-dyn/content/article/2007/12/30/AR2007123002506\\_pf.html](http://www.washingtonpost.com/wp-dyn/content/article/2007/12/30/AR2007123002506_pf.html), Accessed on July 24, 2015.
- MEIER, S., AND C. SPRENGER (2012): “Time Discounting Predicts Creditworthiness,” *Psychological Science*, 23(1), 56–58.
- MIGUEL, E., AND M. KREMER (2004): “Worms: Identifying Impacts on Education and Health in the Presence of Treatment Externalities,” *Econometrica*, 72(1), 159–217.
- MIGUEL, E., AND G. ROLAND (2011): “The Long-Run Impact of Bombing Vietnam,” *Journal of Development Economics*, 96(1), 1–15.



- MUNENE, M., AND J. OTIENO (2007): “Kenya: Raila Tops Table,” *Daily Nation*, Online: <http://allafrica.com/stories/200709281185.html>, Accessed on July 29, 2015.
- NUNN, N., AND L. WANTCHEKON (2011): “The Slave Trade and the Origins of Mistrust in Africa,” *The American Economic Review*, 101(7), 3221–3252.
- OTIENO, J. (2007): “New Poll Predicts Close Race,” *Daily Nation*, Online: <https://web.archive.org/web/20080212172025/http://politics.nationmedia.com/inner.asp?pcat=NEWS&cat=TOP&sid=908>, Accessed on July 29, 2015.
- PETTERSSON, T., AND P. WALLENSTEEN (2015): “Armed Conflicts, 1946–2014,” *Journal of Peace Research*, 52(4), 536–550.
- SCHECHTER, L. (2007): “Traditional Trust Measurement and the Risk Confound: An Experiment in Rural Paraguay,” *Journal of Economic Behavior and Organization*, 62(2), 272–292.
- SCHUMPETER, J. A. (1934): *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*, vol. 55. Transaction Publishers.
- (1939): *Business Cycles*, vol. 1. Cambridge University Press.
- SKRIABIKOVA, O. J., T. DOHMEN, AND B. KRIECHEL (2014): “New Evidence on the Relationship between Risk Attitudes and Self-Employment,” *Labour Economics*, 30, 176–184.
- STANDARD TEAM (2007): “Last Poll, Last Push,” *The Standard*, Online: <https://web.archive.org/web/20071220153404/http://www.eastandard.net/news/?id=1143979128>, Accessed on July 29, 2015.
- STIGLER, G. J., AND G. S. BECKER (1977): “De Gustibus Non Est Disputandum,” *American Economic Review*, 67(2), 76–90.
- TANAKA, T., C. F. CAMERER, AND Q. NGUYEN (2010): “Risk and Time Preferences: Linking Experimental and Household Survey Data from Vietnam,” *American Economic Review*, 100(1), 557–571.
- VAN PRAAG, N. (2010): “View from the bottom: the conspiracy of violence in Nairobi’s slums,” *World Bank Conflict and Development Blog*, Online: <http://blogs.worldbank.org/conflict/slums-in-mathare-kenya>, Accessed on July 24, 2015.
- VON GAUDECKER, H.-M., A. VAN SOEST, AND E. WENGSTRÖM (2011): “Heterogeneity in Risky Choice Behavior in a Broad Population,” *American Economic Review*, 101(2), 664–694.
- VOORS, M., T. TURLEY, A. KONTOLEON, E. BULTE, AND J. A. LIST (2012): “Exploring whether Behavior in Context-Free Experiments is Predictive of Behavior in the Field: Evidence from Lab and Field Experiments in Rural Sierra Leone,” *Economics Letters*, 114(3), 308–311.
- VOORS, M. J., E. E. NILLESEN, P. VERWIMP, E. H. BULTE, R. LENSINK, AND D. P. VAN SOEST (2012): “Violent Conflict and Behavior: a Field Experiment in Burundi,” *The American Economic Review*, 102(2), 941–964.
- WAKI, P. N. (2008): *Report of the Commission of Inquiry into Post Election Violence (CIPEV)*. Government Printer.

