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Citizens and the democratic window of opportunity: An analysis of economic crisis and the demand for democracy on the individual level

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Abstract

This study investigated the relationship between economic crisis and democracy in sub-Saharan Africa on the individual level. This research is based on the theory of Acemoglu and Robinson, which argues that when opportunity cost are sufficiently low, citizens will overthrow the ruling government. This period in time is named the 'democratic window of opportunity'. This research argues that not an economic downturn will not impact everyone equally, and so this study hypothesizes that citizens who experience a negative economic shock are more inclined to demand more democracy. Regional rainfall shocks are included as an intermediate variable, as rainfall shocks can cause negative economic shocks and have a temporal nature. This research hypothesized that individuals that experienced a rainfall shock are more inclined to demand more democracy. These hypotheses were empirically tested via an cross-sectional study involving 34 nations and over 35.000 observations. The citizen's demand for democracy was measured through two key areas: The individual's attitude towards non-democratic change, and their participation in actions against the government. The findings suggest that citizens experiencing a negative economic shock are more inclined to demand more democracy. Furthermore, the results for the relationship between rainfall shocks and negative, economic shocks are inconclusive.

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1   Introduction

The Arab Spring was one of the major news items of the last few years, as demonstrations started in Tunisia in 2010 and revolts took place in various Arabic nations afterwards. These revolts had different outcomes in countries, as dictators and regimes were overthrown in Egypt and Libya, but these demonstrations resulted in a currently ongoing civil war in Syria. Besides various possibilities in outcome of demonstrations and revolts, the cause of these demonstrations may differ. The findings of Korotayev and Zinkina (2011) suggest that unemployment and a number of structural demographic contributed to the revolts in Egypt, as well did the economic decline. This latter one, economic decline, is a factor which has a long history of being influential in the alteration of democratic institutions. The relationship between economic crisis and democracy has been investigated for more than half a century, at least since Lipset (1959).

Over the years, multiple theories on how an economic crisis affects democracy were established. One of these theories is established by Acemoglu and Robinson (2001), whom use a game-theoretical approach. They argue that a negative economic shock causes temporarily lowering of the opportunity cost to undertake action against the regime. If the opportunity cost are sufficiently low, the opposition will decide to overthrow the ruling government. This period of low opportunity cost is labeled the 'democratic window of opportunity', and describes a period when threats of opposing groups towards the ruling government are always credible (Aidt and Leon, 2016). The combination of economic decline, and events such as demonstrations and social unrest, which are symptoms that the democratic window of opportunity is open, occurred in various Middle Eastern nations during the Arab Spring. Additionally, follow-up studies have examined the theory of Acemoglu and Robinson (2001), and their findings suggest that transitory, negative economic shocks cause democratization (Burke and Leigh, 2010; Brückner and Ciccione, 2011).

The existing literature examines the relationship between negative economic shocks and democracy on the national level. Individual analysis on the effects of a personal, negative income shock on democracy are not conducted. As not all citizens are equally impacted by economic recessions, it might be the case that not for each citizen the opportunity cost are sufficiently low that it is preferable to participate in overthrowing the ruling, autocratic regime. Hence, the question arises whether all individuals participate in overthrowing the regime, or just the citizens that experienced the negative, economic shock the most. Or stated differently:

Is the decision to undertake action against the government based on opportunity cost, or perhaps on other factors such as solidarity?

This study will investigate this gap in the existing literature, through examining the effect of the individual's economic condition on their demand for democracy. The research question analyzed in this study is as follows:

Are individuals that experience(d) a negative, personal income shock inclined to demand more democracy?

The theory of Acemoglu and Robinson (2001) discusses transitory, negative economic shocks, and follow-up studies attempt to include economic recessions that have a temporal nature, through including exogenous shocks (Brückner and Ciccione, 2011; Sin and Lim, 2014). To be more precise, these studies utilize shocks in the precipitation level as exogenous shocks. Previous studies suggest that rainfall shocks correspond to transitory economic shocks (Paxson, 1992). This study will imitate this, and rainfall shocks will be included as exogenous shocks.

However, there are also differences between the previous follow-up studies and this study regarding the rainfall shock. Whereas earlier studies use longitudinal data, the variables for the citizen's economic situation and their demand for democracy are derived from a survey, measuring one specific in time. This excludes a longitudinal study as possibility, and this study opts for a cross-sectional study instead.

Figure 1: Rainfall shock, citizen's economic condition and their demand for democracy.
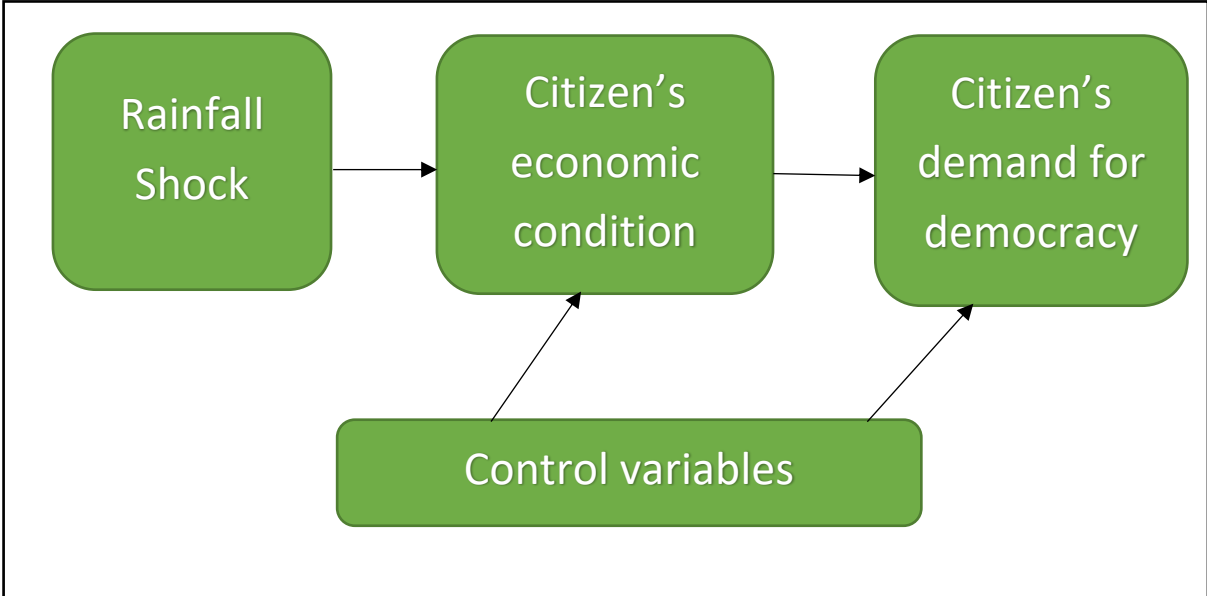
Investigating the impact of an economic crisis on democracy on the individual level also requests for a different approach to measuring democracy. That is, no widely acknowledged measure of the individual's demand for democracy exists. To avoid the complexity of establishing such a measure in this paper, instead this study will investigate two key areas representing the individual's demand for democracy: The citizen's attitude towards non-democratic changes, and the individual's action undertaken to demand more democracy. This study expects that when the citizen's economic situation declines, this will affect their attitude in a negative way, and increase their participation in events against the government. If the findings confirm that this is the case, this study will support the theory of Acemoglu and Robinson (2001), and specifically the assumption that when the opportunity cost are sufficiently low, citizens will try to overthrow the ruling incumbents.

This paper is structured as follows: The next section, section two, will discuss the existing literature on the relationship between economic crisis and democracy, and the theoretical foundation of this study will be established. The section thereafter presents the methodology of this research, and the used data will be described. Section four will present the empirical results of the models tested. Section five will discuss these empirical results, and whether the findings of this study correspond to the existing literature. Furthermore, the challenges of this research will be explained. Finally, section six presents a summary of the research and its conclusions, as well as recommendations for future research.

2 Theoretical foundation

What are the consequences of economic downturns? Previous findings suggest that the Great Depression had an impact on the global economy, as the trade impediments drastically increased and a collapse of trade, capital, and migration flows followed (van Marrewijk et al., 2012). Moreover, Reinhart and Rogoff (2009) show that crises correspond to a decline in output and employment. Besides, recessions can have long term consequences as these can change the dynamics of the economy itself: That is, economic crises can be beneficial for economic reforms (Drazen and Grilli, 2009).

2.1.1 Economic crisis and democracy

The reforms subsequent to economic recessions do not necessarily have to be of an economic nature. There is a long history investigating the relationship between economic crisis and democracy, at least since Lipset (1959) found that economic downturns can destabilize a democracy. His theory consists of two components: Legitimacy and effectiveness. The former entails the legitimacy of a government, while the latter involves the economic development of a country. Lipset (1959) argues that legitimate governments can maintain to exist when an economic crisis arises, while this is not necessarily the case for illegitimate governments. That is, illegitimate governments require effectiveness to survive. This claim is supported by the paper of Seligson and Muller (1987), whose findings on Costa Rica suggest that democratic political systems can undergo crises of effectiveness, as long as they enter these crises with a sufficient level of legitimacy. Furthermore, the work of Huntington (1991) supports this theory, as its findings show a significant, positive relationship between lack of economic growth and the withdrawal of authoritarian regimes.

In contrast to the theory of Lipset (1959), the theory of Acemoglu and Robinson (2001) is not based on the concept of 'legitimacy and effectiveness'. Acemoglu and Robinson (2001) incorporate game theory to analyze why economic downturns cause alterations in democratic institutions. The starting premise of their work is that incumbent rulers will not voluntarily share power with other groups, because this will compromise the rulers' policy objectives. As a result, democratic reform only occurs when the opposition groups put the status quo at risk. Sometimes, incumbents react to this potential threat by acting pre-emptively, in order to avoid radical political change. In times of an economic crisis, the cost of contesting power, 'opportunity cost', temporarily decrease. When the opportunity cost are sufficiently low, the

opposition will decide to undertake action and overthrow the ruling, autocratic government. This moment of low opportunity cost is described as a 'democratic window of opportunity', where threats of the opposition are always credible.

Follow-up studies on the theory of Acemoglu and Robinson (2001) investigate this democratic window of opportunity. The findings of Burke and Leigh (2010) illustrate that rapid economic growth diminishes the likelihood of alteration in democratic institutions in the short-run. Their work is a global study, including 154 countries, and with a timespan of more than 50 years. Furthermore, Brückner and Ciccione (2011) found a significant, positive relationship between transitory, negative economic shocks and democratization in sub-Saharan nations. Their study uses longitudinal data over the period 1980-2008, and their findings suggest that in a significant amount of times democratization followed from a drought-induced economic crisis. Moreover, later studies aligned with the theory of Acemoglu and Robinson (2001), and the follow-up studies (Lin and Sim, 2014; Aidt and Leon, 2016).

The democratic window of opportunity can be opened through transitory economic shocks, as this window of opportunity is a temporary period. Exogenous shocks can cause transitory, negative economic shocks, as did the study of Brückner and Ciccione (2011). Although there is a discussion about the robustness of their results (Barron, Miguel and Satyanath, 2013), previous findings suggest that there is significant, positive relationship between rainfall shocks and transitory economic shocks (Paxson, 1992; Miguel, Satyanath and Sergenti, 2004; Burke and Leigh, 2010; Lin and Sim, 2014; Aidt and Leon, 2016).

The democratic window of opportunity, the period when opportunity cost are sufficiently low for opposition to overthrow the ruling government, introduces social conflict as well. The study of Aidt and Leon (2016) presents a significant, positive relationship between drought-induced riots and democratization in sub-Saharan Africa. The core of their theory is that there is extreme uncertainty during a democratic window of opportunity, and no individual knows whether this window of opportunity is open. If low-intensity conflict (riots) breaks out, the incumbent rulers can pre-emptively clear the threat through democratic reform. The findings of Aidt and Leon (2016) suggest that this is the case.

2.2   Research on individual level

The findings of the studies previously mentioned (Brückner and Ciccione, 2011; Sin and Lim, 2014; Aidt and Leon, 2016), all illustrate that transitory, negative economic shocks cause

democratization. These results align with the theory of Acemoglu and Robinson (2001), as transitory, negative economic shocks result in a decrease in opportunity cost of overthrowing the ruling government. However, these follow-up studies are established in such a way that the theory of Acemoglu and Robinson (2001) in its entirety is not tested, with one assumption in particular neglected.

