Bumba Mukherjee
& Ore Koren

The Politics of Mass Killing in Autocratic Regimes

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Bumba Mukherjee
Department of Political Science
Pennsylvania State University
State College, PA, USA

Ore Koren
Department of Political Science
Indiana University Bloomington
Bloomington, IN, USA

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Preface

Why do authoritarian regimes perpetrate mass killing in some times but not others? What explains the variation in mass killing within nondemocratic states? Despite a large and growing literature on violent repression and civilian mobilization in nondemocratic countries, more work is needed in order to understand and carefully explain one of the most basic decisions authoritarian governments make: whether to kill their own subjects, or not. In this book, we show that food crises play an important role in causing popular resentment and can motivate the civilians to collectively mobilize against the regime. We also show that sustained mobilization against the regime is more likely in developed urban areas, where the civilians can more easily overcome collective action problems.

By showing—using a combination of high-resolution data and detailed case studies—that highly developed urban areas can generate mass killing perpetrated preemptively as a strategy to credibly deter sustained political mobilization by civilians, our book offers a new explanation to the onset and variation in mass killing within nondemocratic countries. It also explains an important linkage between economic development and mass killing. This has implications for our understanding of not only how economic development can cause mass killing, but also how, by impacting human capital, mass killing can cause long-term negative impact on development.

State College, USA — Bumba Mukherjee
Bloomington, USA — Ore Koren

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Note

1. The views expressed in this book are those of the author and do not necessarily reflect the views of the US Institute of Peace.

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Introduction

In 2011, Syrian civilians took the streets to protest against the regime's repressive policies and demand more democratic rights. These protests took place exclusively in the streets of Damascus, Aleppo, and other large cities, where civilians could muster ethnic and social ties more effectively, giving them the ability to wage more sustainable mobilization campaigns (PJTT 2012). The Syrian regime, a military autocracy led by President Bashar al-Assad, reacted violently, killing thousands and plummeting the country into a bloody civil war that few have anticipated (see, e.g., Goldstone 2011). Indeed, from 2011 until mid-2016, the war has claimed the lives of an estimated from 250,000 to 400,000 people (Hudson 2016).

In large part, the protests in the cities of Syria emerged as part of a broader trend of civil disobedience that took place in many North African and Middle Eastern countries, frequently referred to as the "Arab Spring". As was the case in Syria, these protests occurred almost exclusively in large urban areas and involved demands for more democratic rights and anti-corruption policies (Goldstone 2011). Some—such as the protests in Tunisia and, to some extent, Egypt—were successful, others—such as the protests in Jordan and Morocco—face state repression and dissipated, but in only one more case—Libya—the protests took the same path toward a bloody civil war as happened in Syria.

The rapid breakdown of the Syrian polity seems to defy traditional explanations, and recently, a new one emerged: that the droughts that

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preceded the conflict severely imitated food availability and threatened the livelihood of many Syrians, pushing them to mobilize against and protest a highly autocratic, repressive regime (Gleick 2014; Kelley et al. 2015). Yields of wheat and barley dropped 47 and 67%, respectively, and livestock populations plummeted (Gleick 2014, 334), generating mass movement from rural to urban areas, and causing even more pressures on consumption that the regime could not effectively address. Indeed, a displaced Syrian farmer—when asked if the 2011 protests were about the drought—replied: "[o]f course. The drought and unemployment were important in pushing people toward revolution. When the drought happened, we could handle it for two years, and then we said, 'It's enough'" (Friedman 2013). The regime's response was not only violent, as was the case in other Arab Spring countries, but extremely so: military forces and militias intentionally employed mass killings campaigns, murdering thousands of civilians in these cities to prevent these protests from becoming a real threat against the regime.

These violent dynamics were not unique to Syria, but also took place in other nondemocratic states[1] (i.e., autocracies or "anocracies"). For instance, in Tunisia in 1983, the "sudden doubling of bread prices was a crucial factor in the outbreak of mass unrest" (Seddon 1986, 1) staged by civilians against the Habib Bourguiba's authoritarian regime in the country's capital, Tunis. Viewing such anti-regime demonstrations in Tunis as a "threat from 'hostile elements' concerned to overthrow the government" (ibid.), the regime's reaction was swift and violent:

> As the unrest spread, security forces opened fire on crowds in several towns, including the capital Tunis; at least 60 people were killed – as many as 120 according to some reports – and many more injured. (ibid.)

In neighboring Morocco in 1983, opposition to King Hassan's rule within urban areas led to a violent state-sponsored campaign of civilian killings:

> …[a]s social unrest spread through the town of the barren and relatively impoverished north of the country, and broke out even in some of the larger cities of the Moroccan 'heartlands' it was countered by heavy concentrations of state security forces; press reports suggest that at least 100 were killed (as many as 400 according to some sources). (ibid., 1–2)

Likewise, in 1986, the Zia-ul-Haq led military regime in Pakistan responded to civil disobedience with a violent mass killing campaign aimed at political dissidents residing in the country's main commercial city, Karachi (Talbot 1999; Dhulipala 2015). A similar dynamic also emerged in Suharto's Indonesia during 1997 and 1998, when the regime cracked down on dissenters in Jakarta and systematically killed many civilians (Roosa 2006).

Beyond these examples, a close look at new global, *localized* data on civilian killings (PITF 2009)[2] show that nearly 40% of intrastate mass killing events (as defined below) perpetrated by nondemocratic regimes occurred in locations and years that did not experience active conflict. Moreover, the same sample shows that a staggering 56.2% of the locations and years that experienced mass killing[3] had some level of urbanization, although urbanized cells constitute roughly only 17% of all grid cells in our sample. In light of this qualitative and quantitative evidence, it is not surprising that researchers note more work is needed in order to understand and carefully explain one of the most basic decisions such regimes make: *whether* to kill their own subjects, and if so, *when* (Davenport 2007a; Valentino 2014)? Indeed, considering the relative prevalence of these incidents and their magnitude, we find it puzzling that to date no study has attempted to *systematically* evaluate the determinants of mass killing at the *local* level on a *global* scale.

This book does exactly that. Using a combination of anecdotal evidence, theories of economic production, and game-theoretic tools, it tailors a framework to explain how, why, and when mass killing occurs in nondemocratic states, and why it often concentrates in large urban areas rather than the rural countryside. We show that local improvements in development and infrastructure have a crucial effect on the ability of civilian and opposition parties to pose a serious a threat to the authoritarian regime. We also identify *when* such robust civilian opposition is much more likely emerge—when sudden food shortages occur, which generates a political crisis over food access and availability. To protect itself against this sudden and potentially lethal opposition, the regime turns to mass killing as the most viable strategy in a repertoire of repressive responses.

We go into great lengths to show, empirically, that these patterns hold true, both globally and locally. We rely on high-resolution data, many of which originally created for the purpose of writing this book, to validate our main hypothesis linking urban development, food crises, and mass killing. We also conduct detailed case studies of different countries to validate each of the particular mechanisms we hypothesize. In these case studies, we draw on a mixed-methodology, which relies on the quantitative analysis of originally coded data on mass killing, urban development, food crises, and other important factors in different large cities in Pakistan and Indonesia; and a qualitative historical analysis of the economy, politics, urban development, food crises, and violence in Pakistan, Indonesia, and Malaysia.

An important aspect of this book is that, in contrast to many studies on the climate-conflict nexus, it does not linearly equate climatic variations with an overall increase in violence. The Syrian conflict, for instance, has many roots, including long-standing political, religious, and social enmities; economic dislocations due to both global and regional factors; and worsening environmental conditions. This book seeks to systematically explain how and why the onset of food crises—caused by both climatic and global economic factors—concatenates with urbanization patterns to generate *credible* threats to the ruling elite in nondemocratic countries. In doing so, we emphasize that it is not the case that climatic variations always increase the propensity of violence, nor do we argue that drought is a *universal* cause of the violence. Rather, we identify a *specific context* where food crises can generate violence under the right conditions: in developed urban areas within nondemocratic countries.

That is not to say that the book's theoretical contribution is narrow, on the contrary. Through our theoretical and, correspondingly, empirical focus, we are able to develop a well-supported explanation for a large number of mass killing incidents that have not, to our knowledge, received sufficient attention in extant research, especially for mass categorical violence that occurs outside of the immediate context of a civil war. Our focus on subnational patterns of urbanization and violence allows us to predict where and when such campaigns might occur, a useful tool for policymakers. It also allows us to draw more exact linkages between environmental variability and violence, an issue that—again—did not receive sufficient attention by previous research (see, e.g., Blattman and Miguel 2010). If climate and food volatility trajectories hold true, knowing when and how they might impact mass mobilization and—correspondingly—mass killing can help ensuring that the tragic Syrian saga will not repeat itself, or at least that its effects be mitigated. We hope that this book will assist scholars and policymakers in realizing this important endeavor.

Definitions and Substantive Importance

To fully develop our theory and carefully conduct statistical tests to explain how food crises can lead to such extreme violence, we must first define the key concepts and terms used throughout this book. We mentioned earlier that the main aim of this book is to explain why and when nondemocratic states perpetrate mass killing campaigns against their own citizens. But what are nondemocratic states? As described in greater detail in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States," our definition of nondemocratic states—or "non-democracies"—incorporates all authoritarian regimes such as autocracies, anocracies, and other quasi-democratic regimes that are not "true" liberal democracies. To characterize autocracies, we follow Cheibub, Gandhi, and Vreeland who define autocracies as states where executives and legislatures are not chosen by competitive elections, where the winners of elections are known in advance, where the elected candidates do not assume office following the election, or where elections do not take place regularly (2010, 69).

We then characterize "anocracies" using two of the most prevalent definitions in the extant literature.[4] The first approach defines anocracy as a "regime that mixes democratic with autocratic features" (Fearon and Laitin 2003, 81). The second definition views anocracies as regimes that permit some opposition group participation, but in which institutional mechanisms to redress citizens' grievances are weak or nonexistent (Hegre 2002, 8; Gandhi and Vreeland 2004). Further, according to Levitsky and Way (2002, 51), anocracies are in essence "hybrid [or partial] political regimes," which—from a geographic perspective—exist primarily "across much of Africa (Ghana, Kenya, Mozambique, Zambia, Zimbabwe), postcommunist Eurasia (Albania, Croatia, Russia, Serbia, Ukraine), Asia (Malaysia, Taiwan), and Latin America (Haiti, Mexico, Paraguay, Peru)."

While repression might come in many varieties within nondemocracies, we focus on one specific, extreme type of violence: the mass killing of civilians. By mass killing, we refer to situations where the regime *intentionally* kills a large number of *noncombatants* for *political* reasons. This broad definition distinguishes mass killing from other violent situations such as when combatants are killed during war or when civilian deaths occur by intentional targeting, e.g., during naturally occurring famines. Considering the complications involved with defining mass killing qualitatively—for instance, because establishing intent or categorical targeting is complicated if not impossible in many cases—similarly to other studies on the topic we rely on a *quantitative* definition (e.g., Ulfelder and Valentino 2008; Valentino 2004; Downes 2008).

This book, however, diverges somewhat from other studies in that our definition of a mass killing campaign is based on a strategic shift; extreme violence emerges if the regime faces an existential threat *in a given location*. Thus, in contrast to studies that study and empirically measure acts of mass categorical violence, particularly mass killing and genocide, at the country level (e.g., Valentino 2014; Valentino et al. 2004; Koren 2017), we use the term "mass killing" to identify a specific trend of systematic violent repression occurring locally. Thus, as discussed in detail in Chapter "Urban Development and Mass Killing: A First Look at the Data," because we are interested in the variation of violence *within the state*, we adopt a slightly more specific conceptualization of mass killing and define such campaigns as incidents occurring in specific locations within a given country where at least 50 noncombatants are intentionally killed by the state due to political reasons during a given year.

At the heart of this book is the notion that the variation of mass killing campaigns within a given nondemocratic country is strongly impacted by the interaction of two factors. The first is the annual level of local urban development per capita, which represents the material capacity available for each individual in urban areas within the nondemocratic state during a given year. Higher urban development levels increase the amount of resources available for each individual civilian, which can be contributed toward resisting the authoritarian regime (e.g., Tilly 1978; Habermas 1970; Wallace 2013). By improving communication technology and freeing more time for nonwork-related activities, urban development also improves the ability of urban civilians to coordinate their anti-regime activities and more easily sanction "free riders" (e.g., Pierskalla and Hollenbach 2013). Higher urban development per capita levels thus give civilians residing in these areas the *ability* to wage a more effective resistance campaign, making it more likely that the nondemocratic regime will view such efforts as an existential threat. As discussed in greater detail in Chapter "Urban Development and Mass Killing: A First Look at the Data," we rely on annual levels of nighttime light emissions within urban areas to approximate urban development and then normalize the resulting indicator by population to identify the material capacity available for each individual civilian in these locations, in a manner used by past research (e.g., Henderson et al. 2012; Zhang and Seto 2011).

Urban development, however, is only part of the equation. After all, the ability to wage an effective civil resistance campaign does not mean such efforts will take place without some sort of a trigger. In this book, we focus on one important motivator of mass killing in urban areas, which has been relatively neglected by previous research: political crises caused by shocks to food production, or "food crises." When sudden constraints on food availability or access in a given country, for instance due to sharply rising prices or extremely low precipitation, this has grave implications for the amount and types of food the civilians residing in these states can consume. These sharp and sudden declines in consumption can push the civilians to take the street and stage massive protests, especially in urban areas (e.g., Hendrix and Haggard 2015; Bellemare 2015). Thus, while high local urban development per capita levels give urban civilians the ability to wage an effective resistance campaign against the regime, the dissent generated by a food crisis give them the *willingness* to do so. As discussed in greater detail in Chapter "Statistical Analysis of Food Crises and Mass Killing," we rely on different measures to conceptualize food production crises, including food price volatility and climatic variability.

Explaining why and when nondemocratic regimes may resort to mass killing against their own subjects in response to food crises and urban development levels is important for several reasons. First, as shown in Table 1 in Chapter "Urban Development and Mass Killing: A First Look at the Data," the vast majority of nondemocratic regimes are located in the developing world. Considering that developing countries are likely to experience the strongest impact of global temperature variations in future decades if current weather patterns hold (Vidal 2013), identifying linkages between food shortages and political violence can yield important insights into potential approaches for preventing the onset mass categorical violence. This, in turn, can provide policymakers, government agencies, and nongovernmental organizations with theoretical and empirical tools designed to assist with the prevention of such calamities if a food crisis arises.

Second, by focusing on localized mass killing campaigns and their concentration in urban areas with higher levels of development, this book draws the attention of political violence and repression scholars to the importance of these areas as hotbeds of political resistance, and hence violence. Drawing linkages between urban development and protest on the one hand (as some previous studies—e.g., Pierskalla 2010; Wallace 2013; Hendrix and Haggard 2015—have suggested), and localized mass killing on the other can supplement current research, which links political violence primarily to rural areas (e.g., Kalyvas 2006) or ongoing civil conflict (e.g., Valentino 2004; Valentino et al. 2004; Poe and Tate 1994). This complements large bodies of research on mass killing and political violence (discussed below) and highlights some of the intrastate variations in violence, which heretofore received little scholarly attention (Davenport 2007a).

In addition to the theoretical and normative implications of addressing the questions posited above, there is little doubt that mass killing campaigns have substantial socioeconomic and political costs. As indicated by the recent turmoil in Syria, mass killings of civilians produce long-lasting refugee crises, as civilians flee the regimes that target them. Such refugee crises also create significant socioeconomic costs and domestic political pressures in refugee-hosting countries.

Owing to these different issues, understanding the political and economic factors that drive nondemocratic regimes to deliberately target and kill large numbers of their own citizens is imperative because it can help identifying prevention strategies that could be used to deter nondemocratic elites from pursuing this detrimental option. Such strategies can assist the United Nations and advanced industrial democracies—the most likely hosts of civilian refugees—to optimally design collective policies to credibly deter and punish nondemocratic regimes that seek to commit mass killing to preserve power.

Finally, international law scholars show that the repercussions of mass killing and the exodus of civilians fleeing such violence make rebuilding robust economic and rule-of-law institutions in these countries even more difficult (e.g., De Greiff 2006). For once, the exodus of a substantial number of civilians from afflicted countries essentially means that crucial political opposition figures such as members of the intelligentsia, journalists, doctors, teachers, and entrepreneurs are likely to also leave the country. With these "alternative" elites leaving, human and financial capital availability in these countries strongly decreases, which negatively impacts any reconstruction efforts. Given the high and long-term costs of mass killing, improving our collective ability to understand and prevent this mass violence is vital.

Overview of Existing Studies

A guiding premise of this book is that despite a great deal of academic and popular interest in violence, repression, and food security, the causes for the onset of this violence and the linkages between repression and food security remain poorly understood. Extant literature on the subject suffers from a number of limitations. Specifically, these are: the theoretical and empirical level in which violence is aggregated and understood, the vague and noncontextualized focus of climate as a cause of violence, and the overcompensation for urban biases in the literature in favor of rural conflicts, which neglects the role of urban areas as hotbeds of political violence. Accordingly, the theory and analyses presented in this book speak to five main academic literatures, as well as policy research in international development. In doing so, it amalgamates the literatures on political violence and mass killing on the one hand and authoritarian regimes and repression on the other, focusing on potential triggers of violence in nondemocratic countries.

The first relevant body of research focuses on the various causes of political violence, ranging from atavistic irrationality to fully strategic and instrumental approaches. This literature links mass atrocities to factors such as political strategies (Valentino 2004; Kalyvas 2006), ethnic enmities (Horowitz 1985; Fein 1979), societal fanaticism (Gerlach 2010; Scott 1998), violent elite politics (Straus 2015; Gagnon 2004; Wilkinson 2006; Brass 1997), limited democratization (Snyder 2000), and natural resources (Azam and Hoeffler 2002). An especially salient indicator of mass killing, civil war have been the main focus of analysis in recent decades. Kalyvas (2006), for instance, associates violence during civil conflict with factors such as asymmetries of control and missing information on enemy forces and collaborators, and argues that indiscriminate violence frequently arises in low information contexts (2006, 148–149). In the same vein, Valentino et al. (2004) and Poe and Tate (1994) argue that governments in the midst of a civil war might use mass killing as a last-resort strategy against populations they view as potential rebel supporters. From a more macrolevel perspective, Valentino (2004) argues that nondemocratic governments employ mass killings of civilians as a strategy when they find it “both necessary and effective” (2004, 67). Adopting an even more “totalitarian” perspective, Gerlach (2006) argues that such violence “originates from complex processes deeply rooted in the society in which they happen or by which they are generated” (2006, 458).

By highlighting the instrumental nature of such extreme violence, these arguments yield important insights into its causes. By viewing elite behavior as a by-product of their autocratic nature or the conditions of war, however, some of these arguments provide relatively few insights into why mass killing occurs at specific moments, especially considering that many mass killing incidents happen outside the context of civil war (PITF 2009). The focus on civil war, which is fought primarily in rural areas (Kalyvas 2004), also means that these study neglected how features specific to urban areas might also attract significantly higher levels of violence. Moreover, the vast majority of these arguments suffer from level-of-analysis problems—either these studies are focused on the country level, meaning that as a result, as Varshney argues, "did not 'go inside the state' to examine how actually economic policy is performed" (1993, 16); or they are too theoretically and empirically focused on dynamics occurring at the microlevel, which limits their ability to draw inference to a wide variety of cases and contexts.

This book takes the middle way with respect to this research. Both our theory and analysis begin at the microlevel to explain how violence might arise at the bottom-up strategy and then show how these microlevel interactions between different actors in particular contexts affect observed patters of violence at the macrolevel. In doing so, we are able not only to identify salient causes of political violence, but also to explain why such violence frequently occurs outside the contexts of civil war. We also show that despite the fact that they have been relatively neglected in recent research due to the focus on civil war and its rural nature, urban areas attract significantly high levels of state violence.

A second body of research focuses on the motivations of nondemocratic elites to use violence in order to stay in power. Thus, in contrast to research on political violence, it is less concerned with the strong incentives and constraints posed by civil war. Instead, research on state repression and nondemocratic regimes complementarily associates violent state repression with competition between elites (Frantz and Kendall-Taylor 2014; Gagnon 2004; Varshney 2002), the necessity to co-opt the security apparatus (Colaresi and Carey 2008; Mitchell et al. 2014; Krain 1997), increased probability of dissent (Pierskalla 2010; Chenoweth and Stephan 2011; Frantz and Kendall-Taylor 2014), and lack of political openness (Rummel 1995; Lutz and Sikkink 2000; Escribà-Folch 2013). Scholars such as DeMeritt (2015), Koren (2014), and Mitchell et al. (2014)

also associate higher risk of attacks with delegation of violence to different types of military forces.

These studies yield important insights into why mass killing might arise in times and locations that do not experience civil war. However, to the best of our knowledge, barring a handful of papers, few studies of authoritarianism have systematically analyzed the dynamics of repression with a specific emphasis on urban areas and development, despite the latter's important relation to both regime power and dissent, as highlighted almost fifty years ago by Habermas (1970). Nor do these studies explain how such dynamics might be influenced by decreases in food security, food volatility, or climatic shocks.

These shortcomings stem from a focus in this literature on the country level as the unit of analysis. The focus on country-level characteristics has yielded important insights, but understanding how variations in repression patterns *within* countries can help to explain some violent regime behaviors that the focus on the state cannot. While this book focuses on linkages between mass killing, urban development, and droughts—a specific within-country pattern of violence—our disaggregated approach directly relates to two important areas in the research on repression highlighted by Davenport (2007a).

First, similarly to other studies that rely on a similar procedure (e.g., Wood 2014; Pierskalla and Hollenbach 2013) our disaggregated approach allows us to develop a bottom-up "theoretical explanation for why repression takes place" (Davenport 2007a, 17). Our model and its focus on preemptive mass killing in nondemocratic countries provide one explanation for why autocratic regimes systematically kill their own citizens, even when this strategy might backfire (see Chenoweth and Stephan 2011). The localized capabilities available to individual civilians in urban areas mean that the latter enjoy strong mobilization potential. These localized "grassroots" capacities, in turn, can generate a commitment problem at the country level and thus explain preemptive mass killing.

Second, our empirical analysis specifically revolves around, "the disaggregation of repressive behavior across time, space, and types of activity" (Davenport 2007a, 17–18). This can yield counterintuitive results, and sometimes even illustrate that the patterns occurring at the subnational levels are the opposite of these operating in the country level (see, e.g., Koren and Sarbahi 2017; Wood 2014). Our theory and formal model's derivations suggest the existence of one specific geospatial pattern of violent repression: Where the level of urban development is high, authoritarian incumbents are more likely to kill civilians during food crises, i.e., periods when the ability of the civilians to mobilize spells a grave threat to the regime's ability to remain in power. Accordingly, we use a global high-resolution dataset to evaluate these expectations and highlight variations in repression within states on a global scale.

A third body of research to which this book speaks is the literature concerned with civil disobedience, social movements, and dissent. Chenoweth and Stephan (2011), for instance, show that nonviolent civil disobedience is a powerful strategy of resistance within nondemocratic countries. When these campaigns have a "maximalist" aim—i.e., to remove the regime or secede from the state—the reliance on nonviolent methods significantly improves the probability of the opposition's success. A key component of this argument is that during civil disobedience, the use of violence by the regime is more likely to "backfire," resorting with increasing the probability of the campaign's success rather than reducing it. As this is an important factor, the dependent variable we code when validating a key mechanism in our argument using data from Pakistan and Indonesia measures the occurrence of violent anti-regime protests, specifically, and not civilian mobilization more broadly.

An important aspect of civil disobedience is that such campaigns tend to emerge and have the most impact in urban areas. Partly, this is because people residing in urban areas might have more capability to mobilize compared with rural dwellers. Wallace (2013), for instance, shows that higher urbanization levels allow the civilians to solve collective action problems more easily, thus making anti-regime mobilization more likely. Additionally, some nondemocratic regimes might be more dependent on domestic investment and local elites, meaning they are more likely to face constraints on their repressive behaviors in areas where the sources of investment or elites are located (Wright 2008).

A key determinant of whether or not civil disobedience will emerge, which have gained new prominence in recent years, is food-related shocks. This research has been partly motivated by scholars such as Tilly (1971, 1978), but also by historical examples—throughout history, food scarcities frequently led to social unrest. Food riots were associated with the onset of the French Revolution (Rudé 1964), the fall of the Confederate State of America (Smith 2011), and the 1917 Russian Revolution (Wade 2017), and more recently, the Arab Spring protests

(Goldstone 2011). These examples all illustrate that clear and strong linkages between food shortages and widespread civil disobedience exist in both democratic and nondemocratic countries. Looking at the frequency of the global occurrence of riots, Bellemare (2015) finds that these closely follow sharp increases in food prices. Similarly, focusing on urban areas in the developing world, Hendrix and Haggard (2015) find that higher food prices frequently lead to urban unrest in both democratic and nondemocratic states. Finally, Weinberg and Bakker (2015) find that increases in domestic food prices are positively and significantly associated with different types of social conflict.

These studies all yield important insights, but stop short of explaining civilian victimization in these areas and times. They also provide only a partial picture of how these factors impact variation in mobilization within states, because the interactions between urban development and consumption crises as well as the latter's compounding effect on the former are not explored. In this book, we do exactly that. Our three-part theory logically shows how food crises can lead to mass unrest in urban areas and how such mobilization can be met with violent state response done to prevent such campaigns from becoming an existential threat to the regime. We also validate each of these stages statistically using original data from Pakistan and Indonesia to show empirically that these linkages are valid.

The focus on food-related shocks as a cause of unrest and political violence directly relates to a fourth body of research on the climate-conflict nexus, which has gained ample attention in both academic and policy-making circles. For instance, in their analysis of the relationship between climate variability and conflict in Sub-Saharan Africa, Burke et al. find that "[t]emperature variables are strongly related to conflict incidence over our historical panel" (2009). See also Miguel et al. (2004). They further hypothesize that "[t]emperature can affect agricultural yields both through increases in crop evapotranspiration (and hence heightened water stress in the absence of irrigation) and through accelerated crop development…reducing African staple crop yields by 10–30% per °C of warming" (ibid.). Somewhat more cautiously, O'Loughlin et al. conclude that, "[o]ur study and other studies question the evidence that climatic variability is uniformly driving up the risk of conflict in sub-Saharan Africa," while also noting that "the positive association between instability and temperature may result from the harmful effects of high temperatures on food products such as maize" (2012). Some subsequent studies find support for these conclusions (Raleigh and Kniveton 2012; Hendrix and Salehyan 2012; Hsiang and Meng 2014), while other scholars question the validity of these findings and show that the incidence of conflict is primarily related to political and economic conditions (e.g., Buhaug 2010). In common to all these studies, however, is the insight that a major mechanism by which climate change increases the likelihood of conflict is through its effects on food supplies.

Evidence on linkages between armed conflict, climate, and food scarcities is still somewhat limited. However, it is becoming increasingly evident that negative shocks to production can increase the probability and frequency of violence against civilians, specifically. For instance, in their study of religious violence in Europe between 1100 and 1800 AD, Anderson, Johnson, and Koyama find that "a one standard deviation decrease in average growing season temperature in the fifteenth and sixteenth centuries was associated with a one to two percentage point increase in the likelihood that a Jewish community would be expelled" (2017, 1). Similarly, in a high-resolution analysis of violence against civilians within agricultural regions worldwide, Bagozzi, Koren, and Mukherjee find that, "droughts can increase the incidence of rebel-perpetrated atrocities against civilians in agricultural areas of developing countries" by more than 42% in a given location during a given year (2017, 1070).

One important shortcoming of existing research on the relationship between climate, food, and conflict is that extant studies rarely if ever evaluate the role of mediating factors, or analyze how resource scarcity impacts conflict (Theisen et al. 2013). Moreover, many such studies neglect the highly contextual nature of these relationships, which provides one explanation for the divergent findings on whether and how armed conflict is impacted by climatic variability (Buhaug 2010; Gleditsch 2012). In this regard, the book provides two important contributions to this body of research. First, it disaggregated the specific mechanisms that link food production shocks with violence, focusing on the role of geospatial variations in the working of these mechanisms. Second, rather than treating climatic variability as a universal or a continental generator of conflict (see, e.g., Burke et al. 2009), the theory developed and the analyses conducted in this book do the opposite. Specifically, we identify a *specific context* in which climate *can* generate a particular political violence type, urban areas during droughts, explain in detail why this is the case, validate the mechanisms leading to this contextualized claim, and finally validate it globally for a large number of cases comparable to the two used to test these mechanisms (Pakistan and Indonesia). Doing so not only avoids making overly bold claims about highly complex and conditional relationships, but also increases the probability of identification the causal mechanisms behind these specific linkages.

Finally, this book also contributes to a growing body of research on economic development policy. Institutions such as the World Bank, OECD, and UNHCR, as well as nongovernmental organizations such as Human Rights Watch and Amnesty International, publish numerous reports on the impact of development on human rights violation and the determinants of democratization more broadly. Considering the potentially grim implications of food crises, in this book's conclusion we discuss potential policy implications of our research and suggest strategies of mitigating the impact of food crises on political violence. In doing so, we hope that these and other similar organizations will find the book useful as a reference and a research tool for their policy reports and monographs, in the hopes of reducing and eventually eliminating the humanitarian and economic impact of food crises identified here.

Theoretical Framework

This section lays out the book's theoretical framework explaining the variation in state-perpetrated mass killing across autocracies and anocracies, which we label *nondemocratic regimes* (or nondemocracies) for convenience. Our theory examines how a specific trigger—which, as Straus suggests, acts as a "precipitating event" (2015, 53–54)—coalesces with certain microlevel and macrolevel risk factors in nondemocracies to generate localized mass killings by the regime. We use a variety of theoretical and empirical tools to gain insights into the "multifaceted" (Straus 2015, 54)[5] phenomenon that is mass killing to develop our theoretical framework and identify its underlying mechanisms.[6]

Using a combination of formal game-theoretic logic, basic microeconomic theory, and inductive reasoning, we develop our theoretical framework in two parts. The first part begins with a working definition of nondemocracies (our political entities of interest), defined in the previous section, followed by a rationalization for why choose to focus on these regimes. We then discuss how a key triggering event, namely a food crisis, can motivate urban civilians to overtly oppose the ruling elite and seek to depose it. We begin the second part with an in-depth discussion of when and where civilians in nondemocratic countries will successfully undertake collective action and mobilize against the regime if the occurrence of a food crisis gives them the incentives to mobilize against the regime. We then formalize these dynamics, focusing on the strategic interactions between the ruling elite the civilians in nondemocratic regimes, and how these can lead to state-led mass killing under the conditions mentioned above.

This theory can be summarized as follows. First, as we explain in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States," research on mass killing, authoritarianism, state repression, and civil disobedience has identified multiple conditions[7] that can drive civilian in nondemocracies to both develop strong anti-regime preferences, *and* seek to actively depose the incumbent (see, e.g., Davenport 2000; DeMerritt 2012; Danneman and Ritter 2014; Urdal and Hoelscher 2012; Straus 2015; Waller 2016).[8] While we account for these explanations in our empirical analysis, it is important to note here that the link between economic crises (e.g. economic output shocks, food price inflation, and financial flow shrinkages) and popular mobilization against nondemocratic incumbents has recently begun to gain traction among researchers (see, e.g., Bellemare 2015; Hendrix and Haggard 2015; Weinberg and Bakker 2015).

This is not surprising as both mainstream media outlets and policy analysts have repeatedly associated the combination of an economic crisis—especially as these pertain to severe food shortages—and poor governance with mass protests during the recent Arab Spring of 2011–2012 in Egypt, Tunisia, and Morocco (Zoellick 2011; International Crisis Group 2011; Stepan and Linz 2013). Analysts have also argued that sharp drops in food output were a key factor in engendering recent mass protests in other Middle East and North Africa (MENA) countries such as Jordan, Libya, Syria, Algeria, and Bahrain (Zoellick 2011; Kadri and Bronner 2011; Erdogu and Bryan 2015). Motivated by these examples and recent research into the link between economic crises and social unrest,[9] our theory and analysis are focused on one overlooked key factor that—as we argue—*strongly* feeds into existing grievances the civilians hold against the regime in nondemocracies *and* incentivizes them to actively mobilize against the latter: the occurrence of a food production (i.e., output) shock and its associated effect on domestic food consumption, a combination we term "food crisis."

As discussed in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States," food crises can occur as a result of high food price volatility, sudden severe droughts, or exogenous economic shocks such as financial crises. We further suggest in our theory that there are three main reasons as to why food production crises (i.e., acute food shortages) are likely to induce domestic civilians to oppose the ruling elite in nondemocratic countries. First, a severe food crisis directly threatens the well-being of households and individual citizens. As such, fear and uncertainty *ex ante* about their own survival can—at the very least—compel the civilians to voice their concerns and demand that the ruling elite will address these issues. However, due to the relative lack of consumption-smoothing mechanisms in these countries—or the lack of will on the count of the regime to use such measures—the ruling elite will fail to adequately address these concerns, unless some form of external aid is provided.

At the same time, formal institutional venues of political representation that provide a credible means for the civilians to redress their grievances during a food crisis are typically ineffective in nondemocratic regimes. As emphasized by Gehlbach, Sonin, and Svolik:

> Which institutions, rules, or even leaders govern in dictatorships is often unclear or contested. This is because a great deal of authoritarian politics is…noninstitutional and entails the threat or overt use of violence. (2016, 566)

Furthermore, owing to weak institutional constraints on the executive branch in nondemocratic countries, the ruling elite will continue its rent-seeking activities during the crisis and may even seek to capture dwindling food supplies for its own consumption, thus depriving ordinary citizens of much-needed food supplies rather than actively taking steps to redistribute food. The strategy of depriving the civilians of food during times of crisis also provides an opportunity for the ruling elite to signal its willingness and ability to assert its monopoly over the supply of this vital resource. This monopoly power can also help the ruling elite to exercise control over a potentially restive populace if a food crisis hits, e.g., by intentionally depriving its subjects of food to weaken their resistance.

Unfortunately, however, the ruling elite's apathy to their plight is likely to generate negative attitudes among the civilians in advance and thus create expectations *ex ante* that the regime will not address their problems if a crisis occurs. This means that the tensions between the civilians and the ruling elite will increase substantially, owing to the latter's cavalier attitude toward the former's plight. Indeed, building on the work of scholars such as Straus (2015), we argue that it is during a food crisis that, "tensions become exaggerated, when distrust between populations or between states and citizens increases" (Straus 2015, 53–54) exponentially. These political tensions give the civilians the necessary incentives to *overtly oppose* and challenge the ruling elite.

These incentives notwithstanding, as was articulated by Gurr (1970) almost fifty years ago, mobilizing and openly challenging the regime poses a collective action problem for the civilians, who may choose to free-ride on each other's effort rather than take an active part in the protests. Again, an extensive body of research on social movements, protest, and state repression has, for several decades, emphasized the saliency of such collective action problems in preventing effective opposition from forming (see, e.g., Gurr 1970; Tarrow 1994; Lichbach 1998; Moore 1998, 2000). As put by Tarrow:

> Movements *do* have a collective action problem, but it is social: coordinating unorganized, autonomous and dispersed populations into common and sustained action. (1994, 10)

Collective action problems, in short, mean that a food production crisis in-and-of-itself is insufficient in explaining when the civilian would mobilize and revolt again nondemocratic elites.

This raises an important question: When will domestic civilians in nondemocratic countries successfully mobilize against the regime during a food crisis? As an answer to this question, our game-theoretic model suggests that civilians in nondemocracies are more likely to act collectively—and more importantly, mobilize—against the ruling elite in the context of an ongoing food crisis in areas within the state where the level of urban development is sufficiently high.

What do we mean by the term "urban development?" As we discuss in Chapters "Food Crises, Urban Development, and Mass Killing in Nondemocratic States" and "Urban Development and Mass Killing: A First Look at the Data," urban development refers to both technological—such as the extent of electricity and infrastructure provision—and social—such as the ability to create social clusters or effectively articulate common goals—in urban areas within developing countries, which are often captured by nighttime light emissions (see, e.g., Elvidge et al. 2014; Chen and Nordhaus 2011; Henderson et al. 2012; Weidmann and Schutte 2017). These provisions improve productive efficiency, increase wages, free more time for nonwork-related activities and provide the civilians with more technological means that could be used to improve social interactions and anti-regime activities (e.g., cell phones and computer printers).

Building on insights from these and other studies, we argue that high urban development levels provide the civilians with significant material and technological capacity to organize, communicate with each other, and successfully coordinate an effective opposition to the regime. This in turn facilitates both coordination and cooperation among these civilians, promoting collective action between individuals. While the onset of a food crisis gives the civilians the *willingness* to mobilize, high urban development levels give them the *ability* to do so and thus overtly oppose the government. These arguments lead to our first theoretical claim: when a food crisis occurs in nondemocratic regimes, higher levels of urban development per capita will be associated with a higher number of civilian mobilization efforts that are openly aimed against government establishments.

Building on this claim, our model further suggests that once the civilians in more developed urban areas mobilize against the regime, they will be more likely to sustain their opposition campaign as an open civil revolt and increase its effectiveness, and correspondingly, the probability of regime change. It is important to note here that the costs the ruling elite incurs from appeasing the civilians in order to dissuade the latter from opposing the regime will increase substantially under these conditions and may become prohibitive. This poses an *existential threat* to the elite and its ability to maintain power, a possibility that is explicitly recognized or at least perceived by the government. Importantly, this existential threat puts the ruling elite under enormous pressure to preempt the civilians from mounting a sustained civil revolt.

The pressure to preempt this threat using violent means intensifies the already powerful competition between the civilians and the ruling elite. This pressure generates larger returns for violent behavior by the regime and incentivizes "political and security officials to respond to organized and typically substantial street protest with a violent crackdown" (Straus 2015, 86). It also motivates the elite to assert its political control by seeking to forcefully evict a share of the population from urban areas during a food crisis, thus reducing the possibility of overt sustained opposition against its rule. Indeed, if at least some share of the civilians is forced to flee and geographically disperse, then the civilians' ability to coordinate, undertake collective action, and sustain their anti-regime revolt is likely to be significantly reduced. Preemptive violence against civilians also decreases or destroys resources available to civilians in urban areas and can limit and eliminate local networks of civilian interaction. Building on this logic, our model suggests that the ruling elite's preemptive goal of forced eviction influences its strategic behavior in three main ways, as we explain in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States."

More crucially, the central result that emerges from this set of incentives and behaviors exhibited by nondemocratic regimes during a food crisis in areas with high urban development levels is that the probability of localized mass killing substantially increases. The ruling elite perceives mass killing as a "necessary and effective" (Valentino 2004, 67) strategy to credibly deter sustained political mobilization by the capable civilians—who overtly committed themselves to oppose the regime in areas with high urban development levels—and assert political control. These theoretical claims lead to our main testable hypothesis: The onset of a food crisis (that often stems from high food price volatility) in nondemocratic regimes will substantially increase the probability of state-led mass killing campaigns of civilians where the level of urban development per capita is sufficiently high.

In contrast, as described in more depth in Chapter "Urban Development and Mass Killing: A First Look at the Data," when urban development levels are relatively low, collective action problems are likely to persist, meaning that the civilians will be unlikely to successfully mobilize and challenge the regime during a food crisis. As a result, the civilians are unlikely to credibly challenge the ruling elite under this scenario—a limitation the elite fully recognizes. The absence of credible challenges to the elite's rule in turn means that it has little or no incentives to incur the costs of resorting to mass killing to preserve their rule. Hence, the first corollary associated with our main hypothesis is that when the level of urban development is low, a food crisis, in-and-of-itself, will be *unlikely* to lead to mass killing campaigns under nondemocratic regimes.

Finally, when urban development is sufficiently high but when no food crisis occurs, civilians in nondemocratic states will have an inherent advantage with respect to mobilizing against the regime. While the absence of a food crisis implies that civilians may not feel immediately compelled to openly mobilize against the regime, there is always a real possibility that they can feasibly oppose some of its policies if another type of incentive (i.e., unrelated to a food crisis) is provided, given that urban development levels are high. Hence, the ruling elite will occasionally have the incentive to use mass killing locally against the civilians in areas with higher urban development levels even when a food crisis does not occur. As these incentives are beyond the scope of this book, we do not discuss them in detail here. However, some of these incentives might involve demand for more minority rights (as happened, for instance, in Romania in 1989), student activism (as happened, e.g., in China in 1989), and the mobilization of political opposition (as happened, for instance, in the Philippines under Ferdinand Marcos's rule).

Empirical Research Methodology

We adopt a multi-methodological approach to test our main hypothesis and both its corollaries. While this multi-methodological approach is described in detail in Chapter "Urban Development and Mass Killing: A First Look at the Data" of this book, we provide an overview of the empirical research strategy used to evaluate these claims and the mechanisms underlying each here. We begin our empirical analysis by statistically evaluating our main hypothesis—in the context of a food crisis (resulting from negative shocks to agricultural production), the propensity for regime-perpetrated mass killing campaigns against civilians increases sharply if the level of urban development per capita is sufficiently high.

Note that our theory, which leads to the main hypothesis, highlights the within-country variation in the occurrence of mass killing campaigns within nondemocratic states. As discussed in detail in Chapter "Urban Development and Mass Killing: A First Look at the Data," data measured at the annual country level would therefore be inadequate for the purpose of evaluating our hypothesis. Therefore, to verify that our analyses capture *within-country* variations in state-led mass killing in nondemocratic countries, we first develop a comprehensive list of nondemocratic regimes as defined above. Next, within this set of nondemocratic regimes, we define our unit of analysis as the annual (i.e., occurring at year *t*) 0.5-degree grid cell—as measured by the PRIO-Grid framework (Tollefsen et al. 2012)—within each state in our nondemocratic country sample for the 1995 (the first year in which grid cell-level data on mass killing campaigns are available) to 2009. The 0.5-degree resolution corresponds to a squared "cell" of approximately 55km × 55 km at the equator, which decreases in size as one moves toward the Poles due to the Mercator projection. We use this grid cell-year sample to statistically evaluate our main hypothesis in the next chapter.

Since our hypothesis focuses on the likelihood of state-led mass killing campaigns in nondemocratic countries, we construct a binary dependent variable to test this hypothesis, as discussed in greater detail in Chapter "Urban Development and Mass Killing: A First Look at the Data." Correspondingly, we interact two explanatory variable to assess the moderated effect posited by our main hypothesis. The first is a continuous indicator measuring the annual levels of urban development per capita within each 0.5-degree grid cell in the sample, discussed in detail in Chapter "Urban Development and Mass Killing: A First Look at the Data." For the second factor, we create several binary "dummy" variables that use food price volatility or exogenous climatic shocks to approximate the annual outbreak of a food crisis at the state and grid cell level (discussed in detail in Chapter "Statistical Analysis of Food Crises and Mass Killing").

Relying on this 0.5-degree grid-year sample allows us to test the empirical validity and generalizability of our main hypothesis and its two associated corollaries, but they do not allow us to identify whether these relationships are causal. To verify causality and illustrate the validity of each theoretical mechanism at work, we additionally rely on a mixed-methods analysis of three specific countries over time to illustrate and assess the causal pathways that lead to our main hypothesis. Our theoretical framework not only identifies two independent variables—the occurrence of a food crisis and the extent of urban development per capita—but also that the major pathway by which these factors affect the annual probability of a local mass killing campaign in nondemocratic countries is thought their *interaction*.

Thus, we rely on a case selection strategy which allows us to examine (i) the effect of each of these two factors *conditional* on the level of the other factor and (ii) the absence of either of the two factors. In this book, we accordingly implement a widely used, quasi-experimental case study design—the longitudinal case study approach[10]—complemented with a "most-similar-case" strategy to select three cases that allow to carefully assess the claims and mechanisms leading to our main hypothesis and its two corollaries. These three cases are nondemocratic Pakistan (1978–1988, 1999–2008), nondemocratic Indonesia (1978–1998), and nondemocratic Malaysia (1978–2009).

As described in Chapter "Urban Development and Mass Killing: A First Look at the Data," these three cases are *broadly similar* in that they share some key features. First, all three countries are located in Asia and all are observed as nondemocratic during the temporal period identified above. Further, Malaysia is observed as an autocracy for some years and as an anocracy for others, while Indonesia and Pakistan are authoritarian.[11] Pakistan, Indonesia, and Malaysia also exhibit additional key similarities. These include the fact that for the respective periods of concern: (i) each of them is a Muslim-majority state, (ii) each is characterized by similar levels of economic openness, (iii) each exhibits similar levels of ethno-linguistic fractionalization, and (iv) in all countries, political parties are allowed to operate in the national legislature.

Building on the most-similar-case strategy mentioned above, we additionally rely on the longitudinal case study approach to analyze and compare the three countries. In the longitudinal case study approach, scholars exploit temporal variation in the application of an experimental treatment *within* a single country to examine whether or not that treatment affects the outcomes as theoretically posited. This offers researchers the important advantage of "controlling" for other extraneous factors since these are subject-specific (i.e., "fixed effects"). Comparing pre- and post-treatment effects allows us to evaluate whether the causal mechanisms underlying our hypotheses are supported by the data via process tracing of the historical evidence (Gerring 2006, 156; McDermott 2002). We thus must first rely on a nondemocratic case that exhibits temporal variation with respect to the level of urban development but that is also characterized by the consistent occurrence of food crises. This allows us to evaluate the argument that increasing the level of urban development per capita from a low to a sufficiently high level increases the probability of mass killing campaigns in a nondemocratic country during food crises, while holding the latter constant.

As we explain in detail in Chapters "Urban Development and Mass Killing: A First Look at the Data" and "Urban Development, Food Shortages and Mass Killing in Authoritarian Pakistan," Pakistan fits these criteria. This nondemocratic state consistently experienced food crises between the late 1970s and mid-2000s. Our analysis of the Pakistani case, however, shows that the level of urban development in Pakistan was low in 1978, but increased sharply during the mid-1980s, and then again between 2000 and 2008. This case study thus allows us to examine how the shift from low to high levels of urban development influenced the propensity of mass killing campaigns during a food crisis in the mid-to-late 1980s. The *treatment* in this case is the increase in the level of urban development to a sufficiently high level.

The next aspect of the longitudinal case study approach is to test whether the "treatment" of the outbreak of a food crisis (generated by high food price volatility or extreme weather events) impacts the probability of mobilization and mass killing in the context of consistently high levels of urban development per capita. As we explain in detail in Chapters "Urban Development and Mass Killing: A First Look at the Data" and "Food Riots, Urbanization and Mass Killing Campaigns: Indonesia and Malaysia," we chose Indonesia as a case that fits these criteria.

As we show in Chapter "Food Riots, Urbanization and Mass Killing Campaigns: Indonesia and Malaysia," the level of urban development in Indonesia was high from 1978 (the year in which the analysis of the Indonesia case starts) to 1999, the year in which it made a transition to democracy. Indonesia, however, did not experience a food production (i.e., output) crisis until 1996 (Wallenstein 1988; Timmer 2004). Hence, in the case of Indonesia, one of the independent variables of interest (food crisis) was *absent* for most of the period, while the other (urban development) exhibited relatively high levels throughout most of the period. Thus the occurrence of a food crisis in 1996 acts as a "treatment," allowing us to analyze the propensity for regime-perpetrated mass killing campaigns in Indonesia before and after a food crisis occur in the context of high levels of urban development per capita. This in turn allows us to test (i) if the outbreak of a severe food production crisis in the context of high urban development motivated civilian opposition against Suharto's rule, and (ii) whether this subsequently led to regime-perpetrated mass killing campaigns.

Finally, relying on the longitudinal case study approach also requires that we identify a case in which urban development levels were always high, but where no food crises occurred. As shown in Chapter "Food Riots, Urbanization and Mass Killing Campaigns: Indonesia and Malaysia," the case of nondemocratic Malaysia meets these criteria. The level of urban development in Malaysia was high over the entire period of concern (1987–2007). Importantly, over the same period, Malaysia experienced no severe food crises. This third case thus allows us to examine whether high levels of urban development in a nondemocratic state like Malaysia have a strong effect on the probability of localized killing in the absence of a food crisis.

In all three cases, we employ a mixed analysis methodology to verify the hypothesized effects. This approach relies on a combination of secondary historical evidence, process tracing, and statistical analysis of originally coded, within-country data on anti-regime riots and mass killings at the city-year level for each of the three countries. This combined methodology therefore allows us to evaluate the intricacies and nuances of our theoretical arguments in significant detail.

Book Outline

Having laid out the book's central research questions, defined some key concepts and terms used throughout the book, and illustrated its saliency to complementing extant research and understanding real-world events, below we present a brief outline of the book and its structure.

Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States" is devoted to developing the book's theoretical story. This chapter first discusses the foundations of the game-theoretic framework employed to explain *when* incumbents in nondemocratic states will strategically seek to target civilians. To this end, the chapter starts with a detailed overview of the characteristics, theoretical distinctiveness, and preferences of the two key actors in the theory that we develop: the ruling elite and domestic citizens living under a nondemocratic regime. We also describe the economic and political context under which these two actors strategically interact with each other. Building on these foundations, our model analyzes how the outbreak of a food crisis generates a political contest between the civilians and ruling elites in nondemocracies. We discuss in great depth the main arguments of our theory, which explains why and how the political dynamics of an ongoing food crisis interact with existing levels of urban development per capita to incentivize the ruling elite to resort to systematic killing campaigns against their citizens in nondemocratic states. Building on said logical reasoning and a set of relevant comparative statics derived from the model, we develop the book's main hypothesis and both its corollaries.

Chapter "Urban Development and Mass Killing: A First Look at the Data" sets the cross-national empirical framework intended to validate the book's hypothesis and corollaries, and reports the first stage of our quantitative analyses. The chapter begins with a detailed discussion of the book's quantitative and case-based research designs. It proceeds with a discussion of how we construct our grid cell-year sample and a motivation of this empirical choice. This discussion is followed by a detailed description of each of the variables used in the cross-sectional models, and how the dependent variable, controls, and one of our key explanatory variables—0.5-degree grid cell-level urban development per capita—are operationalized. Finally, the chapter reports the first stage of our statistical analyses, which evaluates the association between urban development per capita levels and the probability of local mass killing campaigns in nondemocratic regimes.

Chapter "Statistical Analysis of Food Crises and Mass Killing" builds on the empirical foundation developed in Chapter "Urban Development and Mass Killing: A First Look at the Data" by introducing several distinct operationalizations of the food crisis variable. We begin with a background discussion of food prices and then a specific discussion of how we construct a food-price-volatility-based food crisis indicator. We explain why the data and empirical measures of food price volatility that we use directly capture our theoretical conceptualization of a food crisis and then report a set of models evaluating the *interactive effect* of urban development per capita and a food-price-volatility-based food crisis on the propensity of nondemocratic governments to perpetrate localized mass killing campaigns. We then proceed to discuss two additional operationalizations of our food crisis variable, which rely on different thresholds of drought, an exogenous climatic shock, followed by two sets of empirical models corresponding to food price volatility models. All models include fixed effects by nondemocratic country and year to account for constant features that are political- or temporal unit specific. These models all show that the interactive effect of urban development per capita and food crises is not only statistically significant, but also substantive.