- WORLD BANK (2006): “Kenya Governance Draft Report/Note,” Report 38196, The World Bank.
- (2008): “Cities of Hope? Governance, economic and human challenges of Kenya’s five largest cities,” Report 46988, World Bank Water and Urban Unit 1, Africa Region.
- (2009): “Kenya Economic Development, Police Oversight, and Accountability,” Report 44515-KE, The World Bank Public Sector Reform and Capacity Building Unit, Africa Region.
- (2010a): “Country Partnership Strategy for the Republic of Kenya for the period FY2010-13,” Report 52521-KE, The International Development Association, The International Finance Corporation, and the Multilateral Investment Guarantee Agency.
- (2010b): “Public Sentinel: News Media and Governance Reform,” Report 51842, The World Bank.
- (2011): “Kenya Economic Update Edition 5: Navigating the storm, Delivering the promise,” Report 66308, World Bank Poverty Reduction and Economic Management Unit, Africa Region.
- (2012): “Kenya Economic Update Edition 7: Kenya at work,” Report 7, World Bank Kenya Country Office.

Table 1: Probit Regressions of Self-Employment and Migration on Risk Index

<i>Dependent Variable:</i>	SELF-EMPLOYED		MIGRATED SEEKING WORK	
	PROBIT (1)	PROBIT (2)	PROBIT (3)	PROBIT (4)
<i>Specification:</i>				
Times respondent chose riskiest lottery	0.006*** (0.002)	0.005** (0.003)	0.003** (0.001)	0.002* (0.001)
Demographic controls	No	Yes	No	Yes
Interviewer controls	No	Yes	No	Yes
Month controls	No	Yes	No	Yes
Observations	5049	5047	5047	5005
Pseudo R <sup>2</sup>	0.002	0.095	0.004	0.195

Robust standard errors in parentheses. Probit marginal effects reported. Independent variable is the number of times a respondent chose the riskiest (i.e. highest variance, highest expected value) lottery (out of five). Even-numbered columns include controls for gender, age, education level, marital status, and survey month and interviewer fixed effects.

Table 2: OLS Regressions of the Impact of the Post-Election Crisis on Risk Preferences

<i>Specification:</i>	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)	OLS (7)	OLS (8)
Surveyed after post-election violence	-0.683*** (0.116)	-0.686*** (0.113)	-0.798*** (0.118)	-0.79*** (0.116)	-0.561*** (0.084)	-0.571*** (0.09)	-0.735*** (0.086)	-0.734*** (0.088)
Demographic controls	No	Yes	No	Yes	No	Yes	No	Yes
Interviewer controls	No	No	Yes	Yes	No	No	Yes	Yes
Month controls	No	No	No	No	Yes	Yes	Yes	Yes
Observations	5049	5049	5047	5047	5049	5049	5047	5047
$R^2$	0.023	0.029	0.151	0.155	0.028	0.032	0.153	0.157

Robust standard errors clustered at the month level in all specifications. Outcome variable is the number of times a respondent chose the riskiest (i.e. highest variance, highest expected value) lottery (out of five). Even-numbered columns include controls for gender, age, education level, and marital status (at the time of the survey).

Table 3: Ordered Logit Regressions of the Impact of the Post-Election Crisis on Risk Preferences

<i>Specification:</i>	ORDERED LOGIT (1)	ORDERED LOGIT (2)	ORDERED LOGIT (3)	ORDERED LOGIT (4)	ORDERED LOGIT (5)	ORDERED LOGIT (6)	ORDERED LOGIT (7)	ORDERED LOGIT (8)
Surveyed after post-election violence	-0.641*** (0.104)	-0.641*** (0.101)	-0.787*** (0.12)	-0.773*** (0.116)	-0.54*** (0.088)	-0.546*** (0.097)	-0.749*** (0.098)	-0.742*** (0.102)
Demographic controls	No	Yes	No	Yes	No	Yes	No	Yes
Interviewer controls	No	No	Yes	Yes	No	No	Yes	Yes
Month controls	No	No	No	No	Yes	Yes	Yes	Yes
Observations	5049	5049	5047	5047	5049	5049	5047	5047
Pseudo $R^2$	0.007	0.009	0.045	0.047	0.008	0.01	0.046	0.048

Robust standard errors clustered at the month level in all specifications. Outcome variable is the number of times a respondent chose the riskiest (i.e. highest variance, highest expected value) lottery (out of five). Even-numbered columns include controls for gender, age, education level, and marital status (at the time of the survey).

