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Famine Mortality and Rational Political Inactivity*

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Abstract

Famine mortality is preventable by government action and yet some famines kill. According to Amartya Sen, regime type matters: no famine with significant excess mortality has ever occurred in a democracy. We take issue with this deterministic claim and start by discussing four cases, in which excess mortality has occurred despite central democratic governance. We develop a political theory of famine mortality, which postulates a relationship between democracy and famine mortality that is both probabilistic, rather than deterministic, and altogether more complex than the Sen hypothesis. Built on the 'selectorate' models of political responsiveness, we show why it can be entirely politically rational for a government, democratic or not, to remain inactive in the face of potential famine mortality if action would lead to greater loss of political support to the government than inaction. We derive the testable hypotheses that famine mortality is possible in democracies, but likely to be lower than in autocracies. Moreover, a larger share of people being affected by famine relative to population size together with large quantities of international food aid being available will lower mortality in both regime types, but more so in democracies. Our hypotheses find empirical support in a cross-country time-series analysis of famine mortality in non-developed countries over the period 1972 to 2000.

1. Introduction

Modern famine scholarship regards famine mortality as entirely preventable by governments. If so, the question is why in the 20th century alone between 70 and 80 million people may have died in famines (Devereux 2000: 7). In this article we study why governments sometimes fail to prevent excess mortality from famines. Amartya Sen, probably the best-known scholar of famines, has postulated a simple deterministic relationship between regime type and the prevention of famine mortality: ‘...one of the remarkable facts in the terrible history of famine is that no substantial famine has ever occurred in a country with a democratic form of government and a relatively free press’ (Sen 1994: 34). We are, of course, not the first to have questioned the validity of this claim (Keen 1994a; de Waal 2000), but we go much further than these critics of Sen. First, we discuss in some detail four cases, in which famines have resulted in excess mortality despite the presence of a democratic government. Second, we develop a political theory of famine mortality that leads to the result that famine mortality in democracies is possible, but likely to be lower than in autocracies, and that the mortality difference between democracies and autocracies is contingent on the share of people affected by famine relative to a country’s population size and on the level of international food aid available. Third, we subject the theoretically derived hypotheses to an empirical test.¹

Our theory builds upon the ‘selectorate’ models of political responsiveness (de Mesquita et al. 2003). In brief, we argue that governments may rationally fail to act against famines when the political costs of action are higher than the political gains. We thus describe the

¹ We employ a mixed-methods design. We use qualitative studies to cast doubt on Sen's deterministic theory *and* to generate ideas for an alternative explanation of famine mortality. We then generalize these ideas, provide a micro-foundation and test the hypotheses derived from our theoretical model using quantitative methods on a much broader sample. See King, Keohane and Verba (1994) on valid inference, George and Bennett (2005) and Collier et al. (2004) on case study design, Seawright (2002) on ‘theory testing’ based on qualitative designs.

government's response choice in the wake of a famine threat as a typical dilemma. On the one hand, the government will lose political support if it remains idle. Those members of the 'selectorate' (that is the group of people who can choose the government's leadership), which are directly or indirectly affected by the famine, plus possibly some unaffected bystanders, will withdraw or reduce their support for the government. On the other hand, however, a government's action helping those affected by famine comes at a cost to unaffected members of the selectorate in the form of, for example, higher food prices or taxes. In other words, government action against famines means that the unaffected have to pay for 'bailing-out' those affected by famine. If governments anticipate that the group of unaffected people within the selectorate will reduce political support for the government by more than the group of the affected will increase political support, governments may decide to remain inactive. We do not argue that political inactivity is likely.² Rather, we argue that political inactivity is possible and – indeed – there is a political rationale behind it when it happens.

Importantly, our argument is that both democracies and autocracies face the trade-off just described, which explains why famine mortality is possible in democracies as well. Differences in famine mortality between democracies and autocracies stem from different reactions to this trade-off and different kinds of policies used, which follow from differences in the size of the selectorate. Given the small size of the selectorate in autocracies, autocratic governments may well find it support-maximizing to use targeted transfers that shield the small affected group of the ruling elite from the direct and indirect consequences of famine. Such targeted transfers leave those people affected by famine, but outside the selectorate, vulnerable to the mortal impact of famine. In democracies such targeted transfers are not feasible due to the larger size of the selectorate, unless the share of affected people is very small. Democracies are therefore more likely to use policies that benefit all affected people, not just targeted

² In fact, we will see below that famine mortality is a rare event.

transfers for a few; and the bigger the share of affected people to the total population, the more such policies become necessary to prevent loss of political support. Both democracies and autocracies can employ international food aid to lower the political costs of government action because people affected by the famine can be helped without major (short-run) costs to those unaffected. However, democracies are more likely to channel international food aid to all affected people, whereas autocracies are likely to appropriate large parts of the aid to the private benefit of the small selectorate, leaving those outside the selectorate again vulnerable to the mortal impact of famine.

Our probabilistic political theory of famine mortality differs from Sen's deterministic claim and leads to the expectation that famine mortality in democracies, whilst likely to be lower than in autocracies, is still possible. Furthermore, democracies act more decisively than autocracies with policies aimed at preventing harm from all people affected by famine the larger the share of affected people to the total population and the higher the level of international food aid available. These hypotheses find support in our empirical test of famine mortality in a cross-national time-series analysis of a sample consisting of 130 non-developed countries over the period 1972 to 2000.³

The remainder of this article is structured as follows: The next section briefly reviews theories of famine and Sen's deterministic claim on the link between regime type and famine mortality in particular. We then discuss evidence from four cases in which democratic governments have either spectacularly failed to avert excess famine mortality (Irish potato famine and Sudan in the late 1980s) or have acted, but too late and too little to fully prevent mortality (Indian provinces of Bihar and Maharashtra). We continue by developing our political theory of famine mortality. The hypotheses derived from our theory are then subjected to empirical

³ The developed countries of Northern America, Western Europe, Japan, Australia and New Zealand are food donors, not recipients.

analysis. We conclude by indicating areas for future research and by identifying policy implications following from our analysis.

2. Famine Mortality and Democracy: A Review of Previous Arguments

The field of famine studies is not one of great consensus among scholars. In fact, there is widespread disagreement about most relevant issues, including the very definition of what constitutes a famine (Devereux 1993; Howe 2002; Howe and Devereux 2004). Whatever the exact definition, it is important to distinguish famine, which according to Sen (2001: 160) involves ‘a sudden eruption of severe deprivation for a considerable section of the population’, from problems of general malnourishment and endemic hunger.

Putting it bluntly, one can distinguish between famine theorizing before and after Sen. Early explanations treated famines as the inevitable consequence of a sudden decline in food supply (Devereux 1993, ch. 4). A good example is Brown and Eckholm’s (1974: 25) verdict that ‘a sudden, sharp reduction in the food supply in any particular geographic locale has usually resulted in widespread hunger and famine’. Typically, though not always, the fall in food supply was seen as being caused by persistent droughts, floods and other natural calamities. Famines had the notion of an unavoidable exogenous shock, an act of nature. Aykroyd (1974: 1) portrays a common cause for famine as follows: ‘two years of poor rainfall may be followed by a third year without any rain at all. It is then that famine makes its appearance...’. Nnoli (1989: 170) in a similarly deterministic and inevitable fashion regards a prolonged drought as leading to famine. Combined with the Malthusian concern that populations have the tendency to outgrow the ‘carrying capacity’ of their land (Malthus 1798), the threat of famine is easily summarized as ‘too many mouths and too little food’ (Aykroyd 1974: 5).

Second generation explanations contested this implicit claim that famines are beyond human scope. Amartya Sen is not the only representative of such theories of course, but the most

prominent one (see, for example, Sen 1976, 1981, 1985; Drèze and Sen 1989, 1990). The famous opening sentences of his book on *Poverty and Famines* proclaim: ‘Starvation is the characteristic of some people not *having* enough food to eat. It is not the characteristic of there *being* not enough food to eat.’ (Sen 1981: 2, emphasis in original). It follows that food shortage may be a necessary but not a sufficient condition for the outbreak of famines. What really matters are entitlements (the command over food and non-food commodities), not food availability as such. Famines happen when groups of individuals experience entitlement collapse and are no longer able to buy sufficient amounts of food.