The work of Acemoglu and Robinson (2001) assumes that all citizens have an incentive to overthrow the ruling, autocratic government, as citizens not participating in such an event are omitted from the benefits of overthrowing the government. However, citizens can be differently affected by an economic crisis. Subsequentially, for some the opportunity cost of overthrowing the ruling government will not outweigh the cost, due the fact that some citizens will not experience much of an economic crisis. This unequal impact of an economic crisis would imply that an individual's participation in democracy depends on how much they are affected by a negative shock. To check this assumption, about individual's and their participation in overthrowing the regime, one should investigate the relationship between negative income shocks and democracy on the individual level.

However, investigating the relationship between negative income shocks and democracy on the individual level has some disadvantages in comparison to examining this relationship on the national level. Whereas the majority of the studies about democracy are at country-level, the primarily utilized measure of democracy, the Polity score, is at a national level as well. The Polity score is an annual provided number representing the score of the democratic institutions of each country (Marshall and Jaggers, 2005). This score measures the democratic institutions, and consists of the competitiveness of political participation, the openness and competitiveness of executive recruitment, and the constraints on the chief executive (Center for Systematic Peace, 2016). Although the Polity score has some flaws, and should be approached with scepticism about its precision (Treier and Jackman, 2008), it is a widely-acknowledged measure of democracy. Hence, including the Polity score as the measure of democracy would imply that this study could not investigate democracy on the individual level.

Furthermore, democratic institutions only illustrate one dimension of democracy, namely the "supply-side" of democracy: The supply of democracy by the government, illustrated by elements such as the constraints on the chief executive, and fairness of elections. The 'demand-side' of democracy, the level of democracy that citizens demand, or the level of democracy that citizens perceive as ideal, is not taken into consideration in the Polity score. Aidt and Leon (2016) incorporate the demand for democracy in their research, as their study entails drought-

induced riots. Participating in riots against the government illustrate that a citizen experiences the current situation as sub-optimal, and therefore participation in such events can be presented as evidence for the demand for more democracy. The demand for democracy consists of low-intensity conflicts such as riots, but also incidents on a national scale, such as a revolts to overthrow the government. Previous studies have investigated the demand for democracy (Collier and Hoeffler, 1998; Brückner and Ciccione, 2010; Bratton and Houessou, 2014; Aidt and Franck, 2015; Aidt and Leon, 2016; Guan, 2018).

Thus, investigating the relationship between negative economic shocks and democracy on an individual is viable, when the "demand-side" of democracy is utilised. The inclusion of the demand-side of democracy allows research to examine how the actions and opinions of citizens on democracy are affected through an alteration in their personal economic situation. A negative alteration in personal economic situation can indicate a 'personal economic recession', i.e. a negative income shock on an individual level. Hence, by examining the economic situation and democracy on an individual level, this study can test whether an individual's economic situation affects their attitude towards democracy. Therefore, the research question is as follows:

Are individuals experiencing a personal economic recession more inclined to demand more democracy?

2.3   Measuring the demand for democracy

Due the fact no individual measure of the demand for democracy exists, such a measure should be established. Yet, to understand an individual's demand for democracy, understanding the concept of democracy is of importance. Lipset (1959, p.71) describes the concept of democracy as "a political system which supplies regular constitutional opportunities for changing the governing officials". Defining democracy in this manner, his measure of democracy includes three specific conditions: (a) a "political formula", a system of beliefs, legitimizing the democratic system and specifying the institutions parties, a free press, which are accepted as proper by all citizens; (b) one set of political leaders in office; and (c) at least one more set of leaders, out of office, who act as a legitimate opposition, attempting to gain office. Although the precise definition of democracy might differ between authors, various authors include the same elements in their definitions (Watkins, 1970; Popper, 2012). By measuring a citizen's attitude towards aspects of this concept of democracy, the demand for democracy of a citizen can be identified at a certain point in time.

2.4   Theory and hypotheses

In short, this research examines the following theory: Negative, transitory economic shocks reduce the cost of contesting power, and when the opportunity cost are sufficiently low, a democratic window of opportunity may emerge. One important cue of the democratic window of opportunity is the arise of low-intensity conflict, such as riots, and that threats of the opposition are always credible (Aidt and Leon, 2016). As participation in low-intensity conflicts is not mandatory, and the economic shock is not equally distributed, not all individuals of a society are present. Based on the concept of opportunity cost to overthrow the ruling government, the theory suggests that individuals who experience a personal economic recession are more likely to participate in events such as riots and demonstrations, and in a more general sense, have a stronger demand for democracy. Hence, the first hypothesis of this study is as follows:

H1: Individuals that experienced an decline in their economic condition have an higher demand

for democracy.

Figure 2: Rainfall shock, citizen's economic condition and their demand for democracy.
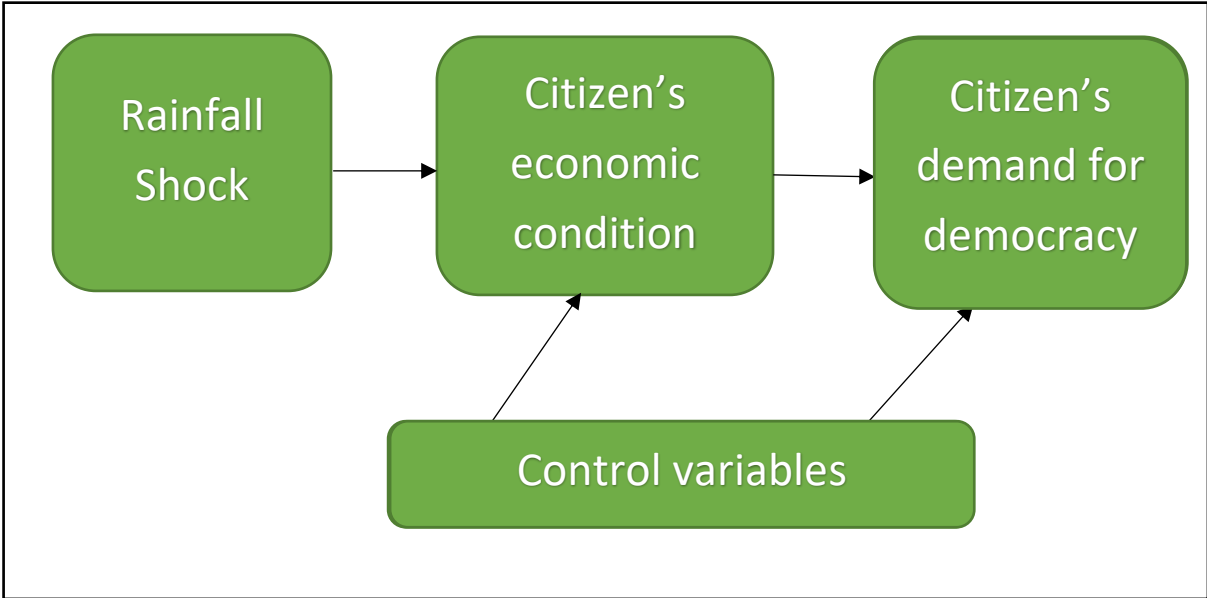
Important to note is that the democratic window of opportunity is considered a transitory period. Previous studies used an exogenous shock to simulate a period of economic downturn, through the inclusion of rainfall shocks. Shocks in the precipitation level have significant, positive relationship with economic shocks, and these shocks have a temporal nature. This is illustrated in Figure 2. Hence, the first part of the second hypothesis is as follows:

H2a: Individuals living in a region that experienced a rainfall shock have an higher demand

for democracy.

The second component of this hypothesis focuses on the size of the effect of experiencing a rainfall shock on the individual's demand for democracy. As the effect of rainfall shocks is mediated through the individual's personal economic recession, the inclusion of the latter would decrease the size of the rainfall shocks. Hence, the second part of the second hypothesis states that:

H2b: The effect of rainfall shocks on the demand for democracy is moderated by the

individual's economic condition.

3   Methods and data

This chapter explores the empirical framework of this study. To test the three different hypotheses, we need two different base models. First, the methods to investigate the relationship between rainfall shocks, the individual's economic situation, and their demand for democracy will be discussed. Secondly, the data sources and variables will be described.

3.1   Methods

Models

This quantitative study examines the effect of rainfall shocks on the respondent's demand for democracy, channeled through the individual's economic condition. The economic shock is mediates the exogenous shock, rainfall shock, and this is illustrated through three different model. One model that without the respondent's economic condition, and two with varying economic conditions included. This is also illustrated in Figures 3a, 3b, and 3c. By making this distinction, the second part of the second hypothesis, whether the effect of rainfall shock is moderated by the citizen's economic condition, can be tested. Moreover, by making a distinction between including the future economic situation or not, this research avoids possible multicollinearity between the two components of the respondent's economic condition.

Figure 3a: Base model 1
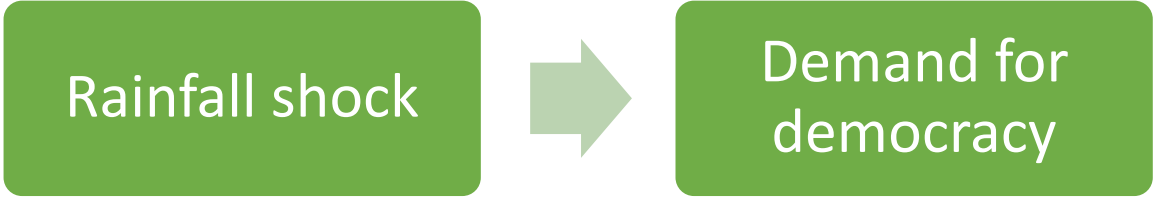
Figure 3b: Base model 2

Figure 3c: Base model 3

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┌──────────────────┐      ┌──────────────────┐      ┌──────────────────┐
│                  │      │    Economic      │      │                  │
│                  │      │ Experience and   │      │   Demand for     │
│  Rainfall Shock  │  ➤   │    Economic      │  ➤   │   democracy      │
│                  │      │  Expectations    │      │                  │
└──────────────────┘      └──────────────────┘      └──────────────────┘
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Next to the intermediary variable and the independent variable, there are also control variables in the base models. Taking all variables into consideration, three levels of analysis are presented: individual, regional, and national. Hence, this research opts for a multi-level model.

The respondent's demand for democracy consists of four separate factors, which are all based on a five-point Likert scale. Due to the fact that the respondent's demand for democracy is the dependent variable, and a five-point scale is not large enough to approach it as a linear variable, this study opts for a categorical approach. The Likert-scale ranks in a logical order, and therefore a ordered logistic regression is being utilized.

To summarize, due to the variety in levels of the variables, and having a categorical variable as dependent variable, this study will investigate the relationship between rainfall shocks, an individual's economic situation, and their demand for democracy via a multi-level, ordered logistic regression.

3.2   Data description

Countries and sources

The choice of countries included in this research is in line with previous studies investigating the democratic window of opportunity, as this research focuses on sub-Saharan Africa (Brückner and Ciccione, 2011; Sim and Lin, 2014; Aidt and Leon, 2016). The data for this region consists of 34 countries, with over 35.000 observations on the individual level. There are three data sources, of which the Afrobarometer is used most intensively in this study. According to their website (www.afrobarometer.org/about), the Afrobarometer is a pan-African, non-aligned research network that measures the public attitudes towards governance, economic conditions, and democracy through surveys in more than 35 countries in Africa. The Afrobarometer consists of multiple rounds, but this study will examine round 5. The data

collection of round 5 lasted from 2011 to 2013. For each country the survey is nationally representative, random, clustered, and stratified.

The second data source is GeoQuerly, from which annual rainfall on a regional level is subtracted. GeoQuerly is a component of the AidData research lab of the University of William and Mary (Goodman et al., 2017). The purpose of the AidData research lab is to make development finance more transparent, effective, and accountable.

