

To What Extent Does Exposure to Conflict Affect Risk Preferences

Undergraduate Dissertation

Student Name: Milind Parwani

Student ID Number: 20454856

Supervisor: Dr. Elke Renner

Abstract

The focal point of this paper lies in providing evidence that contradicts the theory regarding the stability of risk preferences. When considering the heterogeneity in responses to individuals, the effect of risk preferences in response to conflict shifts in opposing directions. Moreover, we investigate the effects of any exogenous factor significantly alter an individual's risk preferences. Initially, we discuss the importance of external stimuli and their corresponding effects on risk preferences. Then, we discuss the psychological responses to conflict where the induced trauma and stress impose long-run negative impacts to the way an individual perceives risk. Ultimately, we touch upon the intensity of exposure to conflict in three forms: the effect of conflict on children, the proximity of conflict as well as the type of conflict that an individual is exposed to.

Word count: 7120

Table of Contents

1. Introduction & Motivation.....	3
2. Impacts of External Stimuli on Risk Preferences	4
2.1. Natural Disasters	5
2.2. Financial Shocks	7
2.3. The COVID-19 Pandemic	8
2.4. Conflict	9
3. The Psychological Effects of Conflict	14
3.1. Habituation vs Sensitization	14
3.2. Impact of Stress on Risk Preferences	16
3.3. Impact of Trauma on Risk Preferences	18
4. The Importance of Intensity of Exposure	19
4.1. Effect of Exposure on Age	19
4.2. Proximity to Conflict	23
4.3. Type of Exposure to Conflict	25
5. Conclusion	28
6. References	31

1. Introduction & Motivation

‘The notion of endogenous preferences gnaws at the foundation of standard welfare theory’ (Voors et al. 2010, pg 3). An individual’s risk preference is their tendency to choose outcomes with a low or high outcome based on their expected utility.

Neoclassical theory believes that the preferences of economic agents are fixed, however this paper aims to provide contrary evidence through aggregating literature on risk preferences within the context of conflict. A multitude of economists have assessed the impacts of conflict in countries such as Syria (Ugur et al. 2023), Uganda (Rockmore et al. 2016) and Burundi (Voors et al. 2010). The literature on the relationship between conflict and risk preferences is relatively new but growing quickly (Schildberg-Hörisch; 2018), thus measuring the extent to which conflict affects risk preferences is key. Recent literature has not come to a consensus with some economists finding that conflict increases risk aversion whereas others find a decrease. Yet an area where a consensus has been reached are the psychological effects of conflict where it was found that emotions have a stronger control over decisions involving risk than cognitive evaluations (Loewenstein et al. 2001). Haushofer & Fehr (2014) find that exposure to stressful events increases the cortisone hormone and impact an individual’s risk preference. Moncada et al. (2015) emphasizes the importance of experiences affecting memories where Malmendier et al. (2011) further elaborates that financial decisions are related to an individual’s experiences. However, it would be reductive to merely conclude that it is just conflict that affects risk; there are a plethora of exogenous factors that affect an individual’s risk preferences. First, we will examine the effects of external stimuli on risk preferences to convey its temporal instability. Then, we will assess the psychological impacts of conflict on an individual’s risk preference, with focus on identifying behavioural adaptations that may help explain the divide in the literature. Then, we will discuss the differences in risk preferences amongst individuals depending on their intensity of exposure to the respective conflict and ultimately conclude. The focal point of this paper is to emphasize the importance of the effect of conflict on an individual’s risk preferences and how the induced trauma and stress is

not a temporary shock to a population. In addition, children are the most susceptible to a conflict-environment due to their incapability of being able to completely process the emotional distress. Studies have measured the effects of mental health and indicates that most children recover quickly from exposure to traumatic events unless they are directly involved in harm to themselves or their family (Masten and Coatsworth, 1998; Pine and Cohen, 2002). Due to the conflict on the news today, this topic is crucial for explaining the shift in risk preferences that will result from the conclusion of these crises. Furthermore, the literature is very contradicting where the effects of conflict or any exogenous factor on risk preferences is inconclusive thus this paper aims to solve the issues of ambiguity through synthesizing the key arguments and provide clarity which can aid affected governments to facilitate post-conflict recovery to the most effective extent.

2. Impacts of External Stimuli on Risk Preferences

The notion that risk preferences change in response to external stimuli has derived from a recent body of literature with the aim of identifying the magnitude and direction to which these exogenous factors can alter an individual's risk preferences.

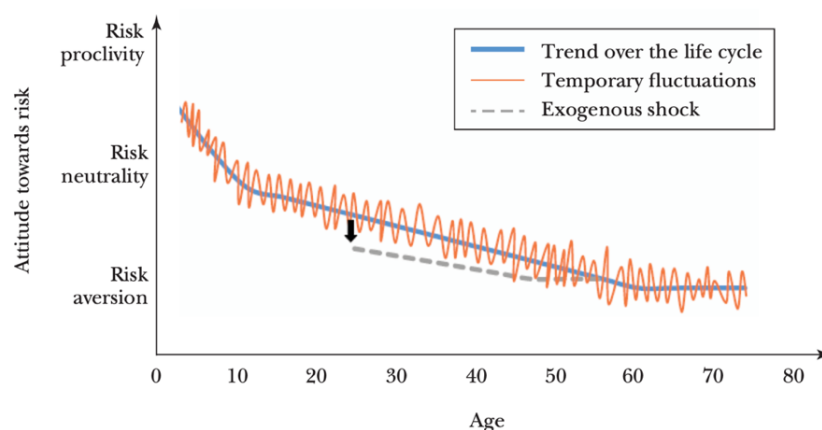


Figure 1: Attitudes towards risk measured from risk-aversion to risk-proclivity with respect to age.

Source: Schildberg-Hörisch; 2018

Schildberg-Hörisch (2018) noted that an individual exhibits more risk-averse behaviour throughout their life cycle where there are temporary fluctuations in their attitudes towards risk dependent on their emotion, mental state and other exogenous factors at play. Exogenous factors include but are not limited to natural disasters, pandemics, financial shocks, and conflict. Other findings include that men are naturally more risk-taking than women (Quiroga et al., 2024). The extent to which risk preferences are altered is dependent on the individual as the effects of these exogenous factors result in differing effects. Through assessing each exogenous factor individually, the distinction between their corresponding effects on risk preferences becomes clearer.

a. Natural Disasters

The direct losses from natural disasters in the developing world average \$35 billion annually (Cameron and Shah, 2015). The concrete effects of natural disasters risk preferences are divisive within this vein of literature where Abatayo and Lynham (2020) find that 40% of papers conclude that the reaction to extreme events make individuals more risk-loving. The instances of natural disasters have been increasing where there were reported to be 410 in 2023 (Ritchie and Rosado, 2024), a 77.5% (rounded to 3 significant figures) increase from 1996. With the increasing frequency, it is important to understand their effects. Cameron and Shah (2015) find that individuals who experienced an earthquake or a flood in the last three years are 7 percentage points more risk-averse, translating into a 41% reduction in the likelihood of making a risky choice, in the case of Indonesia. When examining the case of Thailand, Cassar et al. (2017) ascertained through their regression model that living in a tsunami village causes an approximate 20% increase in their risk aversion coefficient. However, these papers study the effect of a singular instance as opposed to the cumulative effects of a series of natural disasters within the same country. Cheong (2022) uses the Indonesian Family Life Survey (IFLS) and measures the changes in risk preferences between the fourth and fifth wave of the survey, from 2007 to 2014. A reduction in risk-

aversion ensued as a result of the natural disaster which is illustrated through the inwards shift in risk preferences in Figure 2.

