

Post-Electoral Violence, Household Optimism, and Fertility Choice in Kenya

Alice Huang

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Abstract

I study the impact of the post-electoral violence on fertility outcomes in the context of Kenya's 2007 and 2013 presidential elections. I find that the experience of violence led to short- and medium-run reductions in the likelihood of giving birth and total household fertility. Furthermore, these negative effects were concentrated among younger females, which indicates that post-electoral violence affects fertility primarily through postponements of first or earlier births. I further explore the role of household optimism in mediating the relationship between conflict and fertility: using a 23-year panel, I find that individual-level changes in societal views is associated with similar directional changes in short-run fertility. Particularly in the case of cyclical elections, household fertility outcomes are not only affected in the short-run through singular experiences of violence, but also in the medium-run through expectations of future violence, which leads to persistent reductions on fertility.

1 Introduction

The impact of political violence and election cycles on households' fertility decisions is of interest, particularly considering the high levels of political violence around the world. Post-electoral violence often reflects unstable regimes and deep factionalism within the country, and in the aftermath, groups experiencing violence may develop pessimistic views on the direction of the nation's economy and governance as well as the likelihood of repeated violence in future elections. The initial experience of violence, accompanied by fears of future violence in subsequent elections may have consequences for households' fertility decisions in both the short- and medium-run.

Fertility is often a consequential, irreversible decision and affects households' ensuing earnings and consumption choices, housing investments, and parental inputs. It also requires longer-term planning on part of households, and families that decide to conceive (and when to conceive) tend to hold more positive views of the short-term future. For instance, Orsal and Goldstein (2010) using OECD data finds that fertility tends to be pro-cyclical: good economic times are in general associated with higher birth rates. Conversely, Currie and Schwandt (2014) find that short-run fertility declines during periods of high unemployment. Past research suggests that in good economic times, households choose to give birth despite higher opportunity costs of forgone female labor, which suggests that households may respond to optimism of the future over and above rising economic costs.

This paper explores the impact of post-electoral violence on fertility choice in Kenya, mediated through changing household optimism about their country's economic and political future. I use the surprise post-electoral violence of the 2007 Kenyan Presidential Election to estimate the effects of violence on households' immediate decisions to have children. Furthermore, I explore fertility behavior leading up to the 2013 Presidential Election. I hypothesize that households with larger experiences of post-electoral violence in 2007-8, and therefore more negative expectations of repeated violence, are less likely to have children around the time of the subsequent election.

I find that an additional day of post-electoral violence reduces the likelihood of giving birth in 2009, with statistically significant results when pooling across all quarters in 2009 (reductions of 4.8% relative to the control mean). Post-electoral violence exposure in 2007-8 is also associated with decreases in the likelihood of giving birth in Q4 2012, the quarter immediately preceding the 2013 election. Experience of post-electoral violence may also have persistent effects on fertility: females with more prolonged experiences of violence were not only less likely to give birth between the two election, but also had fewer total children as of 2014, 7 years following the 2007 election.

This paper relates primarily to the literature on how short-term expectations affect fertility decisions. Past studies have documented the responsiveness of fertility to households' sentiments of the immediate future. For instance, Dahl et al. (2021) using the context of the 2016 U.S. Presidential Election and surprise changes in outlook among Republican or Democratic households finds that Republican counties experienced sharp and persistent increases in fertility while Democratic counties experienced the opposite. Vignoli et al. (2020) also finds that individuals with labor market uncertainties are more likely to postpone first births. Moreover, fertility is forward looking. Buckles et al. (2021) finds that the growth rate for aggregate conceptions in the U.S. declines several quarters before economic declines. Fertility also often tracks with macroeconomic indicators such as the consumer confidence and durables purchases (Buckles et al. 2021).

Main contributions of this paper include providing evidence of the effects of post-electoral violence and armed conflict on fertility. The existing empirical literature on the direction of this relationship has yielded mixed results (Thiede 2020). Violence may change patterns of marriage and co-residence, households' relative risks and costs of childbearing, child survival, and incidence of sexual violence, which results in a conceptually ambiguous relationship between conflict and fertility. In my setting, I find that more severe experiences of post-electoral violence are associated with statistically significant reductions in fertility.

I also document the anticipatory effects of fertility leading up to the 2013 presidential election. Consistent with the belief that fertility is forward looking, I find that households incorporate expectations of violence and uncertainty about the short-term future in deciding whether (and when) to have children.

Finally, I posit that households' optimism of their country's economic and political future mediates their fertility decisions. Despite the terrors of the 2007-8 post-electoral violence, the majority of Kenyan households did not experience the violence directly. Thus, it is likely that the *fear* of violence, rather than direct experience of violence, negatively affected fertility decisions. In other words, households that were more proximate to the violence may develop more negative short-term expectations about the economy or government (e.g., increased likelihood of a government coup). Furthermore, given that households experiencing violence in the initial election decreased their fertility prior to the subsequent election, before any actual experience of repeated violence, it is likely that households' perception of the future affected their contemporaneous fertility decisions. I provide further evidence of this relationship using a Kenyan panel dataset: respondents with negative views of the short-term economic outlook were 3.0 percent less likely to give birth over that same period (p-value < 0.01).

This paper proceeds as follows: Section 2 describes the empirical setting and provides

graphical evidence. Section 3 provides a description of the data sources. The empirical strategy is detailed in Section 4. Section 5 presents the major findings, and Section 6 concludes.

