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Does revolution change risk attitudes? Evidence from Burkina Faso

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A popular uprising in 2014, led to a revolution overthrowing the sitting president of Burkina Faso. We investigate if individuals' risk attitudes changed due to this revolution. Specifically, we investigate the impact of the revolution on risk attitudes, by gender, age and level of education. The analysis is based on a unique nationally representative panel Household Budget Survey, which allows us to track the changes in the risk attitudes of the same individuals before, during and after the revolution. Our results suggest that the impact of the revolution is short-term. Individuals become risk averse during the revolution but converge back to the pre-revolution risk attitudes, slightly increasing their risk taking, after the revolution is over. Women are more risk taking than the men after the revolution but are more risk averse during the revolution. In general, older individuals tend to have higher risk aversion than the younger individuals. During the revolution, however, the individuals with higher level of education are less willing to take risk.
(JEL D12, D74, D81, O12, Z10).

In all types of decision making, individuals choose actions which differ in their level of risk taking. This holds true for economic behavior as well. For a long time, the consensus in influential economic models was that individuals have stable preferences over time, which are exogenous and fixed at least in the short term (Stigler and Becker 1977). However, with insight from behavioral economics and psychology (Slovic 1972; Barsky et al., 1997; Byrnes et al., 1999; Weber et al., 2002; Hanoch et al., 2006; Borghans et al., 2008; Almlund et al., 2011), recent empirical economic studies have suggested that individuals risk preferences are domain specific (Dohmen et al., 2011;

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Beauchamp et al., 2017), and can be altered by various general large exogenous shocks, such as natural disasters (Eckel et al., 2009), financial crises (Sahm 2012), and traumatic events from conflicts (e.g., Voors et al., 2012) etc. Yet, there is no consensus about the direction of these exogenous shocks and how they affect risk preferences. Some studies find that experiencing a shock makes the individuals more risk tolerant (Voors et al., 2012), others suggest that individuals become risk averse (Cassar et al., 2017), while some find that women do not change their risk level while men become more risk tolerant (Hanaoka et al., 2018).

We investigate if individual's risk attitudes change by experiencing a large general exogenous shock – a revolution, like the popular uprising of 2014 in Burkina Faso which lead to the overthrow of the sitting president Blaise Compaoré. We further test if the revolution has different impact on the individuals risk attitudes depending on their gender, age and education.

The analyses in this study are based on a large nationally representative Household Budget Survey (HBS) panel covering 31,677 individuals in Burkina Faso. During the implementation of the fourth round of data collection, the revolution took place. As a result, some of the respondents were randomly surveyed before the revolution, while others were randomly surveyed during and after the revolution. This creates a unique panel data where we exploit the timing of the response to our survey through a difference-in-difference approach to identify the effect of revolution on individuals' risk attitudes. This panel structure allows us to track the changes in risk attitudes of the same individuals before, during and after the revolution to control for unobserved individual heterogeneity. It thus provides us with the possibility to examine if individuals were more likely to participate in the uprising (risk seeking) rather than staying indoors (risk averse).

One of the earliest theoretical discussion and most influential examples of social contract theory is in book Leviathan (Hobbes 1651, 2014). He analyzed revolution and its consequences for the society, institutions, different social groups, as well as individuals' social and economic wellbeing in the long run. An additional body of literature focuses on the French, American, Russian and the Iranian revolutions, which have been argued to be the four most influential social upheavals, impacting not only the citizens of their respective country but also the international community (Sorokin 1925; Skocpol 1979; Collins 2001). We understand revolution to be defined as: "a popular uprising that leads to a change in the political regime, which takes place in a relatively short period of time". Our aim is to investigate how a revolution impacts a fundamental determinant of individuals' economic behavior, their risk attitudes. We examine how individuals

differ in their risk taking, during and after a revolution, with respect to their gender, age and education characteristics. To the best of our knowledge, there is no other study that investigates changes in individuals' risk attitudes due to a large political shock like a revolution in a developing country.[1]

Risk preferences can be elicited in multiple ways (for an overview see Charness et al., 2013). Our analysis is based on data that employs a self-reported risk question as used in previous nationally representative surveys such as the German Socio-Economic Panel (SOEP).[2] Earlier studies have presented evidence that this risk measurement has a high validity[3] and sufficient reliability[4]. It is an easy and cost-effective approach to elicit risk preferences in a large representative national survey, which facilitates the reproducibility of the risk measurements by other researchers both over time and across countries. The importance of reliability and reproducibility of scientific findings has been highlighted in recent literature (Dreber et al., 2015 and Camerer et al., 2016).

We find that exposure to the 2014 Burkina Faso revolution, has an impact on individuals' risk attitudes. Individuals are risk averse during the revolution, but converge back to the pre-revolution risk levels and slightly increase their risk taking after the revolution has occurred. Women tend to be more risk taking than the men after the revolution but more risk averse during the revolution. Investigation by age categories reveal that older individuals are more risk averse than the younger individuals, during and after the revolution. Individuals with higher education level are more risk averse during the revolution, however, after the revolution the effect is less clear.

Our results are robust to a number of potential concerns about selection bias. It may be argued that during the revolution, the risk seeking individuals are more likely to participate in the uprising and street protests, while the relatively risk averse individuals may refrain from participation and

[1] Acemoglu et al. (2017) analyze whether the intensiveness of protest in the Tahrir square (during Egypt's 2014 Arab Spring) had any effect on stock prices for firms connected to the group currently in power. They found that the more intense protests in Tahrir Square are associated with lower stock market valuations for firms connected to the group currently in power relative to non-connected firms. However, they do not look at individuals risk attitudes; instead, they focus on stock market valuations.

[2] The same type of risk measurement has been used in previous research, such as in China (Ding et al., 2010; Jin et al., 2017), Germany (Dohmen et al., 2012), Netherlands (Wölbert and Riedl, 2013), Thailand and Vietnam (Liebenehm et al., 2015), Sweden (Beauchamp et al., 2017) and Burkina Faso (Sepahvand and Shahbazian, 2017b, 2018).

[3] The self-reported risk questions used in this study has been proven to capture individuals risk preferences by comparing them to incentivized lottery experiments, in developed countries (e.g. Dohmen et al., 2011; Lönnqvist et al., 2015), emerging countries (e.g. Hardeweg et al., 2013), developing countries and comparatively for 30 countries (Vieider et al., 2015).

[4] The reliability of self-reported risk questions in this study has been analyzed by Sepahvand and Shahbazian (2017a). They show that the reliability is satisfactory and to a large extend comparable to other studies using the same self-reported risk questions.

stay indoors. We verify that this is not the case, and hence there exist no selectivity in terms of risk averse individuals in our sample during the revolution.

In this paper, we make several contributions. Several developing countries are experiencing major political, social and economic changes. Social uprising and revolution creates greater volatility in an individuals' decision making. It increases their risk aversion, which may impact their self-employment, investments and total factor productivity, which in turn may amplify macroeconomic downturns. These results may have important policy relevance for several developing countries and provide insights, filling in the gap into the existing literature on behavioral economics on revolution and individuals' risk attitudes.

The results in the previous empirical literature are ambiguous regarding the direction of the impact of an exogenous shock on risk attitudes. Some of these studies are based on analysis of cross-sectional data, collected directly after an exogenous shock like natural disaster etc.[5] Results from such studies are biased as they fail to capture the impact on those that migrate from an area affected by an exogenous shock such as a natural disaster (attrition). Second, most studies (e.g., Cassar et al., 2017) that employ homogenous and nationally un-representative samples are subject to selection bias. Moreover, earlier literature does not analyze the different types of shocks that may have differential affect on different segments of the population. While exogenous shocks, such as natural disasters and conflicts, are likely to have similar consequence for all individuals; this may not be true for other types of exogenous shocks, such as financial crisis, which create opportunities for the informed investor to benefit from a seemingly negative shock. By analyzing the revolution's impact by gender, age categories and different levels of education, our analysis further contributes by revealing how different categories of individuals may react to a large shock like a revolution. Fourth, previous literature uses different measurements to capture risk preferences. For instance, many studies use different hypothetical lottery questions, some incentivized (Kim and Lee 2014) and others not (Sahm 2012). Others use subjective or self-reported risk questions (Guiso et al., 2013; Necker and Ziegelmeyer 2016) or a combination of self-reported questions with other measures such as, binary-stock/bond-market participation-risk (Malmendier and Nagel, 2011). The different methods of elucidating risk preferences make it difficult to compare the results of these studies. Since our analysis is based on a nationally

[5] Hanaoka et al. (2018) is one of few exceptions.

representative HBS panel, we are better able to address these reliability and comparability issues (refer to Sepahvand and Shahbazian, 2017a for further details).

The paper is structured as follows. Section I describes the revolution of 2014 in Burkina Faso. Section II and III describe the data and the research design. In section III we also specify the model and the identification strategy. The empirical evidence and results are discussed in section IV. The final section concludes.

I. Revolution and risk attitudes

We begin by describing the 2014 revolution in Burkina Faso and provide a framework of how a large exogenous shock like a revolution may lead to changes in the individuals risk attitudes.

A. The revolution in Burkina Faso

A revolution usually has three phases. A before phase, during which the citizens continue to accumulate disagreements with the political establishment over a substantial period of time. Due to the lack of accountability, there exist high levels of corruption and mismanagement of public resources and power. This ultimately leads to a lack of legitimacy of the political regime, under which any particular event may trigger the revolution. In the second phase, a popular uprising takes place with the people gathering and protesting against the accumulated disagreements from the political regime. During the popular uprising, uncertainty is the rule and there is no way of knowing if the popular uprising will be successful in overthrowing of the political regime. It also depends on how much force the political regime is prepared to use in order to uphold its position and how determined and firm the protestors are in their quest for overthrowing the political regime. There are numerous examples of popular uprisings that have not resulted in overthrowing the political regime, such as the green movement of Iran in 2009, Gezi Park protests in Turkey 2013 etc. In the final phase, the popular uprising leads to the overthrow of the dictatorship or the incumbent power.

The popular uprising that led to the 2014 revolution, resulting in the change of the political regime in Burkina Faso, took place within a relatively short period of time of 28th October to 2nd November. The president was re-elected for a second and constitutionally last term in 2010.[6] However, in the hope of staying in power beyond his second term, he had plans to amend the two-

[6] Blaise Compaoré had been in power since 1987, however only his last two elections were under the 1991 constitution as amended in 2000-2002 which limits the presidents to two five-years terms.

term limit set by Article 37 of the constitution. The amendment required a 75 percent majority in the parliament. On October 21, 2014, the Council of Ministers announced that the National Assembly would vote on amending Article 37 on October 21.