Table 4: The Impact of the Post-Election Crisis on Risk Preferences — Controlling for Time Trends

<i>Specification:</i>	OLS (1)	OLS (2)	OLS (3)	OLS (4)	ORDERED LOGIT (5)	ORDERED LOGIT (6)	ORDERED LOGIT (7)	ORDERED LOGIT (8)
Surveyed after post-election violence	-0.607*** (0.184)	-0.686*** (0.113)	-0.359** (0.164)	-0.79*** (0.116)	-0.531*** (0.173)	-0.54*** (0.164)	-0.297* (0.171)	-0.315* (0.169)
Demographic controls	No	Yes	No	Yes	No	Yes	No	Yes
Interviewer controls	No	No	Yes	Yes	No	No	Yes	Yes
Linear time trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5049	5049	5047	5047	5049	5049	5047	5047
$R^2$	0.024	0.029	0.162	0.155	.	.	.	.
Pseudo $R^2$	.	.	.	.	0.007	0.01	0.05	0.052

Robust standard errors clustered at the month level in all specifications. Outcome variable is the number of times a respondent chose the riskiest (i.e. highest variance, highest expected value) lottery (out of five). Even-numbered columns include controls for gender, age, education level, and marital status (at the time of the survey).

Table 5: OLS Regressions of the Impact of the Post-Election Crisis on Alternate Measures of Risk Aversion

<i>Dependent Variable:</i>	RISK NEUTRAL OR LOVING	MOST RISK AVERSE	— CHOICE ON DECISION NUMBER... —				
<i>Specification:</i>	2	3	4	5	6	7	
	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)	OLS (7)
Surveyed after post-election violence	-0.057*** (0.017)	0.11*** (0.023)	-0.114*** (0.027)	-0.234*** (0.045)	-0.296*** (0.06)	-0.29*** (0.03)	-0.26*** (0.053)
Observations	5049	5049	5049	5049	5049	5049	5049
$R^2$	0.007	0.033	0.015	0.017	0.027	0.023	0.025

Robust standard errors clustered at the month level in all specifications. All specifications include controls for gender, age, education level, and marital status (at the time of the survey). Thus, the specifications in this table mirror those in Table 2, Column 2. Here, the outcome variables vary by column. The outcome in Column 1 is an indicator for making choices that can be rationalized by risk neutral or risk loving preferences (i.e. always choosing the highest variance, highest expected value lottery). In Column 2, the outcome variable is an indicator for behaving in a manner consistent with extreme risk aversion (always choosing the lowest variance, lowest expected value lottery), so its sign is opposite those in other columns and tables. Columns 3 through 7 use discrete representations of the separate decision problems as outcomes, ordered by risk aversion; thus, the first two of these are indicator variables for taking the riskier option, while the remaining three are variables that take on the values 1, 2, and 3, with 1 being least risky (i.e. lowest variance, lowest expected value) lottery, and 3 being riskiest (i.e. highest variance, highest expected value) lottery.

Table 6: IV Regressions of the Impact of the Post-Election Crisis on Risk Preferences

<i>Specification:</i>	2SLS (1)	2SLS (2)	2SLS (3)	2SLS (4)	2SLS (5)
<i>Panel A. Dependent variable: number of risky (highest variance) choices (out of 5)</i>					
Surveyed after post-election violence	-0.986*** (0.2)	-1.050*** (0.223)	-1.779*** (0.5)	-1.085*** (0.257)	-1.988*** (0.588)
<i>Panel B. Dependent variable: choices consistent with being risk neutral or risk loving</i>					
Surveyed after post-election violence	-0.065** (0.029)	-0.082** (0.034)	-0.087** (0.041)	-0.102*** (0.036)	-0.117** (0.053)
<i>Panel C. Dependent variable: choices consistent with being most risk averse</i>					
Surveyed after post-election violence	0.211*** (0.062)	0.212*** (0.065)	0.328*** (0.125)	0.225*** (0.073)	0.348*** (0.119)
First stage F-stat	9.66	9.21	8.05	13.66	11.56
Demographic controls	No	Yes	Yes	Yes	Yes
Interviewer controls	No	No	Yes	No	Yes
Month controls	No	No	No	Yes	Yes
Observations	5049	5049	5047	5049	5047

Robust standard errors clustered by survey month in all specifications. All specifications estimated via two-stage least squares. All specifications include controls for gender, age, education level, and marital status (at the time of the survey). In all specification, we instrument for being surveyed after the post-election crisis with the indicator for being randomly assigned to the second wave of surveying. The outcome variable in Panel A is the number of times a respondent chose the riskiest (i.e. always choosing the highest variance, highest expected value lottery) lottery (out of five). The outcome variable in Panel B is an indicator for making risk neutral or risk loving choices (always choosing the highest variance, highest expected value lottery). The outcome variable in Panel C is an indicator for always choosing the lowest variance, lowest expected value lottery.