In Chapter "Urban Development, Food Shortages and Mass Killing in Authoritarian Pakistan," we conduct the first in our three case analyses, which focuses on nondemocratic Pakistan. We begin by providing a detailed explanation for why Pakistan is an empirically valid case for estimating the mechanisms we hypothesize in Chapter "Food Crises, Urban

Development, and Mass Killing in Nondemocratic States." We then provide a brief historical discussion of the country and its economy and describe the key features of the Pakistani case. As shown in this chapter, Pakistan consistently suffers from repeated agricultural (i.e., food) production crises over both its nondemocratic spells. However, the level of urban development in the country is fairly low in the late 1970s and does not really increase to reach a sufficiently high level until after 1985. We use both historical evidence and statistical analysis of novel within-country city-year data on anti-regime riots and regime-perpetrated killing campaigns in Pakistan to carefully analyze this case.

In Chapter "Food Riots, Urbanization and Mass Killing Campaigns: Indonesia and Malaysia," we turn to analyze two other historical studies: nondemocratic Indonesia and nondemocratic Malaysia. We begin this chapter with the Indonesian case. We first show that Indonesia was characterized by relatively high levels of urban development over most of its nondemocratic spell. Unlike Pakistan, however, Indonesia did not experience a food crisis until the late 1990s, when severe drought and then the East Asian financial crisis caused a sharp rise in food prices. Importantly, considering that urban development levels in the country were sufficiently high throughout the 1978–1998 period, once a food crisis occurred rioters took to the streets and the regime responded with violent killings targeted at protesters and opposition members. As we did in our analysis of Pakistan, we rely on a combination of secondary historical sources and original within-country city-year data on anti-regime riots and local mass killing campaigns to evaluate our claims.

In the second part of Chapter "Food Riots, Urbanization and Mass Killing Campaigns: Indonesia and Malaysia," we provide a historical analysis of Malaysia, our corollary case. We first present evidence and descriptive data showing that the level of urban development per capita in the country was relatively high over its entire nondemocratic spell. Unlike Pakistan and Indonesia, however, Malaysia experienced no food crises over the same period. Thus, Malaysia serves as our analysis' contrarian case. We then proceed to assess this case in detail using historical process to evaluate whether the *absence* of the food crisis "treatment" in the context of high urban development influenced the probability of local mass killing campaigns in the country.

In Conclusion, we summarize our main findings and discuss relevant policy implications. We discuss the theoretical, empirical, and methodological contributions to our study for a growing body of research on political violence, repression in authoritarian countries, and civil disobedience in developing economies. We explain how our theoretical claims and empirical findings speak to a growing literature on the link between climate change and conflict, emphasizing the importance of *contextualizing* the analysis of such linkages. We also highlight an important aspect of our findings, which suggests that although scholars frequently focus on the *rural* nature of mass violence against civilians, such violence is significantly and substantively more likely to concentrate in urban areas. We illustrate how our findings that food crises can generate conditions conducive for mass killing campaigns by governments in nondemocracies inform the field's understanding of how food prices and the protests they generate impact the strategic calculations of incumbents to perpetrate violence. We end this concluding chapter by outlining this book's implications to the work of policymakers concerned with mitigating and preventing violence against civilians in nondemocratic countries, and illustrating that the occurrence of food prices can be used not only to explain, but also to *predict* state-led mass killing in nondemocratic states.

Notes

1. We provide a detailed definition of nondemocratic regimes (these are the states we focus on in this book) below.
2. That is, "cells" of approximately 55 × 55 km around the equator, which decrease in size as one moves toward the poles (Tollefsen et al. 2012).
3. Defined as incidents where the regime intentionally kills at least 50 civilians, as we define in more detail in Chapter "Urban Development and Mass Killing: A First Look at the Data."
4. Also see: Goldstone et al. (2010), Goldsmith et al. (2013), Rost (2013), and Anderton and Carter (2015).
5. As emphasized by Straus, "at the outset, it is important to recognize that explaining genocide and mass atrocity is an imperfect science and an emerging field. Each case is different to a certain degree, and most scholars would agree that the drivers of genocide and mass atrocity are multifaceted" (2015, 54).
6. For some examples of previous research on the determinants mass killing, see Straus (2006, 2015), Valentino (2004), Gerlach (2010), Su (2011), Charny (1982), Horowitz (1985), Fein (1979), Fujii (2009), Staub (1989), Prunier (2009), and Mamdani (2001).
7. These conditions include, for example, political alienation or deprivation of political rights, past levels of repression committed by the regime,

corruption, electoral fraud, predatory economic policies, or economic crises (Straus 2015).

8. The literature across these research areas is far more extensive than the works listed and cited above. For more examples, see Chenoweth and Stephan (2011), Wallace (2013), Davenport (2007a, b), Pierskalla (2010), and Valentino (2004).
9. See, e.g., Bellemare (2015), Hendrix and Haggard (2015), and Weinberg and Bakker (2015).
10. Also referred to as a "within-subjects" design. See Gerring (2006), McDermott (2002), Kinder and Palfrey (1993), and Gibson et al. (2002) for further discussions of this technique.
11. Pakistan and Indonesia are both ruled by *military* dictators (Zia-ul-Haq and Musharraf in Pakistan, Suharto in Indonesia) for the years we analyze, while Malaysia is ruled by a single-party government with limited participation.

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Food Crises, Urban Development, and Mass Killing in Nondemocratic States

In this chapter, we develop and motivate a detailed theoretical framework to address the book's two central research questions stated in Chapter "Introduction": Why do governments in nondemocratic regimes perpetrate systematic mass killing campaigns against their citizens in some cases, but not in others? What explains the temporal and geospatial variation in mass killing campaigns within nondemocratic states? In answering these questions, we rely on formal and macroeconomic tools to create political economy models of mass killing campaigns by nondemocratic (i.e., authoritarian) incumbents.[1] Using a game-theoretic model, we are able to capture complex interactions between two key actors—which, as described in more detail below, are central, *strategic* players in the mass killing dynamics in nondemocratic regimes—under a unified, *parsimonious* theoretical framework.

Analyzing these strategic interactions in both formal and nontechnical terms allows us to derive logically consistent theoretical insights to explain why and when incumbents in nondemocratic countries will resort to mass killing campaigns against their own citizenry. We rely on these insights to generate a set of sequential claims and ultimately derive a testable hypothesis. The arguments and hypothesis proposed in this chapter are then evaluated both cross-nationally in particular countries in the empirical chapters of this book.

The game-theoretic model that we derive below helps us to extract testable claims, but it also has some notable constraints. One underlying assumption of such formal models, for instance, is the empirically plausible

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assumption that actors are rational, which allows our game-theoretic framework to maintain technical and analytical tractability.[2] We also exclude some extraneous and complex details from the discussion provided below to ensure parsimony in model design and verify the clarity of the resulting outcomes. Nevertheless, when constructing our model, we made sure to verify, to the best of our abilities, that it was as realistic, in empirical terms, as possible. In doing so, we were able to develop a coherent theoretical story and to derive testable theoretical predictions.

The game-theoretic framework we develop focuses on the strategic interaction between two main actors within a nondemocratic polity: the ruling elite, i.e., the economic, political, or ethnic group, that holds political power within the state; and the domestic civilians residing in this polity.[3] We choose to focus on these two particular actors because, as mentioned in the previous chapter, *systematic*, large-scale mass killing campaigns against domestic citizens in nondemocratic countries are often perpetrated by the regime (i.e., the ruling elite) (see, e.g., Davenport 2007b; Pierskalla 2010; Valentino 2014; DeMeritt 2015). We discuss our justification for focusing on these two specific actors latter in the chapter.

We begin developing our theoretical framework by first describing the main material and political preferences of these two actors and the particular strategic choices available to them. We then analyze how the outbreak of a food crisis—resulting from high price volatility or severe food shortages—can generate political contestation between the civilians and the ruling elite in nondemocratic states. Finally, we explain why and how this political contestation in nondemocratic states can moderate the effect of existing urban development levels to generate civil unrest, and correspondingly mass killing as a forceful response by the ruling elite.

This theoretical narrative leads to our central hypothesis, aimed at explaining when incumbents in nondemocratic states resort to systematic mass killings. The theory that we develop in this chapter also explores the absence of mass killing when either *or* both of two conditions are absent. This first condition is the existence of high levels of urban development per capita, which provide urban civilians with high material capacity that could be used to challenge the regime. The second condition is the occurrence of some form of a "food crisis," i.e., a sudden and sharp decrease in domestic food availability. The formal model's full mathematical specifications are presented in this chapter, and the model proofs are provided in the book's online appendix.

The rest of this chapter is organized into five main sections. In the first part, we provide a brief background discussion to motivate our theoretical framework using not only existing studies on the strategic violent choices of incumbents in nondemocratic states, but also detailed *historical* examples of systematic mass killing campaigns in such countries. This discussion is followed by an overview of our theory in the next section. In the second part, we describe the main objectives and preferences of each of the two actors in our theoretical narrative and discuss each actor's strategic choice(s). We also present our formal model's sequence of moves and overall structure. The third part starts with a nontechnical description of the model's main equilibrium result. This is followed by several comparative static results showing how food crises and the resultant shocks to the civilians' consumption can trigger mass killing by the ruling elite when the level of urban development per capita is sufficiently high, which are presented, again, in nontechnical terms.

In the fourth part, we discuss how the absence of either of these two conditions—a food crisis or high urban development levels—affects the incentives for repressive behavior by incumbents in nondemocratic regimes. Finally, in the conclusion, we summarize our main theoretical argument, state its contributions to extant research, and briefly discuss some of its policy implications. To ensure that our theory is accessible to readers without a background in formal theory, each step of our model is discussed and explained in detail in nontechnical terms and is being accompanied by illustrative graphs and simulations derived from the model to illustrate the model's dynamics, equilibrium results, and comparative static predictions.

Background Discussion

The notion that governments in nondemocratic states use mass killings as a strategy when they find it "both necessary and effective" (Valentino 2004) is firmly established in the relevant literature (e.g., Valentino et al. 2004; Valentino 2014; Kalyvas 2006; Strauss 2015).[4] What leads authoritarian incumbents to resort to such extreme measures against their own citizenry? Extant research offers numerous answers to this vital question, as we discussed in detail in the Introduction.[5]

The prevailing view associates violent repression with an increased probability of dissent by citizens in nondemocratic countries (Davenport 2007b; Pierskalla 2010; Valentino 2014; Straus 2006, 2015). Yet, as

Pierskalla argues, "[w]e still do not have a clear understanding of when governments can successfully deter protest, when repression of protest can be effective, and under which conditions escalating violence breaks out" (2010, 19). Thus, to understand *why* citizens are likely to mobilize against the ruling elite in nondemocratic countries, and—even more importantly—*when* such mobilization can escalate into a full-scale mass killing campaign by the regime, we discuss below some recent analyses and examples into the causes of civil disobedience in nondemocratic countries.

While research into the causes of civil disobedience and anti-regime riots spans multiple disciplines, including history, political science, sociology, and—more recently—economics (see, e.g., Schwedler 2005; Tilly and Tarrow 2006; Trejo 2012; Bueno de Mesquita et al. 2003; Johnston and Mazo 2011; Acemoglu and Robinson 2006; Gehlbach et al. 2016; Bellemare 2015), discussing this entire impressive body of research is beyond this chapter's scope. Broadly speaking, however, research on civil dissent in nondemocratic countries typically begins with the premise that unlike democratic incumbents, ruling elites in nondemocratic regimes cannot be held effectively accountable by their citizenry. These nondemocratic elites are able to control elections,[6] the media,[7] the legal and police systems[8] and, to various degrees, have the capacity to weaken and infiltrate civil society groups.[9]

As a result, both domestic and international actors often come to question the political legitimacy of ruling elites in nondemocratic states (Lust-Okar 2005; Schwedler 2005; Gandhi and Lust-Okar 2009; Chenoweth and Stephan 2011). The main consequence of such shaky political legitimacy is the real possibility that certain key factors can trigger open challenge to the regime by domestic citizens—that is "contenders" in Tilly's (1978) famous words—in nondemocratic regimes. Such challenges increase the vulnerability of the ruling elite, making it more likely to eventually be removed from office (Tilly 1978; Schwedler 2005; Tarrow and Tilly 2009; Trejo 2012; Gehlbach et al. 2016). Indeed, Tilly defines the risk potential challenges posed to the ruling authoritarian elite as:

> The extent to which other actors, including governments, are vulnerable to new claims which would, if successful, enhance the contender's realization of its interests. (1978, 133)

The factors that can trigger civilian dissent in nondemocratic countries vary substantially. Examples of such factors—which we take into account in our cross-sectional empirical analyses—include poor governance and elite corruption, macroeconomic crises, anti-regime mobilization in neighboring states, or draconian measures that threaten the civilians' basic civil liberties instituted by the elite (Pereira 2005; Chenoweth and Stephan 2011; Trejo 2012). But as was clearly articulated by Gurr (1970) almost fifty years ago, dissatisfaction with nondemocratic leaders does not explain when civilians in these regimes will develop anti-regime preferences that are sufficiently strong as to push them to actively oppose the ruling elite (also see Lichbach 1998; Moore 1998, 2000; Tilly et al. 2001). Different kinds of literature on authoritarian regimes, state repression, genocide, and social movements have all identified numerous conditions that are likely to drive civilian in nondemocratic regimes to develop strong anti-regime preferences (see, e.g., Davenport 2000; DeMeritt 2012; Danneman and Ritter 2014; Urdal and Hoelscher 2012; Straus 2016; Waller 2016).[10] These conditions include, for example, political alienation or deprivation of political rights, past levels of repression committed by the regime, corruption, electoral fraud, predatory economic policies, or economic crises (Straus 2015).

While we account for these explanations in our empirical analysis, in more recent years, however, scholars have started to focus on another key—often less explored—factor that often triggers both anti-regime preferences *and* overt civilian mobilization against the regime in nondemocratic states: sharp increases in the prices of staple foods such as grains, meats, and vegetable oil seeds (Goldstone 2011; Bellemare 2015; Hendrix and Haggard 2015; Weinberg and Bakker 2015). These sharp price increases are often engendered by generally exogenous phenomena such as extreme weather events (e.g., droughts), variations in oil prices, financial crises, and even agricultural commodity speculations by financial market actors (Abbott et al. 2009; Gilbert 2010; Roache 2010). Importantly, such volatility in food prices has a strong impact on the domestic civilians' food consumption levels, impacting their health, livelihood, and even their very physical survival (Cutler 1986; Roncoli et al. 2001). These declines in food consumption often compel the civilians, who bear the brunt of these shocks' weight, to challenge the regime, particularly (but not only) in urban areas (e.g., Bellemare 2015; Hendrix and Haggard 2015).

While we rely on insights about linkages between food prices and civilian mobilization raised by these and other extant studies, our theory departs from these approaches in an important way. Specifically, we focus on the domestic political impact of staple food prices' *volatility*—particularly its association with food production—in nondemocratic countries, rather than price *levels*. Staple food price volatility can be driven by the occurrence of droughts, oil price shocks, financial crises, and agricultural commodity-price speculation (Abbott et al. 2009; Gilbert 2010; Gilbert and Morgan 2010; Roache 2010). Unlike extant approaches that focus on increases in food prices as a generator of mass protests, our theoretical framework begins with exploring how high food price volatility leads to a precipitous decline in food output. These declines in turn have a strong negative impact on the domestic civilians' ability to continue consuming important staples at the required amount.

We term this combination of strong shocks to food production and their impact on domestic food availability or access and the local civilians' consumption levels "food crises" or "food production crises." We argue in the next section that such food crises act as a specific trigger—or "precipitating event" in the words of Straus (2015, 53–54)—that coalesces with certain macrolevel political features of nondemocracies to generate anti-regime dissent by civilians. We then theoretically analyze when such food (production) crises frequently trigger credible opposition to the region within urban areas in nondemocratic states. Our theoretical analysis builds on these linkages to explain why and how urban-based opposition in nondemocratic countries frequently provokes systematic mass killing campaigns by authoritarian incumbents.

Evidence suggests that the linkages between food crises, anti-regime opposition, and subsequently mass killing campaigns in nondemocratic regimes indeed exist. In North Africa, for instance, high volatility of staple food (e.g., maize and wheat) prices—stemming largely from droughts—generated waves of protest against the ruling elite in several nondemocratic countries during the early 1980s, which resulted with violent repression. A drought in Tunisia led to a 33% decline in grain production in 1983 (Barakat and Handoufe 1997, 11–12), sharply increasing food price volatility levels. This had a strong negative impact on food consumption levels among low- and middle-income households. Tunisia was under a single-party rule headed by President Habib Bourguiba. Crucially, the authoritarian regime was unable to provide credible guarantees to address the impact of this negative consumption shock. This failure generated a massive wave of unrest, which first took place solely in the capital Tunis, but quickly spread to other, relatively developed urban areas such as Sfax and Kairouan (Seddon 1986). The Habib Bourguiba-led regime responded to this threat by launching a vicious campaign of killing and incarceration of civilians to quell further dissent against the regimes (Seddon 1986).

These dynamics were not unique to Tunisia. In fact, the events in Morocco the same year unfolded in a strikingly similar way. An almost 40% drop in food production in Morocco in 1983 also led to a precipitous, sharp increase in prices (Watts and El-Mourid 1988). The result for the strong variation in prices was, again, a severe and unexpected drought. These extreme volatility levels also inflated the *Dirham*, the state's official currency, and generated an economic crisis that Morocco's nondemocratic regime—led by King Hassan—failed to adequately address (Watts and El-Mourid 1988). The result was, again, a "wave of mass demonstrations and street violence" (Seddon 1986, 1). The regime responded with widespread killings of civilians in urban areas (Seddon 1986; Watts and El-Mourid 1988). Similarly to Tunisia and Morocco, Syria experienced severe negative shocks to food output, and thus a food crisis, which generated the first wave of anti-regime protests in the country, which subsequently became a boldly civil conflict and regime-perpetrated killing of civilians (see Friedman 2013).

These relationships between food production, protests, and mass killing are not merely restricted to Middle Eastern and North African nondemocratic states. Rather, as we show in one of the detailed mixed-methods case analyses presented latter in the book, in 1986, a similar food production crisis also caused an overt anti-regime mobilization in Pakistan during General Zia-ul-Haq's rule (Haqqani 2005). The Pakistani regime responded to this incipient civil disobedience campaign with a violent mass killing campaign aimed at political dissidents residing in the country's main urban areas, especially Karachi and Rawalpindi (Dhulipala 2015). Similar dynamics also occurred in Indonesia under the rule of General Suharto. As discussed in Chapter "Food Riots, Urbanization and Mass Killing Campaigns: Indonesia and Malaysia," the financial crisis of 1997 generated sharp volatility in food prices, affecting the civilians' consumption levels. The civilians reacted by staging mass protest and by waging a sustained civil disobedience campaign against Suharto's military rule (Hughes 1999). In response, the authoritarian cracked down on dissenters and systematically killed many civilians over the 1997–1998 period (Roosa 2006).

Other examples where food price volatility and food crises generated urban unrest and violent state response include authoritarian Iran in the mid-1990s (Amid 2007, 545) and the recent 2011 Arab Spring events in Egypt, Libya, Syria, and Yemen (Goldstone 2011). Food price volatility was an important trigger in the latter, as Goldstone states: "fast-growing and urbanizing populations in the Middle East have been hurt by low wages and by food prices that *rose by 32 percent in the last year alone*" (2011, 11, emphasis added).

These examples as well as the extant research into the issue area of food shortages and civil disobedience more broadly provide two important insights into why and how *localized mass killing campaigns* might arise in nondemocratic states. First, they suggest that explanations for extreme state violence occurring locally will be lacking if they focus solely on the (authoritarian) regime and its characteristics. Rather, two key actors play a central role in the context of mass killing campaigns in nondemocratic countries. The first actor in this interaction is indeed the authoritarian regime, or what we broadly term the "ruling elite." The ruling elite, however, is only part of the equation, because—within these contexts—it makes its policy choices in response to the behavior of a second actor: the domestic civilians.

The ruling elite or autocratic leader that controls the tools of coercion—to paraphrase Tilly (1971)—is indeed responsible for systematic mass killing campaigns in nondemocratic states, but it is the domestic citizens that are the ultimate targets of these killing campaigns. Whether or not they become targets for state forces depends on their own behaviors and policy choice. Finally, although other actors (e.g., military forces) might play a role in these dynamics, the ruling elite and the civilians are the most critical players in explaining how localized mass killing might arise in nondemocratic countries, making our decision to focus on these actors empirically defensible.

The second insight provided by the examples and research discussed previously is the importance of an *exogenous event* in causing mobilization and, correspondingly, mass killing. Sudden sharp increases in food price volatility, especially when these are caused by exogenous shocks such as droughts or financial crises, frequently precipitate a food crisis in nondemocratic states. This means that the civilians' food consumption levels suffer as a resulting, prompting them to challenge to the regime. One motivation for dissent might be the civilians' concerns that the politically or electorally unaccountable ruling elite in nondemocratic states will likely be indifferent to their worsening plight. Once an anti-regime movement sprang into action, it might attract—if it is effective enough—violent reprisals by the regime, the most dangerous of which being mass killing. Again, the manner in which systematic mass killing campaigns unfold in nondemocratic countries may involve some additional complexities that we do not discuss here due to space constraints, and because these are beyond the scope of our argument. Nevertheless, by focusing on this relatively simple and, importantly, *exogenous* (in certain contexts, at least) pathway to localized mass killing in nondemocratic countries, we are able to construct a parsimonious theory that in turn generates claims that could be tested with relative ease.

To preview, we develop a theory—backed by a formal model—that explains how and when the strategic interactions between two players in a nondemocratic state—the ruling elite and the domestic civilians/citizens—increase the probability that the regime will employ mass killing locally. We show that the outbreak of a severe food crisis, i.e., strong, sudden decreases in domestic food output, is associated with a strong precipitous decline in the civilians' food consumption levels. Because consumption-smoothing mechanisms are weak or do not exist in many authoritarian regimes, and because the ruling elite does not curb rent extraction even during a food crisis, economic conditions deteriorate, causing popular resentment. Hence, building on scholars such as Straus, we argue that it is during food shortage crises that, "tensions become exaggerated, when distrust between populations or between states and citizens increases" (2015, 53–54) exponentially. These political tensions push the civilians to challenge the elite's rule. But mobilizing against the regime poses a collective action problem for the civilians who—owing to their relatively large number—may choose to "free-ride" on each other's effort, rather than take an active part in the protests.

The assumption that the civilians may face collective action problems when seeking to mobilize against the regime has been analyzed repeatedly in the rich literature on social movements emergence, as well as by recent studies on how rebellion might emerge in response to state-sponsored repression (e.g., Tilly 1971, 1978; Tarrow 1994; Moore 1998; Tilly and Tarrow 2006; DeMeritt 2015; Pierskalla 2010; Pierskalla and Hollenbach 2013). Unlike previous studies, however, our theory identifies an important factor, which to our knowledge has not been systematically explored in extant research even though it plays a crucial role in facilitating collective action among the domestic civilians: the level of urban development per capita within the nondemocratic state. The term "urban development per capita," which we use to approximate the material and social capacity available to the civilians within urban areas, is defined in more detail below.

Importantly, our model shows that the ability of the domestic citizens to act collectively and facilitate the eventual removal of the regime is much higher in developed urban areas. As mentioned above, we treat the two main actors in our model—the ruling elite and the domestic civilians—as being in a political contest. If a food crisis occurs, which impacts the domestic civilians' food consumption levels, a civil revolt becomes a highly likely possibility in areas with high enough levels of urban development per capita (see, e.g., Hendrix and Haggard 2015).

Such massive mobilization of domestic civilians against the regime during a food crisis is a credible threat to the elite's rule in nondemocratic states *if it occurs within the context of high levels of urban development per capita*, an issue we discuss repeatedly throughout the book. This existential threat to the elite's rule drives it to perpetrate mass killing in urban areas *preemptively* early on during a food crisis as a strategy to credibly deter sustained political mobilization by the capable civilians—who have now overtly committed themselves to oppose the regime—and assert its political control. This theoretical narrative leads us to derive a set of testable hypotheses and theoretical predictions. It also provides the necessary foundation to understand and explain how the *absence* of either of these two conditions—a food crisis or high urban development per capita levels—affects the incentives for violent repressive behavior by incumbents in nondemocratic states.

The Model: Foundations and Structure

Players, Food Production, and Political Contest

We begin this section by formally describing the model's players and provide a detailed background discussion of the authoritarian economy in which they interact, focusing on food production. We then proceed to describe the (i) political context influencing the strategic interactions between the two actors and (ii) nature of the political contest between them. This is followed by a description of each player's payoffs and their utility function. Finally, we define the sequence of moves in the model and the solution concept used for deriving the main results.

Consider a nondemocratic polity in which the population is divided into two groups: the authoritarian ruling elite, R, and the domestic citizens, C (which includes workers, or labor), where each civilian c is drawn from $c \in \{1, 2, 3, \ldots, C\}$. The term "ruling elite" is used generically throughout the model, to refer to a system of government in nondemocratic states in which the incumbent rules with the support of a minimum winning ruling coalition, and thus where political power is concentrated de facto (see, e.g., Buena De Mesquita et al. 2003; Gandhi and Przeworski 2006; Gandhi 2008; Magaloni 2008; Svolik 2012; Gehlbach et al. 2016). Additionally, as we stated in the Introduction, the term "non-democracies" refers to the several types of regimes that are not within the realm of what might call a liberal democracy: autocracies, anocracies (often known as hybrid regimes),[11] and regimes termed by Levitsky and Way as "competitive authoritarian" regimes (2002, 14).[12] The word anocracies refers to regimes that may have nominally democratic institutions but which do not hold free and fair elections.

A key, defining feature of nondemocracy is that it lacks *credible* free and fair elections (Levitsky and Way 2002, 2010; Hadenius and Teorell 2007; Magaloni 2008). Additionally, the concentration of political power in the hands of the ruling elite is a second key characteristic of nondemocratic regimes. The ruling elite in nondemocracies "routinely abuse state resources, deny the opposition adequate media coverage, harass opposition candidates and their supporters, manipulate electoral results" (Levitsky and Way 2002, 14). These elites are also less accountable to their citizens—and typically experience less formal political or electoral constraints, if any—compared to their counterparts in democracies (Tullock 1987; Schedler 2002; Svolik 2012; Gehlbach et al. 2016). This lack of accountability and constraints facilitates the ability of nondemocratic elites to engage in rent extraction, frequently violating their subjects' civil rights and liberties (e.g., freedom of expression and freedom of association) in the process (Levitsky and Way 2002, 2010; Haber 2006; Hadenius and Teorell 2007).

Additionally, note that we also use the terms "domestic citizens" and "domestic civilians" interchangeably to refer to individuals residing in these nondemocratic states who are not part of the elite or the security apparatus. Similar to civilians in other nondemocratic countries, the domestic civilians in our model lack credible voting powers due to the absence of genuine and free elections. However, these civilians do have the capacity to *overtly* challenge the regime if required. Indeed, under certain circumstances—discussed in more detail below—the domestic citizens may seek to overturn the national economic and political status quo. Of course, doing so poses risks and raises a collective action problem for the civilians. We return to these two critical issues in a latter section of this chapter.

The two sets of actors defined above strategically interact in the economy of the nondemocratic regime in which total production of food (e.g., crops) depends on two factors of production: Land (N) and Labor (L).[13] More specifically, in this nondemocratic economy, the total production of food comes from the Constant Elasticity of Substitution (CES) production function $F(N, L) = \left[\phi(\alpha N^{\rho} + (1 - \alpha)L^{\rho})^{\varepsilon/\rho}\right]$. This function is homogeneous of degree ε and includes two factors of production: agricultural land N and labor L. The CES production function was originally developed by Arrow et al. (1961) and has since been routinely used by economists to study food and agricultural production in developing countries (Ray 1998; Rossett 1999).[14] Importantly, in this CES production function, $\alpha \in [0, 1]$ is the relative weight of inputs land N and labor L (who are a part of C) and ρ is the elasticity of substitution. The parameter ϕ is an exogenous parameter—influenced by negative shocks to production such as droughts, oil price increases, financial crises, or speculation in agricultural commodities—that captures volatility in food prices. Because strong variations in food prices are inherently unpredictable *ex ante*, the players are uncertain about ϕ. Hence, ϕ is assumed to be normally distributed. Crucially, ϕ affects the productivity of the two production factors (land and labor) and consequently total food output levels. Hence, food *consumption* per capita—which is directly affected by the total *production* of food in the economy—among the civilians is f_c, where $f_c = F(N, L)/C$. The ruling elite's food consumption is f_R where $f_R = F(N, L)/R$.

The strategic interaction between the two actors and the total production of food in the nondemocratic economy do not happen in a vacuum, but within a nondemocratic country where the ruling elite not only controls political power but is also less constrained and thus lacks accountability to its citizens (Tullock 1987; Schedler 2002; Brownlee 2010; Svolik 2012). Civilians in nondemocracies might thus engage in overt anti-regime dissent and challenge the ruling elite, frequently prompting the latter to resort to violent repression, under certain conditions (e.g., Schwedler 2005; Trejo 2012; DeMeritt 2015; Gehlbach et al. 2016; Wallace 2013). We thus introduce several simple political features and the possibility of a violent political contest between the ruling elite and the civilians into our model.

First, note that the ruling elite R holds control of political power in the nondemocratic polity. However, as noted by studies of repression in anocracies and autocracies (e.g., DeMeritt 2015; Pierskalla 2010; Chenoweth and Stephan 2011)—and the anecdotal examples discussed above—the citizens may overtly mobilize, challenge the ruling elite R (as defined formally below), and seek to alter the status quo. Alternatively, the citizens may opt to not challenge R, meaning that the status quo prevails and the elite maintains its political control. If the civilians do not challenge R, they receive a payoff of x_c, given without a loss of generality by the additive function $x_c = b_c + f_c$. In this function, f_c is each citizen's personal food consumption as defined above, while b_c broadly includes the monetary, social, and other nonpecuniary benefits the citizens obtain under the status quo.

The ruling elite's payoff under status quo conditions is $x_R = b_R + f_R$, where f_R is the elite's food consumption and b_R includes additional monetary, nonpecuniary benefits, and others rents they extract while in office. When the civilians C successfully mobilize against R, which means that the status quo is altered, the elite's political grip over office weakens. As suggested by research on repression and mobilization in nondemocratic regimes, the civilians can obtain higher monetary and other nonpecuniary benefits *if and when* they successfully mobilize against the ruling elite (e.g., Schwedler 2005; Gandhi and Lust-Okar 2009; Gehlbach et al. 2016). Hence, the civilians' payoff if they successfully challenge R and alter the status quo is x_c^Δ, given by $x_c^\Delta = b_c^\Delta + f_c$ where, as suggested above, $b_c^\Delta > b_c$. The elite's payoff when the citizens successfully challenge the status quo is $x_R^\Delta = b_R^\Delta + f_R$, where $b_R^\Delta < b_R$ (as the elite R's loss of power if the status quo is altered could result in lower realized benefits, including lower rents or reduced income).

The probability that the citizens will openly challenge the ruling elite R is denoted as $(1 - q)$, while the probability with which the elite successfully defends against this challenge and remains in power is given by q. The parameters q and $(1 - q)$ are discussed in detail below. Importantly, the possibility that the citizens may challenge the regime generates a political contest between the elite R and C, where the civilians may overtly revolt against R to also obtain a set of political concessions P.[15] As suggested by extant research, providing these concessions entails a cost to R (Lust-Okar 2005; Schedler 2006; Gandhi and Lust-Okar 2009). This is because the elite may lose its political privilege, rents, and other monetary benefits from such privilege when compelled to provide concessions to citizens.[16]

Note that if the citizens seek to openly oppose the elite, then the model suggests that they will collectively allocate resources h (where $h \in [0, \bar{h}]$) to challenge R. The citizens' ability to devote resources h and collectively mobilize against R is directly influenced by the nonnegative parameter θ, which captures a key feature that to our knowledge has not received sufficient attention in current research on mass killing and repression in nondemocratic regimes: the extent of local development and its distribution across the entire population within urbanized areas. The citizens' ability to coordinate their actions and mobilize increases when urban development levels (e.g., via electricity provision and Internet connectivity) rise. Higher development levels improve efficiency, increase wages, free more time for non-work-related activities, and provide the civilians with more technological means they can use to improve social interactions and increase the frequency of anti-regime-related activities (e.g., cell phones and computer printers).

Empirically, as numerous studies show, nighttime light emissions are a very effective measure of local development, its concentrations, and its variations across space, especially as these pertain to urbanized localities (e.g., Henderson et al. 2012; Nordhaus 2006; Weidmann and Schutte 2017). Building closely on the work of scholars such as Henderson et al. (2012), we accordingly derive and discuss in detail a nighttime light-based, time-varying indicator in the empirical chapters of this book that corresponds to this θ parameter in Chapter "Urban Development and Mass Killing: A First Look at the Data." Stated briefly, higher (lower) levels of the nonnegative parameter θ capture higher (lower) levels of concentrated urban development of the civilians. And since h is directly influenced by θ, the total resources devoted by the citizen to challenge the elite is fully defined as θh.

When the potential for massive civilian mobilization rises substantively, the authoritarian ruling elite R may—as suggested by the examples discussed earlier—employ atrocities a (i.e., engage in the systematic killing of civilians) as a strategy to prevent the civilians from taking further action. Committing a entails spending resources to target citizens, an additional cost for R, but one that could also help the elite to preserve its rule. Additionally, recall that q is the probability with which R successfully defends itself against the citizens' challenge and remains in power. Given a and θh, we let q follow the standard contest success function (Hirshleifer 1989):

$$q = \frac{a}{a + \theta h} \tag{1}$$

Hence, the probability with which the citizens (the ruling elite) successfully (fails to) demonstrate against and challenge (defend) R's (their) rule is $(1 - q) = \frac{\theta h}{a + \theta h}$.

Utility Functions and Sequence of Moves

Recall that in the political contest success function (Function 1) q is the probability with which the ruling elite successfully defends itself against the citizens' challenge, while $(1 - q)$ is the probability with which R is removed. When R fails to defend its rule with probability $(1 - q)$ in response to C's challenge, the ruling elite not only receives the payoff x_R^Δ, but may also provide concessions P—at a cost to R—to C. If, however, R succeeds in deterring the civilians' challenge by employing atrocities a—which entails an additional cost to R—and remains in power with probability q, it receives the payoff x_R. The ruling elite's expected utility function is thus

$$U_R = qx_R + (1 - q)\left(x_R^\Delta - P\right) - a \tag{2}$$

R's optimization problem is to optimally choose atrocities a or concessions P to C (if R acquiesces to C's challenge) so as to maximize U_R subject to $a \geq 0, P \geq 0$ and a feasibility constraint. The elite's optimization problem and the feasibility constraint associated with the optimization problem are formally defined in the online appendix of the book.

The citizens obtain the payoffs (i) x_c when the status quo prevails and R remains in office with probability q; and (ii) x_C^Δ and P when the civilians successfully mobilize and threaten R's rule with probability $(1 - q)$. Since devoting resources h to confront R entails costs for the citizens, their expected utility function is

$$U_C = qx_c + (1 - q)\left(x_c^\Delta + P\right) - h \tag{3}$$

The citizens' optimization problem is to choose h to maximize U_c, accounting for P and a. We also fully define the domestic citizens' optimization problem and associated constraint associated with the book's online appendix.

The sequence of moves in the model is as follows. First, ϕ is realized and observed by R and C, both of whose net respective payoff and utilities are affected by ϕ. Having observed ϕ, the civilians choose h to maximize U_c taking ϕ and θ as given. At the same time, the ruling elite either opts to provide some political concessions P, or chooses some level of atrocities a—that is, resorting to mass killing—given C's choice of h. This is done to dissuade C from challenging R.[17] The citizens' choice of h and the elite's choice of a or P affects the political contest between the two actors. This in turn determines whether R either remains in office with probability q or is removed if the citizens challenge R with probability $(1 - q)$.

Once uncertainty regarding who controls political power is resolved, the players obtain their respective realized payoffs. In the ensuing section, we derive and formally characterize the model's subgame perfect Nash equilibrium, key results, and comparative static claims, all of which lead to our main hypothesis. The model's equilibrium result also provides the necessary explanation for how the *absence* of either of the two conditions—food crises or high urban development per capita—affects the probability of state-led mass killing in nondemocracies.

Main Model Results

Model Equilibrium

Our model's subgame perfect Nash equilibrium formally describes the best response (i.e., optimal action) of each player in the model as influenced by (i) its opponent's best response and (ii) the exogenous conditions in the model, including the level of food production and urban development. While its characterization and mathematical proofs are reported in full in the book's online appendix, this equilibrium generates a lemma and several comparative static results that lead to claims and hypotheses evaluated latter in the book. The lemma, stated in a nontechnical language here, is as follows:

Lemma 1 *In the subgame-perfect Nash equilibrium of our game model, the*

(i) *Level of food production output is influenced by the marginal productivity of the two factors of production, land and labor, and the parameter* ϕ
(ii) *Propensity with which the ruling elite may commit atrocities against civilians, specifically, mass killing campaigns, and the optimal concessions they may offer to the citizens are influenced by the parameters* θ *(level of urban development),* ϕ*, and the total level of food production. It is also influenced by the elite's net payoff* $(x_R - x_R^{\Delta})$ *and the probability* q^*
(iii) *Level of resources* h^* *the citizens allocate toward collectively mobilizing and challenging the ruling elite is determined by* θ*,* ϕ*, level of total food production, the net payoff* $(x_c - x_c^{\Delta})$*, and* q^*
(iv) *Probability* q^* *with which the ruling elite may remain in office is determined by* θ*,* h^* *and the elite's net payoff defined in part (ii) of this lemma.*

Proof See online appendix of book.

The formal description of Lemma 1 and the mathematical derivation of each of its constituent parts are provided in the book's online appendix. Below, we describe Lemma 1 in words and briefly discuss the intuition behind the main results.

The result in Part (i) of Lemma 1 is straightforward. The *marginal productivity* of the two factors of agricultural production, land and labor, affects food (or crop) production (i.e., output) in the authoritarian economy. This means that the marginal returns to land and labor will also impact food output levels. Part (i) also posits that agricultural production is affected by ϕ. This means that negative shocks—conceptualized in this book as sharp, sudden increases in food price volatility or as severe droughts—directly affect food production (i.e., output levels) and subsequently food consumption.

Part (ii) of Lemma 1 shows that the ruling elite's optimal choices in equilibrium—using atrocities against civilians or providing concessions—is affected by the level of food output, the impact of external crises on this output, and the extent of urban development in the country. In equilibrium, the elite's optimal choices are also influenced by the domestic citizens' actions in the nondemocratic polity given θ, and the net rents R expects to gain from the status quo. Finally, the ruling elite's optimal strategic choices are conditional on R's *ex ante* expectation of the probability with which it will remain in office in the near future.

A key insight provided by Part (iii), Lemma 1, is that the citizens have little or no incentives to devote resources h^* to oppose the ruling elite in the absence of a food crisis. One explanation is that in the absence of such a crisis, the civilians' level of food consumption is relatively stable. Consequently, the civilians' net economic payoff under the status quo remains *positive*. Challenging the regime in the absence of a food crisis is hence costly, meaning that the citizens are unlikely to challenge the regime. As a result, the status quo will prevail in equilibrium if the ruling elite remains in office with probability $p=1$.

Part (iv) of Lemma 1 suggests that the probability with which R successfully defends itself against its subjects and remains in power is determined by two key factors. The first is the (exogenous) level of urban development as distributed across the population in the nondemocratic country. The second factor is the net payoff that both the civilians and the elite expect to receive if the civilians credibly challenge the regime and alter the status quo. This raises three key questions. First, when will civilians seek to *openly* oppose the ruling elite? Second, when will the civilians' challenge to the regime be *credible*? Finally, how will the ruling elite *respond* to this credible challenge? We answer these questions in detail in the next section.

Food Crises, Urban Development, and Civil Resistance

Research into the determinants of civil disobedience illustrates that frequently the factors that drive civilians in nondemocracies to question the political legitimacy of their rulers are also the one that motivate them to challenge them (see, e.g., Schwedler 2005; Tilly and Tarrow 2006; Trejo 2012; Gehlbach et al. 2016). Indeed, other studies (e.g., Bellemare 2015; Hendrix and Haggard 2015), as well as the anecdotal examples discussed previously, suggest that crises that are directly associated with food production and consumption are a powerful factor in motivating overt discontent. The first set of comparative statics from our model, derived from the model's equilibrium result stated informally in Lemma 1, accordingly predicts that the outbreak of severe food production (i.e., output) crisis incentivizes the civilians to mobilize against the ruling elite R. This comparative static result is stated more formally as:

Proposition 1 *In equilibrium, the*

(i) *Marginal productivity of land and labor declines sharply when agricultural production is impacted by an exogenous shock such as sharp increases in food price volatility or droughts. This leads to a food production crisis characterized by a sharp, sudden drop in food output.*
(ii) *Domestic civilians' net economic payoff under the status quo strictly decreases when a food production crisis occurs and*
(iii) *Citizens' strictly dominant strategy is to challenge the ruling elite during a food crisis.*

Proof See online appendix of book.

While the formal derivation of Proposition and each of its constitutive parts is stated in Proposition 1 is described in the book's online appendix, we provide a less technical and more intuitive explanation for this prediction below. To do so, we first must define what we mean by food crises, or food production crises, to explain why such crises will drive civilians in the nondemocratic countries to mobilize against the regime.

Firstly, note that researchers and analysts from the United Nations Conference on Trade and Development (UNCTAD) provide a working definition of a food (production) crisis:

> A food crisis occurs when rates of hunger and malnutrition rise sharply at local, national, or global levels.…A food production crisis is usually set off by a shock to either supply or demand for food and often involves a sudden spike in food prices. (UNCTAD 2011)

Another, albeit slightly different, definition of a food crisis highlights to role of food price volatility. According to this definition, "volatile world food prices can create major import bill uncertainty with concomitant exchange rate uncertainty" (Gilbert and Morgan 2010), and as such "price volatility can lead to acute crisis in all aspects of food production" (World Bank 2007, 17–18).

These definitions of a food crisis are widely used and broadly accepted by researchers and international institutions such as the World Bank and the United Nations (World Bank 2007; Balcombe 2009; Gilbert and Morgan 2010). For our purposes, however, note that the definitions of food crisis as described here offer two important insights into what such crises entail. First, food crises are clearly determined by negative shocks to both the demand and the supply of agricultural commodities. Second, such crises are not caused only by high food prices, but also and specifically by high food price *volatility*.

As discussed in more detail in Chapter "Statistical Analysis of Food Crises and Mass Killing," food prices' volatility is defined as the variability of the prices of a particular staple or a basket of staples (e.g., maize, rice, wheat, and cereals) over time (World Bank 2007; Gilbert 2010; Roache 2010). Across developing countries—which include almost all nondemocracies—staple food price volatility has varied from as low as 2% to as high as 47% over the last three decades (Díaz-Bonilla and Ron 2010, 11–12; Roache 2010).

As much has been written about the determinants of high food price volatility by economists,[18] delving into this discussion is beyond the scope of this chapter. While we discuss the determinants of food price volatility in greater detail in Chapter "Statistical Analysis of Food Crises and Mass Killing," it is sufficient to point out here that upsurges—or spikes—in food price volatility can result from a variety of factors, including rising demand for biofuels, extreme climatic events such as severe droughts, speculation in commodity futures markets, sharp increases in oil prices, trade restrictions, macroeconomic shocks to money supply, exchange rates fluctuations, and even financial crashes (World Bank 2007; Díaz-Bonilla and Ron 2010; Roache 2010). The relative importance and actual impact of these causes of food price volatility have been widely discussed, but a consensus exists regarding the fact that very high food price volatility can cause a food crisis, and correspondingly negative shocks to food consumption in developing economies (World Bank 2007; Gilbert 2010; Roache 2010).

More specifically, high food price volatility generates economic uncertainty among farmers and other food producers in developing economies. This may result in sharp investment declines in food production, especially by farmers and other small agricultural businesses in developing countries that typically lack access to credit or other financial smoothing mechanisms. The ultimate result of these decreases in food and crop production investments is obvious—agricultural output, that is food production, substantively diminishes, engendering in turn acute food shortages (World Bank 2007; Roache 2010; UNCTAD 2011). Or, to state somewhat differently, high food price volatility frequently leads *almost immediately* to a food crisis, which is characterized by scarcity of food supplies and severe food shortages.

To exacerbate matters further, such food crisis sometimes sharply increases inflation rates, which mainly hurt the poor who spend large shares of their income on staple foods (World Bank 2007; UNCTAD 2011). Indeed, while in global markets food grains are considered commodities to be traded, these grains are also the basic staples of many in nondemocratic countries. Moreover, frequently, basic staples also serve as currency for the world's poorest populations, most of which live under nondemocratic regimes.

Thus, food production crises severely depress domestic food stocks, which in turn lead to food shortages. This results in a precipitous decline in the domestic civilians' food consumption, an issue termed by development economists as "negative (food) consumption shocks" (Nehru and Dhareshwar 1993; Rosset 1999). In addition to the immediate impact on child malnutrition and starvation, precipitous declines in food consumption also have a long-lasting negative impact on overall economic productivity in countries that experience food shortages (Rosset 1999; Reardon et al. 2000; IMF 1999, 2001)

Why, as predicted in Proposition 1, would food crises drive domestic citizens to openly mobilize against the ruling elite? To answer this question, first note that our model suggests that exogenous shocks to agricultural production cause sharp diminishing marginal returns to both agricultural land N and labor L.[19] This is hardly surprising since the *ex ante* uncertainty generated by high food price volatility or sudden severe droughts curtails capital investment in land and labor, thus causing diminishing marginal returns in these two factors of production. Crucially, the decline in marginal productivity of land and labor causes a production crisis and a precipitous drop in food output (see Part (i), Proposition 1).

Case-based evidence supports these claims. For instance, we mentioned previously that an agricultural production crisis in 1983 Tunisia led to a 33% drop in grain production under the country's authoritarian regime (Barakat and Handoufe 1997, 11–12). A similar crisis in authoritarian Morocco the same year led to an astounding 40% decline in staple domestic wheat production (Seddon 1986; Watts and El-Mourid 1988). In Suharto's Indonesia, the collapse of global demand for rice combined with domestic supply shocks engendered by the 1997 financial crisis had a strong impact on increasing domestic food price volatility. This led to both a rapid decline in the output of some staple crops—especially rice—and to hyperinflation in food prices (IMF 1999, 2001).

As suggested by these examples, food production crises and the resultant declines in crop output sharply and *suddenly* increase food prices. This depresses real wages, and correspondingly the domestic civilians' food consumption levels, and ensures that the citizens' net payoff in this crisis-affected authoritarian economy strictly decreases (see Part (ii), Proposition 1). As such, serious threats to their food consumption cause fears among the domestic citizens as to whether they will be able to meet even the basic needs required for survival.

This situation can be further exacerbated by three additional factors. First, nondemocratic governments in developing countries often lack credible and sufficiently funded consumption-smoothing mechanisms that can be employed to help stabilizing the civilians' consumption during a severe food crisis (Wintrobe 1998; Lust-Okar 2005; Schwedler 2005). Second, like other developing countries, nondemocratic regimes lack adequate social safety nets, welfare programs, and institutionalized emergency mechanisms, all of which allow these regimes to effectively address the domestic fallout of a severe food crisis and the resultant food shortages (Nooruddin and Simmons 2006; Schedler 2006; Trejo 2012). Third, to further exacerbate matters, governments in nondemocratic countries are less constrained and are less politically accountable to their citizens compared with their democratic developing and developed counterparts (Wintrobe 1998; Schwedler 2005; Davenport 2007a; Trejo 2012).

Owing to these issues, the ruling elite is unlikely to forsake rent extraction or to try and genuinely address the civilians' dire situation even during a food crisis. In effect, this means that R cannot credibly commit to solve and address the hardships faced by their citizens due to the resulting food shortages. The elite's inability to commit itself to solving the deleterious consequences of food production shocks exacerbates the adverse effect of such shocks and further diminishes the civilians' real income. This triggers resentment among the civilians, who now become much more likely to challenge the status quo. Consequently, the possibility of an open revolt against R emerges as a strictly dominant strategy for the civilians (Part (iii), Proposition 1).

While disillusionment with the regime incentivizes the civilians to mobilize against R, it is insufficient in-and-of itself in explaining *when they will act on these incentives*. After all, collectively mobilizing and garnering resources h to dispute R's political power is susceptible to collective action problems, as individual citizens have incentives to free-ride on the effort of and contributions by other citizens. The next set of comparative statics derived from our model, described in Proposition 2, explain when the citizens will successfully organize and mobilize against *R* during a food crisis:

Proposition 2 *When a food crisis occurs, then for sufficiently high levels of urban development per capita, the*

(i) *Resources* h^* *that the citizens allocate toward challenging the regime increases and*
(ii) *Probability with which the citizens openly mobilize against the ruling elite strictly increases.*

Proof See online appendix of book.

As is the case with the previous Proposition, while the formal derivations of the results are provided in the online appendix, we provide a nontechnical explanation of the rationale behind this Proposition and its implications.

According to Proposition 2, the probability that the civilians will successfully organize and collectively garner *h* to *openly and effectively* mobilize against *R* during a food production crisis strictly increases when the levels of urban development—normalized per capita—within the nondemocratic country are sufficiently high. To understand this claim, first note that previous research has drawn important linkages between urbanizations and the probability of mobilization against the regime (Wright 2008; Wallace 2013). Moreover, using nighttime light emissions to model local levels of electricity use and show that more urban development implies greater individual material capacity available to urban civilians is now a standard practice in contemporary research (Henderson et al. 2012; Weidmann and Shutte 2017). Building on these practices, our model illustrates that sufficiently high urban development levels per capita—that is, the urban civilians' material capacity—have two complementary effects that explain why they are more likely to garner resources and successfully mobilize against the authoritarian regime, as we stated in Proposition 2.

The first is the *Communication Effect*: increasing the levels of material capacity available for each urban civilian facilitates communication between clusters of individual *c*, thus allowing *C* to better coordinate their actions against the regime when a food crisis occurs.

More specifically, higher urban development per capita gives the civilians greater access to a variety of technological tools (e.g., cell phones, computer printers, and social media) to enhance communication and improve social interactions, for instance by informing a large number of citizens about opposition meetings. This fosters coordination between individual urban civilians, which can be leveraged toward anti-regime activities (Pierskalla and Hollenbach 2013). Increasing the frequency of communications between individual civilians is also a method of, "increasing trust, creating and reinforcing norms, and developing a group identity" (Ostrom 1998, 7), which in turn increases the likelihood that informal civilian opposition groups will routinely hold collective meetings.

Organizing and participating in such meetings gives the civilians an opportunity to mutually identify and articulate their common concerns. This facilitates coordination in these more developed urban areas, as the civilians find it easier to discuss, devise, and coordinate tactics that can be employed to oppose the regime. Such interactions also give rise to long-term relationships, which lengthen each individual civilian's time horizons in respect to future interactions. Civilians residing in more developed urban areas can thus more easily observe mutual efforts and the contributions provided by others toward opposing R owing to a longer shadow of the future, which allows them to identify and sanction free riders *as a group*. As a result, greater urban development and the associated higher levels of material capacity available to each citizen c will serve to facilitate coordination, cooperation, and collective action among C.

In addition to the Communication Effect, our model also suggests that higher urban development per capita enables the civilians to allocate more resources individually to collectively and overtly mobilize against the regime during a food production crisis. We, therefore, term this phenomenon the *Resource Effect*. Greater urban development, or material capacity, *per capita* implies that the civilians are likely to have more disposable income, free time, and better technology, which gives them increased capacity to collectively garner a larger pool of resources h^*, e.g., by obtaining more funding, recruiting more active participants, and formalizing socioeconomic ties. Greater collective access to a common pool of resources allocated by each individual thus allows the civilians in more developed urban areas to more effectively challenge the ruling elite once the incentives provided by a food crisis and the resultant impact on the civilians' consumption are in place.