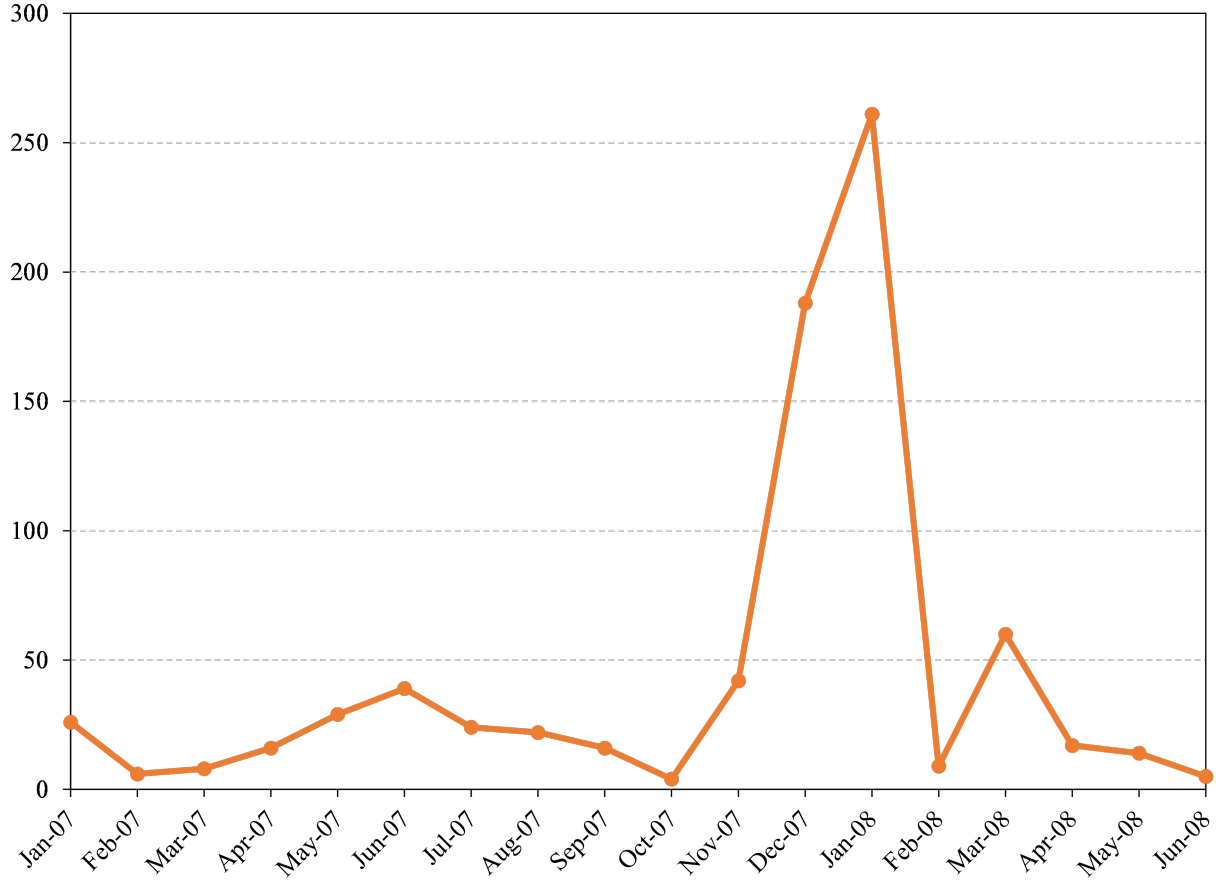
2 Setting

My empirical setting is Kenya, which has held presidential elections approximately every five years since the inception of multiparty politics in 1992. Following the December 27, 2007 election, Kenya experienced unprecedented and unexpected post-election violence. Despite the challenger, Raila Odinga, leading comfortably in exit polls, on December 29, Kenya’s Electoral Commission declared President Mwai Kibaki the winner by a margin of 2% (Ksoll et al. 2021). Immediately and in the ensuing weeks, targeted ethnic violence erupted throughout the country in response to the government’s perceived rigging of the election. Figure 1 shows large surges of violence in December 2007 and January 2008, well above previous levels. Sporadic violence continued until Odinga and Kibaki reached a power-sharing agreement on February 29, 2008 in which Kibaki was named president and Odinga was named prime minister. By the end of the violence, approximately 1,200 Kenyans had died and over 350,000 had been internally displaced due to the violence (CSIS 2009).

Ethnic polarization also played a role in the post-electoral conflict. Kibaki and Odinga are from the Kikuyu and Luo tribes, respectively, two of Kenya’s main ethnic communities. In the 2007 post-election violence, initial violence in ethnically-mixed areas was soon exacerbated by fighting between ethnic groups (e.g., Kikuyu against Luo, Kalenjin against Kikuyu) (Lafargue 2008). Lafargue (2008) states: "Initially ethnically motivated violence gave way to blind destruction [and] a distinct desire to spread terror by choosing soft targets (e.g., pregnant women, children, newly-born babies, and the disabled)". In other words, the experience of post-electoral violence is heightened for Kenyans living in ethnically-diverse communities.

The new coalition government in Kenya meant an increase in uncertainty around future election proceedings. In response to the post-electoral violence, Kenya adopted a new constitution in August 2010, which established the dates of subsequent elections (every five years in August) and put greater checks on presidential power (Reuters 2010). Previously, the president had the power to dissolve parliament, after which the electoral body was able to set the date of the subsequent election. Under the new coalition government however, the president and the prime minister had to agree to dissolve the coalition (CNN 2012). Kibaki and Odinga ultimately did reach an agreement on the dissolution, so the Kenyan high court ruled to hold the election within 60 days of the end of the current parliamentary session. In March 2012, Kenya’s electoral body announced that the general election would be held on

Figure 1: Count of Violent Events in Kenya



Source: ACLED

March 4 of the following year (CNN 2012).