In anticipation of popular protests, all schools and universities in the country were closed on 26th October. Initial mobilization started on the 28 October and thousands of citizens were encouraged by the opposition and the civil rights movement to protest in Ouagadougou, the capital of Burkina Faso.[7] The next morning banks, shops and markets reopened, but the opposition leaders and the civil right activists led mass rallies, huge protests and occasional clashes with the security forces. By October 30, the protests had spread to other bigger cities across the country such as Bobo-Dioulasso, Ouahigouya, Koudougou, Fada N'gourma.[8] On October 30 the protests intensified and the street battles between the protestors and the police and the security forces broke out. The building of the National Assembly of the country was attacked and parts of it was set on fire by protestors. Other buildings associated with the president, such as the headquarters of president's party CDP[9] and residences of the president's family, were also attacked. The protestors got closer to the presidential palace and the state television and radio was stormed. In an attempt to control the crowds, the presidential guard and security forces used tear gas and fired gunshots, thereby killing several of the protesters. During the evening, other incidents of violence and arson, like burning tyres and blocking traffic was also reported in Ouagadougou.

A night curfew was imposed by the military but the tension persisted between the protesters and the security forces on October 31. It became evident that president Compaoré did not have the authority to stay in power. In a speech to the nation, Compaoré announced that he will resign and General Honoré Nabéré Traoré was named the next head of state. It was later revealed that the French special forces helped president Compaoré to leave the country. The French president Hollande, explained that France helped Blaise Compaoré in order to prevent a bloodbath.[10] In the

[7] News reports about the event found at: https://www.huffingtonpost.com/2014/10/31/burkina-faso-protest-photos_n_6084474.html (2015-10-31) and https://uk.reuters.com/article/uk-burkina-politics/clashes-at-burkina-faso-protest-against-leaders-plan-to-extend-rule-idUKKBN0IH10920141028 (2014-10-28).

[8] News reports about the event found at: http://www.bbc.com/news/world-africa-29831262 (2014-10-30) ; https://www.theguardian.com/world/2014/oct/30/protesters-storm-burkina-faso-parliament-constitution-vote-president-blaise-compaore (2014-10-30); https://www.reuters.com/article/us-burkina-politics/burkina-army-imposes-interim-government-after-crowd-burns-parliament-idUSKBN0IJ0NZ20141030 (2014-10-30); http://www.bbc.com/news/live/world-africa-29831591 (2014-10-30) and http://forums.ssrc.org/african-futures/2014/12/09/citizens-revolt-in-burkina-faso/ (2014-12-10).

[9] In French: Congrès pour la Démocratie et le Progrès.

[10] News reports about the event found at http://www.aljazeera.com/news/africa/2014/11/african-leaders-tackle-burkina-faso-crisis-201411511173925951 6.html (2014-11-05).

following days, a power struggle ensued within the army and Lieutenant Colonel Yacouba Isaac Zida, seized the opportunity and took power.

In protest, the opposition and the civil right movement called for a large demonstration on November 2 to demand that a civilian government should take power as soon as possible. In order to calm the protest Colonel Zida aligned himself with the protesters and requested the support of the international actors such as the African Union (AU), the Economic Community of West African States (ECOWAS) and France. He also sought support of the domestic players like military chiefs and key spiritual leaders, promising the 3rd November that a national unity government would rule the country within the framework of the constitution as quickly as possible. These actions by Colonel Zida calmed the situation down.

After the revolution, an interim government was put in place with the mandate to prepare the country for national democratic elections. Dr. Michel Kafando, a former vice-president in the United Nations (UN) General Assembly and Burkina Faso's diplomatic representative to the UN, was appointed as its interim president and Colonel Zida as the interim prime minister. A short military coup dissolved the interim government in September 2015. However, it was not successful in gaining power due to the massive pressure from the Burkinabé people and other regional actors, such as ECOWAS and AU. The general elections were held on November 29, 2015, and Roch Marc Christian Kaboré of the People's Movement for Progress won the elections in the first round of voting and was sworn in as President of Burkina Faso on December 29, 2015, thus bringing greater stability to Burkina Faso.

B. Revolution and change in individuals' risk attitudes

Do individuals change their attitudes and become more or less risk averse after exposure to a revolution? Previous research finds that after exposure to natural shocks like an earthquake, men tend to become less risk averse, while there is no significant change in the risk attitude of women (Hanaoka et al., 2018). Gender is one of the most important determinants of willingness to take risk; most previous literature indicates that women tend to report to be less willing to take risk compared to men (e.g., Donkers et al., 2001; Weber et al., 2002; Croson and Gneezy 2009; Dohmen et al., 2011; Cárdenas et al., 2012; Hardeweg et al., 2013; Andersson et al., 2016; Beauchamp et al., 2017; Sepahvand and Shahbazian 2017a). However, some studies do not find any difference between men and women (e.g., Harrison et al., 2007; Fraser-Mackenzie et al., 2014)

or are critical of it (Nelson, 2016).[11] Women made a substantial contribution to the popular uprising and demonstrations, however, women's participation in public affairs is constrained in Burkina Faso.[12]

Age is another important factor. Younger individuals tend to be more risk willing than older individuals, as they have relatively limited responsibilities and commitments (e.g., Bishai 2004; Tanaka et al., 2010; Dohmen et al., 2011; Sepahvand and Shahbazian 2017a). Thus, the effect of the revolution may be different for the risk averse individuals as compared to the risk taking individuals. Table A1 in the Appendix summarizes the review of literature on shock and changes in the individuals' risk attitudes.[13] The results are mixed. The direction of change in risk attitude due to a shock is ambiguous. There are at least three possible reasons for this.

First is the lack of appropriate data. Predicting when to collect data to match an exogenous shock is impossible. Thus, several studies rely on cross-sectional data that by default are after-samples and hence susceptible to selection-bias. For instance, individuals that decide to migrate away from disaster areas may be non-random selection. Only a few studies analyze panel data that follows the same individuals both before and after a shock (Sahm 2012, Guiso et al., 2013, Hanaoka et al., 2018). Hanaoka et al. (2018), being a notable exception that uses a Japanese nationally representative sample.

Second, previous literature has focused on different types of exogenous shocks from natural disaster (Eckel et al., 2009; Cameron and Shah 2013; Hanaoka et al., 2018; Cassar et al., 2017), war or civil war (Voors et al., 2012; Kim and Lee 2015) to financial crises (Sahm 2012; Guiso et al., 2013; Necker and Ziegelmeyer, 2016). The underlying mechanism behind these shocks and their impact on individuals' risk attitudes, need not to be the same. Moreover, different groups in the society may also be affected differently by shocks such as financial crisis or natural disasters. Thus, the direction of change in risk attitudes may move in different direction.

[11] Moreover, previous literature shows that emotions affect risk attitudes, and it can differ by gender. Fessler et al. (2004) show that the emotion of disgust makes women risk averse while anger makes men risk taking.
[12] In 2015 years parliamentary election, women won just 9 percent of the seats (World Development Report 2016).
[13] Besides the literature in Table A1, there is a growing consensus within the recent literature on the influence of social media on social movements that social media does plays a relevant role in social movement such as the Arab revolutions. But their power should not be exaggerated (e.g., Murthy 2013; Brym et al., 2014; Kidd and McIntosh, 2016). Although, it should be mentioned that there are some who argue that social media were instrumental and decisive in allowing the Arab revolutions to occur (e.g., Castells 2012). The new technologies facilities a direct and faster communication between individuals. For instance, the information about Colonel Zida's having aligned himself with the protesters and his actions towards the transition to a civil government, was assisted by social media. The role of social media also becomes important as traditional media, such as television, radio and newspapers, tend to be more influenced by the ruling elite.

Third, the way to elicit risk preferences is also important to address and is discussed later. The studies reviewed in Table A1, use different incentivized lottery games, hypothetical income gambles and subjective or self-reported risk questions. However, it is important to note that these studies investigate risk taking in financial matters, since all lottery games are oriented to be financial games.

Trying to draw causality between an exogenous shock like a revolution and the individual's risk attitude, is a challenging task. There are two approaches that the researcher can take. One is to rely on laboratory experiments on a limited sample of homogenous respondents (such as university students) and analyze the change in their risk attitude due to an induced shock. The other approach analyzes and evaluates changes in individual risk attitudes in large surveys, implemented in the real world after an exogenous shock.

Choosing the appropriate approach to elicit risk preferences depends on the research question. Complex elicitation of risk preferences may work well in a lab experiment with a homogenous sample of graduate students, with access to a computer and a multiple trials method, used to participate in risk experiments. Eliciting risk preferences through incentivized lotteries or hypothetical gambles focus in particular on the risk domain of financial matters and may not be able to capture other risk domains. Moreover, heterogeneity of the individual's financial risk taking elicitated through lottery-based risk questions may also depend on the level of stakes involved. For instance, varying the level of stakes in lotteries changes the level of risk aversion, where the same individual may switch from risk-seeking to risk averse (e.g., Holt and Laury 2002), or become more risk averse when faced with a gain but not with a loss (e.g., Viedier et al., 2015).

Recent literature shows that individuals do not have one underlying risk preference, but instead differ in their risk taking in different domains (e.g. Weber et al., 2002; Hanoch et al., 2006; Dohmen et al., 2011; Lönnqvist et al., 2015; Beauchamp et al., 2017). Schildberg-Hörisch (2018) presents a framework of how an individual's risk preference may change given different possible scenarios, such as what happens with risk preferences given an exogenous shock (like a natural disaster), a temporary variation in emotions and changes over the life-cycle with age (see Appendix Figure A1). However, she finds inconsistent and contradictory results from the emerging field of research of how risk preferences change due to an exogenous shock.

II. Data

We elicit risk preferences through a non-incentivized questionnaire. This is a cost-effective method[14] that captures differences in individuals' risk preferences across different risk domains (Charness et al., 2013). Our analysis is based on a multipurpose Household Budget Survey (HBS), which is a face-to-face national representative panel survey covering 10,800 households spread across the 13 regions of Burkina Faso. The main objective of the HBS is to evaluate whether Burkina Faso has achieved the UN millennium goals, which is why each household was interviewed in four rounds during 2014. The additional module on risk attitudes was added during the third and the fourth round. It was during the fourth round of the survey that the revolution took place. Thus, we can easily identify the changes in the risk attitudes as that the same individuals were surveyed using the same question modules in the third and the fourth round.

The third round was conducted during July-September 2014, whereas the fourth survey round was implemented during October–December 2014. The respondents of the age of 18 years and older in these rounds (3 and 4) were asked the following question to assess their willingness to take risks in general: "How do you see yourself: Are you a person who is fully prepared to take risks or do you try to avoid taking risks? On a scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk. In general?" This self-reported risk question was also employed in the German Socio-Economic Panel, and has been empirically validated through field experiments around the world by comparing it to the incentivized lottery experiments as being an effective way of eliciting a reliable measurement of risk preferences (Dohmen et al., 2011; Lönnqvist et al., 2015; Hardeweg et al., 2013; Vieider et al., 2015).