The Coordination Effect and Resource Effect generated by sufficiently high θ levels increase the ability of civilians in developed urban areas to coordinate their actions, raise sufficient levels of h (see Part (i), Proposition 2), and undertake the necessary collective action to openly mobilize against the regime. This increases the likelihood that a serious challenge to R's rule will emerge during a food crisis, as additionally suggested in Proposition 2.

Again, historical evidence supports these claims. For instance, during the 1983 food crisis in Morocco, it was primarily citizens in the country's developed urban areas, "especially Rabat and Marrakesh," who coordinated, collectively mobilized, and "resorted to mass demonstrations" against King Hassan's regime, which failed to address the resulting fallout (Watts and El-Mourid 1988). Similarly, the Tunisian government's inability to provide credible guarantees to address the impact of the 1983 crisis led to a "sudden doubling of bread prices [which] was a crucial factor in the outbreak of mass unrest" (Seddon 1986, 1). This "sudden mass unrest" took place primarily in the Tunisia's most developed urban area, such as the capital Tunis and in other relatively developed cities such as Sfax and Kairouan (Seddon 1986, 1–2).

The way events unfolded in Morocco and Tunisia is neither rare not unique. To illustrate this last point, in Chapters "Urban Development, Food Shortages and Mass Killing in Authoritarian Pakistan" and "Food Riots, Urbanization and Mass Killing Campaigns: Indonesia and Malaysia" we construct a new, geocoded, within-country city-year data for Pakistan and, separately, for Indonesia, for the years in which these countries were observed as nondemocratic, to additionally evaluate these predictions. Using these original city-year data, we statistically evaluate the interactive effect of urban development per capita and food production crises on the number of violent riots carried out by citizens within all major cities in Pakistan and Indonesia, and aimed specifically at government institutions. We corroborate these statistical analyses with a detailed historical analysis of these two authoritarian countries to assess linkages between food crises, urban development, and anti-regime violence and riots. Indeed, we find that the occurrence of a severe food crisis has an important impact on the probability that in cities with higher urban development levels per capita the civilians will take to the streets and engage in violent anti-government riots, as suggested in Proposition 2.

Identifying how urban development levels and food crises impact the behavior of the civilians raises new questions about violence in nondemocracies. When their citizens take the streets and begin to wage a serious resistance campaign, how do political regimes in such countries perceive this threat? How will the ruling elite respond to this potentially existential threat, particularly during a food crisis? In addition to illustrating how the domestic civilians behave in these contexts, our model also sheds light on the behavior of the ruling elites, which helps to answer these questions, as we do in the next section.

Mass Killing Campaigns in Nondemocracies

We suggested that when a severe food crisis breaks out in a nondemocratic country, citizens residing in more developed urban areas within these states will be more likely to resort to overt dissent. Importantly, the civilians' ability to better coordinate and initiate a genuine opposition to the regime in more developed urban areas is common knowledge not only to them, but also to the ruling elite. It also implies that the civilians cannot credibly commit themselves *ex ante* not to challenge *R*, given the strong incentive to do so provided by the adverse economic impact of a sudden food crisis. In these situations, the elite *R* will view the ability of the citizens in more developed urban areas to collectively mobilize as a *credible threat* to its rule on the equilibrium path during a food crisis.[20]

Owing to this credible threat, *R* will rationally expect that its ability to retain power during a food production crisis will decreases sharply when θ is high, as higher urban development levels have a direct impact on the probability with which *R* remains in office.[21] This expectation has deleterious consequences according to the next set of comparative statics derived from the equilibrium result in Lemma 1:

Proposition 3 *If the level of urban development per capita is sufficiently high, then during a food shortage crisis, the ruling elite will refrain from offering concessions to the civilians, and instead strategically shift to perpetrating a mass killing campaign against urban citizens.*

Proof See online appendix of book.

Again, while the formal derivation of Proposition 3 is provided in the online appendix, it is important to discuss in detail the key claims behind this prediction. First, note that according to Proposition 3, the threat to the elite posed by the citizens C during a food crisis in developed urban areas within the country *dissuades* R from providing more concessions P to C in order to induce them not to oppose the regime. R has no *ex ante* guarantees that the civilians residing in developed urban areas will not renege on their promise not to openly oppose R *ex post* if a food crisis occurs, even if concessions are provided.

As we explained earlier, the relatively high material capacity of the citizens in more developed urban areas means that they have an inherent advantage with respect to undertaking collective action again R in response to a food crisis. Therefore, R has no incentives to offer equilibrium level concessions P^* to these citizens *ex ante* given this commitment problem. Rather, as suggested in the latter part of Proposition 3, the political threat that R faces in these situations will induce the ruling elite to sharply increase a^*—that is to shift to a perpetrating *mass killing*—during a food crisis when θ is high. More technically, mass killing emerges as a strictly dominant strategy for the ruling elite during a food crisis when the level of urban development per capita is high.[22]

The intuition behind Proposition 3—and the explanation for when R would strategically shift to mass killing—is as follows. First, as explained above, if the degree of urban development levels per capita within the country—that is, θ—is high, then when a food crisis gives the civilians the *willingness* to mobilize, they will have sufficient material capacity to (i) *credibly* challenge the ruling elite and (ii) *sustain* their overt opposition as an open civil revolt by raising h to the upper threshold level of $\bar{h}$. Our model suggests that when h reaches this upper threshold $\bar{h}$, then the costs that R will incur from deterring the civilians will increase substantially and may become prohibitive.[23] This poses an *existential threat* to the elite and its ability to maintain power, a possibility that is explicitly recognized by R on the equilibrium path. This possibility is captured by Straus (2015, 86), who argues that, "another potential trigger for genocide and mass atrocity is a state or non-state actor's perception of a real or imagined threat from large-scale protest activity."

Importantly, the existential threat to R in the model, combined with R's desire to remain in power, puts the ruling elite under enormous pressures to preempt the civilians from mounting a sustained civil revolt. This pressure to preempt intensifies the competition between the civilians and the ruling elite, and generates larger returns for violent behavior by R which incentivizes "political and security officials to respond to organized and typically substantial street protest with a violent crackdown" (Straus 2015, 86). It also motivates R to assert its political control by forcefully evicting a share of the population from urban areas during a food crisis, thus reducing the probability that an overt sustained opposition movement to its rule will emerge. Indeed, if some portion of C is forced to geographically disperse, then the civilians' ability to act collectively and sustain their revolt will decrease significantly. This will also reduce or destroy the amount of resources available to urban civilians and limit their local networks of interaction. Building on this logic, our model suggests that the ruling elite's preemptive goal of forced eviction has three adverse effects.

First, the ruling elite now has strong incentives to dramatically increase a^* as a rational response and strategically resort to a local mass killing campaign against its own citizens in urban areas during a food crisis, if these civilians possess sufficient material capacity. This strategy allows the elite to demonstrate its ability to take punitive action against the civilians and impose high costs on C. Such punitive actions will generate mass fear, inducing the civilians to flee and to stop coordinating their resistance efforts. This facilitates R's goal of evicting at least some share of C and deterring others from challenging it. Moreover, by terminating networks of revolt, limiting available technology by destroying infrastructure, and reducing the amount of free time available for each individual (as the civilians now need to use it to avoid being targeted), mass killing strongly constrains the amount of resources that the civilians can allocate for mobilization and collective action.

Second, the credible threat to the elite's rule where θ is high will produce strong incentives for R to allocate a greater share of its resources to offset the costs of the mass killing campaign during a food crisis. As a result, the constraints on R's behavior become slack—that is, weak—in equilibrium when θ is high, which serves to increase the ruling elite's net marginal benefit from employing mass killing. Finally, if it makes the strategic choice to *systematically* kill its own citizens, the ruling elite must believe that doing so will allow it to credibly threaten their livelihood and physical integrity on the equilibrium path and hence serve to dissuade other residents of developed urban areas from adding their individual material capacity to the resistance campaign. One way for the elite to enhance the credibility of the threat in this context is to potentially use food deprivation as a cost-effective tactic to weaken opposition and resistance as well as carry out mass killing (via mass starvation), especially in the context of limited food supply (e.g., Messer 2009; Gerlach 2010).

Another tactic that R can adopt to carry out such mass killings to threaten civilians is to employ government-sponsored irregular troops such as militia (which tend to be at least quasi-independent) despite the potential agency-loss.[24] Understanding the specific tactics that governments in nondemocracies use to carry out civilian-targeted killings in nondemocracies is important (and needs more attention in future research) but is beyond the scope of this project. More crucially, however, in the context of our model, the credibility of the threat alluded to above will further intensify fears among civilians. This, in turn, makes it more feasible for R to credibly deter challenges to its rule during food crises, which in turn increases the *ex post* probability q with which R may successfully remain in office.[25] The elite thus has additional incentives to initiate a mass killing campaign *ex ante* in the context of high θ when the wake of a food crisis.

To illustrate the validity of this argument, one can refer back to the historical examples discussed throughout this chapter. The Bourghiba regime in Tunisia, for instance, viewed the 1983 protests in Tunis and other cities as a "threat from 'hostile elements' concerned to overthrow the government" (Seddon 1986, 1). As a result, the regime's "response to the demonstrations was itself extremely violent. As the unrest spread, security forces opened fire on crowds in several towns, including the capital Tunis; at least 60 people were killed—as many as 120 according to some reports—and many more injured" (Seddon 1986, 1–2). Likewise, in response to the 1983 protests in Morocco, which again took place almost exclusively in developed urban areas, King Hasan's government brought in "troops from the western Sahara and Sidi Ifni…to quell the disturbances. As social unrest spread…it was countered by heavy concentrations of state security forces; press reports suggest that at least 100 were killed (as many as 400 according to some sources) and many more injured" (Seddon 1986, 1–2).

To complement this historical evidence, in Chapters "Urban Development, Food Shortages and Mass Killing in Authoritarian Pakistan" and "Food Riots, Urbanization and Mass Killing Campaigns: Indonesia and Malaysia" we again rely on the aforementioned geocoded city-year samples from Pakistan and Indonesia to illustrate the validity of the mechanisms proposed by this final theoretical Proposition. To do so, we independently code whether localized mass killing took place in urban areas within these to nondemocratic countries and estimate how the interaction between urban development levels and food crises occurrence affected the probability of state-led violence. Again, as discussed in great detail in these chapters, we find strong corroboration for our prediction about the conditions that can lead to mass killing under nondemocratic regimes.

Put together, the equilibrium result and the three Propositions derived from our game-theoretic model as well as the anecdotal examples discussed throughout this chapter suggest a strong link between urban development, food crises, and mass killing. This linkage leads to the book's main hypothesis, which is repeatedly tested over the next several chapters:

- **Main Hypothesis**: *Food crises will be associated with a significantly higher likelihood of state-led mass killing of civilians in nondemocratic regimes when the level of urban development within these regimes is sufficiently high.*

To evaluate this main hypothesis, we first statistically analyze detail, high-resolution cross-sectional data on nondemocracies in Chapters "Urban Development and Mass Killing: A First Look at the Data" and "Statistical Analysis of Food Crises and Mass Killing." In Chapter "Urban Development and Mass Killing: A First Look at the Data," we first examine the impact of urban development per capita on mass killing in the absence of a food production crisis alongside a large number of potential confounders. In Chapter "Statistical Analysis of Food Crises and Mass Killing," we then add different conceptualizations of food crises into our models to test the interactive effect of both. Further, in Chapters "Urban Development, Food Shortages and Mass Killing in Authoritarian Pakistan" and "Food Riots, Urbanization and Mass Killing Campaigns: Indonesia and Malaysia" we validate the mechanisms behind the claims leading to this main hypothesis using a combined approach that includes both the statistical analysis of original, geolocated data on cities in Pakistan and Indonesia, and a detailed discussion of historical evidence from three Southeast Asian countries.

Importantly, our main hypothesis broadly represents only *one* of three main potential outcomes one might expect to observe in the context of food crisis and high level of urban development in nondemocratic states. These two conditions and their anticipated interactive effect on mass killing campaigns are labeled as ***Scenario I*** in Fig. 1. However, as Fig. 1 shows, two other substantively relevant alternative scenarios might occur if either one of the two conditions is absent. We list these alternative scenarios and discuss their theoretical implications in the next section.

Two Alternative Scenarios

If either one of the two key prerequisites for localized mass killing is absent, then logic dictates that the probability of mass killing is substantively reduced. Aptly enough, we label these two alternative scenarios ***Scenario II*** and ***Scenario III***, respectively (see Fig. 1). In the first alternative scenario (***Scenario II***), a food production crisis and the resultant sharp decreases in food consumption still occur, but they do so within the context of *low levels of urban development per capita*. In the second alternative scenario (***Scenario III***), there is *no food crisis*, but urban development per capita levels are high. These possibilities raise an additional question, which deserves our attention: What is the probability of a localized state-led mass killing campaign in nondemocracies under each of these two alternative scenarios?

To provide at least a provisional answer to this question, we use our model to derive additional sets of comparative statics. We also empirically test these two scenarios both quantitatively and qualitatively in Chapters "Urban Development and Mass Killing: A First Look at the Data" and "Food Riots, Urbanization and Mass Killing Campaigns: Indonesia and Malaysia," respectively. Before proceeding, however, note that a third alternative scenario exists—namely, nondemocratic states that have low levels of urban development per capita and also do not suffer from a food crisis. Due to space constraints, and considering that this scenario is neither very interesting nor substantively important for our purposes, we do not analyze it here. Instead, we use this space to discuss the theoretical and empirical implications of ***Scenario II*** and ***Scenario III***.

Scenario II: Food Crisis in the Context of Low Urban Development

In our formal economic model, the nondemocratic states that fall under this scenario share two main features. First, these countries are nondemocracies that experience an ongoing food crisis. Second, however, unlike the countries that fall under ***Scenario I*** (which is covered by our main hypothesis), these food crisis-affected countries are characterized by *low levels of urban development per capita*. For illustration, within our empirical sample, some cases that fit this category are Chad, Zambia, and

Uzbekistan (see Chapters "Urban Development and Mass Killing: A First Look at the Data" and "Statistical Analysis of Food Crises and Mass Killing").

What is the probability that nondemocratic incumbents will employ mass killing campaigns in response to a food crisis under this scenario? The following Proposition provides an answer to this question:

Proposition 4 *When the level of urban development in a nondemocratic country is low, the citizens will fail to collectively mobilize and challenge the ruling elite even during a food crisis. As a result, the status quo will prevail and the probability that the elite will resort to a mass killing campaign becomes negligible.*

Proof See online appendix of book.

The intuition that leads to this prediction is straightforward and can be described as follows.[26] The outbreak of a food production crisis caused by high food price volatility or some form of an exogenous shock (e.g., drought) will give the citizens of this nondemocratic polity the *willingness* to express their dissent and collectively mobilize against the ruling elite. The rationale underlying this claim was discussed earlier in detail when explaining the main arguments that lead to the prediction in Proposition 1, and we therefore do not repeat it here.

The civilians' willingness to mobilize against the regime in the wake of a food crisis notwithstanding, low urban development per capita levels mean they do not have the *ability* to do so effectively. According to our model, low urban development levels exacerbate collective action problems among the civilians, making it very unlikely that they will be able to (i) garner enough material resources and (ii) establish strong enough social ties, to collectively mobilize and mount a serious challenge to the ruling elite. Specifically, unlike situations where the level of urban development per capita is high, civilians residing in areas with low levels of urban development will have relatively low material and technological capacities.

Low material capacity means that the aggrieved citizens are collectively too weak to muster enough resources h to politically organize, mobilize, and wage an effective resistance campaign against the authoritarian regime. Low technological capacity, especially with respect to communications, will make it in turn difficult for the civilians to coordinate their actions, further accentuating collective action problems. Therefore, the ability for collective action among C thus breaks down when θ is low, leading to a situation where, in equilibrium, the amount of resources the citizens can muster for mobilizing not only sharply decrease, but also remains low. This means that the civilians' efforts to challenge the elite, even if they do occur, lack credibly—a limitation that R fully understanding *ex ante*. Since the citizens are unable to credibly challenge R under this scenario, the ruling elite has little incentives to bear the transaction costs of providing concessions or resorting to atrocities to remain in power. Consequently, the status quo prevails in equilibrium in low urban development contexts. This leads to our first corollary hypothesis:

- **Corollary 1**: *Food crises in the context of low urban development per capita will be associated with little-to-no significant increase in the likelihood of state-led mass killing of civilians in nondemocratic regimes.*

Scenario III: No Food Crisis in the Context of High Urban Development

In our model, nondemocratic countries that fall under this scenario again share two distinct characteristics. First, the level of urban development per capita in these states is *sufficiently high* for civilians to muster enough resources to wage an effective campaign. Second, in contrast to the cases that fall under ***Scenario I***, at least within our temporal periods of interest these countries did not suffer a food crisis. What is the possibility that the regime will perpetrate mass killing against its own civilians under this scenario? The final set of comparative statics derived from our model provides an answer:

Proposition 5 *In countries when urban development per capita levels are high, state-led mass killing campaigns can still occur even in the absence of a food crisis. However, the probability of a mass killing campaign will be substantially lower compared with countries that have similar levels of urban development per capita but that do experience a food production crisis.*

Proof See online appendix of book.

The intuition that leads to the prediction in this Proposition is summarized here as follows.[27] Specifically, in the absence of a food crisis, the

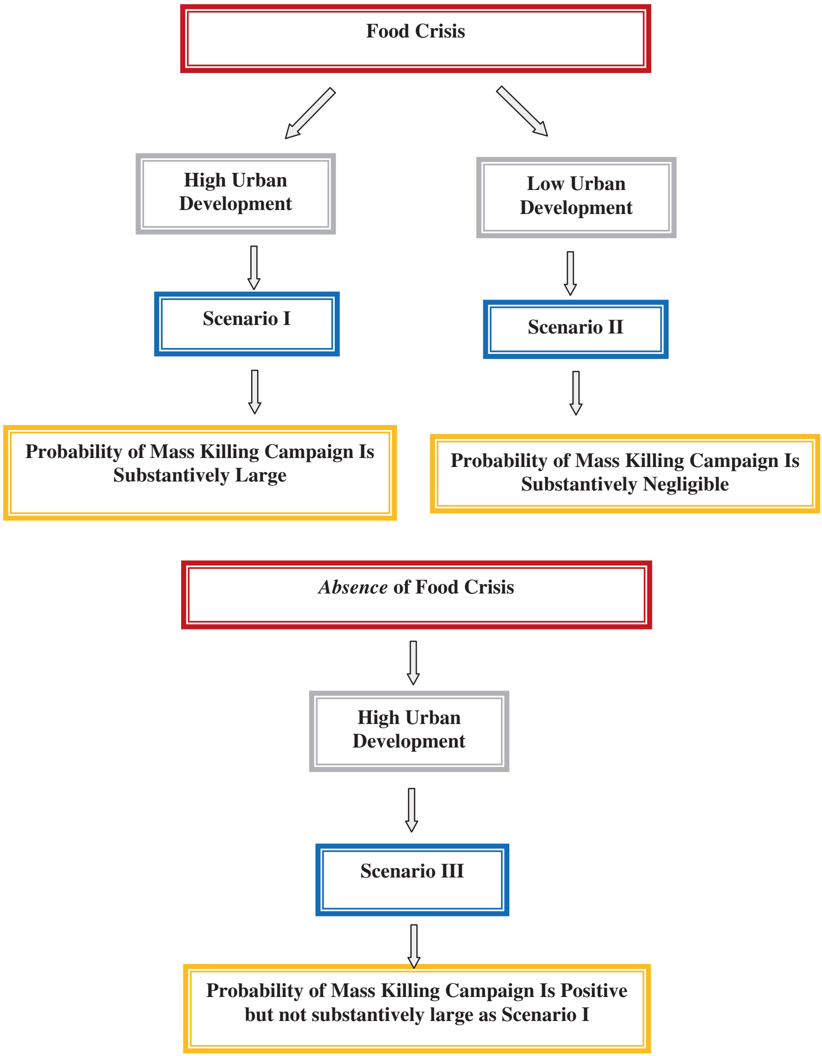

Fig. 1 Conceptual Map of Scenarios

citizens of nondemocratic countries are will be significantly less likely to fear of being deprived of their basic needs. This in turn means they are unlikely to have the *willingness* to bear the necessary costs of and invest the levels of material resources required to overtly oppose the ruling elite. This, however, does not mean that the civilians in these nondemocracies do not hold *any* grievances whatsoever against the regime. Indeed, as we mentioned previously, a large body of researchers argue that civilians residing in authoritarian countries may frequently come to question the political legitimacy of their leaders, and hence mobilize to remove them, even in the absence of price- or climate-driven shocks to agricultural production (see, e.g., Lust-Okar and Gandhi 2009; Trejo 2012; Gehlbach et al. 2016).[28]

Further, as we discussed in the previous section, high levels of urban development can bring together a larger number of civilians that are disillusioned with the regime and facilitate collective mobilization among them. Thus, as long as the level of urban development per capita is sufficiently high, there is always some realistic possibility that the citizens may mobilize against the regime even in the absence of a food crisis. This possibility is, of course, not included in ***Scenario I***, where the citizens openly and violently mobilize against the regime *only during a food crisis.*

Nevertheless, the possibility that the civilians will mobilize against the elite when θ is sufficiently high but a food crisis does not occur raises another pertinent question: How will the ruling elite respond to the possibility of dissent in the context of high θ? Our model suggests that—unlike in ***Scenario I***, where the civilians mobilize in response to a food crisis—the ruling elite is less likely to perceive such potential dissent as a serious threat in the absence of a food crisis. Yet, because high levels of urban development per capita can foster coordination among the civilians, which increases the possibility that their mobilization efforts against the regime will be more effective, the ruling elite will be induced to *hedge* its risk in equilibrium.

To hedge its risk effectively within high urban development contexts, the elite will adopt a more sporadic strategy of violence. In some situations, the elite will commit atrocities against civilians to credibly deter future challenges against its rule, considering that an opposition is always plausible when θ is sufficiently high. But unlike in ***Scenario I***—where a food crisis generates mass willingness to mobilize against the regime, creating an existential threat to the elite—in the absence of a food crisis R will only rarely resort to a sustained mass killing campaigns against C. This is because the emergence of an effective opposition during a food crisis is an actual, realized (as opposed to a potential) threat to the elite's rule.

These theoretical claims thus suggest a positive association between the parameter θ and mass killing campaigns is likely, although this probability increases dramatically during a food crisis. This claim is stated more formally as

- **Corollary 2**: *In the absence of a food crisis, high levels of urban development per capita will be associated with significant but not substantive increases in the likelihood of state-led mass killing of civilians in nondemocratic regimes.*

Conclusion

When do ruling elites in nondemocratic states likely to employ mass killing campaigns against their subjects? In this chapter, we use the tools of game theory to develop a theoretical story to answer this question. The equilibrium solution and comparative statics from the model show that the probability of a state-led mass killing campaign in nondemocratic states is influenced by the interaction of two factors: the level of urban development per capita and the compounding impact of a food crisis caused by high food price volatility or other exogenous events. Such food crises have deleterious effect on the civilians' food consumption levels, which diminish due to the shortages that occur due to a sudden food production shock. Worried they might not be able to feed themselves or even to guarantee their physical survival, and perceiving that the regime will remain indifferent to their plight, many citizens become willing to actively oppose the ruling elite.

While the elite may seek to address this challenge peacefully at first, its ability to do so during a food crisis strongly decreases in the context of high urban development per capita levels. In these situations, the civilians are less able to commit to the status quo, which might lead the regime to favor mass killing as an alternative to concessions. The ruling elite might therefore perpetrate mass killing to solidify its standing and preempt the formation of a sustained civilian opposition, an existential threat to its rule. Although our game model does not explicitly formalize repeated interaction, our equilibrium and comparative static results are drawn from a sequential move (multistage) game, where the optimal behavior of each player is consistent with the rational expectation of their opponent's current and future best response correspondence. This means that once the ruling elite observes overt anti-regime dissent as a credible threat to their rule in equilibrium—this specifically occurs in the combined context of food crisis and high urban development—they will *not deviate* from their "grim-trigger" strategy of preemptively resorting to mass killing as long as the two conditions (food crisis and high urban development) exist.

Building on our set of theoretical arguments derived from our model, we were able to derive this book's main hypothesis. This hypothesis posits that the interactive effect produced by the occurrence of a food production crisis and sufficiently high urban development significantly and substantively increases the probability that the nondemocratic regime will perpetrate mass killing against its own citizens. We spend the rest of the book evaluating this hypothesis and each of its underlying claims and mechanisms, both quantitatively and qualitatively. Finally, we completed our theoretical discussion by explaining in detail how the absence of each of these two enabling conditions would alter or modify the strategic dynamics between the citizens and the elite, and thus affect the associated outcomes associated. This latter discussion generated two corollaries that are also evaluated throughout this book.

Two main theoretical lessons can be drawn from the model and theory presented in this chapter. First, our theory shows that accounting for the role of urban development per capita in theories of repression and regime violence is important. In facilitating collective action between citizens in nondemocracies, especially when they seek to mobilize against the regime, urban development is—or should be—a critical factor informing our understanding how civil disobedience emerges and persists. Many scholars have recognized that such collective political mobilization can only happen if it creates focal point of contestation and norms of cooperation, or if it relies on technologies such as mobile phone or online networks to promote coordination (Tilly and Tarrow 2006; Ostrom 1998; Pierskalla and Hollenbach 2013; Wallace 2013). Building on this research, our theory explains precisely how and why urban development—a factor that has been relatively unexplored in the context of collective action and political violence in nondemocratic countries—can influence the prospects of anti-regime activities, and correspondingly, regime-sanctioned mass killing by state forces.

Second, researchers have invested substantial effort to understand why and how threats to the rule of incumbents in nondemocracies (e.g., dictators) from citizens can induce violent responses by such incumbents (see, e.g., Wintrobe 1998; Bueno De Mesquita et al. 2003; Trejo 2012;

Escribà-Folch and Wright 2015; Gehlbach et al. 2016). The theory we developed in this chapter draws on insights from these and other studies, but it also departs from this research in an important way. Our theory focuses specifically on how food crises and their ability to generate popular mobilization against the regime in more developed urban areas affect the strategic calculation of authoritarian incumbents. We show that such calculations are crucial in explaining the geospatial and temporal variation in mass killing within a given (nondemocratic) country. In doing so, we highlight the importance of and the advantages gained by studying the causes and anti-regime activity and political violence *within states*, an extremely useful—yet relatively unexplored—approach to explaining forceful state response in nondemocratic states, especially in response to adverse (food) shocks. Linkages between the geographic distribution of opposition "hotbeds" and the elite's responses to such potential threats in nondemocracies have important theoretical implications and would therefore benefit from more research.

In Chapters "Urban Development and Mass Killing: A First Look at the Data" and "Statistical Analysis of Food Crises and Mass Killing," we discuss our empirical research design and conduct a systematic, global evaluation of our main hypothesis and its two corollaries at the highly localized level. In Chapters "Urban Development, Food Shortages and Mass Killing in Authoritarian Pakistan" and "Food Riots, Urbanization and Mass Killing Campaigns: Indonesia and Malaysia," we complement these cross-sectional analyses with three detailed mixed-method case studies. Through these case studies, we not only evaluate our main hypothesis and its corollaries, but also validate the relevant mechanisms behind it.

Notes

1. As described below, incumbents in nondemocratic regimes include not only leaders in authoritarian regimes but also heads-of-state in other "hybrid regimes" (Levitsky and Way 2002) that do not hold free or fair elections.
2. This criticism regarding some assumptions underlying game-theoretic models is not a recent one. See, for example, Foss (2000).
3. While we consistently use the term "civilians" throughout this chapter to refer to domestic populations, i.e., "citizenry," residing in a particular nondemocratic polity, we also use the term "citizens" interchangeably in certain parts of the text.

4. Also see, e.g., Colaresi and Carey (2008), Koren (2014, 2017a), Davenport (2007a), and Pierskalla (2010).
5. See, e.g., Davenport (2007b), Straus (2006, 2015), and DeMeritt (2015).
6. See Lust-Okar (2005), Schedler (2006), and Gandhi and Lust-Okar (2009).
7. See Egorov et al. (2009), Norris and Inglehart (2009), and Stockmann and Gallagher (2011).
8. See Pereira (2005), Moustafa (2007), and Gloppen et al. (2010).
9. See Lust-Okar (2005, 2009), Schwedler (2005), Tilly and Tarrow (2006), and Trejo (2012).
10. The literature across these research areas is far more extensive than the works listed and cited above. For more examples, see, for instance, Chenoweth and Stephan (2011), Wallace (2013), Davenport (2007a, b), Pierskalla (2010), and Valentino (2004).
11. Hybrid regimes or in other words anocracies are also at times called "illiberal democracies." This term is drawn from Zakaria (1997), although the term "illiberal democracy" is not new per se. Variants of this term have been discussed in O'Donnell (1973), Levitsky and Way (2002, 2010), and Brownlee (2010).
12. See also, Wintrobe (2000), Haber (2006), Hadenius and Teorell (2007), Magaloni (2008), and Gehlbach et al. (2016).
13. Empirical research by development economists shows that Land and Labor are the two most critical factors of production in the context of developing economies'—which encompass the vast majority of nondemocracies—food production (Nehru and Dhareshwar 1993; Ray 1998). Hence, we focus on these two factors of production in our model. Our equilibrium and comparative static results do not alter if we include more than two factors of production (including capital) in the model.
14. Without loss of generality, we assume constant returns to scale for the CES production function $F(N, L)$. The model's equilibrium and comparative static results do not alter when we (i) assume increasing or decreasing returns to scale (results from increasing and decreasing returns to scale are available on request) and (ii) employ different functional forms of the production.
15. The degree of concessions offered is assumed to range from 0 to $\bar{P}$.
16. For more detailed discussions about the costs and trade-offs that leaders in nondemocracies face if and when they offer political and economic concessions to civilians, see Gandhi (2008), Schedler (2006), Gandhi and Lust-Okar (2009).
17. In addition to h, the ruling elite also accounts for ϕ and θ when strategically opting for P or a.
18. For this, see, e.g., Abbott et al. (2009), Gilbert (2010), and Roache (2010).

19. See “proof of claim 1” in the book’s online appendix.
20. See “proof of claim 3” in the book’s online appendix for a formal proof of this claim.
21. See “proof of claim 4” in the book’s online appendix for a formal proof of this claim.
22. See “proof of claim 5” in the book’s online appendix for a formal proof of this claim.
23. See “proof of claim 6” in the book’s online appendix for a formal proof of this claim.
24. It is plausible that these groups might be especially likely to operate in the context of severe food shortages and possess informational advantages in relatively developed urban areas. Food insecurity can drive governments in nondemocratic countries to rely to some extent on irregular troops for mass killing. We thank an anonymous reviewer for raising this issue, which requires further research.
25. See “proof of claim 7” in the book’s online appendix for a formal proof of this claim.
26. The mathematical proof of the main components of this Proposition is provided in the book’s online appendix.
27. The mathematical proof of the main components of this Proposition is provided in the book’s online appendix.
28. For instance, rampant corruption or a failure to provide basic social services can bring civilians residing in nondemocracies to question the legitimacy of their leaders (see, e.g., Wintrobe 1998; Schedler 2006; Escribà-Folch and Wright 2015).

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Urban Development and Mass Killing: A First Look at the Data

This chapter has two main aims. The first is to describe the empirical research design strategy we employ to evaluate our main hypothesis and its two corollaries, as well as the chain of claims that lead to this hypothesis. The second aim of this chapter is to describe in detail how we develop our 0.5-degree grid cell-year sample—which covers all nondemocratic countries for the years 1996–2009; discuss the operationalization of the dependent variable and its distribution within our sample; and describe the operationalization and main features of the first of our two key explanatory variables—urban development per capita. The sample and variables discussed in this chapter form the foundation on which we conduct a set of statistical tests to evaluate our main hypothesis, which is reported in the next chapter. For illustrative purpose, however, in this chapter we use these data to evaluate our second corollary, which concerns the probability of mass killing in the contexts of high urban development but in the absence of a food crisis.

Importantly, the theory we developed in the previous chapter and the hypothesis we accordingly derived critically associate mass killing campaigns with (i) urban development *within* nondemocratic countries, and (ii) during a food crisis caused by some type of a negative shock to agricultural production. As mentioned in the introduction, this book diverges somewhat from other studies in that our definition of a mass killing campaign is based on a strategic shift; if they face a real existential

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threat in specific locations, the elite would shift its strategy to perpetrating a systematic campaign of capital violence against its own citizenry. Thus, in contrast to studies that empirically measure acts of mass categorical violence, particularly mass killing and genocide, occurring at the *country level* (e.g., Valentino 2014; Valentino et al. 2004; Koren 2017), we use the term "mass killing campaigns" to identify a specific trend of systematic violent repression occurring *locally*.

Accordingly, in this chapter, we describe our empirical framework (i.e., the sample, unit of analysis, and variables) used to evaluate our argument concerning localized mass killing campaigns in nondemocratic regimes and explain how we construct our dependent variable. We also discuss the different steps we take to create an indicator that best approximates the first part of our interactive hypothesis—urban development per capita. We compare this indicator's performance with respect to localized mass killing to other measures of urbanization, thus establishing an empirical relationship between urban development per capita and systematic killings that holds across these different measures and helps us to evaluate our first corollary. Finally, we describe some of the variables used in the analyses presented both here and in the next chapter, which introduces the effect of food crises resulting from an exogenous shock to food production into the models.

The rest of this chapter is organized as follows. We begin explaining, in detail, the broader research design that guides all the empirical tests conducted in this book. We then discuss the large-N empirical framework used in the analyses conducted below and in the ensuing chapter. Having discussed the empirical framework and our unit of analysis, we explain how we derive our localized mass killing indicator and the data used to obtain information on localized mass killing campaigns. This is followed by a discussion of the variables used to account (i.e., control) for alternative, potentially salient explanations for political violence occurring both locally and nationwide. We then provide a step-by-step exposition of how we construct and standardize the first of our two key explanatory variables, which measures urban development per capita levels within nondemocratic countries. We then compare different urbanization and urban development indicators using a set of statistical analyses and model simulations. The chapter is concluded with a brief summary of this chapter's main empirical findings and the analyses we intend to conduct in the next chapter.

Research Design and Methodology

Large-N Analysis

To test our main hypothesis and its corollaries, and to evaluate our broad theoretical argument, we adopt a multimethods approach that relies on a combination of statistical analysis of cross-national and within-country data, on the one hand, and historical evaluation of particular relevant cases, on the other. We begin our empirical analysis by statistically evaluating our main hypothesis—when a food crisis caused by high volatility or an exogenous event such as drought occurs, the propensity for regime-perpetrated mass killing campaigns against civilians increases sharply if the level of urban development per capita is sufficiently high. Note that our theory, which leads to our main hypothesis, highlights the *within-country* variation in the occurrence of mass killing campaigns in nondemocratic states. Data measured at the annual country level would therefore be inadequate for the purpose of evaluating our hypothesis. The focus on the state as the unit of analysis, a standard practice in conflict research, neglects any dynamics occurring at the subnational level (Weidmann 2013; Tollefsen et al. 2012). It is possible to aggregate geospatially varying data such as mountainous areas or urbanization densities to the country level (see, e.g., Buhaug et al. 2009; Fearon and Laitin 2003). However, such aggregated data will not enable us to adequately assess how the propensity of nondemocratic regimes to use violence systematically against their citizenry varies between urban and rural areas, or during particular periods.

Therefore, to verify that our analyses capture such within-country variations in state-led mass killing occurring specifically in nondemocratic countries, we first develop a comprehensive list of nondemocratic regimes that includes authoritarian states and "hybrid illiberal regimes" that do not hold free and fair elections. The criteria that we use to construct this list of nondemocracies as well as this list itself are described in the next section. Next, within this set of nondemocratic regimes, we accordingly define our unit of analysis as the *annual* (i.e., occurring at year *t*) 0.5-degree grid cell—as measured by the PRIO-Grid framework (Tollefsen et al. 2012)—within each state in our nondemocratic country sample for the period 1995 (the first year in which grid cell level data on mass killing campaigns are available) to 2009. The 0.5-degree resolution corresponds to a squared "cell" of approximately 55 km × 55 km at the equator, which decreases in size as one moves toward the Poles due to the Mercator projection. We discuss the construction and the main features of this 0.5-degree grid cell-year sample in greater detail in the next section and use this grid cell-year sample to statistically evaluate our main hypothesis in the next chapter.

Since our hypothesis focuses on the likelihood of state-led mass killing campaigns in nondemocratic countries, we construct a binary dependent variable to test this hypothesis, as discussed in greater detail below and in the next chapter. Correspondingly, we interact two explanatory variables to assess the moderated effect posited by our main hypothesis. The first (binary) variable identifies whether a food crises occurred or not within a given country or grid cell. The second (continuous) variable measures annual levels of urban development per capita within each 0.5-degree grid cell in the sample. Below and in the next chapter, we describe in greater detail the procedures we employ to operationalize each of these two independent variables. We also describe the multiple conceptualizations we use to operationalize food crisis based on different aspects and types of exogenous shocks. This ensures that our results are not determined by the choice of any single food crisis measure in either the country-year level or 0.5-degree grid cell-year level.

We test our main hypothesis on said 0.5-degree grid cell-year sample within 77 nondemocratic regimes observed over the 1995–2009 period using logistic regression (i.e., logit) models designed to handle binary response variables. These models account for temporal dynamics, serial correlation, and country-specific heterogeneity by including binary controls (i.e., fixed effects) for each country and each year in the sample. The estimates obtained from these models provide consistent support for our main hypothesis. These results are robust to the inclusion of a large number of alternative explanations for mass killing campaigns in our model, the reliance on alternative operationalizations of our key explanatory variables, and the use of different estimation techniques for econometric sensitivity analysis.

Case Studies: Pakistan, Indonesia, and Malaysia

While the cross-sectional, localized, and time-varying statistical analyses mentioned in the previous subsection test the empirical validity and overall generalizability of our main hypothesis and its two corollaries, such exercises alone do not allow us to clearly ascertain and assess the mechanisms that give rise to these observed empirical regularities. Therefore, in the second part of the book we complement these statistical models by employing a commonly used quasi-experimental design—the longitudinal case study approach—to illustrate and assess the theoretical arguments that lead to our main hypothesis and its corollaries (Kinder and Palfrey 1993; Gerring 2006; McDermott 2002).[1] This approach permits scholars to exploit temporal variation within a single country to examine whether a particular treatment (e.g., a food crisis) affects the outcomes posited by the theoretical argument (Gerring 2006; Gibson et al. 2002). This approach "controls" for other extraneous factors, since these are context specific, and can thus be held constant. Researchers then compare pre- and post-treatment outcomes to evaluate whether their hypotheses are supported by the data. This design can also be used to identify "pathway cases" or, in other words, cases used to illustrate the mechanism laid out by a particular theoretical argument (McDermott 2002; Fearon and Laitin 2008; Gerring 2006, 156).

Recall that our theoretical argument relies on the concurrence of two distinct factors—the outbreak of a food crisis and the existence of high levels of urban development per capita—to explain higher propensity of localized mass killing campaigns in nondemocratic countries. Applying a viable longitudinal case study approach thus requires that we select cases that vary along each of these individual explanatory variables. More specifically, the cases we select should allow us to carefully examine the effect of each of the variables conditional on the level of the other variable. Accordingly, as part of this research design the second part of this book analyzes three specific cases—Pakistan, Indonesia, and Malaysia—during the years in which each of these countries was observed as a nondemocratic country. For the first case, Pakistan, we analyze the period lasting from 1978 to 1988, and then the period lasting from 2000 to 2006–2007, all years in which Pakistan was ruled by an authoritarian regime.[2]

We analyze Indonesia between 1979 and 1998, again, when it was observed as an authoritarian country.[3] Finally, we analyze Malaysia over the 1979–2009 period, as the country is observed to have nondemocratic regime over the entire period.[4] As described in more detail in Chapters "Urban Development, Food Shortages and Mass Killing in Authoritarian Pakistan" and "Food Riots, Urbanization and Mass Killing Campaigns: Indonesia and Malaysia," these three countries share numerous relevant features. For example, all three countries had been colonized by European powers, and all three gained their independence around the mid-twentieth century. All three countries are also Muslim-majority countries and were (or still are) governed by an authoritarian ruling elite during the different periods of interest. Moreover, ethnic divisions play an important political role in all three countries. These set of overlapping features mean that we can be more confident about the results obtained from analyzing these countries.

The first and arguably most important aspect of this case selection strategy is to verify whether the treatment—an increase in urban development per capita levels from low to relatively high within a nondemocratic country—also increases the propensity of regime-perpetrated mass killing campaigns *in the context of a severe food crisis*. Pakistan as observed during these two time periods—1978 to 1988 and 2000 to 2008—is an authoritarian state that fits these particular criteria (see, e.g., Talbot 1999; Siddiqa 2017). Indeed, over these periods Pakistan suffered repeatedly from negative shocks to its agricultural production, which generated recurring food crises (e.g., Finance Division 2012; Social Policy and Development Centre 2012). Additionally, our fine-grained urban development measure for Pakistan (described in Chapter "Urban Development, Food Shortages and Mass Killing in Authoritarian Pakistan") increased significantly between 1978 and 1988. It increased even further between 2000 and 2008.[5] These gradual increases in the level of urban development in Pakistan, especially after the mid-1980s, allow us to explicitly compare the level of violence in the country over the two periods. Here, we focus on the period (i) prior to 1984, when the country repeatedly suffered from food crisis but the level of urban development was low, and (ii) the period between 1985 and 88, and again between 2000 and 2008, when the country again consistently suffered from food crises, but this time the level of urban development per capita was high (Finance Division 2012; Akbar 2005). Using 1984 as our treatment year offers a quasi-experimental framework to assess whether sufficiently high levels of urban development from 1984 onwards increased the propensity of mass killing campaigns in Pakistan during ongoing food crises over the country's nondemocratic periods.

We conduct the Pakistan case analysis in Chapter "Urban Development, Food Shortages and Mass Killing in Authoritarian Pakistan" by examining and evaluating historical evidence from both before and after the treatment year (1984). Moreover, we rely on novel within-country, *city-year* data to also *quantitatively* analyze whether variations in food crises incidence and urban development per capita impacted the probability of localized mass killing in different Pakistani cities. Our analysis reveals that prior to 1984—that is, when the level of urban development per capita is relatively low—neither credible collective anti-regime mobilization nor state-led mass killing campaigns occurred, *even though the frequency of food crises during this period is high.* As the level of urban development increased sharply from the mid-1980s onwards, however, both the degree of anti-regime dissent in urban areas *and* the frequency of state-led mass killing campaigns increased, but the latter was significantly more likely to occur during a food crisis (see also Talbot 1999; Raman 2003; Siddiqa 2017).

While the Pakistani case study shows how large increases in urban development per capita level make anti-regime mobilization and state-led mass killing much more likely during food crises, it tells us little about the probability of mass killing in both nondemocratic countries that did not experience a large number of severe food crises. In this regard, Indonesia over the 1978–1998 period provides a suitable case. Indeed, as discussed in detail in Chapter "Food Riots, Urbanization and Mass Killing Campaigns: Indonesia and Malaysia," the average level of urban development in Indonesia between 1979 (the year in which data to operationalize the urban development first became available) and 1986 was rather high. It increased even further between 1987 and 1998 prior to the country's transition into a democracy in 1999 (Anderson 2001; Collins 2007). Unlike Pakistan, however, Indonesia experienced only one food crisis over its entire nondemocratic country spell, which occurred in 1996 (Wallenstein 1988; Timmer 2004). In fact, as discussed in Chapter "Food Riots, Urbanization and Mass Killing Campaigns: Indonesia and Malaysia," the combination of a severe drought, which significantly lowered local food availability, and the East Asian financial crisis in 1997, which sharply increased food price volatility, generated a severe food crisis that began in 1996 and lasted until 1998.

We accordingly examine the Indonesian case over the entire 1979–1998 period, since the outbreak of a food crisis in 1996 allows us to compare the occurrence of anti-regime mobilization by citizens against the autocratic elite, and whether these resulted with a state-led mass killing campaigns after 1996. Thus, as we do in our analysis of Pakistan, we divide this case into two time periods: (i) the period *prior* to 1996, when the level of urban development is high but when there is no outbreak of food crisis, and (ii) the 1996–1998 period, when the level of urban development is high and when multiple food crisis episodes occur (Timmer 2004; Ananta and Barichello 2012). This "before-and-after" framework allows us to use the Indonesian case study to test whether the treatment—that is, the outbreak of a severe food crisis—*in the context of high urban development per capita* generated anti-regime mobilization against Suharto, and whether the latter responded with a mass killing campaign.

Similarly to our analysis of urban development, food crises, and mass killing in Pakistan, we use original city-year-level data to also quantitatively assess these dynamics over the entire 1979–1998 period, as discussed in greater detail in Chapter "Food Riots, Urbanization and Mass Killing Campaigns: Indonesia and Malaysia." This analysis shows that indeed, prior to 1996—that is, when Indonesia experienced no food crises—neither strong anti-regime mobilization nor state-led mass killing against urban civilians occurred, even though the level of urban development during these years is high (Glassburner 1978; Wallenstein 1988; Lubis 1993; Ananta and Barichello 2012).[6] However, from the mid-1990s onward the country went through several food crises related to both agricultural shortages caused by a severe drought and economic financial crises, while credible anti-regime mobilization and state-led mass killing campaigns began to occur at an alarming rate (Juwana 2003; Collins 2007; Ananta and Barichello 2012). Again, as our theory expects, these opposition movements and the forceful response of the regime both took place during these ongoing food crises in areas where urban development levels were high (Juwana 2003; Aspinall 2005, 2010).

Finally, in Malaysia the level of urban development per capita remained persistently high during the temporal period of interest (1979–2009) (Samat 2002; Samat et al. 2010). Unlike Pakistan and Indonesia, however, Malaysia did not experience any food crises over its entire authoritarian spell. In Chapter "Food Riots, Urbanization and Mass Killing Campaigns: Indonesia and Malaysia," we analyze Malaysia starting in 1979—the first year in which data to operationalize our detailed urban development per capita indicator were available—and ending in 2009 (the regime was still classified as authoritarian after 2009, see, e.g., Cheibub et al. 2010; Geddes et al. 2014). As it did not experience any food crises between 1979 and 2009 (Wallenstein 1988; Samat et al. 2010), however, Malaysia serves our "contrast" case because one of the key conditions for the onset of a mass killing campaigns according to our theory—the outbreak of food crises due to a negative food production shock—is absent over this period. Hence, building on the theoretical exposition provided in Chapter "Food Riots, Urbanization and Mass Killing Campaigns: Indonesia and Malaysia" and the second corollary of our main hypothesis (as well as the analyses reported below), we anticipate that while some state-sponsored killings of civilians should occur in developed urban areas, a systematic campaign of mass killing should not occur. Indeed, the detailed historical analysis of the Malaysian case conducted in Chapter "Food Riots, Urbanization and Mass Killing Campaigns: Indonesia and Malaysia" confirms these predictions.

Our strategy of using different types of quantitative and qualitative data, including historical evidence, process tracing, and the statistical analysis of original within-country data coding violent anti-regime protests and mass killing by state forces, allows us to evaluate every component of our theoretical argument. This approach also helps us to understand the strategic behaviors of the two key actors in our theoretical model—the ruling elite and the domestic civilians—in each of the three countries. Together, this mixed quantitative and qualitative evidence serves to enhance the depth—and reliability—of our case studies.

The Empirical Framework

Unit of Analysis

As mentioned in the discussion of our research design above, we define our unit of analysis as the annual (i.e., occurring at year *t*) 0.5-degree grid cell as measured by the PRIO-Grid framework (Tollefsen et al. 2012). This empirical framework has at least two advantages. First, it allows us to carefully and accurately operationalize the level and variation of urban development per capita within (and across) different countries, which is necessary for our hypothesis to be evaluated. Thus, this framework is sensitive enough to capture variations in the frequency of systematic killing campaigns as these are reflected in urban development patterns within a given country.

Second, as discussed in the introductory chapter, a substantive share of mass killing campaigns within nondemocratic states occurs in urban areas (56%), despite their relatively small share within the entire autocratic grid cell years (17%). From this perspective, our grid cell framework allows us to identify in later analysis stages how locally occuring droughts in different parts of the country affect systematic killing dynamics not only in developed urban cells within a given country, but also across urban and rural grid cells. This fine-grained grid-level framework is thus disaggregated enough as to allow us to evaluate local variations in violence, but not overly disaggregated such that these localized indicators lose their precision levels due to different approaches of measuring an incident's geographic location (Weidmann 2013).

Given these advantages, we develop our 0.5-degree grid cell-year sample of nondemocratic regimes in two main steps. To start, note that by construction, our definition of nondemocratic states includes autocratic regimes (Svolik 2012; Geddes et al. 2014; Cheibub et al. 2010). However, it also covers other forms of "illiberal" or "competitive authoritarian" regimes that (i) do not hold the kind of free and fair elections expected in "true" democracies, (ii) are likely controlled by a small group of individuals who exercise power over the entire state without being constitutionally accountable to the public, and (iii) restrict individual freedom and civil liberties (Levitsky and Way 2010; Geddes et al. 2014). Hence, in the first step of constructing our sample, we use the comprehensive and updated data of nondemocratic states created by Geddes et al. (2014) to identify a complete list of 77 countries—listed in Table 1—that were considered nondemocratic during the 1996–2009 period, and for which data to operationalize the dependent and independent variables (described below) were available. In the second step, these 16 years of data are structured into a cell-year-level dataset, where cells are the cross-sectional unit of interest, and are measured at the 0.5×0.5 decimal degree cell resolution for the entire terrestrial globe discussed in the introduction (Tollefsen et al. 2012).

