Democracy and Famine Revisited: Investigating the effects of contestation, participation and civil liberties

Jørn Wichne Pedersen

Department of Political Science
Faculty of Social Sciences
University of Oslo
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Abstract

Qualitative famine scholars have for three decades argued that democratic institutions are remarkably effective in reducing famine vulnerability. Yet, only two publications exist where systematized cross-country analyses have been used for empirically investigating the relationship. Plümper and Neumayer (2009) find that democracies are more effective than autocracies in combating famine, while Rubin (2011) finds little evidence to support such a claim. In contrast to these studies, I disaggregate the concept of democracy, and develop a theoretical framework explaining how contestation, participation and civil liberties may all be linked to famine prevention.

A quantitative research design is developed in order to investigate the link between each of these components of democracy and famine occurrence. While there is no strong evidence that political participation and contestation are systematically related to famine vulnerability, the analysis reveals that the protection of civil liberties has a considerable impact on whether famines are likely to occur. The findings thus provide evidence for the proposed theoretical argument that governments are accountable to the public as long as citizens are able to voice their concerns. However, robustness tests reveal that certain caveats are warranted as regards the interpretation of the results. Most notably, it is hard to ascertain the conceptual precision of the civil liberties indicator, and it is therefore not possible to determine whether some factors that characterize 'free societies' are more important than others in preventing famine. Yet, despite this shortcoming, the thesis demonstrates that disaggregating democracy is a viable strategy for more specifically identifying which mechanisms that reduce famine vulnerability.

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Chapter 1

Introduction

Despite major improvements in living standards all over the globe, more than 70 million people died in famines during the 20th century (Devereux 2000, 7). On July 20th, 2011, the United Nations declared famine in parts of Somalia. The appalling reminder that famines still occur in the second decade of the new millennium, underlines the importance of investigating the institutional structures that reduce famine vulnerability.

Famines were earlier understood simply as the result of food shortage. Famine theory has, however, evolved to a perception of famines as failures of accountability and response. Scholars such as Sen (1995a), Devereux (2007) and Rubin (2011) have argued that famines are easy to prevent *if* it is in the interest of those in power to do so. Famines are therefore considered to be a technically preventable, socioeconomic phenomenon either reflecting "political failures - or successes, in cases of malevolent intent" (Devereux 2007, 10). Although famines can be triggered by economic shocks or natural disasters, Rubin (2011, 2) thus argues that the subject of interest should not be the shocks themselves, but the failure to respond to such adversities. The analytical focus should in other words be on politics.

More than thirty years ago Amartya Sen (1982a) argued, in his now famous *Coromandel lecture*, that India had avoided famine post-independence due to its democratic structures. Expanding this assertion, Sen has in several books and articles stated that no democracy has ever experienced famine (e.g. Sen 1993b; 1994; 2000; 2009). This claim has received some criticism, primarily in the new millennium (see e.g. de Waal 2000; Myhrvold-Hanssen 2003; Rubin 2011). Rubin (2011) investigates this relationship thoroughly in his book *Democracy and Famine* and concludes that not only have famines occurred in democracies, democracy does not seem to have a statistically significant impact on famine incidents. While the first discovery is based on a cumulative case-study design, the latter, and more surprising finding, stems from a quantitative cross-country analysis. Plümper and Neumayer (2009), on the other hand, do find that although famine

deaths may occur in democracies, these regimes are far more effective than autocracies in combating famine.

The diverging findings leaves the conundrum – whether democratic institutions are more capable of combating famine – largely unanswered. The conflicting results may be the outcome of methodological challenges. Another possible explanation relates to how famine and democracy are conceptualized. Both are contested concepts, and possible effects of democracy relates perhaps not only to how democracy is measured, but also to how famine is being classified.

1.1   Research questions

During the last decades, it has become a prominent conviction in the social sciences that democracy has a positive and profound effect on the well-being of individuals around the globe (see e.g. Przeworski et al. 2000; Sen 2000; Lake and Baum 2001; Boix 2003; Lindert 2004). This is in accord with the notion that democracies are more responsive to citizen demands than any other forms of government.

With respect to famine prevention, Amartya Sen argues that democracy is an effective guarantee for timely action. This is a generalization that according to Sen applies to poor countries as well as rich ones. More specifically he argues that freedoms to vote, criticize and publish are causally linked to famine prevention (Sen 1993*b*, 44; Sen 1990, 106). Sen emphasizes that these aspects are crucial in two particular ways. First, he argues that an independent and vigorous media can – in combination with public protests – provide early warning of impending food crises. This will hereafter be referred to as *the informational aspect.* Second, he underlines that a pluralist, multiparty political system, which allows for criticism if the government fails to address a crisis properly, generate a political incentive for government action (Banik 2003, 35). This will in the following be referred to as *the accountability aspect.* As an additional element, Sen (2000, 158) also points out that participation in the political system is crucial in order for democracy to achieve the desired effects.

Building on Sen's work, Banik (2003, 103-105) argues in his doctoral thesis that *freedom* ought to replace democracy as the explanatory variable. In short, his argument is that also non-democracies prevent famines as long as certain freedoms are in place. A crucial point is that freedom is much more than democracy, and one would therefore err if the former is regarded as a mere sub-set of the latter. This begs the question whether certain aspects of democracy – or regime types in general – are more important than others in preventing famines. If this is the case, this could potentially also illuminate the diverging statistical findings of Plümper and Neumayer (2009) and Rubin (2011) as

both studies use highly aggregate measures of democracy. By combining the crux of Sen's argument with Banik's emphasis on freedom, I will in this thesis focus on the following research questions:

1. Does political competition affect famine vulnerability?
2. Does political participation affect famine vulnerability?
3. Do civil liberties affect famine vulnerability?

1.2 Defining concepts

Democracy is among the most complex concepts in political science. It has never been – and may never be – measured in such a way that all of its many-faceted and multi-dimensional features are fully captured (Coppedge 2002, 35). Famine has proved similar to the concept of democracy. Not only is the phenomenon extraordinarily difficult to define, but there also seems to be a certain mismatch between scientific cut-points and popular perceptions (de Waal 2000, 4). In order for any analysis to be meaningful it is paramount to have a clear understanding of the concepts at hand. The remainder of this chapter will therefore outline crucial features of both of the contested concepts before arriving at proper definitions.

1.2.1 Defining famine

The word *famine* originates from the latin word *famina*, which in turn was derived from *fames*, meaning 'hunger' (de Waal 1989, 13). Whereas dictionaries often define famine rather narrowly as "an extreme scarcity of food" (Merriam-Webster Dictionary 2013; Oxford Dictionaries 2013), the way in which the phenomenon should be perceived has been a disputed topic among scholars (Devereux 2000, 4). On the one hand, scientists such as de Waal (1989) have argued that famines can be understood in terms of more than just focusing on excess mortality. On the other, scholars such as Banik (2003) have warned against using very broad definitions, arguing that it is important to distinguish *famine* from related terms such as *starvation* and *undernutrition*.

There are at least three reasons for why arriving at a commonly accepted diagnosis of famine is important. The first can be thought of as a practical reason; identifying and categorizing famine could have a positive impact on famine relief. The second reason relates to politics; if a famine is diagnosed this could have implications for political leaders who could be held accountable for allowing the crisis to unfold (Devereux 2007, 13-14; Howe and Devereux 2007, 27-28). The third reason is that of academic purposes (Devereux 1993, 9). Measuring famine according to commonly accepted criteria would

be a valuable tool when analyzing the phenomenon and its causes and consequences
(especially when doing so using quantitative methods). The aim of this section is not cover
the extensive debate on definitions in depth, but rather to clarify what understanding of
famines underlie this thesis and why. In order to do so, the most prominent perspectives
need to be presented.

Related concepts

Hunger, *malnutrition*, *undernutrition*, *starvation* and *famine* are often used interchange-
ably, causing much confusion in both academic and policymaking circles. Despite its
frequent use, the term 'hunger' is without a proper scientific definition and can refer to
a broad range of phenomena of varying intensity (Banik 2011, 224,228). 'Malnutrition'
is defined as a condition in which the physical function of an individual is impaired to
the point where a person can no longer maintain natural bodily capacities, resulting from
an unbalanced diet. Malnutrition is thus a category describing a condition of which both
dangerously thin and obese individuals belong. 'Undernutrition', on the other hand, de-
scribe exclusively the status of people whose food intake does not include enough calories
to meet minimum physiological needs (World Food Programme 2013), while 'starvation'
is the resulting process of sustained undernutrition leading up to the point where life is
threatened (Banik 2003, 61; Devereux 1993, 13). The distinction between starvation
and famine is usually made in terms of the number of people affected. As pointed out
by Devereux (1993, 12) "[i]t is generally agreed that famines affect sizeable populations
over a relatively large area, while starvation afflicts individuals or small groups of people."
However, as will be discussed in detail in subsequent sections, the distinction is not always
clear cut.

Famine as mass starvation

As pointed out by Sen (1982*b*, 39) "[f]amines imply starvation, but not vice versa. [...]
Starvation is a normal feature in many parts of the world, but this phenomenon of 'regular'
starvation has to be distinguished from violent outbursts of famines". The quote under-
lines two important aspects. First, famines entail starvation. Second, and as mentioned
above, famines differ from starvation with regard to magnitude. However, if extreme and
widespread starvation should be described as famine, where should the line be drawn?
Devereux (1993, 12-13) argues that the degree of intensity should be determined by the
area, the duration and the number of affected people, while Alamgir (1980, 7) contends
that the line should be drawn in terms of excess mortality. This latter understanding is
echoed by Sen (1982*b*, 40) who emphasizes that widespread death is an inherent part of

the phenomenon.[1] Yet, despite underlining this aspect, neither Alamgir (1980) nor Sen (1982*b*) provide any account of *where* the line should be drawn in this regard.

Famine as destitution

De Waal (1989) challenges the understanding that starvation and excess mortality are necessary components of a famine, arguing that the calamity should rather be defined in terms of a "lived social experience" (de Waal 1989, x,13). According to de Waal (1989, 77) one can make a distinction between "famines that kill and famines that do not". Second, he argues, one can also differentiate between "famines that consist only of hunger and famines that consist of destitution and social breakdown too." It should in this regard be stressed that one of de Waal's (1989, 20) core arguments is that the "current English notion of 'famine' as mass starvation unto death is inappropriate, and should be discarded." Instead, he argues, one should rely on what Devereux (1993, 16) labels as 'insider definitions'. In sum, this is because victims' descriptions of suffering are more accurately reflecting the phenomena they experience. Hence de Waal (1989) makes the case for a relativistic use of the term.[2] This way of understanding and defining famine is, however, at best inappropriate when analyzing the phenomenon across time and place.

An additional aspect that is underlined by de Waal (1989, 17,27,186-193) is that famine mortality is more often a result of disease than starvation. This has also been noted by Sen (1982*b*, 40) as an important facet. The topic becomes a central, yet somehow confusing feature, when de Waal (2007) introduce the concept of 'new variant famines'. The term is used to explain that the prevalence of HIV/AIDS is a new source of vulnerability in many parts of Africa, but is primarily used in relation to malnutrition and food crises. This has triggered a new wave of confusion where the terms are used interchangeably (see e.g. Gibbs 2008; Ansell et al. 2009; Naysmith, de Waal and Whiteside 2009; Mason et al. 2010).

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[1]In a footnote Sen (1982*b*, 39-40) refers to the following definitions when explaining how he understands the phenomenon: "On balance it seems clear that any satisfactory definition of famine must provide that the food shortage is either widespread or extreme if not both, and that the degree of extremity is best measured by human mortality from starvation" (Masefield 1963, 3-4); "An extreme protracted shortage of food resulting in widespread and persistent hunger, evidence by loss of body weight and emaciation and increase in the death rate caused either by starvation or disease resulting from the weakened condition of the population" (Johnson 1973, 58); "In statistical term, it can be defined as a severe shortage of food accompanied by a significant increase in the local or regional death rate" (Mayer 1975).

[2]de Waal (1989, 13) points out that even the term 'hunger' can be used in reference to more than just food, and argues that "periods of shortage, poverty, suffering, or powerlessness, without starvation, can be periods of 'hunger' and hence 'famine'."

Composite classification frameworks

One of the first approaches that classified famines using several indicators was the Indian Famine Codes, which were developed in the 1880s by the British colonial regime. The framework was an attempt to institutionalize administrative responses to food crises, and distinguished between three levels of food stress: near-scarcity, scarcity and famine. While *scarcity* was identified by three successive years of crop failure and large populations in distress, *famines* were first declared when also a significant rise in food prices, increased migration and mortality took place (Howe and Devereux 2004, 356-357).

Over the past decade, scholars such as Banik (2003) and Howe and Devereux (2004) have tried to operationalize the concept of *famine* in a similar way, although using different indicators.[3] Whereas Banik (2003, 79-85) introduced a 'typology of famine and related terms', Howe and Devereux (2004, 360-367) created an 'famine intensity and magnitude scale'. Both efforts portray famine as the result of a process rather than that of an immediate event. The importance of this emphasis should not be overlooked. By highlighting the process-aspect, Banik (2003) and Howe and Devereux (2004) acknowledge that people who experience famine identify different stages of food crisis. At the same time, it also underlines the temporal dimension, stressing the fact that there are causal linkages between undernutrition, or food insecurity conditions, and famine. These frameworks therefore provide a stark contrast to understandings where the phenomenon is perceived as a sudden event; a catastrophe of which none are to blame.

In Howe and Devereux's (2004, 361-362) framework, *intensity* refers to the severity of a famine at a specific time. This can vary from place to place and over its duration. The intensity scale consists of two sets of criteria. The first is an anthropometric/mortality criterion consisting of malnutrition and mortality indicators such as crude mortality rates and wasting. The second is a food security descriptor focusing on aspects related to the social systems and market mechanisms. Howe and Devereux (2004, 362) use these criteria to create five intensity levels. *Magnitude* refers to "the aggregate impact of the crisis on affected populations", and the aspect is proxied by excess mortality which is classified into another five categories (Howe and Devereux 2004, 360). Banik's (2003, 79-85) 'typology of famine and related terms' differentiate in a very similar way between five categories of 'stress'. However, because this framework is more perspicuous, as it consists of a single scale, Banik's (2003) typology will provide the basis for how I define famine and related terms. An abridged version of this framework is illustrated in Table 1.1.[4]

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[3]For detailed information about the composite classification frameworks see Banik (2003, 79-85) and Howe and Devereux (2004, 360-367).

[4]Banik's (2003) list of indicators has been slightly modified in Banik (2007*b*, 32). These minor changes are reflected in Table 1.1. While the unabridged framework lists five levels of 'stress' I have excluded the

Table 1.1: An abridged version of Banik's (2003) 'typology of famine and related terms'.

Type of stress	Brief description	Possible indicators
Severe undernutrition	Decline in the level of food consumption and high food insecurity among sections of the population.	- Stunting: 20-29% - Wasting: 5-9% - CMR<0.5-10.000/day
Famine threat	Severe undernutrition worsens and starts affecting larger groups in the population who face destitution.	- Stunting: 30-39% - Wasting: 10-15% - CMR=0.5-2/10.000/day
Famine	Community crisis, destitution of large groups and widespread mortality from mass starvation and epidemics.	- Stunting: >40% - Wasting: >15% - CMR>2/10.000/day

Note: CMR refers to the Crude Mortality Rate. For information about stunting and wasting see World Food Programme (2013).

Both the 'severe undernutrition' and the 'famine threat' category refer to situations that are often described as 'food crises' elsewhere in the literature. When discussing cases where I am not able to identify the particular level of stress I will adhere to the same terminology. Evidently a situation must be awfully severe before qualifying as a famine. However, it is essential to recognize that the criteria are rather conventional. Not only do Howe and Devereux (2004) operate with similar benchmarks, but the United Nations also follows comparable standards (see e.g. Salama et al. 2012).

1.2.2 Defining democracy

There are many meanings attached to the word democracy and there is no consensus among political scientists on how to define it. First, while some argue that it is a dichotomous concept (e.g. Alvarez et al. 1996), others contend that it should be understood in terms gradations (e.g. Jaggers and Gurr 1995). Second, there is disagreement over whether democracy should be defined according to the existence of particular political institutions ('institutional definitions' e.g. Schumpeter 1976), or coincide with certain underlying principles ('substantive definitions' e.g. Beetham 1994). Third, even among those who consent to either an institutional or substantive understanding, there are significant dissimilarities with regard to the particular elements included in their definitions (Knutsen 2011, 46). Here I focus on Dahl's (1971) understanding of democracy as this one squarely reflects pertinent aspects outlined in my research questions.

Dahl (1971) separates between two core dimensions, *contestation* and *inclusion*, when discussing democracy and public opposition.[5] Contestation relates to the extent of per-

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'undernutrition' and 'great famine' categories as these are superfluous to my analytical purposes.

[5]Dahl (1971) use the term 'polyarchy' when discussing the normal conception of democracy, reserving the use of the latter to an ideal state where the political system is completely, or almost completely responsive to all its citizens. However, in stark contrast to the two dimensions, the term never gained

missible opposition or political competition, while inclusion concern the breadth of the right to participate in such actions.[6] Thus, if a a regime allows some of its citizens the right to vote, this increases public contestation. The larger the proportion of the population that enjoys this right, the more inclusive the regime (Dahl 1971, 4).

Contestation

Dahl (1971, 1) holds that "the continuing responsiveness of the government to the preferences of its citizens, considered as equals" is a key characteristic of democracy. Furthermore, he argues that in order for the government to be responsive, citizens need to be able to signify their preferences (Dahl 1971, 2). As we live in large-scale societies, elections have arguably become the most important mechanism for doing so (see e.g. Dahl 1998). As pointed out by Cheibub, Gandhi and Vreeland (2010, 74), even if one does not believe that competitive elections are sufficient to classify a regime as democratic, "all theories of democracy find them to be necessary." Specifying the competitive aspect is a crucial element here, because elections can be held without contestation.

Following Przeworski et al. (2000, 16), I argue that contestation occurs when the opposition has *some* chance of winning office as a consequence of elections. According to Cheibub, Gandhi and Vreeland (2010, 69) this entails three features:

1. *Ex ante uncertainty*: the outcome of the election is not known before it takes place.
2. *Ex post irreversibility*: the winner of the electoral contest actually takes office.
3. *Repeatability*: elections that meet the first two criteria occur at regular and known intervals.

In this thesis I comply with this understanding. While the first prerequisite states that there needs to be more than one force competing for power, the second feature ensures that the outcome of the competition actually translates into power. As argued by Przeworski (1991, 14), that no one can intervene to reverse the outcomes of elections is a hallmark of democratic rule. Third, repeatability is believed to strengthen the *continuing* responsiveness of the government, as stressed by Dahl (1971).

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much momentum. The term 'democracy' will consequently be used in the following in order to avoid confusion.

[6]The terms contestation and inclusion will be used interchangeably with competition and participation, respectively. This is also done by Dahl (1971) and is therefore not considered problematic.

Participation

Since a regime may only permit opposition, and more generally political involvement, from a small fraction of society, Dahl (1971, 4) argues that participation (inclusiveness) should be considered a second dimension of democracy. This seems intuitively obvious and is for example often used as the main argument for why ancient Athens was not as democratic as most present day democracies (Knutsen 2011, 68). Similarly one can argue that Switzerland, which in the 1960s had one of the most fully developed systems of public contestation in the world (Dahl 1971, 5), became more democratic when women were granted the right to vote in 1971 (Abrams and Settle 1999).

If some members of society are given greater opportunities than others at expressing their views, this would violate the principle of equality. Under such circumstances one can expect that policies reflect the preferences of those favored by the system, rather than those of the majority (Dahl 1998, 39). Sen (2000, 158) therefore argues that democratic institutions "cannot be viewed as mechanical devices for development" because their effectiveness in reflecting citizens' preferences is conditioned by high levels of participation. It is important to point out that participation in the political process constitutes more than just voting, as citizens can employ a battery of alternatives to signify their preferences.[7] However, since I differentiate between three aspects of democracy I will in concordance with Dahl (1971) primarily focus on the electoral aspect when discussing this dimension.

Civil liberties

In order for a democracy to work properly there must be freedom of expression, alternative sources of information and individuals must be allowed to form and join organizations. As noted by Diamond (1999, 8) this constitutes a third dimension of democracy that may, in part, be considered as embedded in Dahl's (1971) two-dimensional conceptualization. However, one of the reasons why I treat this feature as a separate dimension in this thesis relate to the fact that civil liberties are not only confined to exist in democracies, but can to a certain extent thrive in non-democratic societies as well (this aspect will be discussed in Section 3.4). Freedom of speech can be regarded as a crucial asset for people to voice their preferences. Moreover, if people are allowed to publish, assemble and organize, these preferences can translate into political power in the form of collective opinions that rulers may deem wise to respect.

I define civil liberties as individuals' freedom to speak, think, publish, assemble and organize without interference from the government or other sections of society. It is in this

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[7]In addition to elections, people can for example signify their preferences through petitions or public hearings. See Norris (2002) for a thorough analysis of civic engagement.

regard important to recognize that I understand these qualities as belonging to a universal category. The extent to which civil liberties are present are therefore determined by the extent to which individuals are able to exercise their freedoms, irrespective of whether there exist laws within given states that prohibit or regulate such actions. Following this line of reason Turkey is considered as having fewer civil liberties in place than for example Sweden. One of the reasons for why this is so relate to the fact that legal impediments to press freedom exist in Turkey, but not in Sweden (Freedom House 2011, 647,690). Civil liberties are in other words concerned with 'negative liberty' as defined by Berlin (1991, 34), i.e. whether people are "prevented to obtain a goal by human beings".

Figure 1.1: The logical structure of democracy as conceptualized in this thesis.
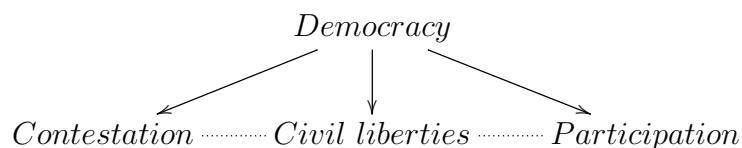
Figure 1.1 illustrates the logical structure of democracy as conceptualized in this thesis. The three attributes – contestation, participation and civil liberties – are all given independent weight, but the stippled lines between civil liberties and the two other dimensions indicate that there exist certain links between them.

1.3   Structure and findings

In Chapter 2, I emphasize that famines are products of societal vulnerabilities and should be understood as the outcome of an endogenous process. I furthermore outline why public action is crucial in order to avoid full blown catastrophes, and describe how aspects of democracy relate to the promotion and protection of social security. In the last part of the chapter I discuss the statistical analyses in Plümper and Neumayer (2009) and Rubin (2011), with a particular focus on problems related to famine data.

In Chapter 3, I develop a theoretical framework which aims at explaining why some regimes are better than others at preventing famine. More specifically I propose that there exists a variety of mechanisms – directly linked to the three dimensions of democracy – that affect incumbent incentives to avoid famines. First, I argue that contested multiparty elections will make rulers more responsive to citizens' demands. Second, I propose that higher levels of political participation will increase social security spending. Third, I describe how civil liberties can provide a non-electoral accountability mechanism.

From this reasoning I derive three hypotheses, reflecting the relationship between each component of democracy and famine prevention.

In Chapter 4, I describe the research design that is later employed to test my theoretical propositions. After first making the case for why a statistical inquiry is a good approach for investigating general relationships between democracy and famine, I move on to discuss the variables that are employed in the empirical analysis. Instead of using seemingly more detailed famine data with dubious reliability and validity, I choose to rely on Braun, Teklu and Webb's (1999) list on major famines when constructing the dependent variable. Particular attention is moreover given to the proper measurement of the three dimensions of democracy, before briefly describing relevant control variables. Thereafter, I discuss methodological challenges related to multicollinearity and missing data, and justify my choice of solutions. Finally, I present the statistical model.