Prior to the March 4, 2013 election, fears of repeated violence were palpable. In spite of the 2010 Constitutional Referendum, which had occurred peaceably, "the underlying causes of past election-related violence remain in place, and in some parts of the country, the tensions have escalated" (HRW, 2013). In the end, the fears of post-electoral violence did not pan out, and Kenya had a relatively peaceful election in 2013 (Brookings 2013).

Despite the widespread nature of post-electoral violence in 2007-8, I posit that household fertility responded primarily to the *fear* of imminent violence, as opposed to direct experience of violence. In contrast to other forms of widespread armed conflict (e.g., the Rwandan Genocide), the majority of Kenyans did not have any direct experiences of violence. Jakiela and Ozier (2015) also finds that among the KLPS study participants in Western Kenya, only 4 percent were direct victims of the unrest. In addition, exploiting the timing of KLPS-2 data collection, which was interrupted mid-way by the 2007 presidential election, Jakiela and

Ozier (2015) finds that in the aftermath of the post-electoral violence, respondents became on average more risk adverse. Thus, the impact of post-electoral violence on fertility is likely mediated through household optimism. In other words, households with more direct or prolonged experiences of post-electoral conflict were more likely to develop negative societal views, which subsequently influenced their fertility outcomes.

2.1 Graphical Evidence

I present graphical evidence of fertility changes around the time of the 2007 and 2013 Kenyan Presidential Elections. Figure 2 shows the percent change in aggregate conception, by quarter. The percent change is calculated relative to the same quarter in the previous year to account for seasonal fluctuations. Conception is defined as twelve months prior to birth. This definition follows the approach of Becker (1960), which brings forward births by one year to account for the time it takes to produce a pregnancy (i.e., 3 months) and capture the event contemporaneous to the time of conception. Becker (1960) studies U.S. births from 1920 to 1957, a period that coincided with the onset of the modern birth-control movement. In a 1978 survey of ever-married white women born between 1901 and 1910, only 71% reported having ever used contraception (CDC 1999). Similarly in Kenya, conception use is increasing but remains low. Kamuyango (2020) finds that from 1989 to 2014, contraceptive use in Kenya increased by 77.5% from 24.0% to 42.6%. Given similar patterns of contraceptive use in 2010's Kenya and early-1900's U.S., I maintain Becker (1960)'s assumption that the fertility production time for my Kenyan sample is approximately one year.

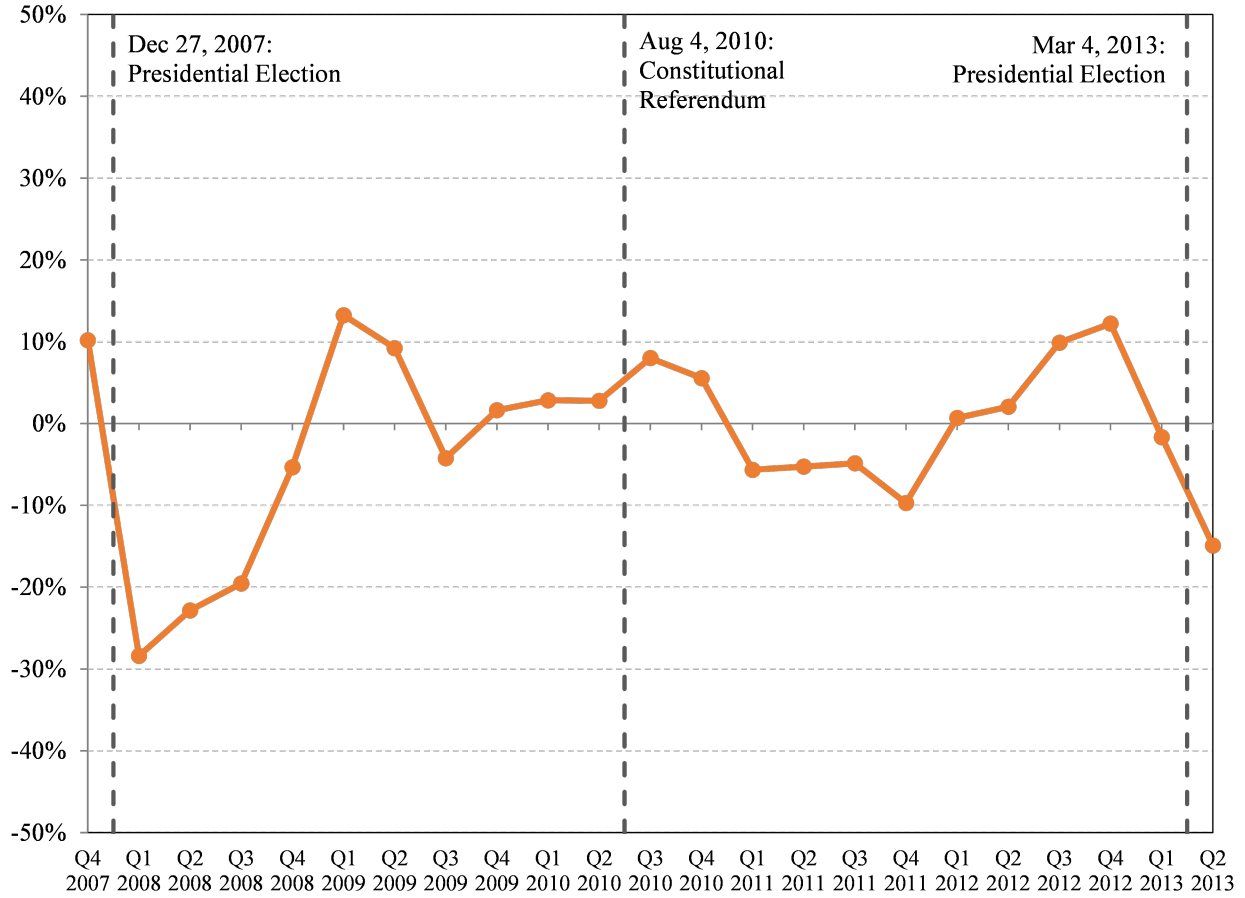
From Figure 2, I note that the annual growth rate of conceptions decreased sharply in Q1 2008 and continued to remain negative through Q1 2009. The annual growth rate was also negative from early 2011 to mid 2012 and decreases again in Q4 2012, the quarter immediately preceding the 2013 March presidential election.