The Dependent Variable

Recall that our hypothesis focuses on the likelihood of state-led mass killing campaigns, which implies that our dependent variable is binary. We therefore operationalize this variable, *Mass Killing Campaign*$_t$, as incidents where the yearly (t) number of civilians killed by atrocities—or deliberate attacks done for political purposes—by official state forces or other armed groups sanctioned by the regime within a given cell was larger than 50.[7] The use of a binary threshold not only permits us to directly evaluate the interactive effect in our hypothesis; it is also a well-established practice in studies of mass killing and mass categorical

Table 1 List of countries analyzed and years as nondemocratic

Country	*Beginning year*	*End year*	*Country*	*Beginning year*	*End year*
Cuba	1995	2009	Haiti	2000	2004
Mexico	1995	2000	Guatemala	1995	1995
Venezuela	2006	2009	Peru	1995	2000
Yugoslavia	1995	2000	Russian Federation	1995	2009
Belarus	1995	2009	Armenia	1995	2009
Georgia	1995	2003	Azerbaijan	1995	2009
Guinea-Bissau	1995	2003	Gambia	1995	2009
Senegal	1995	2000	Mauritania	1995	2009
Niger	1997	1999	Cote d'Ivoire	1995	2009
Guinea	1995	2009	Burkina Faso	1995	2009
Liberia	1998	2003	Sierra Leone	1995	1998
Ghana	1995	2000	Togo	1995	2009
Cameroon	1995	2009	Nigeria	1995	1999
Gabon	1995	2009	Central African Republic	2004	2009
Chad	1995	2009	Congo (Brazzaville)	1998	2009
Congo (Kinshasa)	1995	2009	Uganda	1995	2009
Kenya	1995	2002	Tanzania	1995	2009
Burundi	1997	2003	Rwanda	1995	2009
Eritrea	1995	2009	Angola	1995	2009
Mozambique	1995	2009	Zambia	1997	2009
Zimbabwe	1995	2009	Namibia	1995	2009
Botswana	1995	2009	Swaziland	1995	2009
Morocco	1995	2009	Algeria	1995	2009
Tunisia	1995	2009	Libya	1995	2009
Sudan	1995	2009	Iran	1995	2009
Iraq	1995	2003	Egypt	1995	2009
Syrian Arab Republic	1995	2009	Jordan	1995	2009
Saudi Arabia	1995	2009	Kuwait	1995	2009
United Arab Emirates	1995	2009	Oman	1995	2009
Afghanistan	1997	2001	Turkmenistan	1995	2009
Tajikistan	1995	2009	Kyrgyzstan	1995	2009
Uzbekistan	1995	2009	Kazakhstan	1995	2009
China	1995	2009	Taiwan	1995	2000
Korea (North)	1995	2009	Pakistan	2000	2008
Bangladesh	2008	2008	Myanmar	1995	2009
Nepal	2003	2006	Thailand	2007	2007
Cambodia	1995	2009	Laos	1995	2009
Malaysia	1995	2009	Singapore	1995	2009
Indonesia	1995	1999			

Note 2009 was the last year observed in the sample violence (e.g., Valentino et al. 2004; Valentino 2004; Koren 2014). These studies usually employ a threshold of 1000 or more intentional civilian deaths for an entire campaign, measured at the country-year level. However, considering that our data are (i) annual and (ii) measured at the grid cell level, we believe that a threshold of 50 civilian deaths resulting from atrocities is high enough to capture intentional, *systematic* killing campaigns by state forces; indeed, this threshold corresponds to an average of approximately 14 intrastate killing campaigns per year, which is roughly consistent with the annual number of such ongoing campaigns in extant studies of mass killing at the country level (e.g., Valentino et al. 2004; Koren 2017).

Another advantage of this relatively low threshold is that it accommodates quite a large number of cities and regions within the state where such campaigns were implemented. Considering the relatively small size of a 0.5-degree-resolution grid cell, incidents where 50 or more civilians were killed by the regime in a given cell are relatively rare. Yet, sadly enough of these incidents are observed at the cell level as to provide enough within-country variation to test our hypothesis. The data for constructing *Mass Killing Campaign*$_t$ were obtained from the Political Instability Task Force (PITF) Worldwide Atrocities Dataset, which defines atrocities as "implicitly or explicitly political, direct, and deliberate violent action resulting in the death of noncombatant civilians" (PITF 2009, 3).[7] The PITF uses international news sources to collect and code a reasonably systematic sample of atrocities occurring worldwide between 1995 and 2014.[8] A subset of these atrocities, which only includes incidents perpetrated by the state or auxiliary forces sanctioned by the regime, is then utilized to create the dependent variable. After merging the PITF's atrocity deaths into our cell-year dataset based upon their recorded latitude–longitude coordinates, each cell's identified number of civilians killed by state forces is summed to the yearly level. Finally, the variable *Mass Killing Campaigns*$_t$ is operationalized, as mentioned, by employing a threshold of *at least* 50 civilian deaths by state forces in a given cell during a given year. For summary purposes, a map showing the nondemocratic countries that experienced a killing campaign during the 1996–2009 period is presented in Fig. 1.

The PITF Worldwide Atrocities Dataset offers two notable advantages over other extant datasets for evaluating our hypothesis. First, it identifies all incidents "perpetrated by members of a single organization

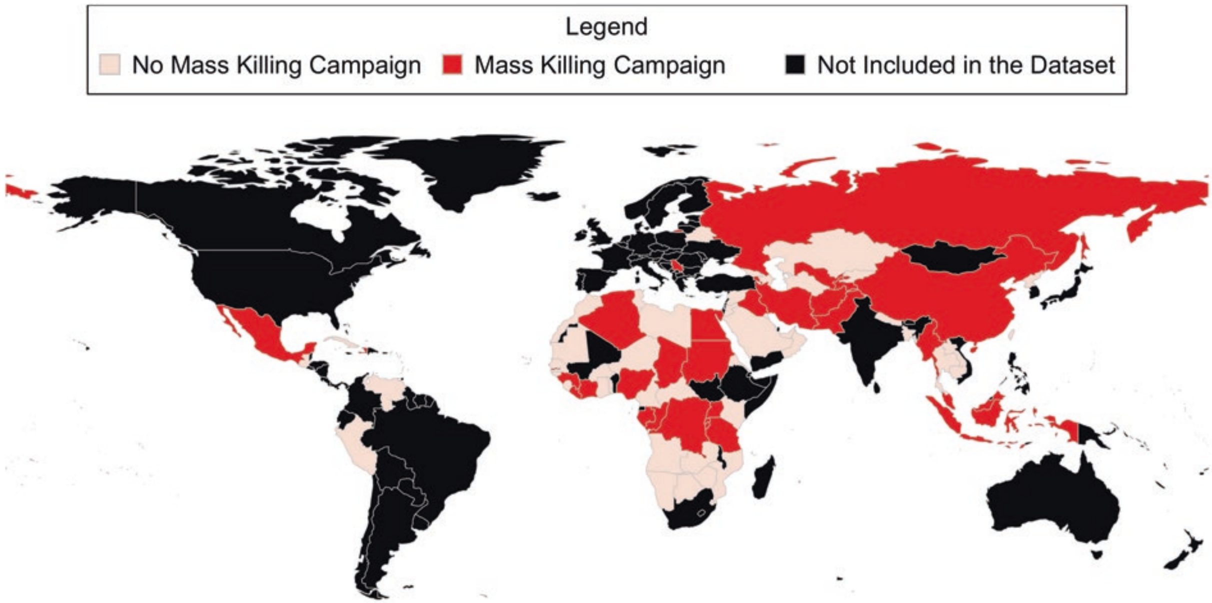

Fig. 1 Mass killing by country for all nondemocratic countries, 1996–2009 (PITF)

or communal group, or by members of multiple organizations or groups reportedly acting in concert, in a single locality" (PITF 2009, 6). Human coders record each attack's geolocation and do not report an event if no information on location is available (PITF 2009, 8). This means that deaths coded as perpetrated by a state organization and occurring within specific regions (e.g., urban areas) did in fact occur there and due to the actions of state forces, and not simply reported as such due to the lack of available information about attack location or perpetrating actor identity. Second, the PITF Worldwide Atrocities Dataset provides a *global* coverage of violence over our entire temporal period, which means that linkages between urban development, drought, and intrastate killing campaigns in nondemocratic countries are evaluated across the entire terrestrial globe for the period of concern.

Because our dependent variable is binary, we rely on logistic regression (i.e., logit) models for statistically assessing our theory and hypothesis. To control of time dependencies unaccounted for by the variables listed below in each specification, all models include yearly dummies (i.e., year fixed effects). To additionally account for the nonrandom assignment of variable values across countries, and because we use country-level variables alongside cell-level indicators, each model includes country fixed effects. Because the data for some variables are duplicated over time, the standard errors in all models were clustered by 0.5-degree grid cell.

Control Variables

Before discussing the first of the two variables used to test our interactive hypothesis, *Urban Development* PC_t, we describe in detail some of the additional variables employed in our analyses, both in this present chapter and in the ensuing one. These "control" variables are used to help to ensure that any identified effects of our explanatory variables and their interaction are less likely to be caused by other theoretically motivated factors.

The first set of variables accounting for alternative explanations are measured, like our dependent variable, at the 0.5-degree grid cell level. First, to ensure that the results are unlikely driven by economic production levels, we include a variable measuring total economic output levels within a given cell during a given year, GCP_t (measured in gross cell product in billion USD), and created by Nordhaus (2006). A second variable, *Population*$_t$, which was also created by Nordhaus (2006), codes population densities in a particular grid cell during year *t*.[9] These variables help to verify that the estimates provided by the model are not the result of broader economic factors or population densities, but rather specifically of urban development at the local level, and—as shown in the next chapter—the compounding effect of drought. Next, to account for temporal dependencies in localized mass killing and the possibility that violence is more likely where it occurred previously, we also include a lagged indicator of our dependent variable, *Mass Killing Campaign*$_{t-1}$ in our models. Several geospatial indicators are also added to account for the potential effect of some constant (i.e., nontime varying) geographic features. Here, we include distance to the nearest border (in kilometers), *Border Distance*; travel time to the nearest city with more than 50,000 inhabitants (in hours), *Travel Time*; and the distance to the capital city (in kilometers), *Distance to Capital*. These variables were all included within the PRIO-Grid framework (Tollefsen et al. 2012).

Additionally, note that numerous studies have highlighted the effect of civil war and localized armed conflict on engendering violence against civilians (see, e.g., Valentino 2004; Valentino et al. 2004; Koren 2017; Wood 2010; Hultman 2007). Therefore, to account for the impact of ongoing war on the killing of civilians highlighted by these and other studies, we also include an annual cell-level indicator, *Conflict*$_t$, denoting whether war—defined as a conflict involving 25 or more combatant casualties, both civil and interstate wars—afflicted a given cell during a given year (Tollefsen et al. 2012; Gleditsch et al. 2002) in some of our specifications. Finally, we add to the models reported below a variable denoting whether a severe drought afflicted a given cell during a given year or not. This variable, *Drought (Cell)*$_t$, is part of the different indicators we use to model food crises to be interacted with *Urban Development PC*$_t$. We discuss this variable in greater detail in the ensuing chapter.

In addition to these 0.5-degree grid cell variables, we also further ensure that our results are not driven by political and economic conditions at the country level by including several lagged country-year level variables in our models. Because these variables are measured at the country level, this means that during a given year every 0.5-degree grid cell within a given nondemocratic country was given the same value. Nevertheless, the resulting autocorrelation is likely to bias any findings toward zero, i.e., statistical insignificance, rather than the other around. Additionally, the use of binary variables, i.e., fixed effects, by country should help alleviate some concerns and ensure that the resulting coefficients on these country-level variables capture only the effect of these measures within the country that vary annually.

First, recall that our argument assumes that killing campaigns are used to preempt the onset of violent protests. However, to account for the possibility that violence occurred due to lagged effect of violent protests the previous year ($t-1$) rather than in the current year (t), we include an additional variable *Violent Civil Disobedience*$_{t-1}$ in our models. Unfortunately, no data on violent protests (similar to those used in our country study chapters) are available globally at the 0.5-degree grid cell level. However, the Nonviolent and Violent Campaigns and Outcomes (NAVCO) v2.0 Data Project, coded by Chenoweth and Lewis (2013), includes information on both primarily violent and primarily nonviolent campaigns occurring at the annual country level. We thus use these data to operationalize *Violent Civil Disobedience*$_{t-1}$ as an indicator denoting whether a given nondemocratic country experienced a *violent* civil disobedience campaign the previous year.[10]

Second, numerous studies argue that more repressive autocratic regimes (e.g., Escribà-Folch 2013; Frantz and Kendall-Taylor 2014; Koren 2014; Ulfelder 2012) or nondemocratic “anocracies” (e.g., Vreeland 2008) are also more likely to intentionally kill large numbers of civilians. Although our analysis focuses on violence occurring within nondemocratic regimes, to account for the effect of political openness levels across different countries, we rely on the widely used, ordinal *Polity2*$_t$ indicator compiled by Marshall et al. (2013). Additionally, several studies have highlighted the role of profitable natural resources, especially oil, in engendering conflict and causing violence against civilians (Azam and Hoeffler 2002; Collier and Hoeffler 2005; Valentino et al. 2004). Considering the potential impact of natural resources on systematic killing campaigns, we include two variables coding annual oil and gas production levels by country, *Oil*$_t$ and *Gas*$_t$, respectively, obtained from Ross (2011). Finally, to account for other economic confounders and the impact of development and state capacity more broadly (Ulfelder 2012), we also include in our analysis an annual measure of gross domestic product per capita, *GDP PC*$_t$, coded by Gleditsch (2002).

The First Explanatory Variable: Urban Development Per Capita

A crucial pillar of the theory we developed in the previous chapter emphasizes the role of urban development and the actions of city denizens in facilitating the emergence of organized opposition. The fact that urban centers are crucial to the regime and its ability to remain in power and—correspondingly—to protest and resistance is not a recent discovery. Cities bring together masses of people, improve communications between individuals, and increase the ability of private grievances to accumulate, spread, and become common injustices. As Wallace argues, "[h]igh levels of urban concentration represent abundant kindling upon which a spark may engulf a territory" (2013, 634). The emergence of the city also allowed workers and artisans to work together, form professional groups, and extract exactions from the regime. Tilly, for instance, writes that,"[t]his new scale of congregation combined with new, pressing grievances, improving communication, the diffusion of new organizational models from government and industry" produced "grudging concessions by the authorities to the right of association" Tilly (1978, 42).

Similarly, Habermas argues that as education and development levels increase, so is the ability of individuals and groups for collective action and the pressures toward more political and economic participation (1970). Rising urban concentration levels in nondemocratic regimes are thus characterized by increases in the civilians' ability to coordinate their actions and by their ambition to pursue a policy of redistribution, which in turn increases the probability of regime removal (Wallace 2013). This might lead to repression as these pressures mount, more civilians move into urban areas (Chenoweth and Stephan 2011), and fault lines begin to appear among the elite (Mason and Krane 1989). Indeed, previous research suggests that urban protests are still a common form of anti-regime violence in nondemocratic states (Chenoweth and Stephan 2011), for instance, in response to variations in food prices (Hendrix and Haggard 2015) and long economic decline (Kim 2016).

Recall that our authoritarian political economy theoretical model begins with the aforementioned notion that the ability of the civilians to act collectively and thus to post a credible threat to the regime is much greater in urban areas with higher development per capita levels. We accordingly construct our first explanatory variable as a thinly disaggregated, time-varying measure of urban development per capita, *Urban Development PC*$_t$, in three steps, in a manner that closely corresponds to previous studies (see, e.g., Zhang and Seto 2011; Henderson et al. 2012). Additionally, we empirically validate the effect of the resulting indicator in each of these steps on the probability of localized mass killing campaign later in the chapter.

We begin with a constant (i.e., nontime varying) indicator of urbanization at the 0.5-degree grid cell level, *Urban*. This continuous variable was operationalized as the percentage of a given 0.5-degree grid cell's area whose land cover class was denoted as "artificial surfaces and associated areas" by the GlobCover 2009 project in grid cells coded as having 50% or more urbanized area coverage (Bontemps et al. 2009, 19). The practice of coding only grid cells whose coverage is 50% or more artificial surfaces is designed to facilitate the identification of urban areas, which are traditionally not well-represented in such satellite imagery-derived samples, using both supervised and unsupervised classification approaches (Bontemps et al. 2009, 10).

While this urbanization indicator is highly disaggregated, it suffers from two main limitations for the purpose of evaluating our main hypothesis. First, this indicator is constant for 2009 (the year when the satellite images used to construct this indicator were taken by the European Space Agency). As it does not vary over time, this indicator, in-and-of itself, does not allow us to evaluate how temporal variations in urban development affect the probability of mass killing from one year to the next within the same urbanized locality. Second, although this indicator captures the extent of a given 0.5-degree grid cell's *area* that is urbanized, it tells us nothing about the level of economic and physical development therein. Considering that the extent of technological and economic development within an urban area is a crucial part of our theory and hypothesis, this indicator, in its current state, is inadequate for our purposes.

Considering this limitation of the *Urban* variable, in the second step we modify this indicator to overcome these two limitations—that is, to both vary over time and reflect the extent of urban development levels within a given 0.5-degree grid cell. To do so, we incorporate a second variable that measures the annual (calibrated) average of nighttime light emissions at the 0.5-degree grid cell resolution into our urban development indicator. This variable, *Nighttime light*$_t$, measures average visible (i.e., cloud free and stable) nighttime light emission obtained from the DMSP-OLS Nighttime Lights Time Series version 4 (Average Visible, Stable Lights, & Cloud Free Coverages).

Original DMSP data were collected by US Air Force Weather Agency and processed by the NOAA's National Geophysical Data Center (see, e.g., Elvidge et al. 2014). While numerous nighttime light measures are available, the indicator we chose to employ for creating a measure of development was calibrated using values from Elvidge et al. (2014) to account for differences between data from different satellites and sensor decay over time, making these measures especially useful for time-series analysis (Tollefsen et al. 2012). Values are standardized to be between zero and one, where one is the highest observed value in the entire time series, and zero is the lowest for the years 1992–2012, and aggregated to the 0.5-degree grid cell level.

Nighttime light provides a good approximation of the degree of urban development, especially the expansion of local infrastructure including roads, telecommunication, and electricity (e.g., Min 2015; Koren and Sarbahi 2017; Chen and Nordhaus 2011; Weidmann and Schutte 2017). It is therefore not surprising that in recent years the use of nighttime light-based data to approximate different aspects of development and institutional capacity has become a standard practice in the literature. Indeed, more than two decades ago Elvidge et al. (1997) recognized that, "[n]ighttime lights provide a useful proxy for development and have great potential for recording humanity's presence on the earth's surface and for measuring important variables such as annual growth for development" (1997, 1378).

Later research relied on nighttime light density to approximate a given country extent of economic development (Chen and Nordhaus 2011) or to calculate the extent of selective public good provision by political parties (Min 2015) or levels of wealth (Weidmann and Schutte 2017) within a given state or territory. Moreover, nighttime light satellite imagery is available at a very high spatial resolution, making these measures especially useful for studies that examine *within-country* variation in development and state capacity. For instance, Koren and Sarbahi (2017) illustrate that nighttime light closely follows standard measures of state capacity such as taxation, the number of health centers in a given region, or the satisfaction of civilians from services provided by the state. In this case, nighttime light is used to approximate state capacity and to illustrate that while weaker countries are more likely to experience civil war, within this countries conflict arises in areas where the state is stronger.

Due to the ability of nighttime light-based measures to capture factors such as development and wealth at the highly localized level, as well as their availability across different platforms, numerous studies have used such measures to approximate local urbanization levels within a given country. Zhang and Seto (2011), for instance, use multiple layers of high-resolution nighttime light images to estimate urban change at regional and global scales. From an economic perspective, Henderson et al. (2012) rely on temporal variations in the distribution of nighttime light within countries to derive a novel indicator of local GDP growth and identify centers of economic and technological activity.

Similarly to Henderson et al. (2012), we rely on temporal variations in (calibrated) average nighttime light levels within a given region, conceptualized here as a 0.5-degree cell grid, to approximate economic and technological capacity. To do so, we first keep all 0.5-degree grid cells denoted as urban, i.e., grid cells 50% or more of whose area was covered by artificial surfaces in 2009 as identified by the GlobCover 2009 project (Bontemps et al. 2009) and discussed above. We then denote the variable *Urban Development* as the *annual* level of calibrated nighttime light emissions within all said urban cells, with all other grid cells (including those with nighttime levels) being given a value of zero on urban development for the entire 1996–2009 period. This variable thus allows us to overcome the limitations of the constant *Urban* variable mentioned above, by making it both an indicator of development levels, specifically, and allowing it to vary over time.

Despite these advantages, however, the resulting urban development indicator fails to account for how access to the benefits of development and material resources is distributed with respect to the local urban populations. This is not only a crucial part of our theoretical argument, but it is also important in order to develop a correctly identified, empirical model that captures the ability and willingness of *individual civilians* to collectively act and mobilize against the regime. Huntington (1968, 210), for instance, argues that concentrated urban areas are often plagued by "praetorian" politics—different groups must take direct actions (strikes, protests) to achieve political aims. Whether these groups accomplish their aims and gain concessions or not, however, strongly depends on the material capacity of their members and the latter's ability to pool their resources together (Habermas 1970).

The role of the average distribution of resources by the population has been used in previous research into the potential causes of civil conflicts, such as profitable resources availability (Collier and Hoeffler 1998) and state capacity (Fearon and Laitin 2003). However, the importance of normalizing potential causal indicators of violence by the population is even higher when the role of urban areas is concerned. First, some very large cities might have high levels of nighttime light but these might simply be the result of the large populations residing therein. More people residing within a given space means higher population densities, which in turn means that the amount of resources that must be allocated to support these civilians in order to maintain some form of minimal standards of living also increases (Hardoy et al. 2013, 1–36). Hence, cities with higher development levels—as captured by nighttime light emissions—might not necessarily reflect locations where individual civilians have a sufficient amount of resources that they *can* pool together to mount opposition against the regime.

To account for that limitation in our urban development indicator and ensure that it empirically aligns with our theoretical model, in the third and final step we normalize this variable by (the natural log of) population size residing in a given cell during a given year. These population density data were obtained from Nordhaus (2006) and discussed above. The resulting indicator, *Urban Development* PC_t, is thus formally defined as,

$$\sum_{i=1}^{n} \left(\frac{l_i}{\ln P_i} \right) \tag{1}$$

where $\ln P_i$ measures the log of population size in a given grid cell, l_i is nighttime light emissions used in this grid cell, and n is the number of urbanized cell years in our sample (nonurbanized cell years are thus given a value of zero). By normalizing urban development per capita, the resulting variable effectively captures the level of material resources available to the civilians residing in urban areas to coordinate their actions and pool together to challenge the regime. Additionally, as discussed in the previous chapter, this variable is also a valid proxy of the urban civilians' ability to identify sanction "free riders" and ensure that every individual in the group works toward a common aim. For summary purposes, the averaged values of *Urban Development* PC_t by autocratic country for the entire 1996–2009 period are plotted in Fig. 2.

First-Stage Analysis Results: Urban Development Per Capita and Mass Killing Campaigns

The interactive hypothesis derived from our broad theoretical argument emphasizes that regions with more urban development per capita will experience higher rates of violence specifically when a food crisis occurs. However, to analyze how a food production crisis significantly and substantively increases the impact of urban development per capita on mass killing campaigns, it is useful to first evaluate what is the baseline relationship between our first explanatory variable *Urban development* PC_t—and urbanization more broadly—and mass killing campaigns in the absence of such crises, as stipulated by the second corollary hypothesis discussed in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States."

To this end, Table 2 reports the estimates obtained from three stages of logistic regression. These specifications are identical between each stage, with the one exception that the explanatory variable of interest is different in each stage. In the first set of models, the extent of a given cell that is urbanized, captured by the constant indicator *Urban*, is included as the main independent variable of interest. In the second set of models, the modified, time-varying indicator *Urban* $Development_t$ without the per capita normalization is included. In this final set of models, we include the variable specifically derived according to our theoretical expectations, *Urban Development* PC_t.

In each stage, the baseline specifications include only the explanatory urban development variable per capita indicator alongside the dependent variable's lag, and country- and year fixed effects. These baseline specifications are followed by comparable models that include key controls for economic and political factors, as well as some geospatial grid cell features, to arrive at a set of full specifications that includes all the control variables discussed above. Across all models, urbanization and urban development have a positive and statistically significant effect on the probability of mass killing campaigns. This finding is in line with our theoretical expectation, as well as with research into relationships between urbanization, protest, and violence in nondemocratic countries

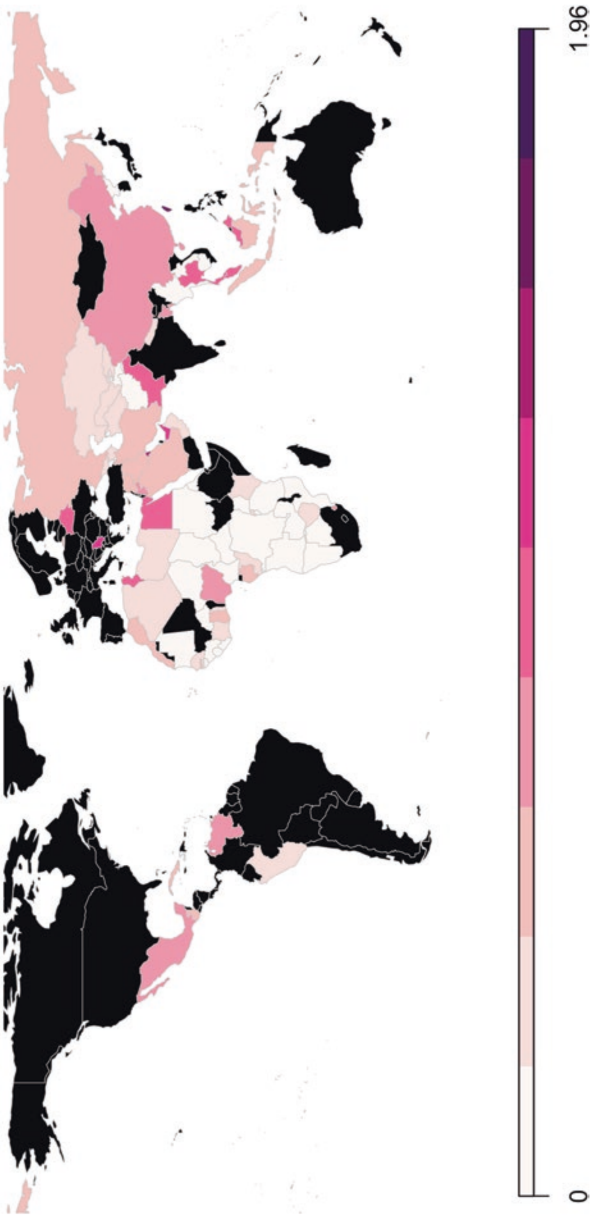

Fig. 2 Average *urban development per capita*$_t$ levels for all nondemocratic countries, 1996–2009

Table 2 Urban development and mass killing campaigns by government forces, 1996–2009

	Urbanization			*Urban development*			*Urban development PC*		
	Bsaseline	*Medium*	*Full*	*Baseline*	*Medium*	*Full*	*Baseline*	*Medium*	*Full*
Urban	0.163***	0.074**	0.094***	–	–	–	–	–	–
	(0.015)	(0.029)	(0.029)						
Urban development$_t$	–	–	–	0.122***	0.072***	0.083***	–	–	–
				(0.011)	(0.022)	(0.022)			
Urban development PC$_t$	–	–	–	–	–	–	1.770***	1.023***	1.178***
							(0.158)	(0.344)	(0.343)
Mass killing campaigns$_{t-1}$	2.749***	2.524***	2.158***	2.618***	2.507***	2.125***	2.673***	2.528***	2.146***
	(0.326)	(0.337)	(0.336)	(0.331)	(0.335)	(0.336)	(0.327)	(0.334)	(0.335)
Drought (cell)$_t$	–	0.854	0.607	–	0.825	0.595	–	0.833	0.604
		(0.610)	(0.609)		(0.610)	(0.609)		(0.610)	(0.609)
Violent civil disobedience$_{t-1}$	–	0.726**	0.092	–	0.711*	0.060	–	0.709*	0.062
		(0.369)	(0.397)		(0.369)	(0.397)		(0.368)	(0.396)
GCP$_t^1$	–	−0.221	−0.222	–	−0.410	−0.395	–	−0.353	(0.265)
		(0.251)	(0.256)		(0.269)	(0.272)		(0.262)	
Population$_t^1$	–	0.645***	0.581***	–	0.634***	0.561***	–	0.625***	(0.118)
		(0.114)	(0.117)		(0.114)	(0.116)		(0.114)	
Border distance[1]	–	−0.334***	−0.419***	–	−0.331***	(0.075)	–	−0.336***	−0.422***
		(0.073)	(0.075)		(0.073)			(0.073)	(0.075)
Travel time[1]	–	−0.875***	−0.911***	–	−0.872***	−0.907***	–	−0.866***	−0.900***
		(0.199)	(0.201)		(0.199)	(0.201)		(0.200)	(0.203)
Distance to capital[1]	–	0.392***	0.400***	–	0.359***	0.350***	–	0.345***	0.334**
		(0.140)	(0.141)		(0.133)	(0.135)		(0.133)	(0.134)
Conflict$_t$	–	–	2.200***	–	–	2.177***	–	–	2.169***
			(0.256)			(0.254)			(0.253)

(continued)

Table 2 (continued)

	Urbanization			*Urban development*			*Urban development PC*		
	Bsaseline	*Medium*	*Full*	*Baseline*	*Medium*	*Full*	*Baseline*	*Medium*	*Full*
$Polity2_t$	–	–	0.152***	–	–	0.152***	–	–	0.153***
			(0.059)			(0.058)			(0.058)
$GDP\ PC_t^1$	–	–	(0.882)	–	–	0.745	–	–	0.740
						(0.882)			(0.882)
Oil_t^1	–	–	0.155	–	–	0.165	–	–	0.165
			(0.130)			(0.133)			(0.133)
Gas_t^1	–	–	−0.057	–	–	−0.123	–	–	−0.113
			(0.361)			(0.355)			(0.355)
Constant	−11.48	−2.870	−6.210	−11.664	−2.422	−6.101	−11.382	−2.201	−5.869
	(2385.656)1	(3.578)	(6.940)	(2474.957)	(3.563)	(6.938)	(2474.318)	(3.569)	(6.941)
N	415,724	363,652	363,619	372,558	349,134	349,101	371,183	347,849	347,816
LL	−1050.621	−806.551	−759.103	−1003.634	−804.541	−757.360	−1004.791	−805.287	−758.294
AIC	2285.243	1789.102	1702.206	2189.268	1785.081	1698.721	2191.582	1786.573	1700.588

Notes Significant at $*p < 0.1$, $**p < 0.05$, and $***p < 0.01$

Values in parentheses are robust standard errors clustered by grid cell ID. All models include year and country fixed effects

[1]In natural log form

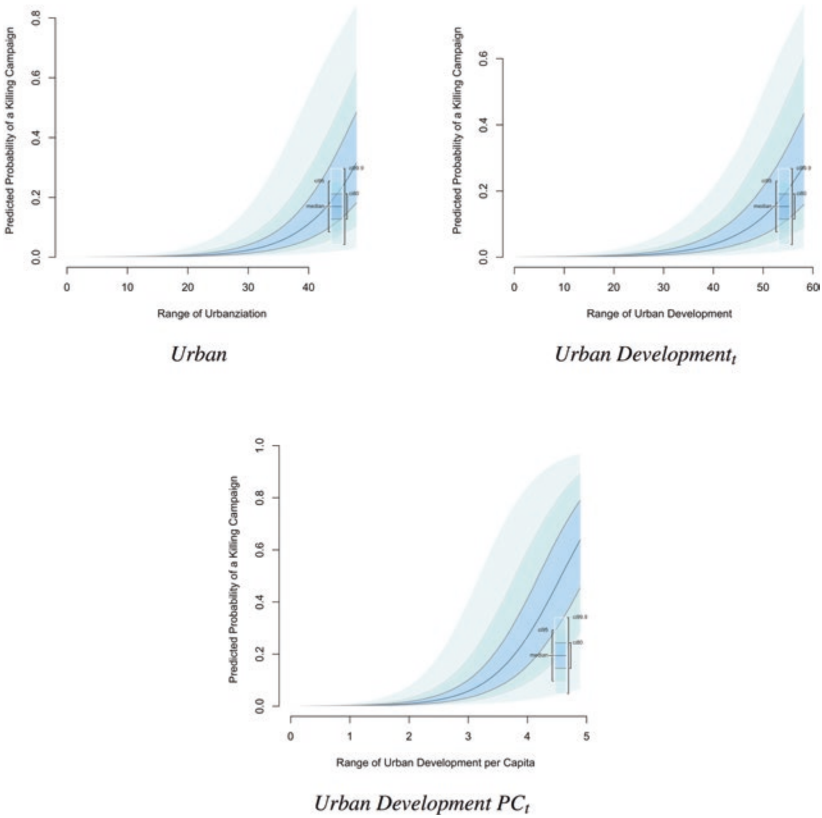

Fig. 3 Percentage change in the annual expected probability of mass killing campaigns in a given grid cell—baseline specification

more broadly (e.g., Chenoweth and Stephan 2011; Habermas 1970; Wallace 2013). Moreover, as Fig. 3 illustrates, in substantive terms, the first change in the probability of our specifically derived indicator, *Urban Development PC$_t$,* when all other variables are held at their median (for ordinal variables), or mean (for continuous variables) is twice that of either *Urban* or *Urban Development* in the baseline model (based on 1000 simulations).

Note, however, that our argument emphasizes that mass killing campaigns become not only significantly, but also *substantively* more likely in areas with higher urban development per capita *when a food crisis occurs*. Hence, even though our specifically derived indicator *Urban Development PC$_t$* outperforms the other two in substantive terms, we still expect that—in-and-of itself—this variable (and the two other urbanization indicators as well) will have a substantively negligible effect on mass killing once other controls, and especially a proxy for one potential food crisis cause (in this case, droughts), are added to the model. To this end, Fig. 4 illustrates that the substantive effect of all urban-related variables

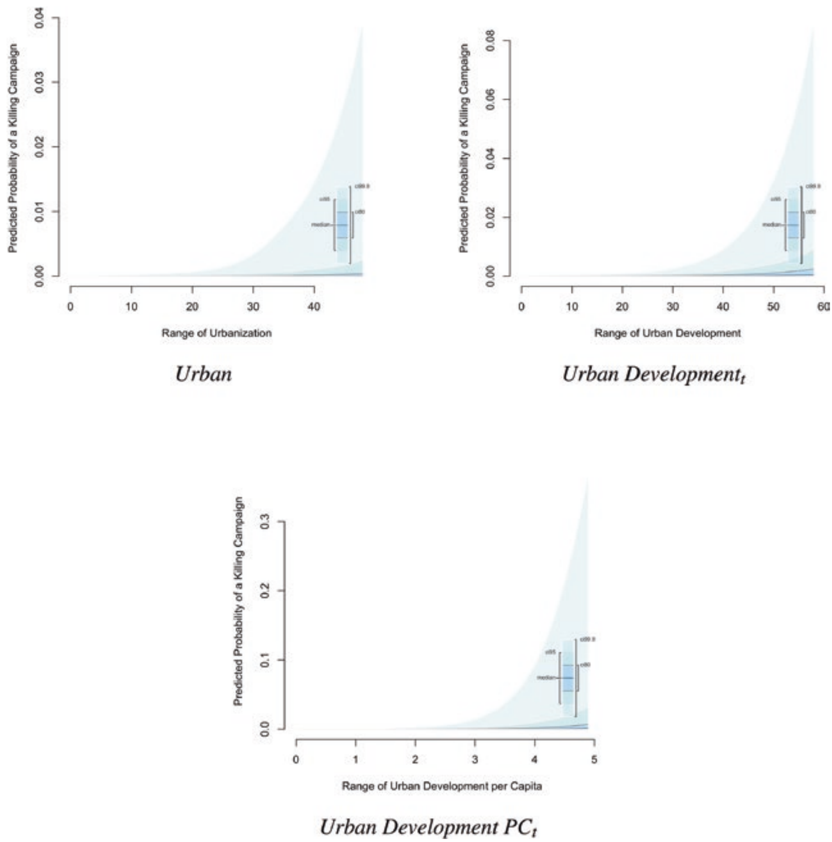

Fig. 4 Percentage change in the annual expected probability of mass killing campaigns in a given grid cell—full specification

is negligible in the control-inclusive, full specifications. Indeed, as this figure illustrate, in the absence of a food crisis (i.e., in this case, when *Drought (Cell)*$_t$ = 0), the influence of *Urban Development PC*$_t$ on *Mass Killing Campaigns*$_t$ within nondemocratic countries is substantively negligible. However, the analyses presented in the ensuing chapter illustrate how the occurrence of a food crisis, the effect of urban development levels per capita on intrastate killing campaigns in nondemocratic countries not only remains positive and statistically significant, but also becomes quite substantive.

Finally, some of the control variables also have a statistically significant effect. First, unsurprisingly, the lag of the dependent variable, *Mass Killing Campaign*$_{t-1}$, significantly increases the probability of a mass killing campaign at year *t*, as does civil conflict, which follows the expectations of past research into these linkages (e.g., Valentino et al. 2004; Koren 2017). Regions with higher population densities or those located further away from the capital are also more likely to experience localized mass killing, as do areas located closer to large cities and near the country's borders. Interestingly, political openness has a positive and significant impact on mass killing, although—considering that our sample is limited to nondemocratic regimes—this follows theoretical explanations that argue political is more likely in "anocracies" or quasi-democratic countries (e.g., Ulfelder 2012; Vreeland 2008). Note that oil and gas prices, however, do not produce a noticeable impact on violence, which diverges from some findings in extent research into the violence-profitable resources nexus (e.g., Azam and Hoeffler 2002).

Most importantly for our purposes, however, the 0.5-degree grid cell indicator for drought produces no statistically significant effect. These findings are in line with our theoretical argument discussed in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States," which emphasizes the interaction between food production crises and urbanization in generating localized mass killing. They also follow a large portion of the literature on the relationship between climate and conflict, which similarly finds little evidence that extreme climatic variations impact the propensity for violence (e.g., Theisen 2012; Theisen et al. 2011; Koubi et al. 2012; O'Loughlin et al. 2012).[11] However, as we show in the next chapter, drought—among other types of exogenous shocks to food production—does have an especially strong impact on increasing the probability of mass killing campaigns *within the context of high urban development per capita*, as we expect. Hence, while we do not argue that droughts and other type of food crises cannot—in-and-of themselves—explain mass killings, we do believe and show that they are strong compounders of other factors, specifically urban development per capita.

Conclusion

This chapter has specified the first part of our cross-national analysis and modeling strategy by carefully deriving a novel indicator to capture the material capability of individual civilians residing in urban areas in non-democratic countries and illustrating its impact on localized mass killing campaigns by government forces. After introducing our highly disaggregated, 0.5-degree-resolution empirical framework, we conceptualized a localized indicator of mass killing campaign using novel PITF (2009) data, which draws on real-time events reported in multiple media outlets. We also discussed the data and variables used both here and in the ensuing chapter to approximate other important alternative explanations of political violence and social conflict. In the following chapter, we keep our focus on mass killing in urban areas and explore its relationship with food production crises.

Notes

1. This approach is often referred to as a “within-subjects design.”
2. Pakistan made a transition to a democracy in 1988 after the death of General Zia-ul-Haq in the fall of 1987. It remained a democracy until 1999 when General Musharraf took over the government through a military coup. Musharraf remained in power until 2008, when Pakistan once again transition to being democracy (Jones 2003; Raman 2003; Siddiqa 2017).
3. Indonesia made a formal transition to democracy in 1999 (Anderson 2001; Collins 2007).
4. While the regime in Malaysia does allow for a multiparty legislature with opposition parties, scholars of authoritarian politics—including those whose research is used below to empirically define a nondemocratic country—consider it to be an authoritarian country (see, e.g., Cheibub et al. 2010; Geddes et al. 2014).
5. Data to operationalize urban development in Pakistan are only available from 1978.

6. Although mass killing campaigns in East Papua and East Timor persisted throughout the entire period (Ulfelder and Valentino 2008).
7. The findings are robust to thresholds that rely on higher number of civilian casualties to define mass killing campaigns or to use a continuous indicator that codes the total number of civilian deaths.
8. Specifically, Agence France Presse, Associated Press, *New York Times*, Reuters, CNN, BBC World Monitor, All Africa, and http://syrianshuhada.com/—though additional local and NGO/IGO sources can appear as primary or secondary sources in the PITF data when quoted by the aforementioned sources.
9. Due to the relatively small changes in the values on these variables, both are measured in five-year interval for the years 1995, 2000, and 2005. Annual values were interpolated to the yearly level using a last value carried forward approach. Both were originally measured at the 1-degree grid cell and averaged to the 0.5-degree level (Tollefsen et al. 2012)
10. It is important to note that due to the coding standards used to compile violent conflict in the NAVCO v 2.0 dataset, some overlap might exist between $\textit{Conflict}_t$ and $\textit{Violent Civil Disobedience}_{t-1}$. Nevertheless, as mentioned above, the resulting autocorrelation will likely bias any findings toward statistical insignificance. For more on the standards used to code violent and nonviolent civil disobedience, see Chenoweth and Lewis (2013).
11. It is important to emphasize that other studies do find linkages between drought and atrocities perpetrated by nonstate actors against civilians, although these studies focus on agricultural areas, specifically (e.g., Bagozzi et al. 2017; Anderson et al. 2017).

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Statistical Analysis of Food Crises and Mass Killing

In the previous chapter, we introduced the data used to create our dependent and control variables and evaluated the impact of urban development per capita using an indicator we derived specifically according to the theoretical expectations discussed in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States." Proceeding with the line of cross-sectional empirical inquiry, this chapter introduces the effect of food crises (aka food production crises) into the models to evaluate how these crises moderate the effect of urban development per capita levels on mass killing. This interaction is the second and most crucial part of our main hypothesis. Recall that, as we have shown in the previous chapter, while our theory—and literature on the relationship between urbanization and protest (e.g., Wallace 2013; Habermas 1970; Escribà-Folch 2013), and urbanization and violence more broadly (e.g., Kilcullen 2013; Fair 2004; Staniland 2010; Goldstein 1983)—associates urban development with higher rates of systematic mass killings, these effects are substantively negligible most of the time. Higher levels of urban development per capita give civilians residing in these locations the *ability* to wage an opposition campaign that is effective enough to pose an existential threat to the authoritarian regimes. However, they will not mobilize without an external shock that gives them the *willingness* to do so.

In other words, if urban development per capita is the kindling for effective protest, it needs a spark that will set it on fire and draw a violent

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response by state forces. Thus, our theory states that the effect of urban development per capita will become substantive only when a food production crisis occurs. Here, we discuss two potential causes of food prices. In the first case, high food price volatility acts as a negative shock that serves to sharply limit access to food domestically, which in effect leads to food shortages and a food crisis. In the second case, a severe drought can limit food domestic and local food availability, which again generates a food crisis and causes food shortages. In both cases, these shortages place strong pressures on the civilians' consumption level. If the government lacks consumption-smoothing mechanisms to alleviate, at least partly, the effect of this crisis on the civilians' access to food, an element that many nondemocratic regimes lack,[1] then the resulting resentment will be enough, in many contexts, to push urban civilians to pool their resources together and mobilize to remove the regime.

This chapter tests this claim using several indicators that were each designed to approximate different types of food crises. The statistical models reported below rely on the data and variables discussed in Chapter "Urban Development and Mass Killing: A First Look at the Data," and the specifications therein are thus identical to those reported previously with one exception—the inclusion of a food crisis proxy. Specifically, the models reported below interact our different operationalizations of the food production crisis variable—measured at both the country and 0.5-degree grid cell levels—with the *Urban Development* PC_t variable derived in the previous chapter. We thus report several stages of analysis, each employing a different food crisis operationalization.

In the first case, we use annual data on food price volatility by country and adapt this measure to analyze variations in violence with respect to urban development levels at the 0.5-degree grid cell level. This measure allows us to directly evaluate when a food production crisis that *specifically results from very high food price volatility* drives nondemocratic incumbents to employ mass killing campaigns. In the second case, we use precipitation information on severe drought measured at both the country and 0.5-degree grid cell levels to approximate a completely exogenous, climate-based shock to local food production. These indicators allow us to evaluate whether the effects of food price-volatility-based crises persist when climatic proxies are used instead.

In every stage of analysis, we find that the results are not only statistically significant, but also substantive. Within the aforementioned sample, a food production crisis increases the impact of urban development per capita on the likelihood of mass killing campaigns in nondemocratic regimes by 200–500% across the different food crisis conceptualizations and model specifications. This suggests that food crises are a powerful compounder of the probability of mass killing campaigns by state forces, indeed, much stronger than previously believed.

This chapter proceeds as follows. We begin with a background discussion of the historical relationship between food production crises, urban unrest, and mass killing. We then proceed to discuss in detail the first food crisis indicator we derive, which is operationalized based on high food price volatility levels. We provide theoretical motivations for relying on food price volatility to approximate food crises, explain how we derive our binary variable, and finally report a set of models corresponding to the analyses reported in Chapter "Urban Development and Mass Killing: A First Look at the Data," but which also include the interaction between this indicator and *Urban Development* PC_t. Having shown that food crises resulting from high food volatility have a substantive impact on urban development per capita's effect on mass killing, we proceed to discuss our drought-based conceptualizations. We provide motivations for relying on droughts for approximating food crises within the context of high urban develop per capita, and explain how we operationalize both drought-based indicators (measured at the country and 0.5-degree grid cell levels, respectively). Next, we re-estimate our empirical models, only this time we interact our drought-based indicators with *Urban Development* PC_t. Finally, we conclude with some implications of this chapter's analysis and findings.

Food Crises and Violence: A Concise Background

Throughout history, food scarcities frequently led to social unrest and political violence. Food riots were associated with the onset of the French Revolution (Rudé 1964), the fall of the Confederate States of America (Smith 2011), and the 1917 Russian Revolution (Wade 2017). Shocks to food supplies and sudden scarcities were also closely associated with violence against civilians. For instance, in their study of Europe between 1100 and 1800 AD, Anderson, Johnson, and Koyama find that "a one standard deviation decrease in average growing season temperature in the fifteenth and sixteenth centuries was associated with a one to two percentage point increase in the likelihood that a Jewish community would be expelled" (2017, 1). Similarly, in a high-resolution analysis of violence against civilians within agricultural regions worldwide, Bagozzi, Koren, and Mukherjee find that "droughts can increase the incidence of rebel-perpetrated atrocities against civilians in agricultural areas of developing countries" (2017, 1070).

Previous anecdotal research also draws linkages between food riots and violence against noncombatants. For instance, prior to the French Revolution, food riots resulting from bad harvests and food shortages occurred with relative regularity in France in 1725, 1740, 1749, 1768, 1775, and 1785 (Rudé 1964). Unlike during the revolution, however, the resulting violence was not political; rioters did not seek new solutions or even to redress grievances, but rather targeted farmers, merchants, and traders in an effort to force a decrease in food prices (Walton and Seddon 2008; Rudé 1964). Violence in these situations was used to induce "taxation for the people" from these merchants and farmers by forcing the latter to incur a loss as a consequence of the price ceiling imposed by rioters (Tilly 1971).

From the middle of the nineteenth century to the late twentieth century, food riots due to production shocks were a relatively rare and sporadic occurrence (Walton and Seddon 2008). This situation changed in the 1970s, when the IMF's involvement in countries' domestic affairs becomes more pronounced. This constituted an important shift in that the aims of these mobilizations were often political. Walton and Seddon (2008), for instance, identify 146 food riots across 39 countries between 1976 and 1992, which occurred in response to austerity measures imposed by the IMF and its structural adjustment policies.

In some ways, both food riot types were similar—they both involved poor individuals and household who were net buyers (i.e., not producers) of food. However, whereas the "classical" food riot, as analyzed by scholars of European history such as Rudé (1964) and Tilly (1971), often took place in the countryside and was aimed at local producers suspected of price manipulations and speculation, the "modern" food riot took place mostly in urban centers and was directed at the state (Bellemare 2015). Rioters in the city were usually members of the working class, who were even more dependent on food producers than their rural counterparts. Urban rioters' targets were also *political* ones—state institutions, supermarkets, centers of affluence (e.g., luxury hotels), and symbols of foreign power (e.g., embassies) (Bellemare 2015).

With the dawn of the twenty-first century, the world experienced, if anything, a possible increase in the frequency of food crisis-induced upheavals—riots related to food price increases occurred in more than 30 countries between 2007 and 2008 (Brinkman and Hendrix 2011). While evidence suggests that these riots are more frequent in democracies rather than in nondemocratic countries due to the mitigating effect of political institutions in allowing civilians to voice their grievances (see, e.g., Hendrix and Haggard 2015), evidence suggests that the probability of violent repressions is significantly more likely in the latter (Escribà-Folch 2013; Pierskalla 2010; Davenport 2007).

In Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States," we discussed some examples of how massive protests related to food output crisis resulted in violent state response and mass killing of civilians by government forces in monarchic Morocco and authoritarian Tunisia during the 1980s (see, Seddon 1986). A more recent and much more violent example is the onset of the civil war in Syria, where—from 2011 until mid-2016—an estimated 250,000–400,000 people died because of intense violence (Hudson 2016). The rapid breakdown of the Syrian polity seems to defy traditional explanations, and recently a new one has emerged: by impacting food availability, the severe drought that preceded the war consisted a strong food production crisis, which fueled political tensions and increased the probability of social conflict and massive state response (Kelley et al. 2015).

A food crisis strong enough to elicit civilian mobilization and a forceful state response in nondemocratic countries can have many causes. Building on extent research into the food protest nexus, some relevant historical evidence discussed in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States," and the meticulous mixed-methods case studies reported in the ensuing chapters, we chose to focus the analyses conducted in this chapter on distinct conceptualizations of food crisis that rely on food price volatility and droughts. These distinct conceptualizations, measured at both the national and 0.5-degree grid cell levels, thus allow us to conduct a comprehensive evaluation of how variations in the occurrence of food crises impact the propensity of nondemocratic regimes to perpetrate mass killing in areas with higher urban development per capita.

Approximating Food Crises Using Food Price Volatility

The first two parts of this section focus on how our first binary food crisis variable is developed from an operationalized measure of food price volatility. To this end, we first add to the theoretical discussion provided in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States" by providing below a more detailed background discussion on what food price volatility means conceptually; why it is important in the context of disobedience and political violence; and what drives variability in staple food prices in developing economies, which encompass all—or almost all—nondemocratic states. We then explain in detail, the steps taken to operationalize the food production crisis variable using available food price volatility indexes. This is followed by a set of analyses assessing the interactive effect of our volatility-based food production crisis indicator and urban development per capita on the likelihood of mass killing campaigns in nondemocracies.

A Brief Background on Food Price Volatility

To test our theoretical prediction as closely as possible, the main conceptualization we use to test food crises' interactive impact on the propensity of state-led mass killing in areas with higher urban development per capita relies on the volatility of food prices. Indeed, as an example, it is worth noting that high food price volatility and the potential shocks to food production and consumption it can generate worldwide were considered a crucial explanation for the 2007–2008 wave of protests and violence.

World Bank chief Robert Zoellick, for instance, warned in the wake of the crisis that "[t]here is no silver bullet to resolving the potent combination of rising and volatile food prices, but food security is now a global security issue" (Wroughton 2011). Similarly, the then French President Nicolas Sarkozy said that the G-8s and G-20 should make it their priority to curb food price volatility, cautioning that, "if we don't do anything, we run the risk of food riots in the poorest countries" (Barrett and Bellemare 2011). And Homi Kharas, a Senior Fellow at the Brookings Institution think tank, stated that "the crux of the food price challenge is about price volatility rather than high prices per se," because it is "the rapid and unpredictable changes in food prices that wreak havoc on markets, politics and social stability" (2011). Further, a special expert panel working on behalf of the Food and Agricultural Organization of the United Nations estimates that "[f]ood price volatility over the last four years has hurt millions of people, undermining nutritional status and food security" (Food and Agricultural Organization 2011, 9).

In simple terms, food price volatility measures how variable food prices are—i.e., how much and how extensively they vary—during a given period (Gilbert and Morgan 2010; Food and Agricultural Organization 2011). Such variations can have several causes. One is speculation in the prices of agricultural goods in futures markets for commodities. According to this view, investors and trades cause variations in food prices by investing in and then shorting particular food commodities (Headey and Fan 2008). This effect should be especially strong in developing countries, where markets are more susceptible to and less protected against such speculations by foreign investors (Clapp 2009). There is little evidence, however, that speculation is a serious cause of unrest resulting from food production crises, and it appears that it rather a consequence—or at most, a compounder—of high volatility periods (Headey and Fan 2008).