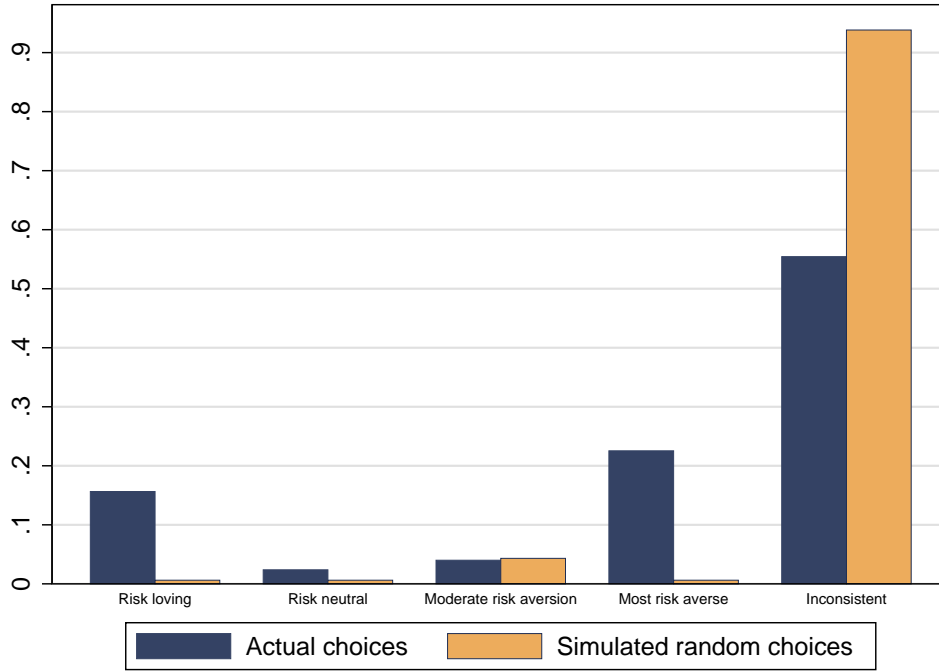
Table 7: Potential Mechanisms: Impacts on Labor Market Outcomes, Beliefs, and Social Capital

<i>Specification:</i>		OLS (1)	OLS (2)	2SLS (3)	2SLS (4)
<i>Income-generating activities and beliefs about the labor market:</i>					
Any off-farm income-generating activity (IGA)	0.202	0.086** (0.033)	0.032 (0.030)	0.071 (0.057)	-0.043 (0.060)
Self-employed	0.126	-0.003 (0.019)	-0.031* (0.016)	-0.016 (0.029)	-0.071** (0.033)
Paid work for someone else	0.081	0.088*** (0.021)	0.060*** (0.019)	0.089* (0.052)	0.029 (0.053)
Total off-farm labor income (conditional on any IGAs)	35.320	4.962* (2.712)	0.582 (2.809)	2.446 (10.585)	-4.534 (10.319)
Belief about average income from paid work	90.305	-25.385*** (2.298)	-24.942*** (2.572)	-35.392*** (5.985)	-37.416*** (7.008)
<i>Job attributes chosen as most important:</i>					
Earning a high income	0.484	-0.017 (0.033)	-0.025 (0.033)	0.078 (0.065)	0.073 (0.069)
Job security	0.488	0.145*** (0.019)	0.137*** (0.023)	0.206*** (0.051)	0.205*** (0.059)
Proximity to friends, relatives	0.189	-0.049*** (0.014)	-0.048*** (0.014)	-0.066** (0.033)	-0.069** (0.034)
Working with people one likes	0.199	-0.020 (0.018)	-0.008 (0.021)	-0.024 (0.032)	-0.010 (0.034)
Doing an important job	0.555	-0.038 (0.027)	-0.041 (0.025)	-0.175** (0.086)	-0.189** (0.089)
Working for one's own ethnic group	0.085	-0.022 (0.019)	-0.015 (0.017)	-0.018 (0.026)	-0.008 (0.026)
<i>Trust and social capital:</i>					
Member of at least one community group	0.730	-0.277*** (0.027)	-0.245*** (0.030)	-0.480*** (0.109)	-0.460*** (0.108)
Most people can be trusted	0.118	-0.061*** (0.010)	-0.056*** (0.011)	-0.095*** (0.022)	-0.095*** (0.024)
Feels members of own tribe can be trusted	0.539	-0.046** (0.022)	-0.020 (0.026)	-0.105* (0.057)	-0.078 (0.063)
Feels members of other tribes can be trusted	0.254	-0.065*** (0.021)	-0.058** (0.023)	-0.129** (0.051)	-0.134** (0.057)