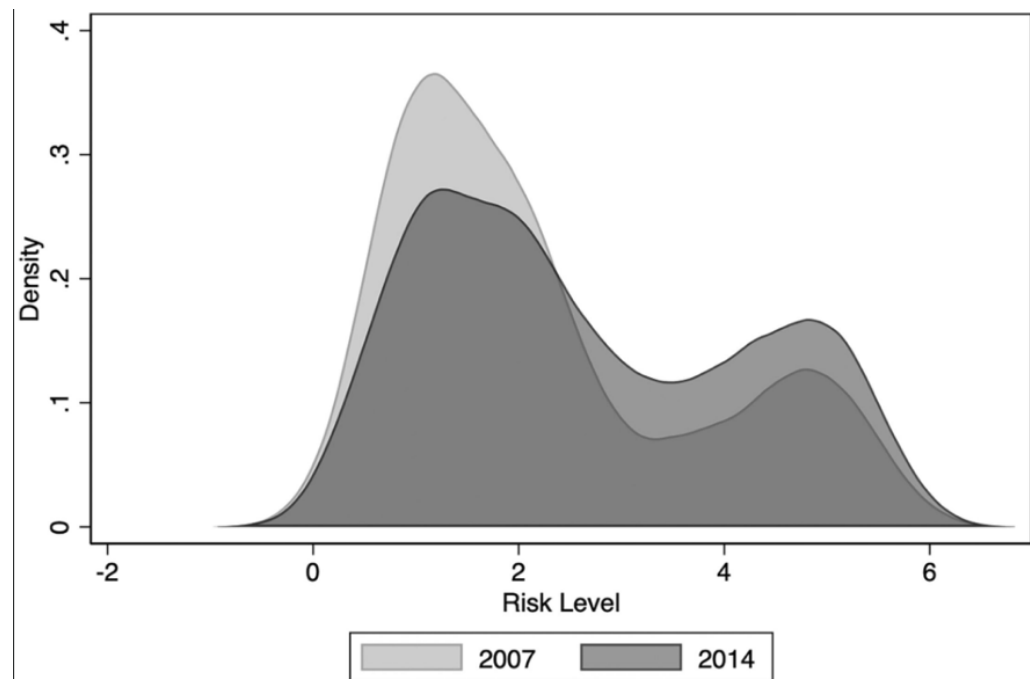


Figure 2: Distribution of risk levels in the case of Indonesia with density estimates of risk preference shifts

Source: Cheong (2022)

Cheong's study emphasizes the cumulative effects of natural disasters as opposed to isolating the effects to a singular instance, a limitation seen under Cameron and Shah (2013) and Cassar et al. (2017). The cumulative effects of the natural disasters can display an accumulation of stress as a response to the prolonged exposure to an inflicted environment thus suggesting that there is a long-term effect on an individual's risk preferences. The difference in response to the natural disaster can also be interpreted through gender. Hanaoka et al. (2015) found that Japanese men became more risk tolerant after the Great East Japan Earthquake where the effect persisted five years following the shock. Moreover, the density of risk level decreased amongst lower risk levels, between 0 and 2, and increased from 4 to 6 which displays the greater weight an individual places on the risk induced from a natural disaster. This can be justified

through potential updates in their background risk through perceiving their environment across both waves of the survey to be riskier.

b. Financial Shocks

An individual becomes more risk-averse throughout their life cycle, seen in Figure 1, which can lead to conservative expenditure, saving patterns and investment. With a lack of risk-taking within the economy, entrepreneurship is discouraged, individuals decide on a riskless asset portfolio through investing in a higher proportion of government bonds. This is corroborated by Voors et al. (2011) where agricultural households affected by conflict invest less in farm buildings due to the uncertainty about the future economic state. However, regarding financial shocks, there is an immediate and long-run impact on an individual's risk preferences where early-life financial experiences such as the Great Depression are linked to more conservative investing behaviour (Malmendier and Nagel, 2011), suggesting an increase in risk aversion. The current empirical findings regarding the Great Financial Crisis conclude that individuals became more myopic. Cardak et al. (2019) find that the effects of the shock lasted seven years whereas Hoffman et al. (2013) suggest that the effects dissipated only after one. Looking closer at Cardak's study, he categorized risk tolerance into four states: 'none', 'average', 'above average' and 'substantial'. Their results note that the initial shock of the Great Financial Crisis (GFC) caused a 6.5% decrease in the probability that an individual would fall into the 'substantial' state and a 3.8% increase in the 'none' state. It is only by 2015 where an individual's risk preferences mirror their pre-GFC level. Risk-taking in a financial capacity is important to consider where in the events of macroeconomic shocks, the heterogeneity of the effects can be attributed to the level of wealth an individual is endowed with. Wealthier individuals may respond less severely and exhibit lower myopic tendencies and risk-aversion relative to those endowed with smaller amounts of wealth.

c. COVID-19 Pandemic

Similarly seen in other veins of this literature, there is uncertainty about the effects of the COVID-19 pandemic on risk preferences. Some studies find that there is an increase in an individual's risk tolerance (Shachat et al., 2021; Tsutsui et al., 2022) whereas others find a decrease (Bu et al., 2020). Through conducting five waves of surveys between March 13th and June 16th, 2020, Tsutsui et al. (2022) finds that 44% of participants became more risk tolerant whereas 19% became more risk averse. Although, the sample size for this study is a limitation in its validity. There were 4,359 respondents therefore it is not by any means representative of the entire population however, it provides a basis on the effects of the pandemic on people's risk preferences in Japan. With the collective response rate across all five waves being 88.9% (rounded to 3 significant figures), there is a basis for suggesting the direction of change irrespective of its representative limitations. However, a study by Angrisani et al. (2020) finds no significant changes in an individual's risk preference. Using the 'Bomb Risk Elicitation Task', coined by Crosseto and Fillipin (2013) as BRET, participants were shown a screen with 100 boxes to choose from. Each box contained money yet one box contained a 'bomb', an instant loss to all their earnings. With the experiment being conducted before and after the outbreak of the pandemic, there was only a 3.56% (rounded to 3 significant figures) increase in the number of boxes that people opened which demonstrates a very marginal increase in risk tolerance. Participants that were diagnosed of COVID-19 or had one of their family members be diagnosed were 30% and 28% less likely to open more boxes in the post-outbreak experiment respectively. The increased risk-aversion based on an individual's personal experiences of the exposure is vital when considering the heterogeneity in responses. The effects of the COVID-19 pandemic affected the behaviours of individuals due to mandatory lockdowns and regulations yet individuals who were never diagnosed or weren't indirectly exposed may have exhibited stable risk preferences as a response to the pandemic. Yet, a factor that may be relevant to the effects on risk preferences of

the pandemic may be the social isolation where increases in anxiety, depression, and post-traumatic stress disorder were reported globally.

d. Conflict

Repeated exposure to stressful stimulus accompanied by the destruction of physical infrastructure and mental health is the nature of conflict. The extent to which conflict can alter an individual's risk preferences is infinitely more severe than the exposure to any other exogenous variable already mentioned within this paper. Conflict has been described as 'development in reverse' (Collier et al., 2003) and the effects it can have on an individual manifests in the form of PTSD, depression and behavioural changes that can last a lifetime. Leon (2012) found that the Peruvian civil conflict had a negative long-run impact on education attainment. This was further iterated by Akbulut-Yuksel (2009) showing that large-scale physical destruction from World War II has had detrimental impacts on education attainment, health status and labour market outcomes.