In Chapter 5, I conduct the empirical analysis. The investigation reveals that certain aspects of democracy are more important than others in combating famine. In my core models neither contestation nor political participation turn out having any significant effect on famine vulnerability. Civil liberties are, on the other hand, negatively correlated with famine onsets in all of the regressions. The effect is even significant after controlling for contestation and participation in my core models. However, the robustness tests reveal that certain caveats are warranted. First, there exists some evidence indicating that contestation may reduce famine vulnerability. Second, it is hard to ascertain the conceptual precision of the civil liberties indicator. These aspects are once more touched upon in the conclusion where I highlight that better data is needed in order to make more precise inferences.

Chapter 2

Literature review

In the first part of this chapter I emphasize that famines are products of societal vulnerabilities and should therefore be understood as the outcome of an endogenous process. Second, I outline why public action can play a crucial role in averting full blown catastrophes, with a particular focus on aspects related to democracy and the promotion and protection of social security. Third, I discuss the role of accountability and information in combating famine. I then point towards some features of democracy that can reduce the prospects for a timely response. Lastly I discuss the two previous quantitative famine studies, with a particular focus on problems with famine data.

2.1 Famine as an endogenous disaster

The view that famine is the product of overpopulation is an old idea which can be traced back five millennia to the Babylonian legend of Gilgamesh. According to the epic tale, the gods reduced the size of the population using starvation as a punishment for disturbing their peace (Ó Gráda 2009, 8). However, in the past few centuries Malthus's (1986) *An Essay on the Principle of Population* has been the most used point of reference when discussing this type of understanding.

Malthus (1986) argued that famines occur as a 'natural check' when population growth exceeds food production, being "the most dreadful resource of nature" (Malthus 1986, 51). Through this view famine came to be defined simultaneously as inevitable, as a consequence of food shortage, and as mass death through starvation (de Waal 1989, 17). The two latter parts of this understanding constitute the basic foundations of what has been termed *The Food Availability Decline* (FAD) approach. In addition proponents of the FAD approach also argued that famine could be caused by natural disasters and lack of infrastructure. Hence, in combating famine, the focus should be on improved food production and logistics (Rubin 2011, 2-3). Classic FAD-understandings of famine include

Blix, Hofvander and Vahlquist's (1971) definition of the phenomenon as a "widespread food shortage leading to significant rise in regional death rates" and Brown and Eckholm's (1974, 25) verdict that "a sudden, sharp reduction in food supply in any particular geographic locale has usually resulted in widespread hunger and famine."[1]

In the influential book *Poverty and Famines: An Essay on Entitlement and Deprivation*, Amartya Sen (1982*b*) rejected the prominent FAD approach. According to Sen, famines do not necessarily occur due to a shortage of food in society. The primary focus is instead directed toward access to food for identifiable population groups. As Sen (1982*b*, 1) famously put it:

> "Starvation is the characteristic of some people not *having* enough food to eat. It is not the characteristic of there not *being* enough food to eat. While the latter can be a cause of the former, it is but one of many *possible* causes."

This simple, yet groundbreaking idea, constitutes the basic logic of what has been termed the entitlement approach. While food-availability decline can be an important factor in explaining famine, the entitlement approach also highlights socioeconomic changes such as rising food prices, falling wages and alienation of land.

Sen (1982*b*, 46) defines a person's *entitlements* as "the set of alternative commodity bundles that the person can command." The entitlement approach to starvation and famine concentrates on the ability of people to get access to food through legal means.[2] This include production possibilities, trade opportunities, entitlements vis-á-vis the state, and other methods of acquiring food (Sen 1982*b*, 45). The perspective is useful when having in mind that the mere presence of food in the market does not entitle a person to consume it. The way in which an individual can establish command over alternative commodity bundles depends on the given legal, political and economic arrangements in society. The magnitude of bundles varies from person to person, and what an individual can eat is directly linked to what these bundles are (Drèze and Sen 1989, 9).[3]

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[1]Brown and Eckholm (1974, 25) also observe, in line with the malthusian logic found in the FAD approach, that "[s]ince agriculture began, food production has increased several hundredfold. Unfortunately, man's numbers have also expanded to absorb the additional food, always pressing against the limits of supply."

[2]While Sen (1982*b*) primarily focus on a person's legal entitlements, it should also be noted that some social relations constitute a broader form of *accepted legitimacy* other than those enforceable in court. Drèze and Sen (1989, 10) refer to this as *extended entitlements*.

[3]Drèze and Sen (1989, 13) argue that the focus on entitlements is only instrumentally important, and that the ultimate concentration should be on capabilities. While the entitlement of a person relates to a set of *commodity bundles*, the capability of a person is that alternative *functioning bundles*. At first glance this might seem like a trivial distinction since larger entitlements contribute to wider capabilities. However, the important difference is that the relationship is not the same for different persons. Hence Drèze and Sen (1989, 13) reason that public action should be based on "an adequately discriminating analysis, and this calls for causal investigations of capabilities and of variation in the relation between entitlements and capabilities."

The entitlements depend on a person's initial ownership and what the person can obtain through exchange. The initial ownership constitute what Sen (1982*b*, 45-46) call *endowment*, and relate not only to assets but also labour power and the like. These endowments can then be used to create entitlements. In private ownership markets this is typically done through what Sen (1982*b*, 2) names *trade-based entitlement, production based entitlement, own-labour entitlement* and *inheritance and transfer entitlement.* These processes constitute what is referred to as a person's *exchange entitlement mapping* (Sen 1995*b*, 52-53). A person will starve if her entitlements does not include any commodity bundle with enough food. This can be the result of a change in either endowments (such as loss of labour power due to ill health) or her exchange-entitlement mapping (e.g. rise in food prices, fall in wages, loss of employment, etc.). These processes are referred to as *entitlement failures*, and a famine occurs when a large number of people within a region suffer from such failures at the same time (Sen 1995*a*, 52-53; Osmani 1993, 5).

In short, the entitlement approach highlights two important aspects. First, that famines are products of socio-economic factors – which directly implies that they are avoidable through socio-economic interventions – and second, that they are the final outcome of a process of entitlement failures.

That famines are products of socio-economic factors does not mean that they necessarily *first* originate from societal processes. The primary force that unleashes them can be either 'natural' or 'man-made'. They can be triggered by the breakdown of regular processes within a social system (e.g. wars or revolutions), or induced by natural events (e.g. floods or droughts). Often they are a mix of both. However, the extent to which such forces result in a famine depends by and large on the social setting. As mentioned in Section 1.2.1, Banik (2003) and Howe and Devereux (2004) portray famine as the result of a process rather than as an immediate event. This is important as a long gestation period provide governments with considerable opportunity for intervention, before relief to prevent mortality becomes imperative (Banik 1998, 265). However, it is important to recognize that the entitlement approach is not primarily a theory of famine causation. Rather Sen (1982*b*, 162) claims it to be a comprehensive framework for the analysis of famine processes, primarily at the micro-level. While 'entitlement collapse' offers an important perspective on the famine process, critics have argued that it is too apolitical and ahistorical to provide us with an in-depth understanding of the structural causes of famine (Devereux 2001, 248). This dimension will be elaborated on in the remainder of this chapter.

2.2   Public action and social security

Avoiding famines is intimately connected with public action and the promotion of social security (Drèze and Sen 1989, 17,65-66). While Drèze and Sen (1989, 61) understand 'public action' rather broadly, arguing that it entails "not just what is done *for* the public by the state, but also what is done *by* the public for itself", 'social security' is viewed as "using social means to prevent deprivation and vulnerability" (Drèze and Sen 1989, 15). The latter intervention can take many forms (e.g. provision of free food or cash to famine victims, food for work programs, etc.), and the character of the state and the nature of the government is believed to be of great importance when it comes to the effective delivery of such measures. This does not only relate to administrative capacity, but more so to "the political commitments and loyalties as well as the power bases of the holders of political power" (Drèze and Sen 1989, 17).[4] This somewhat vague sentiment is clarified by Sen (1991, 334) who emphasizes the link between political incentives and public action. More specifically he argues that there exists no surer way of making the government responsive to famine victims than through a democratic system with an uncensored press.[5]

Public action to feed the starving is not a new undertaking. For thousands of years have the poor, as well as farmers and merchants, been taxed by rulers, and have consequently expected help in times of disaster. In ancient Rome and Greece, oligarch politicians prevented food crises (which were occurring frequently) from developing into famines. Following civil unrest, Gaius Gracchus enacted the first 'lex frumentaria' in 123 BC, guaranteeing all Roman citizens grain at subsidized prices. Two centuries later, emperor Nero's failure to deliver the citizens grain supplies contributed to his downfall (Ó Gráda 2009, 195-197). In Asia, social practices prevented dearths from turning into famines long before colonial adminstration. In north India, the Mughal ruling classes practiced famine policies that prohibited food exports and regulated urban food prices in times of distress (Ahuja 2002, 351,355), while in China the Chinese bureaucracy regarded famine prevention and relief as a key responsibility. In Confucianism, famines were understood as a product of human failure and rulers had a responsibility to prevent them by flood and drought controls as well as by storing food in anticipation (Ó Gráda 2009, 199,202).

What is rather novel, is the strong belief that democracy outperform other regime types when it comes to the provision of public goods. That democracies are better at

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[4]Despite defining public action rather broadly, Sen (1987*b*, 14) emphasize that in times of famine national governments are the crucial actors.

[5]The argument that democratic structures can play an important role in combatting famine was, as mentioned in the introduction, first stated by Sen (1982*a*) in his Coromandel lecture. The argument was further elaborated on in Drèze and Sen's (1989) book *Hunger and Public Action*, but more clearly stated in later books, articles and lectures (see e.g. Sen 1993*a;b*; 1995*b;c*; 1999; 2000; 2009).

providing public services than other types of regimes was first demonstrated statistically by Lake and Baum (2001). After hypothesizing that democracies produce a higher level of services than autocracies, they tested this prediction both cross-sectionally and over time for a variety of public service indicators. Their results strongly support the hypothesized relationship, making the study the first concrete evidence from the domestic political arena that democracies outperform other types of regimes. In similar lines Stasavage (2005) finds clear evidence that electoral competition influences public spending decisions on education in Africa.

Yet, disaster spending does not necessarily follow the same patterns as general public goods provisioning. Two aspects are in this regard of particular importance. The first relate to the observation that some groups are more vulnerable than others. The second aspect concerns uncertainty with regard to preparedness spending.

2.2.1 Promotion and protection

Hussain (1995, 3) argues that an important side of the entitlement approach is the notion of *vulnerable groups* that share some common characteristics that make them susceptible to deprivation. Similarly, Albala-Bertrand (1993, 27) points out that the distribution of risk to disasters among social groups is like the distribution of basic needs. In other words, higher vulnerability is largely the result of poverty and powerlessness, and can therefore not be meaningfully considered outside the context of socio-economic development. Hence, vulnerability reduction is bound to undergo similar resistance from the wealthy and powerful as other egalitarian redistributive policies. However, Albala-Bertrand (1993, 27) argues that "some measures aimed at reducing the worst *effects* of high vulnerability can be compatible with traditionally oligarchic settings" [emphasis added], as long as they do not alter the power structure of society. This can be seen as the case with regard to famine prevention when measures are taken to avoid significant excess mortality, without altering the underlying vulnerability to future crises.

In this regard Drèze and Sen (1989, 16) distinguish between two aspects of social security, namely *promotion* and *protection*. While promotion refers to "the enhancement of general living standards [...] and will have to be seen primarily as a long-run challenge", the latter aspect is concerned with preventing a more imminent decline in living standards during times of hardship. Promotion of entitlements is in general believed to be a more effective form of action than protection at a later stage (Drèze and Sen 1989, 66).

The difference between promotion and protection resembles the division between ex-ante preparedness and ex-post mitigation found in the natural disaster literature (see e.g. Skoufias 2003; Cohen and Werker 2008; Healy and Malhotra 2009). Despite the fact

that preparedness spending is much more cost-effective than ex-post mitigation, Healy and Malhotra (2009) find that US voters to a large extent are unwilling to support government spending on natural disasters before the disasters have occurred. They therefore argue that democratic accountability reduce public welfare by discouraging politicians that want to be re-elected from investing in preparedness (Healy and Malhotra 2009, 402). The basic logic is that response spending is similar to other types of public spending since they are directed toward specific visible actions. Preparedness spending is, on the contrary, characterized by profound uncertainty. Citizens may not value disaster preparedness efforts since it is impossible to observe counterfactual situations (i.e. what the outcome of a disaster would have been in the absence of preventive measures), and are therefore less likely to reward politicians that invest in such measures. A related aspect concern the fact that the benefits of preparedness measures may first become visible years after they were enacted. By then, elected politicians may have left office. Consequently they are incentivized to endorse policies with short-term effects and long-term costs due to re-election pressures (Healy and Malhotra 2009, 389).

Findings in the literature are inconsistent with regard to whether democratic countries experience fewer deaths during disasters. Kahn (2005) investigate this relationship using data from 73 nations for the 1980-2002 period and concludes that democracies suffer less death from natural disaster. Strömberg (2007), on the other hand, finds no such relationship after analyzing worldwide disaster mortality over the period 1980 to 2004. Instead he argues that government effectiveness is the primary driving force behind vulnerability reduction. Flores and Smith (2010) do not investigate the relationship between democracy and disaster mortality directly, but find support for their hypothesis that more people die in disasters in small coalition systems than in large coalition systems.[6]

However, it is important to recognize that famines differ from large natural disasters – despite sharing many attributes – in ways that may affect government responsiveness. According to Albala-Bertrand (1993, 9) disasters can usefully be divided into sudden disasters, such as earthquakes or tsunamis, and slowly developing disasters, such as famines. A sudden disaster is typically characterized by a short impact duration and immediately evident direct effects, but has often limited indirect effects. Slowly developing disasters have, on the other hand, typically few striking immediate effects. Rather they are the outcome of a long-lasting culmination process of direct and indirect effects reinforcing each other until a breaking point. The slow-onset feature may affect the accountability aspect – as stressed by Sen – since it plausibly makes government inaction less tolerable.

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[6]It should be noted that Flores and Smith's (2010) analysis suffer from very high amounts of missing data. While they write that their dataset includes information for 189 countries from 1900 to 2008, their table of descriptive statistics shows that vital variables lack information on almost two thirds of all observations.

It is also a central premise in order for the informational aspect to come into play.

2.3 Information and accountability

A free press will according to Sen (2000, 180-181) contribute to bringing out information that can have a big impact on policies for famine prevention. This can for example take the form of early warnings from distant areas about the early effects of droughts, floods and the nature and impact of unemployment. The Chinese Great Leap Forward Famine, that unfolded in 1958-61, has often been contrasted with the Indian record of famine prevention to illustrate this relationship.

The Great Leap Forward Famine is arguably the largest famine in recorded history in terms of excess mortality, killing more than 30 million people (Drèze and Sen 1989, 210; Devereux 2000, 6). Much evidence is still kept hidden from the public (Dikötter 2013), but food availability decline certainly played an important part: There was an enormous decline in agricultural output and income, and some regions, such as Sichuan and Henan, were particularly affected (Drèze and Sen 1989, 210-211; Li 2007, 358-359).[7] Drèze and Sen (1989, 211) argue that "the remarkable aspect of the famine is its continuation over a number of years without an adequate recognition of the nature of the crisis (and without leading to the necessary changes in public policy)." The famine was actually allowed to unfold over three years without it being admitted in the public that a crisis was occurring, resulting in the Chinese population being unaware of the extent of the national calamity. The lack of adversarial journalism even led the government to be ignorant of local conditions, and the misconception that everything was going well in the rural economy kept the imports of food grains to virtually nothing, while food exports peaked in 1959 and 1960. The misinformation led to a sharp increase in food procurement from rural areas and contributed to the non-revision of production and distribution policies. In addition, no emergency entitlement-protection programme was put in place (Drèze and Sen 1989, 212-213). According to Li (2007, 362), peasants had no other choice than comply with the orders given despite facing certain starvation, and just as peasants were coerced by cadres, cadres were coerced and pressured by higher ranking party officials to comply with unreasonable procurement goals.

Interestingly, Sen (2000, 182) notes that even Chairman Mao recognized the importance of the *informational aspect* of democracy when the failure first was acknowledged. In a speech given to seven thousand cadres in 1962 Mao stated that:

> "Without democracy, you can have no understanding of what is happening

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[7]Li (2007, 358) points out that Sichuan had the highest levels of mortality with estimates ranging from 7 to 9 million of a population of approximately 70 million.

down below; the situation will be unclear; you will be unable to collect suffi-
cient options from all sides; there can be no communication between top and
bottom; top-level organs of leadership will depend on one-sided and incorrect
material to decide issues, thus you will find it difficult to avoid being sub-
jectivist; it will be impossible to achieve unity of understanding and unity of
action, and impossible to achieve true centralism." - Mao Zedong, quoted in
Sen (2000, 182)

However, it is important to stress that Mao focuses solely on the informational side of
democracy, ignoring the incentive role described by Sen.

India's record of famine prevention can be seen as a positive contrast to the Chinese
experience. Drèze and Sen (1989, 211) argue that despite several alarming dips in food
availability, no large-scale famine has taken place in India since independence in 1947.
This can be explained by the operation of two complementary forces, namely an effective
administrative system recreating lost entitlements, and a political system that activate the
administrative system when needed. The *informational aspect* was, however, arguably a
paramount trigger mechanism making these institutions function as intended (Drèze and
Sen 1989, 122-123). The free press played a leading role in making the public and the
government aware of the different situations across the country, which, in tandem with
the *accountability aspect*, made it impossible for the Indian government to remain passive
without major political risks (Drèze and Sen 1989, 126). However, as noted by Banik
(2007*b*, 23), Sen has elaborated little on how such democratic processes *actually* work.
This is especially the case with regard to the accountability aspect.

When thoroughly analyzing the role of the Indian press in relation to hunger, Ram
(1995) argues that there is no doubt that famine-threat situations have been given major
attention and that the press in general has played a crucial role with regard to 'early
warning' of impending food crises.[8] It is in this regard important to recognize that the
Indian press has been widely regarded as the most pluralistic, independent and least
inhibited in the developing world.[9] This is crucial since newspapers' role in combating
hunger depend on the independent, or relative independent, role that newspapers are
allowed to play in society (Ram 1995, 179,188).

Drèze and Sen (1989, 214) argue that the absence of political opposition and free
journalism in African politics is a cause of famine vulnerability on the continent as it
was in China during 'The Great Leap Forward'. However, Drèze (1995*a*, 591) argues

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[8]Ram (1995, 220) cautions, however, against overestimating medias role, especially when it comes to
focusing on 'regular' starvation.

[9]Nevertheless, Ram (1995, 205) points out that the media coverage of hunger-related problems are
uneven across India. Banik (2007*a*) explains this in terms of media ownership patterns, which differ from
one state to another.

that public criticism and adversarial journalism played important roles in galvanizing the governments of Botswana, Zimbabwe and Kenya into action that prevented the 'African drought' of 1984-85 from turning into famine in the respective countries.[10] Moreover, he argues that "it would be a mistake to regard sophisticated democratic institutions as indispensable to the existence of strong incentives for a government to respond to the threat of famine." Reddy's (1988) analysis of a famine threat situation in northern Nigeria can be used to illustrate this argument.

According to Reddy, Nigerian newspapers played a crucial role in mediating public and governmental response during a famine threat situation in 1973-74, despite the fact that Nigeria was highly undemocratic at the time. However, the Nigerian newspapers did not play any 'early-warning' role, as described by Ram (1995) to be one the major functions of the Indian press, since the Nigerian state governments had early become aware of the situation through bureaucratic channels (Reddy 1988, 340). Reddy's account is rather one that illustrates how newspapers can affect public opinion and thereby influence governmental response. Despite the the military regime's sensitivity to press criticism, Reddy (1988, 337) stresses that "there were no formal and few, if any, informal mechanisms of control." As a result, newspapers published comments that were as critical as those to be found in any democracy, and while political parties were lacking in Nigeria during this period, there was a strong bureaucratic consciousness of public opinion that was essential in procuring governmental response (Reddy 1988, 338). As noted in 1973 by Haroun Adamu, political editor of the Daily Times, Nigerias largest newspaper: "The press in this country can count as one of its major successes, the awakening of Nigerians, especially those in authority, to their responsibility to a section of this country, which is going through an agonising experience of slow and inevitable death through hunger" (Reddy 1988, 343). There seems in other words to have been some sort of an accountability mechanism present, despite the fact that Nigeria was a military regime at the time.

Buchanan-Smith and Davies (1995) account of a serious drought that hit in Turkana, provides evidence for similar mechanisms being at play in Kenya in 1992. According to Buchanan-Smith and Davies (1995, 193) the national media "played a very significant role speeding up the relief response". President Daniel Arap Moi was at this point serving his third term, yet the country was by no means democratic. Opposition parties were severely repressed and the Kenya African National Union (KANU) had all the seats in parliament (Freedom House 1994, 341-343). Nevertheless, national newspapers such as

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[10]Drèze (1995*a*, 591) recognizes that this was the case to a lesser extent in Kenya than in the other two countries. This observation is shared by Downing (1990, 215) who concludes that the timely response in Kenya was due to the apparent nature of the drought made visible by the district administration and field staff of non-governmental organisations.

The Nation and The Standard were almost daily covering the famine threat situation with sensationalized stories of people selling their children for food. Buchanan-Smith and Davies (1995, 193) argue that the media politicized the situation, making officials and politicians desperate to cover up the crisis. However, neither here did the media play any early warning role since the government was aware of the situation before news reporting began (Buchanan-Smith and Davies 1995, 193).

In similar lines Besley and Burgess (2002) contend that having a more informed and politically active electorate strengthens incentives for governments to be responsive, arguing that both mass media and democratic institutions have important roles in ensuring that the preferences of citizens are reflected by policy. Using panel data from India, they show that state governments are more responsive to falls in food production and crop flood damage where newspaper circulation is high. Since media helps voters evaluate the action of politicians, politicians have stronger incentives to be more responsive in areas where larger sections of the population have access to newspapers.

While Besley and Burgess (2002) focus on *ex post* effects, Strömberg (2004) shows that politicians' commitment to voters through public spending *ex ante* was significantly related to radio prevalence in U.S. counties during the 1930s. After analyzing spending on unemployment relief, which was the largest of the New Deal programs, Strömberg (2004, 215) concludes that "governors allocated more relief funds to areas where a larger share of the population had radios." However, it is worth noting that the effect of news media can be very different if governments limit press freedom or own the media. Djankov et al. (2001) find that government ownership of the media, which is generally associated with less press freedom, is correlated with inferior social outcomes in areas of education and health. Brunetti and Weder (2003) find that higher press freedom leads to less corruption, while Lessmann and Markwardt (2010) show, using cross-country data, that a free press is a necessary pre-condition for successful decentralization. All findings are in line with the generally accepted logic that freedom of speech and a free press are powerful controls against government malfeasance.

2.4 Democratic inefficiencies

Many scholars have wondered how governments that fail to produce essential public goods to the electorate have been able to stay in power for long periods of time (e.g. Bueno de Mesquita et al. 2003*a*; Acemoglu and Robinson 2012). One of the conundrums relate to the fact that political attention often has been given to areas other than those yielding the greatest benefits. In the two following sub-sections I draw attention to certain democratic inefficiencies that may affect famine vulnerability. The arguments presented here will later

be used to highlight that it is vital to distinguish between famine and related phenomena when investigating 'democratic effects'.

2.4.1 Famine protection as visible public goods

Banik (2007*a*) discusses why democracy has been unable to combat forms of suffering such as chronic hunger and starvation deaths in India, despite the fact that these forms of suffering affect millions of people. Sen's argument – that democracy prevents famine – is used as a point of entry when investigating this dimension. Banik (2007*a*, 307-308) agrees with Sen that democracy and public action has prevented famine threats from becoming famines in India. However, a more mixed picture emerges when it comes to the country's ability to prevent frequent – but less sensational – starvation deaths. Most deaths take place in rural areas, far away from those in power. Hence, Banik (2007*a*, 308) argues that the relative invisibility is a major factor in explaining why this type of calamity is not regarded as warranting the same kind of response as famines. Moreover, different political structures and different levels of political consciousness and participation are emphasized as significant factors in explaining why the districts of Kalahandi and Purulia differ when it comes to prevalence of starvation deaths.