The unanticipated nature of the revolution combined with the planned implementation of round 4, created a unique data on individuals' risk attitudes collected on a daily basis. Some households in round 4 were surveyed before the 2014 revolution in Burkina Faso began (before October 28, 2014). Others were surveyed during the Burkinabe revolution of 2014 (October 28 to November 2, 2014). The remaining were surveyed after the revolution ended (November 3, 2014, and onwards).

Figure 1 presents the structure of the panel data. The sample that we analyze consists of 31,677 respondents that participated in both the rounds and answered the risk question. 13,086 individuals

[14] The cost of the interview is an important factor in a large survey conducted in the field, as going down in cost (for instance through the use of non-incentivized questionnaires, see Sepahvand 2019 for an conceptual framework) leads to an increase in sample size.

of these individuals answered the risk question before the revolution (i.e., before October 28: October 1-27), 4,571 individuals answered the risk question during the revolution (i.e., between October 28 and November 2), and 14,020 individuals were surveyed after the revolution (i.e., after November 2: 3rd Nov.-31th Dec.).

III. Exogeneity, selection bias and identification strategy

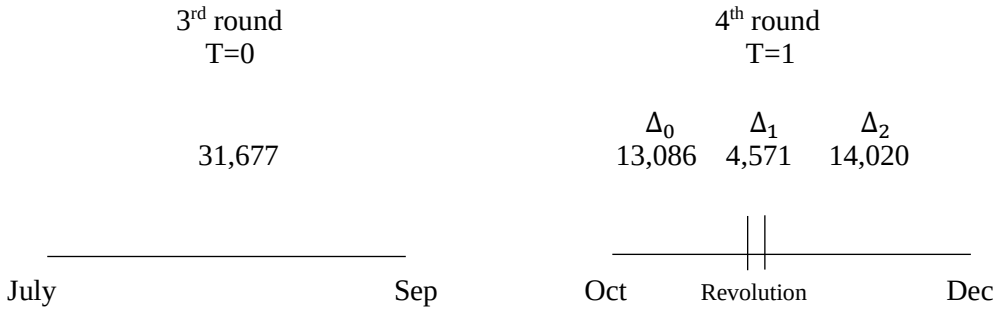
Was the 2014 revolution in Burkina Faso an exogenous shock or was it foreseeable? A key assumption underlying our empirical approach is that the revolution was exogenous with respect to individual risk attitudes. However, any covariance of risk attitudes and exposure to the revolution may be due to non-random attrition in the sample. We argue that the revolution was exogenous and hence the individuals could not have anticipated it and adapted their self-reported risk attitudes to this shock.

The HBS interviews at the household level was randomly scheduled throughout the country before each round, thus there was no way to self-select the timing or the date of the survey. The unanticipated nature of the revolution may also be judged from the fact that none of the foreign governments evacuated their citizens and officials (including the French, Chinese, Americans etc.) to protect them from the expected upheaval of the revolution.[15] This is important, especially since after the tragic events at the US diplomatic compound, in Benghazi and the Ambassor in Libya, several nations decided to evacuate their personal if a violent event was anticipated.[16]

[15] News reports (in French) show that it was only on October 30 2014 at 22.49 hrs that the Belgian embassy passed the security update that no unnecessary trips to Burkina Faso should be taken, and that several embassies suggested to their citizens in Burkina Faso to stay calm and/or contact their embassy. News reports as accessed at: http://www.lefigaro.fr/flash-actu/2014/10/30/97001-20141030FILWWW00433-la-belgique-deconseille-d-aller-au-burkina-faso.php (2014-10-30) and https://www.nytimes.com/2014/10/31/world/africa/burkina-faso-protests-blaise-compaore.html (2014-10-30).

[16] For instance, one of the Authors was living in Burkina Faso at the time of the revolution, in charge of the Swedish statistical aid to Burkina Faso. There were Swedish consultants in Ouagadougou the week before the revolution. If the uprising could have been foreseen or have been anticipated, the Swedish government would not have permitted the consultants to be in the country. Moreover, all Swedish personal would have been evacuated.

Figure 1. The Research Setup.



Note: The Figure shows the basic setup of this study, which exploits the variation in the time-lines of the revolution. We have information of the same 31,677 individuals at two different time points, T={0,1} i.e. the 3rd and 4th round. During the 4th round of data collection of the HBS a revolution occurred. 13,086 individuals answered the risk questions before the revolution (i.e. before October 28: 1-27 October), 4,571 individuals answered the risk questions during the revolution (i.e. between October 28 and November 2), and 14,020 individuals answered after the revolution (i.e. after November 2: Nov. 3 to Dec. 31). As we have a panel structure, the two time points, T={0,1}, allows us to estimate the change in risk attitudes among the same individuals before (Δ_0), during (Δ_1) and after (Δ_2) the revolution.

Furthermore, if the revolution was expected, the financial markets would have reflected it (Acemoglu et al., 2017). The financial markets absorb all publicly available information and investors sentiments. Burkina Faso is the fourth largest gold producer in Africa and gold accounted for 55 percent of its total exports in 2014. Figure 2 presents the stock price of Semafo during 2014, which is a Canadian goldmining company with gold production in Burkina Faso[17], and is registered at the NASDAQ OMX Stockholm in Sweden.[18] It was not until October 29 2014 that the stock price of Semafo exhibited a sudden fall. And after November 3 the stock price recovered and increased rapidly. We take the evolution of Semafo's stock price as evidence that indicates that the financial markets, as other actors, did not foresee the revolution till it actually occurred between 28th October till 2nd November.

[17] Information about Semafo, as accessed at http://www.semafo.com/English/home/default.aspx (2018-01-01).
[18] We have found other companies operating in Burkina Faso and trading with gold, however compared to Semafo they also operate in other neighboring countries. Thus, Semafo has to focus all its risk management on Burkina Faso as it only operates in Burkina Faso.

Figure 2. The evolution of Semafo's stock price, goldmining company.

Note: The Figure shows the stock price of Semafo, which is a Canadian goldmining company with gold production in Burkina Faso. *Source:* NASDAQ OMX Stockholm Sweden, 2018-01-01.

The HBS has an overall household response rate of approximately 95 percent for the third and fourth round respectively, which reveals a low level of attrition. All respondents 18 years and older, who were present in the household at the time of interview, have answered the risk question.[19]

Our identification strategy exploits the exogeneity of the revolution and the timing of the survey. In the absence of an exogenous shock, risk attitudes are assumed to be stable across time. [20] The survey data from the third and fourth round allows us to estimate the change in risk attitudes of the individuals'. In round three of the survey, there is no exposure to the revolution. During the fourth round, as per schedule 13,086 individuals were surveyed before the revolution began. This group is our counterfactual or control group. About 14,020 individuals that were surveyed after the

[19] The interviewers were instructed to ask all individual questions alone with the respondents, since there were other more sensitive modules than the risk module, such as violence, sexual practices etc.

[20] Empirical evidence show that there are temporary fluctuations of risk attitudes, but no trend (for a literature review see Schildberg-Hörisch 2018). However, risk attitude do not need to be constant over the life cycle. Using large representative panel surveys from German (Dohmen et al., 2016) and Burkina Faso (Sepahvand and Shahbazian, 2017a), evidence indicates a negative slow moving trend between willingness to take risk and age.

revolution had ended, constitute our treatment group (treatment group 1). The remaining group of 4,571 individuals, which were surveyed during the revolution is our second treatment group (treatment group 2). The first treatment group is free of selection-bias but the treatment group 2 is susceptible to selection bias as the risk averse individuals may have been present for the scheduled survey while others may have been out protesting.[21]

Attrition in treatment group 2 is investigated further in Table 1. The attrition of the individuals in treatment group 2, is 59. Given the large size of our sample, this implies a very small selection bias. Therefore, the attrition bias is unlikely to affect our results.[22]

We employ the difference-in-difference (DiD) approach to capture the effect of the revolution. We compare the change in the risk attitude over time of the respondents that were surveyed before the revolution in round 4 (control group: T=1, Δ_0) with those in the group after the revolution in round 4 (treatment group 1: T=1, Δ_2). To test the influence of risk attitudes after the revolution has occurred, the model may be written as follows

$$r_{it} = \beta_0 + \beta_1 G + \delta_0 T + \delta_1 T * G + \gamma \mathrm{X}_{it}^{\mathrm{T}} + \varepsilon_{it}, \qquad (1.1)$$

where r_{it} is a measure for our outcome variable, risk attitude of individual *i* at time *t* (3rd or 4th round), T is a dummy variable for the second time period (4th round), the dummy variable G equals 1 for those that were scheduled for survey after the revolution was over. The time period dummy, T, captures aggregate factors that would cause changes in r_{it} in the absence of the revolution. The coefficient of interest, δ_1, captures the DiD effect[23] and hence the impact of the revolution on the outcome individual risk attitude variable after the revolution has occurred. $\mathrm{X}_{it}^{\mathrm{T}}$ includes gender, age and other individual-specific control variables.

The differences-in-difference estimate is

$$\widehat{\delta_1} = \left(\bar{r}_{T2,2} - \bar{r}_{T2,1}\right) - \left(\bar{r}_{C,2} - \bar{r}_{C,1}\right), \qquad (1.2)$$

[21] The HBS is a household survey, it only interviews the household members who are present at the time of interview.
[22] As presented in Table 1, the attrition in the control group and treatment group 1 are also low.
[23] δ_1 multiplies the interaction term, $T * G$, which is the same as a dummy variable equal to one for those observations in the treatment group in the second time period (4th round).

where $\bar{r}_{T2,1}$ denote the sample mean of r_{it} for the treatment group in the first time period, and $\bar{r}_{T2,2}$ is the mean of r_{it} for the treatment group in the second period after the revolution was over. $\bar{r}_{C,1}$ and $\bar{r}_{C,2}$ are defined similarly for the control group.[24]

The individuals were also surveyed during the revolution, the difference-in-difference approach is employed to capture the effect on the risk attitudes during the revolution. This is done by comparing the change in the risk attitude of the respondents before the revolution (control group: T=1, Δ_0) with those respondents surveyed during the period of the revolution from October 28 to November 3 2014 (treatment group 2: T=1, Δ_1).[25]

Table 1. *The attrition of individuals, between 3rd and 4th round*.

	Respondents in the 4th round (T=1)	
	Both in 3 & 4	Missing in the 4th round
Before revolution	4.112 (0.019)	4.413 (0.181)
Obs.	13,086	133
During revolution	4.089 (0.032)	4.356 (0.266)
Obs.	4,571	59
After revolution	4.001 (0.019)	4.096 (0.044)
Obs.	14,020	647

Note: The numbers in this table included those respondents for those households who were surveyed in the 4th round before, during after the revolution (Oct. 28 to Nov. 2) and for the same households in the control group, i.e. in the 3rd round. Mean values and number of observations for all individual's general risk taking are presented. The "Missing in the 4th round" column are those individuals that were present in the 3rd round but not when the same household was interviewed before, during and after the revolution in the 4th round.