Furthermore, Muminovic & Efendic (2022) studies the conflict in Bosnia and Herzegovina, 1992-95, which caused a 90% decrease in industrial production and an estimated fall in GDP per capita by 73.68%. Moreover, there was a corrosive effect on societal trust where exposure to one episode of conflict during childhood caused an approximate 4-5% reduction. Muminovic & Efendic concluded that individuals who lived in municipalities suffering from conflict express more distrust and greater risk-aversion tendencies even two decades following its conclusion. This is in line with Cruwys et al. (2021) who proposed the Social Identity Model of Risk Taking, noting that individuals are more likely to take risks when they trust other people exhibiting the same behaviours. The correlation between trust and GDP growth has been shown to be positive (Keefer, 1997). Implications of conflict on trust can lead to financial risk-aversion. Wang and Young (2020) find that a one standard deviation in the number of terrorists attacks each month leads to a \$75.09 million drop in private

equity investment and an increase in the investment of government bonds by \$56.81 million. The mechanisms behind which this is caused by is the reduction in certainty about the future economic state where investments in the stock market are conditional on all available information presented to the actor. Uncertainty is the most important term when discussing the effects of conflict as it is the fear of being a victim to something out of an individual's control that causes subsequent risk-aversion. Moreover, Brown et al. (2017) finds that a rise in the homicide rate by 1 per 10,000 people increases the probability of an individual in Mexico being risk averse by 1.5% as well as a reduction in labour market participation and incomes.

The two most prominent studies within this literature are: Jakiela et al. (2019) and Voors et al. (2010) examining the cases of the Kenyan and Burundian post-election conflict respectively. Voors et al. were the first within the field to investigate the effects of conflict through examining 300 households across 35 random communities within Burundi. Following the assassination of the country's first Hutu president, the Hutu groups killed in between 30,000 – 50,000 Tutsi in retaliation, prompting the start of the twelve-year conflict.

	(1) gains OLS	(2) gains OLS	(3) gains OLS	(4) gains OLS	(5) gains OLS	(6) gains 2SLS	(7) losses OLS	(8) gains 2SLS
Relative number of dead in attacks (%)	0.11*** (0.042)	0.10*** (0.033)	0.0614* (0.0328)	0.0659* (0.0378)	0.0656* (0.0377)	0.114* (0.0699)	0.0261 (0.0366)	0.247*
Individual victimization Index					-0.0914 (0.0999)			
Household variable								
Respondent literate			-0.404 (0.253)	-0.398 (0.256)	-0.407 (0.258)	-0.351 (0.269)	-0.191 (0.308)	-0.086
Respondent age			0.0105 (0.0066)	0.0107 (0.0065)	0.0114 (0.0068)	0.00945 (0.0074)	-0.0085 (0.0105)	0.073
Respondent is male			-0.288 (0.268)	-0.257 (0.267)	-0.256 (0.268)	-0.208 (0.267)	-0.0456 (0.231)	-0.050
Total land holdings Per Capita			-0.0309 (0.0273)	-0.0384 (0.0285)	-0.0395 (0.0280)	-0.0347 (0.0250)	-0.0298 (0.0288)	-0.086
Community variable								
Land Gini Coefficient			-1.153 (0.769)	-1.020 (0.886)	-1.111 (0.901)	-1.310* (0.758)	0.125 (0.806)	-0.125*
Distance to market			0.237 (0.190)	0.254 (0.178)	0.237 (0.176)	0.189 (0.209)	0.207 (0.225)	0.066
Conflict over land			0.132 (1.243)	0.359 (1.288)	0.358 (1.299)	-0.0068 (1.059)	1.153 (1.210)	0.000
Ethnic homogeneity			0.0122 (0.0086)	0.0133 (0.0086)	0.0143 (0.0086)	0.0101 (0.0114)	0.0001 (0.0143)	0.075
Population density			0.505* (0.291)	0.480 (0.367)	0.473 (0.363)	0.579 (0.426)	0.685 (0.453)	0.125
Per capita total Expenditure			-0.370* (0.197)	-0.340 (0.218)	-0.319 (0.215)	-0.413 (0.284)	0.0433 (0.355)	-0.096
Constant	3.81*** (0.189)	3.88*** (0.201)	2.974 (2.596)	2.933 (2.591)	2.728 (2.603)	3.581 (3.169)	0.351 (3.776)	
Regional FE	no	no	no	yes	yes	yes	yes	yes
N	35	271	261	261	261	261	251	262
adj. R ²	0.16	0.042	0.118	0.115	0.113	0.109	0.09	
First stage instruments								
Distance to Bujumbura (log)						-4.996*** (0.695)		
Altitude (log)						-22.41*** (3.401)		
Hansen J, p-value						0.82		
Partial F						39.31		

Table 1: A table showing the OLS regression results for risk preferences.

Source: Voors et al. (2010)

Table 1 shows that for there was an increase in risk-loving tendencies following the start of the Burundian electoral conflict. This is significant at the 1% level, illustrated through column 1. Furthermore, it is also interesting to note that, there was an increase in risk-seeking in all domains where conflict does not affect risk preferences towards losses. This contradicts Kahneman and Tversky's (1979) paper that individuals value changes in gains and losses differently. As individuals lower their reference points, the baseline used to determine whether an outcome is perceived as a gain or a loss, in response to conflict there may be a subsequent increase in risk-seeking.

On the other hand, Jakiela et al. (2019) examines the effects of Kenyan post-election crisis and finds an increase in risk-aversion. Moreover, they observe an

approximate 26% decrease in the fraction of subjects who are classified as risk-loving or risk-neutral. Their experimental design consisted of offering five lotteries with varying degrees of risk relative to a safer and more probable option.

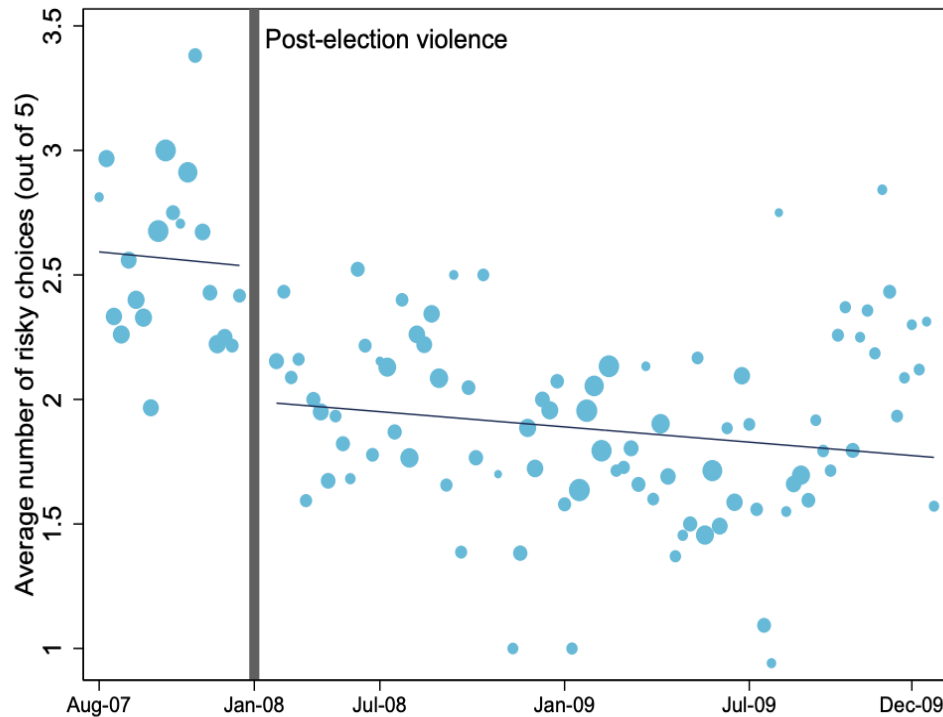


Figure 3: Average number of risky choices by respondents in a given week, weighted by the number of surveys conducted during the week