Robust standard errors clustered by survey month in all specifications. Columns 1 and 2 replicate the specifications presented in Columns 1 and 2 of Table 2, while Columns 3 and 4 replicate the specifications presented in Columns 1 and 2 of Table 6. In Columns 3 and 4, we instrument for being surveyed after the post-election crisis with the indicator for being randomly assigned to the second wave of surveying. Columns 2 and 4 include controls for gender, age, education level, and marital status (at the time of the survey). Outcome variables are listed. Outcome variables are listed in the leftmost. ANY OFF-FARM INCOME-GENERATING ACTIVITY is an indicator for reporting either self-employment or paid work for others. TOTAL OFF-FARM LABOR INCOME is income from self-employment and paid work for others over the month prior to the survey, conditional on reporting any off-farm IGA. BELIEF ABOUT AVERAGE INCOME FROM PAID WORK is the average of a respondent's answer to four questions that elicit beliefs about the average income of those with either a primary school or secondary school education living in either Nairobi or Busia, Kenya. EARNING A HIGH INCOME, JOB SECURITY, PROXIMITY TO FRIENDS, RELATIVES, WORKING WITH PEOPLE ONE LIKES, DOING AN IMPORTANT JOB, are WORKING FOR ONE'S OWN ETHNIC GROUP are indicators for choosing specific individual job attributes (from a menu of those six options) as the most important considerations when looking for work. MOST PEOPLE CAN BE TRUSTED is an indicator for choosing the former option in response to the the World Values Survey question "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?"