A. Pre-trends for the treatment and control groups

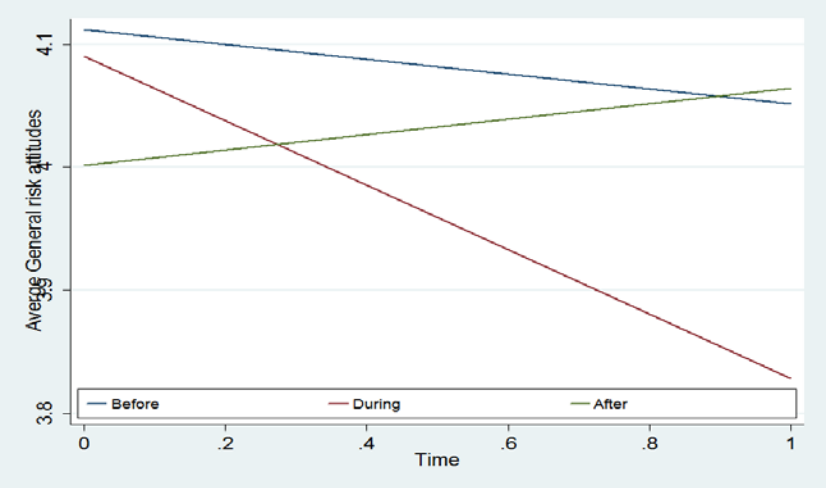
The parallel trend assumption is the main assumption when implementing a DiD approach. This assumption states that in the absence of a treatment, the trends in outcome would be similar between the treatment and control groups. We can examine if the pre-trends are the same for the treatment and control groups. Optimally, we would want to go back as further as we can to investigate the pre-trends. Our data allows us to go back to the 3rd survey round of 2014 and

[24] $\widehat{\delta_1}$ in equation (1.2) captures the effect of Δ_2 - Δ_0, refer to Figure 1.

[25] The influence as the revolution was occurring on risk attitudes can then be modelled as follows: $r_{it} = \beta_0 + \beta_1 G + \delta_0 T + \delta_1 T * G + \gamma \mathrm{X}_{it}^{\mathrm{T}} + \varepsilon_{it}$ (2.1), where the differences-in-difference estimate is $\widehat{\delta_1} = \left(\bar{r}_{T1,2} - \bar{r}_{T1,1}\right) - \left(\bar{r}_{C,2} - \bar{r}_{C,1}\right)$ (2.2). $\widehat{\delta_1}$ in equation (2.2) captures the effect of Δ_1 - Δ_0, refer to Figure 1. The dummy variable G in (2.1.) equals 1 for those that were scheduled for survey during the revolution.

examine the pre-trend to when the revolution occurs in the 4th survey.[26] The pre-trends are presented in Figure 3, where the average general risk attitudes in our data during round 3 are similar for the respondents in the control group, treatment group 1 (after the revolution) and treatment group 2 (during the revolution).

Figure 3. Average General risk attitudes across time.



Note: The Figure shows the average general risk attitudes for the control, treatment and 'during revolution' group over time. Time 0 marks round three of the survey, whereas time 1 marks the fourth survey round.

In the 4th round we see a clear divergence in the average risk attitudes, between the control and treatment group 2, indicating that the respondents surveyed during the revolution have a sharp decline in their risk attitudes. The average risk attitudes for the treatment group 1 compared to the control group, converge in the 4th round.

To examine this further, we pool the data from the 3rd and 4th round and estimate the following regression model[27]:

[26] Compared to the only study we know about so far, using a somewhat similar identification strategy with two time periods to investigate the impact of a natural disaster on risk taking in Japan (Hanaoka et al., 2018), the survey questions used in Burkina Faso on risk attitudes between the different time periods are exactly the same. Hanaoka et al.'s (2018) survey question about risk taking in one round was constructed in terms of multiple choices and in the next round asked the respondents to state a monetary value of their willingness to pay.

[27] Several studies have analyzed the validity of the DiD assumptions and provided methods to test it. Angrist and Krueger (1999) suggest that it is essential to validate that trends do not differ before treatment. Athey and Imbens (2006) and Bonhomme and Sauder (2011) generalize the approach and identify the entire counter-factual distribution of potential outcomes. Donald and Lang (2007) and Bertrand et al. (2004) address problems with standard methods for computing standard errors, whereas Abadie and Imbens (2006) and Blundell et al. (2004) suggest adjusting for exogenous covariates using propensity score methods.

$$r_{it} = \alpha_0 + \beta_1 R_b + \beta_2 R_a + \gamma_1 t_1 + \ldots + \gamma_6 t_6 + \delta_1 R_b t_1 + \ldots + \delta_3 R_b t_3 + \delta_4 R_a t_4 + \ldots + \delta_6 R_a t_6 + \beta_t \mathrm{X}_i^{\mathrm{T}} + \varepsilon_{it}, \quad (3)$$

where r_{it} is the risk attitude of individual *i* in day *t*, R_b and R_a are dummy variables for the time before and after the revolution has occurred, $t_1, \ldots, t_6$ are day fixed effects with 7 days time interval per variable[28] that are interacted with R_b and R_a, and the vector $\mathrm{X}_i^{\mathrm{T}}$ is a set of individual and household-level controls for age, gender, education etc. The coefficients of interest are $\delta_1, \ldots, \delta_6$. These interaction terms measure whether individuals experienced a change in their risk attitudes during and after the revolution and if there is any evidence of diverging trends in risk attitudes before the revolution. We omit the time period during the revolution so that the interaction terms measure changes in risk attitudes relative to before and after the revolution. Therefore, the interaction terms, $R_b t_1, \ldots, R_b t_3$ tests for differential trends for before the revolution and $R_a t_4, \ldots, R_a t_6$ for the treatment effect after the revolution has occurred. Figure A2 Panel A in the Appendix presents the point estimates with 95 percent confidence intervals. Figure A2 shows that risk attitudes decline significantly in the time period when the revolution occurred (during) and then converges back to the same levels (and slightly increases) after the revolution. There is no evidence of diverging trends in the pre-treatment period, i.e. before the revolution. As a robustness check equation (3) is also estimated with different variants of time intervals for the day fixed effect variables $t_1, \ldots, t_6$.

Further examination of how the trends in the risk attitudes move before, during and after the revolution, is revealed in Figure A3 of the Appendix that illustrates the average change per day in risk attitudes between the 4th and the 3rd round. Figure A3 confirms the pattern observed in Figure 3, the average changes in risk attitudes before the revolution starts (before October 28) are similar and indicates temporary variations. During the revolution (October 28 until November 2) there is a decrease in risk compared to the 3rd round, and after the revolution (November 3 and onwards) there is a converging pattern back to the pre-revolution risk levels, and a slow moving increase in risk taking.

[28] The $t_1, \ldots, t_6$ variables include 7 day intervals per variable: $more\ than$ 15, $8-14$ and $1-7$ $days\ before\ the\ revolution\ has\ occured, and$ $1-7$, $8-14$ and $more\ than$ 15 $days\ after$ the revolution has occurred. We have also as robustness check estimated the same model with 4 and 3 day intervals per variable. The reason we don't show for 1 day interval, is that the cell sizes become to small, hence noisy estimates.

While we want to go back as further as possible to investigate the pre-trends for the control and treatment groups, as mentioned earlier the best we can trace back to in individual's risk attitudes is the 3rd survey round of 2014. However, as our panel survey is conducted during four rounds in 2014, one variable of interest that is measured during all four rounds, and is considered an important determinant of risk taking, is the household's food and non-food consumption behaviour.[29] Figure A4 illustrates the average food (Panel A) and non-food (Panel B) consumption for round 1 (conducted during January-Mars 2014), round 2 (conducted during April-June 2014) and the 3rd round for the control, treatment group 1 (after revolution) and treatment group 2 (during revolution). Figure A4 shows that that the pre-trends in average consumption levels in FCFA[30] are similar for the control and treatment groups across time.

IV. Impact of revolution on individual risk attitudes

In this section we investigate whether risk attitudes vary with exposure to revolution. We primarily focus on the impact of the revolution on the two different treatment groups: those that were surveyed after the revolution was over (treatment group 1) and others that were surveyed during the revolution (treatment group 2). Investigating this further we also examine if this impact on risk attitudes varies with gender, age, education and long-term impact. We include several individual and households characteristics as controls: gender, age, education, yearly consumption (food and non-food), civil status, household size, hours worked, employment status, health status, religious belief, level of poverty, having access to a bank account, residential zone (urban/rural), subjective poor, illiteracy, employment sector and food shortage.[31] The descriptive statistics are reported in the Appendix Table A2 and suggest considerable heterogeneity in the survey data.

[29] Consumption is a relevant variable to investigate, as it has been shown to highly correlate with risk taking behavior (for a literature review see de Walque, 2014; and for Burkina Faso see Sepahvand and Shahbazian 2017a).

[30] FCFA, franc CFA is the currency used in Burkina Faso and some other West and Central African countries. The abbreviation CFA stands for African Financial Community (Communauté Financière Africaine). The exchange rate with the euro is fixed (1 euro = 655.957 XOF).

[31] The presence of unobserved individual characteristics in terms of differential risk preference formation in response to past events could be an econometric issue. For instance, individuals in Burkina Faso that have experienced severe shocks in previous years, such as local uprising in their village or community might form different attitudes towards risk that result in unobserved differences in risk preferences. Also the degree of previous shocks could be correlated with the intensity of the revolution in their community, leading to omitted variable bias if we were to estimate the impact of revolution on risk attitudes with cross sectional data as there would be a lack of baseline levels of risk preferences, which would likely give biased estimates. However, as we fortunately have panel data, we can through our difference-in-difference specification isolate the effects of unobserved individual characteristics.

A. Revolution impact on risk attitude after and during the revolution

The results for the relationship between revolution and risk attitudes are presented in Tables 2 - 5. In Table 2 we report the results of our DiD estimates. We find that after the revolution the individuals become more risk taking as compared to the control group. Results from Table 2 (column 2) show that there is a substantial decrease (of about 0.10 standard deviation) in the risk attitudes during the revolution, as compared to before. Our results suggest that during large shocks, like a revolution when the level of uncertainties are high, individuals become more risk averse. The psychological literature argues that experiences of an extreme event or strong emotions influence risk preferences (for literature review see Loewenstien et al., 2003). However, the direction of the change in risk attitudes depends on the type of shock. For instance, if the individuals are faced with a high probability of loss, they are more willing to take risk as compared to a situation of a high possible gain (Tversky and Kahneman, 1992). After the revolution is over, we find that the risk attitudes recovered back to the pre-revolution levels and even showed a slight increase in risk taking. This increase in the risk taking behaviour may be due to the optimism inspired by the new regime or related to the fact that individuals are adjusting to the decline in the political uncertainty and adapting to the new regime. Our results support some of the previous literature dealing with conflicts that investigate the effect of civil war on risk attitudes. Voors et al. (2012) also find that in post-conflict situations, individuals become more risk taking.