Famine theorizing after Sen has contested many aspects of Sen’s writings. In fact, the recognition and admiration his work has received across the wider social sciences is only rivaled by the criticism, opposition and, at times, fury it has encountered as well (see, for example, Rangasami 1985; Bowbrick 1986; de Waal 1989, 1997; Keen 1994a, 1994b). It would be far beyond the scope of this article to survey and critically engage with the detailed controversies.⁴ Much of the criticism has concentrated on how Sen’s ‘entitlement failure’ theory is seemingly ill-equipped to explain the modern conflict-related famines of sub-Saharan Africa. In these conflicts entitlement collapse might still apply, but it often occurs through extra-market violent appropriation, what some call ‘asset transfer’ (Duffield 1994) or ‘asset-stripping’ (de Waal 1993), whereas Sen stresses entitlement collapse within the rule of law and functioning markets.

Interestingly, these critics do not doubt Sen and Drèze’s contention that ‘all famines in the modern world are preventable by human action’ and that large-scale famine mortality must be due to ‘some massive social failure’ (Drèze and Sen 1989: 47). In other words: public action can reduce or even avoid famine mortality, for example, in the form of free or subsidized provision of food, the creation of (temporary) employment and income opportunities for affected

⁴ Others have done so to some extent (see, for example, Ravallion 1997 and Devereux 2001).

people, the control of epidemics and the provision of health services. Indeed, Sen (2001: 175) believes that famines are ‘so easy to prevent that it is amazing that they are allowed to occur at all’. This agrees with the belief advanced by, for example, von Braun et al. (1998: 2) that ‘famine is largely a function of institutional, organizational, and policy failure, not just one of generalizable market- and climate-driven production failure’ (emphasis in original), with Devereux’s (2000: 27) assessment that ‘famines occur because they are not prevented: they are allowed to happen’ as well as with de Waal’s (2000: 18) argument ‘that any government can, if it so desires, take effective measures to combat famine’.

In numerous writings Sen argues that famines in fact will be prevented if governments act responsively. In his view, all democracies are responsive governments. Thus, he comes to the deterministic conclusion that ‘there has never been a famine in a functioning multiparty democracy’ (Sen 2001: 178). According to Sen, democratic leaders respond to the threat of a famine because they have to win elections and face public criticism. Since political survival of autocrats does not depend – at least not to the same extent – on mass support, autocrats are less likely to respond adequately to the threat of famine mortality. The mechanism that Sen sees at work is that in democracies the government is forced by public opinion to act: ‘With a relatively free press, with periodic elections, and with active opposition parties, no government can escape severe penalty if it delays preventive measures and allows a real famine to occur.’ (Sen 1990: 50)

In our view, Sen correctly highlights the importance of politics and policies. But his argumentation ‘overshoots’ in two respects. First, his deterministic prediction – democracies never experience famines – fails to convince on closer inspection. And second, his functional logic of famine prevention – democratic leaders will always prevent famines – lacks a serious microfoundation. As Bhagwati (1995:59) has put it: ‘Sen’s precise argument (...) is too simplistic and fails to persuade.’ In the next section, we confront Sen’s deterministic prediction with four cases that all show the possibility of famine mortality in democratic regimes and

that illustrate that democracies react in rather complex ways to the threat of famine mortality that calls for a serious effort at theorizing the link between regime type and famine mortality.

3. Democracy and Famine Revisited: Empirical Evidence from Four Cases

Four famine cases highlight the fact that Sen's deterministic claim is overly deterministic and that government response is less straightforward than his theory would imply: the Irish potato famine 1845-1850, the two famines in the Indian provinces of Bihar in 1965-1967 and Maharashtra in 1972-1973 and the famine in Southern Sudan in 1988. Let us briefly discuss these four cases in turn.

Though no official records exist, the Irish potato famine was undoubtedly highly mortal, which is not contested by Sen or his co-author Drèze. Estimates vary (as in most famines), but typically range between 500,000 and 1,000,000 famine deaths. Another two million people or so left Ireland and migrated to the US. In order to bring the Irish case in line with Sen's hypothesis, one needs to argue that Ireland was not subject to democratic rule in those years. Indeed, during the potato crisis, Ireland was not an independent country. However, it was not a colony either. Rather, the country formed part, if perhaps involuntarily, of the United Kingdom of Great Britain and Ireland. Sen (2001: 173) acknowledges this by saying that Ireland 'was distinguished in being part of the British Isles itself' from other parts of the British Empire.

Tony Blair, when he was already British Prime Minister, was clearer in accepting the UK's political responsibility for the Irish famine: 'The Famine was a defining event in the history of Ireland and of Britain. It has left deep scars. That one million people should have died in what was then part of the richest and most powerful nation in the world is something that still causes pain as we reflect on it today. Those who governed in London at the time

failed their people through standing by while a crop failure turned into a massive tragedy. We must not forget such a dreadful event.’ (cited in Kinealy 2002: 1).

The polity dataset gives a polity score of +3 to the UK, which suggests the country was a semi-democracy, but quite plausibly democratic enough to qualify for Sen’s hypothesis. Though proportionately underrepresented and the only part of the UK with an administration resident in Dublin castle, Ireland did send political representatives to Westminster. Moreover, the press was relatively free and indeed printed numerous reports of the evolving humanitarian catastrophe in Ireland. Yet, the government in London and its official representations in Dublin, the Lord Lieutenant of Ireland and the Chief Secretary for Ireland, responded too little and too late. Indeed, the Treasury spent only £8 million, mostly in the form of loans. The total value of spending on the famine was about three percent of government spending during the period, or 0.3 percent of the country’s GNP (Ó Gráda 1989/1995: 49). The government certainly could have done much more.

Many observers hold the Corn Laws – high import tariffs on corn that aimed at protecting the English farmers from world market competition – responsible for the fact that Ireland did not import grain on a large scale, which could have replaced the failing potatoes. Even though the UK parliament decided to repeal the Corn Laws on the 16th of May 1846, it was only partly intended to help the starving people in Ireland and must also be seen in the light of an ideological conflict between free-traders and protectionists in the parliament (Kinealy 2002). Moreover, the bill suggested to phase-out the Corn Laws over a three-year period. The effect that imports had on the British food market therefore came too late and too slow for the starving population in Ireland.

It is clear that the parliament in London was responsible for Ireland, that Ireland must be considered a constitutive part of the UK, that the UK was a semi-democratic country with a relatively free press and yet the government’s response came too late and was insufficient to prevent large-scale famine mortality. Thus, Sen’s claim that democratic governments will act

responsively in the presence of sufficient media coverage, does not seem to apply to the potato famine. Sen (2001: 173ff.) invokes 'cultural alienation' between the British and the Irish as the main cause for the British failure to prevent the famine, citing Joel Mokyr's verdict that 'Ireland was considered by Britain as an alien and even hostile nation' (cited in Sen 2001: 173).

Sen's response to the famines of Bihar and Maharashtra is based on a different logic. Here the undeniable fact is that India was an independent state and democracy at the time. As Besley and Burgess (2002: 1416) have observed: 'India is an important case study for testing the political economy of responsiveness. It is home to a large vulnerable population (...). India is a federal democracy, and popularly elected state governments play a key role in relief activities. There is a relatively free and independent press (...).' Sen himself regards post-independence democratic India as a fine example of evidence in favor of his deterministic claim and he insists that India, which was prone to many severe famines with large-scale mortality during its colonial period and before, has not suffered a major famine since 1947: 'The last major famine in India took place before independence, viz. the Bengal famine of 1943, in which about 3 million people died. Since then there have been a number of threats of severe famine (e.g. in Bihar in 1967, in Maharashtra in 1973, in West Bengal in 1979, in Gujarat in 1987), but they did not materialize, largely due to public intervention.' (Drèze and Sen 1989: 8). Sen therefore argues that large-scale famine mortality has been prevented by and because of democratic government in both Bihar and Maharashtra.

Yet, on closer inspection the devil lies in the detail. In his single-authored contribution to their co-edited volumes on *The Political Economy of Hunger*, Drèze (1990) is somewhat more cautious in his assessment. Noting substantial drops in food production, food availability and calorie consumption, he addresses the issue of excess mortality. He regards officially published data on registered deaths as the least unreliable, particularly for assessing changes in mortality. According to these data, there was excess mortality of 1 and 3.5 deaths per thou-

sand people in Bihar in 1966 and 1967, respectively.⁵ These unimpressively small numbers nevertheless suggest an excess mortality in the famine-ridden years of up to several hundred thousand deaths, given a population at the time of roughly 50 million. Dyson and Maharatna (1992) regard the official total mortality data as highly deficient and therefore conclude that substantial excess famine mortality cannot be deducted from these data, but can also not be excluded as a possibility. They regard the registered infant mortality rate as more reliable and find that this mortality increased more in the Bihar districts most affected by the drought, which provides some indirect and tentative evidence for excess mortality. Drèze (1990: 59) comes to the conclusion that even if the official mortality data are questionable, ‘one thing is clear: there is precious little evidence to support the self-congratulatory statements that have commonly been made about the Bihar famine, e.g. “no exceptional mortality was recorded” or “no one died of starvation”.’