A second explanation for price volatility crises relates to stock holding, i.e., the decision producers and investors make to keep food supplies in reserves rather than to sell them on the open market. Over the short-term, farmers cannot harvest what they did not plant, meaning that elasticities are low, especially in developing countries where few alternatives for constant dietary patterns exist (Fafchamps 1992; Gilbert and Morgan 2010). When supplies in stocks are high, volatility tends to be generally relatively low, but over time supplies decline when market prices signal stockholders that they will benefit from selling their stocks. Thus, stock holding—and stock market volatility—tends to go through specific cycles (Gilbert and Morgan 2010; Deaton and Laroque 1992). When food supplies run especially low, as happened in 2006, then volatility can remain high for several years at a time. This persistent volatility, especially when combined with high food prices, can generate price spikes and cause massive social unrest worldwide, as happened in 2007–2008 (Bellemare 2015).

Finally, the third explanation draws linkages between food price volatility and large-scale climatic variations. According to this argument, "extreme weather events such as droughts and floods—exacerbated by global warming—are considered a root cause of global food price fluctuations because they cause crop failure and reduce global food supply, which consequently causes food prices to increase" (Tadasse et al. 2016). A key part of this argument associates the increases in food prices and price volatility with global warming. Moreover, because natural disasters represent shocks to both supply and demand of food, they are likely to impact food-related riots and protests exclusively (at least for empirical purposes) by impacting food prices and food volatility (Bellemare 2015). Thus, rising temperatures and prolonged heat waves decrease cereal output, which generate an unexpected shock to production that available global food supplies—especially in years with low levels of stocks holding—cannot mitigate (Battisti and Naylor 2009). Considering that this effect is felt most strongly by consumers in tropical countries (Carleton and Hsiang 2016; Battisti and Naylor 2009), where the majority of our nondemocratic regime sample is also located, such environmental variations and the potential for food production crises that they generate are a likely compounder of violence, as was stated in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States."

These—and possibly other (e.g., increases in oil price and financial crises)—explanations suggest that operationalizing a food production crisis based on food price volatility is in line with our theoretical expectations. Insofar as sharp price volatility increases result with an external shock to food production, such increases will bring urban citizens that possess sufficient material capacity to mobilize against the regime in nondemocratic countries, frequently generating mass killing as a forceful regime response. We thus approximate our food crisis variable using the domestic price volatility index created by the Food and Agricultural Organization of the United Nations (2016), as we discuss in more detail below. It is worth noting here, however, that some notable scholars argue that food price volatility is an insufficient explanation for political unrest. Barrett and Bellemare, for instance, warn that high volatility hurts producers, but not necessarily consumers. Rather, the authors argue "[p]olicies aimed at curbing food price volatility, such as export bans, price stabilization schemes, and subsidies for farmers are misguided if policymakers aim to increase the welfare of the poor, or avert political unrest in developing countries" (Barrett and Bellemare 2011). However, we believe that our focus on volatility for operationalizing food crises is defensible for at least two reasons.

First, note that our theory focuses on the impact of volatility on food *production* levels, which Barrett and Bellemare (2011) agree are impacted by price volatility. Thus, although we explain in detail in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States" why such food production crises will result with domestic food shortages and thus hurt consumption level, we made sure to focus our theoretical model and empirical analyses on the production side of food, specifically. Second, note that our sample is temporally disaggregated to the *annual* level. Thus, while it might be true that, as Barrett and Bellemare (2011) claim, volatility does not constitute an immediate shock to consumption as measured, say, at the monthly level of temporal disaggregation—indeed, regular price fluctuations or "normal" volatility are expected (Gilbert 2011)—its effects on consumption will be stronger when aggregated over a longer temporal period. We therefore believe that the reliance on domestic food price volatility indexes to approximate food production crises in our empirical 0.5-degree grid cell framework is theoretically defensible.

Empirically Operationalizing Food Price Volatility Crises

We construct a price volatility-based food production crisis variable using the Domestic Food Price Volatility Index coded by the Food and Agricultural Organization of the United Nations (Food and Agricultural Organization of the United Nations 2016). This index measures how variant the prices of all food commodities (e.g., cereals, meat, and oilseeds), on average, were in a given country during a given year for our entire period of interest (1996–2009). This continuous index can take only positive values, with higher values corresponding to higher volatility levels (Food and Agricultural Organization 2011). Due to the technical nature of such indexes, we discuss how the FAO constructed these measures in the book's online appendix.

Recall that our theoretical argument assumes that the probability with which more developed urban areas (normalized per capita) within nondemocratic states will experience mass killing becomes substantively larger during a food crisis, which impacts the civilians' consumption levels. Moreover, from an economic perspective, some levels of food price volatility—including relatively high ones—are to be expected as part of the regular business cycle in agricultural markets, where stockholders choose when and how much of their stored commodities to sell (Food and Agricultural Organization 2011; Gilbert and Morgan 2010; Bellemare 2015). Because our theoretical argument concerns specifically cases where volatility was well above expected levels, however, we operationalize a food price volatility crisis variable to capture the particular effect of extremely high volatility on urban development per capita levels and, correspondingly, mass killing.

We operationalize this variable in three stages. First, note that the Food and Agricultural Organization of the United Nations (2016) Domestic Food Price Volatility (FPV) Index is measured at the country-year level, while our sample is measured at the annual 0.5-degree grid cell level. We thus begin by using the FAO's Domestic FPV index to identify country-years that experienced very high food price volatility levels, which we define as country-years in which volatility values were above the 85th percentile of the entire country-year sample.[2] In the second step, we combine the FAO's Domestic Food Price Volatility Index into our 0.5-degree grid cell-level sample for the entire temporal period.

Finally, we operationalize our binary food price volatility-based production crisis variable, *Food Crisis (Volatility)*$_t$, as one for all 0.5-degree grid cell years in which volatility values were within the 85th percentile of the country-year sample discussed above; it is coded as zero otherwise. While this means that all the 0.5-degree grid cell years within a given nondemocratic country during a given year are all given the same values, this is likely an advantage rather than a disadvantage for empirical purposes. As we mentioned in the previous chapter, the autocorrelation that results from such aggregations is likely to bias any findings toward zero, i.e., statistical insignificance, rather than the other around, while the use of country fixed effects should help alleviate some concerns and ensure that the resulting coefficients on these country-level variables capture only the effect of these measures within the country—that is, at the grid cell-year level—that vary annually. For summary purposes, a global map showing those nondemocratic countries that experienced a volatility-based food crisis during the 1996–2009 period is presented in Fig. 1.

Importantly, the main hypothesis derived based on our theoretical model is *interactive*, because we expect that the effect of urban development per capita—which gives local civilians the ability to wage an effective opposition against the regime—will become substantively more pronounced when a food crisis occurs, because the latter gives

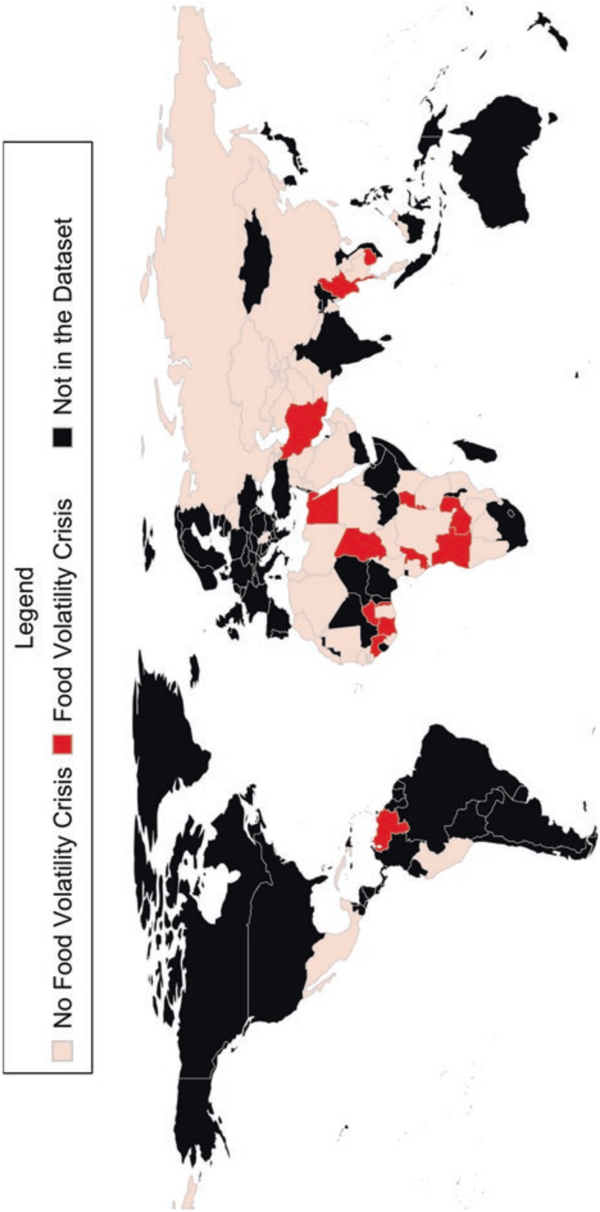

Fig. 1 Volatility-based food crises by country for all nondemocratic countries, 1996–2009

these civilians the willingness to mobilize. We thus interact two explanatory variables to test this hypothesized moderated effect: the *Urban Development* PC_t variable we developed in the previous chapter, and the *Food Crisis (Volatility)*$_t$ indicator developed above. As we have shown in the previous chapter, apart from being directly in line with our theoretical expectations, the *Urban Development* PC_t variable also produces the most substantive direct impact on localized mass killing campaigns. However, we expect that the occurrence of a food production crises would produce substantive increases in the effect of urban development per capita, and thus introduce the term *Urban Development* PC_t × *Food Crisis (Volatility)*$_t$ to capture these moderated dynamics (Brambor et al. 2006), and include it in the model alongside the interaction's individual components (Berry et al. 2010).

Analysis Results: Food Price Volatility Crises

Table 1 reports the estimates of three logit models used to test our hypothesis on a full sample consisting of all global terrestrial cells in autocratic countries for the years 1996–2009. Each of the specification reported in this table corresponds to the models reported in the previous chapter, with the exception of the *Drought*$_t$ variable, which we replaced with *Food Crisis (Volatility)*$_t$ to account for the impact of food crises. The rest of the variables are the same used in the previous chapter's analyses to control for alternative explanations and confounding effects, including fixed effects by nondemocratic country and year.

In all models reported in Table 1, the association between our interaction term *Urban Development* PC_t × *Food Crisis (Volatility)*$_t$ and the binary indicator *Mass Killing Campaign*$_t$ is positive and statistically significant to at least the 5% level. This empirically corroborates our interactive hypothesis by showing that the effect of urban development per capita on mass killing campaigns significantly increases during a food crisis. The interaction's individual components also have a statistically significant effect. In the absence of a food crisis resulting from high food price volatility, the coefficient on *Urban Development* PC_t remains statistically significant to the 1% level. This suggests that—as the analyses reported in the previous chapter illustrated—areas with higher urban development per capita levels within nondemocratic countries are inherently more likely to experience violence by state forces, although this relationship becomes significantly more pronounced when a food crisis occurs.

Table 1 Determinants of mass killing campaigns by government forces in nondemocratic countries, 1996–2009—Food price volatility

	Baseline	*Medium*	*Full*
Urban Development PC_t	1.859*** (0.227)	1.556*** (0.496)	1.712*** (0.503)
Food Crisis (Volatility)$_t$	−1.882** (0.794)	−1.908** (0.850)	−1.534* (0.896)
Urban Development PC_t × *Food Crisis (Volatility)*$_t$	2.359*** (0.845)	2.141** (0.864)	1.869** (0.893)
Mass Killing Campaigns$_{t-1}$	1.261 (0.937)	0.792 (0.927)	0.525 (0.924)
Violent Civil Disobedience$_{t-1}$	–	0.937 (0.844)	1.001 (0.983)
GCP_t^1	–	−0.766* (0.430)	−0.864* (0.449)
Population$_t^1$	–	0.784*** (0.240)	0.787*** (0.264)
Border Distance^1	–	−0.068 (0.169)	−0.084 (0.172)
Travel Time^1	–	0.296 (0.372)	0.207 (0.377)
Distance to Capital^1	–	−0.362 (0.224)	−0.357 (0.240)
Conflict$_t$	–	–	3.292*** (0.675)
Polity2$_t$	–	–	−0.006 (0.152)
GDP PC_t^1	–	–	2.294 (2.636)
Oil_t^1	–	–	0.073 (0.482)
Gas_t^1	–	–	1.490 (1.887)
Constant	4.476 (5.036)	−6.412 (8.291)	−25.455 (20.158)
N	183,826	182,095	182,095
LL	−235.778	−214.099	−194.014
AIC	581.557	544.198	514.028

Notes Significant at $*p < 0.1$, $**p < 0.05$, and $***p < 0.01$
Values in parentheses are robust standard errors clustered by grid cell-id. All models include year and country fixed effects
[1]In natural log form

In contrast, the coefficient on the individual *Food Crisis (Volatility)*$_t$ variable is negative and significant to at least the 10% level. This suggests that in areas without urban development per capita, i.e., rural areas, a food crisis resulting from high volatility is associated with a significantly *lower* probability of state-led mass killing. These findings are in line with several studies that argue against strong linkages between food scarcity and violence (e.g., Theisen 2012; Theisen et al. 2011; Koubi et al. 2012; O'Loughlin et al. 2012). Nevertheless, these models clearly show that a shock to food production, in this particular example approximated by food price volatility, has a strong impact on violence *in some contexts*—in this case, in areas with higher urban development per capita.

Some of the control variables also show a statistically significant relationship with mass killing. Gross cell product, *GCP*$_t$, has a negative and statistically significant (to the 10% level) effect on mass killing, suggesting that 0.5-degree grid cells with less economic output are more likely to experience mass killing after the effect of the material capabilities available to urban civilians is taken into account. Additionally, 0.5-degree grid cells with higher population densities and those that experienced an ongoing conflict are both highly significantly (to the 1% level) more likely to experience mass killing by state forces. These findings all follow theoretical expectations raised by previous research into these issues and their impact on mass killing (e.g., Valentino 2014; Koren 2014; Downes 2008; Ulfelder 2012).

In addition to the statistically significant effect of the interaction term *Urban Development PC*$_t$ × *Food Crisis (Volatility)*$_t$, we use the estimates from each model in Table 1 to gauge the interaction's *substantive* effect. Specifically, we use each model's estimates to compute how the size of the coefficient of *Urban Development PC*$_t$ in respect to *Mass Killing Campaigns*$_t$ changes across two sets of observations in the sample: those that (i) experienced a food crisis due to very high price volatility, that is, where *Food Crisis (Volatility)*$_t = 1$, and (ii) did *not* experience a food crisis due to very high volatility, i.e., where *Food Crisis (Volatility)*$_t = 0$. The resulting change in the coefficient size of *Urban Development PC*$_t$ when a food crisis occurs due to very high price volatility (with 95% confidence intervals) for each model is reported in Fig. 2.

As these three plots show, in the absence of a food crisis resulting from very high volatility—that is, when *Food Crisis (Volatility)*$_t = 0$—the effect of *Urban Development PC*$_t$ on *Mass Killing Campaigns*$_t$ within nondemocratic countries—while statistically significant—is substantively negligible, as was shown in the previous chapter's analyses (see

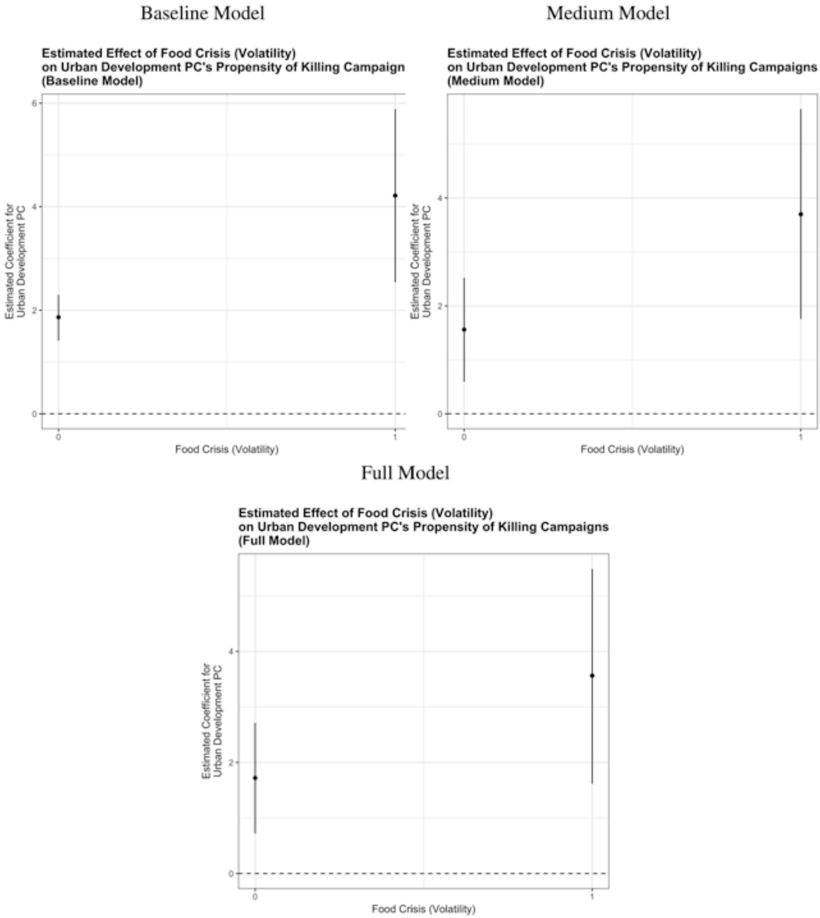

Fig. 2 Change in the effect of *Urban Development PC*$_t$ on *Intrastate Killing Campaign*$_t$ during a volatility-based food crisis

also, Brambor et al. 2006). However, when very high food price volatility generates a food crisis—i.e., when *Food Crisis (Volatility)*$_t$ = 1—the marginal effect of urban development levels per capita on mass killing campaigns in non-democracies—that is, the size of its coefficient—is not only positive and statistically significant, but also becomes substantively sizable. Specifically, Fig. 2 shows that when very high food volatility causes a food crisis, the *conditional effect* of *Urban Development PC*$_t$ on the likelihood of *Mass Killing Campaigns*$_t$ increases—on average—by an additional ~250% in the baseline model to about ~200% in the medium and full models, compared with situations when no such crises occur. This suggests that—*within the context of urban development in nondemocratic countries*—food crises resulting from very high food price volatility are an important risk factor, which considerably increases the probability that the authoritarian regime will perpetrate a mass killing campaign.

Using Drought to Approximate Food Crises

This section is divided into three parts. In the first part, we rationalize the use of a fine-grained grid cell-year measure of droughts as a proxy for our binary measure of food crisis. We particularly emphasize that droughts strongly influence food price volatility and can hence lead to a food crisis, which is precisely the central focus of our theoretical arguments. The second part explains the operationalization of the drought measure in some depth. Finally, in the third part, we discuss the results we obtain from assessing the interactive effect of droughts and urban development per capita on the likelihood of mass killing in nondemocracies.

Why Droughts?

Whereas the relationship between food price volatility, shocks to food production and consumption, and civilian mobilization received relatively copious attention, the role of drought in generating protest and violence has been rather contested. Indeed, numerous studies on the relationship between climate and conflict find little evidence that drought and low precipitation levels impact the propensity for violence (e.g., Theisen 2012; Theisen et al. 2011; Koubi et al. 2012; O'Loughlin et al. 2012). These—and other (e.g., Linke et al. 2015; Butler and Gates 2012; Koren and Bagozzi 2016, 2017; Buhaug 2010)—studies are important in that they illustrate that the relationship between climatic variations and political violence is complex, not always linear, and warrants careful interpretation. However, there is also evidence that shows that *in certain contexts*, drought can impact the probability and frequency of violence. For example, when studying the effect of livestock prices on conflict in Somalia, Maystadt, and Ecker find that "an increase in temperature anomaly and drought length by one within-region standard deviation each (0.59 and

5.73) increases the conflict likelihood by 62%" (2014, 1168), while also conceding that, "Somalia may be seen as an extreme case in terms of length and intensity of civil war and droughts" (2014, 1178). Similarly, when studying violence against civilian perpetrated by rebel groups within agricultural areas, specifically, worldwide, Bagozzi et al. (2017, 1068–1069) show that, "[e]xperiencing a severe drought is expected to lead to a 41.12% increase in the expected number of yearly rebel-perpetrated atrocities" within a given 0.5-degree agricultural grid cell during a given year, a first difference change in probability that is larger than that of either ongoing civil conflict or the history of political violence.

As we mentioned in our discussion of causes to food volatility, climatic events such as droughts can cause price fluctuations by reducing domestic food availability. These are *supply-side shocks*, which lead to high prices in the short run. In many cases, if stock levels are high, governments and private investors can release stocks into the market, which can help smoothing the impact of droughts and push prices down. However, whereas stock-based shocks are generally predictable, droughts constitute *unpredictable* shocks to food availability. If stock levels are already low, then the occurrence of drought will have a strong effect not only on immediate availability, but also on the variability of domestic food prices. Because it takes a long time to replenish stocks, not only will staple food prices experience an unexpected sharp increase, but they will also become highly susceptible to speculation, with even small changes in investment leading to sharp variations in prices due to low stock availability (Gilbert and Morgan 2010). Indeed, world grain stocks fell to low levels by 2006, which can explain why the effect of droughts on domestic food price volatility in later years was noticeable in countries that experienced unrest, such as Egypt, Tunisia, Syria, Haiti, Pakistan, and Mexico to name only a few (Hendrix and Haggard 2015; Bellemare 2015).

These factors suggest that because their timing and severity are frequently unpredictable, droughts are a good measure for estimating when food price volatility would increase dramatically and unexpectedly due to sudden shortages. Moreover, because they are highly unlikely to be affected by ongoing violence, droughts and rainfall variations have also been used as instrumental variables to "exogenize" the effect of food on violence in some cases (Miguel 2005; Bellemare 2015). From an empirical perspective, this suggests that severe droughts, at least, should cause sudden and noticeable increases in price volatility and sharply reduce domestic food availability in different countries. These sudden rises in food prices, especially as accompanied by the latter uncertainty caused by high volatility levels (Gilbert 2010), can push civilians to take the streets in both democratic and nondemocratic countries.

The interactions between food shortages caused by severe droughts, urbanization, and violence have recently received increased attention by both scholars and policymakers due to how civil war dynamics recently unfolded in Syria (see, e.g., Kelley et al. 2015; Gleick 2014). Indeed, the very dynamics hypothesized by our theory were reflected in the words of a displaced Syrian farmer who—when asked if the 2011 conflict was about the drought—replied: "Of course. The drought and unemployment were important in pushing people toward revolution. When the drought happened, we could handle it for two years, and then we said, 'It's enough'" (Friedman 2013). This example, along with the anecdotal evidence discussed in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States," illustrates the affect of drought-based food production shocks and the compounding impact of urban development per capita levels on the ability of the civilians to organize and act collectively in developed urban areas. They also show that this combination of drought-based shocks and urban development per capita can indeed increase the probability that nondemocratic regimes will resort to systematic mass killing campaigns in order to preempt such opposition movement from consolidating and becoming an existential threat.

A final advantage of relying on droughts to approximate a food crisis is data availability. Food volatility and food price data are more likely to be missing in countries that experience ongoing violence, either because the government does not or cannot report this information, or because the FAO is unable to collect it. Information on drought, in contrast, is collected using satellites and standardized according to uniform standards (Guttman 1999; McKee et al. 1993). As such, it is also available at different levels of aggregation, most important for our purposes, the country-year and the annual 0.5-degree grid cell-resolution levels (Tollefsen et al. 2012).

Empirically Operationalizing Drought-Based Shocks

Building on past research into the relationship between drought and violence and how it varies across different contexts discussed here, we thus rely on data on negative variations in precipitation to create two variables of a drought-based food crisis at different levels of geospatial resolution. Considering that research associates negative rainfall shocks with having both national impact (Miguel et al. 2004) and local (Bagozzi et al. 2017) impact, we operationalize these two drought-based indicators at distinct geospatial levels, one country-level operationalization, and one 0.5-degree grid cell-level operationalization.

The first drought-based variable we create to test our interactive hypothesis relies on variations in drought levels *within an entire country*. We begin by identifying 0.5-degree-resolution grid cells where precipitation levels fell 1.5 standard deviations or more below their average for at least one month during a given year. This variable was measured by Guttman (1999), and operationalized into the PRIO-Grid framework by Tollefsen et al. (2012). We then rely on the PRIO-Grid indicator that measures the longest consecutive streak of months in a given year during which precipitation levels fell 1.5 or more standard deviations below their mean to identify locations and countries that experienced severe drought. The interpretation of this continuous PRIO-Grid drought indicator is straightforward. For instance, if the longest consecutive streak of months where precipitation levels fell 1.5 standard deviation below average in a given 0.5-degree grid cell during a given year is four, that cell-year will be given a value of $4/12 = 0.334$. Moreover, if the longest streak starts in the previous year, it is only counted and included in the year in which the streak ended, although theoretically, this means that the proportion can become higher than one (Tollefsen et al. 2012).

We then dichotomize our first drought-based indicator, *Drought (Count.)*$_t$, to code variations in severe drought levels within a given country, measured at the country-year level. One important aspect of droughts, which some studies have emphasized (e.g., Kelley et al. 2015; Gleick 2014; Miguel et al. 2004; Tilly 1978), is that they can trigger migration—especially from rural to urban areas—within the country. These population movements can increase consumption pressures in urban areas or within territories of other ethnic groups, thus triggering resentment, protest, and violence. From this perspective, the localized impact of drought is not really localized, but rather country-wide. We thus operationalize *Drought (Count.)*$_t$ as whether precipitation levels *in any 0.5-degree grid cell within a given country* fell 1.5 or more standard deviations below their mean *for a consecutive streak of five months or more* during a given year. A value of one was given to all 0.5-degree grid cells within a given country during year *t* if this was the case, zero otherwise. For summary purposes, a global map showing those nondemocratic countries that experienced a drought-based food crisis (i.e., where *Drought (Count.)*$_t = 1$) during the 1996–2009 period is presented in Fig. 3.

While the *Drought (Count.)*$_t$ indicator allows us to evaluate how the country-level impact of drought impacts the probability of mass killing

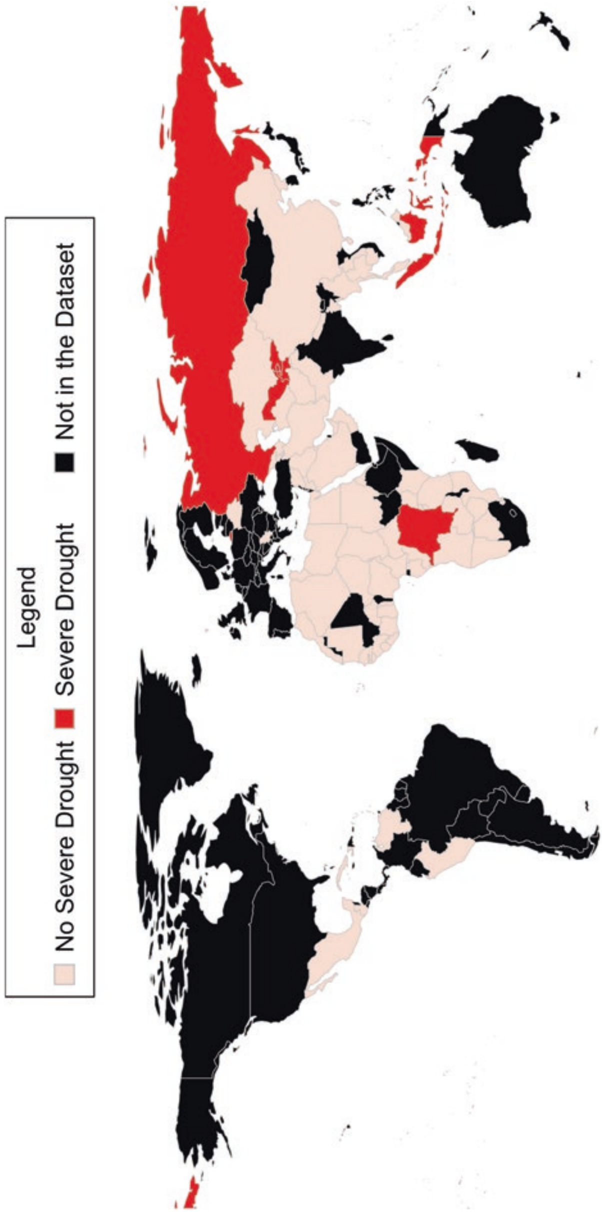

Fig. 3 Drought-based food production shocks by country for all nondemocratic countries, 1996–2009

at the annual 0.5-degree grid cell level, we also want to see how this propensity is affected by interactions between urban development per capita levels and drought-based shocks occurring *locally*. This logic emphasizes that local droughts can have a strong effect on the probability and frequency of civilian victimization (see, e.g., Bagozzi et al. 2017; Maystadt and Ecker 2014; Hendrix and Salehyan 2012; Raleigh and Kniveton 2012). According to this logic, extreme variability in rainfall generates a "zero-sum" competition over shrinking pool of food resources between different actors (Bagozzi et al. 2017). This can lead not necessarily to armed conflict, but rather to increases in incidents of violence against civilians and other types of social conflict, such as protests and riots (Hendrix and Salehyan 2012; Raleigh and Kniveton 2012).

Thus, to account for the impact of severe drought occurring locally on increasing the effect of urban development per capita levels on state-led mass killing, we create a second variable, measured—crucially—at the *annual 0.5-degree grid cell level*, using the same PRIO-Grid drought measure used to code *Drought (Count.)*$_t$. This indicator, *Drought (Cell)*$_t$, is dichotomized based on whether precipitation levels within a given 0.5-degree grid cell fell 1.5 or more standard deviations below their mean for *a consecutive streak of two months or more* during year t (coded one), or not (coded zero). This variable thus accounts for the local effects of drought on urban development per capita levels and their impact on the probability of mass killing campaigns. Importantly, as grid cells do not exist in isolation, the models reported below allow for other factors—such as migration between different regions—to influence the effect of local drought shocks, although these variations are constrained to a given nondemocratic country, considering that our conceptualization of state-led mass killing relies on mass violence perpetrated by authoritarian regimes against their own subjects.

To test whether the effect of drought-based food crises follows our moderated hypothesis, we again rely on interaction terms for empirical verification. We thus introduce two interactions, *Urban Development PC*$_t$ × *Drought (Count.)*$_t$ and *Urban Development PC*$_t$ × *Drought (Cell)*$_t$, to account for how droughts occurring at both the annual country and annual 0.5-degree grid cell levels, respectively, impact the effect of urban development per capita levels on mass killing campaigns by nondemocratic regimes. Like the specifications reported in Table 1, all models include the individual components of each interaction term, alongside a variety of controls to account for potential confounders.

Analysis Results: Drought-Based Shocks

Table 2 reports the estimates of six logit models, which rely on severe droughts to approximate food crises, used to test our hypothesis on a full sample consisting of all global terrestrial cells in autocratic countries for the years 1996–2009. The first three models replicate the same models presented in Table 2, using *Drought (Count.)*$_t$ to approximate a food crisis, while the ensuing three specifications rely on the *Drought (Cell)*$_t$ indicators. In each analysis stage, the first of the three models reports a minimalist baseline specification to test the interactive mechanisms implied by our theory, as more cell—and country-year level control variables are added to arrive at the fully specified model. Note that unlike food price volatility data, which are unavailable for many countries during some periods, information on *Drought (Count.)*$_t$ and *Drought (Cell)*$_t$ is available over the entire 1996–2009 period. Most importantly, as was the case in the analyses that relied on food price volatility, the effect of the interaction term in each of the six models is positive and statistically significant to at least the 5% level. This lends additional strong confirmation to our interactive hypothesis, and theoretical argument more broadly. Simply put, urban development per capita's effect size on mass killing campaigns significantly increases when and where a drought causes a food crisis.

Again, like in Table 2, in the absence of a food crisis, the coefficient on *Urban Development PC*$_t$ remains statistically significant to the 1% level, suggesting that areas with higher urban development per capita levels within nondemocratic countries are more likely to experience violence by state forces, although this effect is substantively weak. In contrast to Table 3 in Chapter "Urban Development and Mass Killing: A First Look at the Data," however, the coefficients on both *Drought (Count.)*$_t$ and *Drought (Cell)*$_t$, while negative, are not statistically significant. This suggests that, outside of high urban development per capita contexts, droughts have no observable effect of the incidence of state-led mass killing specifically.

Some of the control variables also show a statistically significant relationship with mass killing campaigns. The variables *Mass Killing Campaigns*$_{t-1}$, *Population*$_t$, *Distance to Capital*, *Conflict*$_t$, and *Polity2*$_t$ all have a positive and statistically significant (to at least the 5% level) effect, suggesting that these factors all influence the probability of mass killing campaigns by state forces within a given 0.5-degree grid cell during a

Table 2 Determinants of mass killing campaigns by government forces in nondemocratic countries, 1996–2009—Drought-based shocks

	Drought—country			*Drought—grid cell*		
	Baseline	*Medium*	*Full*	*Baseline*	*Medium*	*Full*
Urban Development PC_t	1.716***	0.974***	1.102***	1.725***	0.958***	1.122***
	(0.165)	(0.351)	(0.350)	(0.165)	(0.355)	(0.354)
Drought (Count.)$_t$	−1.203	−1.435	−1.559	–	–	–
	(1.033)	(1.117)	(1.177)			
Drought (Cell)$_t$	–	–	–	−0.114	0.071	−0.199
				(0.768)	(0.816)	(0.816)
Urban Development $PC_t \times$ *Drought (Count.)*$_t$	1.394**	1.525**	1.868**	–	–	–
	(0.619)	(0.686)	(0.735)			
Urban Development $PC_t \times$ *Drought (Cell)*$_t$	–	–	–	2.759***	3.150***	3.884***
				(0.798)	(0.927)	(0.955)
Mass Killing Campaigns$_{t-1}$	2.682***	2.538***	2.161***	2.685***	2.547***	2.162***
	(0.328)	(0.334)	(0.336)	(0.327)	(0.334)	(0.335)
Violent Civil Disobedience$_{t-1}$	–	0.825**	0.155	–	0.751**	0.075
		(0.379)	(0.406)		(0.371)	(0.400)
GCP_t^1	–	−0.369	−0.318	–	−0.341	−0.316
		(0.263)	(0.265)		(0.265)	(0.267)
Population$_t^1$	–	0.625***	0.549***	–	0.607***	0.531***
		(0.114)	(0.118)		(0.114)	(0.117)
Border Distance^1	–	−0.330***	−0.415***	–	−0.338***	−0.426***
		(0.073)	(0.075)		(0.073)	(0.075)
Travel Time^1	–	−0.860***	−0.898***	–	−0.890***	−0.925***
		(0.201)	(0.203)		(0.200)	(0.202)

(continued)

Table 2 (continued)

	Drought—country			*Drought—grid cell*		
	Baseline	*Medium*	*Full*	*Baseline*	*Medium*	*Full*
Distance to Capital[1]	–	0.366***	0.366***	–	0.355***	0.348**
		(0.134)	(0.136)		(0.134)	(0.136)
$Conflict_t$	–	–	2.178***	–	–	2.233***
			(0.253)			(0.256)
$Polity2_t$	–	–	0.155***	–	–	0.150**
			(0.058)			(0.060)
$GDP\ PC_t^1$	–	–	0.889	–	–	0.781
			(0.886)			(0.888)
Oil_t^1	–	–	0.164	–	–	0.161
			(0.133)			(0.133)
Gas_t^1	–	–	−0.096	–	–	−0.097
			(0.353)			(0.360)
Constant	−11.384	−2.375	−7.054	−11.131	−1.707	−5.628
	(2,475.680)	(3.562)	(6.970)	(2,472.194)	(3.564)	(6.977)
N	371,183	347,849	347,816	371,183	347,849	347,816
LL	−1002.615	−803.850	−755.984	−1000.203	−800.645	−752.084
AIC	2191.229	1785.701	1697.967	2186.406	1779.290	1690.167

Notes Significant at $^*p < 0.1$, $^{**}p < 0.05$, and $^{***}p < 0.01$
Values in parentheses are robust standard errors clustered by grid cell-id. All models include year and country fixed effects
[1]In natural log form

given year. Similarly, the coefficients on the variables *Travel Time* and *Border Distance* illustrate that the probability of a mass killing campaign significantly (to the 1% level) increases in 0.5-degree grid cells located closer to large urban areas, and closer to the state's borders.

In addition to the statistically significant effect of the interaction terms *Urban Development* $PC_t \times$ *Drought (Count.)*$_t$ and *Urban Development* $PC_t \times$ *Drought (Count.)*$_t$, we use the estimates from each model in Table 2 to gauge each interaction term's *substantive* effect. As we did when estimating the substantive impact of *Food Crisis (Volatility)*$_t$, we use each model's estimates to compute how the size of the coefficient of *Urban Development* PC_t in respect to *Mass Killing Campaigns*$_t$ changes across observations that experienced drought at either the country or 0.5-degree grid cell level, and those that did not. The resulting change in the coefficient size of *Urban Development* PC_t when a drought causes a food crisis at the country level (with 95% confidence intervals) for each model is reported in Fig. 4. Similarly, the change in the coefficient size of *Urban Development* PC_t when drought-generated food crises occur at the 0.5-degree grid cell level (with 95% confidence intervals) for each model is reported in Fig. 5.

For *Drought (Count.)*$_t$, Fig. 4 illustrates that in the absence of a drought-based crisis (operationalized at the country level), the effect of *Urban Development* PC_t on *Mass Killing Campaigns*$_t$ within nondemocratic countries—while statistically significant—is again substantively negligible. When *Drought (Count.)*$_t = 1$, however, the coefficient size on the *Urban Development* PC_t variable is not only positive and statistically significant, but also increases substantively. Indeed, Fig. 4 illustrates that droughts occurring at the country level increase the effect of urban development per capita levels—on average—by an approximately additional 120% in the baseline specification, 150% in the medium specification, and 180% in the full model.

Turning to Fig. 5, the marginal effect of *Urban Development* PC_t on mass killing campaigns is substantively negligible in the absence of local (i.e., measured at the 0.5-degree grid cell level) severe drought. However, when *Drought (Cell)*$_t = 1$, the effect of urban development per capita increases—on average—by approximately an additional 270% in the baseline specification, 320% in the medium specification, and 390% in the full specification. These substantive-effect changes thus complement the marginal effects analysis reported in Fig. 2 above by lending strong confirmation to the argument developed throughout this

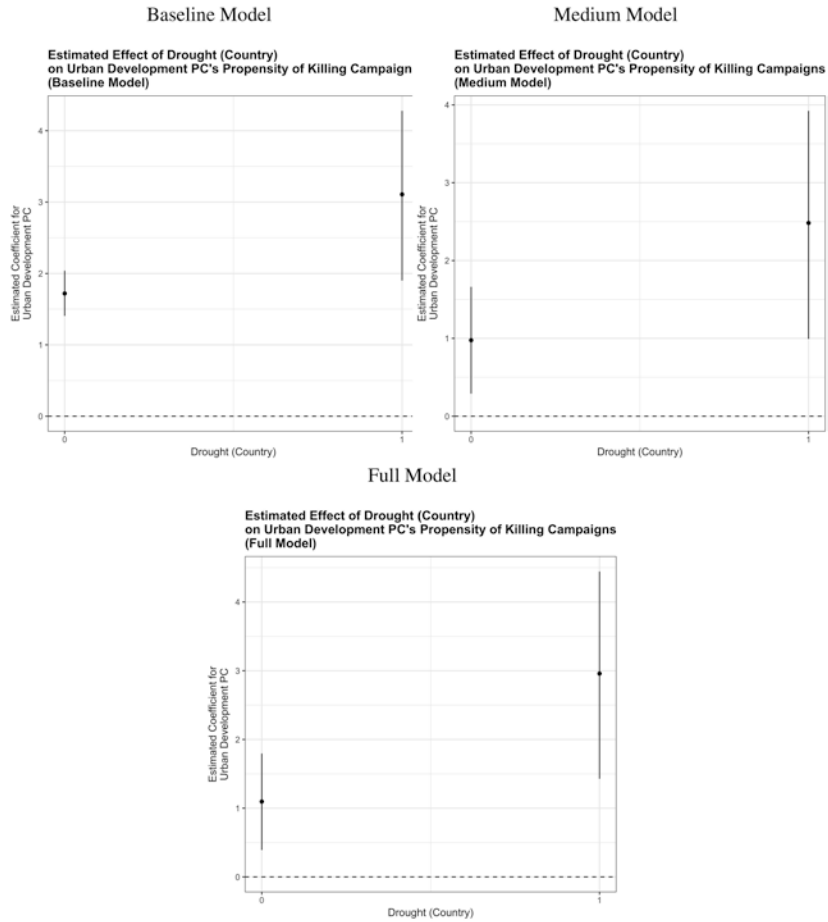

Fig. 4 Change in the effect of *Urban Development* PC_t on *Intrastate Killing* $Campaign_t$ during a severe drought (country)

book. Over repeated analyses of different food crisis conceptualizations estimated, alongside a large number of controls for alternative confounders, we find time after time that *within the context of relatively highly developed urban areas in nondemocratic countries*, food crises are a powerful compounder of the likelihood of mass killing campaigns by state forces, indeed, much stronger than previously believed.

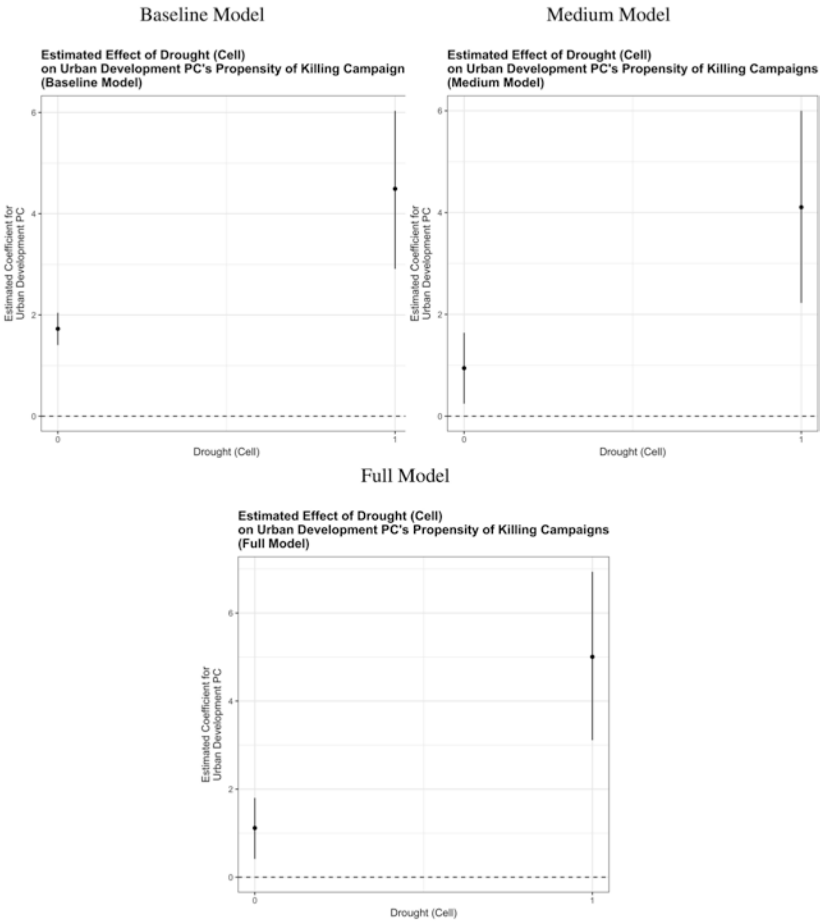

Fig. 5 Change in the effect of *Urban Development PC*$_t$ on *Intrastate Killing Campaign*$_t$ during a severe drought (cell)

Conclusion

This chapter expanded on Chapter "Urban Development and Mass Killing: A First Look at the Data" by providing different analysis sets of theoretically motivated food production crisis indicators to estimate how such crises compound the probability of mass killing by state forces within areas with higher urban development per capita levels. We relied on the same empirical framework and variables discussed in the previous chapter to introduce the effect of these different food crisis conceptualizations into the models. We also provided a thorough discussion, firmly grounded in extant literature, to show that previous research identified each of these food crisis conceptualizations as a potential cause urban unrest, and political violence more broadly.

The findings reported here present a detailed empirical picture that is well aligned without the theoretical argument developed in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States." We showed, repeatedly, that the occurrence of a food production crisis as a resulting of very high food price volatilities, severe droughts at the country levels, and droughts occurring at the local level, all significantly increase the probability that mass killing by state forces will occur within areas with higher urban development per capita. Indeed, our highly disaggregated, 0.5-degree grid cell framework allowed us to provide an important empirical extension to past research by examining highly localized variations in violence, and thus gives our theoretical argument—which emphasizes the geospatial aspect of such violence and its determinants—additional advantages over past studies that favored analyses conducted at the country level, or relied on static measures of urbanization.

Moreover, we illustrated that these localized effects are also substantive—the occurrence of a food crisis increases the probability that areas with more urban development per capita will experience a state-led mass killing campaign by an additional 150–390%. Considering future climate trends are likely to persist (Vidal 2013) and the fact that developing countries—which encompass the vast majority of nondemocratic countries—are more susceptible to the effects of both climatic variation (Burke et al. 2009; Miguel et al. 2004) and food price fluctuations (Food and Agricultural Organization 2011; Clapp 2009), these are alarming conclusions.

While cross-national analyses, even those conducted at high levels of resolution, can provide a "bird's-eye view" of a particular phenomena, such expositions provide only a partial picture of the dynamics and interactions that can lead to violence, and how different state and nonstate actors conceive these events, and react to them. Therefore, to provide a contextualized understanding of the dynamics of violence between the government and civilians in nondemocratic states, and how these are impacted by urban development per capita levels and food crises, over the next chapters we conduct detailed, mixed-methods studies of several illustrative cases. These case studies are thus used to provide a complementary perspective on the reality of food crises, urbanization, and mass killing, and serve as an additional robustness test for our broad theoretical argument.

Notes

1. See, Roncoli et al. (2001), Seddon (1986), Hendrix and Haggard (2015), and Wallace (2013).
2. The results are robust to both somewhat higher and somewhat lower food price volatility thresholds.

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Urban Development, Food Shortages, and Mass Killing in Authoritarian Pakistan

In this chapter, we provide a detailed examination of the causal arguments, main mechanisms, and theoretical claims derived from our theoretical discussion in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States" as these unfolded in nondemocratic Pakistan. To ensure that we identify only nondemocratic regime spells in Pakistan, we limit our analysis to two periods where the country was ruled by a military regime: 1978–1988, and 2000–2008. We described the methodological and substantive motivations for using Pakistan during these periods as one of our illustrative case studies in Chapters "Introduction" and "Urban Development and Mass Killing: A First Look at the Data." Specifically, during both periods, Pakistan offers a quasi-experimental framework, where the treatment is the sharp increase in urban development per capita levels during: (i) the mid-1980s, and (ii) to a lesser extant in 2002. At the same time, as we show below, food (i.e., staple crop) crises occur rather frequently. According to our theory, we expect to see overt collective opposition to the regime in major urban cities of Pakistan in response to food crises emerging after the significant increases in urban development per capita levels in the mid-1980s. We also expect the frequency of such protests during food crises to increase further after the second notable increase in urban development, which occurs during the early 2000s.

The second part of our theoretical argument, which leads to our main hypothesis, argues that the regime might view such opposition as a credible challenge to its rule, thus associating such protests with preemptive,

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state-led mass killing. Accordingly, we anticipate that the frequency of mass killing campaigns by the ruling elite during food crises should rise after these increases in urban development per capita occur, as the regime viewed this opposition as a serious threat to its ability to survive in office. We rely on a mixed-methods analysis—which draws on original qualitative and quantitative data from a large number of academic, official, and media sources—to evaluate the empirical validity of our theoretical predictions and causal arguments in the case of authoritarian Pakistan. Specifically, we rely on a detailed historical analysis of secondary and primary evidence, original time-series data on urban development and food price volatility, and statistical within-country analyses of originally coded city-year data on anti-government demonstrations and local killings for 12 Pakistani cities.

We begin our analysis with a brief overview of the political and economic history of Pakistan, with a particular focus on the agricultural sector. In the ensuing section, we discuss the temporal change in one of our key variables of interest, urban development (normalized per capita per our theory), and the variations in staple food price volatility in Pakistan starting in 1978. Building on a careful analysis of historical evidence and original time-series data, we show that the level or urban development in nondemocratic Pakistan did, in fact, increase sharply around 1985 and then again in the early 2000s. We also show that the country also experienced food crises due to high food price volatility and sharp drops in food output in 1979, 1982, 1986, 1987, 2001, and 2006.

The third section builds on this information about urban development and food crises to analyze if and how higher levels of urban development provoked overt anti-regime opposition in the context of food crisis in Pakistan's major urban areas. We specifically focus on two nondemocratic regime spells: General Zia-ul-Haq's military rule (1978–1988) and General Pervez Musharraf's reign (2001–2008). We show that rapid increases in urban development per capita during each of these two periods helped to facilitate collective action among the civilians, allowing the latter to more easily and effectively mobilize against the regime during food crisis episodes. We then examine the response of each of these authoritarian leaders, General Zia-ul-Haq and General Musharraf, to this overt popular opposition. Careful analysis of primarily and secondary historical evidence shows unambiguously that both military rulers resorted to mass killing campaigns against civilians in large cities during food crises *after* urban development per capita levels increased in order to preserve their power.

In the fourth section, we evaluate these linkages quantitatively using originally coded data. Using a large number of sources (which we list in the book's online appendix due to space constraints), we code annual information on anti-government demonstrations, mass killing campaigns, food crises, and urban development per capita levels, as well as a large number of controls for a 12 large cities in Pakistan for which enough information was available. We then estimate two stages of analysis. In the first stage, we evaluate the effect of the interaction of food crises and urban development per capita on the frequency of anti-government demonstration for each city during a given year during the 1978–1988 and 2000–2006 periods. In the second stage, we evaluate the effect of the same interaction on the probability of mass killing, specifically, in a given city during a given year over the same period. In both cases, we corroborate our theoretical argument from Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States" and the historical analyses presented in this chapter; we find that the effect of food crises on the frequency of anti-government demonstrations *and* the probability of localized mass killing significantly increases when urban development per capita levels rise. We then conclude this chapter with a brief discussion of our findings.

Pakistan: A Brief Overview

Since gaining its independence from the UK in 1947, Pakistan has been ruled primarily under different authoritarian (and therefore nondemocratic) regimes. During the first years after independence, Pakistan was a Parliamentary Democracy headed by Liaquat Ali Khan, the country's first Prime Minister (Jalal 1990; Tudor 2013). Yet, this democratic spell did not last long. In October 1958, General Mohammad Ayub Khan carried out a successful military coup d'état, remaining in power as a military dictator until 1969. After Ayub Khan, General Agha Muhammad Yahya Khan headed a second military regime from 1969 to 1971. Stability under the military regime, however, abruptly ended in 1971 after the country's military dictator Yahya Khan refused to cede political power to civilian political parties such as the Awami League—the predominant political party from the country's Eastern

Region—after the 1970 General Elections. The 1970 election was the first *national-level* election in the country since 1956 (Rizvi 2000; Chadda 2000; Tudor 2013). It resulted in political turmoil in East Pakistan, which not only led to military conflict with neighboring India in 1971, but also paved the way for secession and the formation of the independent country of Bangladesh (until its independent in 1971, formerly known as East Pakistan).