Table 2. *Difference-in-difference results for changes in general risk attitudes.*

VARIABLES	(1) During	(2) During	(3) After	(4) After
Revolution Impact	**-0.10** **(0.03)**	**-0.10** **(0.03)**	**0.06** **(0.02)**	**0.06** **(0.02)**
Controls	NO	YES	NO	YES
Constant	0.02 (0.02)	-0.23 (0.33)	0.02 (0.02)	-0.48 (0.25)
R-squared	0.001	0.111	0.000	0.111

Note: Shows the DiD estimates for individuals general risk attitudes during and after the revolution. The dependent variable is measured on a scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk in general, standardized to mean zero and standard deviation one. The individual's gender, age, education, yearly consumption (food and non-food) civil status, household size, hours worked, employment status, health status, religious belief, level of poverty, having access to a bank account, residential zone (urban/rural), subjective poor, illiteracy, employment sector and food shortage are included as controls. Standard errors in parentheses are clustered at the household level.

Table 3. *Difference-in-difference results for changes in general risk attitudes, by gender.*

VARIABLES	(During) Female	(During) Male	(After) Female	(After) Male
Revolution Impact	**-0.11**	**-0.08**	**0.07**	**0.04**
	(0.03)	**(0.03)**	**(0.02)**	**(0.03)**
Controls	YES	YES	YES	YES
Constant	-0.03	-0.96	-0.03	-1.68
	(0.36)	(0.39)	(0.28)	(0.31)
R-squared	0.054	0.066	0.044	0.070

Note: Shows the DiD estimates for individuals general risk attitudes during and after the revolution for females and males separately. The dependent variable is the same as in Table 2, i.e. risk taking. The individual's age, education, yearly consumption (food and non-food) civil status, household size, hours worked, employment status, health status, religious belief, level of poverty, having access to a bank account, residential zone (urban/rural), subjective poor, illiteracy, employment sector and food shortage are included as controls. Standard errors in parentheses are clustered at the household level.

We further investigate if the revolution impacts men and women's risk attitudes differently in Table 3. Previous research has shown that there exists a difference in the levels of risk attitudes between men and women due to shocks such as earthquakes and natural disasters (Eckel et al., 2009; Hanaoka et al., 2018), while others find no evidence of gender differences in risk attitudes (Harrison et al., 2007; Nelson, 2016). Table 3 presents the DiD estimates for the treatment groups by gender. We observe that women are more risk taking as compared to men, after the revolution. However, during the revolution they are more risk averse. It may be argued that since the political representation of women is quite low in Burkina Faso (World Development Report, 2016) and they are limited to the vicinity of their homes, the revolution would not affect their daily lives as much. Thus, while women are risk averse during the revolution, they may perceive the regime change as a positive development, which may reflect as an increase in their risk attitude. Hanaoka et al. (2018), find that men who lived in the areas affected by an earthquake became more risk tolerant. Our results show that men's risk taking increases after the revolution, though it is not statistically significant. However, previous research has shown that it exist a positive assortative mating of couples in terms of risk attitudes in Burkina Faso (Sepahvand and Shahbazian, 2017b) which might reflect the increase in women's risk taking after the revolution. During the revolution we find that both men and women become more risk averse.

Risk taking has been shown to decrease with age (Bishai 2004; Tanaka et al., 2010). Sepahvand and Shahbazian (2017a) show that individuals in Burkina Faso become more risk averse by age, with a large difference in risk taking between the youngest and the oldest cohorts. Almost half of the population in Burkina Faso is under 20 years old (INSD, 2015). Thus, it is interesting to examine if the revolution has a different impact on the young as compared to the older Burkinabés' risk attitudes. The DiD estimates during and after the revolution, by different age categories are presented in Table 4. Our results suggest that during the revolution the older individuals are more risk averse as compared to before. In the after revolution phase, the older individuals are less risk taking as compared to the younger categories. These results are consistent with the previous literature. Irrespective of the timing of the survey with respect to the revolution (whether it is the during revolution or after revolution phase), the older individuals are as a rule more risk averse as compared to the younger ones.

Previous studies on risk attitudes have shown that there exists a positive relationship between the level of education and risk taking (e.g., Dohmen et al., 2011). Cassar et al., (2017) finds a positive relationship between the level of education and risk taking after a tsunami. Table 5 presents the DiD estimates for during and after the revolution phases, for different levels of education. During the revolution, the individuals with higher education are more risk averse. After the revolution the effect is less clear. Those with secondary education are more risk taking as compared to individuals with no or low level of education. These results are similar to Cassar et al. (2017).[32] Higher education allows the individuals to access information and analyze it more accurately as compared to those with less education, which in turn may influence their risk taking behaviour.

To summarize: our results show that individuals level of risk aversion increases during the revolution, but converges back to the pre-revolution level with a slight increase after the revolution has occurred. The level of risk aversion also varies by gender, age and level of education during and after the revolution. This contributes to the understanding of how a large exogenous shock impacts individuals risk attitudes.

[32] However, the coefficient estimates from the Cassar et al. (2017) is not significant, which might be related to reduced statistical power due to the small sample size (278 individuals).

Table 4. *Difference-in-difference results during and after the revolution for changes in general risk attitudes, by age.*

VARIABLES	(During) 18-29	(During) 30-39	(During) 40-49	(During) 50-59	(During) 60+	(After) 18-29	(After) 30-39	(After) 40-49	(After) 50-59	(After) 60+
Revolution Impact	**-0.08**	**-0.11**	**-0.06**	**-0.09**	**-0.16**	**0.06**	**0.04**	**0.10**	**0.07**	**0.01**
	(0.04)	**(0.04)**	**(0.05)**	**(0.06)**	**(0.05)**	**(0.03)**	**(0.03)**	**(0.04)**	**(0.04)**	**(0.05)**
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constant	0.52	-0.72	-0.16	-0.40	-1.77	0.05	-0.83	-0.30	-0.93	-1.77
	(0.44)	(0.48)	(0.60)	(0.62)	(0.55)	(0.34)	(0.39)	(0.47)	(0.50)	(0.55)
R-squared	0.085	0.107	0.101	0.116	0.114	0.078	0.108	0.102	0.103	0.114

Note: Shows the DiD estimates for individuals general risk attitudes during the revolution for different age categories. The dependent variable is measured on a scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk in general, standardized to mean zero and standard deviation one The individual's gender, education, yearly consumption (food and non-food) civil status, household size, hours worked, employment status, health status, religious belief, level of poverty, having access to a bank account, residential zone (urban/rural), subjective poor, illiteracy, employment sector and food shortage are included as controls. Standard errors in parentheses are clustered at the household level.

Table 5. *Difference-in-difference results during and after the revolution for changes in general risk attitudes, by education*.

VARIABLES	(During) Low/non	(During) Primary	(During) Secondary	(During) University	(After) Low/non	(After) Primary	(After) Secondary	(After) University
Revolution Impact	**-0.08**	**-0.12**	**-0.14**	**-0.37**	**0.05**	**0.04**	**0.11**	**0.06**
	(0.03)	**(0.07)**	**(0.06)**	**(0.19)**	**(0.02)**	**(0.05)**	**(0.05)**	**(0.12)**
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Constant	-0.42	0.13	0.20	4.00	-0.46	-0.97	-0.84	3.39
	(0.35)	(0.78)	(0.76)	(2.14)	(0.27)	(0.62)	(0.63)	(1.69)
R-squared	0.110	0.086	0.073	0.241	0.118	0.091	0.081	0.155

Note: Shows the DiD estimates for individuals general risk attitudes during the revolution for different levels of education. The dependent variable is measured on a scale from 1 to 10, where 1 = not at all willing to take risk and 10 = very willing to take risk in general, standardized to mean zero and standard deviation one. The individual's gender, age, yearly consumption (food and non-food), civil status, household size, hours worked, employment status, health status, religious belief, level of poverty, having access to a bank account, residential zone (urban/rural), subjective poor, employment sector and food shortage are included as controls. Standard errors in parentheses are clustered at the household level.

V. Discussion and conclusions

We investigate the changes in the individuals' risk attitudes due to a large exogenous shock, the popular uprising of 2014 in Burkina Faso, which led to the overthrow of president Compaoré's regime. We further examined if the impact of the revolution on the individuals' risk attitudes is heterogeneous and varies with gender, age and level of education of the individual.

The analyses is based on the nationally representative HBS panel in Burkina Faso, where the pre-scheduled interviews in the fourth round were in the process of being surveyed when the revolution took place (October 28 to November 2, 2014). This unique data allows us to exploit the timing of the response in our survey to identify the effect of the Burkina Faso 2014 revolution on the individuals' risk attitudes. In addition to comparing the risk attitudes between the control group before and the treatment group after the revolution (1), we also analyze the impact of the revolution by comparing the group of respondents surveyed during the revolution (treatment group 2), by employing a DiD approach.

Our empirical evidence shows that the exposure to the revolution did in fact have an impact on the individuals' risk attitudes. Respondents converge back but become slightly more risk taking after the revolution, whereas, during the revolution they are more risk averse. We further find that women are more risk taking than the men after the revolution but more risk averse during the revolution. Investigation by age categories reveal that older individuals (both during and after the revolution) were more risk averse in their attitude, than the younger individuals. During the revolution, the individuals with higher education are more risk averse, however after the revolution the results are ambiguous.

Our results show that while the individuals' risk attitudes become risk averse, during the revolution, they converge back to their pre-revolution level and slightly increase after the revolution is over. However, is this impact transitory? Our reference period captures the last two quarters of 2014, it would be important for future research to understand how a large exogenous shock, a revolution, impacts individual's risk attitudes in the long-term. A long-term impact would imply that the shock might have a persistent impact on risk taking and hence decision making. One notable exception is a similar study by Hanaoka et al. (2018), which finds persistent results over a long-term period where men who live in the areas affected by an earthquake are still risk tolerant five years after the event has occurred.

REFERENCES

Abadie, Alberto, and Guido W Imbens. 2006. "Large sample properties of matching estimators for average treatment effects." *Econometrica* 74(1):235-67.

Acemoglu, Daron, Tarek A Hassan, and Ahmed Tahoun. 2017. "The power of the street: Evidence from egypt's arab spring." *The Review of Financial Studies* 31(1):1-42.

Andersson, Ola, Håkan J Holm, Jean-Robert Tyran, and Erik Wengström. 2016. "Risk aversion relates to cognitive ability: Preferences or Noise?" *Journal of the European Economic Association* 14(5):1129-54.

Angrist, Joshua D, and Alan B Krueger. 1999. "Empirical strategies in labor economics." Pp. 1277-366 in *Handbook of Labor Economics*: Elsevier.