Table 1: Countries overview: Amount of regions and the Polity score

Country	# of regions	% of total regions	Polity score
Benin	11	3,40%	7
Botswana	17	5,30%	8
Burkina Faso	13	4,10%	0
Burundi	17	5,30%	6
Cameroon	10	3,10%	4
Cote d'Ivoire	14	4,40%	4
Ghana	10	3,10%	8
Guinea	8	2,50%	1
Liberia	15	4,70%	6
Lesotho	10	3,10%	8
Mali	6	1,90%	0
Madagascar	22	6,90%	3
Mozambique	11	3,40%	5
Namibia	13	4,10%	6
Niger	8	2,50%	6
Nigeria	37	11,60%	4
Senegal	14	4,40%	7
Sierra Leone	4	1,30%	7
South Africa	9	2,80%	9
Sudan	15	4,70%	-4
Swaziland	4	1,30%	-9
Tanzania	26	8,10%	-1
Togo	5	1,60%	-2
Uganda	1	0,30%	-1
Zambia	10	3,10%	7
Zimbabwe	10	3,10%	1
Total	320	100,00%	

The third source is the Polity IV data base (Marshall and Jaggers, 2005), which measures the democratic institutions of a nation. The Polity IV score is a combination of

different components representing the level of democracy in a country, such as constraints on the chief executive, the openness and competitiveness of executive recruitment and the competitiveness of political participation.

Intermediary variable

The intermediary variable, illustrating the exogenous shock that affects the respondent's economic condition, is presented in this study as *Rainfall Shock*. This variable will be based on the annual rainfall on regional level, and is subtracted from GeoQuerly. Although GeoQuerly is the data base from which the rainfall information is subtracted, this is not the original source of the annual rainfall observations. The rainfall data comes from Willmott & Matsuura, University of Delaware. This database includes a large number of stations, both from the Global Historical Climate Network (GHCN2), and the archive of Legates and Willmott (Willmott and Matsuura, 2001). These rainfall estimates are based on gauge stations, and these estimations are based on a 0.5° x 0.5° latitude-longitude grid, where the grid nodes are centered at 0.25°. To increase the validity of these rainfall estimates, the monthly observation was seen as absent when more than five daily observations per month were missing. In the case of five or more daily missing observations, the monthly observations were provided through Climatology Aided Intrapolation (CAI) (Willmott and Robeson, 1995), which was possible due to the large amount of stations. To identify spatial interpolation errors, the database utilizes a station-by-station cross validation (Willmott and Matsuura, 1995). More information is available at the webpage documenting the Terrestrial Precipitation: 1900-2014 Gridded Monthly Time Series (V4.01).

There is somewhat of a mismatch between the rainfall estimates and the other variables included in this study. Whereas the sub-national precipitation levels have a constant annual timeframe, lasting from January to December, the variables subtracted from the Afrobarometer only measure something at a certain point in time. This certain point in time, depending on the data collection within a country, varies throughout the year. For example, the data collection in Sierra Leone lasted from 23 June to 18 July 2012, while the data collection in Mozambique lasted from 31 March till 15 April 2013. Hence, the question arises which rainfall year should be considered as most appropriate to match with the other variables. Which rainfall year is the most appropriate is based on a straightforward selection process. If the data collection took place in the first six months of the year (T=0), this study considers the rainfall of the year before as most appropriate (T=-1). If the data collection occurred in the last six months of a year (T=0), this study deemed the same year as most appropriate (T=0). Thus, the dividing line is whether

the Afrobarometer data collection in a country took place before or after the 1st of July. When the data collection took place in both June and July, and this dividing line cannot offer a solution, the choice will be based on whether the data collection lasted more days before or after the 1st of July.

Table 2: Regions with Rainfall Shock: sensitivity of the upper bound

	(I)	(II)	(II)
	70% Upper bound	75% Upper bound	80% Upper bound
Regions with *Rainfall Shock*	Inhambane (Mozambique)	Inhambane (Mozambique)	Jwaneng (Botswana)
	Bulawayo (Zimbabwe)	Manica (Mozambique)	Kgalagadi (Botswana)
	Masvingo (Zimbabwe)	Omusati (Namibia)	Inhambane (Mozambique)
	Matabeleland South (Zimbabwe)	Oshana (Namibia)	Manica (Mozambique)
		Dar es Salaam (Tanzania	Sofala (Mozambique)
		Lindi (Tanzania)	Kunene (Namibia)
		Mtwara (Tanzania)	Omusati (Namibia)
		Bulawayo (Zimbabwe)	Oshana (Namibia)
		Manicaland (Zimbabwe)	Dar es Salaam (Tanzania
		Bulawayo (Zimbabwe)	Lindi (Tanzania)
		Manicaland (Zimbabwe)	Mtwara (Tanzania)
			Pwani (Tanzania)
			Zanzibar North (Tanzania)
			Zanbibar South (Tanzania)
			Zanzibar West (Tanzania)
			Bulawayo (Zimbabwe)
			Manicaland (Zimbabwe)
			Mashonaland (Zimbabwe)
			Bulawayo (Zimbabwe)
			Manicaland (Zimbabwe)
Amount of regions with *Rainfall Shock*	4	11	20
Amount of observations with *Rainfall Shock*	759	1736	2691

After the appropriate rainfall year is identified for each country, the binary variable *Rainfall Shock* is established. For each region the annual rainfall over the period 2000-2014 is subtracted from GeoQuerly, which will be used to calculate the average rainfall of this timespan. Next, for each specific region the appropriate year of rainfall will be compared to the average annual rainfall of the period 2000-2014. *Rainfall Shock* is a binary variable, where regions either did or did not have a rainfall shock. If the region's rainfall level was below 70 percent of the average rainfall of that region in the year of data collection, the region was

identified as a 1; if the region's level was above 70 percent of the rainfall of that region in the year of data collection, the region was identified as a 0.

This upper bound of what is considered as *Rainfall Shock* is based on a trade-off between having at least multiple regions and a reasonable amount of observations included with a *Rainfall Shock*, and having a upper bound that allows to make a clear distinction between regions with and without a rainfall shock. For example, if one sets the upper bound at 90 percent the amount of regions and observations with a rainfall shock will increase, but this upper bound level approximates to the average rainfall over the period 2000-2014, which would lead to a scenario where one cannot really speak of a rainfall shock.

Table 2 presents the regions identified with a rainfall shock, based on the upper bound of 70, 75, and 80 percent. These upper bounds are illustrated in columns I, II, and III, respectively. The amount of regions identified with a rainfall shock are 4, 7, and 11. This is out of a total of 330 regions.

Independent variable

The effects of rainfall shocks on the demand for democracy are indirect, and mediated through GDP growth in earlier research (Brückner and Ciccione, 2011; Aidt and Leon, 2016). However, GDP growth is measured on a national level, and including a national variable for an individual's economic situation would imply that valuable information would be lost.

The essence of GDP growth is that it measures the relative, annual change of GDP. This core idea can also be captured on the individual level. In the Afrobarometer, participants are asked to compare their own, current living condition to their living condition of twelve months ago. The answers range from 'much worse', 'worse', 'even', 'better', to 'much better'. This presents a similar factor, except that this factor is categorical instead of linear. One change in the measure is that the 'much worse' and 'worse' group will be combined, which will also be the case for 'better' and 'much better'. Hence, there are only three components in this factor. This variable will be named *Economic Experience*. The specific question regarding the Afrobarometer is presented in Appendix A.

Next to *Economic Situation*, which provides information about the respondent's current economic situation, the individual's expectations about their future economic situation are important. To elaborate, a current personal income crisis can be explained through *Economic Situation*, but if a respondent expects a future income crisis is awaiting, or a worsening of

his/her current income shock, this can also affect the individual's demand for democracy. Therefore, *Economic Expectations* is included. This factor compares the current living situations of a respondent to his/her living conditions next year, based on the respondent's expectations. The answers range from 'much worse', 'worse', 'even', 'better', to 'much better'. Similar to *Economic Experience*, there will be only three groups: 'worse', 'even', and 'better'. The Afrobarometer question corresponding to *Economic Expectations* is illustrated in Appendix A.

With the inclusion of *Economic Experience* and *Economic Expectations*, the possibility of multicollinearity arises between these two factors. It is possible that individuals whose economic situation improved greatly in the last year, are also more optimistic about coming year. The correlation between *Economic Experience* and *Economic Expectations* is 0,282, and this coefficient is significant at a 99 percent level. Hence, the correlation is not very strong Moreover, this study includes two different models with the respondent's economic situation, two check potential multicollinearity: one model including *Economic Experience*, and one model including *Economic Experience* and *Economic Expectations* Table 3 presents the amount of observations regarding these components of the respondent's economic situation.

Table 3: Individual's economic condition

	Economic Situation		Economic Expectations	
	Frequency	Percentage	Frequency	Percentage
Worse	11081	31,01%	5343	16,33%
Even	12295	34,41%	4692	14,34%
Better	12354	34,58%	22674	69,32 %
Total	35730	100,00%	32709	100,00%

Dependent variable

Due the fact that there is no demand for democracy measure available on the individual level, this study will measure demand for democracy in a different manner. Instead of trying to establish a measure, this work will analyze two crucial aspects of the demand for democracy: the respondent's attitude towards non-democratic changes, and the individual's action undertaken to demand more democracy. Both aspects consist of two components, thus the demand for democracy will be tested with four separate factors.

First, let's consider the participant's attitude towards non-democratic changes. This entails alterations a government could make that would decrease the current level of democracy, for which two scenarios are selected. Firstly, respondents are questioned about the attitude

towards a change in their political system where only one party can stand elections and hold office. Secondly, respondents are asked what their attitude is towards a president's decision to abolish the parliament, so he could decide everything alone. Both of these variables are answered via a Likert scale, ranging from 'very disapproving', 'disapproving', 'neither approving nor disapproving', 'approving', to 'very approving'. The questions from the Afrobarometer round 5 coherent to these factors of the individual's demand for democracy variable are illustrated in Appendix B.

Table 4.1: Descriptive of the demand for democracy: Individual's attitude towards one-party political system and the president's decision to abolish the parliament

	One-party political system		Abolishment of parliament	
	Frequency	Percentage	Frequency	Percentage
Strongly Disapprove	16617	47,95%	16496	50,32%
Disapprove	10895	31,44%	11118	33,91%
Neither Approve Nor Disapprove	1355	3,91%	1775	5,41%
Approve	3903	11,26%	2546	7,77%
Strongly Approve	1883	5,43%	848	2,59%
Total	34653	100,00%	32783	100%

Table 4.2: Descriptive of the demand for democracy: Individual's participation in protest marches, and individual's use of violence for a political cause

	Protest marches		Political violence	
	Frequency	Percentage	Frequency	Percentage
No, would never do this	24863	70,90%	31476	89,69%
No, but would do if had the chance	7077	20,18%	2596	7,40%
Yes, once or twice	1562	4,45%	463	1,32%
Yes, several times	1058	3,02%	361	1,03%
Yes, often	510	1,45%	199	0,57%
Total	35070	100%	35095	100%

The second aspect of the demand for democracy consists of the citizens' action undertaken to demand more democracy. This is based on whether an individual have undertaken a specific action in the last 12 months. Firstly, the respondents are asked whether they have participated in protest marches or demonstrations. Secondly, the respondents are asked whether they have used violence for a political cause. These questions about respondent's participation are answered on a Likert scale, ranging from 'No, and have no desire to do so', 'No, but would do

if had the chance', 'Yes, once or twice', 'Yes, several times', to 'Yes, often'. These Afrobarometer questions are also included in Appendix C.

Control variable

To increase the validity of this research, various control variables that could affect the relationship between rainfall shocks, the respondent's economic condition, and their demand for democracy are included. These control variables can be divided into two different components: Variables on an individual level, and a variable on the national level. First, let's consider the person-specific variables. These are related to the respondent's socioeconomic status, because gender, Age, education, and location can be influential. Differences in gender could have explanatory power in situations when an individual is present at an event where violence is used for a political cause. The age of participants is included as *Age*, because it is probable that younger adult civilians are more likely to undertake action against, in terms of demonstrations or using violence for a political cause. The third specific included is education, presented as *Educyears*, as an highly educated individual might have a more negative attitude towards to autocracy and dictatorship. Lastly, *Location* is of importance, as rainfall shocks might have a greater impact in rural areas. Similar to gender, location is a dichotomous variable.

Table 5: Descriptive statistics of the control variables

	N	Mean	Standard deviation	Minimum	Maximum
Gender	35730	0,5	0,5	0	1
Age	35580	36,98	14,52	18	105
Educyears	35634	6,81	4,99	0	17
Polity score	35730	4,22	4,318	-9	10
Urbanization	35730	0,62	0,486	0	1

Next to the person-specific control variables, this study also includes a national variable: the Polity score, hereafter mentioned as *Polity*. This score measures the current state of the democratic institutions in a country. If there is currently an autocracy, the theoretical foundation would suggests that civilians will push more towards a democratization than when currently there is already a democracy (Lipset, 1959; Acemoglu and Robinson, 2001). The Polity IV data base measures the democratic institutions, and consists of the competitiveness of political participation, the openness and competitiveness of executive recruitment, and the constraints on the chief executive. The Polity IV score is an annual, nation-specific grade ranging from -

10 to +10, with -10 to -6 matching to autocracies, -5 to 5 matching with anocracies, and 6 to 10 matching with democracies (Centre for Systematic Peace, 2016).