A detailed study provided by Brass (1986) also shows that democratic response to the Bihar famine has been far from straightforward. Instead of doing everything they can to relieve the famine impact, the relevant political actors ‘used the crisis to gain advantage or prevent harm in their relations with each other’ (Brass 1986: 253). Initially, the central government refused to accept the severity of the crisis and to provide assistance because the state government was regarded as incompetent and out of favor, despite both being run by the Congress party. The state government itself refused to declare a state of famine before the elections in November 1967 and famine was declared only after its election defeat by a new government. India’s central government did provide assistance in the end and ca. 2.5 million tons of food aid, mainly from the United States, was shipped to Bihar that prevented an even higher loss of life. But, if the estimates of excess mortality during this famine discussed above are correct, it

⁵ Singh (1975) reports higher mortality rates still in famine years, but Drèze (1990) notes internal inconsistencies in Singh’s estimates.

is clear that this response came somewhat too late and was insufficient to prevent famine mortality entirely. The Bihar famine highlights two problems of democratic response to famine: A famine becomes easily politicized, which can hinder rather than help immediate famine response as politicians get caught up in their politics rather than concentrating on famine relief, and a central government will be reluctant to redistribute domestic resources to famine victims if the affected population represents only a minority of the electorate and is not decisive for general elections. Fortunately for the famine victims in Bihar, the central Indian government could draw upon generous external assistance.

Available excess mortality estimates for the Maharashtra famine are similarly imprecise as those for the Bihar famine. While Drèze remains skeptical whether the Indian government managed to avert the Bihar crisis, he is by far more positive about government response to the Maharashtra crisis. In Sen and Drèze's (1989: 127f.) view: 'There is, indeed, very little evidence that any of the usual signs of famine developed to a significant extent in this event – whether 'starvation deaths', increases in mortality rates, nutritional deterioration, land sales, or migration to other states.' Indeed, Sen and Drèze (1989: 68) and later Drèze (1990) alone perceive Maharashtra as a success case of government intervention: 'The impressive success achieved at the time by the government of Maharashtra in preventing a severe drought from developing into a famine by organizing massive public works programmes.' Yet, Dyson and Maharatna (1992: 1330) find a positive correlation between the crude death rate and the decline in cereal production across Maharashtra's districts. They thus conclude 'there can be no doubt that there was substantial mortality during the Maharashtra drought – at very least 70,000 excess deaths' (Dyson and Maharatna 1992: 1331). One has to keep in mind, however, that Dyson and Maharatna's data are noisy since they cannot control for famine-induced migration between Maharashtra districts and between Maharashtra and neighboring Indian states.

When Sudan experienced a third interlude of democratic government since independence with a fairly free press over the period 1986-89, the expectation following Sen's deterministic claim is that the government would do everything in its power to prevent famine mortality. In fact, the exact opposite was the case. The central government allowed and encouraged cattle and other raids by armed militia on the economically better off ethnic group of Dinkas in Southern Sudan, which made them vulnerable to famine. Moreover, it allowed the Sudanese military and militia groups to employ famine as a strategy in its warfare against the rebels in Southern Sudan and frustrated and blocked relief efforts. How many people died as the consequence of war-related famine? Devereux (2000) states 250,000 people based on Harden's (1993: 169) estimate. Devereux (2000: 33) himself notes that the estimate is difficult to verify, but Keen's (1994a) detailed and fieldwork-based study, while avoiding estimates of aggregate mortality, leaves little doubt about substantial excess mortality.⁶ Similarly, de Waal (1997: 93) calls it 'the most severe famine in Sudan's modern history'.

While there were representatives from the South in the parliament in Khartoum, which raised the famine issue in parliament, it was unable to mobilize public opinion and unite the democratic opposition for its cause. The press was mainly focused on issues and conditions in the North, with little interest in famine in the South. The government was extremely concerned to keep food prices low in the North and in and around Khartoum in particular, so as not to upset its voters. In a country marked by ethnic strife, the South simply had no political clout in the North. In addition, the government did all it could to mislead the public about the extent of famine and its efforts to contain it. This was helped by some Southern representatives subscribing to the governmental line and by the counter-productive role that the largest Southern rebel group, the Sudan People's Liberation Army (SPLA), played by obstructing

⁶ Prendergast (1991: 49) even states more than 300,000 famine deaths in 1988-89.

relief efforts and itself engaging in warfare tactics that exacerbated the famine (African Rights 1997: 98f.).

To our knowledge, Sen does not directly engage with this particular famine in Sudan. He is less neglectful of famines during Sudan's non-democratic periods of government. For example, in Sen (2001: 183) he writes: 'In various ways, Sudan, Somalia, Ethiopia, several of the Sahel countries and others provide glaring examples of how badly things can go wrong without the discipline of opposition parties and the news media.' In fact, the Sudanese famine of the late 1980s demonstrates just how badly things can go wrong with and despite the discipline of opposition parties and the news media.

These four cases run counter to Sen's claim because they show that famines and substantial famine mortality can take place in democratic regimes. While each single case of 'democratic famine' already casts doubt on the deterministic logic of Sen, together these four cases arguably are sufficient to demonstrate that Sen's deterministic claim is wrong. Perhaps more importantly, these cases also illustrate that public knowledge of a famine is not sufficient to stimulate government counteraction, even in democracies. Ample evidence has been provided showing that the governments in London, New Delhi and Khartoum knew of serious food shortage in the far-away provinces and districts. Still, the governments did not respond adequately. Case studies such as the comprehensive study by Brass (1986) suggest an explanation of why democratic governments may allow a famine to become mortal. The Indian government was mainly concerned with the effect anti-famine measures could have on the population in the politically pivotal parts of the country. The same holds true for Sudan and the UK during the potato famine. The Sudanese government was more concerned with losing popularity due to a price increase for food in Khartoum than with helping starving people in the Southern parts of the country. The UK's government delayed a liberalization of the food market to avert fierce opposition of the politically influential English farmers.

These four cases also allow us to identify two minimum requirements for a good political theory of famine mortality: First, it needs to be probabilistic, not deterministic. In other words, a theory of famines needs to provide arguments why famine mortality is possible in democracies, but likely to be higher in autocracies. Second, a good theory needs to spell out the conditions under which governments are more likely to take action and needs to argue why democracies respond differently from autocracies under these conditions. In the next section, we develop such a theory, which due to space constraints has to be confined to a relatively brief argument.

4. Inactivity or Famine Prevention? A Political Explanation of Famine Mortality

If governments can, but need not, avert famine mortality then the question is: what induces governments to prevent famines from turning mortal? Some have argued that scholars of famine need to move beyond the language of ‘failure, breakdown and disaster’ (Edkins 2002: 15) and instead tackle the question of who benefits from famines and in whose interest do famines happen (Keen 1994a, 1994b; Edkins 2002). We believe that asking the ‘cui bono?’ question is the right one. However, to us the question to ask is not so much who benefits from the deliberately induced and wanted destructive effects of famine on the affected people. Instead, the more relevant question is who benefits from governmental inaction and its failure to prevent famine. In other words, why do some politically influential groups benefit from government inactivity in the wake of a famine and who are the beneficiaries of government inactivity? The first question asks for the benefits to actors that deliberately cause famine mortality, the second question asks for benefits to actors that inhibit governments from preventing famine mortality. While the questions may appear similar, they are in fact quite different.

To be sure, we do not deny that famine is sometimes used as a weapon for the deliberate killing of people, be they ethnic minorities or political groups. For example, while the famine

that engulfed Ukraine, the northern Caucasus, and the lower Volga River area in 1932-1933 resulted from the policy of forced collectivization, Conquest (1986) argues that Stalin imposed even stronger procurements (up to 45% of the harvest) on Ukrainian peasants than on other farmers of the Soviet Union to fight the strong nationalistic and anti-collectivist tendencies, knowing well that many Ukrainians would perish (Conquest 1986). More recently, the former Ethiopian foreign minister in Mengistu's autocratic government told the U.S. chargé d'affaires David A. Korn in December 1984 that 'food is a major element in our strategy against the secessionists' (Korn 1986: 137). Few would come out with similarly frank admissions, but there are cases where governmental and non-governmental political actors have used famine as 'a cheap weapon of mass murder' (Marcus 2003: 252).