The comparative case study of Kalahandi and Purulia is particularly interesting since the two districts can be regarded as equally poor, are being located in neighbouring states and with formal democratic systems in place. While the Kalahandi district in Orissa is widely regarded as the 'starvation capital' of India, no starvation deaths have ever been reported in Purulia, West Bengal. A major difference is that the rural population of Purulia displays a higher level of political consciousness, which is reflected in terms of high voter turnout and participation in elections. What's more, the major political party in Purulia has cadres in virtually every village (Banik 2007*a*, 304-305). Banik (2007*a*, 305) argues that this is invaluable since party workers routinely provide early warning information on drought, food shortages and distress directly to the party leadership at the district level.

Mani and Mukand (2007) introduce what they call a 'visibility effect' when trying to explain why governments neglect provision of some types of essential public goods. After defining public goods as being less visible "if it is harder to assess government competence, based on observed outcomes" (Mani and Mukand 2007, 507), they show through modelling that greater democratization widens the gap in government resource allocation between visible and less visible public goods up to an intermediate level of democracy. Beyond this level of democracy, the difference diminishes. When explaining this relationship, malnutrition prevention is used to illustrate less visible public goods,

while famine prevention, on the other hand, is used as an example of a visible public goods.[11] Having in mind that a famine is concentrated in both space and time with highly visible and alarming consequences, whereas regular starvation deaths are scattered across communities, this distinction seems intuitively fecund. The key point, that not all public goods will be supplied more extensively in democracies, has also been recognized by Sen (2000, 154) who notes that ”[d]emocracy has been especially successful in preventing those disasters that are easy to understand and where sympathy can take a particularly immediate form. Many other problems are not quite so accessible.”

2.4.2   Pork barrel relief

Banik (2011, 113-115) argues that politicians often have incentives to ensure that poor segments of the population remain poor, introducing what he calls the 'saviour argument'. According to Banik this relationship is particularly relevant in situations where poor people reside in areas that are vulnerable to natural hazards such as droughts. Periods of crisis provides democratically elected politicians with an opportunity to frame themselves as saviours of the poor in times of distress. By letting a crisis begin to unfold before reacting, the politicians are able to appear as lifesavers when preventing the situation to escalate any further. By doing so they gain support from both the group of people that are being saved and from other groups of society who approve of the way the leaders handled the situation. Mathur and Jayal (1992, 64-65) also point out that treating drought as a crisis serves certain political purposes, arguing that in India relief measures have provided "an opportunity for the government to project itself as the guardian of public welfare. [...] and uses relief measures to gain political mileage."

A growing literature on disaster relief has found similar patterns where relief funding have been used as 'porks' to buy constituent support. When studying the allocation of federal disaster relief payments made by the Federal Emergency Management Agency (FEMA) Garrett and Sobel (2003) find that politically important states in the US received more disaster relief than non-decisive states. Healy and Malhotra (2009, 397) conclude similarly after investigating federal government spending for the 3,141 counties or county-equivalent units in the United States during the 1984-2004 period, and state that "incumbents are either more prone to respond to disasters that occur in supportive counties, or they dress up other transfers in the guise of disaster relief and then direct those payments to supportive areas". Besley and Burgess's (2002) aforementioned study can in fact also indicate a similar relationship. While they argue that an active media is important for creating electoral accountability, it can also be argued that democratic

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[11]Mani and Mukand's (2007) use of the term *malnutrition* is rather imprecise as they only discuss 'regular' starvation and not obesity. *Undernutrition* would thus seem to be a more correct term.

leaders to a greater extent respond when they possibly enjoy medias limelight.[12] In fact, Rubin (2009, 713) has pointed out that "'dark' sides of politicization were evident in both the Bihar and the Orissa food crises", arguing that famine relief could be prevented in democracies by 'pork barrel politics'.

It is in this regard important to have a somewhat balanced view; not being conspiratorial, yet at the same time recognize that politicians in certain cases have incentives to enact sub-optimal solutions in order to get re-elected. Another important aspect is emphasized by de Waal (2000, 13) who points out that democratic leaders are not dependent on the support of *all* citizens and can therefore be indifferent to the welfare of people in certain constituencies.[13]

2.5 Previous quantitative studies

In 2009 the first quantitative cross-country study on famine was published. In the article *Famine Mortality, Rational Political Inactivity, and International Food Aid*, Thomas Plümper and Eric Neumayer first develop a political theory of famine mortality based on Bueno de Mesquita et al.'s (2003*a*) selectorate theory. The main point is that governmental inaction towards famine can be a rational outcome of a political support maximization calculus. According to the theory both autocracies and democracies may rationally fail to act when the political costs of action are higher than the costs of inaction (Plümper and Neumayer 2009, 50). Based on this theory Plümper and Neumayer (2009, 55) derive testable hypotheses that famine mortality is possible in democracies, but likely to be lower than in autocracies.

Their empirical analysis consists of a cross-national time-series analysis of a sample consisting of 130 developing countries in the period 1972-2000. The dependent variable used in the analysis is the number of people killed by both *famine* and *drought*, as reported in the Emergency Disasters Data Base (EM-DAT). In cases where this source lacks mortality data, estimates from Devereux (2000) are used. These estimates are used in 5 out of the 35 cases, and in cases where the approximations are provided with a minimum and maximum estimate, Plümper and Neumayer (2009) use the mean estimate. Based on the results from two negative binomial regression models, Plümper and Neumayer (2009, 58-59) conclude that their theory holds up, and that democratic governments are more likely to enact policies that benefit all people affected by famine. Autocracies will, on

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[12]In a case study of the 1966-67 famine threat in Bihar, Brass (1986, 246) describes such a situation stating that "[t]he press reports about the developing crisis situation and the responses of the politicians and authorities to the situation turned the Bihar Famine of 1966-1967 into a political drama in which many of the principals selfconsciously played their roles on the public stage."

[13]This was clearly the case during the Sudan famine in 1988 (see e.g. Keen 1994).

the other hand, to a larger extent favor policies that protect a selected elite, leaving the greater population more vulnerable.

In 2011 the second quantitative cross-country study on famine got published. In the book *Famine and Democracy*, Olivier Rubin (2011) combines qualitative and quantitative methods to analyze the effect of democracy on famine vulnerability. He concludes that not only have famines occurred in democracies, democracy does not seem to have an impact on famine incidents. While the first discovery is based on a cumulative case-study design, the latter, and more surprising finding, stems from cross-country regressions.

Rubin (2011, 109-113) starts his quantitative analysis chapter by criticizing Plümper and Neumayer's (2009) analysis for being inherently flawed with difficulties, especially with regard to their dependent variable. First he points out that there are major discrepancies between EM-DAT's and Devereux's (2000) mortality estimates. Using the latter source as a substitute in some cases is therefore problematic. Second he notes that Devereux (2000) provides famine mortality estimates in cases where EM-DAT does not, yet Plümper and Neumayer (2009) do not include these and do not provide any explanation for why this is so. At last he concludes that the EM-DAT famine classifications are so arbitrary up until the late 1980's that he restricts his analysis of the EM-DAT data to only cover the years 1990-99.[14] Because of problems with using mortality estimates as the dependent variable, Rubin (2011) constructs a variable measuring the number of famine years during the period. He then runs an ordinary least square regression using GNI per capita, political rights and disaster vulnerability as the only explanatory variables. All variables are averaged over the ten-year period, and GNI per capita turns out to be the only significant covariate. Rubin (2011, 117) argues that this "indicate[s] that what matters in famine vulnerability is income per capita rather than the political system."

There are in sum a number of problems with both Plümper and Neumayer's (2009) and Rubin's (2011) quantitative studies.[15] My intention is not to discredit any findings, but rather to highlight how problems related to poor data have been treated in the past. In the subsequent section I will turn to additional problems that have not been drawn attention to previously.

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[14]Rubin (2011, 114-120) produces additional regression tables in his book, but these are so poorly described that I am not able to understand how they have been made or what they tell. Nevertheless, Rubin (2011, 116) admit they have serious inherent flaws and therefore puts more trust in the analysis described here.

[15]One of the main inadequacies of Rubin's (2011) analysis is the lack of transparency. The models are poorly described and no descriptive statistics are provided.

2.5.1 Problems with famine data

The Emergency Disaster Database (EM-DAT) is the is the only public accessible international database providing information on famines. The database is managed by the WHO Collaborating Centre for Research on the Epidemiology of Disasters (CRED). Since their data had been used by Plümper and Neumayer (2009) and Rubin (2011), it was also considered to be a natural starting point for this thesis.

EM-DAT distinguishes between three types of disasters – technological disasters, natural disasters and complex emergencies – whereof famines are categorized under the two latter as either drought-famines or complex emergency-famines (EM-DAT 2012; Tschoegl, Below and Guha-Sapir 2006).[16] A *famine* is defined as a "catastrophic food shortage affecting large numbers of people due to climatic, environmental and socio-economic reasons." This definition is very similar to most famine definitions. However, one major attribute is not included, namely a mortality criterion. Famine mortality is difficult to estimate for a number of reasons. Thus, most famines would not be recorded in the database if mortality estimates were a prerequisite. Yet, some of the recorded EM-DAT famines have mortality estimates attached that are surprisingly low. In fact, the majority of the provided famine mortality estimates are below 1000 excess deaths, which at best would qualify as a 'minor famine' using Howe and Devereux's (2004) magnitude scale and as a 'famine threat' according to Banik (2003). Some of the entries even have mortality estimates of less than a hundred deaths.[17] This made me look into the details of the majority of the recorded famines, and it appears that EM-DAT record their famine-entries in a rather arbitrary and ad-hoc manner. First of all they classify food crises as famines even when there exists no evidence of any excess deaths at all (e.g. South Africa in 1986 or the Cape Verde Islands in 1998). Second, EM-DAT has not recorded many of the 'real' famines (such as the the 1974 Bangladesh famine that killed approximately 1,500 000 people, the Ethiopian famine of 1983-85 that killed between 590 000- 1000 000 people, nor any of the Sudanese famines of the 1980s in which an estimated 500 000 people died (Devereux 2000, 6). This is only to mention a few). Not only are mortality estimates missing, but as can be seen in Table 2.1, the events are not recorded at all.

It appears that the majority of the EM-DAT (2012) 'famines' are in fact what Banik's (2003) typology describes as 'severe undernutrition' or 'famine threat' situations.[18] Treat-

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[16]For a disaster to be entered into the database at least one of the following criteria must be fulfilled: ten or more people are reported killed; hundred or more people reported affected; declaration of a state of emergency; call for international assistance (EM-DAT 2012).

[17]Afghanistan is recorded as experiencing a famine in year 2000 with only 37 recorded excess deaths, Guatemala and Angola is recorded as famine-entries in 2001 with 41 and 58 people killed, respectively, while Kenya is recorded as experiencing a famine in 2005 with 27 excess deaths.

[18]Or what Howe and Devereux's (2004) intensity scale describes as 'food-insecurity' or 'food-crises

Table 2.1: List of 'famines' recorded by EM-DAT (2012), 1960-2010.

Famines			
Country	Year	Country	Year
India	1964	Indonesia	1997
India	1965	Mauritania	1997
Indonesia	1965	Niger	1997
Benin	1969	Cambodia	1998
Burkina Faso	1969	Cape Verde Is.	1998
Cape Verde Is.	1969	Sudan	1998
Chad	1969	Uganda	1999
Gambia	1969	Afghanistan	2000
Guinea Bissau	1969	Honduras	2000
Mauritania	1969	Nicaragua	2000
Senegal	1969	Angola	2001
Ethiopia	1973	Guatemala	2001
Somalia	1973	Mali	2001
Comoros	1975	Niger	2001
Rwanda	1976	Lesotho	2002
Zaire	1978	Madagascar	2002
Chad	1980	Malawi	2002
Central African Rep.	1983	Panama	2002
South Africa	1986	Burundi	2005
Malawi	1987	Cameroon	2005
Madagascar	1988	Djibouti	2005
South Africa	1988	Kenya	2005
Rwanda	1989	Madagascar	2005
Cameroon	1990	Malawi	2005
Mozambique	1990	Niger	2005
Armenia	1992	Guinea Bissau	2006
Togo	1992	Mali	2006
Haiti	1993	Burundi	2007
Cambodia	1994	Swaziland	2007
Burkina Faso	1995	Ethiopia	2008
North Korea	1995	Kenya	2010
Rwanda	1996	Somalia	2010

ing such events as 'famines' is highly problematic since they in fact are different phenomena. Both Plümper and Neumayer (2009) and Rubin (2011) use Amartya Sen's arguments – or what Rubin (2011) calls 'Sen's democracy theory' – as their point of entry. When investigating to what extent democracies are better at preventing famines, it should therefore also follow that they analyze the same, or at least similar types of events, as the ones Sen aims at explaining. In order for the informational aspect to have any possible preventive impact, famines cannot equal the first symptoms of distress. Furthermore, as discussed in Section 2.4.1, Mani and Mukand (2007), Banik (2007b) and Sen (2000) all

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conditions'

recognize that a 'visibility effect' is important for democratic response. Consequently, if food-crises are treated as famines, the accountability mechanism is likely to be severely weakened.

2.6 Summary

I have in this chapter presented arguments from the literature on how famines are products of societal vulnerabilities and therefore share common characteristics with other large 'natural' or 'man-made' disasters. I furthermore highlighted that state action can play a crucial role in averting famine, focusing on how aspects of democracy relate to the promotion and protection of social security. When investigating whether some regimes are better at protecting their citizens than others, it is important to recognize that famine is the outcome of a process that involve different levels of food stress. This is crucial for two reasons. First, in order for governments to avoid famines they must have time to respond. Early warnings of impending crises are therefore crucial. Second, a certain degree of gravity must be in place before the accountability mechanism comes into play. Relying on questionable famine data, where food crises are categorized as famines, is therefore problematic as this heightens the risk of underestimating possible democratic effects.

While problems related to famine data will be further elaborated on in Section 4.2, I now turn to my theoretical framework. Elements from this chapter will here be used to advance my theoretical propositions.

Chapter 3

Theorizing famine prevention

Hardin (2010) argues that one should start social science inquiry with individuals and their motivations, more specifically their self-interests. This does not mean that one needs to assume that people are wholly self-interested, but a strong element of self-interest makes behaviour explainable in fairly consistent terms (Hardin 2010, 36). In this regard de Waal (2000, 13) argues that the main reason why governments prevent famine is because of governments' self-interest. Some governments may have an *incentive* to respond to famine threats in order to retain power, whereas other governments' political survival do not depend as strongly on such actions. This logic will constitute the backbone of my analytical framework.

3.1 The basic framework

Famine is the outcome of a process with different levels of food stress. Hence, in order to avoid famines the government can invest in entitlement promotion spending (reducing the likelihood of a 'stress' situation) or entitlement protection spending (reducing the likelihood of a 'stress' situation escalating into a famine). However, the statistical models in Chapter 5 are not able to differentiate between the two since the different levels of stress are unobserved. Both types of investments are therefore treated as ex ante strategies providing social security. These famine preventive social security measures are regarded to be public goods.

There are two reasons for why these measures are conceived as public goods. First, it is reasonable to believe that the populace enjoy the prevalence of famine preventive social security measures as these make them feel more secure about their own situation in the future. Second, one can also argue that empathy for the suffering makes its prevention a public good. This justification was famously put forth by Friedman (1962, 191) who stated that "I am distressed by the sight of poverty; I am benefited by its alleviation; but

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I am benefited equally whether I or someone else pays for its alleviation".[1]

Sen (2009), Devereux (2007) and Rubin (2011) have all argued that famines are fairly easy to prevent. The observation that famines affect only a small proportion of the population is one of the main reasons for why this is so. Sen (2009, 47-48) points out that famines rarely affect more that 5 percent, and hardly ever more than 10 percent of the populace. He therefore argues that only a relatively small redistribution of food supply is needed in order to avoid famines. However, despite only affecting a small portion of the population, I argue that such social security strategies can be expensive, especially for poor nations. Many developing countries have weak public institutions and limited state capacity to deliver basic services, making it more costly to initiate protective measures that are effective in times of emergency. There are in other words always some costs involved in preventing famine. These costs can be extensive and therefore also decisive for government action.[2] Following the same rationale as Plümper and Neumayer (2009, 54), I argue that government response towards famine is the outcome of a political support maximization calculus. No matter what way the government chooses to help those affected by famine, there are always some direct or indirect costs being paid by the unaffected population. Direct costs are imposed if the government raises taxes in order to pay for social security measures (e.g. entitlement protection through relief programs, or entitlement promotion such as irrigation programs in drought prone areas). Indirect costs are, on the other hand, for example being paid by the 'unaffected' population if the government response alters market dynamics. Such a situation can occur if a government buys, or in other ways procures, food from unaffected regions, thereby causing market prizes to increase.

In order to avoid famine, governments are therefore faced with a political trade-off between 'ignoring' the calamity or taking appropriate action.[3] The first type of response will typically result in a loss of support from those who: *(a)* are directly affected by famine; *(b)* worry about their own situation since the famine may escalate; *(c)* worry about being affected by potential famines in the future; and/or *(d)* strongly value the welfare of others.[4] The latter governmental approach is believed to decrease levels of support from 'unaffected' segments of the population that pay for social security measures

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[1] For a thorough discussion on public goods see Cornes (1996).

[2] This is a realistic assumption. Contrary to Sen (2009), Braun, Teklu and Webb (1999, 126) argue that famine prevention requires large resources. They furthermore state that "[g]iven limited public resources for famine mitigation and prevention, concern about cost will continue to be a deciding factor."

[3] By 'ignoring' famines I do not mean that governments necessarily ignore them completely, but rather that their measures are intentionally inadequate.

[4] Those who find themselves in the (a),(b) and/or (c) category will be less supportive of the government because they feel insecure, while those in category (d) will do so on the basis of empathy. The extent to which the support diminishes is likely to vary across the different categories and between individuals, but this is not relevant for my argument.

without belonging to any of the aforementioned categories. It is in this context paramount to recognize that general support is not valued equally across different regimes. Some governments are to a greater extent inclined to heed elite interests, while others need to favor majority preferences.

As highlighted in previous sections, much of the literature on famines portray democracy as an effective remedy reducing famine vulnerability. However, democracy is a complex concept and various contributions emphasize different aspects when explaining outcomes. I will in the following sections systematize and discuss how three basic aspects of democracy may influence governments' policies toward famine prevention. In the absence of a holistic famine theory, elements from famine research will be coupled with arguments from the wider realm of political science when doing so.

3.2 Contested elections

Free and fair elections are by many political scientists considered the hallmark of democracy (see e.g. Alvarez et al. 1996; Cheibub, Gandhi and Vreeland 2010), ensuring that citizens' preferences are reflected in government policy. In accordance with this notion Sen (1995*c*, 16-17) stresses that:

> "[N]o major famine has ever taken place in any country with a multiparty democracy with regular elections and with a reasonably free press. This applies as much to the poorer democratic countries (such as India, Zimbabwe, or Botswana) as to the richer ones. This is largely because famines, while killing millions, do not much affect the direct wellbeing of the ruling classes and dictators, who have little political incentive to prevent famines unless their rule is threatened by them."

If the combination of multiparty elections and a free press is a *guarantee* against famines, then it is likely that multiparty elections themselves have an *effect* on government responsiveness. In fact, Bhagwati (1995, 59) argues that Sen exaggerates media's role in famine prevention since "[i]nformation about something as serious as a major famine will tend to spread even in an authoritarian country."

Contested multiparty elections are crucial since parties makes policy proposals during campaigns and explain how these will affect citizens' welfare. Citizens then decide which of these proposals they want to have implemented and what politicians they want to implement them. Since politicians and parties want to get re-elected, they enact these policies when in office (Przeworski, Stokes and Manin 1999, 29). Yet certain events – such as famines – may occur in non-election years, thereby making them less likely to be

politicized in election campaigns.[5] Nevertheless, elections will also influence government policies in these situations because politicians know they will be evaluated on the basis of all their actions, not only those promised during campaigns, if voters are non-myopic. This latter element is in fact the basic premise for Ferejohn's (1986) model on 'incumbent performance and electoral control'. According to the model, voters cannot trust any of the competing candidates' campaign promises. This is so because once in office, the incumbent's preferences can diverge from those of her constituents, and the politician may therefore choose policies at variance of her platform. Consequently voters primarily evaluate past performance and use retrospective voting to decide whether to keep or replace incumbents. However, it is in this regard important to recognize that many of the incumbents' actions are not directly observable for the electorate. This has led scientists to question whether the electorate is able to hold governments accountable for their actions (see e.g. Kuklinski et al. 2000). Nevertheless, while the so-called Michigan School conceived the public to be myopic, uninformed and lacking an organized belief system of political attitudes (see e.g. Campbell et al. 1980; Converse 1964), scholars such as Page and Shapiro (1992) have shown that voters, despite having unstructured conceptions of politics, respond sensibly to government actions and national events. Famine, I would argue, qualify as such.

If a government is unable to protect large number of its citizens from dying in a famine, it is reasonable to believe that most voters would be discontented. Not only are they likely to have sympathy with those directly affected, but perhaps more importantly also feel insecure themselves. People have, as mentioned in Section 2.2, for thousands of years expected help from their rulers in times of disaster, and for that they have been willing to pay taxes. If governments fail to uphold their end of this bargain it may not only be natural, but also rational for people to punish them. If incumbents have failed the populace once, there is no guarantee that they will not do so again. Opposition parties are therefore, in such settings, likely perceived as preferential alternatives. Consequently, this incentivize governments to behave ex ante, and elections can therefore be seen as a mechanism reducing moral hazard.

As outlined in the basic framework above, the primary reason why a government prevents famine is because the power of the incumbents depends on it. This interest, or incentive, is believed to be stronger if contested multiparty elections prevail. In sum there are two interconnected mechanisms at play bolstering this relationship. The ballot makes it easier for citizens to remove their governments compared to other means, while the existence of opposition parties present the electorate with viable alternatives to the current

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[5]This can at least be expected to be the case as long as 'famine threats' are not a frequent phenomena for the country in question, or as long as a famine has not occurred during the current government's term.

rulers. As incumbents are aware of these factors they are believed to act accordingly and prevent famines in order to retain power. My first hypothesis is therefore:

Hypothesis 1: *Famines are less likely to occur in multi-party democracies with contested elections, all else equal.*

3.3 Political participation

Dahl (1971) stressed that participation is an important aspect of democracy. It is in this regard important to recognize that even modern-day regimes vary extensively when it comes to the level of inclusiveness. In some countries there exist significant obstacles that hinder large sections of the population to partake in the voting process. These can be formal, such as during the Apartheid regime in South Africa, or informal, such as during the 1986 parliamentary elections in Sudan. While many consider Sudan to have been a democratic regime from 1986 until 1989 due to multiparty competitiveness (e.g. Przeworski et al. 2000), it is often forgotten that only 8,9 percent of the total population actually voted (according to data from Vanhanen 2000). Absence of polls in a vast number of constituencies, especially in the south, has been cited as one of the primary reasons for the low turnout (Willis, el Battahani and Woodward 2009, 26). Below I argue that there are at least three reasons for why high levels of political participation can reduce famine vulnerability.

First, broadened participation will, according Dahl (1971), likely bring about a change in the composition of the political leadership. This is so because as new groups are granted suffrage, candidates that are closer in their social characteristics to the newly incorporated segment of voters win a greater share of elective offices. Thus, when the narrow suffrage of a competitive oligarchy is extended to all segments of the population, it becomes probable that parliament members are drawn from broader segments of society (Dahl 1971, 20-21). If members of parliament originate from the poorer classes, one could argue that their affinity with vulnerable groups make them more susceptible to invoke measures that protect such fractions of society from famine. However, studies have shown that the poor are seldom represented by their equals (see e.g. Törnquist, Webster and Stokke 2009; Stokke and Törnquist 2013), and one could therefore argue that the described relationship of solidarity belongs to a category of exceptions. Nevertheless, if all segments of society are granted the right to vote, it follows that all regions will be represented – thereby making it likely that 'famine threat' situations are politicized since elected politicians rely on support from their constituents. Politicization does not necessarily lead to government

action, but is believed to enhance the likelihood of effective government measures that prevent famines.[6]

Second, electoral turnout is believed to shape government action as median voter preferences needs to be reflected in policy. Meltzer and Richard (1981) develop a model on the distributional effects of democracy explaining this relationship: As suffrage expands, the position of the median voter shifts down in the income distribution. If income is not distributed evenly, the mean income will exceed the median income. The decisive voter – who earns less than average in such a situation – will favour a high tax rate (because the tax burden fall most heavily on the wealthy) and high levels of economic redistribution. In short, if a larger share of the population participates in elections they will collectively compel the government to redistribute income downwards through lump sum transfers or increased spending on public goods (see e.g. North, Wallis and Weingast 2009). As famine prevention belongs to the latter category one can expect the overall investments in such social security measures to reflect median voter preferences (i.e. the person's perception of self-exposure to either ongoing or future famines, plus the extent to which she values the welfare of others in respective situations).