Missing observations

The dataset is incomplete, as some variables miss some observations. This is especially the case for both *Economic Experience* and *Economic Expectations*, as the available amount of observations is considerably lower than that of the other variables. Therefore, let's consider these two variables first. These are both categorical variables, which makes linear interpolation impossible. The mean of both variables is close to the middle category, 'even', and could be used to fill all incomplete observations. However, this would decrease the validity of this study. Therefore, this research will not take the observations with missing values for *Economic Situation* and *Economic Expectations* into account in base model 2. Thus, the amount of observations drops when individual's economic condition is taken into account. Furthermore, the remaining variables with missing observations, age and education, are linear. For the missing values, the mean of that specific variable will be used as a substitute for the incomplete observations. This is based on the dummy adjustment method, where a dummy is included for all missing observations (Allison, 2001).

4   Empirical Results

This research investigates the effect of rainfall shocks on the individual's demand for democracy, an indirect relationship channeled through personal negative economic shocks. The three base models are tested: one model without the respondent's economic situation, one model with only the citizen's economic experience is included, and one model with the respondent's economic experience and their economic expectations included. This research selected four separate factors that represent the individual's demand for democracy; two of these factors focus on the individual's attitude towards non-democratic changes, and two factors focus on the individual's actual actions undertaken to demand more democracy. This section will first describe the results of the individual's attitude towards non-democratic changes, followed by the results of the respondent's actions undertaken to demand more democracy. Lastly, various robustness checks are included to check the sensitivity of the rainfall shocks, and to identify possible differences if only non-democratic countries are taken into consideration.

4.1   Approval of a one-party political system and the abolishment of the parliament

In Table 6, the results of the first two factors are presented; the attitude towards a political system where only one party can stand for elections and hold office, and the individual's attitude towards a president abolishing the parliament so (s)he can decide solely. Table 6 columns 1, 2, and 3 show the results of the former, while columns 4, 5, and 6 illustrate the results of the latter. The categories of these factors are ordered from strongly disapproving to strongly approving. The results show the coefficients of the independent and control variables, the number within brackets below the coefficient presents the standard deviation.

The first three columns show an insignificant, negative relationship between *Rainfall Shock* and the individual's attitude towards non-democratic changes. The coefficients are -0,036 and -0,033 points, respectively, and the negative sign is as expected.

In columns 2 and 3, the respondent's economic situation is taken into consideration. Firstly, let's consider *Economic Experience*. The 'worse' and 'even' category both have a significant, negative effect on the individual's demand for democracy. This implies that when the current living conditions are either 'worse' or 'even' to that of one year ago, the attitude towards a political system with only one party decrease with -0,057 and -0,107 points, respectively.

Table 6: Rainfall shocks, economic situation and the individual's demand for democracy; attitude towards a one-party political system, and attitude towards a president's decision to abolish the parliament

		(I) One-party rule	(II) One-party rule	(III) One-party rule	(IV) President rule	(V) President rule	(VI) President rule
	Rainfall Shock	-0,030	-0,028	-0,033	-0,289*	-0,286**	-0,303**
		(0,153)	(0,152)	(0,155)	(0,163)	(0,163)	(0,166)
Economic Experience	Worse		-0,057***	-0,049***		-0,070***	-0,072***
			(0,015)	(0,016)		(0,015)	(0,016)
	Even		-0,107***	-0,105**		-0,054***	-0,063***
			(0,014)	(0,015)		(0,015)	(0,015)
	Better		**Reference**	Reference		**Reference**	**Reference**
Economic Expectations	Worse			-0,048**			0,005
				(0,019)			(0,019)
	Even			-0,025			0,046**
				(0,019)			(0,019)
	Better			Reference			**Reference**
	Male	-0,102***	-0,103***	-0,109***	-0,068***	-0,069***	-0,070***
		(0,012)	(0,012)	(0,012)	(0,012)	(0,012)	(0,013)
	Age	-0,010***	-0,010***	-0,011***	-0,006***	-0,005**	-0,005**
		(0,002)	(0,002)	(0,002)	(0,002)	(0,002)	(0,002)
	Age2	0,000	0,000	0,000	0,000**	0,000*	0,000*
		(0,000)	(0,000)	(0,000)	(0,000)	(0,000)	(0,000)
	DummyAge	0,000	0,000	0,000	0,000	0,000	0,000
	Rural	0,076***	0,077**	0,078***	-0,036**	-0,037**	-0,033**
		(0,015)	(0,015)	(0,015)	(0,015)	(0,015)	(0,016)
	Polity2	-0,007	-0,011	-0,015	-0,068***	-0,068***	-0,063**
		(0,030)	(0,030)	(0,030)	(0,026)	(0,026)	(0,026)
	Educyears	-0,033***	-0,033***	-0,032***	-0,025***	-0,025***	-0,024***
		(0,002)	(0,002)	(0,002)	(0,002)	(0,002)	(0,002)
	DummyEdu	-0,062	-0,059	-0,24	-0,251**	-0,250**	-0,176
Demand for democracy	Cut 1	-1,1221***	-1,244***	-1,196***	-0,1256***	-0,1296***	-0,1235***
	Cut 2	-0,275	-0,298	-0,244	-0,207	-0,247	-0,181
	Cut 3	-0,138	-0,16	-0,106	0,017	0,023	0,044
	Cut 4	0,391*	0,371*	0,423**	0,524***	0,485***	0,444***
	Regions with shock	4	4	4	4	4	4
	Observations with shock	740	740	643	736	736	644
	Total observations	34301	34301	31547	32535	32535	29980

The probability distribution is multinomial, and the table presents both the coefficients, and the standard variation within brackets. *, **, and *** illustrate the significance level at 90, 95, and 99 percent, respectively.

The standard variations are 0,015 and 0,014 points. The third column illustrates comparable coefficients of the 'worse' and 'even' category *Economic Experience*, -0,049 and -0,105 points, respectively. The second component of the individual's economic condition is *Economic expectations*, which illustrates the individual's expectations and compares his/her current living conditions to the expected living conditions in one year. When the respondent expects to be 'worse' off one year from now, this will have a significant, negative impact on the respondent's attitude towards a one-party political system, with the coefficient being 0,048 points.

Furthermore, let's take a closer look at the control variables. Columns 1, 2, and 3 illustrate that gender has a significant, negative impact on an individual's demand for democracy. That is, *Male* corresponds to a more negative attitude towards a one-party political system. These effects are quite comparable in all three models, with the coefficients being -0,102, -0,103 and -0,109 points, respectively. In addition, columns 1, 2, and 3 present that *Rural* is statistically significant, and has a negative relationship with the individual's demand for democracy. This shows that when the respondent lives in a rural area his approval of a one-party system decreases with 0,076, 0,077, and 0,078 points, respectively. Moreover, years of education has a significant, negative impact on the attitude towards a political system with only one party, as an additional year of education has a negative effect of 0,033 points in columns and 1 and 2, and 0,032 points in column 3.

The second component of the attitude towards non-democratic changes is presented in columns 3 and 4. In these columns, the respondent's attitude towards a president abolishing the parliament to decide everything alone is illustrated. Firstly, let's consider *Rainfall Shock*. Columns 4, 5, and 6 show a significant, negative effect. This implies that when an individual lives in a region classified with a rainfall shock, his/her attitude towards the abolishment of the parliament became more negative, as the individual's demand for democracy decreases with -0,289, -0,286 and -0,303 points, respectively. This is statistically significant at a 90 and 95 percent significance level.

Columns 5 and 6 present the effects of the participant's economic condition on their attitude towards president's decision to abolish the parliament. The first part of the economic condition, *Economic Experience*, shows the impact of changes between the current living conditions and those of one year ago. The 'worse' and 'even' category are both statistically significant at a 99 percent level. The coefficients are -0,070 and -0,054 points in column 5, and -0,072 and -0,063 points in column 6.

For Economic Expectations, the 'even' category has a significant, positive impact. This entails that if an individual expects his/her living conditions to be 'even' next year, the respondent's attitude towards such a non-democratic change becomes more positive. The coefficient is 0,046 points.

In addition, multiple control variables have a significant effect on the individual's demand for democracy. First of all, *Polity* has a significant, negative relationship with the attitude towards the president abolishing the parliament. The coefficients in columns 4, 5, and 6 are respectively 0-,068, -0,068, and -0,063 points. These results imply that in countries with a more developed democracy, the citizens have a stronger negative attitude towards the president's decision to abolish the parliament to decide everything alone. Moreover, *Educyears* has a significant, negative impact, as an additional year of education decreases the attitude towards such a non-democratic decision with -0,025 points both in columns 4 and 5, and with -0,024 points in column 6. *Rural* is also statistically significant, as living in a rural area corresponds with a significant, negative effect on the individual's attitude towards a president's decision to abolish the parliament.

4.2   Participation in protest marches and the use of political violence

Table 7 presents the second component of the individual's demand for democracy, involving the respondent's action undertaken to demand more democracy. Columns 1, 2, and 3 present the respondent's participation in protest marches and demonstration in the last year, and columns 4, 5, and 6 illustrate the individual's use of violence for a political cause in the last twelve months. The participant's answer involved a Likert scale, with the following answers: 'No, and have no desire to do so', 'No, but would do if I got the chance', 'Yes, once or twice', 'Yes, several times', and 'Yes, often'.

The first three columns show an insignificant, positive relationship between *Rainfall Shock* and the participation in protest marches of 0,095, 0,091 and 0,080 points, respectively. The positive sign is as expected. This insignificant relationship implies that experiencing a rainfall shock does not result in a higher participation of protest marches.

Next, let's consider the economic condition of the participant. In column 2, both columns of Economic Experience have a significant impact on the participation in protest marches. The 'worse' category has a significant, positive effect, and the 'even' category has a significant, negative impact. The coefficients are 0,034 and -0,029 points, respectively. This

implies that the individual's participation in protest marches increases when their living situation deteriorated in the last year, and their participation decreased when their living situation remained the same. In column 3, only the 'even' category of *Economic Experience* has a significant, negative impact. For the second part of the respondent's economic condition, *Economic expectations*, only the 'worse' category has a significant, positive relationship with the participation in protest marches. The coefficient is 0,103 points, and this is statistically significant at a 99 percent level.

There are various control variables that have a statistically significant relationship with the participation in protest marches. First of all, *Male* has a significant, positive relationship with the participation, as being a male increases an respondent's participation in demonstrations with 0,145, 0,145, and 0,140 points, respectively. Moreover, *Rural* has a significant, positive relationship with the demand for democracy, which implies that if a respondent lives in a rural area his participation in protest marches increases with 0,039, 0,040, and 0,032 points, respectively. *Polity2* corresponds with a significant, positive effect on the participation, implying that living in nations which is more developed democracy increases the chance of participation in protest marches with 0,083, 0,071, and 0,071 points, respectively. Finally, there is a significant, positive relationship between *Educyears* and participation in protest marches. This indicates that one additional year of education has an positive effect of 0,021 points in all of the three models.

Columns 4, 5, and 6 of Table 7 present the results of the second factor, which shows whether the participant has used political violence in the last year. All of these columns illustrate an insignificant, negative relationship between *Rainfall Shock* and the use of violence for a political cause, with the coefficients being -0,096, -0,096 and -0,082 points, respectively.

Next, let's consider the respondent's economic condition. In column 5, only the 'even' category of *Economic Experience* has a significant, negative relationship with the use of violence. Moreover, in column 6 this category has a significant, negative impact on the use of violence for a political cause. In column 6 the 'worse' category has a significant, negative relationship with the use of violence, and this result is statistically significant at a 90 percent level. For the second component of the respondent's economic condition, *Economic expectations*, both the 'worse' and 'even' category have a significant, positive relationship with the use of violence for a political cause. The coefficients are 0,172 and 0,082 points, respectively, and these results are significant at a 99 percent level.