Yet, the use of famines for the deliberate destruction of political or ethnic groups is typically confined to autocratic regimes, often of the totalitarian kind. In fact, with the possible exception of the Sudanese famine in the late 1980s, we know of no case in which democratic regimes have used famine as a weapon of mass murder. Much more often, democracies have stayed inactive despite clear signs of a dawning famine or have started prevention too late, thus allowing some famine mortality to occur. Even for Sudan, even those highly critical of the democratic government in Khartoum at the time acknowledge that 'there is no evidence that a deliberate program of Southern genocide was pursued at the top of Sadiq el Mahdi's government. What is more likely is that the moral and political logic of the war as interpreted in Khartoum created a space where such near-genocidal motives and practices could flourish.' (African Rights 1997, 97). Also, as we have pointed out above, the Khartoum government feared upsetting its voters in Northern Sudan via higher food prices were it to prevent famine mortality in the South.

In order to explain why democracies sometimes experience some famine mortality (and autocracies even higher mortality), a political theory must therefore tackle the much more interesting and challenging question of why governments might fail to prevent famine mor-

tality. We seek to provide an answer to this question *without* distinguishing between autocracies and democracies from the onset. Instead, our argument is based on and draws from standard political-economic models of political responsiveness (dubbed the selectorate theory, see de Mesquita et al. 2003). In brief, selectorate theory perceives political responsiveness of a government as a function of the size of the selectorate to total population⁷ and of the size of winning coalition⁸ within the selectorate relative to the size of the selectorate. As de Mesquita et al. (2003: 26) have argued: ‘Political survival is put at risk whenever leaders lack the resources to maintain the support of the essential backers.’ In what follows we will show how selectorate theory allows us to examine how the political incentive structure influences the probability of famine prevention and famine mortality.

Rational Political Inactivity

Famines almost never hit entire countries. The worst famines in history all took place in more or less clearly defined regions of the countries: Ireland was a part of the UK, the Soviet famine mainly affected the Ukraine, the Indian famines discussed above affected the provinces of

⁷ “We define the selectorate as the set of people whose endowments include the qualities or characteristics institutionally required to choose the government’s leadership.” (de Mesquita et al. 2003: 42) The authors then go on to discuss how citizenship, personal properties, wealth, gender and age, and constitutional characteristics of the polity define the size of the selectorate (ibid: 42-51).

⁸ “The winning coalition is defined as a subset of the selectorate of sufficient size such that the subset’s support endows the leadership with political power over the remainder of the selectorate as well as over the disenfranchised members of the society.” (de Mesquita et al. 2003: 51) For our argument, the size of the winning coalition is of lesser importance and even de Mesquita et al. (2003: 51-55) argue that the winning coalition is typically the size of selectorate divided by 2 plus 1 actor. However, they point out that in majoritarian systems (with abstention) the size of the winning coalition is often smaller and they suggest it to be one-fourth of the selectorate, because “the prime-minister needs support from one-half of his or her constituents, each of whom needed support from one-half of his or her constituents in order to be elected” (p. 55). Note that the authors ‘individualize’ the size of the constituents here – a claim that they do not carry on through the book.

Bihar and Maharashtra, the Sudanese famine of the late 1980s only the Southern parts of Sudan and so on. The Great Chinese famine is perhaps exceptional in this respect as at least 12 (of 28) provinces showed *significant* excess mortality (National Statistics Bureau China 1990).⁹ Most other famines affect only a subgroup of the population either because the food shortage does not affect the entire country or – if it does – is caused by an uneven distribution rather than a lack of food.

At first glance, it would seem that governments will always act to help those members of the selectorate that are directly or indirectly affected by the famine, as otherwise they will withdraw or reduce their support for the government. Moreover, it is plausible that some unaffected bystanders will also reduce their support for inactive governments if the fate of famine-stricken people enters their utility function. There are multiple ways in which a government can help those affected by famine. For example, the government can buy or requisition food from domestic markets in unaffected parts of the country and re-distribute it to affected parts. The government can also open up protected domestic food markets to allow food imports. It can provide affected people with the economic means to buy food either by financial transfers or by creating temporary public employment.

If helping those affected by famine were costless, then all governments would act against all threats of famine mortality at all times. Unfortunately, whichever way the government takes to help people affected by famine, there is always an economic cost to some people unaffected by the famine. If the government buys the food on the domestic market, food prices inevitably rise so that the consumers in the unaffected parts of the country become worse off. Confiscation and opening up protected domestic food markets hurt agricultural producers. Buying food abroad, financial transfers and creating massive temporary public employment

⁹ See Lin and Yang (2000) for an analysis of excess mortality based on this data source. See also Li and Yang (2005).

all cost public money, which has to be financed by higher taxes or public debt. The beneficiaries of government inactivity are therefore the consumers and taxpayers in unaffected regions, which would suffer from higher food prices and/or higher taxes, or agricultural producers, which would suffer from opening protected domestic food markets. As a consequence, if the government acts to help people affected by famine, it will inevitably lose some support from either the expropriated owners of food, peasants, farmers, the land oligarchy, or the consumers and tax-payers. Thus, the government's popularity in unaffected regions is likely to decline.

Rational governments, which seek and depend on political support, will therefore face the following trade-off: On the one hand, ignoring a famine that affects a certain share of the population will lead to the loss of political support of those affected plus those who care strongly about the affected people without being affected themselves. On the other hand, taking action to help those affected by famine will lead to the loss of political support by those harmed by government action or, equivalently, by those benefiting from government inaction.

The Role of International Food Aid

Yet, our theory is still incomplete, because so far we have ignored a potential exogenous source that seemingly can provide governments with a way to mitigate or even solve this trade-off: international food aid. International food aid often makes up a significant part of the total food aid that famine-ridden regions receive. For example, during the Bihar famines approximately 2.5 million tons of grain were shipped to the affected regions, which was about half of the amount requested by the regional government. As Paul Brass (1986: 259) has observed, 'virtually all grain provided to Bihar by the central government came from the United States.'

Typically provided by international donors in the form of grants, food aid from abroad channeled to famine-stricken regions will prevent loss of support by affected people (and their

unaffected supporters) without immediate economic costs to others, thus preventing loss of political support to the government by unaffected people.¹⁰ With food help from international donors, governments can distribute food to the parts of the population most severely affected without significant effects on food prices and food availability in unaffected regions. In other words, food aid allows the government to win political support from the affected parts of the electorate without needing to fear a decline in support from unaffected parts of the electorate. Simple arithmetic suggests that this effect of international food aid increases the probability that governments will act to significantly reduce famine mortality.

Yet, our model also suggests that governments under certain conditions have an incentive not to propel the food grants they receive directly to the affected parts of the population. If the famine already has generated externalities, which threaten the government's popularity in regions unaffected by the famine, governments may direct parts of the additional food supply to unaffected regions. While this policy may be interpreted as misuse of international food aid, the political logic directly follows from the opportunistic model of famine prevention discussed above: if governments maximize their political support by mainly focusing on the famine's effect on the unaffected parts of the population, then there is an incentive to use food aid for fighting the externalities of the famine rather than the famine itself.

¹⁰ We stress the word 'immediate', as it is of course well known by now that even 'free' international food aid often comes at a cost in the long run. For example, it can depress domestic food production and make the recipient country dependent on external donors, undermining their own national capacity and leading to dependency and demoralization (de Waal 2000; Barrett 2002). However, there are two reasons why these costs are unlikely to enter the government's calculus. First, they pertain more to the effect of continuous dependence on the provision of food aid in the form of what is typically called program and project food aid (Clay and Stokke 2000) rather than the short-term influx of emergency food aid to prevent famine mortality. Second, the costs are clearly of a more long-term nature, too long indeed for most governments to worry about. In the short term, international food aid provides an easy and cheap way out of the trade-off described above.

Thus, even if the international community provides food aid, governments may still have an incentive to propel the lion's share of the available resources to recipients who do not suffer from under-supply of food. This implies that food aid alone is not sufficient to ensure an immediate and fully responsible reaction from the government. Only if the availability of resources is accompanied by a political incentive structure that prompts governments to direct resources to the affected, will famine prevention on a sufficiently large scale occur.