After the formation of Bangladesh in 1971, General Yahya Khan was left with no choice but to hand all power over to the Pakistan People Party (PPP), led by Zulfikar Ali Bhutto. This was followed by a (brief) transition to democracy in 1972, with Zulfikar Bhutto as the country's Prime Minister. This democratic spell, however, again did not last long. Although Prime Minister Bhutto's PPP won the 1977 elections, General Zia-ul Haq used the pretext of "political instability" to make a forceful return to the political arena. On July 5, 1977, Pakistan was placed under military rule yet again and the 1973 Constitution, which laid the foundation for the country's democratic institutions, was suspended (Jalal 1985, 1990; Rizvi 2000). Pakistan then remained under Zia-ul-Haq's military rule until 1988, when the general died in a plane crash.

For the first time in fifteen years, General Elections were again held in November 1988 (following Zia-ul-Haq's death). None of the parties won a majority of seats, but the PPP emerged as largest party. Benazir Bhutto, chairperson for the PPP, was named Prime Minister after the PPP formed a coalition of smaller parties to form a working majority. Between 1988 and 1999, Pakistan remained a democracy, albeit an unstable one. Similar to earlier decades, however, democracy faltered yet again in Pakistan in 1999. On October 12, 1999, General Pervez Musharraf successfully led a coup to overthrow the civil government, headed by Prime Minister Nawaz Sharif (Rizvi 2000; Tudor 2013). Musharraf then remained in power until he was exiled in 2008 (Wilson 2009). Therefore, in our analysis of the relationship between food crises, urban development, protests, and mass killing presented in this chapter, we focus on two historical periods during which Pakistan was ruled by (military) nondemocratic regimes: 1978–1988 (under Zia-ul-Haq) and 2000–2008 (under Musharraf).

From an economic perspective, it is worth noting that Pakistan lacks abundant natural resources and arable land. From the 1950s onward, Pakistan relied on foreign aid to expand state investment, primarily in capital-intensive industries and large-scale manufacturing firms of products such as fertilizer, cloth production, and petroleum refining (Noman 1988; Hye et al. 2010). Since the 1970s, the service sector has also grown substantially. However, similar to other developing, low-income economies, the agricultural sector is still one of Pakistan's largest (World Bank 1983; Jalal 1990; Hye et al. 2010). In the first decade after its independence, Pakistan's agricultural sector accounted for 53% of the country's GDP (Noman 1988; Jalal 1985, 1990; Hussain 1999). While the share of agriculture in the country's GDP has declined to around 27% in recent years, the sector continues to be predominant in the country's economy and receives substantial amounts of public investment, subsidies, and aid from both the national government and foreign donors (Noman 1988; Hye et al. 2010). As a result, over the last four to five decades, Pakistan has emerged as a substantial producer of food and crops such as wheat, sugarcane, rice, chickpeas, and maize (Hussain 1999; Hye et al. 2010). Yet, as we show below, Pakistan's agricultural sector is extremely vulnerable to exogenous shocks, which generated recurring food crises throughout its history.

Food Crisis and Urban Development in Pakistan, 1978–2008

We mentioned earlier that during its authoritarian regime spells (i.e., 1978–1988, 2000–2008), Pakistan was characterized by two key features: consistent outbreaks of food production (i.e., output) crises and rising urban development levels. We explore these two features in some depth below, as these are our main explanatory variables in both the models presented below and the analyses conducted in Chapter "Statistical Analysis of Food Crises and Mass Killing."

The first variable we discuss here is food crises, especially as these relate to sudden declines in cereal production. To this end, recall from our broad theoretical argument (presented in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States") and our cross-sectional empirical analyses (presented in Chapter "Statistical Analysis of Food Crises and Mass Killing"), that we draw direct linkages between food production crises—especially crises stemming from high food price volatility—urban development per capita, and mass killing. To this end, Fig. 1 plots food price volatility levels in Pakistan over the 1978–2008 period, normalized to range from zero to one.

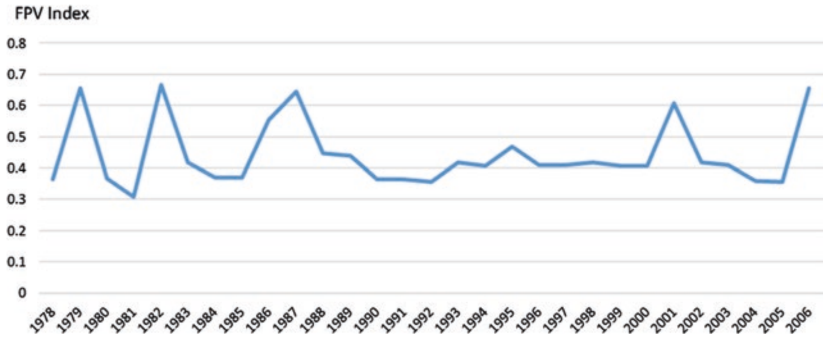

Fig. 1 Food (staple crop) Price Volatility (FPV) index—Pakistan, 1978–2006

Food price volatility in this context explicitly captures the nominal average price volatility of a basket of five main staple crops[1]—as defined by the Government of Pakistan's Ministry of Food, Agriculture and Livestock—irrigated and produced per year in Pakistan. Volatility is defined as the ratio of the absolute value of the annual deviation over the trend (calculated using the Hodrick–Prescott filter) for the basket of these five main staple crops over the 1978–2008 period. This annual variation in nominal food price volatility ranges from a minimum of 0.3 to a maximum of 0.68.[2] The primary and secondary data sources used in the creation of this index are listed in the book's online appendix to save space here.

As can be clearly observed, nominal food price volatility experienced sharp increases in four years during the 1978–1988 period (1979, 1982, 1986, and 1987). Few variations in food price volatility can be observed during the 1990s, when Pakistan is a democracy, and none of these variations is exceptionally sharp. Lastly, during the 2000–2008 period, when Pakistan is again under authoritarian rule, food price volatility exhibits sharp increases in 2001 and then again in 2006. This plot thus suggests a consistent pattern of exceptionally high food price volatility (primarily) during authoritarian regime spells, namely 1978–1988 and 2000–2008.

Past research has suggested numerous reasons to explain why Pakistan experienced such sharp "spikes" in food price volatility throughout the late 1970s, the 1980s, and then in the first decade of this century (Khan and Qasim 1996; Raza and Carroll 2010). One approach argues that oil price shocks in the 1970s caused by the 1973 Arab–Israeli conflict and the Iran Hostage Crisis had a long-term adverse impact on domestic food production and price volatility in Pakistan during the late 1970s and 1980s (Khan and Qasim 1996; Khan and Gill 2007). Another approach associates the persistence of droughts in the late 1970s, early 1980s, mid-1990s, and early 2000s with reductions in food availability and hence with high food price (Raza and Carroll 2010; Hye et al. 2010).

Importantly, the sharp rises in food price volatility that Pakistan experienced during its authoritarian regime spells occurred when crop production sharply decreased. Such sharp declines in staple crop output during high food price volatility years occurred primarily because of the adverse impact of such volatility on capital investment and subsequently crop production in the country (Khan and Qasim 1996; Khan and Gill 2007; Raza and Carroll 2010). More importantly, Fig. 1 and the qualitative evidence discussed in detail below show that food crises occurred repeatedly during the years in which Pakistan is under military rule across the last decades.

Next, we turn to evaluate the role of urban development per capita, our second explanatory variable of interest. Note that until 1975 or so, Pakistan's economy was predominantly agrarian, with much of its population residing within the country's rural regions (Haque and Nayab 2007; Arif and Hamid 2009). To be sure, major urban areas and cities existed in 1970s Pakistan, but the pace of urbanization was generally low and constrained (Haque and Nayab 2007; PCP 2011). Hence, until the early 1980s, the level of urbanization and—subsequently—urban development per capita (as discussed below) was relatively low. But this changed dramatically by the mid-1980s. In fact, urbanization levels in Pakistan started to increase at an annual rate of 3% beginning in 1984, a trend that continued until around 2005 (Arif and Hamid 2009; PCP 2011). As a result, the pace of urbanization was the fastest in South Asia during the last three decades (Jabeen et al. 2017, 129).

Figure 2 illustrates this change visually. Recall that in Chapter "Urban Development and Mass Killing: A First Look at the Data" we derived a formula to empirically approximate urban development levels per capita:

$$\sum_{i=1}^{n}\left(\frac{l_i}{\ln P_i}\right) \tag{1}$$

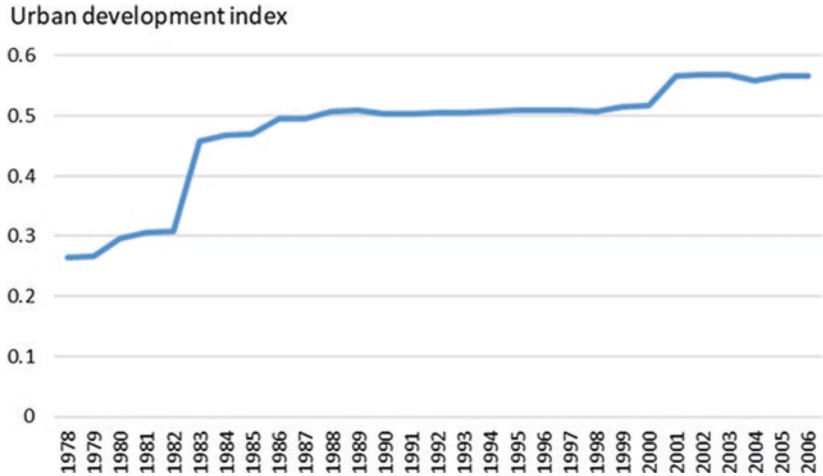

Fig. 2 Urban development (per capita) in Pakistan, 1978–2006

where l_i is the (calibrated) annual levels of nighttime light emissions in a given 0.5 degree grid cell, P_i is the total population residing in the same grid cell, and n is the number of all urbanized cells for each year in the dataset. We followed the same formula to code annual urban development per capita in Pakistan, with two changes. First, instead of using the 0.5 degree grid cell, we use the city year as our unit of analysis rather than the 0.5 degree grid cell. Second, instead of data on nighttime light emissions—which were not available during a large part of our temporal period of interest, we relied on data on provision/supply of electricity per household for each city year, which is taken from several primary and secondary sources that is discussed and listed in the book's online appendix owing to space constraints here.[3]

Using this alternative measure of development thus serves as an additional robustness test to our nighttime light-based measure; if the results of our analysis hold when this new indicator is used, this bolsters our contentious that the relationship between urban development per capita, food crises, and mass killing is valid. Note that these data were only available for 12 major urban areas in Pakistan during the 1978–1988 and 2000–2006 periods. These cities are: Chiniot, Faisalabad, Gujranwala, Islamabad, Karachi, Lahore, Mardan, Peshawar, Rawalpindi, Muridke, Quetta, and Sialkot. Having derived this indicator for each city year and normalized it by capita, we then constrain it to range between zero and one for convenience.

Figure 2 clearly illustrates that the level of urban development per capita is relatively low from 1978 until 1984. After that, however, a sharp increase in the degree of urban development is noticeable over the 1984–1986 period. This is followed by a steady increase in urban development per capita levels from 1986 onward, with particularly a visible increase in 2001.

Scholars have argued that factors such as higher levels of migration into urban areas from the countryside, increased investment in infrastructure, and remittances from Pakistani citizens working in Gulf countries (among others) account for the sharp increase in urban development in Pakistan from the mid-1980s onward (Haque and Nayab 2007; Arif and Hamid 2009; Jabeen et al. 2017). It is beyond the scope of this study to analyze the reasons for the increase in urban development in Pakistan in the mid-1980s. However, it is important to note that the substantial increase in urban development during the mid-1980s and early 2000s (which provides the necessary "treatment") coupled with the occurrence of repeated food crisis episodes in these years allows us to study the propensity for anti-regime opposition and state-led mass killing campaigns during both autocratic regime spells: (i) prior to 1985 when food crisis episodes occur, but urban development per capita levels are low and (ii) after 1985—specifically 1985–1988 and 2000–2006—when urban development is sufficiently high while food crisis episodes also occur. We turn to this analysis in the following two Sections.

1978–1985: Food Crises in the Context of Low Urban Development

The theoretical argument development in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States" suggests that overt anti-regime civilian mobilization in nondemocracies is unlikely to occur during a food crisis if urban development per capita levels are low. One explanation for this is that low urban development exacerbates collective action problems, which hinders the possibility of mass-based coordinated anti-regime action. Because collective anti-regime mobilization is unlikely in this case, incumbents will not feel politically threatened, and as a result, state-led mass killing campaigns are unlikely to occur.

Are these theoretical claims valid in the case of nondemocratic Pakistan for the 1978–1985 period? Historical evidence gathered from Pakistan suggests that these predictions are indeed valid. To see why, first recall that at least two food crises (stemming from food price volatility) occurred during the 1978–1985 time period: in 1979 and again in 1982. What is particularly striking is the fact that these food crisis episodes had particularly deleterious consequences for food supplies across every major city in the country, including Karachi, Islamabad, Lahore, Multan, Peshawar, and Rawalpindi (Noman 1988; Korson 1993; Burki 1999). High food price volatility, caused by the Arab–Israeli conflict of 1973 and the resultant oil price shocks, led to a precipitous decline in capital investment in the agricultural sector from the late 1970s until the early 1980s (Noman 1988; Korson 1993). This in turn led to a significant decline in the output of staple crops that was most acute in 1979 and 1982.

As such, these declines in crop output led to hyperinflation in key food consumption of staple items such as wheat, rice, and sugar across "all major urban locations in Pakistan" (Korson 1993, 79). It was largely middle-income, low-middle-income, and low-income households that directly felt the "economic pinch" and "adverse consumption effects" engendered by the food crisis in 1979 and 1982 (Korson 1993, 57; Noman 1988; Hussain 1999). As one authoritative study of Pakistan's political economy states:

> A catastrophic decline in output of staple crops in 1979 and also in 1981–82 meant that consumers, especially the poor, in Pakistan's cities had to cope with harsh economic conditions during these years…there was also little to no respite from this crisis of crop production at the time. (Burki 1999, 104)

The conspicuous absence of relief for consumers in urban (as well as in rural) areas was—as suggested by the theoretical argument we developed in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States"—at least partly the result of the lack of action by the Zia-ul-Haq-led military regime (Shafqat 1997; Chadda 2000; Ahsan 2005; Aziz 2009). Indeed, in both 1979 and 1982, it was common knowledge to most citizens and political actors in Pakistan that the Zia-led military regime had achieved a substantial level of political consolidation (Rizvi 2000). Such consolidation, however, was a double-edged sword. On the one hand, it helped to promote domestic political stability, albeit under a draconian military dictator (Noman 1988; Burki 1999; Chadda 2000).

On the other hand, this consolidation also meant that the Zia-led military regime did not really feel politically compelled or accountable enough to react effectively to the aforementioned food crises (Jalal 1985; Rizvi 2000; Chadda 2000). Newspapers blamed the Zia-led regime of being intentionally callous. For instance, a newspaper report from August 1979 stated that "…had the government taken urgent steps to store adequate food stocks and supply these stocks to cities once the crisis hit, it would have helped to stabilize the ongoing food shortage problem."[4] Another article made it quite clear in the fall of 1979 that the food crisis situation would "not have been a crisis in the first place, and the country's denizens would not have suffered, if the government devised and used tools at its disposal to preempt the crisis."[5] Similarly, in 1982 and 1983, both the print media and opposition figures (who had previously gone into hiding) openly criticized the Zia-led government for not tackling the food crisis at the time (see, e.g., Noman 1988, 72; Korson 1993; Burki 1999).

Even the World Bank suggested that the military-led regime in Pakistan needed to take "immediate steps" to address the grave crisis in the country's cities that resulted from the sharp drop in crop output (World Bank 1983, 27). The regime's apathy and callousness "made an already dire situation even worse" (Hussain 1999, 112; Aziz 2009). Throughout 1979 and likewise, throughout 1982, there were further food shortages and spikes in food inflation (World Bank 1983; Jalal 1985; Noman 1988). This consequently served to further exacerbate the effects of the food output crises (Noman 1988; Hussain 1999; Aziz 2009).

Thus, between 1978 and 1984, residents in Pakistan's urban areas were clearly facing adverse consumption shocks due to consistent episodes of food crisis, an issue that was further exacerbated by the autocratic government's lack of interest to genuinely address the problem. Conditions were therefore, in the words of one journalist in 1982, "conducive for opposing the country's authoritarian ruling class that showed remarkable apathy towards citizens who faced the brunt of food shortages."[6] Notwithstanding these conducive conditions for mobilization, historical evidence *offer no evidence* of collective mobilization and overt anti-regime opposition resulting from food shortages in any of city in

Pakistan (and for that matter, in rural areas as well) between 1978 and 1984 (Jalal 1985; Korson 1993; Burki 1999).

Granted, demonstrations against the regime did take place in the early 1980s, for instance, in Karachi by Shiite political figures and some extremist Sunni groups (Jalal 1985; Rizvi 2000; Chadda 2000). But these demonstrations arose along sectarian lines and were based on issues related to either ethnic minorities (the Shias in this case) seeking quotas and jobs in state-owned industries, or to demands for implementation of orthodox religious policies by Sunni-based groups (Noman 1988). Indeed, as one scholar argues, "collective riots and challenges to Zia's government on economic issues like acute food shortages were simply non-existent in the early years of Zia's reign."[7]

Why did overt anti-regime demonstrations *not* occur in during the consistent food shortage crisis episodes during the 1978–1982 period? Historical evidence from primary and secondary sources suggest that—as predicted by our theory—relatively low levels of urban development per capita levels in Pakistan during the same period made it difficult for citizens in urban areas to communicate and coordinate. This exacerbated collective action problems among the civilians in cities, impeding collective anti-regime mobilization by these civilians (Amin 1988; Gayer 2007). In fact, an early study on the history of collective mobilization in urban Pakistan offers this exact argument:

> Although ethnic strife or demands by specific ethnic groups has often driven mass mobilization against the government, it is remarkable that we never witnessed any 'bread' riots in the cities of Pakistan when Zia-ul-Haq first entered office…Drastic cuts in food supplies and high food inflation was a central issue facing Pakistan when the Soviet Union initially invaded and occupied Afghanistan. Yet there was a lack of coordination and concerted effort among these citizens to oppose the Zia-ul-Haq government in the early 1980s on issues related to food shortages. Low rates of urban growth contributed to such poor coordination…in the absence of sufficient resources in urban areas, citizens neither had the will power nor the capacity to challenge the military regime. (Khan 1983, 57–58)

More recent research corroborates this argument. For example, Rahman argues that "poor and shackled" urban development meant that the "middle-class in Pakistan's cities" did not have "the necessary infrastructure to communicate" and form a collective tight-knight group to challenge the Zia-led regime in the late 1970s and early 1980s (1996, 84–85).[8] Other studies on urban violence in Pakistan also emphasize that the relative absence of urban growth in the 1970s and the early 1980s meant that civilians in urban areas were "handicapped by low resources and thus focused on day-to-day survival"[9] rather than devising ways of mobilizing against and challenging the Zia-ul-Haq's government. Instead, in the late 1970s and in the early 1980s, "anti-regime activism and opposition was largely confined to the country's rural hinterlands in Sindh and Punjab" (Moon 1998, 129).

It is not only secondary sources that highlight the link between low urban development and the conspicuous absence of collective mobilization against the country's military regime at the time. Journalists in prominent newspapers such as *Dawn, The Express Tribune, The Nation*, and *Daily Times* during the late 1970s and early 1980s were also quick to point out that low urban development meant that there was "no reasonably developed central and confined geographic location or locations that could be used as a launching pad by ordinary citizens to get together and oppose the government's indifference"[10] to the suffering caused by the food crisis.

We lack the space to discuss more historical evidence regarding the aforementioned issue here. But numerous historians, policymakers, and journalists consistently emphasized throughout the early 1980s (and beyond) that "sparse urbanization indeed reduced the scope for collective deliberation among citizens"[11] and that as a result, it was difficult for urban denizens to mount an effective challenge against the military junta despite the outbreak of severe food shortages (Khan 1983; Amin 1988). Indeed, a cursory examination of some annual data of the total number of overt anti-regime riots across the 12 major cities listed earlier over the 1978—2008 period reveals that the number of anti-regime demonstrations at the city-year level was either negligible or nil between 1978 and 1984.[12]

Thus, as predicted by our theory, low levels of urban development in effect meant that the propensity for anti-regime mobilization by citizens in Pakistan's citizens was virtually nonexistent during the 1978–1983 period, despite the consistent outbreak of food production crises. This, of course, does not suggest that there were no protests whatsoever during this period. In fact, in the political arena, the Movement for the Restoration of Democracy (MRD)—the political wing was formed by the opposition Pakistan Peoples' Party (PPP)—effectively organized demonstrations in the country's major cities, especially Karachi and Lahore, to restore democracy and bring an end to military rule. But these protests were not related to the repeated food crises the country experiences, and more critically, they were ineffective and therefore had little effect on General Zia-ul-Haq's strong grip over political power (Singh 1995; Haleem 2003; Abbas 2005; Rana 2005).

The absence of serious overt anti-regime opposition thus meant that the Zia-ul-Haq's military regime *did not* face credible challenges to its rule from domestic civilians in either urban or rural areas between 1978 and 1984 (Jalal 1985, 1990; Rahman 1996; Rizvi 2000; Aziz 2009). This had three immediate effects. First, the military regime was able to further consolidate its tight grip over office (Jalal 1985, 1990; Rizvi 2000; Aziz 2009). Second, being able to consolidate power so effectively encouraged Zia-ul-Haq to introduce "harsh measures (such as public floggings, executions, sentencing by military courts and torture) against any and all opposition and did not allow opposition groups to organize themselves in a more coherent and systematic manner."[13] These punitive measures helped to not only further dampen any anti-regime opposition in the late 1970s and early 1980s, but also bolstered the country's military junta (Amin 1988; Singh 1995; Haleem 2003; Ahmar 2005). Thus, between 1978 and 1985, the Zia-ul-Haq military dictatorship did not face any open political threats, which in effect meant that the regime's political power was at its peak (Jalal 1990; Haleem 2003; Rizvi 2000).

Third, because the Zia-led military regime faced almost no political threats, there was little if any need for the regime to engage in systematic mass killing campaigns to preserve its rule. This explanation was also suggested by the retired Major-General Mirza Aslam Beg (long after Zia-ul-Haq's death in 1988). General Beg served in Pakistan's army during Haq's rule in office and was a close confidante of the Zia-ul-Haq. In a 1995 interview, he states that, "by 1984, General Zia and the Pakistan Army felt it had the mandate of the people of Pakistan…we did not have any concerns or fear about the possibility of revolt by the country's citizens."[14] A similar observation was suggested by historians as well:

> Once the decade of the 1980s started, the Zia-ul-Haq regime's political prowess was at its peak. There were no serious domestic challenges to Zia's government and few citizens or opposition groups—if any—openly opposed the government. The cities of Pakistan were unusually calm and we observe almost no violent anti-government action and riots in this era.

> The atypical domestic political stability and absence of opposition to Zia's military regime meant that the military neither had any rationale for terrorizing and incarcerating civilians nor reasons to resort to extrajudicial killings against domestic actors. Thus in the first few years of the 1980s, the military dictatorship assiduously avoided killings and mass incarcerations as it did not have a political rationale to do so. (Shafqat 1997, 121)

Other scholars have also argued that state-led killings by Zia's authoritarian government in the late 1970s and early 1980s had reached "an all-time low," even though political rights were being denied on a "daily basis" to ordinary citizens (Hussain 1999; Chadda 2000; Verkaaik 2004). Moreover, event-based data on the number of mass killing campaigns carried out by the military regime across all 12 aforementioned cities shows that the number of such campaigns was indeed extremely low during the 1978–1985 period.

Thus, overall, the historical evidence discussed here supports the theoretical prediction, epitomized by the first corollary discussed in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States": In the absence of high urban development per capita levels, food crises are unlikely to generate mass killing as a preemptive response. This evidence shows that the incidence of state-led mass killing campaigns was negligible in nondemocratic Pakistan during the 1978–1985 period, when urban development per capita level was low and despite the outbreak of at least two food crises. This should not be taken to mean that there were no government killings of civilians whatsoever by Zia's military dictatorship during the same period. Indeed, scholars have shown that the Zia regime routinely imprisoned, tortured, and killed civilians, and particularly, the members of opposition parties such as the PPP and political figures would later form the "Muttahida Qaumi Movement" (Jalal 1985, 1990; Hussain 1999; Rizvi 2000; Aziz 2009). Nevertheless, as predicted by our theory, systematic, large-scale mass killing campaigns did not occur in Pakistan between 1978 and 1985 (Korson 1993; Shafqat 1997; Hussain 1999).

Protests and Mass Killing in Authoritarian Pakistan

The theoretical story presented in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States" posits that when the degree of urban development per capita in nondemocracies is sufficiently high, then citizens within these states will be more likely to successfully coordinate and collectively mobilize against the ruling elite during food crises. Such collective mobilization and overt opposition against the ruling elite within high urban development contexts are a credible threat to the elite's rule. It is this threat that induces the elite to use systematic mass killing campaigns as a preemptive strategy to deter credible and sustained opposition to its rule. We next show that historical evidence from the Pakistan case in two distinct time periods, 1985–1988 and 2000–2008, two periods characterized by sufficiently high levels of urban development and repeated outbreaks of food crises—support these theoretical claims.

Food Crises, Anti-government Demonstrations, and Killing Campaigns Under Zia-ul-Haq

We showed earlier that food (crop) output crises occurred in Pakistan in 1986 and 1987 and, moreover, that these food crisis episodes occurred *after* urban development per capita had increased sharply. Food shortages during this time had adverse effects on the food consumption levels and general well-being of civilians in some of the country's major urban areas, including Islamabad, Karachi, Lahore, Peshawar, and Rawalpindi (Noman 1988; Arif and Hamid 2009; Awad and Iqbal 2011). Of course, food crisis episodes in Pakistan and their detrimental impact on consumption levels were not merely confined to these years and had also occurred in 1979 and 1982. However, unlike during the 1979 and 1982 crises, the 1986 crisis generated large-scale (and violent) riots against the regime in urban areas, which were directed at the regime's response to the crisis.

To see this in more detail, consider two prominent examples of overt urban-based *anti-government demonstrations* that broke out in: (i) Karachi in late 1986 and (ii) Rawalpindi in fall 1987. Firstly, note that during the summer of 1986, Karachi experiences a series of successive violent ethnic clashes between Pashto-speaking Pashtun settlers and Urdu-speaking settlers, members of the MQM movement (Hussain 1999; Ahsan 2005; Verkaaik 2004; Aziz 2009). The military regime under Zia-ul-Haq successfully ended this inter-ethnic riots and bought stability to the city (Verkaaik 2004; Ahsan 2005; Wilson 2009). While these inter-ethnic clashes did leave behind simmering resentments, Karachi's population (including individuals from both Pashto-speaking and Urdu-speaking groups) was severely affected by the dire food crisis and resulting shortages that took root by September 1986 (Hussain 1999; Ahsan 2005; Verkaaik 2004).

A precipitous drop in crop output caused by a persistent drought and the resultant harvest failure in the summer of 1986 took a particularly heavy toll from the city's low and low-middle-income households (Hye et al. 2010; Awan and Iqbal 2011). To exacerbate matters even further, the Zia-led military regime—which was neither institutionally constrained nor politically accountable enough to respond to the food crisis—took no tangible steps to address the acute food shortages experienced by the civilians residing in Karachi (Noman 1988; Jalal 1990; Verkaaik 2004). Unsurprisingly, by December 1986, "social workers... reported widespread food shortage and appealed to the Government to rush in food supplies."[15]

Despite these and other appeals, the military regime's response to the crisis continued to be "incompetent" and "downright callous" (Noman 1988, 72; also see, Hussain 1999; Ahsan 2005). As a result, citizens in Karachi became increasingly exasperated, and subsequently, "the first stirrings of a significant opposition movement against Zia's regime arose in December 1986" (Rizvi 2000, 82; also see Hussain 1999; Hye et al. 2010). Throughout December 1986, these "stirrings of a significant opposition" evolved into consistent outbreaks of vandalism and violent anti-regime riots in Karachi, in which government buildings and installations were repeatedly targeted by civilians outraged over the government's inept handling of the food crisis (Rizvi 2000, 83; Noman 1988; Hussain 1999).

Such anti-regime activities, engendered by the food crisis, were not confined to Karachi alone. Another example of a food crisis-motivated opposition to Zia's regime came from Rawalpindi. Similar to the residents of Karachi, the persistent drought of 1986 led not only to a significant decline in crop output, but also to a veritable bottleneck in essential food supplies to the city of Rawalpindi (Moon 1998). Similarly to its actions in Karachi, the Zia-ul-Haq regime did not adopt any concrete steps to address the grave food shortages faced by the citizens of Rawalpindi (Noman 1988; Jalal 1990; Moon 1998). Shortages in essential food consumption items such as rice, wheat, sugar, and *daal* continued throughout Fall 1987, and restive citizens responded to the Zia government's lack of action by staging demonstrations (Moon 1998; Rizvi 2000). These protests developed into violent riots targeted at government buildings, post offices, and other state installations (Hussain 1999; Rizvi 2000; Niazi 2001). It is worth noting that apart from Karachi and Rawalpindi, overt anti-regime opposition triggered by the food crisis occurred throughout 1986 and 1987 in other major cities of Pakistan, including Lahore, Peshawar, Faisalabad, and Quetta (Verkaaik 2004; Niazi 2001; Ahsan 2005; Wilson 2009).

What explains this sudden surge in overt urban protests in response to the food production crisis in 1986 and 1987? This question is all the more intriguing given that the aforementioned cities had also been adversely affected by food crisis episodes in 1979 and 1982. Yet, no open mass opposition or riots in response to the crisis took place in 1979 and 1982, while such anti-regime protests occurred with increasing frequency in 1986 and 1987. Interestingly, as predicted by our theory, both primary and secondary sources suggest that one answer to this question can be found in the fact that sufficiently high levels of urban development in Pakistan in 1986 made it far easier for citizens in the country's major cities to coordinate, act collectively, and act against the regime (Moon 1998; Niazi 2001; Verkaaik 2004; Wilson 2009).

For instance, in his carefully researched study of the surge in open challenges to the Zia regime in Pakistan's cities in the mid-1980s, the Pakistani historian Saeed Shafqat states that the growth in "urban infrastructure and the increasing installation and use of telephones in Karachi's middle-income and even low-income residential areas facilitated regular communication between protagonists who were determined to challenge Zia-ul-Haq's government" (1997, 163–164) after the latter had failed to effectively address the grievances that resulted from acute food shortages. Improved communication in turn made it far easier for anti-regime groups to organize and collectively mobilize Karachi's citizens on a "mass scale to openly riot against all symbols of government authority" in the city (Shafqat 1997, 164; also see, Rizvi 2000; Aziz 2009). Indeed, in an op-ed published in the *Dawn* (one of Pakistan's prominent daily newspapers), the newspaper's editorial team marveled at how the "newly developed urban landscape provided key landmarks and rendezvous points for societal actors and politicians to get together and oppose"[16] the callous-handling of the food crisis by the Zia regime.

Several other studies, which also analyzed the wave of urban unrest that broke out across cities in Pakistan in 1986 and 1987, suggest that although grievances over food shortages combined with inter-ethnic ties helped to "provide the initial spark that ignited civilian opposition to Zia-ul-Haq's rule in Karachi, Rawalpindi and Peshawar, it was communication networks that resulted from rapid urban growth"[17] that helped to "nurture and strengthen the anti-Zia movement"[18] (Moon 1998; Niazi 2001; Ahsan 2005). But it was not merely improvements in communication resulting from rapid urban development that helped foster collective mobilization against Zia's rule in 1986 and 1987; two additional factors also contributed to foster anti-regime collective action.

The first was the fact that higher levels of urban development per capita also gave ordinary citizens access to public transportation that was "much needed to coalesce"[19] in certain centrally located areas of Karachi and Rawalpindi in order to protest against the military regime (Moon 1998; Rizvi 2000; Niazi 2001). Growths in transportation infrastructure, a key feature of urban development, provided a *key resource* to citizens, strongly increasing their ability to openly oppose and mobilize against Zia-ul-Haq's government. Second, as suggested by a Pakistani sociologist, the substantial growth in urban development during the 1980s also "produced central and easily identifiable geographic locations"[20] within large cities, providing the necessary focal point for citizens to meet and collectively challenge Zia's military dictatorship (Amin 1988; Shafqat 1997; Abbas 2005).

It is important to emphasize that the emergence and spread of anti-regime protests in urban areas against the regime's inept response to the food crisis episodes in 1986 and 1987 bolstered domestic opposition parties and leaders to also openly oppose the Zia-led military dictatorship (Jalal 1990; Ahmar 2005; Aziz 2009). Encouraged by the protests, these opposition parties began to publicly call for the restoration of democracy in Pakistan (Noman 1988; Jalal 1990; Hussain 1999). As suggested in a widely publicized study:

> Significant opposition against Zia's regime arose by 1987. Eleven diverse political parties formed a coalition called Movement for the Restoration of Democracy (MRD) to pressure Zia's regime to hold elections and suspend martial law. Zukifar Ali Bhutto's PPP was prominently included, as well as the Awami Tehrik, the Jamiatul-Ulemai Islam, the National Awami Party, the National Democratic Party, the Pakistan Mazdoor Kisan Party, the Pakistan Muslim League, the Pakistan National Party, the Quami Mahaz-i-Azadi and the Tehrik-e-Istiqlal. Many of the parties in the MRD were formerly

> antagonistic to each other, but became united in opposition to Zia. The primary base of support for the MRD lay in the Sindh Province… The MRD immediately initiated a campaign to pressure Zia to suspend martial law and restore democracy. They issued a press release calling for free, fair and impartial elections. (Amin 1988, 67)[21]

The MRD and the urban uprisings against Zia's military dictatorship in 1986–1987 more broadly threatened to seriously undermine the legitimacy of the Zia-led regime (Hussain 1999; Rizvi 2000; Niazi 2001; Hussain 2008). It also, in the words of a journalist, "directly threatened the political future of the country's military rulers."[22]

The Zia-led military regime made attempts to broker peace with the opposition and with leaders of the urban protest movements in Karachi and Rawalpindi by making promises to restore democracy (Jalal 1990; Hussain 1999; Rizvi 2000; Aziz 2009). This helped to restore some stability, particularly in Pakistan's major cities. Yet, "there were apprehensions though that below the surface, things were simmering again and could flare up again" and that there was still "collective mistrust and fear"[23] of the opposition among Zia-ul-Haq and his closest confidantes, who feared that its leaders would seek revenge, and might imprison military leaders, and even send them to the gallows, once democracy was restored (Amin 1988; Shafqat 1997; Abbas 2005). By late 1987, General Zia-ul-Haq was "visibly disturbed by the popular uproar and the demand for his trial and trial of the other Generals"[24] and as such, there was a palpable sense that the political future of the military regime in Pakistan was in serious jeopardy (Noman 1988; Jalal 1990; Burki 1999; Niazi 2001). There was, in fact, little doubt among Pakistan's military elite in 1987 that its political survival in office was in serious danger (Amin 1988; Jalal 1990; Ahmar 2005; Aziz 2009).

How did the Zia-ul-Haq-led military dictatorship respond to what it rightly saw as a clear threat to its political survival in office? Both previous and recent scholarship on the Zia-led military has suggested that the military under Zia-ul-Haq resorted to systematic "killing, liquidation and mass incarceration of political opponents and civilians who were considered a serious political threat" to the regime (Amin 1988, 79).[25] In the words of a well-respected Pakistani journalist, the "ostensible strategy behind extrajudicial and often highly targeted killings was to strike fear among the populace.…the message was that threatening the military regime meant dire consequences"[26] irrespective of whether or not the concerned individuals or groups were an actual threat to Zia-ul-Haq's rule in office (Singh 1995; Burki 1999; Corsi 2004).

Motivated by the protests, the military dictatorship under Zia's leadership began a series of highly classified military operations in major cities in late 1986 and early 1987 to eradicate political threats. One such operation was the infamous *Sohrab Goth*, which has since then been dubbed as the *Sohrab Goth* Massacre (Rahman 1996; Moon 1998; Niazi 2001). Launched in December 1986, this operation both aimed to "liquidate" the regime's political opponents in Karachi and to deter overt political challenges to its rule (Hussain 1999; Rizvi 2000; Hussain 2008). As part of this operation, "Zia sent 45,000 troops into Karachi to suppress the uprising against its rule" (Rahman 1996, 120).[27] The purpose of sending these troops was not merely to deter opposition members, but also to generate outright fear among the civilians by deliberately killing those who openly opposed the regime—many of whom resided or operated from the Sohrab Goth area of Karachi (Kennedy 1991; Singh 1995; Burki 1999; Chadda 2000).

Given the nature and objectives of this operation, to target and kill civilians, it is not surprising then that journalists in 1987 dubbed it a "massacre." One journalist, for instance, wrote in February 1987 that "the Sohrab Goth Massacre began on the twelfth of December 1986, two days before the Aligarh Colony killings."[28] Another reporter emphasized that this operation was a killing campaign in which, among others, "a boy was shot to death and another seriously wounded when troops opened fire on people breaking curfew in Karachi."[29] Newspaper reports from late 1986 and early 1987 make it abundantly clear that the Sohrab Goth operation was intended to kill, maim, and intimidate civilians; indeed, one article summarizes this fear-mongering phenomenon quite clearly by stating:

> On 12 December 1986, the people of Sohrab Goth woke up to discover that their settlements had been surrounded by the army, and guns pointing towards them had been placed on the roofs of the neighbouring plazas. Announcements from the mosques informed them that they were under curfew. Shortly afterwards a search of their houses was undertaken by the police.[30]

The Sohrab Goth operation was a clear example of a systematic state-led mass killing campaign designed to consolidate the regime's grip on office. Moreover, this operation was just one example. Throughout the winter of 1986 and well into 1987, Zia's military dictatorship consistently and repeatedly resorted to mass killing campaigns—much like the Sohrab Goth operation—in several cities across Pakistan, including Peshawar, Quetta, Rawalpindi, and Faisalabad to suppress dissent against its rule in these urban locations (Amin 1988; Jalal 1990; Ahmar 2005; Aziz 2009). For instance, following the anti-government riots in Rawalpindi in early 1987, the military dictatorship launched a violent campaign against those who participated in these demonstrations (Singh 1995; Burki 1999; Hussain 1999; Chadda 2000). This campaign was specifically "designed to kill and cause widespread fear among civilians"[31] in Rawalpindi who opted to challenge the regime (Kennedy 1991; Singh 1995; Corsi 2004).

We lack the space to list and discuss each and every civilian-targeted mass killing campaign that was initiated by the Zia regime in Pakistan's cities throughout 1987. But both historical accounts and research have indicated that "targeted killing of ordinary—and often—innocent civilians in Pakistan's cities became an integral part and parcel of the military dictatorship's strategy"[32] to preserve its political power and grip over office in the mid-to-late 1980s (Rahman 1996; Rizvi 2000; Rana 2005). The end result of these mass killing campaigns was that in 1986 and 1987 alone:

> Between 1600 and 2000 people were killed in cities across Pakistan and up to 15,000 were arrested. The jails overflowed and the regime was forced to set up camps to keep prisoners in tents.[33]

As noted previously, these civilian-targeted mass killing campaigns were carried out by the Zia regime to crush civilian opposition to its rule—which emerged during food crisis episodes in the late 1980s—and deter serious political challenges. As emphasized in a report, "calculations of political survival and preventing a revolution at home were at the heart of the military operations and subsequent killings carried out by Zia's military"[34] across numerous major cities in Pakistan in 1987.

Thus, this brief historical analysis illustrates that the Zia-ul-Haq military regime did violently respond to overt challenges against its rule in the country's major cities during the food crises of 1986 and 1987 by conducting systematic killing campaigns. Were these civilian-targeted killing campaigns effective? While this is a debated topic,[35] there is a general consensus that, at least over the short run, mass killing did help to preserve Zia's rule. As stated by Abbas:

> By November 1987, it became apparent that the anti-Zia movement was not gaining momentum nationally and Zia was not prepared to concede. The Pakistani military was quite effective in its repression by using some combination of actual killing of opposition members and rounding up the second and third level organizers of anti-Zia groups at the community level. This strategy cut the center out of the Movement organization. (2005, 114)

So far, our analysis focused on mass killing campaigns during the mid-to-late 1980s. How about the 2000–2008 period, when Pakistan is once again under authoritarian rule? We analyze this more recent time period below.

Food Crises, Anti-regime Opposition, and Civilian Killings Under Musharraf

As a military dictatorship under the rule Pervez Musharraf, two additional features of Pakistan during the 2000–2008 period stand out. First, as noted earlier, Pakistan suffered from at least two food crises, in 2001 and in 2007. Second, since the middle 1980s, the level of urban development per capita in the country remained rather high and even increased. Our broad theoretical argument suggests that in the context of food crisis, overt anti-regime opposition in nondemocracies is likely to occur when urban development is high. Such opposition threatens the political survival of the ruling elite in the nondemocratic regimes, inducing the latter to resort to mass killing to preserve its rule. As we show below, these claims are empirically valid for the 2000–2008 period as well.

First, note that food price volatility increased and crop output declined significantly in both 2001 and 2006, owing to severe droughts in these two years (Khan and Gill 2007; Raza and Carroll 2010; PCP 2011). Sharp drops in crop output meant that food supplies in major cities, including Karachi, Lahore, Faisalabad, Quetta, Peshawar, and Rawalpindi, dwindled rapidly, which engendered severe food shortages in these cities (Arif and Hamid 2009; Hye et al. 2010; Burki 2011). Low- and middle-income households in these cities were directly affected by acute negative shocks to their consumption due to these food shortages in both 2001 and 2007 (Khan and Gill 2007; Raza and Carroll 2010; Burki 2011). Similarly to the Zia-ul-Haq regime, Musharraf's military dictatorship failed to adequately address acute food shortages (see, e.g., Hussain 2008; Aziz 2009). For instance, the *Pakistan & Gulf Economist*, a weekly business magazine, wrote in April 2007:

> Pakistan's cities are once again witnessing food insecurity on a substantial scale. Yet this tragic drama has been enacted many times before in the country's history…Crop production dropped because of bad monsoons. But in this case ministers in Musharraf's government did almost nothing to stave off a pending food crisis that can result from rapidly declining crop output. Instead, passive responses by a government that is not accountable and out of touch with the daily woes of citizens literally ensured that food supply stocks across cities will rapidly diminish.[36]

Even the International Monetary Fund, which provided substantial loans to Pakistan in 2007 and 2008, in a rare moment of candor publicly rebuked the Musharraf-led regime for failing to address the incessant food crises in both 2007 and 2001 (also see, Raza and Carroll 2010; Burki 2011). The Musharraf's government inability, or more likely lack of interest, to resolve the food crises of 2001 and 2007 was *not* puzzling according to numerous scholars (Raza and Carroll 2010; Burki 2011). Indeed, researchers have emphasized that the absence of "credible institutional constraints on Musharraf's military dictatorship" meant that, "Musharraf and his military cronies did not feel any political pressure to respond with alacrity to the impending and actual food shortages" (Wilson 2009, 171).[37] Some scholars also suggest that the Musharraf-led regime was more interested in engaging in military adventurism in neighboring Afghanistan and India rather than addressing domestic grievances stemming from chronic food shortages (Aziz 2009; Wilson 2009).

The lack of concrete (or sufficient) action taken by the Musharraf government to resolve these two major episodes of food output crises generated sufficient consternation among domestic citizens, particularly in large urban areas (Haleem 2003; Verkaaik 2004; Ahmar 2005; Gayer 2007). Citizens were exasperated because the Musharraf-led military regime did not take significant measures to address their adverse plight, even while it was "busy touting its economic achievements"[38] to international institutions and foreign governments. This sentiment generated both immense anxiety and downright anger, which in turn triggered overt demonstrations against the regime across several cities in both 2001 and 2007 (see, e.g., Haleem 2003; Abbas 2005; Ahsan 2005). These demonstrations were often violent, with government installations, offices, and other types of government property being attacked, particularly Karachi, Peshawar, and—to a lesser extent—Lahore (Hussain 2008; Aziz 2009; Wilson 2009).

The outbreak of urban-based protests and riots against the Musharraf regime in 2001 and then 2007 exhibited strikingly similar dynamics to those observed during the Zia-ul-Haq's period. Like in 1986, the protests against Musharraf's rule were triggered by acute food shortages (Niazi 2001; Corsi 2004; Rana 2005). Additionally, as was the case during the 1980s, collective mobilization was facilitated by sufficiently high levels or urban development. For example, in his analysis of the riots that took place in Lahore in 2001 and 2002, Rana points out that:

> By the turn of the twenty-first century, major cities like Karachi and Lahore suffered from excessive crowding and poor sanitation. That said, whole areas of these cities were densely concentrated and had substantial social and communication networks that opposition leaders could exploit to galvanize social movements against Musharraf' military dictatorship.… in the winter of 2001, it was the leaders of the PPP that used this 'urban' advantage to collectively gather and mobilize large social groups in Lahore against Musharraf. These social groups were by that point of time completely disillusioned by the military leadership's incompetent handling of food shortages, high food prices and other economic problems. (2005, 109–110)

Rana's (2005) claim is not unique. Numerous sociologists, historians, and political scientists have consistently argued that, "from the turn of the century, rapid urbanization and growth of communication technology in Pakistan's largest cities provided the necessary material and social capital for organization and collective mobilization of the masses" (Ahmar 2005, 206)[39] against the "whimsical tendencies of Musharraf's rule" in both 2001 and 2007 (see, e.g., Niazi 2001; Haleem 2003; Corsi 2004; Aziz 2009).

In addition to academic research, reporters have also noted the link between growing urban development and the propensity for collective action by citizens in Pakistan's cities against Musharraf's military dictatorship in the first decade of this century. For instance, in his report of the mass urban unrest in Lahore in the wake of the 2001 food crisis, the eminent Pakistani journalist, Irfan Husain (2008, 143–144), argued that the "developed central geographic spaces like the grounds of Lahore Press Club in Lahore and the Jodia Bazar area in Karachi combined with the increasingly developed public transportation system in these cities to facilitate collective mass-based *gheraos* by residents, workers and political figures…these *gheraos* allowed urban groups to effectively protest, surround and even threaten government-owned property, office and security installations." Furthermore, it must be noted here that once urban residents could resort to mass-based *gheraos*, it generated a domino effect in that such demonstration of *gheraos* against the Musharraf regime quickly developed into "a much larger movement against Musharraf's military rule that gained momentum by the winter of 2001 and persisted into the early months of 2002" (Rana 2005, 116).[40]

The emergence of these resistance movements in Karachi, Lahore, and other cities in response to the food crisis also allowed journalists to write openly against the regime (Wilson 2009; Ahmar 2005; Aziz 2009; Tudor 2013). This not only lent more legitimacy to the anti-Musharraf protests but also provided the resistance with more "widespread publicity and coverage" throughout 2001 and 2002 (also see, Wilson 2009; Aziz 2009).

Ironically—or perhaps interestingly—the overt anti-military regime protests and violent riots that took place in 2007 in Faisalabad, Karachi, Lahore, and Peshawar (again, triggered by a food crisis during this year as well) shared the same features as their 2001 predecessors. For example, scholars generally agree that unlike in rural areas, the "available transportation and communication infrastructure in Pakistan's cities by the mid-2000s directly empowered large groups of urban residents to organize and sustain their collective movement against Musharraf's rule" (Hussain 2008, 129) in Faisalabad, Karachi, and Lahore throughout 2007 (Wilson 2009; Aziz 2009). Others have emphasized that it was primarily the existing social and economic networks in these cities that made it "easier for organizers to bring together citizens in these cities in spring 2007 to act in the wake of a common cause… which was to weaken Musharraf's military regime at any cost" (Bhasin 2012, 72). Thus, a common thread between the domestic urban protests against Musharraf's military rule in 2001 and those that took place in 2007 is the fact that sufficiently high levels of urban development facilitated collective mobilization against Musharraf's military rule and allowed urban residents to credibly challenge the military junta across both these years (Wilson 2009).

Needless to say, the mass-based opposition to Musharraf's regime in urban Pakistan in first 2001, and particularly in 2007, posed an existential threat to the regime. There was little doubt in both 2001 and 2007 that Musharraf's tenure in office might come to an abrupt end and that the military junta would be deposed (Ahmar 2005; Wilson 2009; Aziz 2009; Tudor 2013). This view was articulated in May 2007 by Daniel Markey, a (former) South Asia specialist at the State Department, who mentioned in an interview that,

> Musharraf has received a sort of a reprieve over the past five years, but the time is running out, and so the expectation is that he would need to embark on some sort of a maneuver, either actually to step down from one of those offices, or find a way around the constitutional provisions, or change laws, amend the constitution, or some combination of these things. A very creative solution would be to have him no longer be chief of the army, but have him essentially retain the capacity to run the army.[41]

To exacerbate matters for Musharraf even further, the Supreme Court of Pakistan formally approved a petition in 2007 that constitutionally challenged Musharraf's dual role as President of Pakistan and Army Chief on technical legal grounds (see Bhasin 2012; Aziz 2009; Wilson 2009). In response, President Musharraf summoned the Supreme Court Chief Justice Iftikhar Muhammad Chaudhry to his office and effectively dismissed him for alleged "misuse of office" (Wilson 2009; Tudor 2013). This turned out to be a serious miscalculation as it triggered another round of mass nationwide protests in Pakistan's major cities against Musharraf for several months.

The 2007 mass protests against Musharraf's rule, often led by high-profile lawyers, attracted extensive media coverage not only of the protests, but also of the ensuing retaliatory violence by police and plainclothes intelligence personnel. Perhaps more crucially, mobilization of large segments of society against Musharraf's rule in major urban centers effectively helped to reinvigorate anti-regime opposition by hitherto considered apathetic, depoliticized, or simply disinterested—the urban privileged (Bhasin 2012; Aziz 2009; Tudor 2013). This urban-based mass mobilization—which in emerged after the government failed to handle the food shortages—achieved what its political parties had failed to create a deep schism within the Pakistani ruling establishment, raising serious questions about the lack of accountability in governance and mobilizing public opinion on the side of transparency, accountability, and the rule of law (also see Wilson 2009; Aziz 2009; Tudor 2013).

Thus, there was little doubt that by the summer of 2007, Pakistan's military dictatorship was not only immensely unpopular, but also that it had largely lost its legitimacy, especially in the cities. Indeed, even senior military officers understood by 2007 that their political tenure is likely to come to an end (Hussain 2008; Aziz 2009). This last point was also raised in a recent interview in 2013 with Tariq Aziz, a former income tax officer, political ally, and a close Musharraf confidante, who stated that, "the military had no illusions about its shaky grip on political power… this was being widely and openly talked about by Musharraf, his advisers, his military staff and his appointed cabinet."[42] It was therefore common knowledge among many domestic actors (including civilians, opposition figures, and the military itself) that Musharraf was unlikely to survive in office, both in 2001 and in 2007 (Corsi 2004; Ahmar 2005; Abbas 2005; Wilson 2009; Aziz 2009).