Table 7: Rainfall shocks, economic situation and the individual's demand for democracy; the individual's participation in protest marches, and the individual's use of violence for a political cause

		(I) Protest March	(I) Protest March	(III) Protest March	(IV) Political violence	(V) Political violence	(VI) Political violence
	Rainfall Shock	0,095	0,91	0,080	-0,096	-0,096	-0,082
		(0,156)	(0,155)	(0,157)	(0,160)	(0,160)	(0,158)
Economic Experience	Worse		0,034**	0,025		0,004	-0,033*
			(0,015)	(0,016)		(0,017)	(0,019)
	Even		-0,029*	-0,037**		-0,046***	-0,065***
			(0,015)	(0,015)		(0,017)	(0,018)
	Better		**Reference**	Reference		Reference	Reference
Economic Expectations	Worse			0,103***			0,172***
				(0,019)			(0,022)
	Even			-0,014			0,082***
				(0,019)			(0,022)
	Better			**Reference**			**Reference**
	Male	0,145***	0,145***	0,140***	0,095***	0,095***	0,092***
		(0,012)	(0,012)	(0,012)	(0,014)	(0,014)	(0,014)
	Age	0,005**	0,005**	0,005**	0,000	0,000	0,000
		(0,002)	(0,002)	(0,002)	(0,002)	(0,002)	(0,003)
	Age2	0,000	0,000	0,000	0,000	0,000	0,000
		(0,000)	(0,000)	(0,000)	(0,000)	(0,000)	(0,000)
	DummyAge	0,000	0,000	0,000	0,000	0,000	0,000
	Rural	0,039***	0,040**	0,032**	-0,012	-0,011	-0,017
		(0,015)	(0,015)	(0,016)	(0,023)		(0,024)
	Polity2	0,083***	0,071***	0,071**	0,051	0,048	0,035
		(0,031)	(0,031)	(0,031)	(0,031)	(0,031)	(0,031)
	Educyears	0,021***	0,021***	0,021***	-0,001	-0,001	-0,001
		(0,001)	(0,001)	(0,002)	(0,002)	(0,002)	(0,002)
	DummyEdu	-0,036	-0,039	-0,084	0,291*	0,291*	0,241
Demand for democracy	Cut 1	-0,009	0,024	0,056	0,770***	0,786***	0,839***
	Cut 2	0,731***	0,764***	0,788***	1,261***	1,277***	1,328***
	Cut 3	1,005***	1,038***	1,065***	1,439***	1,455***	1,509***
	Cut 4	1,345***	1,378***	1,404***	1,687***	1,704***	1,763***
	Regions with shock	4	4	4	4	4	4
	Observations with shock	744	744	643	745	745	644
	Total observations	34767	34767	31929	34789	34789	31946

The probability distribution is multinomial, and the table presents both the coefficients, and the standard variation within brackets. *, **, and *** illustrate the significance level at 90, 95, and 99 percent, respectively.

Of all control variables included, only *Male* has a statistically significant, positive relationship with use of violence for a political cause, implying that being a male increases the likelihood of using violence for a political cause. The coefficients are 0,095, 0,095, and 0,091 points, respectively.

4.3   Robustness checks

Rainfall Shock upper bound sensitivity

In this section, until now, only one of the four separate factors of the individual's demand for democracy *Rainfall Shock* had a significant effect. A possible cause could be the upper-bound of *Rainfall Shock*, which is arbitrarily set on 70 percent. This upper-bound is based on a trade-off between having at least multiple regions, as well as a reasonable amount of observations, included, and having a upper bound that allows to make a clear distinction between regions with a rainfall shock and without a rainfall shock. To check the sensitivity of the upper bound, in Table 8 and 9 the same regressions are run, only now an upper bound is established at 75 percent. The set-up of the demand for democracy is similar to that of the previous tests: Table 5 investigates the attitude towards non-democratic changes, and Table 6 examines the individual's participation in actions to demand more democracy.

Columns, 1, 2, and 3 of Table 8 present the individual's attitude towards a political system where only one party is allowed. These show a significant, negative impact of *Rainfall Shock*, The coefficients are -0,182, -0,179, and -0,186 points, respectively. This implies that when an respondent lives in a region where a *Rainfall Shock* is identified, the respondent's attitude towards a one-party political system becomes more negative. These results differs from the results shown in Table 3, which presented an insignificant effect of *Rainfall Shock*.

Next to the *Rainfall Shock*, let's consider the individual's economic condition. In columns 2 and 3 the 'worse' and 'even' category of Economic Experience have a significant, negative relationship with the one-party rule. The coefficients in the second model are -0,057 and -0,107 points, and in the third model the coefficients are -0,049 and -0,105 points, respectively.This implies that when the individual's living conditions have become much worse or remained the same, compared to last year, it has a negative impact on the individual's attitude towards a one-party political system. Furthermore, the 'worse' category of *Economic Expectations* has a significant, negative relationship with the attitude towards a political system with only one party.

Table 8: Rainfall shocks with a 75 percent upper bound, economic situation and the individual's demand for democracy; attitude towards a one-party political system, and attitude towards a president's decision to abolish the parliament.

		(I) One-party rule	(I) One-party rule	(III) One-party rule	(IV) President rule	(V) President rule	(VI) President rule
	Rainfall Shock	-0,182**	-0,179*	-0,186**	-0,039	-0,038	-0,065
		(0,093)	(0,092)	(0,094)	(0,163)	(0,163)	(0,166)
Economic Experience	Worse		-0,057***	-0,049***		-0,070***	-0,072***
			(0,015)	(0,016)		(0,015)	(0,016)
	Even		-0,107***	-0,105**		-0,054***	-0,063***
			(0,014)	(0,015)		(0,015)	(0,015)
	Better		**Reference**	Reference		Reference	**Reference**
Economic Expectations	Worse			-0,048**			0,005
				(0,019)			(0,019)
	Even			-0,025			0,046**
				(0,019)			(0,019)
	Better			Reference			**Reference**
	Male	-0,102***	-0,103***	-0,109***	-0,068***	-0,069***	-0,070***
		(0,012)	(0,012)	(0,012)	(0,012)	(0,012)	(0,013)
	Age	-0,010***	-0,010***	-0,011***	-0,006***	-0,005**	-0,005**
		(0,002)	(0,002)	(0,002)	(0,002)	(0,002)	(0,002)
	Age2	0,000***	0,000***	0,000***	0,000**	0,000*	0,000*
		(0,000)	(0,000)	(0,000)	(0,000)	(0,000)	(0,000)
	DummyAge	0,000	0,000	0,000	0,000	0,000	0,000
	Rural	0,076***	0,077**	0,078***	-0,036**	-0,037**	-0,033**
		(0,015)	(0,015)	(0,015)	(0,015)	(0,015)	(0,016)
	Polity2	-0,007	-0,011	-0,015	-0,068***	-0,068***	-0,063**
		(0,030)	(0,030)	(0,030)	(0,026)	(0,026)	(0,026)
	Educyears	-0,033***	-0,033***	-0,032***	-0,025***	-0,025***	-0,024***
		(0,002)	(0,002)	(0,002)	(0,002)	(0,002)	(0,002)
	DummyEdu	-0,063	-0,059	-0,024	-0,251**	-0,250**	-0,176
Demand for democracy	Cut 1	-1,222***	-1,245***	-1,196***	-0,126***	-0,130***	-0,124***
	Cut 2	-0,276	-0,298	-0,244	-0,207	-0,247	-0,181
	Cut 3	-0,138	-0,160	-0,106	0,017	0,023	0,044
	Cut 4	0,391*	0,371*	0,423**	0,524***	0,485***	0,444***
	Regions with shock	7	7	7	7	7	7
	Observations with shock	1690	1690	1521	1683	1683	1520
	Total observations	34385	34385	31547	32535	32535	29980

The probability distribution is multinomial, and the table presents both the coefficients, and the standard variation within brackets. *, **, and *** illustrate the significance level at 90, 95, and 99 percent, respectively.

In columns 4, 5, and 6, *Rainfall Shock* has an insignificant impact on the attitude towards a president's decision to abolish the parliament and decide solely. This is in contrast to the tests where *Rainfall Shock* has a 70 percent upper bound, which presented a significant, negative effect of Rainfall Shock on the respondent's attitude.

The results of the respondent's economic condition are comparable to the results presented in Table 6, as the difference between these two differences is the 70 and 75 percent *Rainfall Shock* upper bound. In column 5 of Table 8, the 'worse' and 'even' categories of *Economic Experience* have a significant, negative relationship with the attitude towards the abolishment of the parliament. The coefficients are -0,070 and -,054 points, respectively. The coefficients in column 6 are comparable, being -0,072 and -0,063 points, respectively. All these results are statistically significant at a 99 percent level. For the second component of the individual's economic condition, *Economic Expectations*, the 'even' category has a significant, positive impact on the president's decision to abolish the parliament. The coefficient is 0,046 points.

Respondent's actions undertaken against the government

Next, let's consider the second key area of the demand for democracy, which involves the individual's actions against the government. Table 9 presents the results of the models with the upper bound of Rainfall Shock at 75 percent. Columns 1, 2, and 3 illustrate the respondent's participation in demonstrations and protest marches, whereas columns 4, 5, and 6 present the participant's use of violence for a political cause.

In the first three columns, *Rainfall Shock* has an insignificant, negative impact on the individual's participation in protest marches. The coefficients are -0,019, -0,019, and -0,026 points, respectively. This implies that living in a region where a *Rainfall Shock* was identified, did not have a significant impact on the individual's participation in protest marches or demonstrations.

In column 5, the 'worse' category of *Economic Experience* has a significant, positive relationship with the participation in demonstrations, whereas the 'even' category of this factor has a significant, negative impact on the respondent's participation rate. The coefficients are 0,034 and -0,029 points, respectively. In the model where *Economic Expectations* is included, shown in column 3, only the 'even' category of *Economic Experience* is significant.

Table 9: Rainfall shocks with a 75 percent upper bound, economic situation and the demand for democracy; the individual's participation in protest marches, the individual's use of violence for a political cause.

		(I) Protest March	(II) Protest March	(III) Protest March	(IV) Political violence	(V) Political violence	(VI) Political violence
	Rainfall Shock	-0,019	-0,019	-0,026	-0,016	-0,014	-0,023
		(0,095)	(0,095)	(0,095)	(0,097)	(0,097)	(0,096)
Economic Experience	Worse		0,034**	0,025		0,004	-0,033*
			(0,015)	(0,016)		(0,017)	(0,019)
	Even		-0,029*	-0,037**		-0,046***	-0,065***
			(0,015)	(0,015)		(0,017)	(0,018)
	Better		**Reference**	Reference		**Reference**	**Reference**
Economic Expectations	Worse			0,103***			0,172***
				(0,019)			(0,022)
	Even			-0,014			0,082***
				(0,019)			(0,022)
	Better			**Reference**			**Reference**
	Male	0,145***	0,145***	0,140***	0,095***	0,095***	0,092***
		(0,012)	(0,012)	(0,013)	(0,014)	(0,014)	(0,014)
	Age	0,005**	0,005**	0,005**	0,000	0,000	0,000
		(0,002)	(0,002)	(0,002)	(0,002)	(0,002)	(0,003)
	Age2	0,000***	0,000***	0,000***	0,000	0,000	0,000
		(0,000)	(0,000)	(0,000)	(0,000)	(0,000)	(0,000)
	DummyAge	0,000	0,000	0,000	0,000	0,000	0,000
	Rural	0,039***	0,040**	0,032**	-0,012	-0,011	-0,017
		(0,015)	(0,015)	(0,016)	(0,023)		(0,024)
	Polity2	0,083***	0,079***	0,071**	0,051	0,048	0,035
		(0,031)	(0,031)	(0,031)	(0,031)	(0,031)	(0,031)
	Educyears	0,021***	0,021***	0,021***	-0,001	-0,001	-0,001
		(0,001)	(0,001)	(0,002)	(0,002)	(0,002)	(0,002)
	DummyEdu	-0,036	-0,039	-0,084	0,291*	0,291*	0,241
Demand for democracy	Cut 1	-0,010	0,024	0,056	0,770***	0,786***	0,839***
	Cut 2	0,730***	0,764***	0,788***	1,261***	1,278***	1,328***
	Cut 3	1,004***	1,038***	1,065***	1,439***	1,456***	1,508***
	Cut 4	1,344***	1,378***	1,404***	1,688***	1,704***	1,763***
	Regions with shock	7	7	7	7	7	7
	Observations with shock	1706	1706	1533	1708	1708	1535
	Total observations	34767	34767	31929	34789	34789	31946

The probability distribution is multinomial, and the table presents both the coefficients, and the standard variation within brackets. *, **, and *** illustrate the significance level at 90, 95, and 99 percent, respectively

Additionally, the 'worse' category of E*conomic Expectations* is positive and statistically significant at a 99 percent level. The coefficient is 0,103 points, which implies that when a respondent expects his living expectations to deteriorate in the coming year, this will increase their participation in protest marches and demonstrations.