Source: Jakiela et al. (2019)

Figure 3 shows that an individual chose the riskiest choice an average of 2.6 out of 5 times prior to the election. However, this decreases to an average of 2 times following the start of the conflict. There is not only the increase in risk-aversion, yet individuals are progressively becoming more risk-averse. Amongst the two-year period of the study, there is no sign of risk preferences returning to their baseline. However, it is worth noting that towards the end of the study there is greater dispersion in the plots thus it can be inferred as the effects of the conflict slowly dissipating. Yet the maintenance of the average number of risky choices shows this to be a marginal and insignificant

increase in risk-seeking tendencies. Furthermore, the heterogeneity in response to the conflict was captured within the study in the form of age.

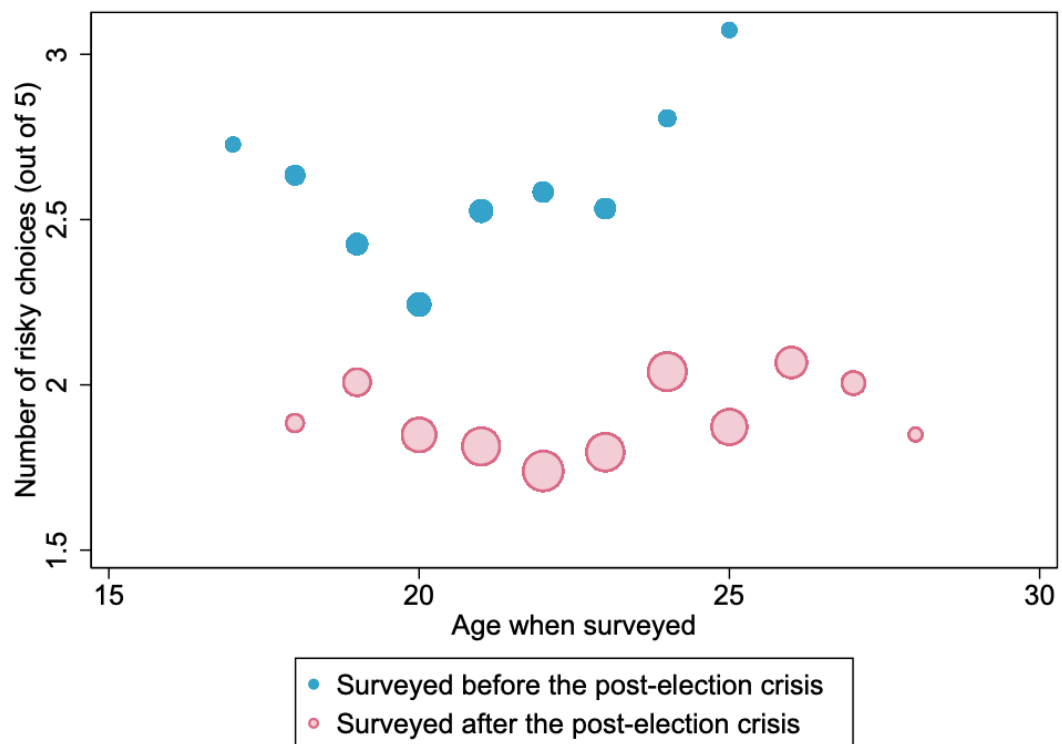


Figure 4: The effects of age and the number of risky choices made before and after the post-election crisis

Source: Jakiela et al. (2019)

When assessing Figure 4, it seems like the effects of the post-election crisis were homogenous amongst all ages yet the extent to which each age is affected is different. The most responsive individuals to the conflict were 25-year-olds. The number of risky choices made fell from approximately 3.1 to 1.8. However, the least responsive age group to the effects of the post-election crisis appears to range from 18 to 20 years old. It is difficult to interpret why this is the case, especially when before the post-election crisis, there is a contradiction to the empirical findings that individuals exhibit risk-averse tendencies as they age. Younger adults show higher levels of risk-taking propensity relative to older adults. (Josef et al. 2016; Mata, Josef, and Hertwig 2016). It is only following the post-election crisis where hints of that correlation exist in the older age groups. The direction of the effect of conflict on risk preferences was homogenous on age yet the magnitude differs thus suggesting a level of statistically insignificant

heterogeneity. Fear is a natural response to conflict where Lerner and Keltner (2000) find that uncontrollable situations incite fear in individuals and subsequently leads to increased risk-aversion.

The difference in results between both studies may stem from the duration of exposure to the conflict environment and the time the study was conducted. Voors' study is conducted four years following the Burundian post-election conflict therefore it may be feasible that the induced stress and trauma induced on an individual dissipated where risk-seeking behaviours were seen favourably. However, Jakiela's experiment being conducted a year after the Kenyan post-election conflict may have led to exaggerated risk-aversion coefficients due to the nature of the conflict being intense and short-lived.

3. The Psychological Effects of Conflict

a. Habituation vs Sensitization

To assess the extent to which conflict can alter an individual's risk preferences, estimates of their background risk, the inherent likelihood of an event occurring independent of any specific factors or interventions, is crucial. In an environment that is susceptible to increased incidences of conflict, an individual's background risk would be higher thus may be prone to exhibit risk-seeking tendencies. Contrastingly, a low background risk would facilitate for risk-aversion as the perception of their environment is free of risk.

A key behavioural adaptation of an individual's ability to perceive risk is habituation, the diminishing of an innate response to a frequently repeated stimulus. The opposite effect, sensitization, is the progressive amplification of a response to a stimulus. The effects of habituation have been tested within the

laboratory where Pitman et al. (1988) found that with intense stress imposed on adult rats, the plasma corticosterone (a hormone responsible for stress responses) rose on the first and second day but then habituated over a period of seven days.

Through habituation and sensitization, it is feasible that the contradictions within the literature can be explained because of individual behavioural adaptations. Jakiela's study on the Kenyan post-election conflict concluding an increase in risk-aversion can be explained through sensitization where the intensity of the conflict induced repeated stress on an individual. With a failure to update their background risk as the conflict was escalating, these individuals are prone to the progressive amplification of their response to conflict, in this instance fear and anxiety. Evidence of this can be seen through the Appraisal Tendency Framework (Han et al., 2007) which indicates that fear results in risk aversion while anger leads to risk-seeking choices. Can also be justified through the Affect Infusion Model (Forgas, 1995) which conveys that negative emotions lead to risk-aversion tendencies as individuals are more attentive of the consequences of a risk. Moreover, in the context of conflict, research has found that uncertainty and low situational control is associated with fear (Smith and Ellsworth, 1985). Exposure to conflict is uncontrollable thus it is expected to elicit fearful reactions that would cause an increase in risk-aversion. This is seen Kenya, yet the individual response differs. Due to the inherent vulnerability of developing countries to instances of conflict, individuals should exhibit high estimates of background risk. Not only to large-scale exposure to conflict yet also the smaller instances of conflict that can occur on a daily basis, such as crime. The lack of a habituation effect can be explained by conflict not being a low-threat, predictable or controllable stimuli. Habituation effects are dominant given time as an individual is able to incrementally adjust their background risk. The Mood Maintenance Hypothesis, proposed by Patrick and Isen (1983), holds that positive affect induces risk-averse behaviour whereas negative affect leads to risk-seeking behaviour. Conte et al. (2018) shows this through priming individuals with a

horror movie with the result of greater risk-seeking tendencies exhibited. Although this hypothesis fails to hold its integrity under Jakiela's study.