As predicted by our theory, the Musharraf-led military regime responded to threats to its rule in urban areas with immense violence and human violations, which eventually developed into vicious killing campaigns (Ahsan 2005; Bhasin 2012; Aziz 2009). The violence during the summer and fall of 2007 began with the suspension of fundamental citizen rights in the country's cities, banning certain constitutional protections and resorting to intimidation. This was summarized by Peter Beaumont of *The Observer*, who in November 18 described Musharraf's retaliation against urban-based opposition:

> Retribution is being meted out on a massive scale… The aim of the state of emergency has been largely to humiliate the opposition. …Reports of humiliation and abuse are common from those who, because of age or good connections, have been let go or transferred to house arrest… Even those who have thus far avoided arrest are not immune to the threats…

> Last week The Observer listened as a warning was delivered to a prominent civil society activist, who asked to remain anonymous, about how a relative had been sent with a message from Pakistan's intelligence organization, the ISI, warning: 'Shut up or else.'[43]

The Musharraf-led military regime did not simply focus on intimidation and threats. Rather, both in 2001 and in 2007, human rights abuses by military forces became rampant, and the leadership repeatedly escalated its strategic response from imprisonment to killings. This shift was noted in a report by the US State Department:

> Pakistan's human rights record continued to be poor. Major problems included restrictions on citizens' right to change their government, extrajudicial killings, torture, and rape. The country experienced an increase in disappearances of provincial activists and political opponents… The government (has) limited freedoms of association, religion, and movement, and imprisoned political leaders. (2007)

Historians have since noted that such mass killings by the Musharraf regime were driven by the prime objective of generating fear among protesters in order to deter them from openly challenging its rule (Ahmar 2005; Verkaaik 2004; Hussain 2008; Aziz 2009). The same view was advocated by Tariq Aziz (Musharraf's confidante), who not only stated that "it is true that some innocent civilians did get killed in Karachi and Lahore because of the military's heavy-handed tactics" but also claimed that "these tragic killings occurred in part because miscreants, trouble-makers and Indian-sponsored agents were undoubtedly destabilizing the regime and Pakistan in general."[44]

The situation in Pakistan continued to deteriorate throughout 2007 and 2008. By the winter of 2007, state-led killings of civilians became—in the words of one observer—a "daily occurrence in Karachi, Lahore and Peshawar"[45] with little or no respite for ordinary citizens. In fact, as Musharraf's reign in power became increasingly fragile, the number of civilians killed increased further. As suggested by Peter Tatchell of *The Guardian* in March 2008,

> As he continues to cling to power, Pervez Musharraf presides over a regime in Pakistan that routinely engages in kidnapping, detention without trial, torture and extra-judicial killings.[46]

While extra-judicial killings became "routine," the frequency of military-style operations or campaigns to kill and eradicate civilians who openly challenged the regime also came to the forefront in 2001 and 2007–2008. For example, in response to the urban *gheraos* in 2001 and 2002, "the government relied on police and paramilitary forces to use against the growing anti-regime resentment expressed by residents in urban areas, industrial workers and opposition figures. Often, the use of these forces resulted in many killings".[47] More importantly, civilian killings by the Musharraf regime were not restricted to specific cities. Rather, both in 2001–2002 and in 2007–2008, civilian killings were rampant across all the major urban areas in Pakistan, such as Faisalabad, Karachi, Lahore, Peshawar, Quetta, and Rawalpindi (Ahsan 2005; Wilson 2009; Aziz 2009).

Anti-government Demonstrations and Mass Killing in Pakistan's Cities: Statistical Analysis

Food Crises, Urban Development, and Anti-government Demonstrations: Data and Results

To verify the linkages between food crises, urban development per capita, and anti-government riots, we code an original datasets coding the longitudinal levels of these and other factors in 12 major urban cities in Pakistan, defined as cities where the Government of Pakistan's Bureau of Statistics recorded 500,000 or more residents: Chiniot, Faisalabad, Gujranwala, Islamabad, Karachi, Lahore, Mardan, Peshawar, Rawalpindi, Muridke, Quetta, Sialkot.[48] Similarly to the qualitative analysis conducted above, this sample's temporal range is the years during which Pakistan was observed as a nondemocratic regime: 1978–1988 (Zia-ul-Haq's military regime) and 2000–2006 (Pervez Musharraf's military rule). Accordingly, the unit of analysis in this sample is the city year. Due to space constraints, the data and sources used to code all the variables used both here and in the next stage of analysis are reported in the book's online appendix.

Recall that we are interested in using these high-resolution original data to evaluate the first stage in our two-stage hypothesis about the linkages between food crises, urban development, and mass killing. Accordingly, the dependent variable in this first analysis stage is coded as to specifically capture actions taken by the civilians that the Pakistani regime could perceive it constituting a potential danger in the long term. This variable, *Anti-Government Demonstrations*$_t$, is operationalized for each city as the annual number of violent riots and demonstrations carried out by civilians against:

i. Government property, including causing physical damage or destroying government administrative buildings, offices, and other government-owned assets such as the General Post Office and Trade Emporiums;
ii. Government security forces, including police units and paramilitary forces stationed within or outside the city (within a 10 km radius);
iii. Government personnel, including members of the Zila Nazim, District Coordination Officer, and Union Administrators.

The resulting *Anti-Government Demonstrations*$_t$ thus effectively captures a wide range of civilian-led action types—more or less violent—that could be construed by the regime as the harbinger of a potential disobedience campaign.

As we did in Chapter "Statistical Analysis of Food Crises and Mass Killing," we code two main explanatory variables and test the impact of their interaction on the probability of *Anti-Government Demonstrations*$_t$. The first variable, *Urban Development* PC$_t$, is operationalized and normalized according to the guidelines discussed at the beginning of this chapter (see Fig. 2). The second variable is labeled *Food Crisis*$_t$ (a dummy variable), which (according to our theory) occurs when food price volatility is high. This latter variable is operationalized in three steps. First, recall that our unit of analysis in the Pakistan sample is at the city year rather than the aggregate national level. Hence, we gathered data on the nominal average price of a basket of the five main staple crops—recorded by Government of Pakistan's Ministry of Food, Agriculture and Livestock—that are sold for food consumption at the wholesale level in Pakistan's urban areas for *each* city year in our sample in which Pakistan is observed as an autocracy. Note that data on the nominal average price for this "basket" of staple crops sold in urban areas is only available per year (starting from 1978) for the cities in our Pakistan sample. This suggests that the within-country data on food prices that we compiled for

Pakistan are as comprehensive as possible. Due to space constraints, the sources used to gather the food price data from Pakistan are reported in the book's online appendix.

Second, using the annual data on the nominal average wholesale price of staple crops (i.e., food) sold in each city in the Pakistan sample, we calculated the *unconditional volatility* of this price (denoted as "FPV" for food price volatility) per city year via the following expression:

$$\mathrm{FPV}_{c,t} = \mathrm{stdev}(r)\left[\sum \frac{1}{N-1}(r_{c,t} - \bar{r})^2\right]^{0.5} \quad (2)$$

where c is the particular city of measurement and t is the year. In this equation, $r_{c,t} = \ln(p_{c,t}) - \ln(p_{c,t-1})$ is the "returns," defined as the proportional change in price (again, for the entire basket of crops) for each city between one year to the next; this return is measured as the difference in the logarithm of prices for the basket of the five crops from one year to the next for each city. Further in Eq. (2), $\bar{r} = \sum \left(1/N\right) r_{c,t}$ is the within-city mean of nominal food prices of the basket of crops. If the nominal price of the "food basket" is not characterized by a unit-root process—which is indeed the case for the Pakistan city-year sample[49]—then $r_{c,t}$ will be stationary and its standard deviation will not depend on the size of the sample.

Third, using the food price volatility measure described above, the dichotomous *Food Crisis*$_t$ variable is coded as one for those periods where $\mathrm{FPV}_{c,t}$ exceeds the city-specific mean by at least two standard deviations, zero otherwise. The results reported below do not alter statistically or substantively when *Food Crisis*$_t$ is operationalized for $\mathrm{FPV}_{c,t}$ values between 1.5 and three standard deviations above the city-specific mean. The results reported in this section also remain robust when we employ a conditional measure of food price volatility to operationalize the *Food Crisis*$_t$.

As we did in the global analyses presented in Chapter "Statistical Analysis of Food Crises and Mass Killing," to test the moderated effect of *Food Crisis*$_t$ on how *Urban Development* PC_t impacts the frequency of anti-government demonstrations in Pakistani cities, we also introduce the interaction term *Urban Development* $\mathrm{PC}_t \times$ *Food Crisis*$_t$ and control for the individual constitutive components of this interaction term. According to the theoretical argument development in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States," we expect this interaction term to produce a positive impact on the frequency of demonstrations.

In order to account for the persistence of demonstrations from one year to the next, we also include the lag of the dependent variable, *Anti-Government Demonstrations*$_{t-1}$, in the model. However, considering the potential sensitivity of these analyses to potential socioeconomic and political confounders, we also introduce several controls to further ensure that any observed correlations are the result of the linkages between urban development and food crises. First, we include the variable GDP PC$_t$, which measures gross domestic produce by province, normalized per capita. Next, we include the variable *Municipal Election*$_t$, a binary indicator dichotomized according to whether local municipal elections were held in a given city during a given year (coded one), or not (coded zero). The third control, *Population*$_t$, is coded as the number of people residing in a given city during a given year and is used to account for the potential (log) linear relationships between the number of residents and the number of demonstrations.

Fourth, we include the variable *Paramilitary Barracks*$_t$, which codes the annual number of barracks of paramilitary forces, such as the Pakistan Rangers and the Civil Armed Forces, located within a 10 km radius of the city. We also include the variable *Police Stations*$_t$, which codes the annual number of central police stations, i.e., stations with 100 or more police personnel, located in each city. Finally, note that opposition parties (e.g., MQM) in Pakistan often mobilize Muslim migrants from the states of Uttar Pradesh and Bihar in India, called "Mohajirs" (immigrants). To account for their potential impact on the frequency of demonstrations in a model, we include a variable, *Mohajirs*$_t$, coding the fraction of the population in a given city that were defined as Mohajirs during a given year.

Table 1 presents the results of three negative binomial models evaluating the effect of the main explanatory variables and their interaction on the dependent variable *Anti-Government Demonstrations*$_t$, accounting for a large number of controls (Models 1–3). In all models, the *Urban Development* PC$_t$ × *Food Crisis*$_t$ interaction's effect is positive and statistically significant to the one percent level.[50] Thus, in line with the theoretical argument presented in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States," this suggests that, at least in nondemocratic Pakistan, the occurrence of food crises significantly increases the impact of urban development per capita on

Table 1 Model results for anti-government demonstration and mass killing in Pakistan's cities

	Anti-government Demonstrations$_t$ (*Negative binomial*)			*Mass Killing*$_t$ (*Random effects probit*)	
	Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*
Urban Development PC$_t$	4.438 (5.102)	0.870 (0.596)	0.878* (0.509)	4.438 (5.102)	2.276 (4.42)
Food Crisis$_t$	−16.296*** (5.575)	−2.034*** (0.466)	−1.520*** (0.406)	−16.296*** (5.575)	−12.980** (5.98)
Urban Development PC$_t$ × *Food Crisis*$_t$	23.223*** (9.022)	3.115*** (.818)	2.442*** (.707)	23.223*** (9.022)	18.868** (9.67)
Dependent Variable$_{t-1}$	–	–	0.003*** (0.0004)	–	2.048** (0.491)
GDP PC$_t^1$	−1.512*** (0.463)	−0.251*** (.028)	−0.184*** (0.024)	−1.512*** (0.463)	−0.850* (0.460)
Population$_t^1$	–	−0.044** (0.020)	−0.040** (0.0177)	–	–
Municipal Elections$_t$	–	0.442*** (0.059)	0.281*** (0.053)	–	–
Paramilitary Baracks$_t$	−0.101 (0.235)	0.011 (0.020)	−0.002 (0.017)	−0.101 (0.235)	−0.087 (0.232)
Police Stations$_t$	0.235 (0.292)	−0.001 (0.002)	−0.023 (0.017)	0.235 (0.292)	0.134 (0.325)
Mohajirs$_t$	–	0.032*** (0.009)	0.025*** (0.007)	0.730 (0.456)	0.687 (0.325)
Constant	10.751** (4.790)	6.61*** (0.351)	−3.69*** (0.160)	10.751** (4.790)	5.022 (4.420)
Observations	162	159	157	162	161
Log likelihood	−365.34	−735.66	−698.55	30.17	29.80
LR/Wald Chi Square	301.7	238.98	292.05	30.17	29.80

Note Significant at *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$. *Mass Killing*$_t$ models include random effects at the city level
[1]In natural log form

the probability of civilian mobilization. Moreover, in the absence of high urban development levels, food crises have a negative association with the number of protests. This again supports the *contextualized* aspect of our interactive argument: Food crises alone cannot generate sufficient and significant anti-regime mobilization; they do so—on average—only in areas with sufficient urban development levels, where the citizens have sufficient time and other material resources to dedicate to the mobilization effort.

To derive the *substantive* effect of this interaction term, we use the estimates from Model 3 to compute the average predicted effect of *Urban Development* PC_t × *Food* $\textit{Crisis}_t$ on *Anti-Government* $\textit{Demonstrations}_t$ for city years in which a food crisis occurred (i.e., when *Food* $\textit{Crisis}_t$ was equal one) across the entire range of *Urban Development* PC_t. The results from this exercise reveal that the occurrence of a food crisis is a one standard deviation increase in *Urban Development* $\textit{PC}_t$ from its mean approximately yields an 8% increase in the extent of *Anti-Government* $\textit{Demonstrations}_t$ when and all other variables are held at their sample mean. This predicted effect is statistically significant at the 95% confidence level and is substantial.

In addition to the explanatory variables, some controls also had a statistically significant effect. First, as expected, the lag of the dependent variable was positively associated with a higher frequency of demonstrations at year t, suggesting that in some cities demonstration trends persist over several years. Additionally, the variable GDP PC_t has a negative and significant effect, suggesting that, unsurprisingly, cities located in poorer provinces are more likely to experience demonstrations. Interestingly, protests were more likely in smaller cities with less population, although recall that all cities in the sample had at least 500,000 residents, making them still some of the most populated regions in the country overall. However, as was stated by previous research (e.g., Wilkinson 2006), election years were more likely to involve civilian mobilization, as were cities with more Muhajirs.

Mass Killing in Pakistan: Analysis Results

The second stage of microlevel quantitative analyses evaluates the impact of the interaction between urban development and food crises on the probability of mass killing in cities in Pakistan. In this stage, we rely on the same data used in the anti-government demonstrations discussed above. However, the dependent variable in this stage is a binary indicator denoting whether government forces were recorded to have killed 50 or more unarmed civilians in a given city during a given year (coded one), or not (coded zero).[51] Information on this variable was obtained from different datasets as well as daily newspapers, which we list in the book's online appendix due to space constraints.

As we did in the first stage of our quantitative microlevel analysis, we rely on the interaction term *Urban Development* $\text{PC}_t \times$ *Food Crisis*$_t$ to evaluate how the occurrence of a food crisis on moderates the effect of urban development on the probability of localized state-led mass killing. We thus include this interaction alongside its constitutive terms in the model. Additionally, while we accounted for a large number of socioeconomic and political conditions in the set of models reported in Chapter "Statistical Analysis of Food Crises and Mass Killing," we nevertheless add several pertinent controls in the mass killing models below to account for the potential effect of some salient confounders. Here, we include the variables GDP PC_t, *Paramilitary Barracks*$_t$, *Police Stations*$_t$, and *Mohajirs*$_t$ discussed in the previous stage, in addition to the lag of the dependent variable.

Table 1 additionally lists the estimates obtained from two models designed to evaluate the impact of the interaction *Urban Development* $\text{PC}_t \times$ *Food Crisis*$_t$ on the probability of localized mass killing in a given Pakistani city year (Models 4–5). The effect of the interaction term *Urban Development* $\text{PC}_t \times$ *Food Crisis*$_t$ is again positive and statistically significant (to at least the five percent level). This supports the conclusions of the cross-national analyses reported in Chapter "Statistical Analysis of Food Crises and Mass Killing": the effect of urban development per capita on the probability of localized state-led mass killing levels significantly increase during a food crisis. Interestingly, as was the case when anti-regime demonstrations were considered, in the absence of high urban development levels, food crises have a *negative* effect on the probability of mass killing, at least in nondemocratic Pakistan. Again, this highlights the importance of accounting for the location and context in theories and models that evaluate how sudden declines in food availability can cause violence.

To derive the substantive effect of this interaction term, we use the estimates from Model 5 to compute the average predicted effect of *Urban Development* PC_t on the probability of localized mass killing in Pakistan in the context of a food crisis, across the entire range of *Urban*

Development PC_t. The results from this exercise demonstrate that when our *Food Crisis*$_t$ variable is set to one (indicating the outbreak of a food crisis) and all other variables in the specification are held at their sample mean, a one standard deviation increase in *Urban Development* PC_t from its mean approximately yields a 7% increase in the probability of localized regime-perpetrated mass killing campaigns in Pakistan's cities. This predicted effect is statistically significant at the 95% confidence level.

In addition to the explanatory variables, several controls also have a statistical association with mass killing in Pakistani cities. First, the lag of the dependent variable, *Mass Killing*$_{t-1}$, has a positive and significant effect on the probability mass killing at year t, suggesting that violence tends to persist once it has already occurred in a given city. Second, the coefficient on the GDP PC_t variable has a negative and statistically significant effect (to at least the ten percent level) on the probability of mass killing. This suggests that, presumably because poorer cities are more likely to experience more anti-government protests, such locations are also more likely to experience strong regime response in the form of civilian mass killing.

Conclusion

In this chapter, we analyzed the case of nondemocratic Pakistan in substantial depth, using both qualitative and quantitative approaches. To this end, the chapter first provided concrete evidence on our the two key conditions, i.e., our explanatory variables, for this case study analysis: the temporal change in urban development per capita in large urban areas over the 1978–2006 period and the consistent outbreak of food (i.e., crop) output crises over the same period. Historical evidence from the reign of General Zia-ul-Haq and later General Musharraf shows that, crucially to this book's theoretical framework, the level of urban development did in fact mattered greatly for the probability of collective action in Pakistan. Historical evidence showed that the ability of civilians residing in large cities to communicate, coordinate, and organize increased significantly as urban development per capita rose to a sufficiently high level. This allowed these civilians to collectively mobilize against the military regime more effectively after the latter failed to address the negative consumption shocks engendered by the food crisis.

The main empirical insight in this chapter is that the positive association between severe adverse consumption shocks, which in this case are associated with a food crisis, and successful overt mobilization against the regime in nondemocracies is heavily dependent on the level of urban development. This is a simple yet crucial insight. Scholars know relatively little about the mechanisms that tie urbanization to collective anti-regime action in nondemocratic countries. Our analysis of the Pakistan case—and this book's empirical framework more broadly—illustrates one pathway through which the mechanisms that link increases in urbanization to credible anti-regime opposition operate.

A second insight is that authoritarian elites can indeed view protests against their rule in relatively developed urban areas, particularly the context of a food crisis, as a serious existential threat. The Pakistan case illustrates that the mobilization of urban residents against the authoritarian regime in times of economic (in this case, food) crisis is frequently viewed *ex ante* as a credible threat to the elite's ability to survive in office *ex post*. This threat creates strong incentives for the nondemocratic elite to take preemptive steps to preserve its rule. Although, in theory, there exists a menu of preemptive choices from which the authoritarian ruling elite can choose an adequate strategy, we find that the military regime in Pakistan did not hesitate to use systematic mass killing campaigns against civilians to protect its rule.

In the next chapter, we continue our case-focused analysis, analyzing both qualitatively and quantitatively the causal impact of our second key variable—food crises—in the context of high urban development in Indonesia. In the second part of that chapter, we examine the case of Malaysia, a nondemocratic country with relatively high level of urban development per capita where no food crises occur over our period of interest.

Notes

1. These crops are wheat, rice, sugarcane, chickpeas, and maize.
2. The food price volatility index presented in Fig. 1 does not change substantively when we use another commonly used measures of food price variability, such as the standard deviation of returns in nominal prices of the basket of the five aforementioned staple crops, where the return is defined as the proportional change in price (again of the basket) from one year to the next. The return is measured as the difference in the logarithm of prices for the basket of these five crops from one year to the next.

3. Hence, in terms of our city-year analysis, P_i is the total residing population for each city year and l_i provision/supply of electricity per household for each city in the sample.
4. Hassan Malik, "Responding Urgently to Food Shortages," *The Express Tribune*, August 4, 1979, p. A.6.
5. Ishrat Jahan, "Did the Government Respond Adequately to the Decline in Crop Production?" *The Herald* (Lahore, Pakistan), p. 19.
6. Salim Yousef, "Is Unrest Possible in the Nation's Cities?" *The Nation*, November 15, 1982, p. I.3.
7. Rizvi (2000, 71).
8. See also, Moon (1998) and Niazi (2001).
9. Rahman (1996, 133).
10. Shahid Butt, "Where Is the Nation Headed?" *Daily Time*, September 12, 1979, p. 2. Also see, e.g., "Pakistan's Future: Grim or Hopeful?" *Dawn*, op-ed, October 5, 1979, p. 5 and Zainab Hassan, "Politics and the Problem with Food Supplies," *The Nation*, November 7, 1982, pp. I.1–2.
11. Zainab Hassan, "Politics and the Problem with Food Supplies," *The Nation*, November 7, 1982, p. I.2. Also see, e.g., Salim Yousef, "Is Unrest Possible in the Nation's Cities?" *The Nation*, November 15, 1982, p. I.3.
12. The sources used to construct these data are listed in the book's appendix.
13. Nadeem F. Paracha, "Uprisings and Downfalls: Attempts at Ousting Pakistani Governments," *Dawn*, October 30, 2014.
14. Mirza Aslam Beg quoted in an interview reported by Syed Nawaz, "General Beg's Views on Pakistan," *The Daily Times*, July 2, 1995, p. B.2.
15. Cited from "Pakistan's Cabinet Resigns After Riots," *The New York Times*, December 21, 1986. Available at http://www.nytimes.com/1986/12/21/world/pakistan-s-cabinet-resigns-after-riots.html?mcubz=1.
16. "Riots in Karachi", *Dawn*, op-ed, December 27, 1986.
17. Burki (1999, 177); for this perspective, also see Noman (1988), Niazi (2001), Verkaaik (2004), and Wilson (2009).
18. Burki (ibid, pp. 177–178).
19. Hussain (1999, 141). Further, see Niazi (2001), Verkaaik (2004), and Hussain (2008).
20. Amin (1988, 45). Others who subscribe to this view include Abbas (2005) and Hussain (2008).
21. Also see Jalal (1990), Ahmar (2005), and Aziz (2009).
22. Muhammed P. Khan, "Political Unrest and Pakistan's Future," *The Daily Times*, November 3, 1987, p. 9.

23. Shaikh Aziz, "A Leaf from History: Bushra Zaidi's Killing and the Riots in Karachi," *Dawn*, September 20, 2015.
24. Moon (1998, 92); also see Kennedy (1991), Shafqat (1997), and Ahmar (2005).
25. Amin (1988, 79). For more details on this see Hussain (2000), Rizvi (2000), Aziz (2009), Kennedy (1991), Singh (1995), Burki (1999), Corsi (2004), and Ahsan (2005).
26. Muhammed P. Khan, "Political Unrest and Pakistan's Future," *The Daily Times*, November 3, 1987, p. 9.
27. See also, Burki (1999) and Corsi (2004).
28. Arif Hasan, "The Sohrab Goth Massacre," *The Herald*, February 2, 1987. Available at http://arifhasan.org/articles/the-sohrab-goth-massacre.
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30. Arif Hasan, ibid.
31. Muhammed P. Khan "Political Unrest and Pakistan's Future," *The Daily Times*, November 3, 1987, p. 9.
32. Nasir Mohammed, "Control and Stabilization of Pakistan's Cities," *Express Tribune*, October 10, 1987, p. A.2.
33. Irfan Sharif, "Will Karachi Always Remain Vulnerable?" *Newsline*, December 1989, Issue 4, p. 18.
34. Sharif., ibid., 18–19.
35. See, for instance, Singh (1995), Hussain (1999), Chadda (2000), and Ahmar (2005).
36. "In the Wake of Another Crisis in Food Supplies," *Pakistan & Gulf Economist*, April 8–14, 2007, Karachi, Pakistan, p. 31.
37. Also see Hussain (2008), Aziz (2009), and Burki (2011).
38. "In the Wake of Another Crisis in Food Supplies," *Pakistan & Gulf Economist*, April 8–14, 2007, Karachi, Pakistan, pp. 30–31.
39. Also see Haleem (2003), Verkaaik (2004) and Gayer (2007).
40. Also see, Abou Zahab (2004), Corsi (2004), and Abbas (2005).
41. Interview of Daniel Markey, Former South Asia Specialist at the State Department, Concerns That Anti-Musharraf Protests Could Spiral Out of Control, Council of Foreign Relations (CFR) May 16, 2007. See https://www.cfr.org/interview/markey-concerns-anti-musharraf-protests-could-spiral-out-control.
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43. Peter Beaumont, "Musharraf Widens His Sphere of Punishment," *The Guardian*, November 18, 2007, http://www.guardian.co.uk/pakistan/Story/0,,2212932,00.html.

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46. P. Tatchell, "Pakistan's Human Rights Hero," *The Guardian*, March 3, 2008, https://www.theguardian.com/commentisfree/2008/mar/03/pakistanshumanrightshero.
47. See also, Bhasin (2012), and Tatchell 2008.
48. These cities were selected due to higher availability of data on the dependent, explanatory, and control variables.
49. Both the augmented Dickey–Fuller test and the Phillips–Perron test strongly rejected the null of a unit root process for the within-city "food price volatility" measure in Pakistan.
50. This result remains robust when the negative binomial models are each estimated with city and year fixed effects.
51. The results are robust to the use of higher thresholds: 75, 100, 125, and 150 deaths.

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Food Riots, Urbanization, and Mass Killing Campaigns: Indonesia and Malaysia

In this chapter, we provide a detailed case study analysis of two countries, Indonesia and Malaysia, to better understand the microlevel dynamics involving our second key explanatory variable: the occurrence of a food crisis. Due to the variance of urban development in the country, Pakistan—the case analyzed in the previous chapter—is instrumental in illustrating how the temporal variations in urban development per capita levels corresponded to the frequency of anti-regime demonstrations and, correspondingly, the probability of state-led mass killing campaigns during food crisis episodes. Unlike in the case of Pakistan, urban development per capita levels in both Indonesia and Malaysia were stable and relatively high. As we show more systematically below, the degree of urban development per capita in both countries is relatively high throughout their entire respective nondemocratic regime spells: 1976–1998 in Indonesia and 1978–2009 in Malaysia.

Although urban development levels in these countries remain constant over these respective periods, however, they differ markedly on the frequency both experience food crises. In Indonesia, severe food crisis episodes do not occur prior to 1996, but then happen repeatedly between 1996 and 1998. Therefore, in contrast to Pakistan, Indonesia offers us a natural experimental treatment on our second key explanatory variable, the outbreak of food (particularly crop) output crises, which occur in the context of a high level of urban development per capita during the 1996–1998 period. According to the theoretical argument presented

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in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States," the frequency of collective mobilization in major urban areas against the country's military regime, led by General Suharto, should increase significantly during the food crises that occur after 1996. Moreover, and again according to our theoretical argument, we expect to see that such overt challenges (i) were perceived by the Suharto regime as an existential threat, which, and (ii) motivated the nondemocratic regime to employ mass killing campaigns against urban civilians to maintain power.

In contrast to both Pakistan and Indonesia, Malaysia, which was observed as a nondemocratic state within the entire temporal period of our analysis (1977–2009), did not experience any serious food crisis episodes. However, as shown in the latter half of this chapter, civilians residing in important cities, especially the capital Kuala Lumpur, have frequently protested against the single-party *Barisan Nasional*'s (BN's) rule and its political grip. Further, these protests occurred within the context of relatively high levels of urban development per capita, but in the absence of food crises. Hence, the Malaysia case provides us with the appropriate empirical background to evaluate the theoretical prediction stated in Corollary 2: that in the absence of food crises, large urban areas would still experience protests and mass killing, although these will be much lower in frequency and intensity, respectively.

The rest of this chapter is divided into two main sections. The first section includes a mixed-methods analysis of food crises, anti-regime demonstrations, and mass killing in Indonesia. We begin with an overview of the political and economic history of the country since independence, with a particular focus on the agrarian sector. We then discuss trends in both urban development per capita and the outbreak of food crises over the 1976–1998 period. Next, we discuss in detail primary and secondary historical evidence to see how the sudden onset of food crises in Indonesia concatenates with sufficiently high levels of urban development to increase (i) the frequency of overt civilian opposition to Suharto's regime and (ii) the latter's strategic decision to conduct mass killing campaigns as a preemptive strategy to maintain its political rule. Finally, as we did in the case study analysis of Pakistan, we report a detailed within-country statistical analysis of 14 cities in Indonesia to illustrate how the interaction of urban development per capita and the occurrence of food crises impact the probability of (i) anti-government demonstrations, and (ii) localized state-led mass killing.

In the second part of this chapter, we turn to analyze the case of nondemocratic Malaysia. Again, we begin with a summary of the political and economic history of the country, with a particular focus on the agrarian sector. We then provide an illustration of the history of urban development in the country, starting in 1977. Having showed these trends, we conduct a detailed historical analysis of primary and secondary sources, focusing on some key examples of the linkages between high urban development and collective mobilization against the ruling elite; and how the latter responded to such mobilization efforts. The chapter ends with a brief conclusion of our main findings.

Indonesia: A Concise Overview

Indonesia is a prominent developing country. It has the largest economy in Southeast Asia, which is larger than both Pakistan's and Malaysia's in nominal GDP terms.[1] Indonesia is also an important emerging developing market and is considered a key player in the G-20 group of nations (Schwarz 1994; Hill 1999; World Bank 2010). Similar to most developing countries, Indonesia's economy is characterized by a division of labor between formal and informal sectors, and an uneven distribution of wealth and income (Hill 1999; World Bank 2008, 2010). The formal sector is based on mining, manufacturing, services, and agriculture and is relatively well developed. Yet, as we discuss below, the country's agricultural sector is weighted heavily toward production of staple crops for food consumption and as such, it is a central part of the country's economy.

Indonesia made a transition to a full-fledged democracy in 1999 (Eklöf 1999; Philpott 2000). However, prior to 1999 the country was ruled by several military regimes and is thus observed as an authoritarian regime (McDonald 1980; Mulder 1996; McLeod 1998). Between the end of World War II and 1998, Indonesia, a former Dutch colony, was ruled by only two presidents: Sukarno and Suharto. Sukarno, the main political leader of the independence movement and Indonesia's first president, forged a national identity through his ideals of *Pancasila*.

Mohammed Suharto, a general, established a military dictatorship in Indonesia in 1965 after taking control of the executive's office via a violent coup (McLeod 1998; Philpott 2000). As the newly appointed "commander for the restoration of security and order," Suharto oversaw the military's retaliation (Mulder 1996; Eklöf 1999; Philpott 2000).

Formal titles bestowed over the next few years provided evidence of his control of the government. He was granted executive powers in 1966, was named acting president in 1967, and was finally formally established as the country's president in 1968. By 1970, when Sukarno died, the transition from Sukarno's "Guided Democracy" to Suharto's "New Order" was complete (McDonald 1980; Mulder 1996; McLeod 1998).

Suharto annexed territory for Indonesia, including the former Portuguese colony of East Timor. His regime was ruthless in suppressing dissent, stifling the press, and imprisoning opponents (Schwarz 1994; Uhlin 1997; McLeod 1998). Despite this, some opposition leaders achieved prominence in the 1990s, including Amien Rais, an Islamic reformer, and Megawati Sukarnoputri, the daughter of Sukarno (McIntyre 1997; Hill 1995, 1999; Bhakti 2004). By the end of the 1990s, secessionist movements in Aceh and East Timor gained support and—as described in the next section—the country's economy faced a major financial crisis, which is involved a food crisis, in 1997. Massive student-led protests forced Suharto to resign on May 21, 1998 (Eklöf 1999; Tanuwidjaja 2010). When Suharto resigned, he announced that the business-oriented but eccentric vice president, B. J. Habibie, would assume the presidency. Habibie was considered a caretaker rather than a real political contender. In 1999, following national elections, Abdurrahman Wahid was selected as president by the People's Consultative Assembly (Hill 1999; Eklöf 1999; Tanuwidjaja 2010). With the rise of Abdurrahman Wahid as the country's chief executive, Indonesia made a rapid transition to a consolidated democracy (Eklöf 1999; Tanuwidjaja 2010). And, by the first decade of the twenty-first century, Indonesia in essence emerged as a full-fledged democracy with Megawati Sukarnoputri serving as the country's president from July 2001 to October 2004 (Bhakti 2004; Tanuwidjaja 2010).

While Indonesia does possess some lucrative natural resources such as timber and palm oil, it is also a major global key producer of a wide variety of agricultural tropical products and arable land. Between 1950 and the mid-1970s, the agricultural sector's share of GDP was around 40%. Although agriculture's share of the country's gross domestic product (GDP) has declined to around 25% since 1980, this sector still supports the majority of Indonesian households today. In fact, in the first decade of the twenty-first century, this sector employed an average of around 49 million Indonesians per year, a 41%

of the total Indonesian labor force during the same decade (World Bank 2008).

Thus, the agriculture sector is arguably the most crucial sector in the country, at least in terms of employment. More importantly, this sector is vital for domestic food consumption. Apart from palm oil and rubber, some additional important agricultural products are cocoa, coffee, tea, cassava, rice, soybeans, corn, and sugar (World Bank 2008). Note that cassava, rice, soybeans, corn, and cassava are vital staples for domestic food consumption. Thus, the health of the agricultural sector is absolutely vital for maintaining stable food consumption levels in Indonesia. Given the importance of the agricultural sector to food consumption, it is thus not surprising that successive governments in Indonesia have invested substantial capital in this sector (World Bank 2008). As a result, food (i.e., crop) production in Indonesia has been relatively stable over the last five decades. Yet as we will see in the next section, Indonesia did suffer from debilitating food crises in 1996 and 1997, which in turn had dramatic political consequences.

Urban Development and Food Production in Indonesia

We mentioned above that Indonesia was ruled by a nondemocratic regime between 1976 (the first year in which data to operationalize our variables of interest were available) and 1998. Furthermore, during this period, the country was characterized by two relevant key features: high levels of urban development per capita and a near absence of food crises prior to 1996. We unpack each of these two features in more detail below.

To illustrate the temporal variation in food crises over the 1976–1998 period (or lack thereof), we report a similar plot to that reported in Chapter "Urban Development, Food Shortages and Mass Killing in Authoritarian Pakistan." That is, Fig. 1 shows the annual levels of nominal food price volatility in Indonesia starting in 1976 and ending in 1998, to gain a sense of the years in which food crises occurred in the country. This indicator of food price volatility measures the nominal average price volatility of six staple crops (rice, sugar, soybean, cassava, cocoa, and coffee) produced annually and used for domestic consumption. Similarly to Eq. (2) that we reported in Chapter "Urban

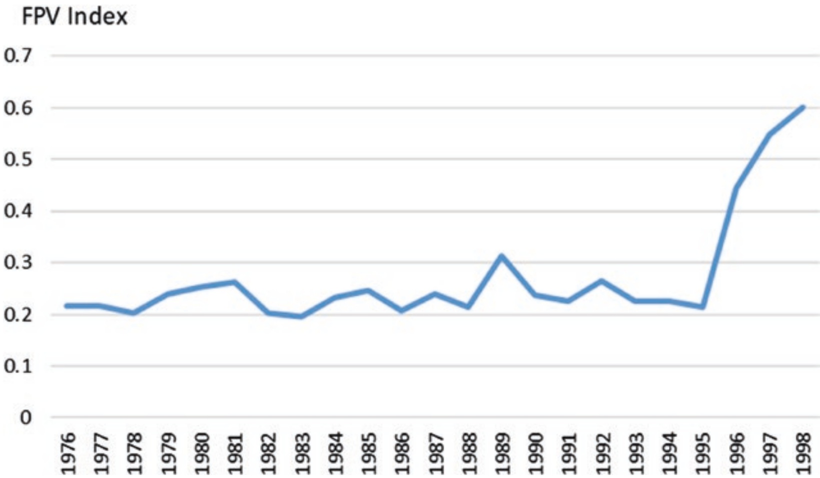

Fig. 1 Food (staple crop) Price Volatility (FPV) index—Indonesia, 1976–1998

Development, Food Shortages and Mass Killing in Authoritarian Pakistan," food price volatility is defined as the ratio of the absolute value of the deviation over the trend (calculated using the Hodrick–Prescott filter) for the six aforementioned staple crops per year for the time period being analyzed.[2]

As Fig. 1 illustrates, the annual level in nominal food price volatility—normalized to vary between zero and one—for the 1976–1999 period in Indonesia ranged from a minimum of 0.19 to a maximum of 0.61.[3] This figure also suggests that, unlike in Pakistan, food price volatility in Indonesia is noticeably more stable, with one clear exception: a sudden and sharp increase in volatility occurs between 1996 and 1998. This suggests that a "spike" in food price volatility occurred during the final three years of Suharto's rule, i.e., the last years during which Indonesia was under authoritarian rule. More crucially, this sudden rise in food price volatility led almost immediately to a precipitous decline in the agricultural output of these six staples. This combination of sudden and extreme high volatility, sharp drops in output, and their corresponding impact on consumption thus strongly fit into our definition of a food crisis developed and discussed in detail in Chapter "Statistical Analysis of Food Crises and Mass Killing."

Two factors explain the food crises that occurred over the 1996–1998 period. First, note that between the latter part of 1996 and 1998, Indonesia experienced a severe drought, the result of severe weather conditions commonly known as El Niño. This severe drought not only persisted for several years, but also damaged affected cropland areas where rice, sugar, and soybean were cultivated (World Bank 2008). The fact that this persistent drought destroyed large areas of arable land where key staples are grown both exacerbated the volatility in these crops' prices and depressed their output, leading to food shortages (World Bank 2008).

Second, in addition to natural drought, recall that Indonesia also experienced a debilitating financial crisis during 1997–1998. This crisis was caused, at least in part, by currency speculations, which increase inflation in the Indonesian Rupiah by 70% (World Bank 2008). This currency crisis compounded the difficulties already experienced by farmers due to the drought, pushing up prices for vital inputs such as quality seeds and fertilizer, and consequently reducing staple crop output even further. The precipitous drop in crop output, in turn, generated hyperinflation in food prices. It is therefore not surprising that the FAO concluded in its report on Indonesia in April 1998 that:

> The combined effect of severe drought - attributed to El Niño - and the current financial crisis in Asia has left 7.5 million people in Indonesia facing acute food shortages, according to a joint FAO/World Food Programme (WFP) mission to the country[4]

Put together, historical evidence and these descriptive agricultural output data from Indonesia strongly suggest that the country did, in fact, suffer from high food price volatility, which generated acute food crises in 1996, 1997, and 1998.

Our second key explanatory variable of interest is level of urban development (normalized per capita) in Indonesia during the 1976–1998 period.[5] Indonesia experienced rapid economic growth throughout the 1970s and 1980s, which led to rapid urbanization and increases in urban development during the same period (World Bank 2008). Hence, as suggested in an official 1992 report by the Indonesian government, "by the late 1970s, the depth and pace of urban development in Indonesia resembled the urbanization patterns of more advanced countries in Asia including South Korea and Malaysia".

To assess the level of urban development per capita in Indonesia from 1976 to 1998, we again use the formula we derived in Chapter "Urban Development and Mass Killing: A First Look at the Data" to empirically approximate urban development per capita,

$$\sum_{i=1}^{n}\left(\frac{l_i}{\ln P_i}\right) \tag{1}$$

where l_i is the (calibrated) annual levels of nighttime light emissions in a given 0.5-degree grid cell, P_i is the total population residing in the same grid cell, and n is the number of all urbanized cells for each year in the dataset. As we did when coding our annual urban development per capita measure for Pakistan, we followed this formula with two main changes. First, instead of using the 0.5-degree grid cell, we relied on the city year as our unit of analysis rather than the 0.5-degree grid cell. Data availability allowed us to code annual variations on this indicator for 14 cities in Indonesia with a population of 400,000 or more individuals over the 1976–1998 period: Jakarta, Bekasi, Denpasar, Bandung, Bogor, Malang, Tangerang, Pontianak, Surabaya, South Tangerang, Surakarta, Depok, Cimahi, and Serang. Second, as was the case with the measure we coded for Pakistan, data on nighttime light emissions were not available during a large part of our temporal period of interest. Accordingly, we similarly relied on data for electricity provision/supply to households for each city year obtained through primary and secondary sources that are discussed and listed in the book's online appendix.[6] For illustration, the annual average of this urban development per capita measure across these 14 cities (normalized between zero for the lowest levels of urban development per capita over the period and one for the highest) is reported in Fig. 2.

As Fig. 2 clearly illustrates, the level of urban development in Indonesia in 1976 is a little over 0.61 on a scale ranging from zero to one, a rather high level (for comparison, the 1978 level for Pakistan is 0.26). Further, a constant and steady but rather marginal increase in urban development per capita is noticeable throughout the 1976–1998 at a rate of approximately 0.002 per year, without any sudden sharp increases. Overall, the level of urban development per capita in Indonesia is high, and it remains consistently high during the entire period. While analyzing why Indonesia shows relatively high levels of urban development, scholars have suggested several explanations for this constant

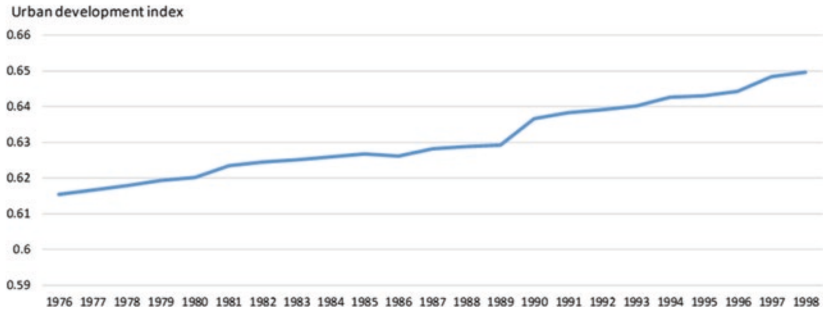

Fig. 2 Urban development (per capita) in Indonesia, 1976–1998

growth in urbanization, including rapid industrialization and growth in urban infrastructure during the 1960s and early 1970s, and migration from rural areas to urban centers (World Bank 2008).

Importantly, note that—as shown in Fig. 1—in the case of Indonesia, the outbreak of a series of food crises during the 1996–1998 period provides an effective "treatment" for assessing the propensity of regime-perpetrated mass killing in the context of high urban development. That is, we use Indonesia to understand how the propensity for anti-regime demonstrations and state-led mass killing campaigns varies between two specific periods: (i) the 1976–1996 period, when urban development per capita levels are high but food crisis episodes *do not* occur and (ii) the 1996–1998 period, when food crises occur repeatedly in the context of high urban development per capita. We turn to a historical analysis of these two time periods below.

Collective Action Against Suharto Before 1996

We have so far noted that although the country was characterized by relatively high levels of urban development, no food crisis episodes occurred in Indonesia prior to 1996. The theory developed in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States" suggests that under conditions of sufficiently high urban development in nondemocracies, collective civilian mobilization in urban areas may occur even in the absence of food crises, given the lack of wide popular mandate on the political power and legitimacy of nondemocratic incumbents. We also argued that such anti-regime opposition may invite violent retaliatory responses against the civilians by the ruling elite (mass killing being an extreme form of which), but also noted that the scale of civilian killings in this case is likely to much lower compared with mass killing campaigns that occur during food crises. Historical evidence from Indonesia between the years 1976 and 1996 lends support to these theoretical predictions. To show this in more detail, we focus on two specific historical phenomena that occurred during this period, which allow us to assess whether our theoretical claims are valid, at least in the case of non-democratic Indonesia.

The first case we examine is the urban-based student movement against the Suharto regime, which emerged in 1977, with a short but impactful revival in 1989 (see, e.g., Karim 1983; Hill 1999; Bhakti 2004). During the 1970s, tensions between the Suharto regime and university students across all the major cities of Indonesia, including Jakarta, Surabaya, Medan, and Bandung, had reached a boiling point (Lubis 1979; Mackie and MacIntyre 1993; Schwarz 1994). An anti-Suharto movement led by university students emerged, for example, in 1974, but was brutally repressed by the military junta (Lubis 1979; Mackie and MacIntyre 1993; Uhlin 1997). This generated resentment against the regime. Unsurprisingly, when the Suharto-led military regime rigged the 1977 parliamentary elections (a regime-controlled election for few parliamentary seats) and resorted to widespread coercion, another urban-based movement emerged in the urban centers of Bandung and Jakarta (Karim 1983; Uhlin 1997; Hill 1999). Moreover, in January 1978, the student council (*dewan mahasiswa*) at the prestigious Bandung Institute of Technology (*Institut Teknologi Bandung*, ITB) published the White Book of the 1978 Students' Struggle, a work that has been called the "first systematic Indonesian critique of the domestic policies of the New Order regime."[7]

The White Book lambasted the government for endemic corruption, economic policies that facilitate self-enrichment at the expense of social welfare, repression of independent political voices, and claimed that it lost touch with the Indonesia people.[8] Concerns about poor governance, corruption, and lack of freedom also sparked the urban-based student movement in 1989 that was largely concentrated in Jakarta (Antlöv 1995; Uhlin 1997; Bhakti 2004). Indeed, in 1989 and, to a certain extent, in 1990, protests against the Suharto regime became an "important source of pressure on the government for relaxation of political controls and broader citizen autonomy" (Robison 1990, 64). The students in (largely) Jakarta and (less so) in other cities demanded greater relaxation of political controls because there was no institutionalization of protection for basic rights and they wanted to change or end this particular status quo (Mackie and MacIntyre 1993; Uhlin 1997; Hill 1999). Put differently, they did not want to be "loaned" political freedoms, but rather demanded fully protected constitutional rights (Mulder 1996; Eklöf 1997, 1999).

Setting aside the motivations underlying the 1978 and 1989 campaigns, it is important to emphasize here that—as predicted by our theory—high levels of urban development played a crucial role in facilitating the emergence of the student protests against Suharto, both in 1978 and in 1989 (see, e.g., Jenkins 1984; Cribb 1995). Research by Indonesian scholars has, in particular, highlighted two main factors that explain why urban development facilitated the formation of an opposition against Suharto in Jakarta and the other major Indonesian cities during these years (Karim 1983; Bhakti 2004). First, these scholars suggest that rapid urbanization in Indonesia during the early 1970s led to "substantial development of public infrastructure as well as the emergence of educational institutions"[9] in Indonesia's main cities (Karim 1983 MacFarling 1996). A central component of these newly emerged (or emerging) educational institutions was the formation of large urban universities with strong social and political networks (Antlöv 1995; Uhlin 1997; Bhakti 2004).

Second, similar to the case of Pakistan discussed in Chapter "Urban Development, Food Shortages and Mass Killing in Authoritarian Pakistan," high levels of urban development in Indonesia also facilitated the "growth of communication and transport infrastructure" (Cribb 1995, 108)[10] in the country's major cities. More importantly, scholars have suggested that the combined growth of communication infrastructure and educational institutions—two critical components of urban development in Indonesia—in the country's major cities paved the way for the "emergence of large bodies of educated citizens that resided in close proximity" who could ostensibly "communicate with each other in similar geographic locations" within urban centers. These developments helped the "educated citizens" (i.e., students) to more easily "organize, mobilize and come out collectively against the Suharto regime" in the late 1970s and in the late 1980s. This perspective is also shared by several historians and sociologists who emphasize the centrality of high urban development underlying the outbreak of the anti-Suharto student movements discussed here (Jenkins 1984; Tanter 1990; Cribb 1995).

How did the Suharto-led military regime respond to these student movements? First, note that Suharto and his regime perceived these urban opposition movements as a "direct political threat to their political power in office".[11] In particular, there was concern among the senior military leadership that the anti-Suharto movement initiated by the students in Jakarta and other major cities would develop into a full-blown movement toward democracy. Top military officials also opined that pro-democracy movements could turn violent and may seek reprisals against Suharto and those serving under Suharto (Jardine 1999; Martin 2002). In short, in both the late 1970s and the 1980s, the Suharto regime believed that these urban-based student opposition movements could blossom into a full-fledged challenge to its rule.

The immediate response was to thus "clamp down" quite aggressively on these students' movement (Tanter 1990; Cribb 1995; Jardine 1999). In 1979, for instance, the regime initiated martial law on entire campuses in Jakarta, Bandung, and other cities following waves of protests. Through a policy formally known as "Normalization of Campus Life," the government banned political expression on these campuses and placed all student activities under the supervision and control of the university rectors (Jenkins 1984). Student councils were outlawed, and other on-campus activities were closely monitored (Karim 1983; Tanter 1990). These draconian measures, however, were insufficient in eliminating these anti-Suharto movements. As a result, the regime took even more radical and violent steps to repress the urban-based student movements (Karim 1983; Tanter 1990).

In both 1978 and 1989, the first phase involved mass incarcerations (Jenkins 1984; Tanter 1990; Cribb 1995). The regime quickly escalated its violent tactics, relying on extrajudicial killings, hunting down and killing students and their supporters to ostensibly eradicate them. These systematic killings persisted throughout 1979 and occurred again in 1989 (Jenkins 1984; Jardine 1999). Thus, as predicted by our theoretical story—and as summarized in our second corollary in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States"—the authoritarian incumbent did in fact respond to organized and coordinated urban unrest by resorting to some level of systematic killings. These urban killings, however, were certainly not as substantial or dramatic as those that occurred during the 1996 and 1997 food crises.

The second case we examine in this chapter is the movement for the independence of East Timor, which first emerged as a violent anti-regime movement in 1976 and then remerged in 1987 (e.g., Antlöv 1995; Uhlin 1997; Bhakti 2004). Much has been written about the opposition and violence that took place in East Timor over the last three decades of the twentieth century (see, e.g., Karim 1983; Hein 1989; Robison 1990; Schwarz 1994; Hill 1995). We certainly cannot do justice to this vast literature here. Nevertheless, considering the intensity of regime violence, it is worth briefly discussing this campaign here.

The independence movement in East Timor—spearheaded by the leaders of the Frente Revolucionária de Timor-Leste Independente (FRETILIN)—emerged in 1975, after the Portuguese decolonization of the Island of East Timor. However, its primary *raison d'être* was to fight the brutal invasion of East Timor by Indonesia's National Armed Forces in 1975 (e.g., MacFarling 1996). This invasion generated deep-rooted grievances against the authoritarian Indonesian government, and a strongly held belief that East Timor should be an independent nation (Jenkins 1984; Tanter 1990). This movement was brutally crushed by Indonesia's armed forces (more on this below) by the early 1980s (Cribb 1995). Although the movement for independence of East Timor lost power in the 1980s, it remerged yet again in 1989 (MacFarling 1996). While several reasons for this reemergence exist, there is scholarly consensus that it was by East Timor's desire to gain independence as well as due to the repeated brutalities, killings, rape, and torture carried out by Indonesian troops in 1981–1982 as part of "Operasi Keamanan" and in 1983 as part of "Operation Clean Sweep" (Jenkins 1984; Tanter 1990).