Athey, Susan, and Guido W Imbens. 2006. "Identification and inference in nonlinear difference- in-differences models." *Econometrica* 74(2):431-97.

Barsky, Robert B, F Thomas Juster, Miles S Kimball, and Matthew D Shapiro. 1997. "Preference parameters and behavioral heterogeneity: An experimental approach in the health and retirement study." *The Quarterly Journal of Economics* 112(2):537-79.

Beauchamp, Jonathan P, David Cesarini, and Magnus Johannesson. 2017. "The psychometric and empirical properties of measures of risk preferences." *Journal of Risk and uncertainty* 54(3):203-37.

Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan. 2004. "How much should we trust differences-in-differences estimates?" *The Quarterly Journal of Economics* 119(1):249-75.

Bishai, David M. 2004. "Does time preference change with age?" *Journal of Population Economics* 17(4):583-602.

Blundell, Richard, Monica Costa Dias, Costas Meghir, and John Van Reenen. 2004. "Evaluating the employment impact of a mandatory job search program." *Journal of the European Economic Association* 2(4):569-606.

Bonhomme, Stéphane, and Ulrich Sauder. 2011. "Recovering distributions in difference-in-differences models: A comparison of selective and comprehensive schooling." *Review of Economics and Statistics* 93(2):479-94.

Borghans, Lex, Angela Lee Duckworth, James J Heckman, and Bas Ter Weel. 2008. "The economics and psychology of personality traits." *Journal of Human Resources* 43(4):972-1059.

Brym, Robert, Melissa Godbout, Andreas Hoffbauer, Gabe Menard, and Tony Huiquan Zhang. 2014. "Social media in the 2011 Egyptian uprising." *The British journal of sociology* 65(2):266-92.

Byrnes, James P, David C Miller, and William D Schafer. 1999. "Gender differences in risk taking: A meta-analysis." American Psychological Association.

Camerer, Colin F, Anna Dreber, Eskil Forsell, Teck-Hua Ho, Jürgen Huber, Magnus Johannesson, Michael Kirchler, Johan Almenberg, Adam Altmejd, and Taizan Chan. 2016. "Evaluating replicability of laboratory experiments in economics." *Science* 351(6280):1433-36.

Cameron, Lisa, and Manisha Shah. 2015. "Risk-taking behavior in the wake of natural disasters." *Journal of Human Resources* 50(2):484-515.

Cassar, Alessandra, Andrew Healy, and Carl Von Kessler. 2017. "Trust, risk, and time preferences after a natural disaster: experimental evidence from Thailand." *World Development* 94:90-105.

Castells, Manuel. 2015. *Networks of outrage and hope: Social movements in the Internet age*: John Wiley & Sons.

Charness, Gary, Uri Gneezy, and Alex Imas. 2013. "Experimental methods: Eliciting risk preferences." *Journal of Economic Behavior & Organization* 87:43-51.

Collins, Randall. 2001. "Weber and the Sociology of Revolution." *Journal of Classical Sociology* 1(2):171-94.

Croson, Rachel, and Uri Gneezy. 2009. "Gender differences in preferences." *Journal of Economic literature* 47(2):448-74.

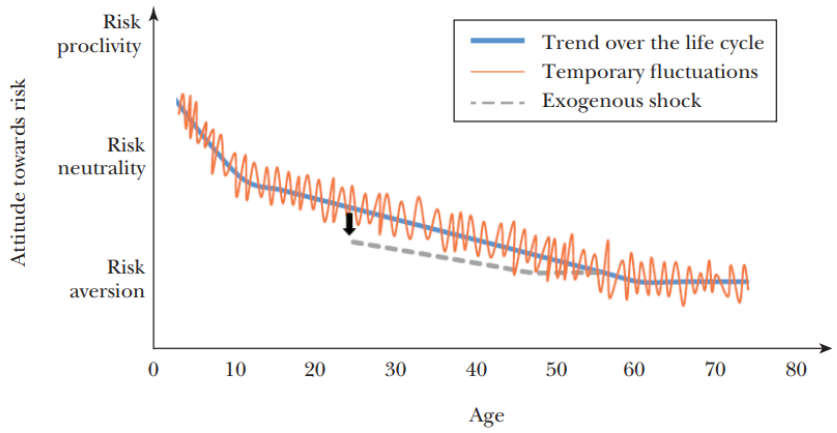
de Walque, Damien. 2013. *Risking your health: causes, consequences, and interventions to prevent risky behaviors*: World Bank Publications.
Ding, Xiaohao, Joop Hartog, and Yuze Sun. 2010. "Can we measure individual risk attitudes in a survey?".
Dohmen, Thomas, Armin Falk, David Huffman, Uwe Sunde, Jürgen Schupp, and Gert G Wagner. 2011. "Individual risk attitudes: Measurement, determinants, and behavioral consequences." *Journal of the European Economic Association* 9(3):522-50.
Dohmen, Thomas, Armin Falk, David Huffman, and Uwe Sunde. 2012. "The intergenerational transmission of risk and trust attitudes." *The Review of Economic Studies* 79(2):645-77.
Dohmen, Thomas, Hartmut Lehmann, and Norberto Pignatti. 2016. "Time-varying individual risk attitudes over the Great Recession: A comparison of Germany and Ukraine." *Journal of Comparative Economics* 44(1):182-200.
Donald, Stephen G, and Kevin Lang. 2007. "Inference with difference-in-differences and other panel data." *The review of Economics and Statistics* 89(2):221-33.
Donkers, Bas, Bertrand Melenberg, and Arthur Van Soest. 2001. "Estimating risk attitudes using lotteries: A large sample approach." *Journal of Risk and uncertainty* 22(2):165-95.
Dreber, Anna, Thomas Pfeiffer, Johan Almenberg, Siri Isaksson, Brad Wilson, Yiling Chen, Brian A Nosek, and Magnus Johannesson. 2015. "Using prediction markets to estimate the reproducibility of scientific research." *Proceedings of the National Academy of Sciences* 112(50):15343-47.
Eckel, Catherine C, Mahmoud A El-Gamal, and Rick K Wilson. 2009. "Risk loving after the storm: A Bayesian-Network study of Hurricane Katrina evacuees." *Journal of Economic Behavior & Organization* 69(2):110-24.
Fessler, Pirmin, and Alyssa Schneebaum. 2012. "Gender and educational attainment across generations in Austria." *Feminist Economics* 18(1):161-88.
Fraser-Mackenzie, Peter, Ming-Chien Sung, and Johnnie EV Johnson. 2014. "Toward an Understanding of the Influence of Cultural Background and Domain Experience on the Effects of Risk-Pricing Formats on Risk Perception." *Risk Analysis* 34(10):1846-69.
Guiso, Luigi, Paola Sapienza, and Luigi Zingales. 2013. "Time varying risk aversion." National Bureau of Economic Research.
Hanoch, Yaniv, and Michaela Gummerum. 2011. "A comparison of the risk-taking behaviors of prisoners and non-prisoners." *Journal of Behavioral Decision Making* 24(4):431-42.
Hanaoka, Chie, Hitoshi Sheigeoka and Yasutora Watanabe. 2018. "Do Risk Preferences Change? Evidence from the Great East Japan Earthquake." *American Economic Journal: Applied Economics* 10(2):298-330.
Harrison, Glenn W, Morten I Lau, and E Elisabet Rutström. 2007. "Estimating risk attitudes in Denmark: A field experiment." *The Scandinavian Journal of Economics* 109(2):341-68.
Helmke, Gretchen, and Steven Levitsky. 2004. "Informal institutions and comparative politics: A research agenda." *Perspectives on politics* 2(4):725-40.
Hobbes, Thomas. 1651. "Leviathan." *Scolar P., 1969, University of Michigan* :1-396.
Hobbes, Thomas. 2014. "Leviathan." *Wordsworth Editions Ltd* :1-592.
Holt, Charles A, and Susan K Laury. 2002. "Risk aversion and incentive effects." *American Economic Review* 92(5):1644-55.
Jin, Jianjun, Rui He, Haozhou Gong, Xia Xu, and Chunyang He. 2017. "Farmers' Risk Preferences in Rural China: Measurements and Determinants." *International journal of environmental research and public health* 14(7):713.
Kidd, Dustin, and Keith McIntosh. 2016. "Social media and Social movements." *Sociology Compass* 10(9):785-94.
Kim, Young-Il, and Jungmin Lee. 2014. "The long-run impact of a traumatic experience on risk aversion." *Journal of Economic Behavior & Organization* 108:174-86.
Liebenehm, Sabine, Hermann Waibel, and L Menkhoff. 2015. "Changes in risk attitudes and vulnerability to idiosyncratic and covariate shocks-Evidence from panel household data in Thailand and Vietnam." *Unpublished manuscript, Leibniz University Hannover*.

Lipsky, Michael. 1968. "Protest as a political resource." *American political science review* 62(4):1144-58.
Loewenstein, George, Daniel Read, and Roy F Baumeister. 2003. *Time and decision: Economic and psychological perspectives of intertemporal choice*: Russell Sage Foundation.
Lönnqvist, Jan-Erik, Markku Verkasalo, Gari Walkowitz, and Philipp C Wichardt. 2015. "Measuring individual risk attitudes in the lab: Task or ask? An empirical comparison." *Journal of Economic Behavior & Organization* 119:254-66.
Malmendier, Ulrike, and Stefan Nagel. 2011. "Depression babies: do macroeconomic experiences affect risk taking?" *The Quarterly Journal of Economics* 126(1):373-416.
Murthy, Dhiraj. 2013. *Twitter: Social communication in the Twitter age*: John Wiley & Sons.
Necker, Sarah, and Michael Ziegelmeyer. 2016. "Household risk taking after the financial crisis." *The Quarterly Review of Economics and Finance* 59:141-60.
Nelson, Julie A. 2016. "Not-so-strong evidence for gender differences in risk taking." *Feminist Economics* 22(2):114-42.
Sahm, Claudia R. 2012. "How much does risk tolerance change?" *The quarterly journal of finance* 2(04):1250020.
Schildberg-Hörisch, Hannah. 2018. "Are Risk Preferences Stable?" *Journal of Economic Perspectives* 32(2):135-54.
Sepahvand, Mohammad H, and Roujman Shahbazian. 2017a. "Individual's Risk Attitudes in sub-Saharan Africa: Determinants and Reliability of Self-reported Risk in Burkina Faso." Working paper 2017:11, Uppsala Univerity, Department of Economics.
—. 2017b. "Intergenerational Transmission of Risk Attitudes: The Role of Gender, Parents and Grandparents in Burkina Faso." Working paper 2017:13, Uppsala Univerity, Department of Economics.
—. 2018. "Sibling Correlation in Risk Attitudes: Evidence from Burkina Faso." Working paper 2018:6, Uppsala Univerity, Department of Economics.
Skocpol, Theda. 1979. *States and social revolutions: A comparative analysis of France, Russia and China*: Cambridge University Press.
Slovic, Paul. 1972. "Information processing, situation specificity, and the generality of risk-taking behavior." *Journal of personality and social psychology* 22(1):128.
Sorokin, Pitirim Aleksandrovich. 1925. *The sociology of revolution*: JB Lippincott Company.
Stigler, George J, and Gary S Becker. 1977. "De gustibus non est disputandum." *The American Economic Review* 67(2):76-90.
Tversky, Amos, and Daniel Kahneman. 1992. "Advances in prospect theory: Cumulative representation of uncertainty." *Journal of Risk and uncertainty* 5(4):297-323.
Weber, Elke U, Ann-Renee Blais, and Nancy E Betz. 2002. "A domain-specific risk-attitude scale: Measuring risk perceptions and risk behaviors." *Journal of Behavioral Decision Making* 15(4):263-90.
Vieider, Ferdinand M, Mathieu Lefebvre, Ranoua Bouchouicha, Thorsten Chmura, Rustamdjan Hakimov, Michal Krawczyk, and Peter Martinsson. 2015. "Common components of risk and uncertainty attitudes across contexts and domains: Evidence from 30 countries." *Journal of the European Economic Association* 13(3):421-52.
Voors, Maarten J, Eleonora EM Nillesen, Philip Verwimp, Erwin H Bulte, Robert Lensink, and Daan P Van Soest. 2012. "Violent conflict and behavior: a field experiment in Burundi." *American Economic Review* 102(2):941-64.
Wölbert, Eva, and Arno Riedl. 2013. "Measuring time and risk preferences: Reliability, stability, domain specificity." CESifo Working Paper No. 4339.
Zeisberger, Stefan, Dennis Vrecko, and Thomas Langer. 2012. "Measuring the time stability of prospect theory preferences." *Theory and Decision* 72(3):359-86.