The Importance of the Size of the Selectorate

Importantly, our theoretical argument so far has proceeded without recourse to distinguishing between democracies and autocracies. In fact, we argue that the basic trade-off that governments face when contemplating acting against famine exists in both types of regimes. We argue that variation in political response to the threat of famines between democracies and autocracies does not result from systematic differences between democracies and autocracies per se, but from the different sizes of their respective selectorates. In general, we can say that the selectorate in democracies is large, while in autocracies only the members of a (possibly broadly defined) elite constitute the selectorate and is thus much smaller.

This has important consequences on the way in which democratic as opposed to autocratic regimes respond to the threat of famine and the kind of policies they are likely to adopt. As de Mesquita et al. (2002: 581) have summarized their theory: 'Our main deductive predictions relate to the quantity and quality of public policy provision. In particular, because democrats rely on large winning coalitions, they must provide more public goods.' As Plümper and Martin (2003: 29) have put it: 'If political participation is severely restricted, governments rationally choose rents as an instrument to buy political support. With growing democracy, however, the provision of public goods becomes more and more efficient in ensuring that the

government remains in power.¹¹ Empirical evidence for these claims is summarized by Lake and Baum (2001).

What this means for the case of famines is that if the size of the selectorate is small as in autocracies, then it might be support-maximizing for the government to shield the affected members of the selectorate from the direct and indirect consequences of famine by transferring targeted resources to them, which leaves those affected people outside the selectorate vulnerable to the mortal impact of famines. Members of the ruling elite in autocracies never starve because the small size of the elite renders it easy to provide them with enough food without great cost despite famine. Even if members of the ruling elite suffer economic losses because the famine damages economic life in the affected regions, the government can compensate them for these indirect consequences of famine. If the size of the selectorate is large like it is in democracies, however, then targeted transfers become infeasible unless the share of population being affected by famine is very small. Government action in democratic regimes is more likely to take the form of policies that benefit all affected people, not just those that form part of the ruling elite, and the more so the larger the share of affected people.¹²

¹¹ For an exhaustive characterization of equilibrium strategies, see de Mesquita et al. (2002) and Hausken et al. (2004).

¹² These differences between democracies and autocracies are reinforced by the influence of special interest groups on the government (Grossman and Helpman 2001). By providing information to the government, directing the government's attention in certain directions and – at times – buying governmental policies, special interest groups direct governmental policies away from the preferences of the otherwise pivotal individual. The influence of special interest groups is related directly to the differences in the reaction function of democracies and autocracies, because the smaller number of voters – or the smaller size of the selectorate (Plümper and Martin 2003: 30-35; de Mesquita et al. 2003) – the larger in turn becomes the relative influence of organized special interest groups on the government. Since political influence in democracies is more evenly distributed than in autocracies, lobbies and highly influential individuals find it relatively easier to influence policies in autocracies than in democracies. This increases the likelihood of government inaction in autocracies for two

Selectorate theory also suggests important differences in the way democracies and autocracies use international food aid. Because democratic regimes are more likely to use policies for the benefit of all affected people rather than targeted transfers to a small group of the ruling elite, they are more likely to make (good) use of international food aid for the prevention of famine mortality. Lavy (1992) finds no systematic evidence that international donors discriminate against autocracies in the provision of food aid in emergencies. However, democracies are more likely to ask for food aid and allow the staff of foreign donors into their country, thus maximizing the chance that food aid will be fairly and efficiently allocated to all affected people. As pointed out in the previous section, the reaction of the Indian government to the famine in its state of Bihar was everything but straightforward. However, once famine was officially declared the government happily accepted very large quantities of food aid and allowed staff from foreign donors and international organizations to help in administering and allocating the food aid. With the help of 'the dedicated cooperation of the international community' (Mayer 1974: 111) famine mortality was not prevented, but at least contained.

Autocratic regimes, on the other hand, will regard foreign food aid and its donors with suspicion despite the relief it can bring. They are more likely to hamper and obstruct foreign aid intervention and will try to appropriate as much of the rents from food aid for the ruling elite to the detriment of the broader affected populace. Contrasting the Indian experience of the Bihar famine with that of North Korea provides a case in point. Starting from the mid- to late 1990s, famine has been a persistent phenomenon in North Korea. Despite the reluctant acceptance on the part of the North Korean government that the country faces severe food

reasons: First, while in principle the influence of interest groups can work in both directions, it is likely that those groups that lobby against government action to prevent famine mortality are both more organized and more powerful, e.g., farmer organizations benefiting from protectionist domestic markets. Second, autocracies are likely to suppress lobby groups in favor of government action such as humanitarian and human rights organizations because these typically challenge the right of a small elite to restrict the size of the selectorate to itself.

shortages, it decided to no longer accept international food aid in December 2005.¹³ All private aid groups were expelled. WFP was allowed to resume its operations half a year later in May 2006, but the new contract does not allow the WFP to open offices outside the capital Pyongyang and the operation will be much smaller in size than previous ones. Rather than feeding 6.5 million people as before 2005, the new operation is said to be down to feeding 1.9 million people.¹⁴ At the same time, WFP will no longer have control over the storage, transportation and distribution of food aid, which will be entirely in the hands of North Korean government officials.

Summary and hypotheses

In sum, we argue that both democratic and autocratic regimes face the trade-off between loss of political support for government action and loss of support for governmental inaction toward famine. Democratic regimes are not immune from a political rationale that might induce governments to remain inactive altogether or for too long, which explains why famine mortality can happen even in democracies. In fact, if anything democracies are more severely exposed to the trade-off since autocracies in principle can make those outside the selectorate pay the costs of government action, whereas this is typically not possible for democracies. If democracies have lower famine mortality than autocracies, then this can be explained by differences in how they respond to this trade-off given the different sizes of the selectorate. Stated succinctly, autocratic regimes might maximize their support by compensating members of the selectorate affected by famine via targeted transfers, leaving those outside the selectorate unprotected from the potentially fatal impact of famine. The larger size of the selectorate induces democratic governments to use policies that benefit all affected people, not just a small elite, and the more so the larger the share of affected people to the total population. Of

¹³ World Food Programme press release. (<http://www.wfp.org/english/?ModuleID=137&Key=2092>)

¹⁴ Associated Press. (<http://www.msnbc.msn.com/id/12729278/>)

course, even autocracies will have to eventually respond to an increasing share of the affected population by going beyond targeted transfers to a small elite, if only for fear of riots and rebellion that could undermine the regime. Importantly, however, their reaction will always be more targeted at the benefit of the small selectorate than at the benefit of all affected people.

Furthermore, both democratic *and* autocratic governments are more likely to help those affected by famine if abundant international food aid is available and/or if a large share of the population is affected by the famine. Food aid and the share of affected to total population thus jointly determine the government's response to famine threats and thereby indirectly also famine mortality. The larger the share of affected people to the total population, the more likely are governments to act using measures that benefit all affected people, not just directed targeted transfers. Governments that exclusively use international food aid provided by grants to prevent famines no longer face the trade-off governments face in contemplating acting against famines. However, democratic governments are more likely than their counterparts in autocratic regimes to make good use of international food aid to the benefit of all affected people. The presence of international food aid also increases the probability of famine mortality prevention in autocracies, but to a lesser extent than in democracies, because the autocratic government will direct a large share of the international food aid to directly and indirectly affected members of the elite and a smaller share than their democratic counterparts to the directly affected general population. For any given share of affected people, higher international food aid will lower famine mortality, but more so in democracies than in autocracies. This suggests that a large ratio of affected individuals to the total population and international food aid are partly substitutes. When a larger share of the population is affected by the famine and when international food aid is available, even autocratic governments will act against the threat of famine mortality, and democratic governments even more decisively so.

Our theory of differential famine mortality in democracies and autocracies allows us to formulate three hypotheses to be subjected to an empirical test:

1. Democracies can experience famine mortality, but mortality is likely to be lower the more democratic the country.
2. Famine mortality is lower when international food aid is available and a large share of the population is affected by the famine.
3. Democracies respond more elastically to the simultaneous presence of international food aid and a large share of the population being affected. Thus, the mortality gap between democracies and autocracies increases when both the share of the affected population becomes larger and when more international food aid is available.

5. Research Design

While the four empirical cases lend support to our theoretical claim that democracies may at times fail to effectively prevent famine mortality, these cases were not meant to test our theory. They were deliberately selected to cast doubt on Sen's deterministic claim and they may also generate insights into the politics of famine prevention. But for these very same reasons they were sampled on the dependent variable and this prohibits drawing any general inferences from them. In this section we subject our theory to an empirical test.