Third, Bueno de Mesquita et al.'s (2003*a*) 'Selectorate theory' holds that the size of the governments winning coalition is decisive in explaining government behaviour. The framework – which Plümper and Neumayer (2009) use to develop their 'political theory of famine vulnerability' – share many of the same characteristics as Meltzer and Richard's (1981) model, but is more concerned at explaining government's allocation decisions, distinguishing between private and public goods.[7] The selectorate theory assumes that political leaders need to hold office in order to accomplish their goals. In addition every leader must rely on a group of people in order to retain power. This group of people makes up what is called the *winning coalition* and are the ones who control the crucial elements that constitute political power in the system. In democracies this means the group of voters who elect the leader. The coalition members are drawn from the *selectorate*, namely the group of people that have a say in choosing leaders (which in a democracy with universal suffrage in principle equals the adult population).

According to Bueno de Mesquita et al. (2003*a*, 8) political leaders make three related sets of decisions that are essential for staying in power. First, they choose how to gen-

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[6]Unfortunately it is not always the case that politicized issues lead to preventive measures. During the Sudan famine of 1988, parliament representatives from the southern part of the country raised the famine issue in the parliament in Khartoum. They were, however, unable to mobilize public opinion and unite the opposition for its cause (Plümper and Neumayer 2009, 52).

[7]Ghobarah, Huth and Russett (2004) develop a third theory that aims at explaining why government's allocation decisions depend on participation. Their argument, however, is almost identical to the rationale behind Bueno de Mesquita et al. (2003*a*)'s 'Selectorate theory' and will consequently not be explained here.

erate government revenue. Second, they decide how to spend these resources, aiming at sustaining support among members of their winning coalition. Third, they balance their spending between supporting the winning coalition and the selectorate. Private benefits are distributed to members of the winning coalition while public goods are nonexcludable.[8] The selectorate theory holds that the larger the winning coalition, the more inclined are its leaders to provide public policies that meet the demands of their winning coalition members. Since democracies in general have a larger winning coalition than autocracies, democratic governments tend to provide more public goods than their autocratic counterparts (Bueno de Mesquita et al. 2003*a*, 50). The logic behind this assumption is straightforward. The allocation of resources to public and private benefits depend on institutional constraints and how much revenue there is to spend (Bueno de Mesquita et al. 2003*a*, 58). Imagine that a leader has a pool of $100 dollars which, if used on public goods, would be worth $1 dollar to everyone in society. However, if the winning coalition only requires 20 members, the leader can provide each of them with private goods worth $5 dollars (which they would prefer to the public good). As the size of the winning coalition increases, the amount of resources to be spent on private goods will be spread more thinly, and at certain equilibria it becomes more cost-effective for the leader to produce public goods to satisfy the winning coalition. (Bueno de Mesquita et al. 2002, 562).[9]

When applying this logic to explain famine vulnerability in particular, one can expect small and large-coalition systems to behave differently before and during 'stress' situations. In small coalition systems (i.e. oligarchies) one can expect the government to primarily help affected elites through private social security provisions. This can for example include targeted entitlement promotion subsidies to winning coalition members in the form of irrigation systems, flood control measures and improved infrastructure in the areas where the elite resides. And/or in the form of private entitlement protection measures, such as selective transfers of food and money, during 'stress' situations. Importantly, non-elite individuals are left vulnerable in oligarchies because neither promotion nor protection spending are targeting these groups. The only exception to this pattern is invoked by the basic framework outline above; namely the extent to which elite members

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[8]In the domain of domestic policies, the rule of law, general access to education, communication and transportation infrastructure and the like are examples of public goods. Private goods can on the other hand take form as subsidies, favourable tax policies, or as rewards (say food surpluses) that are only distributed among supporters of the regime (Bueno de Mesquita et al. 2003*a*, 29). Thus, generally everyone in the selectorate, including the winning coalition, enjoy the benefits of public goods, while only the winning coalition reaps the benefits of private goods.

[9]In reality, all policies are made up of both public and private goods. Even a public goods such as national security, that all members of society benefit from, also involve an amount private goods for those who provide this form of protection. However, the core focus of the selectorate theory is how institutions affect the relative mix between them (Bueno de Mesquita et al. 2002, 562).

value the welfare of others.

In large coalition systems (i.e. democracies with high levels of participation) the government is believed to act differently. Both before and during 'stress' situations, social security measures are aimed at promoting and protecting the welfare of the entire populace as this becomes the most cost-effective strategy. The entitlement promotion measures are likely to resemble the ones targeting only the elites, but will be of a more universal character. Entitlement protection measures are, however, believed to diverge. Unless the electorate is highly empathic toward the affected population, they will most likely favor non-discriminatory measures. This can for example involve that minimum food rations are given to all members of society. Food for work programmes is another alternative possibly yielding similar support. While this latter alternative involves a discriminatory element – as it is only attractive for famine affected individuals to participate – it will nevertheless generate public goods (e.g. roads or government buildings) that all parts of society benefit from.

In sum I have presented three main arguments for why high levels of political participation are likely to influence famine prevention. First, broadened participation will bring about a favorable change in the composition of the political leadership. Second, higher levels of electoral turnout will increase taxation and redistributive spending. Third, when more people are granted the suffrage the size of incumbents' winning coalition increases, making it more cost-effective for the government to to appease them – and thereby remain in office – by providing public instead of private goods. The second hypothesis is therefore:

Hypothesis 2: *Famines are less likely to occur in countries with high levels of political participation, all else equal.*

3.4   Civil liberties

Civil liberties such as freedom of expression, freedom of the press, and the freedom to form and join organizations are, as noted in Section 1.2.2, vital in order for a democracy to work properly. The aspect is therefore defined as constituting the third dimension of democracy. However, civil liberties are not only confined to exist in democracies, but can to a certain extent thrive in non-democratic societies as well. The absence of contested elections does, in other words, not necessarily equal the nonexistence of civil liberties. Hence, one of the benefits for treating this as a separate dimension is therefore that it enables me to account for this relationship.

The relationship between democracy and liberty is complex and has generated a certain degree of confusion among scholars. On the one hand liberty is treated as a consequence of democracy, on the other as a necessary precondition (Bova 1997, 113). However, the close connection between the two dimensions has perhaps also made scholars exaggerate the effect of democracy. Sen (1994, 34) discusses whether the connection between democracy and famine is a 'bogus correlation' and points out that this "may seem plausible when one considers the fact that democratic countries are typically rather rich, and thus immune to famine for other reasons." Yet, the reason for why this is *not* so, is, according to Sen, because "the absence of famine holds even for those democratic countries that happen to be poor, such as India, Botswana and Zimbabwe" (Sen 1994, 34).[10] I believe this argument suffer from two shortcomings. First, it fails to explain why other poor countries have been exceptionally successful at preventing famines despite being undemocratic.[11] Sen (1993*b*, 44) argues that this is so because "an undemocratic country can avoid famine through luck: a crisis might not arise or some benevolent despot might implement effective famine-relief polices."[12] However, as discussed in Section 2.3 there are probably other factors than 'luck' at play. Second, democracy is not only correlated with high levels of economic development, but also with other aspects that are believed to have an effect on famine prevention. If these aspects are accounted for it might be that the connection between democracy and famine is a 'bogus correlation' after all.

Banik (2002; 2007; 2007b) argues that non-democracies have enjoyed considerable success in preventing famines as long as certain freedoms, such as the freedom of speech and expression and the right to organize, have been guaranteed. Reddy's (1988) analysis of the near-famine situation in northern Nigeria in 1973-74, discussed in Section 2.3, underpins this argument. As does Buchanan-Smith and Davies's (1995) account of the 1992 famine threat in Kenya.

Since civil liberties enable people to speak relatively freely, formulate discontent and protest, this is believed to affect the political support maximization calculus outlined above, even if elections are absent. I argue here that there are primarily two reasons for why this is so.

First, in order for the government to enact measures that prevent famines during times of 'stress' they must first be aware of the situation. Civil liberties are in this regard crucial as they further enable and strengthen the public 'voice' (e.g. in the form of public protests, unfettered journalism etc.), making it more likely that famine threats are identified. As discussed in Section 2.3, even chairman Mao recognized this in the aftermath of the Great

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[10]The same argument is repeated in Sen (2000, 178).

[11]For a list of African countries that did not experience famine during the 1970s 80s and 90s see Braun, Teklu and Webb (1999, 32).

[12]The exact same argument is repeated by Sen (1993*a*, 33-34) replying to criticism from Nolan (1993).

Leap Forward Famine. However, early warning is not only a requirement for preventive government action, but also a vital element in the political support calculus. Protection at a later stage is, as was discussed in Section 2.2.1, more expensive than early intervention. Financial costs therefore depend on how early a government responds to a 'famine threat' situation. Hence, the earlier a government receives information about a forthcoming catastrophe, the more likely it becomes that adequate protection strategies are put in place.

Second, civil liberties are also believed to increase government accountability. According to Diamond (2008, 255), civil liberties raise citizens' expectations of government, and organizational abilities makes them challenge abuses of power. He also argues that nongovernmental organizations (NGOs) are teaching people their rights and obligations as citizens – in other words 'awakening' the public. This aspect may be particularly important with regard to famines, because in the absence of elections regimes may derive their legitimacy from their record at preventing or reducing human suffering. As argued by Bay (1968, 241), the "only acceptable justification of a particular form of government [...] is that it serves to meet human needs". Similarly, London and Williams (1988, 750) point out that governments must at least *appear* to act in the best interests of the entire population in order to fulfill what they call 'the legitimation function'.

Thus, if the populace feel severely neglected by the government they are likely to express discontent. There are a number of historical examples with regard to famine that buttress such a relationship. Emperor Nero's downfall was, as discussed in Section 2.2, in part an outcome of his inability to deliver grain to the citizens of Rome. Haile Selassie's failure to relieve the people from the Ethiopian famine of 1972-74 led – in much the same way – to the 1974 revolution and his downfall. The Ethiopian famines in the late 1980s also proved to be "the ultimate undoing of Colonel Haile Mengistu Mariam's brutal administration in 1991" (Ó Gráda 2009, 56). De Waal (2000, 17) argues correspondingly that the 1940s famine in Hunan helped discredit the nationalist government and therefore played a crucial role in bringing the Chinese communists to power. What is interesting to recognize here is that the incumbents were held accountable for their (in)actions even in the absence of democracy. Civil liberties were, however, thoroughly restricted in all of these cases. Yet, this should not be taken as evidence for such freedoms being unimportant. Rather I would argue that transaction costs to public protest are higher if civil liberties are repressed. It is therefore plausible that the gravity of the respective situations made people accept the risk of retribution if the revolts failed.

Here I assume that the easier it is for citizens to express discontent, the more likely they are to do so during 'stress' situations – *before* famine potentially occurs. Furthermore, I argue that the public's 'voice' will serve as a disciplining mechanism affecting incumbent's

response. Interestingly Sen (2000, 156) describes such a link when discussing the role of the opposition in pre-democratic South Korea and in Chile under Pinochet. In both countries public criticism and the persistence of opposition had a significant indirect effect on public policy, despite the lack of democratic guarantees. Sen argues in particular that many of the social programs that were initiated, were aimed at reducing the appeal of the opposition.

In sum, both democratic and authoritarian governments are in other words believed to be accountable to the public as long as citizens are able to voice their concerns. Furthermore, if a non-democratic regime tolerates criticism, one can also expect that the media and NGOs can provide 'early warning' similar to what Sen argues they do in democracies. The third hypothesis is therefore:

Hypothesis 3: *Famines are less likely to occur in countries where the regimes allow more extensive civil liberties, all else equal.*

3.5 Summary

I have in this chapter developed a theoretical framework which aims at explaining why some regimes are better than others at preventing famine. By separating between three different – but highly correlated – regime components, I propose that there exists a variety of mechanisms that can affect incumbent incentives, and thus famine vulnerability, differently. I will in the next chapter operationalize the three dimensions, before empirically investigating possible effects in Chapter 5.

Chapter 4

Research design

In this chapter I first make the case for why a quantitative investigation is a good approach for testing the hypotheses proposed in Chapter 3. Thereafter follows an account of how the variables used in the analysis are being operationalized. Third, I discuss methodological challenges related to multicollinearity and missing data, before finally presenting the statistical model.

4.1   The rationale behind a quantitative investigation

The goal of scientific research is making inferences, and social science is primarily concerned with making sense of social situations that we perceive as more or less complex (King, Keohane and Verba 1994, 7-9). Famines can in this regard be perceived as one of the more complex phenomena. They are all likely products of a multitude of factors, and the combination and relative importance of these may differ from one situation to the next.

As discussed in previous chapters, there have been strong claims in the qualitative literature about the existence of causal relationships between certain rights and liberties and famine prevention. While case studies have illustrated how these mechanisms work (see e.g. Ram 1995; Drèze 1995b), comparative case studies have frequently been used as a platform for generalizations (see e.g. Drèze and Sen 1989; Drèze 1995a; Sen 2000). The validity of such generalizations can, however, be questioned due to possible selection bias. Sen's claim that democracy reduce famine vulnerability is, for example, primarily based on the observation that democratic India has successfully prevented famines, while authoritarian China has not (see e.g. Sen 1982a; 1983; 1987b;a; 1990; 1993a;b; 1995b;c; 1999; 2000; 2009). Even though such comparative case studies provide interesting insights, "they do not by themselves provide clear guidance for generalization to other cases" (Achen and Snidal 1989, 146). As argued by Geddes (2003, 94), in order to be persuasive,

general claims must be tested on a large number of cases. The statistical analyses of Plümper and Neumayer (2009) and Rubin (2011) are in this regard exemplary attempts to do just so, but as they reach different conclusions, it is still – to some extent – a puzzle whether democracy is better at safeguarding people from famine. Another statistical inquiry is therefore considered to be an important undertaking as this can provide further evidence in support of either of the previous conclusions.

When exploring famine vulnerability using statistical methods, it is important to be aware of several challenges. First, in order to make valid inferences one is highly dependent on a proper conceptualization and measurement of the phenomenon under study. Both of the former statistical studies have in this regard relied on questionable famine data. A second hitch relates to the fact that famines are rare events, and small amounts of variation can make it hard to estimate statistical effects properly. Third, in order to minimize the risk of omitted variable bias one needs to control for relevant factors that can influence the hypothesized relationships. Significant amounts of missing data on relevant variables are in this regard a complicating factor.

As argued by King, Keohane and Verba (1994, 10), when data is limited and measurements unclear, method becomes progressively more important. By adhering to the scientific principle of transparency, I will in the remainder of this chapter therefore elaborate on methodological challenges and justify my choice of solutions.

4.2   Famine as the dependent variable

In order for any statistical analysis to make sense it is of paramount importance that the dependent variable actually measures what it is supposed to measure, namely the the theoretical concept at hand. There are, as discussed in Section 2.5, numerous flaws attached to EM-DAT's (2012) 'famine' data. I will consequently not rely on this source of information when constructing my dependent variable. Instead I have chosen to use Braun, Teklu and Webb's (1999) list on major famines in the twentieth century for doing so.

There is one great advantage and several smaller disadvantages associated with this choice. While the EM-DAT (2012) data contain information about the number of people killed and the number of people affected, Braun, Teklu and Webb's (1999) list only provides information about where and when famines occurred. Consequently the range and sophistication of inferences that can be drawn from the material are fairly limited. The number of recorded famines are in addition significantly reduced, making it hard – but not impossible – for statistical methods to yield reliable results. A paramount benefit, however, is the fact that these observations squarely reflect the phenomenon under study

as defined in Section 1.2.1.[1] Braun, Teklu and Webb's (1999) list is furthermore – to my knowledge – the most thorough record of famines that exists today.[2]

Table 4.1: List of famines recorded by Braun, Teklu and Webb (1999), 1968-1998.

Famines			
Country	Year	Country	Year
Nigeria	1968-69	Somalia	1983-85
Mauritania	1969-74	Sudan	1984-85
Niger	1969-74	Mozambique	1985-86
Chad	1969-74	Sudan	1988
Bangladesh	1971-72	Somalia	1988
Ethiopia	1972-74	Ethiopia	1989-90
Cambodia	1973	Liberia	1992-93
Bangladesh	1974-75	Somalia	1992-93
Angola	1974-76	Sudan	1993
Zaire	1977-78	Angola	1993-94
Uganda	1980	Liberia	1995-98
Mozambique	1982-83	Sierra Leone	1995-98
Niger	1982-85	North Korea	1996-98
Chad	1982-85	Zaire	1997
Ethiopia	1983-85	Sudan	1998

Similar famine listings are produced by Devereux (2000, 6) and Ó Gráda (2009, 23-24). However these lists are primarily concerned with mortality estimates, and are therefore only providing information on famines where mortality estimates exist.[3] Devereux (2000) and Ó Gráda (2009) therefore present a smaller amount of famines despite having what appears to be a less strict inclusion criteria than Braun, Teklu and Webb (1999).[4] There is, however, one potential famine that is lacking from Braun, Teklu and Webb (1999)'s list, because some scholars argue that a famine occurred in Maharashtra, India in 1972-73. This particular event has sparked much controversy in scholarly circles (see e.g. Drèze and Sen 1989; Hussain 1995; Dyson and Maharatna 1992; Myhrvold-Hanssen 2003;

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[1]Braun, Teklu and Webb (1999, 6) define a famine as follows: "Famine is a widespread and extreme hunger that results for individuals in a drastic loss of body weight and an increase in morbidity, and, at the community level (as an interaction of these two symptomps), in a rise in the death rate and massive social dysfunction and dislocation."

[2]A list of additional sources that refer to these famines are produced in Table 1 in Appendix 1.

[3]While Braun, Teklu and Webb (1999, 3) include 25 famines, Devereux (2000) is only listing 15 for the 1968-1998 period. Ó Gráda (2009) appears to be more restrictive than Devereux (2000) when it comes to including trustworthy mortality estimates, and is presenting only 10 famines for the same period.

[4]Unfortunately, after personal communication with Stephen Devereux (2013) and Cormac Ó Gráda (2013), it appears that neither of them have any additional information about the famines listed in their studies, nor have they updated their lists. This is another reason for why I only rely on Braun, Teklu and Webb's (1999) list, as it is unfortunately beyond the reach of this thesis to collect qualitative data and classify events as famines.

Rubin 2011), and in order to evaluate the robustness of my findings I include this event
in an additional analysis of my main models.

In their book, Braun, Teklu and Webb (1999, 3) record 26 famine-onsets for the 1968-
1998 period. Two entries are recorded as occurring in the 'Sahel region', while another
entry is listed as occurring in the 'Horn of Africa region'. Patrick Webb (2013, personal
communication) has clarified the lack of specificity, pointing out that the 1969-74 famine
in the 'Sahel region' affected Mauritania, Niger and Chad, while the 1982-85 Sahelian
famine affected only Niger and Chad. The 'Horn of Africa region'-famine in 1983-85 took
place in both Somalia and Ethiopia. As can be seen in Table 4.1, this leaves me with a
total of 30 famine entries. However, one of the famines started in Angola in 1974, while
the country was still a Portuguese colony, and is therefore not included in my analysis.

4.3   Independent variables

Democracy is, as mentioned earlier, among the more complex concepts in political science,
and its abstract nature has led researchers to operationalize the concept in different ways.
Since different variables are likely to yield diverging results, it is of vital importance to
choose valid and reliable classifications. When doing so, two principles have guided my
selection. The variable must first of all reflect the theoretical concept in an appropriate
manner. Second, it must be of as much analytical use as possible. These attributes are
important to evaluate in order to maximize validity and minimize problems of conflation.
The two aspects are often intertwined as many constructs are created on the basis of
maximalist definitions of democracy (Munck and Verkuilen 2002). Consequently, one
can easily end up using variables that include too many aspects relative to the theoretical
goals of the study, while at the same time making it hard, if not impossible, to identify
crucial aspects with precision. As noted by Alvarez et al. (1996, 4), "lumping all good
things together is of little use." Hence, Munck and Verkuilen (2002, 15-16) stress that an
important guideline should be to select multiple indicators that compliment each other in
order to maximize validity.

4.3.1   Contestation

Contestation are, as discussed in Section 3.2, believed to affect famine vulnerability. How-
ever, while there exists numerous measures of democracy, relatively few of them concen-
trate solely on the prevalence of competitive elections. Alvarez et al.'s (1996) democracy
index, hereafter referred to as the ACLP-index, can be thought of as a notable exception
in this regard. The index is arguably the most commonly used dichotomous measure of

democracy, and classifies a country as such if all of the four following criteria are met (Alvarez et al. 1996, 7-14):

1. The chief executive must be chosen by popular election, either directly or indirectly.
2. The legislature must be popularly elected.
3. There must be more than one party competing in the elections.
4. The regime must prove that it is democratic by a change in leadership through an election under similar electoral rules that brought the incumbent to office.

However, while there are advantages and disadvantages to this method of classifying regimes, I do not intend to use the measure in the perhaps most conventional way. Alvarez et al.'s (1996) classification of democracies and non-democracies can, as pointed out by Cheibub, Gandhi and Vreeland (2010, 74), "be interpreted simply as one component of a broader characterization that includes other features of political regimes." This is exactly the way I am going to use the measure in this thesis, namely as a variable capturing the dimension of contestation. Whether one agrees with Przeworski's (1991, 10) dictum that "[d]emocracy is a system in which parties lose elections" is therefore not important. What matters is that the ACLP-index measures contestation in an exemplary way in terms of stringency and logical clarity.

The first two rules relate to whether relevant offices are filled through popular elections. The third rule establishes whether eventual elections were competitive, and the fourth rule makes sure that regimes are proven democratic by allowing for leadership change through election. This latter 'alternation rule' may at first look harsh, and is not unproblematic. Nevertheless, as discussed in Section 1.2.2, repeatability of contested elections is crucial in order to ensure the continuing responsiveness of the government. But how are one to be sure that elections in fact are contested? Remember that contestation, as defined in the introduction, holds that the outcome of an election is not known before it takes place and that the winner of the electoral contest actually takes office. Alvarez et al. (1996, 10-13) argue that one can never be sure of this unless governments have proved themselves through action rather than words. They fourth rule is therefore invoked as a precautionary stand against false promises. The result is that some countries are 'wrongly' classified as belonging to the non-democratic – or in this case non-contestation – category.[5] Alvarez et al. (1996, 13) admit that this is a problem, but an unavoidable one – as one must always decide which way to err.

Both South Africa and Botswana are two candidates belonging to the category of

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[5]The inverted commas are used because the countries which belong to the category of uncertainty are not classified as non-democracies by mistake, but rather perhaps mistakenly so as a consequence of stringent coding rules.

uncertainty and therefore end up in the non-democracy/non-contestation group. This
may at first thought appear as grave mistakes since both countries have held several
elections that in general have been considered as free and fair. Botswana, for example,
is often considered to be an African success story with regard to democracy (see e.g.
Holm, Molutsi and Somolekae 1996; Acemoglu, Johnson and Robinson 2004), yet the
Botswana Democratic Party (BDP) has never lost an election since they came into power
in 1966 (Taylor 2003; Knutsen 2011). Przeworski et al. (2000, 23) therefore argues that
there is a chance that elections are held only because the ruling party is certain to win
them. Whether this is the case or not remains of course speculation. However, Diamond
(2008, 260) argues that democracy is diminished by one-party dominance in a number of
countries. He asserts that this is particularly so for countries such as South Africa and
Botswana where, despite significant levels of political freedom, parliaments lack of mean-
ingful oversight on the executive branch, produce stultified democracies. Furthermore,
he points out that when surveyed in 2006, only two in five South Africans said elections
enable voters to remove leaders they do not want. One can therefore argue that the alter-
nation rule is problematic, but only to a certain extent. While it may 'wrongly' classify
a limited amount of observations as belonging to the non-democracy/non-contestation
category, many of these cases are likely to possess inherent democratic flaws as the ones
described by Diamond (2008). The problem should therefore not be exaggerated when us-
ing the index as a measure of contestation, because such democratic imperfections severely
weaken the theorized disciplining mechanism of elections.