3 Data

3.1 Data Sources

My primary data is from the 2014 Kenya Demographic and Health Surveys (KDHS), which I use to construct fertility histories for a nationally representative sample of 31,079 Kenyan women between the ages of 15-49 as of 2014. Data collection occurred between May 2014 and October 2014, which means I observe complete fertility histories through Q1 2004. The mean age of the sample as of December 2007 is 22.8 years, and the mean age of first birth is 20.0 years. The KDHS data are also geocoded by community clusters, although urban

Figure 2: Percent Change in Conceptions



Source: KDHS

clusters are displaced up to 2 kilometers and rural clusters are displaced up to 5 kilometers, with approximately 10% of rural clusters displaced up to 10 kilometers.

For post-electoral violence, I use data from the Armed Conflict and Event Data Project (ACLED), which includes geocoded locations of all instances of violence (e.g., protests, riots, strategic developments, battles, violence against civilians) in Kenya between December 27, 2007 and January 31, 2008 ($N = 386$) from various international and national news sources. Most of the violent events during this period were categorized as Riots (179), followed by Violence Against Civilians (112). Finally, I use data from the Central Bureau of Statistics (1994) to assess whether individuals belonged to a minority ethnic group in their province of residence. See Appendix 1 for the dominant ethnic groups in Kenya by province prior to the 2007 election.

A shortcoming of using the KDHS, which is a cross-sectional dataset, is that I am unable to capture the violence exposure for respondents who relocated after 2008. However, survey

evidence from Miguel and Gugerty (2005) suggests that land sales are extremely rare in Busia County. Furthermore, ethnic residence patterns across Kenya have remained stable over the past century (Miguel and Gugerty 2005). However, to the extent that individuals' likelihood of migration is positively correlated with socioeconomic factors that lead to lower fertility, inclusion of migrants would tend to bias the effect of conflict upwards. Conversely, assuming that individuals' likelihood of migration is positively correlated with experience of violence (i.e., households tend to migrate from high-violence to low-violence regions), inclusion of migrants would tend to bias the effect of conflict downwards.

A further limitation is that KDHS only includes data on live births (e.g., no data on miscarriages, stillbirths, aborted births). Thus, to the extent that post-electoral violence affects the incidence of miscarriages or stillbirths differentially depending on the experience of violence, lack of the full conception histories could bias the results.

A final dataset I use is the Kenya Life Panel Survey (KLPS), a 23-year panel with an underlying experimental intervention in deworming, to provide supplementary evidence of the link between fertility and household optimism. The KLPS was launched in 2003 to track a representative sample of approximately 7500 students in Busia county, Western Kenya enrolled in grades 2-7 as of 1998. At present, there have been four rounds of KLPS data collection, with a high overall tracking rate of 86.5%.¹ Each round of KLPS data collection has included information on individuals' views on society as well as information on fertility and child health.

3.2 Descriptive Statistics

Table 1 presents the summary statistics for my sample of interest. The females in my sample were born between 1964 and 1999, with the average age of approximately 29.4 years old. As of December 2007, the average female had approximately 1.8 children, although this figure is less for the group that experienced violence (1.5 versus 2.0 children). Finally, about 31.8 percent of my sample reside in areas that experienced violence, with an average exposure of about 1.9 days.

See Appendix Table 2 for summary statistics on KLPS societal views. In general, I observe that the mean for the response variables increases over successive survey rounds, which indicates that individuals on average developed less optimistic views over time.

¹Timeline of data collection: KLPS-1 (2003-7), KLPS-2 (2007-9), KLPS-3 (2011-14), KLPS-4 (2017-21).

Table 1: Descriptive Statistics across Violence vs Non-Violence

	Violence	Non-Violence
Age	29.181 (9.056)	30.833 (9.552)
Birth year	1984.888 (9.056)	1983.277 (9.548)
Age became sexually active	17.272 (3.272)	16.950 (2.738)
Age at first birth	20.164 (3.761)	20.057 (3.342)
Children as of December 2007	1.538 (2.064)	2.007 (2.352)
Duration of violence (days)	1.9116 (1.782)	N/A N/A
Num. Observations	9754	20912

Note: Data are from KDHS 2014. Violence exposure is defined as an indicator variable for whether the respondent experienced a violent event within a 10 kilometer radius.