Dependent variable

Famine mortality is notoriously difficult to estimate. To our knowledge, there are only two sources that provide estimates of mortality for all the major famines of the 20th century. One is the Emergency Disasters Data Base (EM-DAT) provided by the World Health Organization Collaborating Centre for Research on the Epidemiology of Disasters (CRED), which contains information on the occurrence and effects of more than 10,000 natural disasters since 1900. According to the CRED, the database is compiled 'from various sources, including UN agencies, non-governmental organizations, insurance companies, research institutes and press agencies' (www.em-dat.net) and is maintained and continuously updated by its staff. The

other source is a compilation of mortality estimates from several mostly academic sources on each individual famine put together by Devereux (2000), a well-known scholar of famines. We use EM-DAT as our main source because Devereux (2000) only lists famines with more than 1,000 people killed, whereas EM-DAT also includes famines of smaller size, and use Devereux (2000) only for the few cases in which EM-DAT refrains from providing a mortality estimate (5 out of 35 famines with positive mortality in our dataset).

EM-DAT formally distinguishes between “famines” and “droughts” since not all famines result from drought, but in EM-DAT droughts merely form a sub-set of the broader famine category. Hence we add drought and famine mortality. Our dependent variable is the number of people killed by both “famines” and “droughts” in a country-year, as reported by EM-DAT, complemented by excess famine mortality estimates reported in Devereux (2000) for famines in which EM-DAT does not provide mortality estimates itself.¹⁵ For simplicity, we refer to this as famine mortality. Data availability on our explanatory variables reduces the number of famines with reported fatalities further to 35. No doubt, fatal famines are a rare event. This renders estimation more difficult, but advanced estimation methods can deal with the problem and still generate valid results, which we discuss now.

Estimation technique

Our dependent variable is a count variable, in which on the one hand counts above zero are rare, but counts on the other hand can be fairly large in these rare cases. This is just another way of saying that the sample variance exceeds the sample mean – and it does so by more than a factor of 40. Accordingly, a negative binomial model is more appropriate than the Poisson model. If we were to choose a Poisson distribution to estimate this data, the observa-

¹⁵ For two of the five famine mortality estimates taken from Devereux (2000), he provides a minimum and maximum estimate of excess mortality. We took the mean estimate, but we stress that our results are hardly affected if one takes the minimum or maximum estimate instead.

tions would be over-dispersed and the estimates were likely to be biased. The negative binomial distribution has one more parameter than the Poisson. This parameter is used to adjust the variance independently of the mean. Thus, the negative binomial model avoids over-dispersion and allows unbiased estimates given the sample mean and variance represent the population mean and variance.

Yet, we do not use a standard negative binomial model but a variant of it called the zero-inflated negative binomial model. This model is a maximum likelihood estimator in which a logit (or probit) equation is used to distinguish the functional form of the zeros from the functional form of the non-zeros. To test whether a standard negative binomial model or its zero-inflated variant is more appropriate, we performed the Vuong test, which is based on a normal distribution, so that positive values above 1.7 suggest the use of the zero-inflated model, negative values below -1.7 point towards the use of the simple negative binomial and values between -1.7 and 1.7 are inconclusive. With no exception, we find that the zero-inflated model is more appropriate. However, our results remain *substantively* unchanged if we use the traditional negative binomial model instead (results of which contained in Appendix).

Main explanatory variables

Following our hypotheses, the main variables of interest are democracy, the number of people affected relative to total population, and international food aid. We use Freedom House data on political rights as well as the polity2 variable from the Polity project as our measures of democracy.¹⁶ The advantage of the Freedom House source is that it is conceptually close to

¹⁶ There are two reasons why we built our political theory of famine mortality on selectorate models of political responsiveness and yet do not use the so-called ‘wovers’ variable (W/S=size of winning coalition divided by selectorate size) contained in de Mesquita et al. (2003, 132–36). First, we use the selectorate models to argue for differential political responses of democracies and autocracies, but our hypotheses are not formulated in terms of selectorate size (or winning coalitions). We thus use standard measures of regime type. Second, to compute ‘wovers’, de Mesquita et al. transform selected

the focus of our theoretical argument: “Political rights enable people to participate freely in the political process, including through the right to vote, compete for public office, and elect representatives who have a decisive impact on public policies and are accountable to the electorate.”¹⁷ In contrast, the Polity project puts more emphasis on executive constraints and on equal opportunity in gathering administrative jobs or joining a party.¹⁸

Our theory suggests that democracies respond more elastically to the simultaneous presence of a large share of affected people to total population and international food aid. The number of people affected by a famine is taken from EM-DAT and is defined as ‘people requiring immediate assistance during a period of emergency’. For the very few cases, in which EM-DAT does not provide an estimate, we consulted the sources listed in Devereux (2000) to establish the number of people affected. The number of people affected was divided by population data from World Bank (2004) to create the share of people affected relative to population size. International food aid in tons of cereals was taken from FAO (2004).

Given our theory, we are interested in the interaction effect between both variables and specifically whether the coefficient of this interaction effect is higher in democracies than it is in autocracies. We thus condition the interaction effect between the population share affected by famine and international food aid on regime type dummies (democracy vs. autocracy). If

components of the Polity IV scale – ‘legselec’ for S and ‘xrcomp’, ‘xropen’, and ‘parcomp’, plus ‘regtype’ (Banks 1996), for W (see Stone 2004 for a discussion). While ‘wovers’ is a useful measure of political responsiveness, it assigns similar or identical values for countries that combine a large winning coalition with a large selectorate on the one hand, and countries that combine a small winning coalition with a small selectorate on the other hand. Our theory suggests that governments with a small selectorate use direct transfers to members of the selectorate which are somehow negatively affected by the famine and governments with a large selectorate are much more likely to use broader channels for the distribution of food aid. We therefore need to distinguish political responsiveness along with the size of the selectorate – a task that ‘wovers’ does not deliver.

¹⁷ <http://www.freedomhouse.org/template.cfm?page=35&year=2005>. Last visited 25 June 2006.

¹⁸ <http://www.cidcm.umd.edu/inscr/polity/polreg.htm>. Last visited 25 June 2006.

our theory's predictions are correct then the coefficients of both interaction effects should be negative and statistically significantly different from zero, but the coefficient of the interaction effect in democratic regimes should be significantly larger in absolute terms than the one in autocratic regimes. In other words, democratic governments respond more elastically than autocratic governments to an increase in the share of affected people for any given level of food aid available (or, conversely, to an increase in available food aid for any given share of affected population). We reverse the political rights measure from Freedom House so that it runs from 1 to 7 and higher values mean more democracy. We call regimes with a value of 5 or above a democracy (this is consistent with Freedom House's own categorization of countries as "free"). For polity2, which runs from -10 to 10, we call a regime democratic if it has a value above 6. In both cases, slightly less than one third of countries are democratic and the two democracy dummies are correlated at $r = .81$.

Control variables

Our theory developed a specific causal contingent relationship between democracy (size of selectorate), share of the individuals affected by the famine to the total population, and international food aid on famine prevention and famine mortality. Such a partial model has the advantage of being more focused and typically more consistent than 'washing list' theories, which aim at explaining a phenomenon in its entirety. But partial explanations also have disadvantages. Most importantly, since they ignore some potentially important determinants of the dependent variable, they do not completely inform the choice of an estimation model. Thus, in order to test partial models, researchers need to include control variables to obtain unbiased estimates. In our case, results would be biased if we excluded variables that exert an influence on famine mortality *and* if these variables are simultaneously correlated with the variables of main interest. Our choice of control variables seeks to minimize this bias.