In sum I argue that the ACLP-index has good prospects for measuring the perti-
nent aspects of the hypothesized relationship between contestation and reduced famine
vulnerability. In the analysis I will therefore use Cheibub, Gandhi and Vreeland's (2010)
updated ACLP-index where regimes with regularly contested elections (minimalist democ-
racies) are coded as ones. However, while the validity and reliability of the ACLP-index
is considered to be of high quality, Elkins (2000) has shown that is not stainless. When
evaluating the robustness of my findings in Section 5.3, I will therefore apply Coppedge,
Alvarez and Maldonado's (2008) contestation-index as an alternative measure.

4.3.2   Participation

While the ability to participate in decision making processes hinges on more than just
voting, I will here focus on electoral participation when operationalizing the participation
dimension. This is considered appropriate since all of my theoretical arguments that
regards participation and famine vulnerability concentrate on this particular aspect, and
because it is arguably the most important tool for participation in politics.

Electoral participation is relatively straightforward to measure. Aidt and Eterovic (2011, 185) argue that one can either focus on the number of eligible voters, or assess the extent of voter turnout. However, as discussed in Section , there can exist many informal obstacles to *actual* participation despite formal suffrage rights. I therefore consider voter turnout to be the best measure for the purpose at hand. Vanhanen's (2000) participation-index will for that reason be employed. The measure is widely used (see e.g. Reiter and Tillman 2002; Davenport and Armstrong 2004; Fredriksson et al. 2005; Aidt and Eterovic 2011), and is calculated by dividing election turnout on the total population in countries where multiparty elections are held (Vanhanen 2000, 253).

There are considerable advantages but also significant drawbacks related to this oper-ationalization. First of all, when dividing election turnout on the *total* population one is not able to take into account the variation in age structure across countries and over time. The percentage of the adult population is in general much higher in developed countries than in their poor counterparts, making the indicator exaggerate differences in the degree of electoral participation between the two groups. Vanhanen (2000, 255) acknowledges this and points out that the bias may be as high as 10-15 percent in extreme cases.[6] Second, he also notes that the measure is unable to differentiate between the nature and the importance of elections. Both of these aspects weaken the validity of the variable. A third disadvantage, that Vanhanen (2000) does not mention, is for instance, what could be called 'the rainy day effect'. Studying US elections, Fraga and Hersh (2010) finds that rain decreases turnout on average, an effect that is likely to be valid for other coun-tries as well. This aspect is probably not of vital importance in most settings, but could nevertheless influence results in extreme cases.

Besides directly capturing the dimension behind my theoretical arguments, the two greatest advantages of Vanhanen's (2000) participation measure relates to its simplicity and reliability. The combination of stringent coding rules and generally exact data on elections has, according to Vanhanen (2000, 257), made little room for subjective judge-ments when assigning country scores. However, in order to evaluate the robustness of my findings, I will employ Coppedge, Alvarez and Maldonado's (2008) inclusiveness-index as an alternative measure of participation in Section 5.3.3.

4.3.3 Civil liberties

Civil liberties were in Section 1.2.2 defined as individuals' freedom to speak, think, pub-lish, assemble and organize without interference from the government or other sections of society. These freedoms have in the two preceding chapters been described as an impor-

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[6]The reason why Vanhanen (2000, 253) use the total population, and not the adult or enfranchised population, is because more data are available.

tant element in reducing famine vulnerability. I seek to investigate this dimension using Freedom House's index of civil liberties as an independent variable.

According to Freedom House (2011, 813), civil liberties "allow for the freedom of expression and belief, associational and organizational rights, rule of law, and personal autonomy without interference from the state." Countries receive ratings from 1 to 7 based on evaluations of these aspects, where countries that receive a rating of 1 come closest to ensuring civil liberties, while in countries with a rating of 7, citizens are severely repressed (Freedom House 2011, 817-818). The ratings are based on a multilayered process of evaluation in which regional experts and scholars use 15 main check questions to assign country scores (see questionnaire checklist displayed in Table 4.2). The criteria used for scoring civil liberties are relatively subjective compared to the two other explanatory variables described above. This has to do with the fact that it is easier to measure the presence of multiparty elections, or voter turnout, empirically, than for example to what extent there are open and free private discussions about politics (as in check-question D4).[7] Consequently this may result in biases and unsystematic measurement errors (for a discussion on this see e.g Bollen and Paxton 2000; Munck and Verkuilen 2002; Knutsen 2010). This is however an indispensable flaw when seeking to account for not only the presence, but also the functionings of different institutions.

That Freedom House uses a large subset of indicators can be seen as a second disadvantage, reducing analytical precision. The maximalist, inclusive nature of the indicator, combined with a purely additive aggregation procedure, makes it impossible to say whether it is an independent media or the rule of law that generates potential effects. This is, however, an unavoidable shortcoming since Freedom House does not release indicator-level data that would make it possible to create a better and more specific construct. However, on the whole, the Freedom House indicator of civil liberties is recognized by many as a high-quality measure (see e.g. Bollen 1993; Bollen and Paxton 2000), and is widely used in empirical research (see e.g. Isham, Kaufmann and Pritchett 1997; Li and Resnick 2003; Adam and Filippaios 2007). Diamond (1999, 12) even goes as far as to state that the Freedom House indicators (which includes another indicator of political rights) are the best measures of liberal democracy available. This is a crucial recognition. In parallel to the two independent variables chosen above, there are certain drawbacks which are essential to be aware of. But despite certain shortcomings, the variables are

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[7]The two sub-questions to check-question D4 are: 1) "Are people able to engage in private discussions, particularly of a political nature (including places like restaurants, public transportation, and their homes) without fear of harassment or arrest by the authorities?"; 2) "Does the government employ people or groups to engage in public surveillance and to report alleged antigovernment conversations to the authorities?"

Table 4.2: The main check questions of Freedom House's Civil Liberties index.

Civil liberties category	Check-questions
D. Freedom of Expression and Belief	1. Are there free and independent media and other forms of cultural expression? 2. Are religious institutions and communities free to practice their faith and express themselves in public and private? 3. Is there academic freedom, and is the educational system free of extensive political indoctrination? 4. Is there open and free private discussion?
E. Associational and Organizational Rights	1. Is there freedom of assembly, demonstration, and open public discussion? 2. Is there freedom for nongovernmental organizations? 3. Are there free trade unions and peasant organizations or equivalents, and is there effective collective bargaining? Are there free professional and other private organizations?
F. Rule of Law	1. Is there an independent judiciary? 2. Does the rule of law prevail in civil and criminal matters? Are police under direct civilian control? 3. Is there protection from political terror, unjustified imprisonment, exile, or torture, whether by groups that support or oppose the system? Is there freedom from war and insurgencies? 4. Do laws, policies, and practices guarantee equal treatment of various segments of the population?
G. Personal Autonomy and Individual Rights	1. Does the state control travel or choice of residence, employment, or institution of higher education? 2. Do citizens have the right to own property and establish private businesses? Is private business activity unduly influenced by government officials, the security forces, political parties/organizations, or organized crime? 3. Are there personal social freedoms, including gender equality, choice of marriage partners, and size of family? 4. Is there equality of opportunity and the absence of economic exploitation?

nevertheless among the very best measures available.

As can be seen from Figure 4.2, the two first sub-categories (D and E) of the civil liberties index directly concern freedom to speak, think, publish, assemble and organize. These are the crucial features of the civil liberty aspect as defined in Section 1.2.2, and the ones given attention in Chapter 2 and 3. However, several of the check-questions in category F and G are also related to these aspects. The protection from unjustified imprisonment of groups that oppose the government is, for example, important as it enables people to voice criticism without fear of unlawful retribution. Laws that guarantee equal treatment of various segments of the population may be equally important. If certain

groups are not entitled to the same kind of judicial protection as the rest of the population, they may be more vulnerable to famine.[8]

In sum I contend that the Freedom House civil liberties index captures the essential aspects as theorized in Section 3.4 in an adequate manner. Its maximalist nature impose restrictions with regard to interpretational specificity, but this shortcoming is, in the absence of a more precise alternative, outweighed by the fact that it covers all relevant aspects in a versatile way.[9] It should, however, be noted that the variable is only covering the post 1971 period. This poses a challenge since I intend to analyze the entire 1968-1998 period, but the matter is solved through the use of multiple imputation. The process is described in detail in Section 4.5.2 below.

To avoid confusion I reverse the direction of the civil liberties index by subtracting their scores from 8. This ensures that higher scores are associated with higher levels of civil liberty protection. All the independent variables can therefore be interpreted in the same direction.

4.4   Control variables

Control variables are used in order to minimize the risk of omitted variable bias. Such bias occurs if factors that have a causal effect on the dependent variable, while at the same time being correlated with one or more of the independent variables, are left out of the model, making it over- or underestimate the effect of the modeled covariates. However, controlling for too many factors can also be erroneous. King, Keohane and Verba (1994, 182-183) warn against pursuing an 'include everything' approach because the inclusion of irrelevant variables can be very costly. Their key point is that even if the control variable has no explanatory power, but is correlated with the independent variable(s), this will make the estimate of the explanatory variable's causal effect less efficient. A second quandary relates to multicollinearity problems as described below. In sum one should therefore adhere to a principle of parsimony when selecting controls. In the following I therefore select and describe variables that in the literature are believed to affect famine vulnerability, while also possibly being correlated with the independent variables.

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[8]If certain groups are not entitled to the same kind of judicial protection as the rest of the population it is likely that e.g. social security measures in the form of both entitlement promotion and protection measures are deficit in areas where such groups reside.

[9]There are other, more specific, alternative measures available for the post 1980 period (such as the freedom of speech variable found in the ? dataset). Applying any of these measures would, however, limit the time period under study, and thereby reduce the number of famines in the sample dramatically.

Level of economic development

Economic development affects numerous aspects that can be related to famine vulnerability, such as infrastructure and administrative capacity. Besides, Lipset (1959) argued that economic development has an impact on democratic institutions and how they function (see also Diamond 1992). In short there are strong grounds for expecting that economic development has an effect on famine prevention capabilities while also being correlated with the independent variables.

To control for economic development I use Strand et al.'s (2012) measure of GDP per capita. The variable is measured in 1990 international Geary-Khamis dollars per capita, and is compiled using GDP data from Maddison (2007) supplemented with GDP data from Gleditsch (2002) and the World Bank (for more information see Strand et al. 2012, 20).[10] Using constant Geary-Khamis dollars is preferable to other GDP measures as it permits standardized comparisons to be made across countries and over time. In order to account for a declining marginal effect from economic development on famine vulnerability I take the natural logarithm of the variable. Consequently this also reduces the likelihood of there being any outlier observations that influence the results disproportionately. The variable is furthermore lagged by one year to account for reciprocal effects.

Economic growth

The risk of experiencing a famine is not only believed to be affected by the level of economic development, but also by economic growth. Economic distress is likely to affect people's exchange entitlement mapping, and a fall in wages or loss of employment can, as discussed in Section 2.1, result in entitlement failures, which according to Sen (1982*b*) is the primary reason why people starve. In addition, while there is currently no strong evidence that regime type is correlated with growth, Przeworski and Limongi (1997) show that economic growth makes democracies endure. Economic crises are furthermore found to increase the risk of democratic breakdown.[11] I control for this aspect by including a variable measuring the annual increase in Strand et al.'s (2012) abovementioned GDP per capita measure. Also this variable is lagged by one year in order to avoid endogeneity problems.

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[10]The 1990 international Geary-Khamis dollars will also be referred to as 'international PPP $'s'.

[11]In a similar vein Hegre, Knutsen and Rød (2012) show that high levels of economic growth enhances democratic stability, but reduces the probability of democratization.

Population and population density

The total population of a country is an important control variable as populous countries are more likely to experience famines, all else being equal. This intuitively obvious since a country with hundreds of millions of people can be expected to experience 'stress' situations more often than smaller countries. One school of thought also argues that the size of the population affects how democracy thrives in a country (see e.g. Dahl and Tufte 1974). To account for this aspect, I include a variable measuring the total population of a country in a given year. Data are collected from The World Bank (2013), which base the measure on a *de facto* definition of population that count all residents of a country, regardless of legal status or citizenship. The variable is transformed using the natural logarithm. This is done for the same reasons as with economic development, namely to account for a declining marginal effect and outliers.

It is also plausible to assume that governments find it harder to provide social security if vulnerable segments of the population are widely scattered in rural areas. To control for this I include a variable measuring a country's population density in a given year. Population density is measured as the midyear population divided by land area in square kilometers. Also this variable is collected from The World Bank (2013) and log-transformed using the natural logarithm.

Urban population

It is reasonable to believe that governments are especially sensitive to criticism from urban dwellers, because living in cities makes it easier for people to meet, communicate and protest. Timmer (1989, 23) argues that governments are held accountable for providing food to cities at reasonable costs and points out that "citizens have repeatedly demonstrated their capacity to bring down governments that fail in this obligation." Food riots occurred frequently in Africa through the 1980s and 1990s and Maxwell (1999, 1942) notes that these disturbances were strongest in the most urbanized countries.[12]

The correlation between democracy and urbanization is according to Barro (1999) strongly positive, and urban population is thus a relevant control. The variable is collected from The World Bank (2013) and measures the percentage of the total population living urban areas as defined by national statistical offices.

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[12]Sudan in the late 1980s can be regarded as an exemplary case to illustrate this relationship. The parliamentary government of prime minister Sadiq el Mahdi was highly dependant on – and sensitive to – demands of the urban populace in Karthoum, while at the same time ignoring the needs of the rural people, especially the southerners – against whom a war was being fought (for an excellent analysis of the 1988 Sudan famine see Keen (1994)). According to de Waal (2000, 12), this made the government forgo a major agreement with the IMF because they needed to subsidize wheat for urban consumption.

War

Famines are often occurring within the context of armed conflicts. As noted by Braun, Teklu and Webb (1999, 15), this include both interstate and intrastate wars. Wars affect a country's vulnerability to famine in several ways; they disrupt trade, commerce and economic activity, destroy crops and cause population displacements (for a discussion on this see Drèze and Sen 1989, 274-275). War is in addition negatively related to democracy (Baum and Lake 2003, 345). To control for this I create a dummy variable based on Gleditsch et al. (2002), denoting whether a country was the location of an interstate or intrastate war in a given year.

Precipitation

There is a strong link between weather and the welfare of poor populations in many parts of the world, and lack of precipitation has been an important trigger mechanism in many famines (Chantarat et al. 2007). Precipitation may also be correlated with the independent variables if for example autocratic regimes are over-represented in drought prone regions of the world.

Precipitation data is collected from Tollefsen, and Buhaug (2012). Their rainfall variable measures the yearly total amount of precipitation (in millimeters) in a GRID-cell (0.5 x 0.5 decimal degrees) based on meteorological statistics from the University of Delaware. Since I am conducting an analysis based on country-year units I averaged the GRID-cell precipitation data so that it fits a country-year format. The precipitation variable used in my analysis is therefore measuring the yearly total amount of rainfall in an average country GRID-cell.

Food grain supply

While the entitlement approach highlights socioeconomic factors in explaining famine vulnerability, it also holds that that the overall food-availability in a country can play and important role. As noted by Amartya Sen, "in almost all cases the total availability of food would tend to have some influence on the prices that prevail in the market, thereby influencing food entitlements of people to a varying extent" (Haggard and Noland 2007, xvii). In order to control for this aspect I include a measure of a country's food grain supply.[13] The data is collected from the Food and Agriculture Organization of the United Nations (FAO 2013) and is measured in kcal per capita per day. That the variable only

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[13]Food grain supply is not necessarily the same as total food supply, but it is notwithstanding the best measure available. However, it is in this regard interesting to note that food grain intake is considered as so important that some scholars regard it to be a definitional attribute of famine (see e.g. Alamgir (1980, 7); Banik (1998, 267)).

measures the grain supply available for human consumption is considered advantageous (quantities exported, fed to livestock, or used for seed are subtracted) (FAO 2001).

Food aid

Food aid can reduce famine vulnerability (Braun, Teklu and Webb 1999, 42), and it is crucial to control for this element since democratic countries tend to receive more foreign aid than non-democracies (Alesina and Dollar 2000).[14] Reliable data on food aid is, however, hard to come by for longer time series. In order to control for this aspect I therefore use the total official flows from the World Food Programme (WFP). The variable is collected from The World Bank (2013) and is measured in millions current U.S. dollars.

Time

EM-DAT (2012) reports an increasing number of 'food crises' (classified as famines) during the past two decades. This is likely an indication of more complete disaster reporting in recent years. However, it may also in part be a sign of an increase in food-insecure conditions around the world. Barrett (2010) argues that food security is a growing concern and points out that the undernourished population has increased by 9 percent globally in spite of a 12 percent rise in global food production per capita since 1990. Because the number of countries with contested elections, the level of participation and civil liberties also have increased over the time period under study, I include the variable 'Time', which captures a linear time trend, to account for this relationship. Decade dummy variables will also be employed as an alternative control.

4.5 Methodological challenges

Before employing any of the operationalized variables in the regression models, two important methodological challenges needs to be addressed. That is multicollinearity and missing data.

4.5.1 Multicollinearity

An important part of valid measurement is, as discussed above, the proper alignment of theoretical and empirical dimensions. Since democracy is a multidimensional concept, I have chosen to use three separate indicators. However, Coppedge, Alvarez and Maldonado (2008, 632) warn against doing so since high levels of correlation can make it impossible

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[14]However, the role and effectiveness of foreign aid in preventing famines are frequently overstated (see e.g. Drèze and Sen 1989, 68; Ó Gráda 2009, 218-225)

for statistical software to distinguish between the effects of the predictors on the response variable.

High, but not perfect correlation between two or more explanatory variables is often referred to as multicollinearity. It should be stressed that multicollinearity does not violate any of the assumptions of the regression models (Wooldridge 2009, 96-97). It does not create any bias, nor does it invalidate inferences, but can result in high standard errors, thereby reducing the chance of obtaining significant coefficients (Kennedy 2003, 207,402).[15]

Table 4.3: Correlation matrix

Variable	ACLP-index	Participation	Civil Liberties
ACLP-index	1.00		
Participation	0.52	1.00	
Civil Liberties	0.77	0.49	1.00

The independent variables described above are not only chosen because they tap the latent theoretical concepts in an appropriate manner. Their combination is also believed to minimize multicollinearity problems compared to other amalgamations. The variables are, as can be seen in Table 4.3, only correlated at a moderate level. However, it is important to recognize that multicollinearity becomes increasingly problematic if there is little variance in the dependent variable to be explained by the predictors. Goldberger (1991, 248-250) has in this regard reacted to econometricians' focus on multicollinearity, and introduced the term 'micronumerosity' when discussing the problem. As pointed out by Wooldridge (2009, 99), it can therefore be misleading to rely on statistics intended to determine the severity of muliticollinearity, because it is impossible to determine how much correlation among explanatory variables that is 'too much' in a given setting. I have nevertheless chosen to estimate the Variance Inflation Factor (VIF), as this measure gives me a certain *idea* of whether there exist potential problems.[16] The test shows that none of the variables operationalized above have higher VIF-values than 10, which is often considered to be a critical threshold (Wooldridge 2009, 99).[17] While this is encouraging, it should once again be stressed that the test is not adequate for determining whether multicollinearity poses a significant threat to my analysis. I will therefore return to this aspect when discussing the empirical results in the next chapter.

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[15]For a thorough discussion about multicollinearity and how this should be dealt with see Kennedy (2003, 205-217).

[16]The VIF for coefficient j is simply: $VIF_j = \frac{1}{1-R_j^2}$, where R_j^2 is the variance of the variable j that is accounted for by the other explanatory variables in the model (Wooldridge 2009, 99).

[17]The results of the VIF-test are displayed in Table 5 in Appendix 4. GDP per capita has the highest VIF score (5.87).

4.5.2   Missing data

Missing data often pose a substantial challenge when analyzing time-series cross-section data. The problem is particularly evident when using data from developing countries, especially for the pre-1990 period. As can be seen in Table 4.4 in Section 4.6, some of the independent and control variables that are to be used in the analyses have a moderate, but significant amount of missing data. I will in this section explain why missing data should be treated with care, describe the rationale behind multiple imputation, and justify why using the imputation method Amelia II is considered a proper solution for my analysis.

First, in order to understand the problem of missingness – and how this should be dealt with – a brief summary of the different types of missing data is appropriate. According to Little and Rubin (2002, 14), it is useful to distinguish between three types of missing data: data missing completely at random (MCAR), data missing at random (MAR), and data not missing at random (NMAR). If data is missing completely at random this means that the absence of information is uncorrelated with any of the variables in the dataset. Put differently, MCAR entails that missingness occur in an haphazard manner of which no logical pattern can be found, irrespective of information. MAR, on the other hand, holds that the probability of missingness depends on the observed part of the data (Schafer and Graham 2002, 151). Missing at random therefore implies that the lack of information can be explained by the other observed non-missing values in the dataset.[18] Third, observations are NMAR if the lack of information depends on predictors that are not included in the dataset.[19] A core problem when dealing with missing data is that we in general cannot be sure which of the these mechanisms that are at play (Høyland and Nygard 2011, 2-3).

In the social sciences, listwise deletion has until recently been the conventional way of dealing with missing data in statistical analyses. This procedure entails discarding all units that lack information on one or more variables, with the result that only units with complete data coverage are being utilized. The number of excluded units depends on the pattern of the missing data. This procedure is unlikely to yield any significant bias if the MCAR assumption holds, but will nevertheless result in a loss of efficiency.[20]

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[18]Schafer and Graham (2002, 152) point out that the term 'random' is easy to misunderstand in this setting, and that it is important to recognize that it is being used in a statistical sense. In statistics, random suggests that a process is probabilistic rather than deterministic. MAR is therefore not implying that the missing is exogenous or unpredictable to the model under study (Høyland and Nygard 2011, 3).

[19]As an illustration of the difference between MAR and NMAR, imagine the following situation: A country is so poor that it cannot afford to measure the infant mortality rate every year. Consequently, missingness occurs in the dataset. If none of the other variables in the dataset are able to account for this tendency, the missingness is NMAR. However, if certain relevant variables are included –such as GDP per capita, administrative capacity and the like– the missing data could be described as MAR.

[20]A loss of efficiency is caused by a decreasing number of units which enlarge uncertainty estimates, thereby increasing the probability of a type 2 error.

However, if the MCAR assumption does not hold, which is likely to be the case for studies that rely on –and try to explain– demographic and socio-economic factors, this way of dealing with missing data can introduce serious bias (Høyland and Nygard 2011, 4). In my analysis both these problems become highly evident when applying listwise deletion. The missing pattern discards 1409 of the total 4508 country-year observations, and in the process 13 of the 29 famine onset observations are being excluded. Not only does this reduce efficiency, but the number of famines dropped also suggests that the MCAR assumption does not hold. This is not surprising having in mind that socio-economic factors can increase the likelihood of missingness. Poor countries are for example likely to have a higher amount of missing observations simply because data collection is costly. Additionally, some governments may not want to share details regarding their level of development (e.g. if they perform badly).

Linear imputation techniques have until recently been the second most used type of procedure for handling missing data in political science. Linear interpolation entails a replacement of missing data using information from prior and subsequent observations, adhering to the assumption that there is a linear time trend in the data. This solution is perhaps not very problematic for single missing time points. However, when the period between the observed time points increases, this procedure becomes progressively more problematic. A second problem relate to the fact that researchers using linear imputation seldom estimate the uncertainty of their imputed values, thus simply treating them as known values (Høyland and Nygard 2011, 5-6). Multiple imputation can be viewed as a remedy for both these shortcomings.