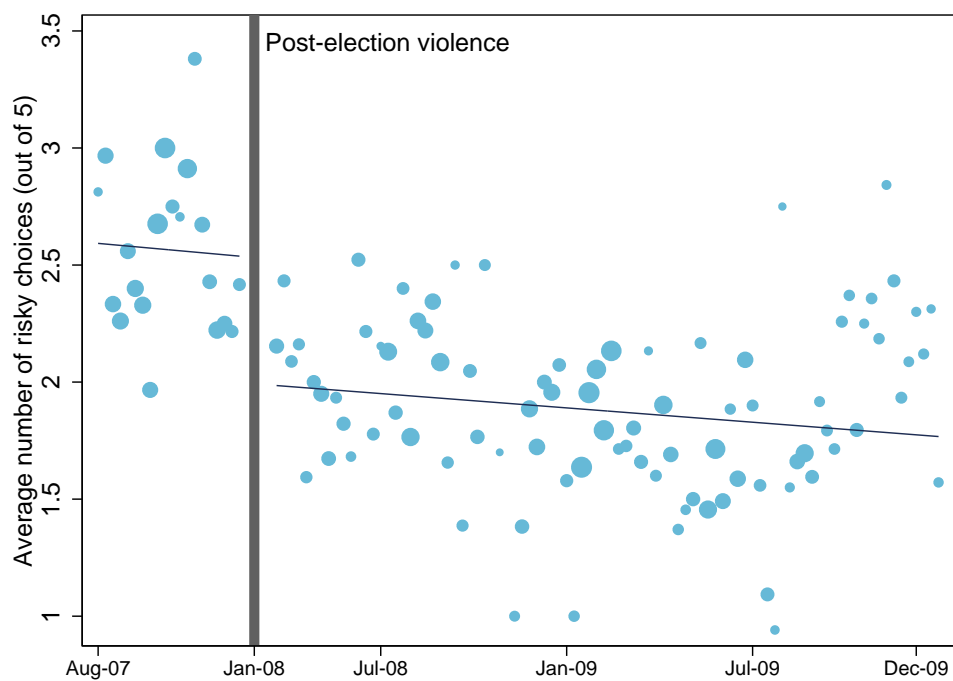


Figure 1: Histogram of Patterns of Responses to Lottery Choice Questions



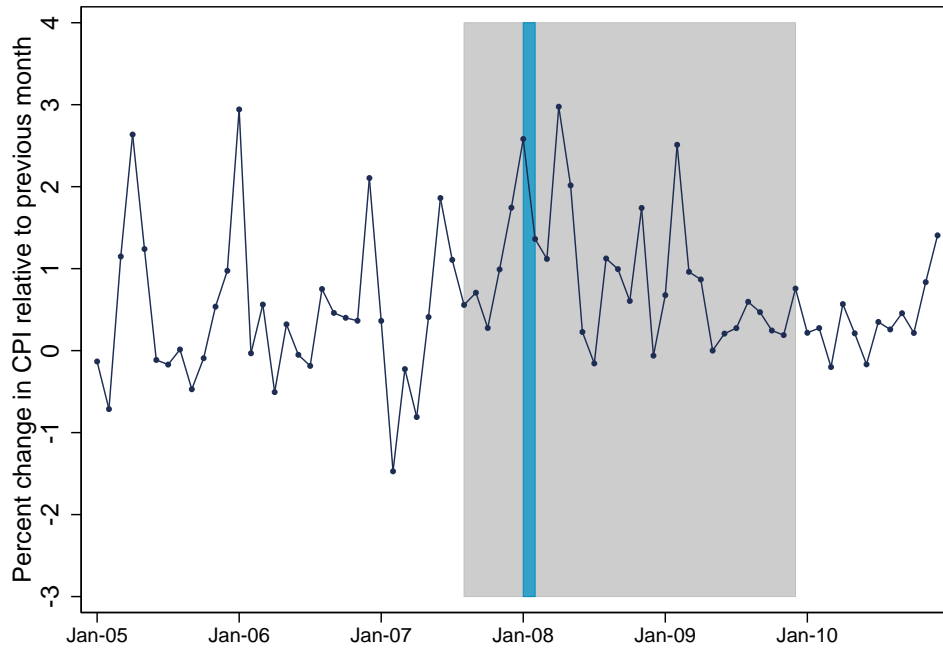
Dark bars show the proportion of subjects falling into each risk preference category. Lighter bars show the proportion that would fall into each category if subjects choose lotteries at random (i.e. if each lottery alternative were equally likely to be chosen in each decision problem). A pattern of choices is classified as RISK LOVING if the respondent always chose the highest variance lottery. A pattern of choices is classified as RISK NEUTRAL if the respondent always chose the highest expected value lottery; such choices are distinguished from risk loving behavior because risk neutral subjects are those who chose the lottery with, respectively, low and high payoffs 70 and 160 Kenyan shillings over the lottery with low and high payoffs 10 and 200 Kenyan shillings. A pattern of choices is classified as being consistent with MODERATE RISK AVERSION if a respondent consistently chooses the lottery alternative that would maximize expected utility for an intermediate CRRA coefficient. A pattern of choices is classified as being consistent with MOST RISK AVERSE if the respondent always chooses the lowest variance, lowest expected value lottery. A pattern of choices is classified as being INCONSISTENT if it is not consistent with a CRRA utility representation.

Figure 2: Measured Risk Preferences Before and After Kenya's Post-Election Violence



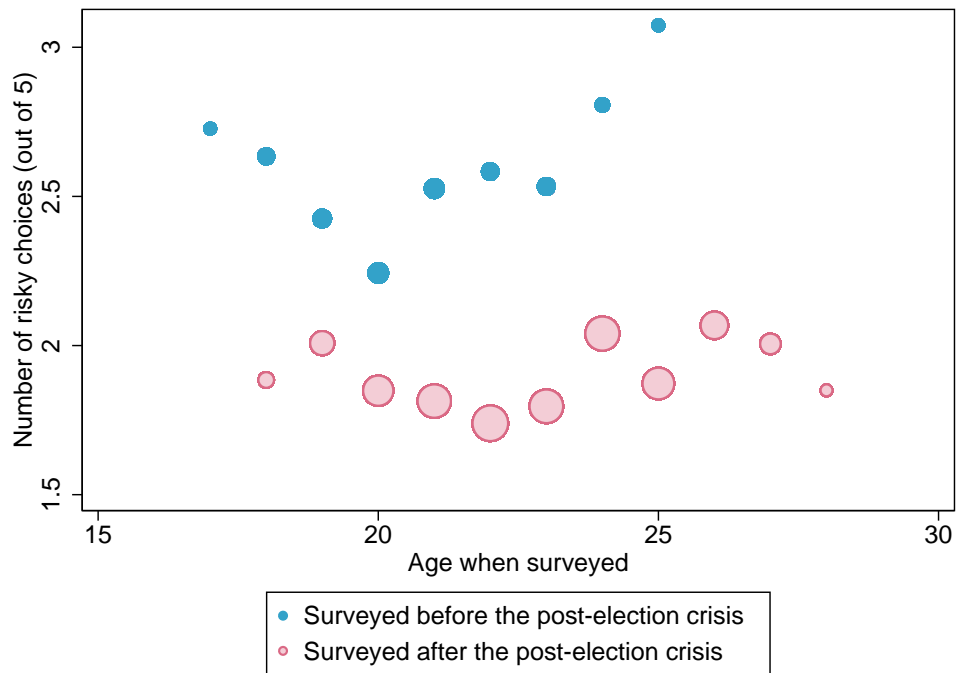
Gray circles indicate the average number of risky (i.e. highest variance, highest expected value) choices (out of five) by respondents surveyed in a given week, weighted by the number of surveys conducted during the week. Lines are linear regressions of the number of risk choices on the survey week, counting from the first week in which surveys were conducted.