It can, however, help explain Voors' findings, the positive correlation between exposure to violence and willingness to take risks. Brown et al. (2017) assessed the impacts of the Mexican Drug War on risk preferences and found that individuals with a lower socio-economic status are less sensitive to the increases in the instances of violence. Moreover, Brown et al. (2017) also observed the existence of a 'threshold' where any further increases in violence were unable to significantly alter an individual's risk preferences. Thus, Voors' findings may reflect the individual's behavioural adaptation of habituating to their conflict environment and reaching a 'threshold' such that any further exposure to the Burundian conflict over the ten years was negligent, suggesting habituation. In addition, similar effects can be seen within Tsutsui's (2022) study of COVID-19 in Japan where individuals displayed habituation in response to the worsening of the pandemic. Furthermore, it was also concluded that 19% of respondents report risk aversion through sensitization in the same study. The habituation effects were stronger with 44% of respondents increasing their risk-tolerance. This can also be seen through Callen et al. (2011) and their study into the Afghanistan where individuals were randomly primed with fearful recollections of the Afghani conflict. Callen also noted, however, that 'individuals with violent exposure may be changed for a period of time, but what changes is not necessarily their risk preferences, but rather the susceptibility of their behaviour to fearful recollections' (Callen et al. 2013, pg 23).

b. The Impact of Stress on Risk Preferences

Stress is an instinctive psychological, physiological and behavioural reaction to perceived threats and as such it cannot be controlled by human will (Goldstein and McEwen 2002). However, this assumption may not always hold as risk preferences temporarily fluctuate (Guiso et al., 2013), stress can be altered by direct administration of cortisol (Kandasamy et al., 2014), as well as emotions

(Nguyen and Noussair., 2014). Furthermore, stress can have a detrimental effect on various cognitive processes (Qin et al., 2009; McEwen & Sapolsky, 1995; Shields et al., 2016). Cahlíková and Cingl (2017) conducted an experiment to ascertain the effects of the administration of acute stress and its effect on risk preferences. Figure 3 shows the elicitation of risk preferences under stress using the Trier Social Stress Test for Groups (TSST-G). This entails subjecting the participants in the treatment condition to a public speaking task and a mental arithmetic task that would be evaluated in public and recorded on video. As the participants were only granted five minutes to complete the task, it provided an adequate stressor that could be compared to the control group who were not subject to the same level of evaluation.

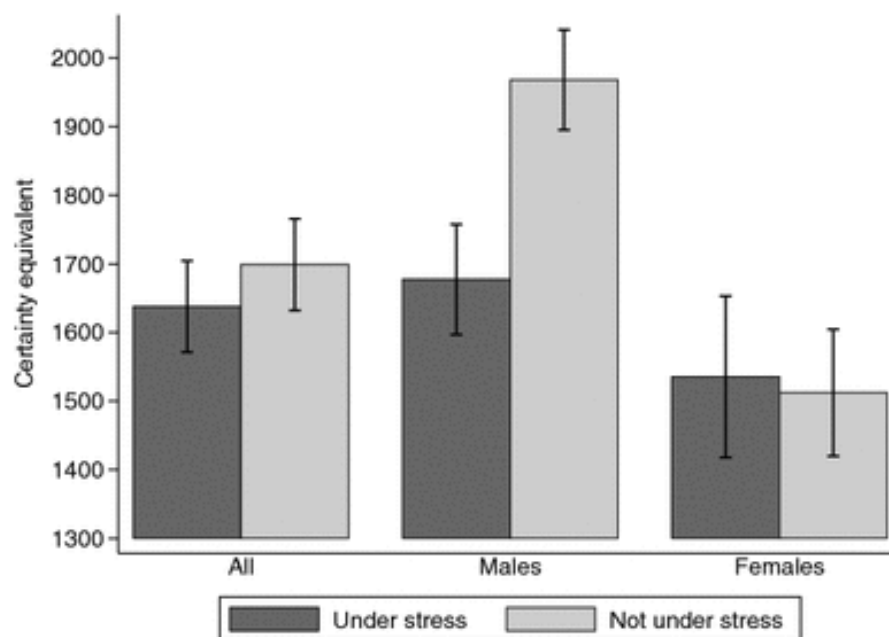


Figure 5: The certainty equivalent relative to men and women when considering the administration of acute stress.

Source: Cahlíková and Cingl's (2016)

Figure 3 represents the certainty equivalent, the guaranteed amount of money an individual would consider as equally desirable as a risk investment or outcome, and those under the TSST-G treatment procedure exhibited more risk averse tendencies. The effects on risk preferences when considering the participants collectively were marginal, with an approximate 6.4% reduction in the certainty

equivalent of the treatment group relative to the control. However, men under stress were more risk averse than women who were not under stress which was significant at the 1% level. This can also be conveyed in Kajantie and Phillips' (2006) study where it was found that the female physiological reaction to stress is of a smaller magnitude than the reaction of men of the same age. Further effects of induced stress on risk preferences can be seen through Kandasamy et al. (2013) which applies it to the context of financial risk-taking following the GFC. It was found that an acute level of cortisol has no significant effect on financial risk-taking whereas a sustained elevation leads to greater risk aversion. In addition, Moya's (2018) paper regarding conflict in Columbia accounts for the response of stress to the severity and temporal proximity of violence where it was found that symptoms of anxiety disorders become less prominent over time. This implies that the effects of stress induced by conflict dissipates which further explains the contradiction between Voors' and Jakiela's findings where in the case of Burundi, it appears that the stress induced by the post-election conflict either diminished or became unresponsive due to habituation effects.

c. Impact of Trauma on Risk Preferences

"The long-term consequences of mass violence stem primarily from the psychological trauma it causes" (MacDermid Wadsworth, 2010). Literature states that traumatic experiences can last decades (Hubbard et al. 1995; McSharry and Kinny 1992; Schnurr et al. 2004) therefore it is not something that policymakers should discount as the effects of trauma differs between individuals and there is no generalised time at which these mental health effects dissipate. Hassan et. al (2016) state that conflict affected Syrians suffer from the exacerbations of pre-existing mental health disorders. If conflict does have a significant grasp on risk preferences, it will take a country longer to return to their pre-crisis state. Kolter et al. (2001) and Tull et al. (2016) find that individuals with Post-Traumatic Stress Disorder (PTSD) tend to exhibit impulsive behaviour which can affect their economic preferences. This can be explained by avoidance symptoms of PTSD where

individuals are focused on avoiding potentially negative outcomes. Following a study conducted by Bayer et al. (2023) on the effects of the Israel-Hamas conflict on risk preferences, it was found that those suffering from PTSD showed a preference for immediate consumption over future savings. The conflict persisted of the ‘Guardians of the Walls’ operation which was a 12-day conflict between Israel and Hamas where 4,360 rockets were fired into Israel. This demonstrates a higher subjective discount rate, the rate a person requires for postponing consumption from the present to the future and shows a reduction in their willingness to take economic risks. Within the study, risk preferences were elicited through asking the participants what the maximum amount they would pay for a lottery ticket that had a 10% probability of winning. Bayer found that for each point increase the PCL-5 test, method used to measure the severity of PTSD symptoms, score, there was a reduction in the willingness to pay for the lottery ticket by 47.7% (rounded to 3 significant figures). Kovnick et al. (2021) examine the life-long effects of the exposure to the Vietnam War amongst adults and finds that the loss of family and friends during wartime continues to heighten psychological distress and suicide ideation. With PTSD being pervasive among those fleeing war zones (Birman and Tran 2008; Momartin et al. 2004), the long-term effects of trauma induced by conflict is dependent on a government’s rehabilitation schemes. Ben-Zur and Zeidner (2009) support this where exposure to traumatizing environments can trigger coping strategies to counteract the induced negative emotions.