4 Empirical Strategy

My empirical strategy uses the cross-sectional and temporal variation in the occurrence of violent events to measure the effects of violence exposure on fertility outcomes. My main measure for post-electoral violence also incorporates the duration of exposure, which allows for the intensity of violence exposure to vary across regions. Using a differences-in-differences specification, I assess whether the experience of post-electoral violence affected the likelihood of giving birth in the short- and medium-run and total household fertility.

I use the following equation:

$$Y_{i,c,p,t} = \alpha + \beta \text{Violence}_{i,p,t} + \gamma X_i + \mu_p + \mu_c + \epsilon_{i,c,p,t} \quad (1)$$

where $Y_{i,c,p,t}$ refers to whether female i , born in cohort c , residing in province p gives birth in time t . The outcomes of interest include whether the female respondent gave birth in a particular quarter and total household fertility. I assume that each pregnancy was conceived 12-months prior to the birth date, to account for the time it takes to produce a pregnancy as well as the duration of the pregnancy. Therefore, the events that occurred one-year prior to birth are assumed to be contemporaneous with the time of conception (Becker 1960). In other words, births occurring in Q1 2009 is the same as conceptions occurring in Q1 2008. All regressions control for ethnic and religious identities, marital status, educational attainment,

urban-rural residence, number of children as of December 2007 as well as birth cohort and county fixed effects. Standard errors are clustered at the county level.

My coefficient of interest is β . I measure exposure to violence in two primary ways: (i) the number of days between December 27, 2007 and January 31, 2008 an individual was exposed to a violent incident within a 10 kilometer radius (hereafter, *Duration of Exposure*), and (ii) an interaction between the *Duration of Exposure* and an indicator for whether the individual belonged to a minority ethnic group (e.g., at the time of the election, the individual was not residing in her ethnic homelands). The second measure captures differential experiences of violence based on whether an individual belonged to a minority ethnic group. Since the post-electoral violence often involved inter-ethnic conflicts, I hypothesize that the fear of violence is more acute when an individual belongs to a minority ethnic group.

Alternative measures of violence exposure should also be considered. Previous studies using ACLED data have operationalized violence as the exposure to a violence event within a 10 kilometer radius of women’s communities, an indicator variable (Williams et al. 2012). Violence exposure should also take into account population density and potential diffusion effects. For instance, a violent incident within 10 kilometers of an urban versus rural area will have different consequences on residents’ experiences or fear of violence. Arguably, residents in less-densely populated areas will have greater fear of imminent violence than residents in higher-densely populated areas, all else equal. Finally, since the threshold for violence exposure (i.e., 10 kilometers) is somewhat arbitrarily determined, I also conduct sensitivity checks using varying distance thresholds (See Appendix Tables 1 and 2 for results using 100 kilometers as the threshold for violence exposure.)

4.1 Household Optimism and Fertility

I also use regressions with individual fixed effects to estimate the impact of household optimism on fertility outcomes. The KLPS captures individuals’ views on society at multiple points in her life: “*Compared to the economy (government) now, the economy (government) in two years will be...*”, where respondents have the option to respond “*Better*”, “*Worse*”, or “*Same*”. I also observe full fertility histories up until the survey date (i.e., as of each survey, respondents are asked to list all their children, including birth dates).

I estimate a fixed effects model using the following linear specification:

$$Y_{i,t} = \alpha + \beta \text{Optimism}_{i,t} + \gamma X_{i,t} + \delta_i + \epsilon_{i,t} \quad (2)$$

where $Y_{i,t}$ refers to whether individual i gives birth in the two years following survey round t . The outcome of interest is whether the individual gave birth in the subsequent

two years, the same period over which we measure household optimism. $Optimism_{i,t}$ is a categorical variable that takes on values for 1 = “*Better*”, 2 = “*Same*”, and 3 = “*Worse*”. “*Better*” is the excluded category. $X_{i,t}$, which refer to individual time-varying controls, include age and marital status. Finally, δ_i corresponds to unobserved individual effects that are not time-varying. Standard errors are clustered at the individual level.

The main advantage of using a fixed effects specification is that I am able to control for time-invariant, individual-level differences, including those unobserved individual-level characteristics that affect societal attitudes and perceptions on the economy and government. This approach also allows me to assess whether fertility outcomes are associated with individual-level changes in societal attitudes, which is exactly my question of interest (e.g., whether changing a response from *Better* to *Worse* over successive survey rounds is associated with declining fertility). It should be noted that I am unable to capture the *why* behind the responses; I am unable to observe why respondents become more optimistic or pessimistic with regards to their societal views. However, taking the *why* for granted, I am able to observe the impact of societal views on subsequent fertility outcomes.

In order to interpret β as a causal effect, I need to address three fundamental causal assumptions: (i) classic unobserved heterogeneity, (ii) reverse causality, and (iii) lagged treatments (Hill et al. 2019). With regards to the first assumption, I attempt to control for possible time-varying confounders through inclusion of age and marital status. Since I study the impacts of survey response on future fertility outcomes, it is unlikely that my results suffer from reverse causality. Finally, since my explanatory variable assesses respondents’ short-term societal views (i.e., within the next two years), it is unlikely that these short-term views affect medium-term birth outcomes.