Figure 3: Percent Changes in the Consumer Price Index — 2005–2010



The figure plots the percent change in the Consumer Price Index relative to the previous month. Data were downloaded from the website of the Kenya National Bureau of Statistics ([http://www.knbs.or.ke/index.php?option=com\\_phocadownload&view=category&download=14:quarterly-cpi&id=8:consumer-price-indices-cpi&Itemid=562](http://www.knbs.or.ke/index.php?option=com_phocadownload&view=category&download=14:quarterly-cpi&id=8:consumer-price-indices-cpi&Itemid=562)). The gray area indicates the period of the Kenyan Life Panel Survey; the darker blue area indicates the period of the post-election crisis.

Figure 4: Risk Preferences by Age when Surveyed — Before vs. After the Crisis



Blue circles indicate the average number of risky (i.e. highest variance, highest expected value) choices (out of five) among respondents of each age (in years) who were surveyed prior to the post-election crisis, weighted by the number of surveys in that cell. Red circles indicate the average number of risky choices among respondents of each age (in years) who were surveyed after to the post-election crisis, weighted by the number of surveys in that cell.

## A Online Appendix: not for print publication

Table A1: Decision Problems Embedded in Kenyan Life Panel Survey 2

	Option A		Option B		Option C	
	Heads	Tails	Heads	Tails	Heads	Tails
Practice Decision Problem 1	100	100	150	150	-	-
Practice Decision Problem 2	100	150	200	250	-	-
Decision Problem 1	100	100	100	120	-	-
Decision Problem 2	100	100	0	400	-	-
Decision Problem 3	30	340	100	100	0	400
Decision Problem 4	100	100	55	240	30	340
Decision Problem 5	30	230	60	170	90	110
Decision Problem 6	10	200	70	160	90	110

All payouts in Kenyan shillings.

Table A2: Balance Check — KLPS2 Wave 1 vs. Wave 2 Comparison

Variable	WAVE 1	WAVE 2	DIFFERENCE
Female	0.49 (0.01)	0.49 (0.01)	0.00 (0.01)
Age in 2007	21.13 (0.05)	21.21 (0.05)	0.09 (0.07)
Born in Busia District	0.88 (0.01)	0.88 (0.01)	-0.00 (0.01)
Luhya ethnic group	0.96 (0.00)	0.95 (0.00)	-0.00 (0.01)
Highest grade completed by 2006	8.56 (0.04)	8.48 (0.04)	-0.08 (0.06)
Married by 2006	0.31 (0.01)	0.30 (0.01)	-0.01 (0.01)
Number of observations	2469	2580	

Standard errors in parentheses.

Table A3: The Impact of the Post-Election Crisis on the Likelihood of Choosing the Safest Alternative

<i>Dependent Variable:</i>	— SAFEST CHOICE ON DECISION NUMBER... —				
	2 (1)	3 (2)	4 (3)	5 (4)	6 (5)
Surveyed after post-election violence	0.114*** (0.027)	0.114*** (0.027)	0.11*** (0.029)	0.204*** (0.015)	0.18*** (0.027)
Observations	5049	5049	5049	5049	5049
$R^2$	0.015	0.017	0.019	0.037	0.033

Robust standard errors clustered at the month level in all specifications. All specifications include controls for gender, age, education level, and marital status (at the time of the survey). Thus, the specifications in this table mirror those in Column 2 of Table 2. The outcome in each case is an indicator variable for taking the safest (lowest variance, lowest expected value) lottery in a given decision.

Table A4: OLS Regressions of the Impact of the Post-Election Crisis — Controlling for Inflation and Time Trends

<i>Specification:</i>	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)	OLS (7)	OLS (8)
Surveyed after post-election violence	-0.683*** (0.116)	-0.681*** (0.11)	-0.798*** (0.118)	-0.792*** (0.121)	-0.561*** (0.084)	-0.571*** (0.093)	-0.735*** (0.086)	-0.739*** (0.101)
Demographic controls	No	Yes	No	Yes	No	Yes	No	Yes
Interviewer controls	No	No	Yes	Yes	No	No	Yes	Yes
Month controls	No	No	No	No	Yes	Yes	Yes	Yes
Observations	5049	5049	5047	5047	5049	5049	5047	5047
$R^2$	0.023	0.029	0.151	0.155	0.028	0.032	0.153	0.158

Robust standard errors clustered at the month level in all specifications. Outcome variable is the number of times a respondent chose the riskiest (i.e. highest variance, highest expected value) lottery (out of five). Even-numbered columns include controls for gender, age, education level, and marital status (at the time of the survey).