Appendices

A. Figures

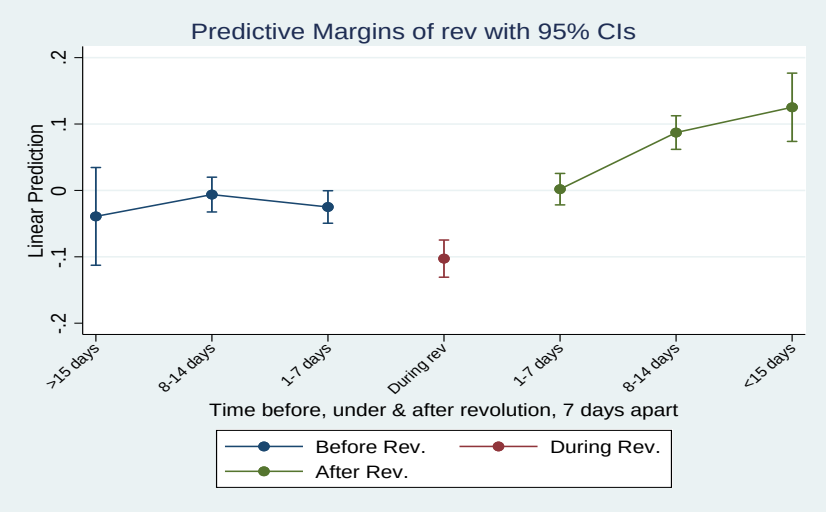
Figure A1. Schildberg-Hörish (2018) Illustration of Changes in Risk Attitudes.



Note: The Figure provides a conceptual framework for understanding why an individual's risk attitude may change due to an exogenous shock. The solid line shows that individuals become less risk taking with age. The dashed line shows a possible shift of the solid line given an exogenous shock. The jagged line shows temporary fluctuations in risk attitudes caused by temporary variation in stress, self-control, or emotions. The figure focuses on a representative individual and ignores the substantial heterogeneity in risk preferences across individuals. The sketched effect sizes are inspired by empirical findings as described in Schildberg-Hörisch (2018). Source: Schildberg-Hörisch (Figure A1, 2018:142)

Figure A2. Estimation of interaction terms in equation (3).

Panel A. 7 days apart.



Panel B. 4 days apart.

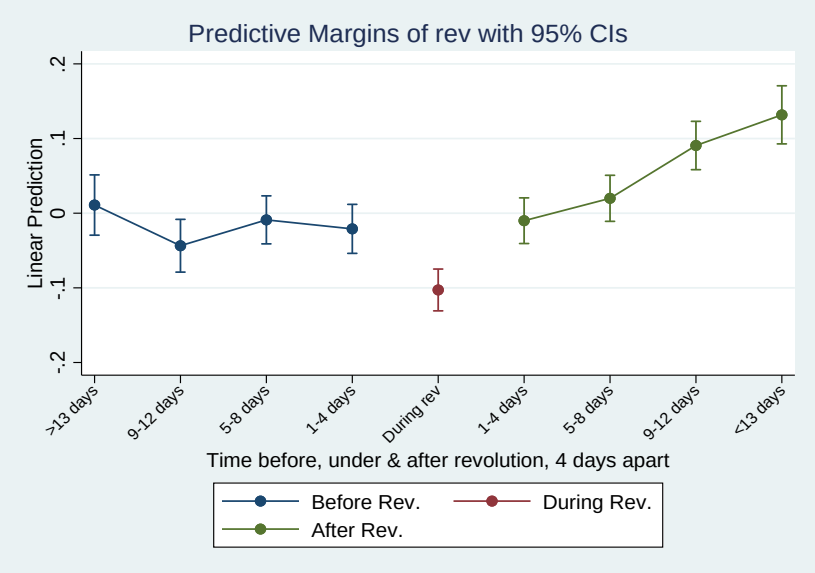
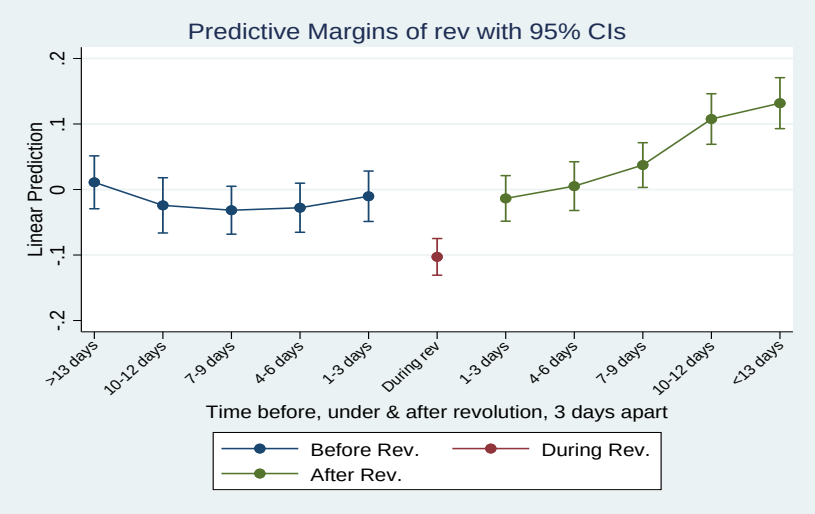


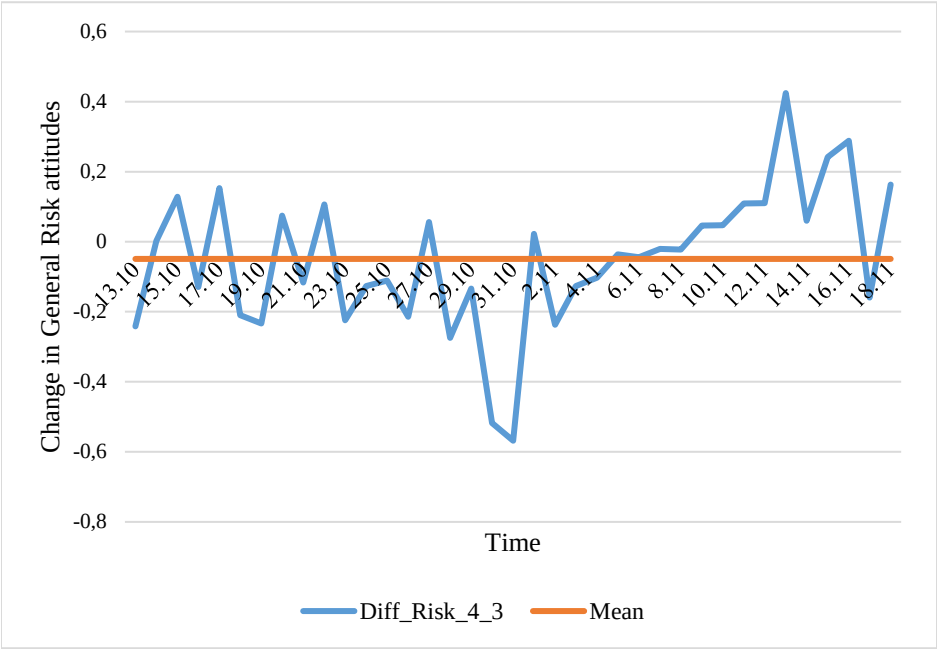
Figure A2. (Continued).

Panel C. 3 days apart.



Note: shows the point estimates with 95 percent confidence interval for the interaction terms in equation (3). Standard errors are clustered at the household level.

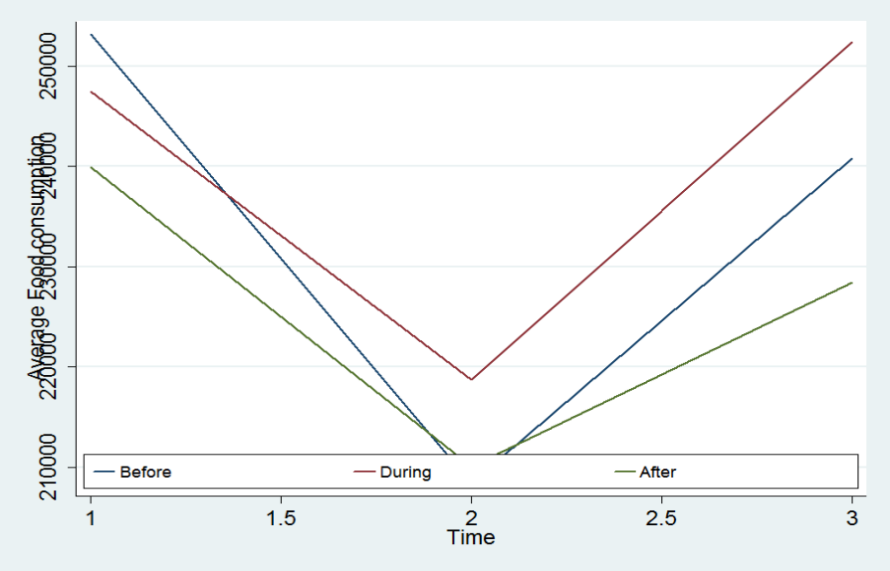
Figure A3. Average changes in General risk attitudes across time.