Finally, columns 4, 5, and 6 present the results on the respondent's use of violence for a political cause. Firstly, there is an insignificant, negative relationship between *Rainfall Shock* and the participant's use of violence for a political cause. The coefficients are -0,016, -0,014, and -0,023 points, respectively.

In column 5, only the 'even' category of *Economic Experience* has a significant, negative relationship with the use of violence for a political cause. The coefficient is -0,046 points. In column 6, both the 'worse' and 'even' category of *Economic Experience* are statistically significant, and both have a negative relationship with the use of violence. The coefficients are -0,033 and -0,065 points, respectively. Column 6 also presents Economic Expectations, the second component of the respondent's economic situation. For this component both the 'worse' and 'even' category have a significant, positive impact on the use of violence for a political cause. The coefficients are 0,172 and 0,082 points, respectively, and these results are statistically significant at a 99 percent level.

Rainfall Shock upper bound of 80 percent

Next to the 70 and 75 percent upper bound of the variable *Rainfall Shock*, this research also investigated the impact of *Rainfall Shock* when the upper bound is established at 80 percent. However, for each of the four separate factors used to measure the demand for democracy, an insignificant impact of *Rainfall Shock* is found. The results of the independent variable and the control variables, are comparable to the results of the models established for the 70 and 75 percent upper bound. Hence, this study will not discuss these results in more detail in this section. The models corresponding to the 80 percent upper bound of *Rainfall Shock* are presented in Appendix D.

Non-democratic regimes

Furthermore, this study considers the relevance of the current level of democracy. It might be the case that individuals living in a democracy react differently than individuals who do not. This is already taken into account through including *Polity* as a controlling variable, but as a robustness check this study will also run regressions on models where only non-democratic nations (Polity score ≤ 5) are included. Table 10 presents the respondent's attitude towards non-democratic change, and Table 11 illustrates the participant's action undertaken to demand more democracy.

The first three columns of Table 10 present the individual's attitude towards a political system where only one party is allowed. In all of these columns is there an insignificant effect of *Rainfall Shock* on the individual's attitude towards a one-party political system.

In column 2, the 'worse' and 'even' category of *Economic Experience* have a significant, negative relationship with the respondent's attitude towards a one-party political system. The coefficients are -0,088 and -0,116 points, respectively. This implies that when individuals living condition either deteriorated or remained the same compared to last year, it has a negative effect on their attitude towards political system with only one party. In column 3, the results for *Economic Experience* are comparable. For *Economic Expectations*, the 'worse' category has a significant, negative impact on the respondent's attitude towards a one-party rule.

Columns 4, 5, and 6 illustrate the respondent's attitude towards a president's decision to abolish the parliament and decide solely. These columns show that *Rainfall Shock* has a significant, negative impact on the individual's attitude towards such a non-democratic change. The coefficients are -0,299, -0,296, and -0,313 points, respectively. The standard deviations are 0,149, 0,149, and 0,152 points. The negative relationship is as expected.

Column 5 shows that the 'worse' and 'even' category of *Economic Experiences* have a significant, negative relationship with the president's decision to abolish the parliament. The coefficients are -0,086 and -0,059 points, respectively. This implies that the living conditions of a respondent worsened or remained the same, the attitude towards a president's decision to abolish the parliament becomes more negative. The results in column 6 of *Economic Experience* are comparable. Next, the 'even' category of Economic Expectations has a significant, positive impact on the individual's approval of such a non-democratic change.

Table 10: Rainfall shocks, economic situation and the individual's demand for democracy in non-democratic nations; attitude towards a one-party political system, and attitude towards a president's decision to abolish the parliament.

		(I) One-party rule	(II) One-party rule	(III) One-party rule	(IV) President rule	(V) President rule	(VI) President rule
	Rainfall shock	-0,031	-0,026	-0,030	-0,299**	-0,295**	-0,313**
		(0,157)	(0,156)	(0,159)	(0,149)	(0,149)	(0,151)
Economic Experience	Worse		-,088***	-0,076***		-0,086***	-0,096***
			(0,020)	(0,021)		(0,021)	(0,022)
	Even		-0,116***	-0,109***		-0,059***	-0,074***
			(0,020)	(0,021)		(0,021)	(0,022)
	Better		**Reference**	Reference		Reference	Reference
Economic Expectations	Worse			-0,068***			0,014
				(0,025)			(0,025)
	Even			-0,024			0,094***
				(0,026)			(0,026)
	Better			**Reference**			**Reference**
	Male	-0,114***	-0,114***	-0,124***	-0,085***	-0,085***	-0,085***
		(0,016)	(0,016)	(0,017)	(0,017)	(0,017)	(0,018)
	Age	-0,008***	-0,008***	-0,008***	-0,006***	-0,006***	-0,006***
		(0,003)	(0,003)	(0,003)	(0,003)	(0,003)	(0,003)
	Age2	0,000**	0,000**	0,000**	0,000**	0,000	0,000
		(0,000)	(0,000)	(0,000)	(0,000)	(0,000)	(0,000)
	DummyAge	0,000	0,000	0,000	0,000	0,000	0,000
	Rural	0,076***	0,077**	0,078***	-0,034	-0,035*	-0,033
		(0,015)	(0,015)	(0,015)	(0,021)	(0,021)	(0,021)
	Polity2	-0,008	-0,01	-0,013	-0,069***	-0,070***	-0,065***
		(0,031)	(0,030)	(0,031)	(0,024)	(0,024)	(0,024)
	Educyears	-0,033***	-0,034***	-0,032***	-0,025***	-0,026***	-0,025***
		(0,002)	(0,002)	(0,002)	(0,002)	(0,002)	(0,002)
	DummyEdu	-0,076	-0,074	-0,001	-0,322***	-0,317**	-0,182
Demand for democracy	Cut 1	-1,229***	-1,283***	-1,197***	-1,384***	-1,433***	-1,310***
	Cut 2	-0,244	-0,297	-0,202	-0,272	-0,32	-0,19
	Cut 3	-0,096	-0,149	-0,053	-0,033	-0,081	0,048
	Cut 4	0,450*	0,399*	0,494**	0,472***	0,424***	0,555***
	Regions with shock	3	3	3	3	3	3
	Observations with shock	326	326	278	328	328	281
	Total observations	18624	18624	16948	16970	16970	15475

The probability distribution is multinomial, and the table presents both the coefficients, and the standard variation within brackets. *, **, and *** illustrate the significance level at 90, 95, and 99 percent, respectively.

Table 11 presents the results of the second key area of demand for democracy, as it shows the individual's action undertaken to demand more democracy. First, let's consider columns 1, 2, and 3, illustrating the respondent's participation in demonstrations or protest marches. For all three columns, an insignificant, positive relationship between *Rainfall Shock* and participation in such events is found.

For the first component of the individual's economic condition, *Economic Experience*, the 'worse' category has a significant, positive impact on the respondent's participation in demonstrations. This is true in both column 2 and column 3. The coefficients are 0,066 and 0,056 points, respectively. In table 3. the 'even' category of *Economic Experience* has a significant, negative impact on the individual's participation rate. Furthermore, column 3 shows that the 'worse' category of *Economic Expectations* has a significant, positive effect. The coefficient is 0,114 points.

Next to the participation in demonstrations and protest marches, columns 4, 5, and 6 illustrate the individual's use of violence for a political cause. All of these columns show insignificant impact on the individual's use of violence for a political cause.

Furthermore, let's examine the results of the respondent's economic condition. In columns 5 and 6 the 'even' category of *Economic Experience* has a significant, negative effect on the use of violence for a political cause. The coefficients are -0,048 and -0,071 points, respectively, and these are both statistically significant at a 99 percent level. Column 6 illustrates that for the second component, *Economic Expectations*, the 'worse' and 'even' categories have a significant, positive relationship with the use of violence for a political cause. The coefficients are 0,176 and 0,110 points, respectively. These results imply that when a respondent expects that his living situation will either remain the same or worsen in the coming year, the likelihood of him/her using violence for a political cause increases.

Table 11: Rainfall shocks, economic situation and the demand for democracy in non-democratic nations; the individual's participation in protest marches, and their use of violence for a political cause.

		(I) Protest March	(I) Protest March	(III) Protest March	(IV) Political violence	(V) Political violence	(VI) Political violence
	Rainfall Shock	0,090	0,084	0,071	-0,097	-0,097	-0,087
		(0,177)	(0,177)	(0,177)	(0,176)	(0,176)	(0,173)
Economic Experience	Worse		0,066***	0,056**		0,003	-0,034
			(0,020)	(0,022)		(0,023)	(0,025)
	Even		-0,025	-0,037*		-0,048***	-0,071***
			(0,020)	(0,022)		(0,024)	(0,025)
	Better		**Reference**	**Reference**		**Reference**	**Reference**
Economic Expectations	Worse			0,114***			0,176***
				(0,025)			(0,028)
	Even			0,017			0,110***
				(0,027)			(0,030)
	Better			**Reference**			**Reference**
	Male	0,187***	0,187***	0,185***	0,134***	0,134***	0,134***
		(0,016)	(0,016)	(0,017)	(0,019)	(0,019)	(0,020)
	Age	-0,001	-0,001	0,005**	0,000	0,000	-0,001
		(0,003)	(0,003)	(0,002)	(0,002)	(0,003)	(0,004)
	Age2	0,000	0,000	0,000	0,000	0,000	0,000
		(0,000)	(0,000)	(0,000)	(0,000)	(0,000)	(0,000)
	DummyAge	0,000	0,000	0,000	0,000	0,000	0,000
	Rural	0,026	0,029	0,020	-0,035	-0,033	-0,039
		(0,020)	(0,015)	(0,021)	(0,023)	(0,023)	(0,024)
	Polity2	0,085**	0,079**	0,070**	0,048	0,048	0,036
		(0,035)	(0,035)	(0,035)	(0,034)	(0,031)	(0,031)
	Educyears	0,025***	0,021***	0,026***	0,000	-0,001	-0,001
		(0,002)	(0,001)	(0,002)	(0,002)	(0,002)	(0,002)
	DummyEdu	0,260*	0,248	0,225	0,439**	0,439**	0,400*
Demand for democracy	Cut 1	0,253	0,302	0,383	0,916***	0,932***	0,975***
	Cut 2	0,991***	1,043***	1,110***	1,423***	1,440***	1,480***
	Cut 3	1,259***	1,311***	1,381***	1,610***	1,627***	1,666***
	Cut 4	1,600***	1,652***	1,722***	1,864***	1,881***	1,931***
	Regions with shock	3	3	3	3	3	3
	Observations with shock	331	331	287	332	332	285
	Total observations	18996	18996	17243	18992	18992	17238

The probability distribution is multinomial, and the table presents both the coefficients, and the standard variation within brackets. *, **, and *** illustrate the significance level at 90, 95, and 99 percent, respectively.

5   Discussion

This chapter will elaborate on the empirical results, and analyze whether these results correspond to the hypotheses established in this research. This chapter first focuses on the relationship between the individual's economic condition and their demand for democracy, and will discuss whether these findings align with the existing literature. Next, the same approach will be used to examine the relationship between the effect of a rainfall shock on the respondent's demand for democracy. Finally, the challenges faced in this research will be highlighted.

5.1   Individual's economic condition and their demand for democracy

This research investigated the relationship between rainfall shocks, the individual's economic condition, and their demand for democracy. According to the theory of Acemoglu and Robinson (2001), negative, transitory economic shocks decrease the cost of contesting power, and when these opportunity cost are sufficiently low this can affect the individual's decision to overthrow the ruling government. In comparison to previous studies investigating this theory on the national level, this work focuses on what the impact of personal economic recessions is on the citizen's demand for democracy. Therefore, the first hypothesis to be analyzed is:

H1: Individuals that experienced an decline in their economic condition have an higher demand

for democracy.