First, we include measures of rainfall and per capita renewable water resource availability relative to withdrawal in the inflation stage of our estimation model. The idea is that abundance of rainfall in a country renders it less likely that the country would ever experience any famine mortality at all. However, some countries can access water via rivers and lakes that are less vulnerable to lack of domestic rainfall (e.g., Egypt's access to the river Nile), which is why we additionally include the second measure, which approximates the abundance of available water resources of a country. Average yearly rainfall in millimeters is taken from the climate data set for political areas described in Mitchell, Hulme and New (2002). Data on water resources and withdrawal in cubic meters is taken from WRI (2004).¹⁹

Second, we include four control variables in the negative binomial stage of our estimation model that can plausibly impact the level of mortality. To start with, we include population size since countries of larger size might have higher absolute mortality numbers, all other things equal. We need to log this variable, however, because famines hardly affect entire countries. The larger a country gets, the smaller is the likelihood that the whole country is affected. To capture both facets of the geography of famines, a log-linearized population variable seems most appropriate. Second, we include population density. Getting food aid to people affected by famine is facilitated by dense populations. Third, we use per capita income in constant US\$ as a proxy variable for a country's extent and quality of infrastructure and administrative capacity to deal with famines and prevent mortality. Data are taken from the World Bank (2004). Fourth, we use a measure of the intensity of civil conflict taking place in a country. In civil conflicts, food blockades are sometimes employed as part of the military strategy of siege, agricultural production is destroyed as a counterinsurgency measure and rural populations have been forcibly removed from their land in Angola, Ethiopia and Mozambique and many other places by both governmental and rebel forces (Macrae and Zwi

¹⁹ Due to lack of time-series data, this variable is purely cross-sectional.

1992; de Waal 1997). Accounting for civil conflict intensity should also capture the cases in which food is deliberately used as a weapon against ethnic or political minorities, which is typically undertaken as part of general warfare (i.e. famine is never used as the only weapon). All of this implies that more intense civil conflicts increase famine mortality. As our measure of civil conflict intensity, we rely on the Uppsala/PRIO 'Armed Conflict Database' (Gleditsch et al. 2002).²⁰ The variable codes conflict intensity on a scale from zero to three, depending on the number of battle deaths (minimum 25, maximum more than 1000 annual battle deaths).

6. Empirical Analysis

Table 1 displays our main estimation results. Model 1 reports the results for political rights as the measure of democracy, model 2 uses the Polity variable.

²⁰ Note that we have adjusted the original data such that the reference point for coding is whether the conflict takes place on the territory of a country. A conflict is not coded for a country participating in a conflict outside its own territory since such conflict involvement is very unlikely to lead to famine mortality.

Table 1. Zero-inflated Negative Binomial Estimates of Famine Mortality.

	Model 1	Model 2
political rights	-0.7681 (0.2487) **	
polity2		-0.1526 (0.0751) *
civil wars	1.5420 (0.5064) **	1.7957 (0.5439) **
per capita income	-0.0061 (0.0009) ***	-0.0065 (0.0010) ***
population (logged)	0.8945 (0.3519) *	0.7947 (0.4402) *
population density	-0.9919 (0.3951) *	-1.1935 (0.4247) **
food aid	0.0011 (0.0015)	0.0003 (0.0013)
affected to total population \equiv aff/pop	119.58 (20.41) ***	114.75 (20.80) ***
food aid * aff/pop in democracies	-0.1935 (0.0495) ***	-0.1802 (0.0567) **
food aid * aff/pop in autocracies	-0.0472 (0.0098) ***	-0.0437 (0.0100) ***
intercept	-8.0800 (5.9042)	-8.4574 (6.8928)
annual rainfall	-0.0009 (0.0003) **	-0.0008 (0.0003) *
net water availability	0.0035 (0.0032)	0.0037 (0.0033)
intercept	2.0144 (1.5024)	1.9533 (1.3754)
1/lnalpha	4.1227 (1.2550) **	4.2061 (1.3754) **
alpha	61.726 (77.465)	67.094 (92.280)
-(pseudo-likelihood)	471.35	473.40
N obs. (=0 / \neq 0)	35/2364	35/2269
Wald chi ²	322.53 ***	270.96 ***
Vuong	2.16 *	2.12 *

* = p<0.1 **=p<0.01 ***=p<0.001

Huber-White robust standard errors in brackets , estimates with standard errors clustered on ID give substantively identical levels of significance

Let us briefly discuss our choice of an estimation model, before we come to the substantive results. The Vuong test, which tests the zero-inflated negative binomial model against the simple negative binomial model, is significantly different from zero and positive for all models. The inflation stage component of our model is thus analytically warranted (the Vuong

test), but we obtain very similar results if we ignore this econometric complication and estimate a simple negative binomial model (see Appendix).²¹ Higher rainfall lowers the likelihood of a country ever experiencing any famine mortality (abundant renewable freshwater resources only matter in the negative binomial model). We also included additional variables such as annual changes in the available food-stock and the ratio of hot deserts to the total size of the country in the inflation stage. Again, the results proved to be robust.

Substantively, table 1 lends support to our hypotheses. We find that democracy reduces famine mortality significantly. This result is robust to whether we operationalize democracy as political rights (model 1) or as the polity2 variable (model 2) variable (hypothesis 1). At the same time, we also find that international food aid reduces famine mortality if the ratio of affected individuals to total population differs significantly from zero in both regime types (hypothesis 2). The larger the ratio of affected individuals to the total population, the stronger the life-saving effect of international food aid becomes. This result suggests that governments use food aid more effectively, when larger parts of the country are affected. Most importantly for our theory, the interaction effect of international food aid and the share of affected individuals is much stronger in democratic than in autocratic regimes (hypothesis 3). In fact, the confidence intervals of the two interaction effects never overlap. Accordingly, governments in democratic countries are much more likely to effectively fight famine mortality, if the famine affects large parts of the population and international food aid is available. To be fair, autocratic governments also respond to famines if the famine is widespread and international food aid is available, but they do so to a much lesser extent. Specifically, our results suggest that everything else being equal, democratic and autocratic governments reduce famine mortality

²¹ As concerns our main variables of interest, the only difference is that the polity2 variable becomes marginally insignificant, whereas the interaction effects remain significant and similar in relative size.

about equally if the share of the population in the autocratically ruled country affected by famine is about four times larger than the share of famine affected people in a democracy.

The coefficients of our control variables also have the expected signs. While civil wars tend to increase famine mortality, per capita income significantly reduces the number of famine deaths. More populous countries tend to have higher famine fatalities, all other things equal. Higher population density lowers famine mortality. It might seem surprising that the ratio of affected people to total population on its own is positive and significant, and that the food aid variable on its own is insignificant. However, with the interaction effects included, these variables cannot be interpreted in isolation. Instead, what matters is the total effect. Figure 1 nicely depicts the effect of increasing the level of food aid for a given share of affected people in both democratic and autocratic regimes.²²

²² Note that we display a representative example of this conditional effect. In this example, the affected population is fitted at 16 percent of the total population. The functions are estimated employing the ‘exponential decay’ algorithm of Origin 7.0. Data points represent the values of the interaction effect that we used for computing the conditional effects. We used Stata’s ‘margeff.ado’ written by Tamas Bartus. The values for all other variables we set to their mean levels to generate famine mortality. Results are substantively identical (but numerically different) if we start with a higher or lower level of famine mortality.

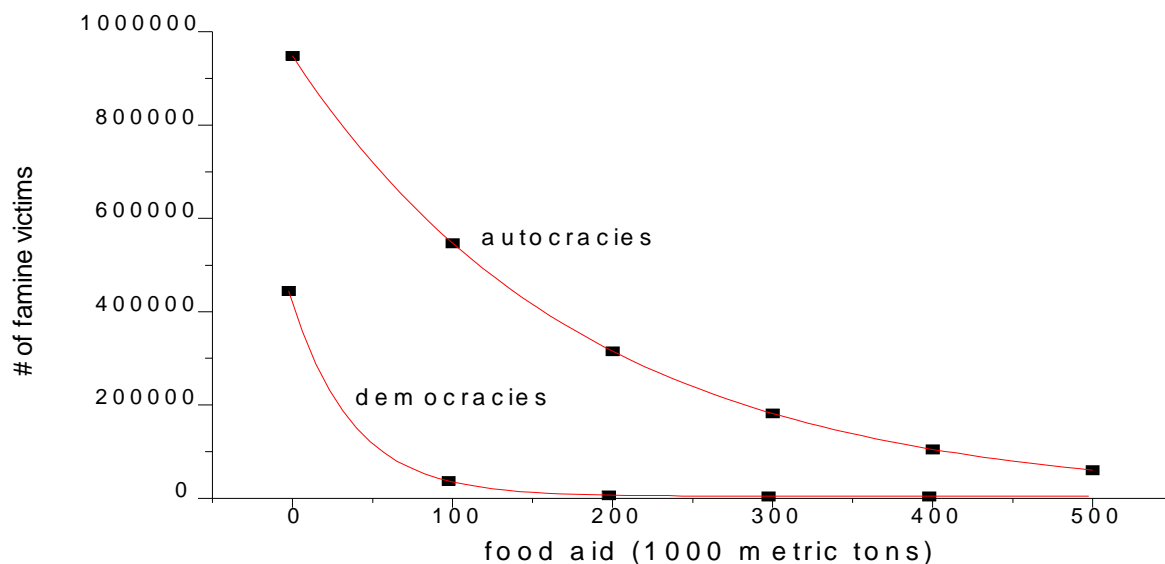


Figure 1: The Conditional Effect of Food Aid on Famine Mortality in Democracies and Autocracies (based on a ratio of affected to total population of 16 percent)

Observe, first, that famine mortality tends to be lower in democracies than it is in autocracies. This, of course, mirrors the negative sign of the democracy variable, but consistent with the four cases that we discussed above, our model predicts significant famine mortality rates in democracies when food aid is absent. While in democracies even moderate levels of food aid prevent famines from becoming mortal, autocracies need much more international food aid to prevent famine mortality altogether. Given our results, the relative difference between democracies and autocracies in famine mortality thus is highest when only a moderate amount of food aid is available.