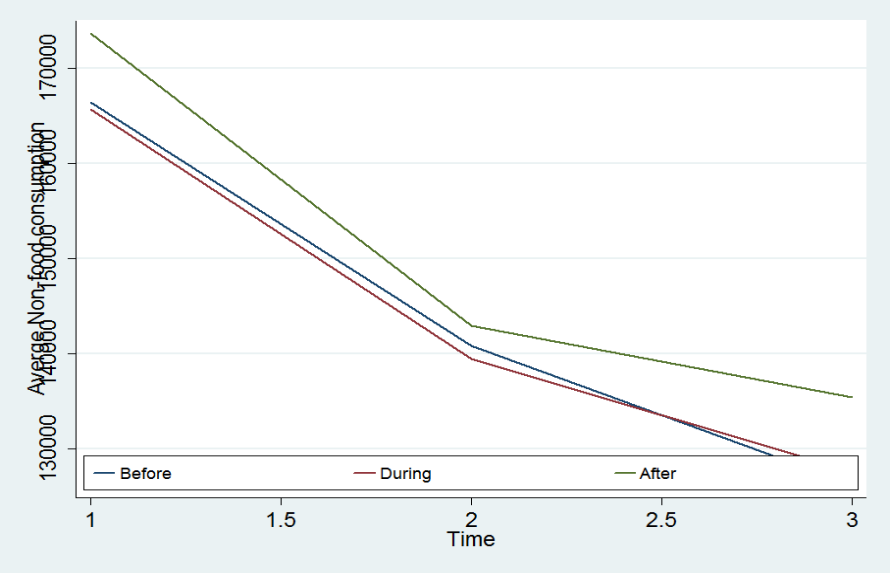
Note: The Figure shows the average changes per day in general risk attitudes between round 4 and 3 for the time period October 13 until November 18.

Figure A4. Average consumption across time.

Panel A. Average Food consumption.



Panel B. Average Non-food consumption.



Note: The Figure shows the average food and non-food consumption in FCFA for the control, treatment and 'during revolution' group over time. Time 1 and 2 marks round 1 and 2 of the survey, whereas Time 3 marks the third survey round.

B. Tables

Table A1. *Summary overview of literature.*

	Change in direction of risk attitudes		
	↑	-	↓
Cassar, Healy and von Kessler (2017)			
i. 2004 Tsunami (rural Thailand)			**X**
ii. N=334			
iii. Only post/after sample, collected four and a half years after the event.			
iv. Use incentivized lottery. Follows risk elicitation by Andersen et al. (2008) and get measures equivalent to the Multiple price list of Holt and Laury (2002).			
Hanaoka et al. (2018)			
i. 2011 Great East Japan Earthquake			
ii. N=3 221	**X** *(men)*	**X** *(women)*	
iii. Panel data (National representative sample), before and after the event.			
iv. Use non-incentivized hypothetical lottery Follows risk elicitation by Cramer et al. (2002), Hartog et al. (2002), Guiso and Paiella (2008) and get measures equivalent to a measure of risk aversion of Pratt (1964) and Arrow (1965).			
Necker and Ziegelmeyer (2016)			
i. 2008/2009 Financial crisis in Germany			
ii. N=2 047			**X**
iii. Representative panel data, before and after the event.			
iv. Use self-reported financial risk question. Follows risk elicitation through self-reported risk questions and get measures of risk attitudes and risk aversion.			

Table A1. *(Continued).*

	Kim and Lee (2014)			
i.	1950 Korean war			
ii.	N=approx. 8 000		**X** *all other age cohorts*	**X** *(treatment group, 4-8 years of age in 1950)*
iii.	Only post/after sample (representative), collected 54 years after the event.			
iv.	Use non-incentivized hypothetical lottery. Follows risk elicitation by Holt and Laury (2002) and Andersen et al. (2008) to get a structural noise parameter and a probability choice index to get a measure of risk aversion.			
	Guiso et al. 2013			
i.	2008 Financial crisis in Italy			
ii.	N=666			**X**
iii.	Panel data (Only one Italian bank's clients, to be included in the survey: at least 10 000 euros invested in the bank)			
iv.	Use self-reported financial risk question and non-incentivized hypothetical lotteries Follows risk elicitation by using the US Survey of Consumer Finance and *Affari Tuoi* (the Italian version of the TV game *Deal or no Deal*) to get measures of risk attitudes and measures equivalent to the Multiple price list of Holt and Laury (2002).			
	Cameron and Shah (2013)			
i.	2005-2008 Floods & earthquake in Indonesia			**X**
ii.	N=1 503 or 1 538			
iii.	Only post/after sample, one to three years after the event			
iv.	Use incentivized gambles. Follows risk elicitation by Binswanger (1980) and get measures of risk aversion of Pratt (1964), Arrow (1965) and Schechter (2007).			

Table A1. *(Contineud).*

Sahm (2012) i. 1992-2002 US Health and Retirement Study (HRS) ii. N= 12 003 iii. Representative cross-sectional data. iv. Use hypothetical non-incentivized income gambles Follows risk elicitation by Barsky et al. (1997) and Kimball et al. (2008) by using the HRS and get measures of risk attitudes and risk tolerance.			**X**
Voors et al. (2012) i. 1993-2006 Civil war in Burundi ii. N=278 iii. Only post/ after sample, 16 years after the event. iv. Use incentivized gambles. Follows risk elicitation by Harbaugh et al. (2002) and get measures of risk aversion.	**X**		
Eckel at al. 2009 i. 2005 Hurricane Katrina ii. N= Between 210-362 iii. Only post/after samples. Two different samples, in a few weeks after the event and 11 months after the event. iv. Use incentivized lotteries Follows risk elicitation by Eckel and Grossman (2002, 2006) and get measures of risk aversion.	**X** *direct after (women)*	**X** *after 1 year (women)*	

Note: The Table shows the summary over previous literature on how exogenous shocks changes individuals risk attitudes. The following information in each study has been summarized: **i.** The event that the study focuses on, **ii.** The number of observation used, **iii.** Data information, and **iv.** The risk elicitation method.

Table A2. *Descriptive Statistics.*

	Before	**During**	**After**
	Mean or %	Mean or %	Mean or %
	s.d.	*s.d.*	*s.d.*
		Outcome variables	
Number of Observation	13,086	4,571	14,020
General_3	4.11	4.09	4.00
	0.02	*0.03*	*0.02*
General_4	4.05	3.83	4.06
	0.02	*0.03*	*0.02*
		Explanatory Variables	
Age			
18-29 years	38%	37%	37%
	0.00	*0.01*	*0.00*
30-39 years	23%	23%	23%
	0.00	*0.01*	*0.00*
40-49 years	16%	16%	15%
	0.00	*0.01*	*0.00*
50-59 years	11%	11%	11%
	0.00	*0.00*	*0.00*
60+ years	13%	13%	13%
	0.00	*0.01*	*0.00*
Average age	37.93	37.99	38.08
	0.14	*0.24*	*0.14*
Sex			
Male	42%	43%	42%
	0.00	*0.01*	*0.00*
Female	58%	57%	58%
	0.00	*0.01*	*0.00*
		Socio-Eco. Status	
Education level			
Low education	76%	80%	76%
	0.00	*0.01*	*0.00*
Primary education	11%	8%	11%
	0.00	*0.00*	*0.00*
Secondary education	11%	10%	12%
	0.00	*0.00*	*0.00*
University	1%	1%	2%
	0.00	*0.00*	*0.00*
Literacy			
Literate	19%	18%	18%
	0.00	*0.01*	*0.00*
Illiterate	81%	82%	82%
	0.00	*0.01*	*0.00*

Table A2. *(Contineud).*

Employment status 7 past days			
Not employed	30%	29%	29%
	0.00	*0.01*	*0.00*
Employed	70%	71%	71%
	0.00	*0.01*	*0.00*
Missing	0%	0%	0%
	0.00	*0.00*	*0.00*
Employment sector			
Food Farming	68%	70%	64%
	0.00	*0.01*	*0.00*
Export & Ind.Farming	2%	1%	3%
	0.00	*0.00*	*0.00*
Breeding	1%	1%	1%
	0.00	*0.00*	*0.00*
Industry	2%	2%	2%
	0.00	*0.00*	*0.00*
Commerce	7%	7%	8%
	0.00	*0.00*	*0.00*
Manufacturing	1%	1%	1%
	0.00	*0.00*	*0.00*
Other occupation	8%	7%	9%
	0.00	*0.00*	*0.00*
No occupation	12%	11%	11%
	0.00	*0.00*	*0.00*
Hours worked 7 past days	38.03	37.94	37.72
	0.18	*0.28*	*0.16*
Household consumption 2014			
Food consumption*	925548	956449	893624
	5557	*11450*	*5820*
Non-food consumption	866865	855676	898814
	6085	*9990*	*6080*
Bank account			
No	89%	91%	88%
	0.00	*0.00*	*0.00*
Yes	11%	9%	12%
	0.00	*0.00*	*0.00*
Food shortage			
Yes	54%	60%	59%
	0.00	*0.01*	*0.00*
No	46%	40%	41%
	0.00	*0.01*	*0.00*
Subjective poor			
Yes	61%	61%	61%
	0.00	*0.01*	*0.00*
No	39%	39%	39%
	0.00	*0.01*	*0.00*

Table A2. *(Contineud).*

	Family Structure		
Religion			
Catholic	21%	22%	21%
	0.00	*0.01*	*0.00*
Muslim	61%	62%	65%
	0.00	*0.01*	*0.00*
Protestant	6%	3%	4%
	0.00	*0.00*	*0.00*
Anemism	10%	11%	7%
	0.00	*0.00*	*0.00*
No religion	0%	0%	0%
	0.00	*0.00*	*0.00*
Other religion	0%	0%	0%
	0.00	*0.00*	*0.00*
Missing	2%	2%	2%
	0.00	*0.00*	*0.00*
Marital status			
Single	18%	17%	18%
	0.00	*0.01*	*0.00*
Married	73%	75%	74%
	0.00	*0.01*	*0.00*
Divorced	*1%*	*1%*	*1%*
	0.00	0.00	0.00
Widowed	*7%*	*7%*	*7%*
	0.00	0.00	0.00
	Health		
Disability			
Yes	5%	4%	4%
	0.00	0.00	0.00
No	95%	96%	96%
	0.00	0.00	0.00
	Residential zone		
Urban	38%	40%	36%
	0,00	*0,01*	*0,00*
Rural	62%	60%	64%
	0,00	*0,01*	*0,00*

Note: The Table shows mean, standard deviation and number of observations for individual's characteristics before, during and after the revolution. The variable Sick was not collected in the fourth round. *Food consumption consists of 4,569 observations during the revolution and 14,006