When conducting multiple imputation I use the program Amelia II developed by Honaker and King (2010). The program generates imputed values using a predictive model which takes account of *both* time trends and patterns in the observed data.[21] The procedure involves making a number of 'completed' datasets in which the imputed missing values differ across the sets while the observed data remain the same (Honaker and King 2010, 561). A great advantage of this procedure is that the variance of the imputed values across the different sets can be directly interpreted as imputation uncertainty, and when the regression analysis is run on all the imputed datasets this uncertainty is incorporated into the models (Høyland and Nygard 2011, 7).[22]

The only disadvantage of multiple imputation, compared to single, linear imputation, is that it is more labour intensive (Little and Rubin 2002, 256). However, while the technique previously took considerable time and required much work, greater computer

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[21]The imputed values are generated using an expectation-maximization algorithm on multiple bootstrapped samples of the original incomplete data. For more information see King et al. (2001, 54-56), Honaker and King (2010, 563-565) and Honaker, King and Blackwell (2011, 2-5).

[22]For detailed information about how the uncertainty is estimated see Little and Rubin (2002, 256-259).

speed and the development of programs such as Amelia II has significantly reduced the efforts. Nevertheless, it should be stressed that the method is not a perfect solution to all problems. When using multiple imputation one needs to assume that the missing observations are MAR. This has to be the case since the imputed values are predictions based on the observed data (King et al. 2001, 50-51; Høyland and Nygard 2011, 8). The assumption does not necessarily hold for all missing observations. Therefore, in order to make the MAR assumption more plausible, I have added twenty complimentary, additional variables, to the dataset, other than just those being used in the analysis.[23] This is will help the model predict both the value of the missing data and when missingness is likely to occur (Honaker, King and Blackwell 2011, 3).

When running the imputation model, the other settings are as follows: A second order polynomial is used to model time trends. I also allow the polynomial to vary within each cross-section, thereby taking account for country-specific time trends. For variables that exhibit high degrees of autocorrelation – GDP per capita, population, population density and urban population – I have adjusted the imputation model so that it takes account of this information by using lagged and leading values. This is also done with all the all the independent variables, as recommended by Honaker and King (2010, 567). Logical bounds corresponding to maximum and minimum values are also imposed on the independent variables in order to prevent outlier imputations. As a fift step, I include a prior ridge of 1 promille in order to speed up convergence (Høyland and Nygard 2011, 11). Finally, I have chosen to create twenty imputed datasets. Creating such a relatively large number may appear as unnecessary since Honaker, King and Blackwell (2011, 2) argue that five imputed datasets are normally adequate. This is nevertheless done because the civil liberties-variable lack data on all observations for the 1968-71 period. The imputation model therefore has to 'backcast' values four years. While this is not considered as very problematic since I use leading values – and a large number of other highly correlated institutional variables – in the imputation model, imputing a large number of datasets can be seen as yet another precautionary measure.

After running the imputations I am interested in how well the model worked. However, because missing data are unobserved it is impossible to tell whether the predictions of the imputation model are close to the real unobserved values. As a solution to this problem, Honaker, King and Blackwell (2012, 30-33) have developed 'overimputation' as a technique to judge the fit of the imputation model by estimating counterfactual predictions. This involves sequentially treating the observed values *as if they had been missing*, making the model generate several hundred imputed values for each observed value. As a result one

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[23]I include 10 institutional and 10 socio-economic variables – in addition to the ones used in the main analyses – to improve the imputation model. For an overview of these variables see Table 3 in Appendix 3.
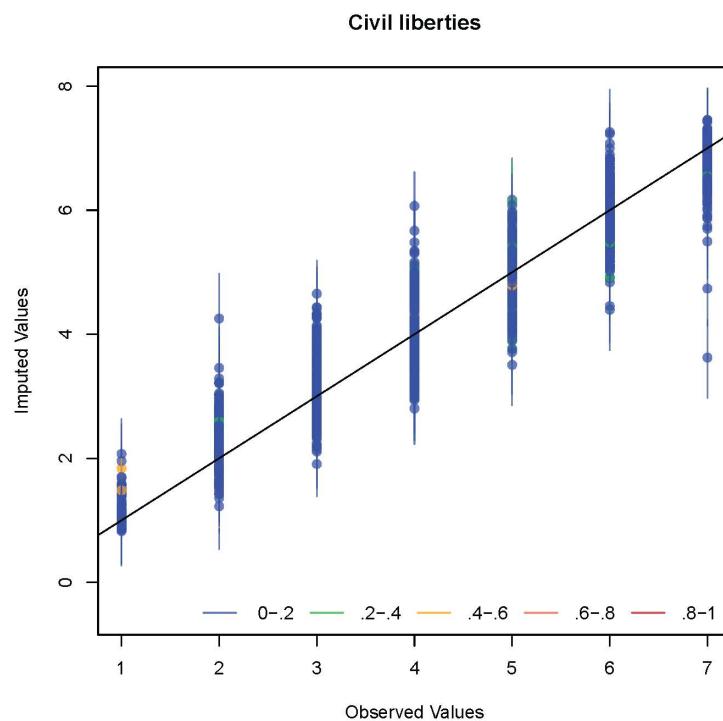
Figure 4.1: Civil liberties overimputation diagnostic graph.

can inspect whether the observed data tend to fall within the same range where it would have been imputed if it had been missing (Honaker, King and Blackwell 2012, 30).

Figure 1 illustrates the results after overimputing the civil liberties-variable. The diagonal line in the figure indicates the line of perfect agreement, while the dots represent the mean imputation with lines indicating their 90 percent confidence intervals. As can be seen in the figure, the vast majority of these confidence intervals cross the line of perfect agreement, which means that the true values fall within this range. Additional overimputations, displayed in Appendix 3, show similar results. The diagnostics do in other words bear support to the imputation process being successful.[24] However, it should once again be noted that there are uncertainty attached to the estimates. Yet, I am willing to accept this uncertainty in order to avoid other sources of bias that are considered to be more serious.

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[24]See also the imputation density plots illustrated in Figure 2 in Appendix 3.

4.6   The dataset

The data used in my regressions consists of comparable time series observed on all major independent countries in the world from the year 1968 up to and including 1998. The analysis is restricted to these years since Braun, Teklu and Webb's (1999) list on famines only covers the pre-1999 period, and because I deem it inappropriate to 'backcast' values on the civil liberties indicator more than about four years.[25] When creating the dataset I only included independent countries with a total population greater than 500,000 as of 2011, which means that mini-states are excluded from my analysis. The exclusion is considered necessary because the vast majority of such states are plagued by extensive amounts of missing data on most, if not all, relevant variables that are to be used in the analysis. Imputing these values is therefore not considered a viable strategy as it would violate the assumptions of the imputation model described above. The complete dataset used in my analysis therefore consists of 4508 country-year observations, covering 170 countries altogether. For an overview of the countries and respective country-periods, see Table 2 in Appendix 2.

Table 4.4: Summary statistics before imputation.

Variable	Mean	Std. Dev.	Min.	Max.	N
Famine onset	0.01		0	1	4460
ACLP-index	0.35		0	1	4473
Participation	28.04	22.93	0	71	4465
Civil liberties	3.72	1.91	1	7	3828
ln GDP per capita$_{t-1}$	7.92	1.11	4.21	10.67	4379
ln GDP per capita growth$_{t-1}$	1.36	7.28	-95.43	97.05	4340
ln Total population	15.83	1.57	11.68	20.94	4294
ln Population density	3.62	1.44	-0.25	8.68	4263
Urban population (%)	45.93	24.36	2.31	100	4297
War	0.08		0	1	4508
Precipitation	983.24	643.27	76.91	4030.69	4365
Grain supply	2530.32	530.02	1434	3771	3985
Food aid	4.37	12.05	0	248.8	4004
Time	15.59	8.96	0	30	4508

Instead of relying on a small sample of poor states, I have chosen to include all major countries in the world in the analysis. This is done in order to extract as much information as possible from the available data. The logic behind this approach is straightforward.

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[25]The next famine on Braun, Teklu and Webb's (1999) list is the 'The Great Leap Forward Famine' which started in 1958. In order to include this famine in my analysis I would therefore have had to impute civil liberties values back fourteen years. This is not considered to be a proper alternative.

First, by not selecting on the dependent or independent variables, the prospects for being able to draw valid, general inferences are strengthened. Second, there is much to learn from countries that have not experienced famine.[26]   As statistical methods enable me to control for relevant properties, such as level of economic development and total food availability, there is in principle no cost – but several advantages – of including all states in the sample.

Table 4.5: Summary statistics after imputation.

Variable	Mean	Std. Dev.	Min.	Max.	N
Famine onset	0.01		0	1	4508
ACLP-index	0.35		0	1	4508
Participation	27.98	22.89	0	74.43	4508
Civil liberties	3.70	1.89	1	7	4508
ln GDP per capita$_{t-1}$	7.92	1.1	4.21	10.67	4508
ln GDP per capita growth$_{t-1}$	1.39	7.234	-95.43	97.05	4508
ln Total population	15.83	1.54	11.68	20.94	4508
ln Population density	3.63	1.402	-0.25	8.68	4508
Urban population (%)	45.92	23.83	2.31	100	4508
War	0.08		0	1	4508
Precipitation	983.03	634.1	0	4030.69	4508
Grain supply	2530.75	506.58	1434	4025.69	4508
Food aid	4.41	11.65	0	248.8	4508
Time	15.59	8.96	0	30	4508

4.7   The statistical model

All of my three hypotheses are concerned with famine occurrence. The dependent variable being employed in my analyses is therefore binary, measuring whether a famine started in a given year or not. Consequently, I will use ordinary logistic regressions in my main models. The basic logistic model can be specified as:

$$ln\left(\frac{Py}{1-Py}\right) = \beta_0 + \beta_1 X_1 + ...\beta_n X_n \qquad (4.1)$$

where $ln(\frac{Py}{1-Py})$ denotes the probability of an outcome (famine), β_0 is the intercept and $\beta_1...\beta_n$ are the coefficients for the variables $X_1...X_n$. When including all the variables

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[26]It is in this regard important to recognize that food crises and famines *can* occur in all regions of the world. EM-DAT (2012) has for example, as illustrated previously, recorded that 'famines' have occurred in Africa, South-America and Asia (including Caucasus). Watson (2007) has in addition pointed out that food crises have occurred in war-torn countries such as Bosnia, while Gazdar (2007) writes that famine threats have occurred in modern-day Iraq.

operationalized above, the regression model is as follows:

$$ln\left(\frac{P_{FAM_{i,t}}}{1 - P_{FAM_{i,t}}}\right) = \beta_0 + \beta_1 ACLP_{i,t} + \beta_2 PART_{i,t} + \beta_3 CL_{i,t} + \beta_4 GDP_{i,t-1} +$$

$$\beta_5 GDPgrowth_{i,t-1} + \beta_6 lnPOP_{i,t} + \beta_7 lnPOPdens_{i,t} +$$

$$\beta_7 URB_{i,t} + \beta_8 WAR_{i,t} + \beta_9 PREC_{i,t} + \beta_{10} FOOD_{i,t} +$$

$$\beta_{11} FOODaid_{i,t} + \beta_{12} TIME_{i,t} + \epsilon_{i,t}$$

(4.2)

Subscript i is used to denote country, t is used for year, and $\epsilon_{i,t}$ is the error term. The effect of a unit change in X_n can be interpreted as an expected β_n change in the log odds of the outcome, holding all other variables constant (Long 1997, 79). In order to correct for time dependence of observations all models are fitted with standard errors clustered by country (Long and Freese 2006, 86).[27] Moreover, following Beck, Katz and Tucker (1998), I drop all but the first year of famine from the analysis in cases where famines are multi-year events. This is done in order to estimate the discrete time yearly hazard of transitioning from being in a state of zero to being in a state of one (from no famine to famine) properly. Consequently, the number of country-year observations are reduced from 4508 to 4460 in my regressions.

4.8   Summary

I have in this chapter described the research design that will be employed in order to test the theoretical propositions developed in Chapter 3. Instead of using questionable famine data, I have chosen to rely on Braun, Teklu and Webb's (1999) list on major famines when constructing the dependent variable. Particular attention was moreover given to how the three dimensions of democracy are being operationalized, and the appropriateness of each indicator was discussed in light of the theoretical understandings. Relevant control variables were thereafter briefly described, before discussing methodological challenges related to multicollinearity and missing data. Multiple imputation was in this regard explained at length, and justified as being a solution to the missingness problem. Finally, after presenting the dataset and the descriptive statistics, I explained the statistical model.

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[27]Clustered standard errors takes account of autocorrelation within countries and country-specific heteroscedasticity, thereby allowing the ϵ of e.g. Ethiopia to have a different variance than for example Buthan.

Chapter 5

Empirical analysis

In this chapter I present the results of the empirical analysis. The aim of the chapter is to investigate whether the hypotheses advanced in Chapter 3 can be discarded or confirmed, based on the research design outlined in Chapter 4. In order to ensure that my results are not driven by arbitrary specifications, I perform a series of robustness tests before drawing any conclusions.

5.1   Descriptive statistics

Before turning to the regression analyses it is useful to inspect some of the characteristics that distinguish famine-onset observations from the others. The average scores on the operationalized variables are displayed in Table 5.1.[1] Not surprisingly, countries that experience famine onsets differ in those years on average significantly from the normal country-year observations: They are much poorer, have a larger population, and a smaller percentage of the population reside in urban areas. Grain supply per capita is 20 percent below the global average, and a large proportion of the famine-onsets coincide with wars. Most importantly, the scores on all of the independent variables are way below the normal average.

Table 5.2 displays correlations between the independent variables and famine onsets. When entered alone, all of the variables turn out significant with estimated effects in the expected direction. The variables measuring contestation, participation and civil liberties are in other words negatively correlated with famine onsets as hypothesized in Chapter 3. However, when the variables are included simultaneously, the ACLP-index, measuring

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[1]Because some of the countries once marked by famine have changed considerably over the 1968-98 period, I have chosen to contrast average scores in famine-onset years with the average scores for all countries in normal years.

Table 5.1: Initial characteristics.

	Average scores	
Variable	Famine country-year	Normal country-year
ACLP-index	0.07	0.35
Participation	12.9	28.2
Civil liberties	1.9	3.7
GDP per capita$_{t-1}$	739	2813
GDP per captia growth$_{t-1}$	-0.8	1.4
Total population	12115546	7462044
Population density	18	38
Urban population (%)	23.4	46.3
War	0.52	0.07
Precipitation	876	986
Grain supply	2037	2540
Food aid	21.51	4.18

contestation, turns out to be insignificant. This is surprising having in mind that the independent variables only correlate at moderate levels, but may relate to the problem of 'micronumerosity' as discussed previously, and/or simply indicate that the effect of contestation is severely weakened when the two other dimensions are accounted for.

Table 5.2: Preliminary logistic regressions.

	(1)	(2)	(3)	(4)
	Famine onset	Famine onset	Famine onset	Famine onset
ACLP-index	-2.001**			0.660
	(0.697)			(0.927)
Participation		-0.035***		-0.019*
		(0.008)		(0.008)
Civil liberties			-0.798***	-0.843***
			(0.161)	(0.210)
Constant	-4.664***	-4.338***	-2.926***	-2.558***
	(0.262)	(0.272)	(0.447)	(0.501)
Observations	4460	4460	4460	4460
LL	-168.40	-167.87	-157.85	-133.49
AIC	340.81	339.73	319.71	318.85

Notes: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. All models are logit models.
The table reports regression coefficients with clustered standard errors in parentheses.
The sample consists of 170 countries, with maximum time series from 1968-1998.
LL and AIC scores are estimated when all 20 datasets are averaged.

5.2 Logistic regressions

The aim of this thesis is to investigate whether there exists any general relationship between the three aspects of democracy and famine vulnerability. When doing so I seek to extract as much information as possible from the available data in order to enhance the likelihood of obtaining valid inferences. Yet in this exercise there exists a possible trade-off between minimizing the risk of omitted variable bias and overfitting the models. In the following I therefore present two analyses; one that guards against overfitting, and one that aims at minimizing the threats posed by omitted variable bias.

5.2.1 Baseline models

Which variables to include in a regression analysis should in principle be guided by theory. Nevertheless, when using statistical tools one needs to pay attention to the limitations of the available data. As I have set out to analyze the rare phenomenon of famines, there may be some vital restraints. In this section I therefore present my baseline models. Because democracy consists of different dimensions I have chosen to first estimate the effect of each dimension independently, before entering the variables simultaneously in the last regression. By adhering to the the principle of parsimony I only include *GDP per capita*, *total population*, *war* and *time* as controls.[2] The results are displayed in Table 5.3.

As can be seen in Table 5.3, neither the ACLP-index, measuring contestation, nor Vanhanen's (2000) participation measure turn out to have a significant effect on famine onsets in any of the models, even at the ten percent level. This is surprising as there are strong theoretical grounds for expecting a negative relationship here. Contested elections are, as theorized in Chapter 3, believed to incentivize incumbents to respond to famine-threat situations in order to retain power. High levels of electoral turnout are similarly expected to yield more public goods in the form of social security, making it less likely that famines will occur. Yet, the results do not support either Hypothesis 1 or Hypotesis 2.

There are possibly several explanations for the unexpected results. First, it may indicate that scholars have exaggerated the effects of these dimensions of democracy when it comes to famine prevention. This is a plausible explanation because certain famines have, as pointed out in Section 4.1, received more attention in the literature than others. There may in other words not exist a general pattern in which higher levels of contestation or political participation reduce famine vulnerability when the effects of war,

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[2]I have chosen to include these variables as controls because there are strong theoretical grounds for expecting them to influence the hypothesized relationships. Previous research has furthermore shown that these particular variables account for important factors (see Plümper and Neumayer 2009).

Table 5.3: Baseline regresion models.

	(1) Famine onset	(2) Famine onset	(3) Famine onset	(4) Famine onset
ACLP-index	-0.960 (0.711)			-0.041 (0.832)
Participation		-0.007 (0.012)		-0.001 (0.010)
Civil liberties			-0.471** (0.176)	-0.464* (0.212)
ln GDP per capita$_{t-1}$	-1.223*** (0.167)	-1.258*** (0.179)	-1.153*** (0.168)	-1.145*** (0.186)
ln Total population	0.164 (0.129)	0.141 (0.126)	0.123 (0.141)	0.123 (0.142)
War	1.933*** (0.365)	1.889*** (0.369)	1.699*** (0.379)	1.692*** (0.395)
Time	0.014 (0.025)	0.013 (0.025)	0.011 (0.026)	0.011 (0.026)
Constant	0.595 (2.106)	1.221 (2.137)	1.895 (2.253)	1.837 (2.366)
Observations	4460	4460	4460	4460
LL	-136.47	-137.10	-133.51	-133.49
AIC	284.93	286.19	279.03	282.97

Notes: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. All models are logit models. The table reports regression coefficients with clustered standard errors in parentheses. The sample consists of 170 countries, with maximum time series from 1968-1998. LL and AIC scores are estimated when all 20 datasets are averaged.

level of economic development and the total population of a country is accounted for. A second explanation can be that there are so few famines in the sample that it is hard for the statistical models to estimate the effects properly. Yet, both war and level of economic development turn out having significant effects in all of the models. Even more important, the extent to which civil liberties prevails also turn out as having a significant effect on famine vulnerability in both Model 3 and 4. It is also worth noticing that the coefficients are remarkably stable across the models. Moreover, because civil liberties are correlated with the two other dimensions, the fact that this aspect turns out as significant even in model 4, indicate that the model is able to capture and estimate effects in an appropriate manner. A third explanation can nevertheless be that the results are influenced by the choice of independent variables. Both the ACLP-index and Vanhanen's (2000) participation measure have, as discussed previously, flaws of their own. I will return to this aspect in Section 5.3 below.

The results in Table 5.3 suggest that what matters when it comes to reducing famine vulnerability is the extent to which civil liberties are protected. The indicator is significant at the .01 level in Model 3 and at the .05 level in Model 4. The estimated effects do in other words provide evidence in support of Hypothesis 3. Following the theoretical framework, civil liberties enable citizens to signify their preferences, and by voicing their concerns they can hold both democratic and authoritarian governments accountable for their actions. Civil liberties are furthermore strengthening the prospects for early warning, because if regimes tolerate criticism, it is likely that the media and NGO's are able to provide information about 'food stress' situations that may escalate into famines. Conversely, in the absence of such an environment it is likely that governments are able to suppress criticism, rendering it harder for citizens to hold their rulers accountable, and moreover make it less probable that the media and NGO's are able to provide early warning about impending crises.

However, as pointed out in Section 4.4, there may be other factors than the ones controlled for in the baseline models, that can influence the true relationships between the different aspects of democracy and the risk of experiencing a famine. The estimated effects may, in other words, suffer from omitted variable bias. In order to evaluate whether this is the case I will in the subsequent section present and discuss the more extensive models.

5.2.2 Extensive models

In Table 5.4 I include all the control variables that were operationalized in Section 4.4 in order to reduce the risk of omitted variable bias. It should be stressed that Hosmer and

Lemenshow (2000, 92) warn against this approach as it may 'overfit' the models, producing numerically unstable estimates which are typically characterized by unrealistically large estimated coefficients and/or standard errors. They point out that this problem may be especially troublesome if the number of variables in the model is relatively large compared to the observations, *or* if the overall proportion with a positive outcome (Y=1) is close to either 0 or 1. Overfitting may in other words be a problem in the extensive analysis since famine-onsets occur in less than one percent of the country-year observations.

However, when comparing the estimated effects in Table 5.4 with those in the parsimonious models, all of the results are fairly stable. The standard errors do not appear to be inflated, nor do the results differ any more from the estimators in the baseline models than could be expected. As before, neither of the models detect any systematic relationship between the variables measuring contestation and participation and famine onsets. The estimated effects of civil liberties are moreover almost identical to the ones presented in the baseline models. The Akaike Information Criteria (AIC) – which is partially designed to evaluate whether overfitting is a problem – furthermore indicates that the extensive models are the ones to be preferred (Greene 2003, 565: Dahl and Hylleberg 2004).[3]

Before interpreting the effects of independent variables substantively, it is interesting to note that the different control variables' estimates point in the expected directions. GDP per capita and war are still highly significant with the anticipated effects on famine onsets, but the substantial effects are somewhat reduced from the baseline models. The total population variable furthermore turns out to have a significant effect in all of the models, as do also population density. The findings are in line with the justifications for why the variables were included in the analysis. Larger countries are likely to experience 'stress' situations more often than smaller countries, and it is also plausible to assume that it is harder for governments to protect their citizens from famine if they are widely scattered in rural areas. There may also be smaller incentives for a government to protect rural citizens as their deaths are less 'visible' to the general public, thereby affecting the political maximization calculus outlined in Section 3. Food aid is moreover positively correlated with famine-onsets in all of the models, but the effect is only significant in model 3 and 4. The effect being positive may at first glance appear as counterintuitive since food aid is supposed to reduce the risk of famines. It is, however, important to realize that this type of aid is given to countries that are food-insecure, and more importantly

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[3]While the perhaps more common Log-likelihood (LL) statistics always favor models with more parameters, the AIC measure introduces a penalty term for the number of parameters in the model. The formula for the AIC is: $AIC = \frac{-2lnL(M_\beta)+2P}{N}$, where $L(M_\beta)$ is the likelihood of the model and P is the number of parameters. The the model with the lower value of AIC is the one to be preferred (Long 1997, 109-110).

Table 5.4: Extensive regression models.