A3

Table A5: Ordered Logit Regressions of the Impact of the Post-Election Crisis — Controlling for Inflation

<i>Specification:</i>	ORDERED LOGIT (1)	ORDERED LOGIT (2)	ORDERED LOGIT (3)	ORDERED LOGIT (4)	ORDERED LOGIT (5)	ORDERED LOGIT (6)	ORDERED LOGIT (7)	ORDERED LOGIT (8)
Surveyed after post-election violence	-0.641*** (0.104)	-0.635*** (0.099)	-0.787*** (0.12)	-0.773*** (0.123)	-0.54*** (0.088)	-0.544*** (0.103)	-0.749*** (0.098)	-0.749*** (0.117)
Demographic controls	No	Yes	No	Yes	No	Yes	No	Yes
Interviewer controls	No	No	Yes	Yes	No	No	Yes	Yes
Month controls	No	No	No	No	Yes	Yes	Yes	Yes
Observations	5049	5049	5047	5047	5049	5049	5047	5047
Pseudo $R^2$	0.007	0.009	0.045	0.047	0.008	0.011	0.046	0.048

Robust standard errors clustered at the month level in all specifications. Outcome variable is the number of times a respondent chose the riskiest (i.e. highest variance, highest expected value) lottery (out of five). Even-numbered columns include controls for gender, age, education level, and marital status (at the time of the survey).

Table A6: Regressions of the Impact of the Post-Election Crisis — Controlling for Inflation

<i>Specification:</i>	OLS (1)	OLS (2)	OLS (3)	OLS (4)	ORDERED LOGIT (5)	ORDERED LOGIT (6)	ORDERED LOGIT (7)	ORDERED LOGIT (8)
Surveyed after post-election violence	-0.607*** (0.184)	-0.681*** (0.11)	-0.359** (0.164)	-0.792*** (0.121)	-0.531*** (0.173)	-0.516*** (0.136)	-0.297* (0.171)	-0.273** (0.122)
Demographic controls	No	Yes	No	Yes	No	Yes	No	Yes
Interviewer controls	No	No	Yes	Yes	No	No	Yes	Yes
Linear time trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5049	5049	5047	5047	5049	5049	5047	5047
$R^2$	0.024	0.029	0.162	0.155	.	.	.	.
Pseudo $R^2$	.	.	.	.	0.007	0.01	0.05	0.053

Robust standard errors clustered at the month level in all specifications. Outcome variable is the number of times a respondent chose the riskiest (i.e. highest variance, highest expected value) lottery (out of five). Even-numbered columns include controls for gender, age, education level, and marital status (at the time of the survey).



Table A7: IV Regressions of the Impact of the Post-Election Crisis — Controlling for Inflation

<i>Specification:</i>	IV (1)	IV (2)	IV (3)	IV (4)	IV (5)
<i>Panel A. Dependent variable: number of risky (highest variance) choices (out of 5)</i>					
Surveyed after post-election violence	-0.986*** (0.2)	-1.054*** (0.221)	-1.763*** (0.492)	-1.072*** (0.224)	-1.784*** (0.48)
<i>Panel B. Dependent variable: risk neutral or risk loving</i>					
Surveyed after post-election violence	-0.065** (0.029)	-0.084** (0.033)	-0.088** (0.041)	-0.115*** (0.033)	-0.129*** (0.048)
<i>Panel C. Dependent variable: most risk averse</i>					
Surveyed after post-election violence	0.211*** (0.062)	0.215*** (0.065)	0.328*** (0.125)	0.201*** (0.059)	0.297*** (0.09)
First stage F-stat	9.66	9.27	7.97	18.07	15.53
Demographic controls	No	Yes	Yes	Yes	Yes
Interviewer controls	No	No	Yes	No	Yes
Month controls	No	No	No	Yes	Yes
Observations	5049	5049	5047	5049	5047

Robust standard errors clustered by survey month in all specifications. All specifications estimated via two-stage least squares. All specifications include controls for gender, age, education level, and marital status (at the time of the survey). The outcome variable in Panel A is the number of times a respondent chose the riskiest lottery (out of five). The outcome variable in Panel B is an indicator for making risk neutral or risk loving choices (always choosing the highest variance, highest expected value lottery). The outcome variable in Panel C is an indicator for always choosing the lowest variance, lowest expected value lottery.

Figure A1: Histograms of Individual Choices in Each Decision Problem