4. The Importance of Intensity of Exposure

a. Effect of Exposure on Children

Under the empirical finding that individuals become more risk-averse over their life cycle, children are expected to exhibit risk-seeking behaviours. Economists within this vein of literature have identified that children as early as five or six can

understand the concept that one thing can be more probable than another (Huber & Huber, 1987) as well as understand the concept of risk (Harbaugh et al., 2002). Furthermore, a study by Schlottmann (2000) reveals that many children showed risk seeking and risk avoidant patterns like those found in adults. Harbaugh et al. (2002) find that children between the ages of 5 and 8 are more risk averse than children between the ages of 9 and 13 thus highlighting a contradiction. However, Khachatryan et al. (2015) find that boys from the ages 7 to 16 becoming increasingly risk-seeking with age whereas Sutter et al. (2013) finds no age effect for those aged from 10 to 18 years old. Piovesan and Willadsen (2021) observe substantial heterogeneity in risk-taking in early childhood where the differences remain large throughout life (von Gaudecker et al., 2011). Similarly to Crosseto and Fillipin (2013), Piovesan and Willadsen elicit risk preferences through BRET and find that the average number of boxes opened to be 35.3 which is 14.7 boxes lower than the expected number a risk-neutral individual would open. This shows that on average, children are significantly more risk averse in their early childhood yet there is also evidence suggesting an increase in risk-seeking tendencies as they age. This is further reinforced by Levin and Hart (2003) where majority of children's decisions exhibited risk-taking.

Shemyakina (2011) studied the effect of armed conflict on accumulation of schooling within Tajikistan. The results conclude that a girl is approximately 12 percentage points less likely to be enrolled in the 1988-1999 academic year if her household reported damage to their home during the civil unrest. Moreover, In Guatemala and Tajikistan, the number of years of schooling also reduces significantly for children who experience civil war (Chamarbagwala and Moran, 2011; Shemyakina, 2011). The effect of conflict on children is imperative where Castillo et al. (2011) and Golsteyn et al. (2014) find that childhood preferences are an important determinant of future behaviour and life outcomes in adulthood. Moreover, the effect of exposure to conflict on children deteriorates future labour market earnings by 6% on average (Akbulut-Yuksul, 2009).

Bellucci et al. (2020) investigates the correlation between childhood exposure to World War II and financial risk taking in adult life where exposure decreases the likelihood to invest in stocks and decreases the share of stocks held. Figure 6 shows the proportion of stocks an individual holds and includes those who were exposed to conflict and those who were unexposed. The extent to which exposure to conflict affected financial risk-taking is significant where exposed individuals have been 1.8 percentage points less likely to hold stocks. Furthermore, this risk-averse behaviour is also mirrored by the increased likelihood to hold life insurance by 3.3 percentage points. Thus, remarking that exposed individuals value a sense of security to have a level of control over the random exposure to future conflicts.

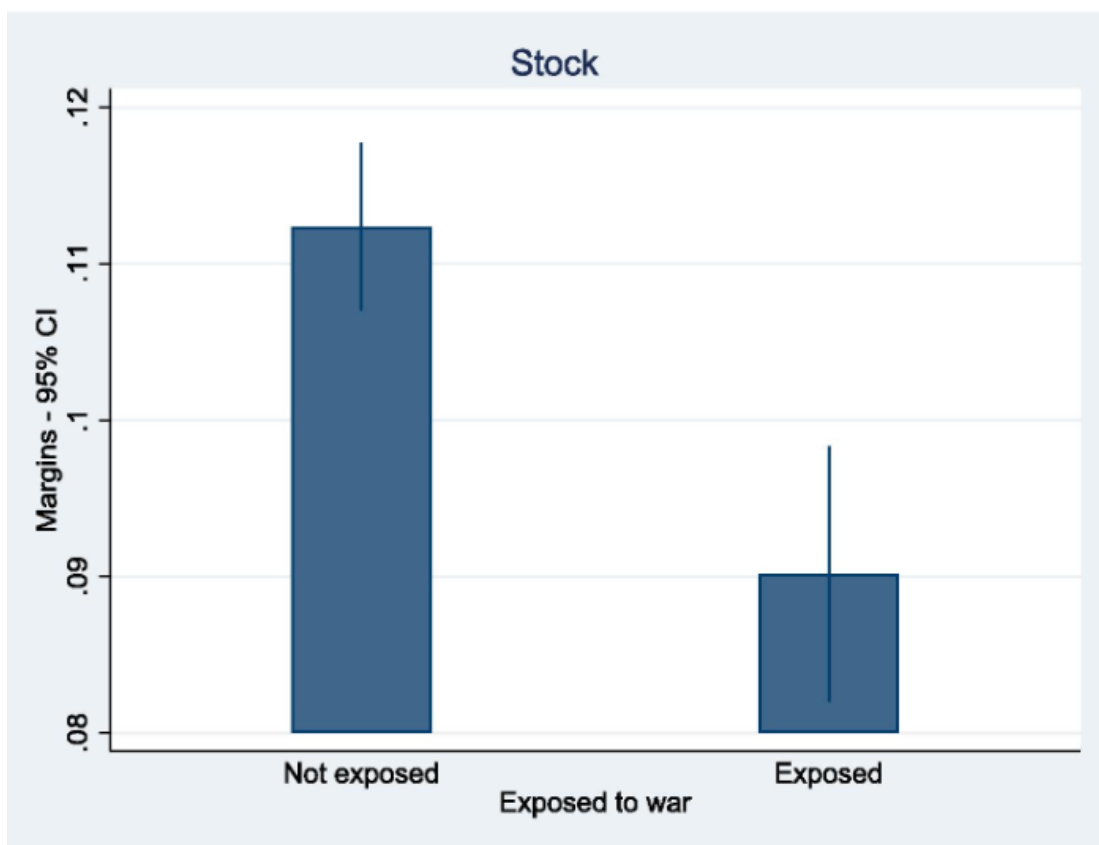


Figure 6: Predictive margins from panel probit or OLS random-effects regressions controlling for wave, country and year of birth. Shows the likelihood of an individual holding stocks dependent on their exposure to conflict.

Source: Bellucci et al. (2020)

Another important study regarding the effects of conflict on children is Kim et al. (2014) which assesses the impact on risk preferences due to the Korean War. The results conclude that exposure to the Korean War on participants below the age of 4 had no significant effects on risk-taking which is corroborated by Bauer et al. (2014) who finds that infancy is not included in the sensitive period of development. However, those between the ages of 4 and 8 at the time of the war were significantly more risk-tolerant in their adulthood. Causality is difficult to establish where participants of the survey were approximately 60 years old where the increases in risk-aversion may be due to the nature of risk-seeking behaviours deteriorating over the life cycle. Yet, these findings are in line with Danese and McEwen (2012) who reveal that childhood experience alters 'biological systems responsible for maintaining physiological stability' (Danese and McEwen; 2012, Abstract) in the brain. Furthermore, Roberts and DelVecchio (2000) reveal that the level of continuity in personality formed after age 3 is high.