	(1) Famine onset	(2) Famine onset	(3) Famine onset	(4) Famine onset
ACLP-index	-0.550 (0.736)			0.354 (0.832)
Participation		0.002 (0.012)		0.004 (0.010)
Civil liberties			-0.439* (0.194)	-0.484* (0.223)
ln GDP per capita$_{t-1}$	-0.850** (0.285)	-0.893** (0.279)	-0.741* (0.301)	-0.756* (0.300)
ln Total population	0.354* (0.176)	0.344$^+$ (0.178)	0.319$^+$ (0.179)	0.315$^+$ (0.177)
War	1.627*** (0.350)	1.645*** (0.347)	1.388*** (0.386)	1.403*** (0.409)
GDP per capita growth$_{t-1}$	-0.029 (0.022)	-0.030 (0.022)	-0.027 (0.021)	-0.027 (0.022)
ln Population density	-0.627** (0.239)	-0.639** (0.228)	-0.613* (0.245)	-0.623* (0.248)
Urban population (%)	-0.020 (0.022)	-0.021 (0.022)	-0.020 (0.024)	-0.022 (0.025)
Precipitation	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
Grain supply	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)
Food aid	0.014 (0.010)	0.015 (0.010)	0.015$^+$ (0.008)	0.016$^+$ (0.008)
Time	0.008 (0.026)	0.007 (0.026)	0.008 (0.026)	0.007 (0.026)
Constant	-2.041 (2.741)	-1.557 (2.626)	-1.216 (2.828)	-0.934 (2.749)
Observations	4460	4460	4460	4460
LL	-128.37	-128.61	-125.88	-125.67
AIC	280.74	281.21	275.76	279.34

Notes: $^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. All models are logit models. The table reports regression coefficients with clustered standard errors in parentheses. The sample consists of 170 countries, with maximum time series from 1968-1998. LL and AIC scores are estimated when all 20 datasets are averaged.

that the quantity of food aid is likely to be larger if famine occurs. Urban population, economic growth, precipitation and total grain supply are not significantly correlated with famine onsets in any of the models, but the estimated effects point in the expected directions.

As regards my independent variables, in Model 1 the ACLP-index has the expected negative sign, but the indicator is far from significant at conventional levels. In model 2, Vanhanen's participation indicator turns out with an unexpected positive sign, but also this point estimate is highly insignificant. The civil liberties index is, however, significant at the five percent level in both Model 3 and 4.

In order to interpret the effects more substantively, I use King, Tomz and Wittenberg's (2000) CLARIFY software.[4] The simulated probability of a famine onset is less than 0.1 % in Model 4, when all variables are at their means. If civil liberties are severely repressed (value 1), the chance increases to approximately 0.4 %. Furthermore, if a country has similar values on all variables as Ethiopia in 1980, the chance of experiencing a famine increases to astounding 5.2 %.[5] However, if all variables are kept at the same level, but civil liberties are as extensive as in Botswana in 1980 – in other words moving from having a civil liberty score of 1 to having a score of 5 – the probability drops to 1 %. Hence, the effect of civil liberties is not only statistically significant, but also substantially large.

The results are not only in concordance with the hypothesized relationship discussed in Section 3, but also with qualitative famine literature. As discussed in Section 2.3, Drèze (1995*a*, 591) argues that public criticism and adversarial journalism played important roles in galvanizing the government of Botswana into action that prevented the 'African drought' of 1984-85 from turning into a famine. The same mechanisms were not in place in Ethiopia, and Kumar (1990, 191) argues that domestic political priorities dictated that news about the unfolding crisis should be played down.

In sum, the multivariate analyses find empirical evidence in support of Hypothesis 3, namely that famines are less likely to occur in countries where the regimes allow more extensive civil liberties, all else equal. However, neither political contestation nor participation turn out as having any effect on famine vulnerability in any of the models. I am nevertheless not ready to reject or confirm any of the hypotheses before running additional checks.

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[4]Clarify is a widely used program that uses Monte Carlo simulation to calculate quantities of substantive interest without changing the statistical assumptions in the model. This is valuable since logit coefficients are hard to interpret substantively. The simulated probabilities are presented with uncertainty estimates in Table 6 in Appendix 4.

[5]Ethiopia had the following scores in 1980: ACLP-index=0, Participation=0, Civil liberties=1, ln GDP per capita$_{t-1}$=5.85, ln Total population=17.38, War=0, GDP per captia growth$_{t-1}$=6.89, ln Population density=3.471, Urban population=10.41, Precipitation=750, Grain supply=1842, Food aid=24.62.

5.3 Evaluating robustness

When using statistical models to investigate complex phenomena there is always a possibility that particular properties of the data and/or research design are influencing the results. Therefore one cannot rely on just one specification of a model, one statistical method, or one single operationalization of a theoretical concept, when aiming at drawing valid inferences. In the remainder of this chapter I will therefore evaluate the robustness[6] of my results in the foregoing models by taking account of these aspects, before drawing any conclusions.

5.3.1 Initial checks

The results in the previous models are robust to a number of different specifications. First, because some scholars argue that a famine started in Maharashtra, India in 1972, I re-ran my models including this event. This did, however, not alter any of the preceding results. Second, I replaced the *Time* variable with decade dummies, but neither this had any notable effect on the estimates.[7] Third, I ran the regressions on a reduced sample where all 'Western countries' were excluded, but also this left the estimates basically unchanged.[8] Fourth, I checked for influential observations. This was done since extreme observations can influence the estimates (Long 1997, 100), possibly as a result of measurement errors (Wilson 1995, 28). The aim of the exercise is to be alert to the possibility of dominant observations, and to take them into consideration when evaluating the estimated effects. Influential observations can be detected by calculating Pregibon's (1981) Cook-dbeta statistic. The measure "summarizes the effect of removing the i'th observation to the entire vector $\hat{\beta}$" (Long 1997, 101), and observations with scores higher than .5 should be scrutinized (Menard 2010, 136-139). After calculating the dbeta statistics, only one observation – Bangladesh in 1974 – turned out having a value above .5.[9] That Bangladesh in 1974 is an influential observation is not surprising. A devastating famine started that year, which according to Alamgir (1980, 142-143) killed nearly 1 million people in 1974 alone. Yet Bangladesh was fairly democratic (Rubin 2011, 56-59), with a relatively high

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[6]I define robustness as the stability of results across different specifications.

[7]When replacing the *Time* variable with decade dummies, the T-value of the civil liberties indicator change from being -2.19 in Model 4 in Table 5.3 to being -2.21. In Model 4 in Table 5.4 the indicator's T-value change from -2.18 to -2.27.

[8]I define 'Western countries' as countries in Western Europe and North America, plus Australia and New Zealand. When these countries are removed, the T-values of the civil liberties indicator change from -2.19 to -2.17 in Model 4 in in Table 5.3, and from -2.18 to -2.15 in Model 4 in Table 5.4.

[9]Because Stata 12 is not able to calculate the dbeta statistics using all the imputed datasets, I averaged all 20 datasets in order to obtain this score. A plot of the dbeta values is displayed in Figure 3 in Appendix 4.

score (4) on the civil liberties indicator.[10] The country had become independent from Pakistan two years earlier (Rubin 2011, 56), but the recently elected government in Dhaka was not able to tackle extensive floods and the resulting food shortages (Banik 2007*b*, 37). Dowlah (2006, 353-354) moreover states that the crisis was occurring despite the fact that the "opposition and the press raised their voices against government mismanagement and corruption as well as the impending famine." The observation is in other words contradicting assumptions of the theoretical framework, and it is therefore encouraging that the observation is detected as being outside the average pattern. When estimating the models after having removed this observation, civil liberties appear to have a marginally stronger negative effect on famine onsets while the other estimates remain largely unchanged. This is as expected, and is not considered problematic as the observation is not driving the results in an inappropriate manner.

5.3.2   Rare events logistic regression

The small number of famines in the sample can make it hard for statistical software to detect and confirm systematic relationships between the dependent variables and famine onset, even if such relationships exist in the real world. There are in other words a considerable risk of committing Type 2 errors.

In cases where the number of zeros in the sample (not famine) outnumber the 1's (famine onsets) by dozens to thousands of times, King and Zeng (2001) have argued that this can lead standard logistic estimation methods to underestimate the probability of rare events.[11] In order evaluate whether this was the case in my analysis, I re-estimated my main models using 'rare events logistic regression'. The estimated effects from these regressions were, however, almost identical to the ones in the parsimonious and extensive models displayed above.[12] I consequently consider normal logistic regression to be an appropriate statistical method, and will in the following therefore continue to employ this estimation technique.

5.3.3   Alternative measures of contestation and participation

The independent variables used in my analysis are regarded as being some of the best extensive measures of democracy currently available. They are all widely used, and are believed to compliment each other in a deliberate way. Yet, Elkins (2000) and Casper

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[10]Bangladesh 1974 scores 0 on the ACLP-contestation variable and 24.9 on Vanhanen's participation variable.

[11]For a thorough explanation of logistic regression, rare events data and rare events logistic regression see King and Zeng (2001).

[12]The results of the rare events logistic regressions are displayed in Table 6 in Appendix 4.

and Tufis (2003) have shown that subtle differences between highly correlated measures of democracy can affect substantive results. In order to evaluate whether my analysis hinges on the choice of independent variables I therefore run additional regressions where the ACLP-index and Vanhanen's (2000) participation variable are replaced with Coppedge, Alvarez and Maldonado's (2008) measures of contestation and inclusiveness, respectively.

Both of Coppedge, Alvarez and Maldonado's (2008) measures are created using a principal component factor analysis on three overlapping samples of country-years (1950-1971, 1972-1988, and 1981-2000) where the component scores are obtained after analyzing a dozen or more of the most commonly used indicators of democracy (the data sources vary by country-year sample, for more detailed information see Coppedge, Alvarez and Maldonado 2008). While the measures are intuitively hard to understand, the advantage of employing these variables relate to the fact that they are created with the sole purpose of reflecting Dahl's (1971) two-dimensional conceptualization of democracy.

As can be seen in Table 5.5, contestation appears to have a significant effect on famine onset in Models 1 and 5. Yet the effect is only significant at the 10 percent level when all the control variables are included in the regression. The results do, nevertheless, indicate that political contestation may be an important factor with regard to famine prevention after all.

There are possibly two – not mutually exclusive – explanations for why the alternative contestation variable turns out having a significant effect on famine onsets while the dichotomous ACLP-index does not. First, because the scale of the alternative variable is more fine-grained than the ACLP-index, it may be that it is able to pick up nuances in data that remain hidden when employing the dichotomous measure. While the elections in countries such as Botswana and post-Apartheid South Africa hitherto have been dominated by the majority parties (making them belong to the ACLP-category of non-contested regimes), it is nevertheless plausible that the elections have served as a disciplining mechanism, affecting the political support maximization calculus outlined in Chapter 3. It is for example likely that the main reason why the Botswana Democratic Party (BDP) and the African National Congress (ANC) have never lost any elections, is because they have performed well when in power. Since Alvarez et al. (1996) employ the 'alternation rule' when creating the ACLP-index, the variable may have turned out to be a too strict measure of contestation as it is unable to account for the above-described mechanism.

The second explanations is that the alternative contestation measure encapsulates variables that measure substantive, and not only procedural, elements of democracy, such as Banks's (2008) measure of 'legislative effectiveness'. There is in principle nothing wrong

Table 5.5: Regression models with Coppedge et al. (2008) variables

	(1) Famine onset	(2) Famine onset	(3) Famine onset	(4) Famine onset	(5) Famine onset	(6) Famine onset	(7) Famine onset	(8) Famine onset
Copp. Contestation	-0.708* (0.324)			-0.263 (0.550)	-0.627+ (0.329)			-0.260 (0.533)
Copp. Inclusive		-0.011 (0.177)		0.119 (0.196)		0.095 (0.205)		0.187 (0.218)
Civil liberties			-0.471** (0.176)	-0.392 (0.273)			-0.439* (0.194)	-0.363 (0.299)
ln GDP per capita$_{t-1}$	-1.180*** (0.166)	-1.299*** (0.171)	-1.153*** (0.168)	-1.175*** (0.178)	-0.779* (0.309)	-0.905** (0.280)	-0.741* (0.301)	-0.759** (0.294)
ln Total population	0.148 (0.135)	0.138 (0.127)	0.123 (0.141)	0.120 (0.147)	0.355+ (0.182)	0.334+ (0.175)	0.319+ (0.179)	0.301+ (0.179)
War	1.869*** (0.362)	1.935*** (0.384)	1.699*** (0.379)	1.786*** (0.404)	1.563*** (0.358)	1.674*** (0.352)	1.388*** (0.386)	1.506*** (0.404)
GDP per capita growth$_{t-1}$					-0.029 (0.020)	-0.030 (0.022)	-0.027 (0.021)	-0.027 (0.021)
ln Population density					-0.642** (0.243)	-0.635** (0.226)	-0.613* (0.245)	-0.610* (0.242)
Urban population (%)					-0.020 (0.024)	-0.022 (0.021)	-0.020 (0.024)	-0.021 (0.024)
Precipitation					0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
Grain supply					-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)
Food aid					0.015+ (0.009)	0.015 (0.010)	0.015+ (0.008)	0.016+ (0.008)
Time	0.018 (0.026)	0.013 (0.026)	0.011 (0.026)	0.011 (0.025)	0.014 (0.026)	0.005 (0.026)	0.008 (0.026)	0.006 (0.025)
Constant	-0.017 (2.238)	1.419 (2.178)	1.895 (2.253)	1.735 (2.809)	-3.143 (2.880)	-1.166 (2.626)	-1.216 (2.828)	-0.985 (3.087)
LL	-134.91	-137.25	-133.51	-133.31	-126.99	-128.50	-125.88	-125.44
AIC	281.81	286.50	279.03	282.61	277.99	280.99	275.76	278.88
Observations	4460	4460	4460	4460	4460	4460	4460	4460

Notes: $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. All models are logit models. The table reports regression coefficients with clustered standard errors in parentheses.
The sample consists of 170 countries, with maximum time series from 1968-1998. LL and AIC scores are estimated when all 20 datasets are averaged.

with this as long as one is aware of the difference.[13] While the coding rules of the ACLP-index makes it a purely institutional and procedural measure, the alternative contestation variable also incorporates knowledge about how well the democratic institutions actually function. Thus, when using Coppedge, Alvarez and Maldonado's contestation variable in the regressions, one therefore needs to qualify the interpretation of the estimated effects so that it reflects this feature. This is important as Hypothesis 1 only concerns the effect of contested multi-party elections, and not how well the democratic institutions work in practice. I will return to this aspect when discussing the overall findings in Section 5.4.

When turning to political participation, the results in Table 5.5 show that the alternative measure of participation does not have a significant effect on famine onsets in any of the models. This is in accordance with the previous findings as neither Vanhanen's (2000) measure of participation turned out to be systematically related to famine vulnerability. There is, in other words, no evidence confirming that higher levels of political participation reduce a country's risk of experiencing a famine.

Moreover, multicollinearity becomes a problem when all the independent variables are included simultaneously in the regression analysis. This is so because civil liberties and the alternative contestation variable correlate at 0.91. It is therefore not surprising that neither of the variables turn out having significant effects on famine onsets in model 4 and 8. However, the T-value of the civil liberties indicator in model 4 is -1.44, which is way higher than the two other independent variables.[14] This indicates that civil liberties has the strongest effect of the three variables.

5.3.4 Civil liberties and political rights

There are, as noted previously, no other alternative indicators available that measure the civil liberty dimension for the time period under study. Unfortunately, I am therefore not able evaluate the effects of the civil liberties indicator in an ideal, extensive manner. However, it is nevertheless interesting to assess whether it is possible to distinguish 'the civil liberty effect' from other, parallel factors that reflect the functioning of democratic institutions.

The civil liberties indicator is, as discussed in Section 4.3.3, created in such a way that it engulfs a variety of attributes. Because numerous aspects are accounted for, the index is highly correlated with other substantive measures of 'liberal democracy'. Most notably the Freedom House indicator of political rights. This is so because 'good things' often

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[13]Variables that aim at measuring substantive elements of democracy are in general prone to subjective coding errors (Bollen and Paxton 2000). However, because Coppedge, Alvarez and Maldonado (2008) create their alternative measures of contestation and participation using a large set of variables, it is less likely that such errors cause any reliability problems.

[14]In this model contestation has a T-value of -0.48, while participation/inclusion has a T-value of 0.61.

go together. If there is 'freedom for non-governmental organizations', there is most likely also freedom to form political parties. If there is 'freedom of assembly, demonstration, and open public discussion', there is often also a freedom to vote. While the freedoms denoted with inverted commas belong to the civil liberties checklist, their comparisons constitute central features that are used to assign scores on the political rights indicator (see Freedom House 2011, 819-830). Hence, in order to evaluate whether it is possible to be certain that the civil liberties variable captures the hypothesized relationship – and not only a more general aspect of 'democratic quality' – I re-estimated the parsimonious and extensive models with both of the Freedom House variables. The results are displayed in Table 5.6.

The results clearly show that both variables have a significant, negative effect on famine onsets when entered alone in the regression models. However, the estimated effects are nearly identical.[15] Moreover, when the variables are entered simultaneously in Model 3 and 5, none of them turn out having a significant effect. This is not surprising since the two variables correlate at .92, but unfortunately one can thus not be fully sure whether it is civil liberties alone – or civil liberties in conjunction with other related factors – that hinder the onset of famine. The uncertainty is nevertheless unavoidable in the absence of more precise data.

5.4   Discussion

My theoretical framework holds that the primary reason why a government prevents famine is because the power of the incumbents depends on it. This interest, or incentive, is believed to be stronger if contested multiparty elections prevail. In sum, I proposed that two interconnected mechanisms bolster this relationship. While elections make it relatively easy for the population to remove their governments, the existence of opposition parties present the electorate with viable alternatives to the current rulers. Because incumbents are aware of these factors, they are believed to act accordingly and prevent famines in order to retain power. However, the analysis presented in this chapter does not exclusively support the theorized relationship. The ACLP-index, measuring contestation, did not turn out having a significant effect on famine vulnerability in any of the regression models. Yet, when employing Coppedge, Alvarez and Maldonado's (2008) contestation variable, another pattern emerged. The diverging results imply that my initial findings, as regards contestation, are not completely robust. It is in this regard important to remember

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[15]The T-value of the civil liberties estimates is -2.68 in Model 2 and -2.26 in model 5, while the T-value of the political rights variable is -2.60 in Model 1 and -1.99 in Model 4. The minor differences can, however, not meaningfully be interpreted one way or the other.

Table 5.6: Regression models with Freedom House variables

	(1) Famine onset	(2) Famine onset	(3) Famine onset	(4) Famine onset	(5) Famine onset	(6) Famine onset
Political rights	-0.484** (0.186)		-0.364 (0.285)	-0.416* (0.209)		-0.258 (0.291)
Civil liberties		-0.471** (0.176)	-0.171 (0.292)		-0.439* (0.194)	-0.231 (0.294)
ln GDP per capita$_{t-1}$	-1.121*** (0.173)	-1.153*** (0.168)	-1.118*** (0.173)	-0.708* (0.320)	-0.741* (0.301)	-0.707* (0.314)
ln Total population	0.139 (0.142)	0.123 (0.141)	0.133 (0.143)	0.334+ (0.180)	0.319+ (0.179)	0.324+ (0.179)
War	1.765*** (0.368)	1.699*** (0.379)	1.724*** (0.383)	1.479*** (0.356)	1.388*** (0.386)	1.411*** (0.395)
GDP per capita growth$_{t-1}$				-0.026 (0.021)	-0.027 (0.021)	-0.026 (0.021)
ln Population density				-0.606* (0.250)	-0.613* (0.245)	-0.605* (0.250)
Urban population (%)				-0.021 (0.024)	-0.020 (0.024)	-0.021 (0.024)
Precipitation				0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
Grain supply				-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)
Food aid				0.014 (0.009)	0.015+ (0.008)	0.015+ (0.008)
Time	0.010 (0.025)	0.011 (0.026)	0.010 (0.025)	0.008 (0.026)	0.008 (0.026)	0.008 (0.026)
Constant	1.319 (2.247)	1.895 (2.253)	1.556 (2.277)	-1.974 (2.926)	-1.216 (2.828)	-1.567 (2.946)
LL	-132.79	-133.51	-132.63	-125.78	-125.88	-125.48
AIC	277.59	279.03	279.26	275.56	275.76	276.95
Observations	4460	4460	4460	4460	4460	4460

Notes: $^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. All models are logit models. The table reports regression coefficients with clustered standard errors in parentheses. The sample consists of 170 countries, with maximum time series from 1968-1998. LL and AIC scores are estimated when all 20 datasets are averaged.

that the ACLP-index was used in my main models because it measures contestation –
as defined in this thesis – in an exemplary manner. The alternative indicator does, on
the other hand, incorporate more extensive sources of knowledge which are concerned
with more than the minimalist conception of contested, multiparty elections. The two
variables do, in other words, measure contestation in two slightly different ways. I can
therefore not confirm Hypothesis 1, which states that "famines are less likely to occur in
multi-party democracies with contested elections, all else equal", but my results indicate
that contestation – more loosely defined – might still reduce famine vulnerability.

My second hypothesis states that "famines are less likely to occur in countries with
high levels of political participation, all else equal." Yet, neither Vanhanen's (2000), nor
Coppedge, Alvarez and Maldonado's (2008) participation variable turned out having a
significant effect on famine onsets in any of my models. This is surprising as there are
strong theoretical grounds for expecting such a relationship. In Chapter 3, I argued that
broadened political participation will bring about a favourable change in the political
leadership. I furthermore proposed that higher levels of electoral participation would
result in an increase in social security spending, thus lowering famine susceptibility. The
empirical analysis does, however, not support any such relationship.

In Chapter 3, I proposed that both democratic and authoritarian governments may
be relatively more responsive to citizens' demands as long the people are able to voice
their concerns. Civil liberties were, in other words, believed to provide a non-electoral
accountability mechanism. I furthermore argued that if criticism is tolerated, one can
expect that the media and NGOs will provide 'early warnings' about famine threat sit-
uations. Such warning is not only a requirement for preventive government action, but
also important with regard to the political support maximization calculus outlined in my
basic framework. This is so because late protection is, as was discussed in Section 2.2.1,
more expensive than early intervention. The foregoing analysis supports these arguments
as the civil liberties indicator has a significant, negative effect on famine onsets in nearly
all of the models. Most notably, the effect was still significant – and substantially large
– *even* after controlling for contestation and participation in Model 4 in Table 5.3 and
Model 4 in Table 5.4. The robustness test in the preceding subsection revealed that it
is hard to ascertain the conceptual precision of the civil liberties indicator. However, as
both the political rights variable and the civil liberties indicator capture nearly the same
theoretical dimension, the findings nevertheless corroborate Hypothesis 3, namely that
"famines are less likely to occur in countries where the regimes allow more extensive civil
liberties, all else equal."

In sum, some aspects of democracy appear to be more important than others with re-
gard to famine vulnerability. While none of the hypotheses can be confirmed or discarded,

my findings lend support to the argument that civil liberties are of particular importance in famine prevention.

Chapter 6

Concluding remarks

I started this thesis by asking whether certain aspects of democracy are more crucial than others in reducing famine vulnerability. After examining pertinent contributions in the scholarly literature on famines and natural disasters, I developed a theoretical framework explaining how three different dimensions of democracy can shape governments' incentives to prevent famines. More specifically, I proposed that contestation, participation and civil liberties all carry independent weight that affects governmental decisions with regard to the protection and promotion of social security.

My empirical analysis revealed that certain aspects of democracy are more important than others in combating famine. Disaggregating the multi-dimensional concept of democracy therefore proved to be a fruitful undertaking. More specifically, I showed that the level of political participation does not appear to be systematically related to famine vulnerability. This is a surprising finding since there are strong theoretical grounds for expecting a negative relationship between higher levels of political participation and the onset of famines. Moreover, the analysis was not able to detect any statistically significant relationship between the existence of contested, multiparty elections and famine occurrence. However, when employing an alternative indicator, which measures contestation more broadly, I found some evidence indicating that higher levels of contestation might reduce famine vulnerability.