7. Measurement Error

The exact extent to which famines become mortal remains typically unobserved. In most countries suffering from a famine, no government agency exists which registers the number of deaths along with the reasons that ultimately caused death. Therefore, no one actually *knows*

the number of famine victims.²³ Rather, the published numbers are *estimated* from either mortality data or from census data, which is collected many years, sometimes decades after the famine took place. Both procedures give good estimates of famine mortality, but the information we have available is not error-free.

There can thus be no doubt that the estimation results we have reported in the previous section are based on the analysis of noisy data. To be sure, measurement error renders the estimation less efficient, but – as long as the measurement errors are unsystematic and uncorrelated with the regressors – unbiased and consistent. Of course, the asymptotic properties of our estimates are of little relevance since we are dealing with a very rare event. While we certainly have a sufficiently large number of ‘zeros’ in the dataset, the number of ‘nonzeros’ remains fairly small. We should therefore be more interested in the finite sample properties of our model rather than in its asymptotic properties.

With ‘finite sample econometrics’ (Ullah 2004) still being in its infancy, the most widely used tool to explore the finite sample properties of estimators are Monte Carlo studies. We therefore conducted a Monte Carlo study, which aims at exploring the effect of measurement error on our estimates. Specifically, we re-estimated model 1 1000 times. In each re-estimation, we multiplied the value of the dependent variable of approximately 15 percent of our observations²⁴ by a uniform random number of the interval [0.5..1.5], which mirrors measurement errors of up to 50 percent. Table 2 reports the summary results from this analysis.

²³ Accordingly, the number of famine deaths is not a ‘count variable’ in the strictest sense. Needless to say that the data we analyzed in the previous sections still has the properties which make estimation by count models appropriate and necessary.

²⁴ To determine the ‘subsample with measurement error’ we drew a second continuous uniform random variable of the interval (0..1) and changed only those observations for which the randomly drawn parameter exceeded 0.85. Thus, on average, we changed the dependent variable of about 15 percent of the ‘nonzeros’ in each iteration of the MC.

Table 2: Summary Statistics of the Monte Carlo Analysis testing the Importance of Measurement Error (based on model 1; 1000 iterations)

Variable	Mean	Std. Dev.	Min	Max
political rights	-0.7665	0.0288	-0.8911	-0.6444
civil wars	1.5392	0.0533	1.2650	1.7660
per capita income	-0.0061	0.0001	-0.0063	-0.0057
population (logged)	0.8943	0.0265	0.7287	1.0197
population density	-0.9921	0.0503	-1.2420	-0.7513
food aid	0.0011	0.0002	0.0002	0.0021
affected to total population	119.42	2.11	109.92	125.28
food aid * aff/pop in democracies	-0.1932	0.0045	-0.2075	-0.1729
food aid * aff/pop in autocracies	-0.0471	0.0010	-0.0501	-0.0430

The Monte Carlo analysis reveals that our estimates are moderately sensitive to measurement error. The range in which the coefficients change due to the adding of measurement errors is about as large as the standard error of the estimate. Moreover, the mean of simulated coefficients is very close to the estimated coefficient reported in table 1. Clearly, this exercise reveals that the results reported in table 1 are robust to measurement error.

8. Conclusion

In this paper we have argued that Amartya Sen's deterministic claim – democracies never experience famine mortality – does not stand up to scrutiny. Our discussion of four cases has not only shown that famine mortality in democracies is possible, but also that the response of democratic governments is often complex and delayed as well as subject to political support-maximizing considerations. We have therefore developed a political theory of famine mortality that builds on the 'selectorate' models of political responsiveness (de Mesquita et al. 2003). Our theory leads to testable hypotheses that are very different from Sen. Both democracies and autocracies can experience famine mortality if governments find that inaction is the support-maximizing strategy. The larger size of the selectorate in democracies renders it more likely that democratic governments will act with policies that benefit all affected people, whereas the smaller selectorate in autocracies favors targeted compensating transfers to the selected few, leaving the affected population at large vulnerable to the potentially fatal impact

of famine. Higher levels of international food aid together with a larger share of affected people to total population means that both democracies and autocracies will do more to prevent famine mortality because such aid mitigates the trade-off which support-maximizing governments face, but democracies will again use food aid more for the benefit of all affected people than autocracies.

We have subjected our theory to an empirical test of famine mortality in developing countries over the period for which we have data available (1972-2000). The results lend credence to our theory and are robust to several changes in model specification. Inevitably, a caveat is in order. We do not claim that our quantitative data analysis is conclusive or should be considered as an exhaustive test of our theory. However, we believe that we cannot get much further with the available data and with quantitative methods. Future research must analyze in more detail how governments in different countries deal with the threat of famine mortality and act to prevent it. As yet, published evidence is rather sparse, unsystematic and mainly focuses on the origins and consequences of famines rather than on governments' responses.

Despite this caveat, we believe that our political theory of famine mortality and the empirical evidence presented suggest two important policy conclusions. First, if governmental inaction can be a support-maximizing strategy of governments, then generous international food aid can be a necessary condition for preventing famine mortality despite abundant aggregate food resources being available in the country. This is because international food aid allows governments to respond without incurring short-term costs on the unaffected parts of the population and thus potentially losing political support. In other words, donors interested in preventing famine mortality should not necessarily shy away from offering food aid to a country experiencing famine even though the country has abundant food is already available in the aggregate. Second, international donors need to deal seriously with the fact that democracies react more elastically to international food aid than autocracies for a given share of

population being affected by famine. This does not mean that international food aid should necessarily go preferentially to democracies. Rather, international donors need to find ways to maximize the chances that the international food aid benefits all affected people in autocracies, not just the selected few members of the ruling elite. This is no easy task and provides political scientists with ample opportunity to study the use of food aid in autocratic regimes and the lessons to be learnt thereof.

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Appendix. Negative binomial estimate of famine mortality

	Model A1	Model A2
political rights	-0.8264 (0.2287) ***	
polity2		-0.0889 (0.0652)
civil wars	1.4900 (0.4052) ***	1.2764 (0.4329) **
per capita income	-0.0037 (0.0004) ***	-0.0042 (0.0005) ***
population (logged)	1.4602 (0.2814) ***	1.3797 (0.3042) ***
population density	-0.1763 (0.3955)	-0.4792 (0.4357)
food aid	-0.0003 (0.0012)	-0.0004 (0.0009)
affected to total population \equiv aff/pop	72.58 (13.54) ***	68.19 (13.80) ***
food aid * aff/pop in democracies	-0.1180 (0.0285) ***	-0.1189 (0.0332) ***
food aid * aff/pop in autocracies	-0.0220 (0.0069) **	-0.0199 (0.0331) **
annual rainfall	-0.0016 (0.0004) ***	-0.0015 (0.0004) ***
net water availability	-0.0156 (0.0057) **	-0.0162 (0.0046) ***
intercept	-17.8548 (4.4261) ***	-18.0573 (4.4098) ***
1/lnalpha	5.6729 (0.1793) ***	5.7240 (0.1805) ***
alpha	290.89 (52.14) ***	306.14 (55.25) ***
-(pseudo-likelihood)	472.97	474.74
N obs.	2399	2304
Wald chi ²	787.98 ***	715.35 ***

* = p<0.1 **=p<0.01 ***=p<0.001

Huber-White robust standard errors in brackets , estimates with standard errors clustered on ID give substantively identical levels of significance