Looking further into the effect of conflict on children, Uğur et al. (2023) conducted an experiment with children aged 5 to 14 by providing an endowment of 10 chocolates and offering them an opportunity to double as many as they chose to invest. It was found that those exposed to conflict invested an average of 4.69 in comparison to the control group that invested 2.84 as seen in Figure 4. This study was conducted following the escalation of violent incidents caused by terrorist organisations in Syria where the treatment group consisted of Syrian refugees that migrated to Turkey. When assessing Figure 4, it is seen that there are risk-seeking tendencies amongst the treatment group in Ankara is higher thus suggesting that the further proximity from the conflict accommodated for a higher sense of security as opposed to Gaziantep, a town bordering Syria. The higher levels of security may translate to the increased risk-taking tendencies observed in Ankara. Despite the effect being very marginal, it is a plausible conclusion.

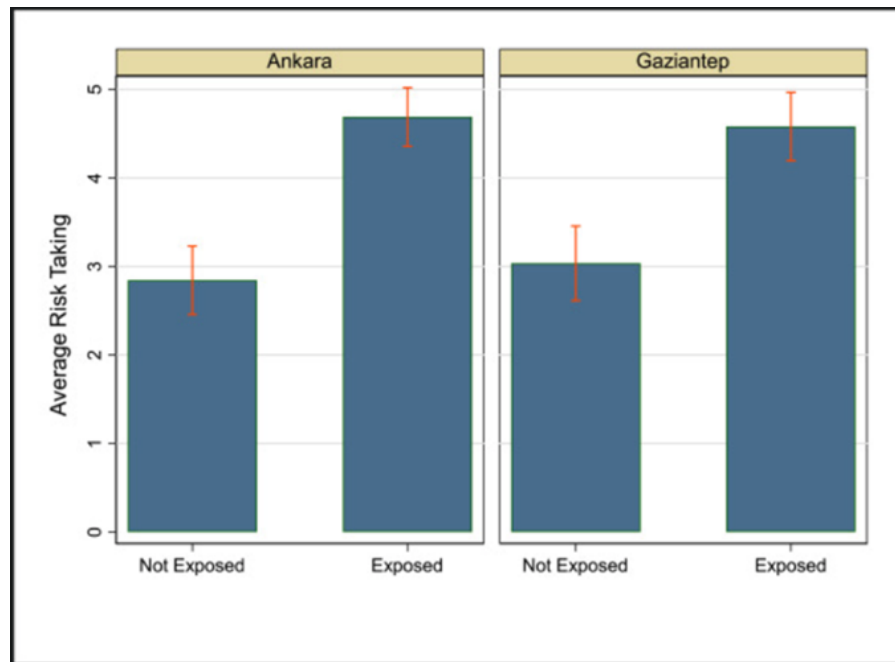


Figure 7: The effects of conflict on risk taking on children derived from an investment game.

Source: Ugur et al. (2023)

Yet the choice of demographic is questionable as the literature states that childhood traits are malleable until their adulthood (Heckman et al., 2006; Kautz et al., 2014). Although, those children exposed to war portray greater tendencies to take risks than those who have not experienced conflict, it is difficult to state whether this is a temporary or permanent change to their risk preferences. It is all dependent on the severity of conflict they faced where Macksoud et. al (1996) and Mollica et al. (1998) stress the importance of correctly identifying exposure and its intensity.

b. Proximity to Conflict

Mironova and Whitt (2019) study the effects of conflict on risk preferences following the outbreak of the Syrian conflict. As the intensity of the conflict was concentrated in Aleppo, the largest city by urban area, their study compares risk preferences of individuals to those in Idlib, a city that was deemed to be objectively safe at the time of the study. Through framing an individual's risk preferences as their choice to flee from the conflict zone or stay, it was found that Syrians inside Aleppo conveyed significantly higher risk-seeking tendencies

that was justified by an obligation to ‘help those who are fighting’ (Mironova and Whitt, pg 773). Furthermore, Mironova and Whitt also conducted an Eckel-Grossman Choice Game consisting of offering participants the choice of a lottery or a guaranteed chance to receive a sum of money, in this instance the extremes were a 50% chance of receiving 500 or a 100% chance of receiving 100 Syrian Pounds.

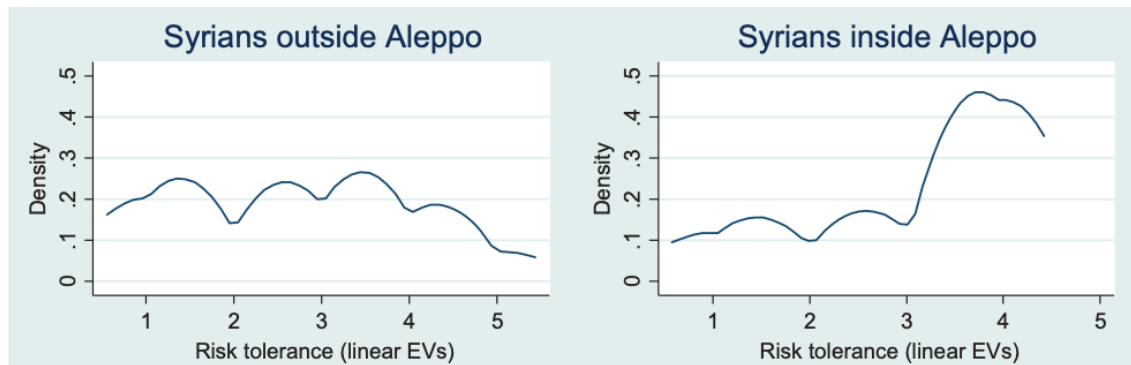


Figure 8: Risk preferences in the choice games (kernel density plots)

Source: Mironova & Whitt (2019)

Figure 6 portrays the elicitation of risk preferences derived from the Eckel-Grossman Choice Game where individuals inside Aleppo demonstrated a significantly higher tolerance to risk than those in Idlib. The difference in risk tolerance between Idlib and Aleppo can be explained by a psychological phenomenon, learned helplessness. It consists of a psychological state in which an individual stops attempting to change a negative situation as they deem their efforts to do so as futile. Individuals in Idlib may exhibit learned helplessness where their inability to make a difference to their environment can cause an increase in risk-aversion with the subsequent decision to flee from the conflict environment. However, individuals in Aleppo are bound by social solidarity and a moral obligation to protect their home. The only instance where this is disrupted is when they are no longer about to sustain themselves thus, they become more risk averse. Moreover, in the instance of the COVID-19 pandemic, Bu et al. (2020) found that those who were quarantined in a region more exposed to COVID-19 were more risk-loving than those quarantined in significantly less-affected areas. This suggests a similar interaction with the proximity to a risk through the subsequent increase in risk-tolerance.

c. Type of Exposure to Conflict

To define the importance of the type of exposure to conflict, Rockmore and Barret's (2022) paper examines the effects on risk preferences through mapping exposure as four separate indices: personally suffered, witnessed, suffered by the respondent's family, and perpetrated by the respondent. Their study is conducted in Uganda following the emergence of the Lord's Resistance Army (LRA) where the total number of children abducted during the conflict is estimated to be 60,000-80,000 (Blattman and Annan, 2010; Lomo and Hovil 2004; Pham et al. 2007). Some abductees were trained to join the LRA thus were forced to perpetrate acts of violence.