The main finding of the analysis was that the extent to which civil liberties are protected appears to have a considerable impact on whether famines are likely to occur. Not only was the civil liberties indicator negatively correlated to famine onsets in all of the regressions, but the effect was even statistically significant after controlling for contestation and participation in my core models. To the extent that these results hold, the findings suggest that the effect of regime type institutions – which has previously been ascribed to democracy in general – primarily relates to the degree to which civil liberties prevail. This may be considered as an important empirical discovery, illustrating that it is not

sufficient for regimes to hold contested elections and guarantee broad-based political participation. In order to significantly reduce famine vulnerability, societies need to be open and receptive to critique. However, the robustness tests revealed that certain caveats are warranted as regards this interpretation.

In Section 5.3 I demonstrated that it is hard to ascertain the conceptual precision of the civil liberties indicator. It is therefore not possible to be fully sure whether it is civil liberties alone – or civil liberties in conjunction with other related factors – that hinder the onset of famine. The uncertainty is nevertheless unavoidable given the currently available data. While the analysis clearly suggests that 'free societies' are less prone to famines, future research would benefit from more precise indicators, as this would make it possible to better identify which freedoms are important. Coppedge et al.'s (2011) 'Varieties of Democracy Project', which is already in progress and where global data are expected to be made available in 2014, is in this regard a promising initiative. However, regarding famine data there is still important work to be done. Before starting the analysis related to this project, I discovered that there were numerous flaws attached to EM-DAT's (2012) 'famine' data. Not only were food crises classified as famines in the database, but additionally a large number of substantial famines were missing. This is unfortunate as the Emergency Disaster Database is the only publicly accessible international database providing information on famines. The scholarly community should therefore strive to improve these data, or data on famines in general. Not only would this facilitate the development of quantitative famine research, but it could arguably also be an important step toward reducing the chances of future food crises from turning into famines.

In conclusion, this thesis has shown that disaggregating democracy is viable strategy for identifying which mechanisms that reduce famine vulnerability. A theoretical framework was developed that clarified the specific channels that link democracy to famine prevention. This framework was subjected to empirical testing, which illustrated that civil liberties appear to be the most important political factor explaining famine susceptibility. Other aspects of democracy are less robust indicators of famine prevention.

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Appendix 1: Additional famine sources

Table 1: List of famines based on Braun, Teklu and Webb (1999) with additional sources.

Famines		
Country	Year	Additional sources
Nigeria*	1968-69	Iliffe (1987, 251)
Mauritania	1969-74	Caldwell and Caldwell (1992, 384-386)
Niger	1969-74	Caldwell and Caldwell (1992, 384-386)
Chad	1969-74	Caldwell and Caldwell (1992, 384-386)
Bangladesh	1971-72	Curlin, Chen and Hussain (1976)
Ethiopia	1972-74	Seaman and Holt (1980, 285-286); Sen (1995a, 53-54); de Waal (1997, 106-107)
Cambodia	1973	Schrimshaw (1987, 16); de Waal (1997, 78)
Bangladesh	1974-75	Alamgir (1980, 101); Caldwell and Caldwell (1992, 369); de Waal (1997, 17)
Angola	1974-76	Devereux (2000, 7)
Zaire	1977-78	Devereux (2000, 7)
Uganda	1980	Iliffe (1987, 253); Caldwell and Caldwell (1992, 384)
Mozambique	1982-83	Iliffe (1987, 251); Devereux (2000, 6,30)
Niger	1982-85	Kahn (1994)
Chad	1982-85	Iliffe (1987, 253); Buchanan-Smith and Davies (1995, 111-138)
Ethiopia	1983-85	Ram (1995, 181-182); Kumar (1990, 189-209)
Somalia	1983-85	Human Rights Watch (1992)
Sudan	1984-85	de Waal (1989); de Waal (1997, 91-92)
Mozambique	1985-86	Devereux (2000, 6,33)
Sudan	1988	Keen (1994); de Waal (1997, 93-98)
Somalia	1988	Bridges (1988); Watts (1991)
Ethiopia	1989-90	Buchanan-Smith and Davies (1995, 55-83)
Liberia	1992-93	Devereux (2000, 7)
Somalia	1992-93	Moore et al. (1993); Ahmed and Green (1999); de Waal (1997, 163-168)
Sudan	1993	Bradbury (1998, 465)
Angola	1993-94	Devereux (2000, 7)
Liberia	1995-98	FAO (1996); Garenne (2007, 192)
Sierra Leone	1995-98	Garenne (2007, 192); Keen (1998)
North Korea	1996-98	Haggard and Noland (2007)
Zaire	1997	Devereux (2000, 7)
Sudan	1998	Deng (2002); Salama et al. (2004, 1805-1806)
India	1972-73	Dyson and Maharatna (1992); Rubin (2011, 70-71)

Appendix 2: List of country-year observations

Table 2: List of country-year observations in the dataset.

Country	Period	Country	Period	Country	Period	Country	Period
Afghanistan	1968-98	Ecuador	1968-98	Lativa	1991-98	Singapore	1968-98
Albania	1968-98	Egypt	1968-98	Lebanon	1968-98	Slovak Rep.	1993-98
Algeria	1968-98	El Salvador	1968-98	Lesotho	1968-98	Slovenia	1991-98
Angola	1975-98	Eq. Guinea	1968-98	Liberia	1968-98	Solomon Is.	1978-98
Argentina	1968-98	Eritrea	1993-98	Libya	1968-98	Somalia	1968-98
Armenia	1991-98	Estonia	1991-98	Lithuania	1991-98	South Africa	1968-98
Australia	1968-98	Ethiopia	1968-98	Macedonia	1991-98	Spain	1968-98
Austria	1968-98	Fiji	1970-98	Madagascar	1968-98	Sri Lanka	1968-98
Azerbaijan	1991-98	Finland	1968-98	Malawi	1968-98	Sudan	1968-98
Bahrain	1971-98	France	1968-98	Malaysia	1968-98	Suriname	1975-98
Bangladesh	1972-98	Gabon	1968-98	Mali	1968-98	Swaziland	1968-98
Belarus	1991-98	Gambia	1968-98	Mauritania	1968-98	Sweden	1968-98
Belgium	1968-98	Georgia	1991-98	Mauritsius	1968-98	Switzerland	1968-98
Benin	1968-98	Germany	1990-98	Mexico	1968-98	Syria	1968-98
Bhutan	1968-98	Germany East	1968-90	Moldova	1991-98	Taiwan	1968-98
Bolivia	1968-98	Germany West	1968-90	Mongolia	1968-98	Taijikistan	1991-98
Bosnia	1992-98	Ghana	1968-98	Morocco	1968-98	Tanzania	1968-98
Botswana	1968-98	Greece	1968-98	Mozambique	1968-98	Thailand	1968-98
Brazil	1968-98	Guatemala	1968-98	Myanmar	1968-98	Togo	1968-98
Bulgaria	1968-98	Guinea	1968-98	Namibia	1990-98	Trinidad	1968-98
Burkina Faso	1968-98	Guinea-Bissau	1974-98	Nepal	1968-98	Tunisia	1968-98
Burundi	1968-98	Guyana	1968-98	Netherlands	1968-98	Turkey	1968-98
Cambodia	1968-98	Haiti	1968-98	New Zealand	1968-98	Turkmenistan	1991-98
Cameroon	1968-98	Honduras	1968-98	Nicaragua	1968-98	U.A.E	1971-98
Canada	1968-98	Hungary	1968-98	Niger	1968-98	USSR	1968-91
Cape Verde	1975-98	India	1968-98	Nigeria	1968-98	Uganda	1968-98
C. African R.	1968-98	Indonesia	1968-98	Norway	1968-98	Ukraine	1991-98
Chad	1968-98	Iran	1968-98	Oman	1968-98	United Kingdom	1968-98
Chile	1968-98	Iraq	1968-98	Pakistan	1968-98	United States	1968-90
China	1968-98	Ireland	1968-98	Panama	1968-98	Uruguay	1968-98
Colombia	1968-98	Israel	1968-98	Papua N. Gu.	1975-98	Uzbekistan	1991-98
Comoros	1975-98	Italy	1968-98	Paraguay	1968-98	Venezuela	1968-98
Congo Braz.	1968-98	Ivory Coast	1968-98	Peru	1968-98	Vietnam	1976-98
Congo Kinsh.	1968-98	Jamaica	1968-98	Philippines	1968-98	Vietnam North	1968-75
Costa Rica	1968-98	Japan	1968-98	Poland	1968-98	Vietnam South	1968-75
Croatia	1991-98	Jordan	1968-98	Portugal	1968-98	Yemen	1990-98
Cuba	1968-98	Kazakhstan	1991-98	Qatar	1971-98	Yemen South	1968-90
Cyprus	1968-98	Kenya	1968-98	Romania	1968-98	Yemen North	1968-90
Czech Rep.	1993-98	Korea North	1968-98	Russia	1992-98	Yugoslavia	1968-98
Czechoslovakia	1968-92	Korea South	1968-98	Rwanda	1968-98	Zambia	1968-98
Denmark	1968-98	Kuwait	1968-98	S. Arabia	1968-98	Zimbabwe	1970-98
Djibouti	1977-98	Kyrgyzstan	1991-98	Senegal	1968-98		
Dominican Rep.	1968-98	Laos	1968-98	Sierra Leone	1968-98		

Appendix 3: Imputation diagnostics

Table 3: Additional variables included to improve the imputation model.

| Institutional variables	
Variable	**Source**
Selectorate Size	Bueno de Mesquita et al. (2003b)
Winning Coalition Size	Bueno de Mesquita et al. (2003b)
WCS relative to SS	Bueno de Mesquita et al. (2003b)
Polity 2	The Polity IV Project (2011)
Sip 2	Strand et al. (2012)
Political rights	Freedom House (2013)
Democracy index	Vanhanen (2000)
Political competition	Vanhanen (2000)
Contestation	Coppedge, Alvarez and Maldonado (2008)
Inclusiveness	Coppedge, Alvarez and Maldonado (2008)
Socio-economic variables	
Variable	**Source**
Infant mortality	The World Bank (2013)
Rural population	The World Bank (2013)
Life expectancy	The World Bank (2013)
Fertility rate	The World Bank (2013)
Population growth	The World Bank (2013)
Trade (% of GDP)	The World Bank (2013)
Foreign direct investment	The World Bank (2013)
Telephone lines	The World Bank (2013)
Newspapers per capita	Banks (2008)
Radios per capita	Banks (2008)
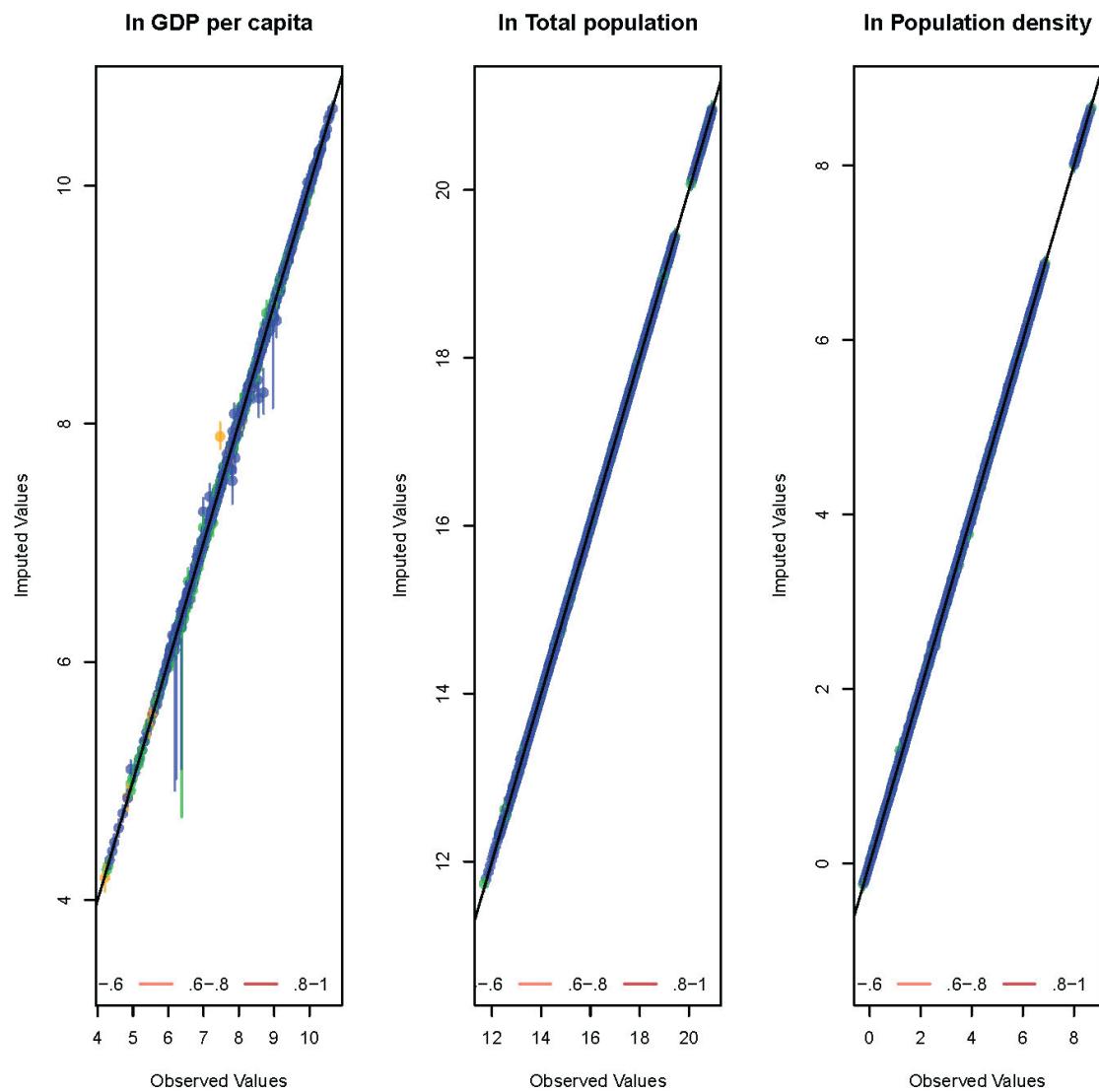
Figure 1: Overimputation diagnostic graphs.

Figure 2: The distribution of the mean imputations are red while the distribution of the observed values are black.
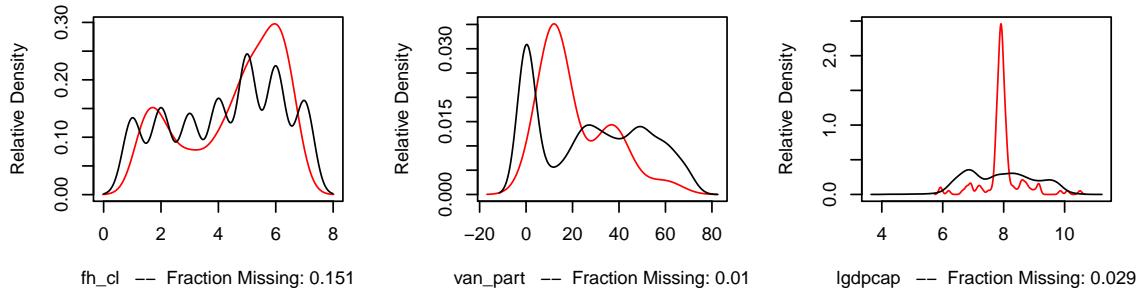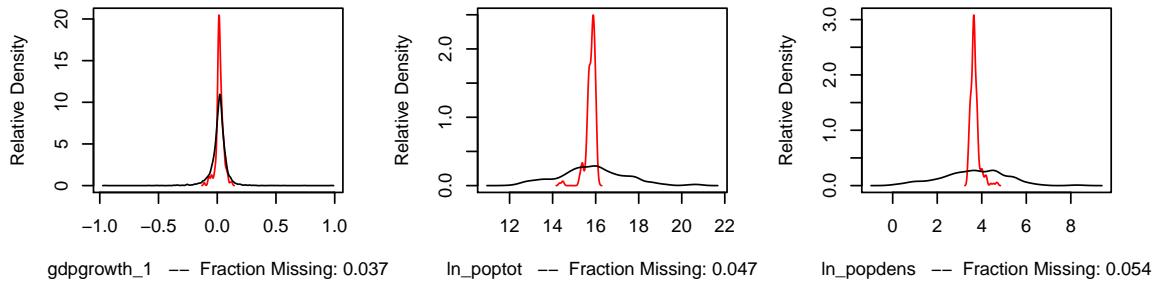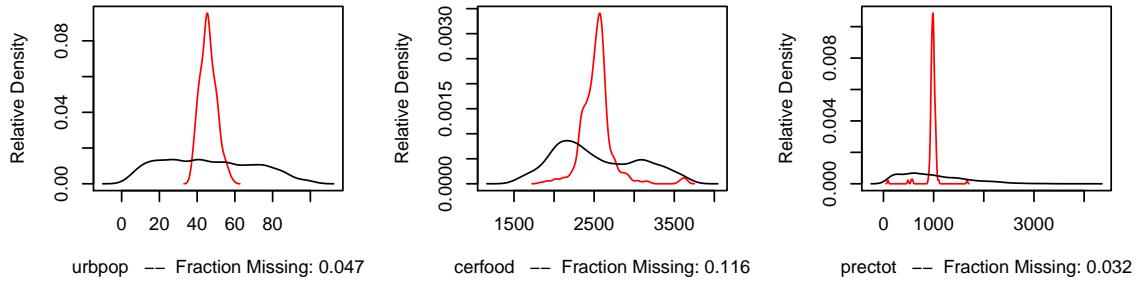
Appendix 4: Additional diagnostics and results

Table 4: Summary statistics Coppedge et al. (2008) variables

Variable	Mean	Std. Dev.	Min.	Max.
Copp. Contestation	0.06	1.067	-1.843	1.961
Copp. Inclusive	0.086	1.037	-2.985	1.911
N		4508		

Table 5: VIF collinearity diagnostics

Variable	VIF	Tolerance
ACLP-index	2.83	0.35
Participation	1.84	0.54
Civil liberties	3.17	0.32
ln GDP per capita	5.87	0.17
GDP per captia growth	1.06	0.94
ln Total population	1.26	0.79
ln Population density	1.31	0.76
Urban population	3.56	0.29
War	1.12	0.90
Precipitation	1.26	0.80
Grain supply	3.47	0.29
Food aid	1.26	0.80
Time	1.17	0.85

Figure 3: Index plot of *dbeta* scores.
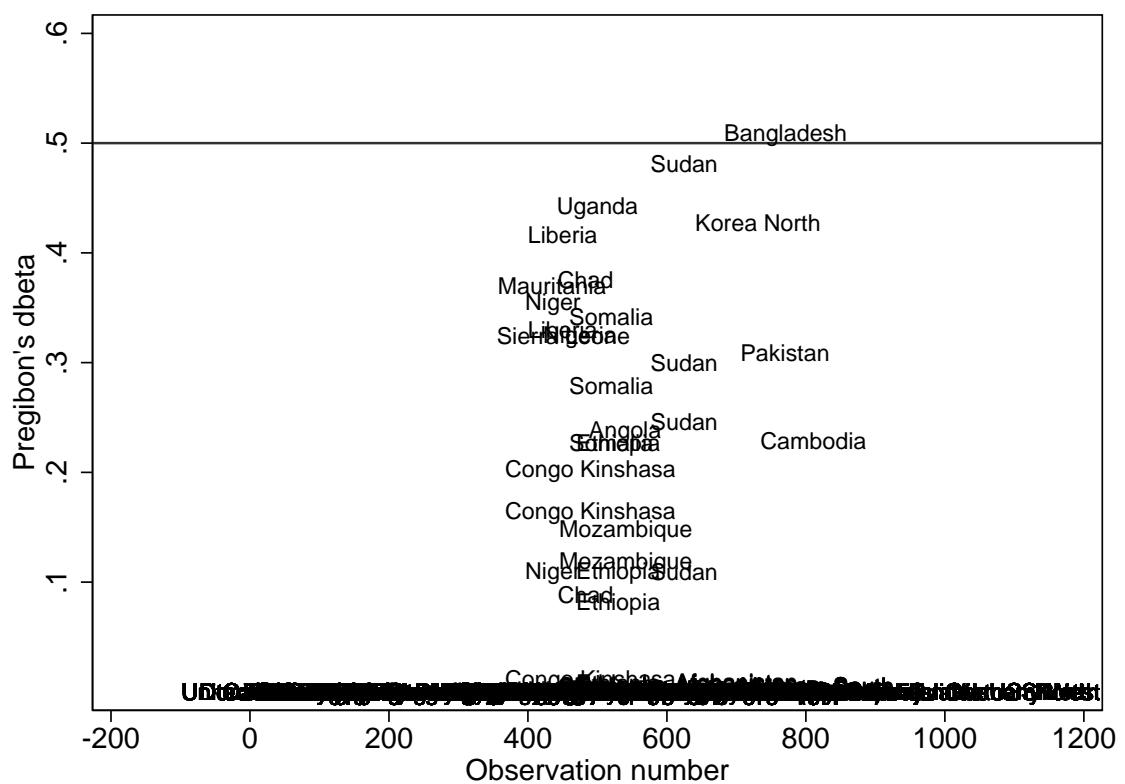
Table 6: Predicted probabilites

Other values as	Variable	Value	Mean	Std. Err.	95 % conf. intervals Upper	Lower
Global average	Civ. lib.	3.69	.001	.0003	.0003	.0018
Global average	Civ. lib.	1	.0035	.0027	.0006	.0109
Ethiopia (1980)	Civ. lib.	1	.0522	.0206	.0227	.1018
Ethiopia (1980)	Civ. lib.	5	.0101	.0092	.0014	.0350

Table 7: Rare events regression

	(1) Famine onset	(2) Famine onset	(3) Famine onset	(4) Famine onset	(5) Famine onset	(6) Famine onset	(7) Famine onset	(8) Famine onset
ACLP-index	-0.705 (0.710)			0.145 (0.829)	-0.303 (0.734)			0.536 (0.829)
Participation		-0.006 (0.012)		-0.001 (0.010)		0.002 (0.012)		
Civil liberties			-0.438* (0.175)	-0.438* (0.211)			-0.405* (0.193)	-0.455* (0.221)
ln GDP per capita$_{t-1}$	-1.213*** (0.166)	-1.243*** (0.179)	-1.135*** (0.168)	-1.123*** (0.185)	-0.890** (0.284)	-0.922*** (0.278)	-0.788** (0.300)	-0.796** (0.299)
ln Total population	0.165 (0.128)	0.143 (0.125)	0.129 (0.141)	0.127 (0.142)	0.328+ (0.176)	0.318+ (0.178)	0.294+ (0.178)	0.285 (0.176)
War	1.898*** (0.364)	1.852*** (0.368)	1.668*** (0.378)	1.651*** (0.394)	1.564*** (0.349)	1.574*** (0.346)	1.334*** (0.385)	1.331** (0.407)
GDP per capita growth$_{t-1}$					-0.033 (0.022)	-0.034 (0.022)	-0.031 (0.021)	-0.031 (0.022)
ln Population density					-0.573* (0.238)	-0.586* (0.228)	-0.551* (0.245)	-0.557* (0.248)
Urban population (%)					-0.015 (0.022)	-0.017 (0.022)	-0.015 (0.024)	-0.016 (0.025)
Precipitation					0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
Grain supply					-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)
Food aid					0.014 (0.010)	0.014 (0.010)	0.015+ (0.008)	0.015+ (0.008)
Time	0.013 (0.025)	0.012 (0.025)	0.010 (0.026)	0.009 (0.026)	0.006 (0.026)	0.005 (0.026)	0.005 (0.026)	0.004 (0.026)
Constant	0.626 (2.103)	1.213 (2.133)	1.734 (2.250)	1.729 (2.359)	-1.465 (2.733)	-1.078 (2.619)	-0.714 (2.820)	-0.390 (2.739)
Observations	4460	4460	4460	4460	4460	4460	4460	4460

Notes: $+$ $p < 0.10$, $*$ $p < 0.05$, $**$ $p < 0.01$, $***$ $p < 0.001$. All models are logit models. The table reports regression coefficients with clustered standard errors in parentheses.
The sample consists of 170 countries, with maximum time series from 1968-1998.

Appendix 5: Data and do-files

The relevant data and do-files are on the accompanying CD, or can be provided upon request (contact: jwp113@hotmail.com).