An issue with the KLPS is external validity. The KLPS is not a nationally-representative sample, but rather drawn from students attending rural primary school in Busia District in 1998. The high tracking rates across survey rounds implies that the sample has remained largely representative of the original study population. However, despite not being nationally-representative, the KLPS sample appears to be representative of other Sub-Saharan African settings on the basis of schooling attainment and income levels (Kenya Population and Housing Census, 2009; World Bank, 2010).

5 Results

In this section, I quantify the effects of violence on fertility outcomes. As discussed earlier, I use two measures of violence: (i) *Duration of Violence* and (ii) *Duration of Violence* interacted with Ethnic Minority status. Table 2 shows the effects of violence exposure on

likelihood of births in 2009. I show birth outcomes in 2009 to account for the time it takes to produce a pregnancy and carry a baby to term (12 months in total). In other words, I assume that for a baby born in Q1 2009, the events contemporaneous to his conception occurred in Q1 2008. I find that violence exposure decreased the likelihood of births across all quarters in 2009, although the results are only statistically significant for Q4. Table 2-Columns 9 shows that exposure to one additional day of post-electoral violence exposure reduces the likelihood of births in Q4 2009 by 1.7 births per 1000 females (p-value < 0.1). These result represents a 5.3% decline in births relative to the control mean. When pooling across all quarters in 2009 (see Column 1), I find that one additional day of post-electoral violence reduces the likelihood of births in 2009 by 6.4 births per 1000 females (p-value < 0.01), a reduction of 4.8% relative to the control mean. For all quarters in 2009, ethnic minorities were not differentially affected.

Table 3 shows the results for violence exposure on likelihood of births in 2012, in anticipation of the March 2013 presidential election. In general, I find limited evidence of anticipatory effects: post-electoral violence exposure in 2007-8 is not associated with statistically significant differences in likelihood of births in 2012. However, it is interesting that the point estimate for Q4 2012, the quarter immediately preceding the 2013 election, is negative and exceeds that for the previous quarters (see Table 3-Column 9). A reduction of 2.2 births per 1000 females in Q4 2012 represents a 7.0% decrease relative to the control mean.

It should be noted that births in 2012 correspond to conceptions in 2011. In other words, a decrease in the births among the violence group in Q4 2012 suggests a decrease in conceptions in Q4 2011, relative to the no-violence group. A potential explanation for the noisy estimates is uncertainty around the timing of the 2013 general election. As previously mentioned, the 2010 constitution had established that the election was to be held in August 2012. However, when the president and prime minister failed to reach an agreement on the election date, with Odinga's political party in favor of establishing an earlier election date, the electoral body decided that the election would be held in March 2013. Given the general uncertainty, an analysis of anticipatory effects would require a more detailed analysis of the timeline of events leading up to the 2013 presidential election.

I also observe changes in total fertility between the two elections. Table 4 shows the effect of post-electoral violence on the likelihood of giving birth between January 2008 and February 2013 and total children. I find that an additional day of violence experience reduces the likelihood of giving birth between elections by 11.1 births per 1000 women (p-value < 0.001). Table 4-Columns 3 and 4 show that post-electoral violence is also associated with fewer total children, and an additional day of violence exposures lead to a 0.01 reduction in total children (p-value < 0.1), relative to a control mean of 2.8 children. Changes in total

household fertility suggest persistence in the effects of violence on fertility. In other words, there is limited evidence that households compensate for short-run declines in fertility over the medium- to long-run. Thus, births delayed could translate to births foregone, which may have significant implications on demographics and population structure.

I also conduct heterogeneity analysis by age of exposure. Table 5 shows the effects of post-electoral violence on the fertility outcomes of those who were younger than 25 as of December 2007 versus those who were 25 or older. Approximately 61.7 percent of my sample belong in the former category, and on average, younger and older females had 1.5 and 4.7 total children, respectively, as of survey collection. I find that the violence effects are primarily concentrated among the younger than 25 population: a one-day increase in the experience of post-electoral violence reduces the likelihood of giving birth between elections by 15.6 births per 1000 women ($p\text{-value} < 0.01$) and the number of total children by 0.0143 children ($p\text{-value} < 0.05$), relative to the control mean of 1.6 children. These results also suggest that post-electoral violence is more likely to delay first or earlier births as opposed to later births. In addition, similar to the pooled results above, I find no evidence that ethnic minorities were differentially impacted by the violence.

Taken together, these results suggest that females with more prolonged exposure to post-electoral violence were more likely to reduce their fertility, both in the short run (i.e., less likely to conceive in the 1-year period following the 2007 election) and in the medium run (i.e., between election periods). I also observe a persistence in reduced fertility, with potential long-term consequences. Even as of 2014 (when the DHS data were collected), household experiencing greater violence had fewer total children than the contrary. Finally, I find limited evidence of anticipatory effects, although the likelihood of giving birth does decrease among the violent group in the quarter immediately preceding the 2013 election.

Appendix Tables 3 and 4 show similar results: using a 100 kilometer threshold for violence exposure, I find lower point estimates but similar patterns in fertility. This suggests that even with a less sensitive measure for post-electoral violence, my general results hold.

5.1 Household Optimism and Fertility

In this section, I explore the relationship between household optimism and fertility. I posit that the effect of violence on fertility is mediated by households' views of the future. In other words, households with greater experiences of post-electoral violence are more likely to develop negative views of the immediate future and thus reduce their likelihood of giving birth.