	Gains	Losses	Ambiguity
A. Full Sample			
Index of violence received	0.30*** [0.09]	-0.01 [0.18]	0.05 [0.20]
Index of violence witnessed	0.03 [0.14]	-0.15** [0.07]	0.00 [0.15]
Index of violence perpetrated	-0.20 [0.12]	0.10 [0.08]	-0.22* [0.11]
Index of violence suffered by family	-0.21 [0.14]	0.38*** [0.10]	0.11 [0.10]
Abducted (1=yes)	-0.84** [0.40]	0.39 [0.40]	0.34 [0.54]
F-test for equality (3,19)	0.104	0.011	0.125
Observations	427	421	419
B. Abducted Sub-Sample			
Index of violence received	0.43* [0.21]	0.67** [0.28]	0.11 [0.24]
Index of violence witnessed	-0.39** [0.17]	0.08 [0.15]	-0.13 [0.26]
Index of violence perpetrated	-0.06 [0.18]	-0.17 [0.14]	-0.40** [0.15]
Index of violence suffered by family	-0.13 [0.24]	0.14 [0.34]	0.51*** [0.17]
F-test for equality (3,19)	0.093	0.128	0.063
Observations	257	253	252

Table 2: Disaggregated Violent Exposure and Risk Attitudes

Source: Rockmore et al. (2022)

Table 2 portrays that individuals are more risk-taking when receiving violence, significant at the 1% level. Moreover, individuals become more risk-taking when witnessing violence, yet this effect is very marginal. However, when individuals perpetrate violence or indirectly experience violence through a family member, they exhibit strong risk-averse tendencies. The interpretations on the indices of violence differ when considering the abductees individually. They still exhibit

risk-seeking intendencies when receiving violence however, witnessing, perpetrating or indirectly suffering from violence through a family member increase risk-aversion. This is vital as it displays the extent to which conflict affects the individual; the type of exposure is crucial in determining the effects on risk preferences. An individual who indirectly experiences war through a family member may be likely to exhibit risk-averse tendencies due to the fear and anxiety produced as a byproduct. Furthermore, in the case of the abductees, the risk-aversion caused by witnessing or perpetrating acts of violence may be caused by their guilt. Mancini et al. (2004) assess the effects of guilt on risk preferences and found that it increased risk-aversion. Furthermore, abductees are subject to higher rates of depression and where 30 to 90% of child soldiers suffer from PTSD (Rockmore et al. 2016) which is associated with favouring less-risky outcomes. However, when observing the second round of the survey, the effects of abduction appear to diminish thus representing the effects of induced stress and trauma being temporary.

Kibris et al. (2013) conducted a similar experiment in Turkey through quantifying conflict as: the number of deaths witnessed at a soldier's station and a binary indicator for being wounded or having witnessed a death. The proxy for measuring conflict exposure, Exposure to Armed Conflict Environment (ACE), assesses the intensity of conflict at each respondent's location through factoring total number of deaths in deployment districts. Whereas the binary indicator manifests in the form of: Experiences of Armed Violence (TDE). The difference between both measures is that ACE represents the immersion in the conflict environment whereas TDE accounts for the episodes of violence within that environment. Through regressing ACE against the survey, it was found that exposure to a conflict environment reduces an individual's educational attainment by 3.5% thus emphasizing the fact that exposure to conflict irrespective of personal exposure has detrimental effects in the long run. Furthermore, there was a 6% increase in the likelihood of risk aversion and a 10% increase in the likelihood of extreme risk aversion for those who witnessed conflict. However, in contradiction to Rockmore and Barret's paper, it was found

that those who received violence were more likely to be risk averse. The nature of these differences may stem from the Turkish army being conscription based therefore exposure to violence is forced rather than random and uncontrollable. Moreover, the Turkish conscription system is very strict with estimated 14 million men have been drafted through Turkey's military conscription program from 1984 – 2012. The type of conflict an individual is exposed to is crucial in determining their risk attitudes. In the case of Turkey, those that were exposed to intense conflict environments became habituated to risk whereas individuals who had traumatizing experiences while serving in the army exhibited risk-aversion. Moreover, the effects are based on an individual's emotional response. Anger makes people indiscriminately optimistic about their own chances of success (Fischhoff et al., 2005). Raghunathan and Pham (1999) find that sadness increases tendencies to favour low-risk, low-reward options. Contrastingly, Colasante et al. (2017) finds that sadness leads to higher risk aversion through ego depletion, suggesting self-control as being a limited resource.

5. Conclusion

The extent to which exposure to conflict is affected by risk preferences is difficult to state due to the contradictory findings within the literature. However, objectively, risk preferences are definitely altered by conflict especially when considering its psychological impacts. Eckel et al. (2009) and Hanaoka et al. (2015) suggest that the observed disaster-induced decrease in risk aversion is derived from an emotional response. The importance of the link between emotion and the propensity of taking a risk can be seen through anxious and depressive states being linked to risk-aversion. (Heilman et al., 2010; Kusev et al., 2017). Furthermore, the trauma that conflict can induce on an individual through PTSD, anxiety and depression are long-lasting negative effects. In Columbia, the incidence of chronic anxiety is 2.6 times higher for victims than bystanders (Doctors Without Borders, 2010). The exposure on children being arguably the most prevalent piece of evidence displayed within this paper. This is due to

early life traumatic shocks altering the regions in the brain related with risky decision making where Carrion et al (2010) report that paediatric post-traumatic stress can decrease brain volume and lead to abnormalities in the frontal cortex

This paper has assessed the cases of the Burundian and Kenyan post-electoral conflict where despite the contradictions in the findings, both papers portrayed the effects of conflict on risk preferences in contradicting directions yet there was proof of causality.

In the case of Uganda, there is strong evidence regarding how each individual type of conflict is associated to a change in risk preferences. Violence witnessed, violence suffered, violence perpetrated, and violence indirectly suffered are the types of exposure assessed within this paper. Through attaching an emotion to each of these types of exposure, the effects on risk preferences are evident. Violence witnessed represents trauma, associated with an increase in risk-aversion through Bayer et al. (2023). Suffering violence induces feelings of anger, known to increase risk-seeking under the Appraisal Tendency Framework (Han et al., 2007). Perpetrating violence can lead to guilt, assessed by Mancini et al. (2004) who a risk-aversion. Ultimately, indirectly being exposed to violence invokes sadness, which is known to increase risk aversion. There is concrete evidence regarding the changes in a psychological state in response to conflict. Callen et al. (2013) primes individuals with fearful recollections of wars which lead to increases in risk-seeking potentially explained through the habituation effect. Exposure to conflict affects risk preferences where its destruction reduces the proportion of individuals investing in government bonds as well as the share of private sector output as GDP. Furthermore, in the cases of developing countries, conflict affects risk preferences to the greatest extent as the lack of strong institutions in developing countries lead to systemic weaknesses across the entire economy. Governments are obligated to understand the effects of conflict on risk preferences as it tackles a multitude of dimensions with the economy, ranging from the economic agents to the physical infrastructure as well as the financial markets. Moreover, understanding the implications of conflict on mental health can provide the government with an incentive to invest in rehabilitation schemes following the conflict and minimize the long-run consequences.

Yet to say it is just conflict that affects risk preferences is not plausible, rather it is the plethora of exogenous factors that can affect an individual's risk preferences in the smallest to largest of magnitudes. Conflict carries the greatest significance out of the exogenous factors listed within this paper as it is able to take the largest scale in both size and destruction. Yet the true extent to which it does affect risk preferences needs to be considered in future avenues of research.

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