In previous studies examining the relationship between economic crisis and democracy on the national level, the majority of the studies utilized GDP growth as a measure of economic development (Haggard and Kaufman, 1995; Huntington, 1995; Brückner and Ciccione, 2011). GDP growth measures the economic differences between subsequential years, and it can be helpful tool to see whether there is economic development or stagnation in a nation. This essence is also captured in this work by *Economic Experience*, which measures the respondent's economic situation compared to that of one year ago. This factor consists of three components:

'worse', 'even', and 'better', and the last category is used a reference category. As this research investigates the demand for democracy of citizens with a personal economic recession, this discussion will focus on the 'worse' category.

Besides *Economic Experience*, the citizen's expectations of their economic situation in the future is also taken into consideration as *Economic Expectations*. This measure illustrates whether respondents expect what their economic situation will be one year from now. Similar to *Economic Experience*, this category consists of three categories, 'worse', 'even', and 'better'. For this factor the 'better' category is the reference category, and this discussion will primarily focus on the findings of the 'worse' category. The 'worse' category of *Economic Expectations* can provide information that can be explained in two different manners: Either the individual will experience a personal economic recession in the coming year, or the individual's current economic recession will worsen.

The citizen's demand for democracy is measured through two key areas: the respondent's attitude towards non-democratic changes, and their action against the government. First, the respondent's attitude towards non-democratic changes will be discussed.

Individual's attitude towards non-democratic changes

The findings of this study suggest that the individuals whose economic situation deteriorated in the last year, in comparison with the citizens whose economic situation improved, have a more negative attitude towards to non-democratic changes. There is a significant, negative effect of this group of citizens whose economic situation worsened on their attitude towards a one-party political system, as well as on their attitude towards a president's decision to abolish the parliament and decide solely. These results are found throughout the different models. Therefore, the findings of suggest that individuals who experienced a personal, negative economic shock, instead of a personal, economic improvement, are more inclined to have a negative attitude towards non-democratic changes.

The results of the second component, *Economic Expectations*, are more ambiguous. The results suggest that individuals who expect that their economic situation will worsen in the coming year have, in comparison to those who expect that it will improve, a significantly more negative attitude towards a political system where only one party can stand elections and hold office. There is no significant difference between citizens who expect that their economic situation will decrease or increase in their attitude towards a president's decision to abolish the parliament.

The individual's actions undertaken to demand more democracy.

The second key area of the individual's demand for democracy is their actions undertaken to demand more democracy. For this area, the results are more ambiguous. There is a significant, positive relationship between a personal economic recession on the participation in protest marches and demonstrations for the model without the citizen's economic expectations, and this is consistent for all the results. For the models where *Economic Expectations* is included, the significant, positive effect of an experienced personal economic recession on the participation rate is only found when only citizens of non-democratic countries are included in the sample. Furthermore, the second part of this key area focuses on the citizen's use of violence for a political cause. Individuals who experienced a personal economic recession, instead of a personal economic improvement, are less inclined to use violence for a political cause. This significant, negative impact can only be found in the models where *Economic Expectations* is included as well. Moreover, this significant, negative effect is absent when only the non-democratic nations are included.

Although the results of *Economic Experience* is ambiguous, the findings of the individual's expectations about their economic situation in the coming year provides some context. The results of *Economic Expectations* show that individuals who expect that their economic situation will deteriorate in the next 12 months, in comparison to those who expect that it will improve, are more inclined to participate in protest marches and demonstrations, as well as use violence for a political cause. For both factors the 'worse' category has a strong significant, positive impact on the participation rate and use of violence.

Hypothesis and existing literature

All in all, the findings present a definite impact of the individual's (expected) negative economic shock and their demand for democracy. Citizens that either experienced, or expect to experience a personal economic recession have a more negative attitude towards non-democratic changes. Moreover, members of this group are more inclined to participate in demonstrations and protest marches, while their use of violence for a political cause is more ambiguous. Combining all these findings, this study presents a definite trend between personal economic recessions and demand for democracy. Hence, this research fails to reject the hypothesis that citizens who (expect to) experience a personal economic recession are more inclined to demand more democracy.

The findings of this study supports the theory of Acemoglu and Robinson (2001), which argues that in times of crisis, citizens are more likely to demand more democracy. Moreover, this research aligns with the previous studies investigating opportunity cost and the 'democratic window of opportunity' (Brückner and Ciccione, 2011; Lin and Sim, 2014). The results of this research suggest that negative economic shocks can cause social unrest, and even increase the individual's use of violence for a political cause. This supports earlier works focusing the relationship between economic downturns and social unrest (Koroyatev and Zinkina, 2011; Aidt and Leon, 2016). In addition, the findings of this research align with previous works documenting adjustments in democracy after negative economic shocks (Haggard and Kaufman, 1995; Geddes, 1999; Berger and Spoerer, 2001; Acemoglu and Robinson, 2006).

5.2   Rainfall Shock and the impact on the individual's demand for democracy

This study examined the relationship between negative, economic shocks and democratization through an exogenous shock as intermediate variable. *Rainfall Shock* was used as the exogenous shock, as rainfall shock can cause negative economic shocks and have a temporal nature. As the democratic window of opportunity is considered a short period, it is important that the negative economic shocks are transitory. The following hypotheses were established:

H2a: Individuals living in a region that experienced a rainfall shock have an higher demand

for democracy.

H2b: The effect of rainfall shocks on the demand for democracy is moderated by the

individual's economic condition.

The first part of this hypothesis suggests a relationship between Rainfall Shock and the individual's demand for democracy. Due the arbitrary upper bound of the variable *Rainfall Shock*, three different upper bounds have been tested: 70, 75, and 80 percent. There are a few findings that suggest that the examined relationship between rainfall shocks and demand for democracy exist. In the model with the 70 percent upper bound, there is a significant, negative

relationship between experiencing a rainfall shock and the individual's attitude towards a president's decision to abolish the parliament. This implies that when a respondent experienced a rainfall shock in the last year, this would have a negative effect on his/her attitude toward such a non-democratic change. In the 75 percent model, there is one significant, negative effect as well, only this impact of experiencing a rainfall shock concerns the respondent's attitude towards a one-party political system. Both of these effects of experiencing a rainfall shock are as expected, as these effects entail an increase in the citizen's demand for democracy. No other significant relationships were found.

Findings and existing literature

The findings suggest that citizens experiencing a rainfall shock are more inclined to demand more democracy. However, only a small portion of the models found such a significant impact of experiencing a rainfall shock. Although this definite trend is present, this study rejects the hypothesis that individual's that experienced a rainfall shock have a greater demand for democracy. Moreover, due to the lack of such a relationship, the second sub-hypothesis, that the effect of rainfall shocks is supposedly only in an indirect manner impacting the demand for democracy, is also rejected.

These findings do not align with the previous literature concerning the effect of exogenous shocks on democracy (Brückner and Ciccione, 2011; Lin and Sim, 2014; Aidt and Leon, 2016). A potential cause of these contrasting results follows from the difference in time span of the precipitation between the aforementioned studies and this research. Whereas earlier works entail longitudinal data, consisting of observations over more than 25 years, this study examines precipitation for one specific year for each region included. Due the longer timeframe in earlier research, more variation in rainfall levels was found. Hence, the upper bound of rainfall shocks was lower in previous studies, and so a stronger distinction between region with and without rainfall shocks was established. Due the lack of heavy droughts in the timespan of this study, a trade-off was made between having at least multiple regions and a reasonable amount of observations with rainfall shock included, and having an upper bound that allows to make a clear distinction between regions with and without *Rainfall Shock*. However, even using different upper bounds of what was considered a rainfall shock did not present enough evidence for the hypothesized relationships.

5.3   Challenges

There are a few challenges concerning this study. The primary challenge of the second hypothesis is already mentioned in the previous section, as there are no regions with high levels of droughts. Because of the absence of rainfall shocks with a great magnitude, the upper bound of what is considered a rainfall shock is higher than in previous studies. This paper is a cross-sectional study, whereas earlier research regarding rainfall shocks utilized longitudinal data. Although this is a challenge of this study, the benefits of using regional data on the precipitation levels instead of data on the country level partially offset this disadvantage. Working with subnational data increases the precision of areas experiencing a drought. Instead of nations experiencing a drought, this study entails regions experiencing a drought.

A second challenge of this challenge is the interpretation of *Economic Expectations*, considering the timeframe of the individual's demand for democracy. *Economic Expectations* provides information about the individual's expectations about their economic situation for the following year. This can be connected straightforwardly to the first key area of the demand for democracy, i.e. the citizen's attitude towards non-democratic changes, because both are measured at the same point in time. That is, the expectations and attitude of respondent's are both measured at the time of the data collection. For the second key area of the demand for democracy, the respondent's actions, the findings are more difficult to interpret. There can be a significant differences between the respondent's expectations about their future economic situation 11 months ago, in comparison to their current expectations about the future. Thus, if the respondent used violence for a political cause 11 months ago, their current expectations do not have any explanatory power. In comparison, if the respondent's used violence one month ago, their current expectations could be relevant, and the findings can say something. Therefore, the results concerning the impact of individual's who expect to experience a negative economic recession on their actions undertaken against the government should be interpreted cautiously.

Another potential concern of this research is part of the demand for democracy variable. One factor involving the individual's demand for democracy entails whether respondent's have used violence for a political cause in the last twelve months. However, it might be the case that individuals that participated in such an event are imprisoned. Hence, there is a bias in citizens who are able to fill in the Afrobarometer survey. To elaborate, the findings of this study suggest that individuals who (expect to) experience a negative economic shock are more inclined to demand more democracy. This introduces the possibility that citizens part of this group are more forceful in their use of violence for a political cause as well. On its turn, this could

correlate to an increased likelihood of imprisonment. If this theory is true, the findings of this study are skewed, and the relationship between the individual's economic crisis and their demand for democracy is stronger than the empirical results indicate.

6   Conclusion

This paper investigated the relationship between the economic condition of individuals and their demand for democracy. Although there are multiple theories to analyze this relationship, this study followed the work of Acemoglu and Robinson (2001). This theory argues that negative, transitory economic shocks reduce the cost of contesting power, and when the opportunity cost are sufficiently low, a democratic window of opportunity may emerge. One important cue is the arise of low-intensity conflict, such as riots (Aidt and Leon, 2016). As participation in low-intensity conflicts is not mandatory, not all individuals of a society are present. Hence, the question arises whether all individuals participate in overthrowing the regime, or just the citizens that experienced the transitory, negative economic shock the most. Negative, transitory income shocks are sometimes channeled through rainfall shocks, due to their effect on income and their temporal nature. This research hypothesizes that individuals who do experience such an negative income shock have a stronger demand for democracy. Additionally, this study hypothesizes that individuals who experienced a rainfall shock are more inclined to demand more democracy.

Similar to previous research examining the theory of Acemoglu and Robinson (2001), this empirical study consists of solely sub-Saharan nations. As there is no widely-used measure of the individual's demand for democracy, this research examined two key areas representing this variable: The citizen's attitude towards non-democratic changes, and the individual's action undertaken to demand more democracy. Furthermore, this study utilizes two components of the individual's economic condition: *Economic Situation* and *Economic Expectations*. While the former entails information about the differences between the citizen's current economic situation and their economic situation one year ago, the latter focuses on whether the individual's expect that their economic situation will improve or not in the coming year.

The findings of this paper support the first hypothesis, as the empirical results suggest that individuals who experienced a personal economic recession, or expect yet to experience such a recession, are more inclined to demand more democracy. When the citizen experienced a personal economic decline in the last twelve months, his/her attitude towards non-democratic changes became more negative. This is also partially the case for the second key area, actions undertaken against the ruling government. When citizens expect that their economic situation will deteriorate in the next 12 months, they are also more inclined to participate in protest marches and use violence for a political cause. These findings align with previous follow-up

studies on the theory of Acemoglu and Robinson (2001), as there is a significant, negative relationship between economic development and democratization (Brückner and Ciccione, 2011; Sin and Lim, 2014). Moreover, these results support earlier work on the relationship between economic recession and social unrest (Aidt and Leon, 2016; Korotayev and Zinkina, 2011).