Using KLPS data, I find that household optimism does have a statistically significant im-

impact on fertility (see Table 6). When asked their views on how the economy today compares to the economy in two years, households responding that the economy is two years will be worse were 3.0 percentage points less likely to give birth over the same period (p-value < 0.01), relative to households with optimistic views on the economy (i.e., households responding that the economy in two years will be better). Similarly, households responding that the government in two years will be worse than the government today were 1.7 percentage points less likely to give birth over the same period (p-value < 0.1), relative to households with optimistic views on the government). I also find that households with beliefs that the economy (government) will be the same in two years were slightly more likely to give birth in the short-run, although the results are not statistically significant. These results suggest a clear divergence in fertility patterns among optimistic and pessimistic households.

6 Conclusion

That household optimism affects fertility supports the finding that fertility is pro-cyclical: namely, fertility increases in good economic times. To some extent, this suggests that the positive effect of household optimism surpasses the negative effect of rising female labor opportunity costs, leading to a net positive effect on total fertility. Similarly, in bad economic times, household pessimism prevails.

The cyclical nature of Kenyan elections offers the ideal setting to study the impacts of household optimism on fertility. Despite the terrors of the post-electoral violence of 2007-8, the majority of Kenyans were not directly impacted. Thus, for the majority of Kenyans, the negative impact on fertility was mediated through *fear* of violence as opposed to actual experience of violence. Arguably, those with more proximate exposure to post-electoral violence were more likely to develop pessimistic views of the Kenyan economy and government. Furthermore, the five-year election cycle meant that Kenyan households could anticipate the timing of the subsequent election. Those with greater experiences of post-electoral violence in 2007-8 were more likely to expect repeated violence and thus change their fertility behaviors ahead of the 2013 general election.

Overall, I find limited evidence of anticipatory effects leading up to the 2013 election. However, a closer examination of the events leading up to the 2013 election suggests that this was an uncertain period. It is unclear what households knew, and when they knew, with regards to the timing of the subsequent election. Thus, it is difficult to assess whether households changed their fertility behavior based on anticipations of violence. An additional layer of complication is that periods of uncertainty are often associated with shorter birth terms (e.g., less than 37-week pregnancies), which makes it difficult to relate births to the

events contemporaneous to conception.

The Kenyan elections suggest that past events affect households perception of the future, both in the short-run and medium-run, in the case of cyclical events. Household sentiment matters, and the decision to have children may be the ultimate signal of household confidence in the short-term future. Furthermore, the results indicate that earlier experiences of post-electoral violence have the largest negative effects on fertility, which suggests that remedial policies to boost the confidence of younger households may be especially effective in promoting fertility.

Table 2: OLS of Violence Exposure on Likelihood of Birth

	2009									
	Pooled		Q1		Q2		Q3		Q4	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Duration of Violence	-0.0064*** (0.0020)	-0.0046* (0.0022)	-0.0015 (0.0009)	-0.0010 (0.0010)	-0.0019 (0.0014)	-0.0016 (0.0013)	-0.0013 (0.0011)	-0.0009 (0.0013)	-0.0017* (0.0010)	-0.0012 (0.0011)
Duration of Violence \times Minority		-0.0032 (0.0025)		-0.0011 (0.0012)		-0.0008 (0.0018)		-0.0003 (0.0015)		-0.0010 (0.0012)
Control Mean	0.1325	0.1313	0.0310	0.0302	0.0360	0.0357	0.0340	0.0339	0.0316	0.0307
Observations	30620	30620	30620	30620	30620	30620	30620	30620	30620	30620

Note: *p<0.1; **p<0.05; ***p<0.01. Data are from KDHS and ACLED. Standard errors clustered at the county level are shown in parentheses. The dependent variables include likelihood that a female gives births in quarter t . Control variables include ethnicity and religious identities, marital status, education level, urban-rural residence status, children as of December 2007, and birth year and county fixed effects.

Table 3: OLS of Violence Exposure on Likelihood of Birth

	2012									
	Pooled		Q1		Q2		Q3		Q4	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Duration of Violence	-0.0005 (0.0022)	-0.0025 (0.0025)	-0.0001 (0.0012)	-0.0007 (0.0015)	0.0013 (0.0008)	0.0000 (0.0016)	-0.0001 (0.0013)	0.0001 (0.0014)	-0.0022 (0.0014)	-0.0020 (0.0021)
Duration of Violence \times Minority		0.0041 (0.0030)		-0.0011 (0.0012)		0.0035** (0.0015)		-0.0003 (0.0017)		-0.0003 (0.0018)
Control Mean	0.1348	0.1328	0.0310	0.0302	0.0360	0.0357	0.0340	0.0339	0.0316	0.0307
Observations	30620	30620	30620	30620	30620	30620	30620	30620	30620	30620

Note: *p<0.1; **p<0.05; ***p<0.01. Data are from KDHS and ACLED. Standard errors clustered at the county level are shown in parentheses. The dependent variables include likelihood that a female gives births in quarter t . Control variables include ethnicity and religious identities, marital status, education level, urban-rural residence status, children as of December 2007, and birth year and county fixed effects.

Table 4: OLS of Violence Exposure on Total Fertility

	Births Between Elections		Total Children	
	(1)	(2)	(3)	(4)
Duration of Violence	-0.0111*** (0.0038)	-0.0106** (0.0041)	-0.0086* (0.0051)	-0.0101* (0.0058)
Duration of Violence \times Minority		0.0002 (0.0050)		0.0051 (0.0071)
Control Mean	0.7552	0.7392	2.8486	2.7967
Observations	30620	30620	30620	30620

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Data are from KDHS and ACLED. Standard errors clustered at the county level are shown in parentheses. Births between elections is the number of births between January 2008 and February 2013. Control variables include ethnicity and religious identities, marital status, education level, urban-rural residence status, children as of December 2007, and birth year and county fixed effects. Columns (3) and (4) also include interview-month fixed effects.

Table 5: Heterogeneity by Age of Exposure

	Births Between Elections		Total Children	
	(1)	(2)	(3)	(4)
<i>Panel A: Younger than 25</i>				
Duration of Violence	-0.0156*** (0.0052)	-0.0165*** (0.0047)	-0.0143** (0.0059)	-0.0196*** (0.0056)
Duration of Violence \times Minority		0.0026 (0.0054)		0.0121 (0.0071)
Control Mean	0.7438	0.7318	1.5463	1.5274
Observations	18890	18890	18890	18890
<i>Panel B: 25 or Older</i>				
Duration of Violence	-0.0012 (0.0096)	-0.0010 (0.0111)	0.0030 (0.0124)	0.0044 (0.0152)
Duration of Violence \times Minority		0.0027 (0.0122)		0.0011 (0.0150)
Control Mean	0.7729	0.7508	4.8780	4.7833
Observations	11730	11730	11730	11730

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Data are from KDHS and ACLED. Standard errors clustered at the county level are shown in parentheses. Births between elections is the number of births between January 2008 and February 2013. Control variables include ethnicity and religious identities, marital status, education level, urban-rural residence status, children as of December 2007, and birth year and county fixed effects. Columns (3) and (4) also include interview-month fixed effects.

Table 6: KLPS Household Optimism and Fertility

	Births in 2 Years
<i>“Two years from now, the economy will be...”</i>	
Same	0.0203 (0.0116)
Worse	-0.0296*** (0.0100)
Control Mean	0.0649
Observations	11303
<i>“Two years from now, the government will be...”</i>	
Same	0.0053 (0.0122)
Worse	-0.0165* (0.0096)
Control Mean	0.0657
Observations	11277

Note: *p<0.1; **p<0.05; ***p<0.01. Data are from KLPS. Standard errors clustered at the individual level. Time-varying controls include age and marital status.

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Appendix

Table 1: Distribution of Ethnic Groups in Kenya, 1994

Province	Dominant Ethnic Group	Percentage of Total Provincial Population
Nairobi	Kikuyu	32.4
Central	Kikuyu	93.8
Coast	Mijikenda	54.4
Eastern	Kamba	53.9
North-Eastern	Ogaden	36.0
Nyanza	Luo	57.9
Rift Valley	Kalenjin	46.4
Western	Luhya	86.2

Note: Data are from Central Bureau of Statistics (1994) and Alwy and Schech (2004).

Table 2: Descriptive Statistics on KLPS Societal Attitudes

Outcome	Observations	Mean
Economic Outlook in 2 Years	19238	1.8363 (0.8929)
KLPS-1	4874	1.4009 (0.6781)
KLPS-2	2413	1.7820 (0.8408)
KLPS-3	6990	2.0024 (0.9252)
KLPS-4	4961	2.0564 (0.9030)
Government Outlook in 2 Years	19140	1.7403 (0.8516)
KLPS-1	4812	1.3703 (0.6512)
KLPS-2	2412	1.7135 (0.8185)
KLPS-3	6954	1.8519 (0.8892)
KLPS-4	4962	1.9559 (0.8696)

Note: Data are from KLPS. For societal attitudes, 1 corresponds to “*Better*”, 2 corresponds to “*Same*”, and 3 corresponds to “*Worse*”.

Table 3: OLS of Violence Exposure on Likelihood of Birth

	2009							
	Q1		Q2		Q3		Q4	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Duration of Violence	-0.0009 (0.0005)	-0.0003 (0.0005)	-0.0009** (0.0004)	-0.0008 (0.0005)	0.0002 (0.0006)	0.0006 (0.0006)	-0.0004 (0.0003)	-0.0002 (0.0005)
Duration of Violence \times Minority		-0.0013 (0.0008)		-0.0002 (0.0006)		-0.0008 (0.0007)		-0.0005 (0.0006)
Observations	30620	30620	30620	30620	30620	30620	30620	30620

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Data are from KDHS and ACLED. Standard errors clustered at the county level are shown in parentheses. The dependent variables include likelihood that a female gives births in quarter t . Control variables include ethnicity and religious identities, marital status, education level, urban-rural residence status, children as of December 2007, and birth year and county fixed effects. *Duration of Violence* is defined as the number of days a violence event occurred within a 100 kilometer radius.

Table 4: OLS of Violence Exposure on Likelihood of Birth

	2012							
	Q1		Q2		Q3		Q4	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Duration of Violence	0.0001 (0.0006)	0.0001 (0.0007)	-0.0005 (0.0004)	-0.0011** (0.0005)	0.0001 (0.0005)	-0.0003 (0.0006)	-0.0005 (0.0004)	-0.0006 (0.0004)
Duration of Violence \times Minority		-0.0001 (0.0007)		0.0013* (0.0007)		0.0007 (0.0008)		0.0002 (0.0006)
Observations	30620	30620	30620	30620	30620	30620	30620	30620

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Data are from KDHS and ACLED. Standard errors clustered at the county level are shown in parentheses. The dependent variables include likelihood that a female gives births in quarter t . Control variables include ethnicity and religious identities, marital status, education level, urban-rural residence status, children as of December 2007, and birth year and county fixed effects. *Duration of Violence* is defined as the number of days a violence event occurred within a 100 kilometer radius.