The second hypothesis focuses on the (indirect) relationship between citizens experiencing a rainfall shock and their demand for democracy. Important to note is that this empirical paper conducted a cross-sectional study, as the individual's economic condition, and their demand for democracy were measured at one specific point in time. This is in contrast to previous works, which investigated the relationship between rainfall shocks, economic crisis, and democracy in longitudinal study (Paxson, 1992; Burke and Leigh, 2010; Brückner and Ciccione, 2011). As a consequence of the shorter timeframe in this study, the upper bound of what should be considered as a rainfall shock was higher than earlier works. This upper bound is based on a trade-off between having at least multiple regions, as well as a reasonable amount of observations, included with a rainfall shock, and having a upper bound that allows to make a clear distinction between regions with and without a rainfall shock.

This higher level of the rainfall upper bound could potentially be a cause of the inconclusive results. Either way, the hypothesis was rejected. Although some models found a significant, negative impact of experiencing a rainfall shock on the individual's attitude towards non-democratic changes, this trend was insufficiently present to accept the hypothesized relationship. Hence, as the findings were inconclusive, they do not completely align with earlier works that did find a significant, positive relationship between drought-induced periods and democratization (Brückner and Ciccione, 2011; Aidt and Leon, 2016).

This empirical study has three main challenges that could harm the validity of the findings. The first challenge is discussed shortly before, as this research opts for a cross-sectional study instead of using longitudinal data. As a consequence of the shorter timeframe of this research, a lower amount of regions with a rainfall shock are identified.

A second challenge is the interpretation of the impact of citizen's expectations about their economic situation one year from now on their actions undertaken against the ruling government. The citizens are asked whether they have participated in demonstrations or used violence for a political cause in the last 12 months ago, whereas the expectations of their future economic situation are stated at the point of the data collection. If an individual has used

violence for a political 11 months ago, their current expectations about their economic situation for the next year does not have much explanatory power. Therefore, the findings concerning this relationship should be interpreted with caution.

Another challenge is the potential bias of respondents of the Afrobarometer survey. One factor of the demand for democracy variable entails whether citizens have used violence for a political cause in the last twelve months. As the findings illustrate that individual's experiencing an economic shock are more inclined to demand more democracy, it is possible that citizens belonging to this group are more forceful as well. Consequently, this group has a higher probability of imprisonment due to their actions against the ruling government. Hence, citizens belonging to this group might be excluded from the survey. If this is true, it implies that the effects of citizens experiencing a negative, economic shock are stronger than the findings indicate.

Furthermore, there is still much ground uninvestigated on these subjects. Not only the theoretical frame of Acemoglu and Robinson (2001), but in a broader context also the relationship between economic crisis and democracy is primarily analyzed on the national level. Examining this relationship within the context of other sub-continental regions or within specific countries could provide a greater understanding of the influence of the citizen's economic condition and their demand for democracy. Moreover, it could be interesting to see if the citizens affected the most by an economic downturn are the ones that play a major role in the democratization of countries. Additionally, as the findings of the impact of the exogenous shock were inconclusive, further research is suggested to discover its impact on how citizens act towards the ruling government.

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8 Appendix

8.1 Appendix A: Respondent's economic condition

Afrobarometer round 5, Question 5B: Looking back, how do you rate the following compared to twelve months ago: Your living conditions?

A	Much worse	1
B	Worse	1
C	Same	2
D	Better	3
E	Much better	3
F	Don't know	
G	Refused to answer	
H	Missing Source	

Delete all observations with the answers 'refused to answer' and 'missing source'. Label the answers from 1 to 5, with 'Much worse' as the lowest, and 'Much better' as the highest.

Afrobarometer round 5, Question 6B: Looking ahead, do you expect the following to be better or worse: Your living conditions in twelve months' time?

A	Much worse	1
B	Worse	1
C	Same	2
D	Better	3
E	Much better	3
F	Don't know	
G	Refused to answer	
H	Missing Source	

Delete all observations with the answers 'refused to answer' and 'missing source'. Label the answers from 1 to 5, with 'Much worse' as the lowest, and 'Much better' as the highest.

9.2 Appendix B: Respondent's demand for democracy – Attitude towards non-democratic changes

Afrobarometer Round 5, Question 31A: There are many ways to govern a country. Would you disapprove or approve of the following alternatives: Only one political party is allowed to stand for election and hold office?

A	Strongly disapprove	1
B	Disapprove	2
C	Neither approve nor disapprove	3
D	Approve	4
E	Strongly approve	5
F	Don't know	
G	Refused to answer	
H	Missing Source	

De-select all observations with the answers 'Don't know', 'Refused to answer', and 'missing source'. Label the answers from 1 to 5, with 'Strongly disapprove' as the lowest, and 'Strongly approve' as the highest.

Afrobarometer Round 5, Question 31C: There are many ways to govern a country. Would you disapprove or approve of the following alternatives: Elections and Parliament are abolished so that the president can decide everything?

A	Strongly disapprove	1
B	Disapprove	2
C	Neither approve nor disapprove	3
D	Approve	4
E	Strongly approve	5
F	Don't know	
G	Refused to answer	
H	Missing Source	

De-select all observations with the answers 'Don't know', 'Refused to answer', and 'missing source'. Label the answers from 1 to 5, with 'Strongly disapprove' as the lowest, and 'Strongly approve' as the highest.

Appendix C: Individual's demand for democracy – Action undertaken

Afrobarometer Round 5, Question Q26D: Here is a list of actions that people sometimes take as citizens. For each of these, please tell me whether you, personally, have done any of these things during the past year. If not, would you do this if you had the chance: Attended a demonstration or protest march.

A	No, would never do this	1
B	No, but would do if had the chance	2
C	Yes, once or twice	3
D	Yes, several times	4
E	Yes, often	5
F	Don't know	
G	Refused to answer	
H	Missing Source	

De-select all observations with the answers 'Don't know', 'Refused to answer', and 'missing source'. Label the answers from 1 to 5, with 'No, would never do this' as the lowest, and 'Yes, often' as the highest.

Afrobarometer Round 5, Question 26E: Here is a list of actions that people sometimes take as citizens. For each of these, please tell me whether you, personally, have done any of these things during the past year. If not, would you do this if you had the chance: Used force or violence for a political cause.

A	No, would never do this	1
B	No, but would do if had the chance	2
C	Yes, once or twice	3
D	Yes, several times	4
E	Yes, often	5
F	Don't know	
G	Refused to answer	
H	Missing Source	

De-select all observations with the answers 'Don't know', 'Refused to answer', and 'missing source'. Label the answers from 1 to 5, with 'No, would never do this' as the lowest, and 'Yes, often' as the highest.

9.3 Appendix D: 80 percent upper bound *Rainfall Shock*

Appendix D – Rainfall shocks with a 80 percent upper bound, economic situation and the individual's demand for democracy; attitude towards a one-party political system, and attitude towards a president's decision to abolish the parliament.

		(I) One-party rule	(II) One-party rule	(III) One-party rule	(IV) President rule	(V) President rule	(VI) President rule
	Rainfall shock	-0,057	-0,054	-0,074	-0,013	-0,013	-0,028
		(0,077)	(0,077)	(0,078)	(0,083)	(0,082)	(0,083)
Economic Experience	Worse		0,057***	-0,049***		-0,070***	-0,072***
			(0,015)	(0,016)		(0,015)	(0,016)
	Even		-0,107***	-0,105**		-0,054***	-0,063***
			(0,014)	(0,015)		(0,015)	(0,015)
	Better		**Reference**	**Reference**		**Reference**	**Reference**
Economic Expectations	Worse			-0,048**			0,005
				(0,019)			(0,019)
	Even			-0,025			0,046**
				(0,019)			(0,019)
	Better			**Reference**			**Reference**
Gender	Male	-0,102***	-0,103***	-0,109***	-0,068***	-0,069***	-0,070***
		(0,012)	(0,012)	(0,012)	(0,012)	(0,012)	(0,013)
	Age	-0,010***	-0,010***	-0,011***	-0,006***	-0,005**	-0,005**
		(0,002)	(0,002)	(0,002)	(0,002)	(0,002)	(0,002)
	Age2	0,000	0,000	0,000	0,000**	0,000*	0,000*
		(0,000)	(0,000)	(0,000)	(0,000)	(0,000)	(0,000)
	DummyAge	0,000	0,000	0,000	0,000	0,000	0,000
	Rural	0,076***	0,077**	0,078***	-0,036**	-0,037**	-0,033**
		(0,015)	(0,015)	(0,015)	(0,015)	(0,015)	(0,016)
	Polity2	-0,007	-0,011	-0,015	-0,068***	-0,068***	-0,063**
		(0,030)	(0,030)	(0,030)	(0,026)	(0,026)	(0,026)
Education	Educyears	-0,033***	-0,033***	-0,032***	-0,025***	-0,025***	-0,024***
		(0,002)	(0,002)	(0,002)	(0,002)	(0,002)	(0,002)
	DummyEdu	-0,062	-0,059	-0,24	-0,251**	-0,250**	-0,176
Demand for democracy	Cut 1	-1,1221***	-1,244***	-1,196***	-0,1255***	-0,1295***	-0,1235***
	Cut 2	-0,275	-0,298	-0,244	-0,206	-0,246	-0,181
	Cut 3	-0,138	-0,16	-0,106	0,018	-0,022	0,044
	Cut 4	0,391*	0,371*	0,423**	0,525***	0,486***	0,444***
	Regions with shock	11	11	11	11	11	11
	Observations with shock	2608	2608	2368	2578	2578	2348
	Total observations	34301	34301	31547	32535	32535	29980

The probability distribution is multinomial, and the table presents both the coefficients, and the standard variation within brackets. *, **, and *** illustrate the significance level at 90, 95, and 99 percent, respectively.

Appendix D - Rainfall shocks with a 80 percent upper bound, economic situation and the demand for democracy; the individual's participation in protest marches, the individual's use of violence for a political cause.

		(I) Protest March	(I) Protest March	(III) Protest March	(IV) Political violence	(V) Political violence	(VI) Political violence
	Rainfall Shock	-0,087	-0,082	-0,077	-0,107	-0,103	-0,099
		(0,078)	(0,078)	(0,078)	(0,082)	(0,082)	(0,082)
Economic Experience	Worse		0,034**	0,025		0,004	-0,033*
			(0,015)	(0,016)		(0,018)	(0,019)
	Even		-0,029*	-0,037**		-0,046***	-0,065***
			(0,015)	(0,016)		(0,017)	(0,018)
	Better		**Reference**	**Reference**		**Reference**	**Reference**
Economic Expectations	Worse			0,103***			0,172***
				(0,019)			(0,022)
	Even			-0,014			0,082***
				(0,019)			(0,022)
	Better			**Reference**			**Reference**
	Male	0,145***	0,145***	0,140***	0,095***	0,095***	0,092***
		(0,012)	(0,012)	(0,012)	(0,014)	(0,014)	(0,014)
	Age	0,005**	0,005**	0,005**	0,000	0,000	0,000
		(0,002)	(0,002)	(0,002)	(0,002)	(0,002)	(0,003)
	Age2	0,000	0,000	0,000	0,000	0,000	0,000
		(0,000)	(0,000)	(0,000)	(0,000)	(0,000)	(0,000)
	DummyAge	0,000	0,000	0,000	0,000	0,000	0,000
	Rural	0,039***	0,040**	0,032**	-0,012	-0,011	-0,017
		(0,015)	(0,015)	(0,016)	(0,023)		(0,018)
	Polity2	0,083***	0,071***	0,071**	0,051	0,048	0,035
		(0,031)	(0,031)	(0,031)	(0,031)	(0,031)	(0,031)
	Educyears	0,021***	0,021***	0,021***	-0,001	-0,001	-0,001
		(0,001)	(0,001)	(0,002)	(0,002)	(0,002)	(0,002)
	DummyEdu	-0,036	-0,039	-0,084	0,291*	0,291*	0,241
Demand for democracy	Cut 1	-0,01	0,024	0,056	0,770***	0,785***	0,839***
	Cut 2	0,730***	0,764***	0,787***	1,261***	1,277***	1,327***
	Cut 3	1,004***	1,038***	1,065***	1,439***	1,455***	1,508***
	Cut 4	1,344***	1,378***	1,404***	1,687***	1,704***	1,763***
	Regions with shock	11	11	11	11	11	11
	Observations with shock	2642	2642	2394	2649	2649	2401
	Total observations	34767	34767	31929	34789	34789	31946

The probability distribution is multinomial, and the table presents both the coefficients, and the standard variation within brackets. *, **, and *** illustrate the significance level at 90, 95, and 99 percent, respectively.