Both in 1978 and in 1989, the resistance to Suharto's rule by the residents of East Timor involved primarily guerrilla war tactics. As such, it is complicated to blame regime violence solely on urbanization and urban mobilization, considering that mass killing is especially likely during guerrilla wars (Valentino 2004; Valentino et al. 2004). Nevertheless, collective urban mobilization against Suharto flourished in the largest urban center on the island (now capita), Dilli, during both 1978 and 1989 (Cribb 1995; MacFarling 1996). Indeed, scholars emphasize that although a desire to gain full independence was the main political cause that galvanized the anti-Suharto opposition in East Timor, it was rapid urbanization and urban development that facilitated the "first steps necessary for the collective organization" that allowed the independence movement to emerge (Jenkins 1984; Tanter 1990). Central political figures such as

Arnaldo dos Reis Araújo and Lopez da Cruz were from Dilli, and with the support of wealthy landowners, these and other leaders used the "newly developed communication and transportation system in Dilli to organize, bring together and mobilize large groups of residents" to openly oppose Suharto's rule in 1978 (Tanter 1990; MacFarling 1996).

Furthermore, in both 1978 and 1989, the leaders of FRETILIN used the rapidly growing infrastructure in and around Dilli as a "base to knit together a powerful cohesive and well organized political group" that would come to openly challenge the legitimacy of Indonesia's invasion of East Timor (MacFarling 1996). Indonesia's intelligence service alleged that FRETILIN leaders were using the communication infrastructure to communicate with foreign embassies and to actively mobilize the insurrection, thus directly threatening Indonesia's national security (Tanter 1990, 17–18; Cribb 1995). We lack the space to discuss the link between urban development and the rise of Timorese opposition to Suharto's rule in more detail here. But most researchers subscribe to the view that large-scale urban development in Dilli combined with persistent grievances against Indonesia was the primary driving force behind East Timor's opposition (Jenkins 1984.

These researchers also emphasize that the open urban protests against Suharto were not merely seen by the regime as a threat to Indonesia's sovereignty, but also—considering the ongoing insurgency—as a clear danger to the regime (Tanter 1990; Cribb 1995). Indonesian nationalist and military hardliners in particular feared that an East Timor governed by leftists could be used as a base for incursions by unfriendly powers into Indonesia, and also that an independent East Timor within the archipelago could inspire secessionist sentiments within Indonesian provinces (Schwarz 1994, 208; MacFarling 1996). As such, they suggested to Suharto that once secessionist forces emerged, then Suharto's military would quickly lose political control, which could lead to the downfall of his government (Tanter 1990; Schwarz 1994). Suharto's fear of an "imminent loss of power"[12] with the emergence of East Timor's push for independence remained as one of Indonesia's strongest justifications for refusing to entertain the prospect of East Timorese independence or even autonomy until the late 1990s (Tanter 1990; Cribb 1995).

This fear also induced the military regime in Indonesia to turn to brutal violence and repression against the East Timorese in the late 1970s, throughout the 1980s and in the early 1990s to deter their serious challenge to Suharto's rule *and* to compel them to become an integral part of the Indonesian state. The brutalities, human rights abuses, and mass killing campaigns carried out by Suharto's military dictatorship against the people of East Timor during the late 1970s, 1980s, and 1990s—especially after an urban-based, overt opposition to the regime emerged—have been extensively documented by scholars, journalists, and human rights groups such as Human Rights Watch (see, e.g., Jenkins 1984; Lubis 1993; McFarling 1996; HRW 2001). There is a wealth of research that has established that between 1975 and 1998, the Suharto regime had systematically killed between 50,000 and 90,000 civilians in East Timor,[13] with some suggesting that this number is much higher (see Amnesty International 1991, 1995; Jardine 1999; Martin 2002; Vickers 2005).

Food Crises and Mass Killings in Indonesia Between 1996 and 1998

The level of urban development per capita in Indonesia remained fairly high between 1996 and 1998 (see Fig. 2). Unlike the period prior to 1996, however, during these three years Indonesia suffered from several food crises, which persisted well into 1998 (McLeod 1998; Hill 1999; Philpott 2000). As we showed earlier (see Fig. 1), this period was characterized by sharp increases in food price volatility, effectively leading to a substantial decrease in the production of some main staples, including rice, sugar, soybean, cassava, cocoa, and coffee. Hence, this means that between 1996 and 1998, Indonesia was characterized both by high levels of urban development per capita *and* the outbreak of several food crises.

The theoretical argument developed in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States" associates the interaction of these two factors not only with the incentives to oppose the nondemocratic incumbent, but also with a more successful collective mobilization effort. This overt opposition credibly threatens the political survival of the ruling elite. The credibility of this threat induces the elite to use systematic mass killing campaigns to deter opposition to its rule in the country's urban areas, where protesters possess the greatest strength. Historical evidence from Indonesia between 1996 and 1998 corroborate these two theoretical mechanisms.

To see why this is the case, we first turn to examine the overt opposition to the Suharto regime, which emerged in the latter part of 1996.

In this regard, note that there are two main incidences of anti-regime opposition that broke out during the period. The first is the spontaneous anti-regime riots that resulted from acute food shortages in 1996 and 1997 and which occurred in two Indonesian cities: Pontianak[14] and Tangerang[15] (the latter is a large city located 20 km west of the national capital Jakarta). The second wave took place mostly in the nation's capital, Jakarta, during 1997 and 1998, and was triggered not only by food shortages but also by the hyperinflation (including exorbitantly high food prices) engendered by the collapse of the Indonesian rupiah in foreign exchange markets (World Bank 2008).

In the case of Pontianak and Tangerang, there was a substantial decline in the supply of essential food items such as rice and soybean into each these two cities in 1996 and 1997. This was primarily the result of the severe drought caused by the El Niño weather conditions. Such food shortages led to a significant drop in the levels of food consumption in these two cities, especially among middle-income and low-income households (Uhlin 1997; World Bank 2008). Hence, it is not surprising that the International Monetary Fund (the IMF) requested the Suharto government—Indonesia was a recipient of IMF loan following the 1997 crisis—to expand and stabilize rice supplies into the country's main cities.[16]

To further exacerbate matters, the Suharto-led regime, which faced little-to-no formal institutional and constitutional constraints on its behavior,[17] did not take any concrete action to mitigate the impact of food shortages in these cities (Hill 1999). Some attempts were made to bring in essential rice supplies to Tangerang but it was a "classic case of too little and too late" (McLeod 1998, 45). This lack of ability or will to tackle the effect of the food crises caused "looting and vandalism of food stalls and the sudden outburst of large protests against Suharto's government in Tangerang",[18] which also spilled over to Pontianak (Eklöf 1999, 85; Hill 1999; Bhakti 2004). This overt opposition Suharto's rule persisted throughout 1997 and 1998 (Eklöf 1999; Hill 1999).

While the public display of opposition in Tangerang and Pontianak was violent and (as discussed below) constituted a threat to Suharto's regime, the magnitude of the protests in these cities was significantly lower than the anti-regime protests that took place in Jakarta in 1997 and 1998. A voluminous literature analyzes the outbreak of large-scale demonstrations that took place in Jakarta in 1997 and 1998, and we lack the space to discuss this literature in-depth here (for more detail, see, e.g., Eklöf 1999; Hill 1999; Philpott 2000; Boudreau 2004; Vickers 2005). As we noted earlier, however, the overt opposition to Suharto's regime started *as a result of food shortages* and was further accentuated by the currency crisis that affected Indonesia in 1997–1998 (Bhakti 2004; World Bank 2008). Notwithstanding these issues, prevalent corruption and economic mismanagement by Suharto and his cabinet made things even worse and did little to help resolve the crisis (Philpott 2000; Bhakti 2004).

As a result, criticism of Suharto's rule was raised not only expressed by civilians in Jakarta, but also by political opposition figures such as Megawati Sukarnoputri, the head of the Indonesian Democratic Party (PDI), and Amien Rais, leader of Muhammadiyah, one of the two biggest Muslim organizations in Indonesia (Philpott 2000; Boudreau 2004; Vickers 2005). The most influential criticism, however, came once again from university students who sought to bring forth political reform and engender a transition to democracy (Bhakti 2004; World Bank 2008). Indeed, by late 1997 and early 1998, students and political opposition groups in Jakarta became not only better organized, but also openly vocal about the volatility in food prices, calling to put an end to Suharto's mismanagement of the crisis. The most common cry in the massive demonstrations that took place in Jakarta in 1997 and 1998, which emphasized *reformasi damai* (peaceful reform), was "Suharto step down!" (see, e.g., Eklöf 1999; Hill 1999; Philpott 2000; Boudreau 2004; Vickers 2005). Political leaders, academics, retired generals, and leading student and NGO activists in Jakarta signed petitions, made public declarations of protest, and released statements calling for a new president (Hill 1999; Philpott 2000; Vickers 2005).

The food crisis combined with the regime's failure to address the recurring shortages certainly motivated citizens in Jakarta, Pontianak, and Tangerang to openly mobilize against Suharto during the late 1990s. But what conditions facilitated collective action and anti-regime mobilization by the citizens of Jakarta (in 1997 already a city with more than 7 million residents), Pontianak, and Tangerang's during this period? Researchers and contemporary journalistic accounts suggest that—as predicted by our theory—high levels of urban development in Indonesia by the late 1990s made it substantially easier for the residents of major cities to organize, coordinate, and openly challenge Suharto's rule (for this, see, e.g., McLeod 1998; Eklöf 1999; Philpott 2000; Boudreau 2004; Bhakti 2004).

For example, in his systematic study of the factors that influenced the successful organization of mass protests against the Suharto regime in

Jakarta and Tangerang in 1997–1998, the highly respected Indonesian sociologist Endang Turmudi pointed out that,

> Although Jakarta appears chaotic at most times, the development in city's roads and public transit system and also the construction of large open parks in areas close to government buildings had two effects. First, it helped create the necessary geographic space for large gatherings. Second, residents who wanted to demonstrate against the government could with relative ease move to these central geographic spaces…Politicians, NGO activists and opposition leaders understood these urban advantages quite well. Therefore they used the urban advantage to mobilize large gatherings of people to protest the tyranny of Suharto's military rule. (Turmudi 2004, 91)

The view proposed by Turmudi (2004) is also reflected in the commentaries made by mainstream media outlets. For instance, an op-ed in Indonesia's most widely read newspaper, *Kompas*, bluntly suggested in the summer of 1998,

> How did families, individual citizens, and households organize so often and so quickly to go out and successfully protest against the government in Jakarta and Tangerang? The growth of these cities and particularly the rising income of middle-class families living in these cities gave them enough time and financial capacity to coalesce, organize and support politicians opposed to the government and to mobilize when needed.[19]

In addition to these insights, a wealth of studies have suggested that growing urbanization and urban development also meant greater *geographic density* of politically active citizens within all the major cities of Indonesia by the late 1990s (Kristof 1998; Martin 2002; Turmudi 2004, 2007; Vickers 2005; Sidel 2006). The upshot of this higher geographic density and thus concentration of citizens in Indonesia's cities—who by 1997–1998 were completely disillusioned with the ability of the Suharto-led regime to handle the food crises and the economic crisis more broadly—was that it made it much easier to "band together into collective groups" (Turmudi 2007, 95) in order to "jointly march and oppose the tyranny" (Turmudi 2007, 96) of Suharto's military dictatorship (Kristof 1998; Vickers 2005; Sidel 2006). Furthermore, rising incomes and the formation of a middle class, key characteristics of urban development, also provided urban residents in Indonesia with the "money, time and the financial confidence required"[20] to bear the transaction costs of coordination, collective mobilization and subsequently open opposition to Suharto's regime (Eklöf 1999; Philpott 2000; Boudreau 2004; Bhakti 2004).

All of this should not be taken to mean that rapid urban development was the only factor that facilitated collective anti-regime protest against the Suharto regime. For instance, some of the protests against Suharto, particularly in Jakarta, were driven in part by the extent to which the popularity of the incumbent regime among ordinary citizens plummeted (McLeod 1998; Hill 1999; Philpott 2000). Yet, as suggested here, that high urban development levels played a key role in facilitating and galvanizing collective mobilization to the Suharto regime in large urban areas is hard to deny (see, e.g., Martin 2002; Turmudi 2004, 2007; Vickers 2005; Sidel 2006).

Once protesters took to the streets of Jakarta, Tangerang, and other major Indonesian cities, Suharto and his cabinet—fearing the growing influence of these mass urban-based protests—announced policies to ban student groups, open marches, and public expression of dissent against the regime (see Hill 1999; Philpott 2000). They feared that these definite groups would eventually call for the toppling of the regime and seek to depose Suharto (Turmudi 2004, 2007; Vickers 2005; Sidel 2006). This was confirmed by Bacharuddin Jusuf Habibie, a Suharto confidante, who mentioned in an interview have gave to a local newspaper in 2008 that,

> Members in Suharto's cabinet and his trusted friends were alarmed once violent riots and protests erupted in Jakarta…we feared that these protests would go out of control and would be used by miscreants, foreign agents, and foreign-sponsored opposition politicians to forcibly remove Suharto and his cabinet from office….and also possibly liquidate Suharto's family.[21]

By the spring of 1998, Suharto's political grip over office began to considerably weak. As such, both Suharto and his military supporters recognized just how precarious the government's hold on power has become (Philpott 2000; Vickers 2005; Sidel 2006).

Recognizing this existential threat, Suharto gave a speech to the nation in May 1998. In this speech,

> General Suharto refused to bow to demands for his resignation, but instead pledged to stand aside after an indefinite 'transitional' period. Backed by military chiefs, Suharto declared he would use his presidential powers to establish a "reform council", reshuffle his cabinet and…choose his replacement…Suharto stated that he would not stand again for the post, yet is desperately clinging to power and attempting to keep the basic structures of his 32-year military dictatorship in place.[22]

Several other studies also suggest that by the middle of 1998, Suharto and his regime fully recognized that their political survival was under a grave threat (Philpott 2000; Martin 2002; Boudreau 2004; Bhakti 2004). Yet, as illustrated by the above quote, Suharto had no intentions of stepping down without naming his successor. Nor did the military regime have any intention to voluntarily hand over the reins of power to civilian leaders (Turmudi 2004, 2007; Vickers 2005; Sidel 2006).

Initially, the military's response was to simply engage in a show of force, particularly in Jakarta, to restore law and order in the increasingly chaotic and riot-prone city (Turmudi 2004, 2007; Vickers 2005; Sidel 2006). To this end, in May 1998, "tanks and armored personnel carriers rolled through the center of the city, while 15,000 troops took up positions at the Presidential Palace and elsewhere."[23] The ostensible purpose of this show of force was to promote stability and intimidate protestors from challenging the Suharto regime (McLeod 1998; Philpott 2000; Turmudi 2004, 2007; Sidel 2006). Yet this tactic proved largely ineffective. Anti-government protests continued to openly riot in Jakarta, Tangerang, and Pontianak (McLeod 1998; Philpott 2000; Turmudi 2004, 2007). Further, "rioting and looting broke out in every quarter of the city and the death toll rose. Bands of people swept up and down Jakarta's main streets, setting fire to cars, shattering windows in office buildings, and burning and pillaging stores."[24]

While the protests in these cities focused specifically on removing Suharto and the military dictatorship from office, the riots often involved the looting and burning of shops owned by ethnically Chinese residents. For example, in the "riots in Medan, in North Sumatra, much of the aggression was aimed at ethnic Chinese, who account for less than 5 percent of the population but control much of Indonesia's economy. Banks and shops owned by Chinese were gutted, sending clouds of smoke over the ethnic Chinese district in North Jakarta."[25]

Once the wave of protests and riots intensified, there was renewed concern among Suharto's inner circle that the regime is in serious jeopardy (Eklöf 1999; Philpott 2000; Boudreau 2004; Bhakti 2004). The regime hence faced immense pressure to crack down on citizens and opposition figures who were openly mobilizing again Suharto in Jakarta and reinforce the military's control (Eklöf 1999; Boudreau 2004). Under Suharto's personal orders, the Indonesian military began a violent reprisal campaign against these protesters, which involved "indiscriminate killing of opposition figures, students, and even ordinary families" (McGlynn 2005, 81)[26] in Jakarta and Medan (McLeod 1998; Vickers 2005; Sidel 2006). For instance, at one anti-Suharto demonstration that took place at Trisakti University in Jakarta on 12 May 1998, soldiers opened fire on unarmed protestors. Four students were killed on the spot and more than a hundred students were seriously injured (Eklöf 1999; Boudreau 2004; Bhakti 2004; Vickers 2005).

The incidence at Trisakti University was hardly unique. Rather, "clashes and fatalities had mounted in the closing years of Suharto's presidency". Indonesia's military—ostensibly under Suharto's orders—embarked on a mass killing campaign, "hunting down, targeting and killing almost anyone who dared challenge the military regime in Jakarta, Medan" (McGlynn 2005, 59)[27] and other cities, including Tangerang (Philpott 2000; Sidel 2006; Tanuwidjaja 2010). Furthermore, a "year later, having already 'disappeared' a series of dissidents, security forces had shot and killed" several protestors, "setting the stage for the looting, burning and raping that swept Jakarta on 13–15 May 1998".[28] State-led killings of civilians continued unabated in almost every other major city in Indonesia in 1998 (McLeod 1998; Vickers 2005, as the "violence spiraled into 1999, including isolated but horrific instances of killings" perpetrated by the military against the civilians. Again, a voluminous literature has analyzed the extent of the mass killings that occurred in urban centers in Indonesia in response to these protests, particularly during 1998 (see, e.g., Eklöf 1999; Philpott 2000; McGlynn 2005). However, to further analyze the linkages between urban development, food crises, anti-government demonstrations, and mass killing highlighted this historical evidence; in the next section, we conduct within-country statistical analysis using original city year data on 14 Indonesian cities. We use this original sample to evaluate (i) the association between food crisis, urban development, and anti-regime demonstrations and (ii) the interactive effect of food crisis and urban development on the probability of a mass killing campaign at the city level.

Anti-government Demonstrations and Mass Killing in Indonesia's Cities: Statistical Analysis

Mass Killing in Indonesia: Data and Variables

We test the linkages between food crises, urban development per capita, and anti-government demonstrations subnationally on a sample of 14 Indonesian cities whose population was 400,000 or more individuals: Jakarta, Bekasi, Denpasar, Bandung, Bogor, Malang, Tangerang, Pontianak, Surabaya, South Tangerang, Surakarta, Depok, Cimahi, and Serang.[29] Information on each of these cities is recorded annually for the entire 1976–1998 period, Indonesia autocratic regime spell. Therefore, similarly to our subnational analysis of Pakistan, the unit of analysis in the models presented below is the city year.

The dependent variable in this first analysis stage, which evaluates at the effect of the interaction between urban development per capita and food prices impact the frequency of demonstrations, is coded as to specifically capture actions taken by the civilians that the Pakistani regime could perceive it constituting a potential danger in the long term. This variable, *Anti-Government Demonstrations*$_t$, is operationalized for each city as the annual number of violent riots and demonstrations carried out by civilians against:

1. Government property, including causing physical damage or destroying government administrative buildings, offices, and other government-owned assets;
2. Government security forces, including city forces such as the Indonesian National Police and the Municipal Police as well as national-level paramilitary and military forces stationed within city limits (up to a radius of 10 km);
3. Administrative buildings owned and operated by the national and municipal governments.

The resulting *Anti-Government Demonstrations*$_t$ thus effectively captures a wide range of civilian-led action types—more or less violent—that could be construed by the regime as the harbinger of a potential disobedience campaign. Due to space constraints, a list of the sources used to code this variable is presented in the book's online appendix.

As we did in Chapter "Urban Development, Food Shortages and Mass Killing in Authoritarian Pakist," we also code two main explanatory variables to test the impact of their interaction on the probability of *Anti-Government Demonstrations*$_t$. The first variable, *Urban Development PC*$_t$, is operationalized and normalized according to the guidelines discussed above (see Fig. 2). Second, similarly to the food crisis indicator used in our Pakistan analysis, the indicator used here, *Food Crisis*$_t$, for the Indonesia city year sample is operationalized as follows. To start with, we gathered data on the nominal average price of a "basket" of six main staple crops (recorded by Indonesia's Agricultural Ministry) sold for food consumption at the wholesale level in Indonesia's urban areas for *each* city year in our Indonesia sample during the 1978–1998 period. The within-country data on food prices gathered for Indonesia are comprehensive as they include all the data that are available to calculate the nominal average price for a "basket" of staple crops sold in Indonesia's urban areas. The sources used to gather the food price data for Indonesia are reported in the book's online appendix. Next, using the aforementioned food price data, we employ the formula for $\mathrm{FPV}_{c,t}$ expressed in Eq. (2) from the previous chapter ("Urban Development, Food Shortages, and Mass Killing in Authoritarian Pakistan") to calculate the *unconditional volatility* of this price per city year for Indonesia. As we observed in the case of Pakistan, we find that nominal food basket prices do not follow a unit-root process in our Indonesia city year sample.[30] This implies that these data are stationary and its standard deviation will not depend on the size of the sample.

Finally, using the food price volatility measure ($\mathrm{FPV}_{c,t}$), the dichotomous *Food Crisis*$_t$ variable in the Indonesia case is coded as one for those periods where $\mathrm{FPV}_{c,t}$ exceeds the city-specific mean by at least two standard deviations, zero otherwise. The results reported below do not alter statistically or substantively when *Food Crisis*$_t$ is coded as one when $\mathrm{FPV}_{c,t}$ is between 1.5 to three standard deviations above the city-specific mean. The results also remain robust when we employ a conditional measure of food price volatility to operationalize *Food Crisis*$_t$.

To test the moderated effect of *Food Crisis*$_t$ on how *Urban Development PC*$_t$ impacts the frequency of anti-government demonstrations in cities in Indonesia, we again introduce the interaction term

Urban Development $PC_t \times$ *Food Crisis*$_t$ and control for the individual constitutive components of this interaction term. According to the theoretical argument development in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States," we expect this interaction term to produce a positive impact on the frequency of demonstrations.

In order to account for the persistence of demonstrations from one year to the next, we also include the lag of the dependent variable, *Anti-Government Demonstrations*$_{t-1}$, in the model. To additionally account for potentially salient confounders, we also include several key control variables. First, as we did in our analysis of the Pakistan sample, we include the variable *GDP* PC_t, which measures gross domestic produce by province, normalized per capita. Additionally, considering the important role of the 1997 financial crisis in the removal of Suharto, we include a binary variable, *Inflation Crisis*$_t$, coded as 1 when the local (i.e., city-) level inflation rate in housing and utilities, clothing and footwear, and transport exceeded 10% for a given city year, zero otherwise. We also include a measure of unemployment, *Unemployment Rate*$_t$, which is defined as the percent of the local labor force that was unemployed during a given year and is used to account for the possibility that more unemployment leads to resentment and frees more individuals to participate in the protests.

The next control, *Population*$_t$, is coded as the number of people residing in a given city during a given year and is used to account for the potential (log) linear relationships between the number of residents and the number of demonstrations. Fifth, we include the indicator *Municipal Police*$_t$, which measures the annual number of police stations located within a 10 km square radius of the city. Finally, we include the variable *Chinese Proportion*$_t$, which measures the fraction of city residents who are of Chinese descent for each city year. These residents have often been the targets of discrimination and killing by the Suharto regime and might be hence more likely to participate in the protests. Due to space constraints, the sources used to code each control variable are reported in the book's online appendix.

Table 1 presents the results of three negative binomial models evaluating the effect of the main explanatory variables and their interaction on the dependent variable *Anti-Government Demonstrations*$_t$, accounting for a large number of controls (Models 1–3). In all models, the *Urban Development* PC_t x *Food Crisis*$_t$ interaction's effect is positive and

Table 1 Model results for anti-government demonstration and mass killing in Indonesia's cities

	Anti-Government Demonstrations$_t$ (negative binomial)			*Mass Killing$_t$ (random effects probit)*		
	Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*
Urban Development PC$_t$	−0.106 (1.322)	−0.45 (1.324)	−0.216 (0.627)	−0.870 (2.970)	−0.364 (3.060)	−0.513 (3.107)
Food Crisis$_t$	−1.705*** (0.421)	−1.523*** (0.420)	−0.851*** (0.202)	−7.598** (3.842)	−8.260** (3.880)	−7.653 (3.943)
Urban Development PC$_t$ × Food Crisis$_t$	2.249*** (0.707)	1.916*** (0.707)	1.348*** (0.337)	13.140** (6.560)	14.442** (6.690)	13.430** (6.808)
GDP PC$_t^1$	−1.555*** (0.029)	−0.146*** (0.028)	−0.0670*** (0.014)	−1.512*** (0.463)	−0.010 (0.224)	−0.021 (0.225)
Population$_t^1$	0.043 (0.052)	0.046 (0.052)	0.012 (0.024)	–	–	–
Inflation Crisis$_t$	–	0.442*** (0.059)	0.050 (0.043)	–	–	–
Unemployment Rate$_t$	–	0.168* (0.089)	−0.005 (0.004)	–	–	–
Dependent Variable$_{t-1}$	–	–	0.003*** (0.001)	–	–	0.436 (0.466)
Municipal Police$_t$	–	–	0.442*** (0.032)	–	−1.241* (0.668)	−1.033 (0.688)
Chinese Proportion$_t$	–	–	0.001 (0.001)	–	−0.021 (0.018)	−0.019 (0.018)
Land Area (km^2)	–	–	–	$-9.97 \times 10^{-07***}$ (4.66×10^{-06})	-1.13×10^{-06} (5.29×10^{-07})	-1.08×10^{-06} (5.42×10^{-07})

(continued)

Table 1 (continued)

	Anti-Government Demonstrations$_t$ (negative binomial)			*Mass Killing$_t$ (random effects probit)*		
	Model 1	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*
East Timor Campaign$_t$	–	–	–	0.170 (0.413)	1.462 (0.838)	1.275 (0.843)
Military Barracks$_t$	–	–	–	−0.068 (0.137)	−0.012 (0.141)	−0.001 (0.140)
Constant	−2.057*** (0.084)	−2.077*** (0.085)	−3.69*** (0.160)	−0.055 (2.955)	−0.935 (3.08)	−0.844 (3.11)
Observations	313	312	312	312	276	274
Log Likelihood	−1591.729	−1583.44	−1361.36	−365.39	−269.90	−472.15
LR/Wald χ^2	160.3	166.91	590.38	30.17	29.80	11.01

Notes Significant at $^{*}p < 0.1$, $^{**}p < 0.05$, and $^{***}p < 0.01$
Mass Killing$_t$ models include random effects at the city level
[1]In natural log form

statistically significant to the one percent level.[31] Hence, in line with the theoretical argument presented in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States," this suggests that in nondemocratic Indonesia, the occurrence of food crises significantly increases the impact of urban development per capita on the probability of civilian mobilization and protests. Moreover, as was the case with the Pakistan analyses presented in Chapter "Urban Development, Food Shortages and Mass Killing in Authoritarian Pakistan," in the absence of high urban development levels, food crises have a negative association with the number of protests. This again supports the claim, emphasized repeatedly throughout this book, that food crises have a strong impact on the frequency of protests only in sufficiently high urban development contexts, where citizens have enough material resources to dedicate to the mobilization effort.

As we did in the within-country analyses presented in Chapter "Urban Development, Food Shortages and Mass Killing in Authoritarian Pakistan," we use the estimates obtained from Model 3 to compute the average predicted effect of *Urban Development* PC_t × *Food* $Crisis_t$ on *Anti-Government* $Demonstrations_t$ when a food crisis occurs across the entire range of *Urban Development* PC_t. This exercise reveals that when *Food* $Crisis_t$ is set to one (implying the outbreak of a food crisis in a given city year), a one standard deviation increase in *Urban Development* PC_t yields an approximate 7% increase in the extent of *Anti-Government* $Demonstrations_t$ when all other variables in the specification are held at their sample mean. This predicted effect is statistically significant at the 95% confidence level.

In addition to the explanatory variables, three controls also had a statistically significant effect. First, as expected, the lag of the dependent variable was positively associated with a higher frequency of demonstrations at year *t*, suggesting that in some cities demonstration trends persist over several years. Additionally, the variable *GDP* PC_t has a negative and significant effect, suggesting that, unsurprisingly, cities located in poorer provinces are more likely to experience demonstrations. Finally, a higher number of municipal police stations were positively correlated with more demonstrations, although this finding might be due to a simultaneous relationship, where more police are likely to be found where more protests occur. The effect of the rest of the coefficients is not robust in sign or significance, and is hence not discussed here.

Mass Killing in Indonesia: Analysis Results

The second stage of microlevel quantitative analyses evaluates the impact of the interaction between urban development and food crises on the probability of mass killing in cities in Indonesia. In this stage, we rely on the same data used in the anti-government demonstrations discussed above, with several notable exceptions. First, the dependent variable in this stage is a binary indicator denoting whether government forces were recorded to have killed 50 or more unarmed civilians in a given city during a given year (coded one), or not (coded zero).[32] Information on this variable was obtained from different datasets as well as daily newspapers, which we list in the book's online appendix due to space constraints.

As we did in the first stage of our quantitative microlevel analysis, we rely on the interaction term *Urban Development* $PC_t \times$ *Food* $Crisis_t$ to evaluate how the occurrence of a food crisis moderates the effect of urban development on the probability of localized state-led mass killing. We thus include this interaction alongside its constitutive terms in the model, as well as a lag of the dependent variable to account for the persistence of mass killing in a given city from one year to the next. However, while we keep the indicators *GDP* PC_t, *Municipal* $Police_t$, and *Chinese* $Proportion_t$, we changed some of the control variables used in this stage of analysis due to some specific characteristics of the Indonesia case. First, we include a variable denoting whether a given city was one in which the Indonesian military carried out violent reprisals to quell the East Timorese rebellion, *East Timor* $Campaign_t$, which serves to account for the possibility that mass killing in these locations was not the result of food crises and high urban development levels. Somewhat related, we include a second control, *Military* $Barracks_t$, measuring the number of bases with military or other national security forces within a 10 km radius of each city during a given year. Finally, we include a constant indicator measuring the total geographic areas of each city (in square kilometers), *Land Area (SqKms)*, to account for potential geospatial challenges that might induce the regime to use more violence. Again, due to space constraints, the sources used to code each control variable are reported in the book's online appendix.

Table 1 additionally lists the estimates obtained from three models designed to evaluate the impact of the interaction *Urban Development* $PC_t \times$ *Food* $Crisis_t$ on the probability of localized mass killing within a given Indonesian city year (Models 4–6). The effect of the interaction term *Urban Development* $PC_t \times$ *Food Crisis*$_t$ is again positive and statistically significant (to the five percent level) across all three models. This supports the conclusions of the cross-national analyses reported in Chapter "Statistical Analysis of Food Crises and Mass Killing" as well as the subnational analyses of Pakistan reported in Chapter "Urban Development, Food Shortages and Mass Killing in Authoritarian Pakistan": the effect of urban development per capita on the probability of localized state-led mass killing levels significantly increases during a food crisis. Interestingly, as was the case when anti-regime demonstrations were considered, in the absence of high urban development levels, food crises have a *negative* effect on the probability of mass killing, although this effect is not statistically significant in the fully specified model. Again, this highlights the importance of accounting for the location and context in theories and models that evaluate how sudden declines in food availability can cause violence.

To derive the substantive effect of this interaction term in respect to mass killing, we use the estimates from Model 6 to compute the average predicted effect of *Urban Development* PC_t on the probability of localized mass killing in Indonesia in the context of an ongoing food crisis across the entire range of *Urban Development* PC_t. Setting *Food Crisis*$_t$ to equal to one (which indicates the outbreak of food crisis) and increasing the values on *Urban Development* PC_t by one standard deviations yield an approximate increase of 7% in the probability of localized a state-led mass killing campaign in Indonesia's cities when all other variables are held at their sample means. This predicted effect is statistically significant at the 95% confidence level.

Interestingly, the effect of none of the controls was robust in terms of sign or significance and is hence not discussed here. Nevertheless, overall the weight of the subnational evidence from these large city analyses strongly suggests that in nondemocratic Indonesia food crises generated a strong impact on the probability of dissent and—correspondingly—state-led mass killing in areas with higher levels of urban development per capita. These linkages support the theoretical argument developed in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States" and also suggest that the global localized linkages between urban development per capita, food crises, and mass killing reported in Chapter "Statistical Analysis of Food Crises and Mass Killing" are the result of the same hypothesized effects.

The Malaysian Economy—A Brief Overview

Malaysia was founded as a British protectorate in 1957 and gained full independence as the Malaysian Federation in 1965. The country consists of 11 provinces and two federal territories, including the capital of Kuala Lumpur and Malaysian Borneo.[33] Its legislative branch includes a bicameral parliament with a system of representation along federal lines; 195 members are directly elected in single-seat districts through plurality rules to the lower house, the House of Representatives. The prime minister must come from the largest party or coalition in the lower house. The upper house consists of 40 Senators appointed by the country's monarch and 69 indirectly by the state legislatures. Multiparty elections have been held regularly every 4–5 years since 1957 with the exception of 1969–1971.

Despite holding regular elections and the presence of genuine opposition parties, however, Malaysia is generally considered to be an "electoral dictatorship" since 1957, considering that the country is dominated by the United Malay National Organization (UMNO)—since 1957, the UMNO have formed every single government. Another crucial factor in understanding Malaysian politics is ethnicity, given that the country has a highly diverse population, which includes ethnic Malays, Chinese, and Indians. The UMNO, founded in 1946 by Malay nationalists, has dominated the two coalitions that have ruled Malaysia since independence—the Alliance and the BN(Case 2011).

Yet, despite UMNO dominance of the executive and the extensive gerrymandering that favors the ruling parties, opposition parties have always competed and won seats in every parliamentary election. Opposition groups have captured between 9.6% (in 2004) and 40.1% (in 2013) of the parliamentary seats, winning 21.8% of seats on average with a standard deviation of 10.6% since 1957. Therefore, opposition parties have been an integral part of the political history of Malaysia, making it somewhat distinct compared with Pakistan and Indonesia, which were both ruled by military regimes. Nevertheless, Malaysia has been under a nondemocratic regime, albeit with a multiparty legislature, throughout our *entire temporal period of interest*, that is, 1977–2009.

The Malaysian economy has performed markedly well over the last five decades (World Bank 2011). Successive Malaysian governments engaged in selective state intervention to promote growth via an export-oriented industrialization process, exporting vast amounts of tin, palm oil, oil, and gas. In 1971, the state also adopted the New Economic Policy (NEP), which instituted various types of positive incentives to encourage indigenous Malays—or "bumiputras"—to participate in business in order to dilute the dominance of Chinese entrepreneurs in the private sector (Gomez and Jomo 1999). Today Malaysia boasts a diverse, sophisticated economy. It is a leading exporter of electronics and electrical products and is classified as a middle-to-upper-middle-income country. While Malaysia's market-friendly policies attracted and retained several prominent multinational corporations, the agricultural sector continues to play a crucial role in Malaysia's economy. Indeed, until the mid-1980s, the agricultural sector has been the backbone of its economy, producing agricultural products for domestic consumption, as well as an earner of foreign exchange.

Agriculture contributes significantly to the national gross domestic product (GDP) of Malaysia. It is a major employer, especially in rural areas. In 1990, for instance, more than 22.1% of the total labor force was employed in agriculture-related activities, which decreased to about 15% in 2005. Nevertheless, as recently as 2013, the agricultural sector contributed more than 23% of the total export earnings and has added roughly 7.2% of the gross output to Malaysia's GDP annually over the last two decades. In the agricultural sector, oil palm, rubber, cocoa, and rice have been and continue to be, the major crops grown by the private and publicly owned farms. However, other crops such as coconut, tropical fruits, vegetables, flowers, and cassava are also grown in the country, primarily by small landholders.

Among Malaysian agricultural crops, the oil palm industry occupies a key place in the agricultural section. This rural-based industry has evolved from a mere producer and exporter of crude palm oil (CPO) into a highly diversified entity, creating new downstream industries and supporting a large number of producers. Moreover, over the years, it stood resilient against many challenges and has continued to contribute significantly to the national economy.

Apart from the oil palm industry, rice farming and production continues to occupy the central place in Malaysia's agricultural sector. Total rice production increased from 2.7 tonnes per hectare in the late-1970s to around 4.2 tonnes per hectare by 2006. Perhaps more importantly, over the 1977–2005 period, domestic rice production accounted for an average of 77% of total domestic food consumption per year. Irrigation of other agricultural products such as cocoa, fruits, and cassava has also grown steadily, with these irrigated food products being geared largely toward domestic food consumption. As discussed in the next section, however, successive governments have steadily invested in the agricultural sector. Moreover, unlike many developing countries, Malaysia permits—and consistently receives—foreign agricultural investment. As a result of this diversity and resilience, the Malaysian economy has so far been effectively immune to severe food crises.

Food Production and Urban Development in Malaysia

We showed above that Malaysia was under a nondemocratic regime between 1977 (the first year in which data are available to operationalize our independent variables for this case) and 2009. It is important to note here that during these years and similarly to Indonesia, Malaysia was characterized by a relatively high level of urban development. However, *unlike* Indonesia and Pakistan, Malaysia did not experience a severe food crisis episode during the same period. We thus discuss these key features in more detail, considering their centrality to our empirical analysis of this case.

To illustrate the relative immunity of the Malaysian economy to food crises, we compute the same food volatility data we created for both Pakistan and Indonesia. To this end, Fig. 3 plots annual level of nominal food price volatility for Malaysia over the entire 1977–2009 period, normalized to vary between zero and one. This volatility measure focuses on the annual nominal average price volatility of four main food crops (oil palm, rice, cocoa, and cassava) used for domestic consumption. Similarly to the two measures, volatility is defined as the ratio of the absolute value of the deviation over the trend (calculated using the Hodrick–Prescott filter) for the four aforementioned agricultural products per year for the 1977–2009 period. The data sources used to create this figure are listed in the book's online appendix.

Much like Indonesia—but in contrast to Pakistan—this figure indicates that there is very little volatility in the main staple food prices in Malaysia between 1977 and 2009. There are certainly periodic bouts of relatively high food price volatility, but these are relatively small in scale (about 0.01, compared with 0.3 in Pakistan and 0.4 in Indonesia). The strongest increase in food price volatility (about 0.05) occurred during the financial 1997 financial crisis, which again, is extremely mild compared with the respective variations in Pakistan and Indonesia. Given

Fig. 3 Food (staple crop) Price Volatility (FPV) index—Malaysia, 1977–2009

that nominal food price volatility was rather low in Malaysia during this period, it is hardly surprising that the food price volatility index has a narrow range. Specifically, it ranges from a minimum of 0.2 to a maximum of just 0.27.[34]

Thus, in contrast to both Pakistan and Indonesia, nominal food price volatility remains low throughout the entire 1976–2009 period in Malaysia. At no point does food price volatility increase sufficiently enough as to warrant a policy response or adopt emergency measures. Indeed, the stability of food price volatility in Malaysia over the last four decades is commendable. Considering the almost near absence of high food price volatility from 1977 to 2009, it is not surprising then that there are in effect no episodes of precipitous drops or decline of food output in Malaysia over the same period.

Figure 3 thus suggests that Malaysians—including those residing in urban areas—did not experience a severe negative shock to their food consumption during the 1977–2009 period. This is further emphasized in a recent study which states that, “departing from the experience of other developing economies, including middle-income economies, Malaysia has not till date suffered any bouts of crisis in agricultural output…this has allowed incumbents in the country to achieve the goal of self-sufficient food supplies” (Kamaruddin 2009, 48–49).

Economists have suggested a variety of reasons to explain this strong stability in food prices and thus the absence of food crises (see, e.g., Ariff 1991; Kasim 1992; Kamal 2000). These scholars argue, for instance, that both stable flows of public and foreign investment in the country’s agricultural sector have ensured a “sufficient and steady supply of capital in the agricultural sector which serves to ‘cushion’ this sector against production shocks and hence sustain stability" (Kamal 2000, 172). While discussing the reasons for this food price stability in detail are beyond the scope of this book, it is rather clear that between 1977 and 2009 Malaysia experienced no serve food crises.

Next, we turn to evaluate urban development in the country of the same temporal period. We begin our evaluation in 1977, the first year for which data to operationalize urban development per capita are available for Malaysia. To create this variable, we rely on the same standard and steps used in creating the first two measures. As we did when coding our annual urban development per capita measure for Pakistan and Indonesia, we followed the formula presented in Chapter "Urban Development and Mass Killing: A First Look at the Data" with two main changes. First, instead of using the 0.5-degree grid cell, we relied on the city year as our unit of analysis rather than the 0.5-degree grid cell. Data availability allowed us to code annual variations on this indicator for eight Malaysian cities with a population of 400,000 or more individuals over the 1977–2009 period: Kuala Lumpur, Alor Setar, George Town, Ipoh, Johor Bahru, Kota Kinabalu, Kuala Terengganu, and Petaling Jaya. Second, as was the case with the measure we coded for Pakistan and Indonesia, data on nighttime light emissions were not available during a large part of our temporal period of interest. Accordingly, we similarly relied on electricity provision/supply by household data obtained through sources discussed in the book's online appendix. The annual average of the resulting urban development per capita measure across these eight cities (normalized between zero for the lowest levels of urban development per capita over the period and one for the highest) is reported in Fig. 4.

As Fig. 4 illustrates, urbanization and urban development patterns in Malaysia are largely similar to those of Indonesia (Onn 1986; Okposin et al. 1999). In particular, growth in industrial and manufacturing capacities within Malaysia's urban areas beginning in the late 1970s—and persisting throughout the 1980s, 1990s and 2000s[35]—promoted both rapid migration from rural to urban areas; and the development of transportation and communication infrastructures in the country's major cities, including Selangor, Kuala Lumpur and Ipoh (Ahmad 1999; Milne and Mauzy 1999; Tan and Lee 2008). This generated rapid increases urbanization and urban development over the same period (Ariff 1991; Tan and Lee 2008; Liew 2009). Therefore, it is unsurprising that a recent study of urban development in Malaysia finds that "the urban population

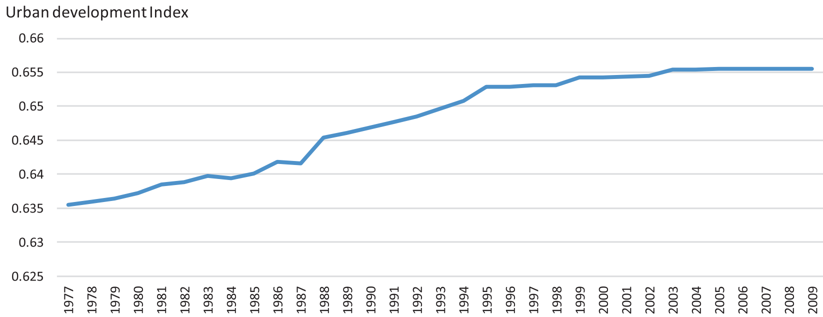

Fig. 4 Urban development (per capita) in Malaysia, 1977–2009

in Malaysia has increased very rapidly after 1970…the annual growth rate of the urban population has increased by more than 5.0 percent"[36] since 1970.

Note that Fig. 4 shows that the moving average of the level of urban development per capita in Malaysia between 1977 and 2009 is substantially high, with a mean of about 0.67 on a zero-to-one scale. An increase in urban development per capita from 1981 to 1985 in noticeable, but, as was the case with Indonesia, this increase is substantively marginal (approximately 0.001 per year); the level or urban development remains at the same level between 1995 and 2009. Thus, we conclude that the level of urban development per capita in Malaysia was, on average, rather high over the entire 1977–2009 period.

These high levels of urban development per capita combined with the lack of a severe food crisis make Malaysia a vital, *contrarian* case for our purposes. Unlike Indonesia and Pakistan, there is no "treatment," neither of sudden rises in urban development (Pakistan) nor food crises (Indonesia). We thus focus on historical analysis of the country, as reported below.

Anti-regime Demonstrations and the *Barisan Nasional's* Response

Malaysia is observed as a single-party "electoral" dictatorship that has been ruled by the BN (an umbrella political party)[37] for the entire 1978–2009 period. While elections to the national parliament are held in the country, there is no effective de facto opposition party in Malaysia and the ruling party—BN—has won all the parliamentary elections between 1978 and 2009, typically garnering more than 75% of the electoral votes in each election (Gomez and Jomo 1999; Case 2010; Tajuddin 2012). As a result, each of the three incumbents (i.e., prime ministers) that have served as the head of government from 1978 to 2009 was party leaders of the BN. More specifically, the three successive incumbents in Malaysia from the BN (hereafter BN) that have ruled Malaysia for the time period in our analysis (1978–2009) are as follows: Hussein Onn (1976–1981), Mahathir Mohamad (1981–2003), and Abdullah Ahmad Badawi (2003–2009).

Apart from being a single-party dictatorship, we emphasized in the previous section that the level of urban development per capita within the country's nine major urban centers is also rather high over the same period. Yet, unlike Indonesia and Pakistan, severe food crises have not occurred in Malaysia during the 1978–2009 period.

Recall, however, that the theoretical argument developed in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States," and especially Corollary 2, lays down the expectation that even in the absence of a food crisis, collective anti-regime protests are still likely to occur in the urban areas if the level of urban development is sufficiently high. Such anti-regime challenges are likely to stem from the lack of political legitimacy of incumbents in nondemocratic regimes and may invite violent retaliatory responses against the civilians by the ruling elite in the form of civilian-targeted killings. However, the magnitude of these killings will be substantively lower compared with the mass killing campaigns that occur in during food crises and in the context of high urban development. How valid are these claims in the case of Malaysia? To answer this question, we examine in detail the microdynamics underlying two historical cases of overt anti-regime mobilization in Malaysia over the 1978–2009 period: the 1986 Sabah Riots and the 2007 Bersih rally.

The Sabah Riots

The Sabah riots took place between March and May of 1986 in Kota Kinabalu, the capital of the Sabah province. They later spread to other towns, mainly Tawau and Sandakan. These protests were directed against the Mohamad Mahathir's autocratic government and, as discussed below, were meant to topple, or at least pressure the Mahathir regime to negotiate with the protesters (Kasim 1992; Milne and Mauzy 1999; Rodan 2013). *Unlike* the anti-regime protests that took place in urban centers in Pakistan and Indonesia—which were sparked by food crises and the inept response by the nondemocratic incumbents these crises—the Sabah anti-regime riots were triggered by an inherent political movement that challenged the legitimacy of the Mahathir regime (see, e.g., Ahmad 1999; Milne and Mauzy 1999; Hwang 2003; Tan and Lee 2008).

Again, numerous studies explore the origins of these riots (see, e.g., Kasim 1992; Ahmad 1999; Hwang 2003).[38] Briefly, the Sabah Riots emerged as a response to the results of the 1985 state election in Sabah. Similar to most so-called national elections that were held in Malaysia before 1985, the BN ruling party won both the national and provincial elections with strong electoral majorities, thereby ensuring that Malaysia remained an electoral dictatorship (Kasim 1992; Milne and Mauzy 1999; Hwang 2003). In Sabah in 1985, however, a minor opposition party called *Parti Bersatu Sabah* (United Sabah Party) won the Sabah state election. In the process, it ousted *Parti Berjaya*, a key regional partner of the ruling BN (Crossette 1987; Milne and Mauzy 1999; Hwang 2003). Once BN and its coalition partner *Parti Berjaya* (PB) were ousted from power, supporters of the BN began to riot on the streets of Kota Kinabalu to challenge the election result that drove the BN and its regional partner, PB, out of office (Crossette 1987; Hwang 2003; Case 2010).

Many observers at the time suspected that BN's supporters engineered the mayhem in Kota Kinabalu in summer 1986 in order to create the impression that *Parti Bersatu Sabah* (United Sabah Party) would not be able to govern the state (Ahmad 1999; Milne and Mauzy 1999; Tan and Lee 2008). The engineering of riots by BN's supporters turned out to be a grave miscalculation as citizens and supporters of the United Sabah Party (USP) residing in Kota Kinabalu perceived the mayhem as a deliberate attempt to undermine the legitimate province election result, which the USP won (Kasim 1992; Ahmad 1999; Milne and Mauzy 1999). As a result, USP supporters in Kota Kinabalu protested not only the legitimacy of the BN's rule in Sabah, but also the legal basis and the political legitimacy of Mahathir's regime in Kuala Lumpur (Crossette 1987; Ahmad 1999; Milne and Mauzy 1999; Hwang 2003).

The civilians also questioned whether Mahathir had "despite his promises, any intention whatsoever to respect the rule of law and the aspirations of the people of Sabah" (Hwang 2003, 112; also see Crossette 1987; Kasim 1992). The fact that the residents of Kota Kinabalu were both frustrated with the violence in Sabah and deeply concerned about the legitimacy of Mahathir's rule was "powerful motivating factors"[39] that eventually drove them to openly challenge the BN's authoritarian grip over political power in the summer of 1986 (Milne and Mauzy 1999; Hwang 2003; Tan and Lee 2008). The residents of Kota Kinabalu and USP supporters specifically challenged the BN's rule by "openly demonstrating against Mahathir and protesting against the constitutional legitimacy"[40] of the BN's control of office (Andaya and Andaya 2001; Hwang 2003). To exacerbate matters further, this open challenge to the BN rule evolved very rapidly into large mass protests against the Mahathir regime in Kota Kinabalu, which persisted from May 1986 to July 1986 (Milne and Mauzy 1999; Andaya and Andaya 2001). These protests were often accompanied by violent riots that targeted installations, buildings, and offices operated by the Mahathir-led national government as well as the BN in the city of Kota Kinabalu (see, e.g., Kasim 1992; Ahmad 1999; Andaya and Andaya 2001). Thus, there was little doubt that by late summer and early fall of 1986, the Mahathir-led BN government was facing a serious challenge to its rule in Sabah (Crossette 1987; Milne and Mauzy 1999; Tan and Lee 2008).

While there are few debates about the causes of the 1986 Sabah protests against the Mahathir regime, policymakers and scholars have noted the spontaneity, scale and "successful coordination"[41] of these protests (see, e.g., Crossette 1987; Roff 1994; Raslan 1996; Rashid 1997; Andaya and Andaya 2001). For instance, a scholar who observed the protests emphasized that for "over three months, the center of Kota Kinabalu was filled with huge mobs of angry protesters who first organized themselves successfully and then demanded that the Mahathir government should leave office"[42] owing to its "irresponsible behavior" toward the people of Sabah (Raslan 1996; Rashid 1997; Milne and Mauzy 1999). A local reporter also pointed out in June 1986 that "the number of people who met regularly and vocally raised their voice against Mahathir's government in Kota Kinabalu was substantial, well organized and could therefore not be ignored"[43] by Mahathir's government (Roff 1994; Raslan 1996; Rashid 1997; Milne and Mauzy 1999).

Although a handful of researchers suggest that the organization of the protests against Mahathir's rule in Kota Kinabalu was driven by deep-held grievances against the BN-dominated government,[44] scholars generally agree that the urban development that took place in Sabah over the 1970s, particularly in Kota Kinabalu, was a crucial factor in driving the successful organization of an overt opposition in the city (Roff 1994; Raslan 1996; Rashid 1997; Milne and Mauzy 1999). A study of political opposition in urban centers in Malaysia claims that "urban growth and development of Kota Kinabalu produced central and highly visible geographic spaces that opposition movements could and did use to mobilize, organize and bring together masses"[45] during times of anti-regime protest (Roff 1994; Rashid 1997; Andaya and Andaya 2001). Researchers who have examined the 1986 Sabah riots also suggest that the "urban concentration of the Sabah riots was no accident….it was, after all, developments in urban infrastructure in Sabah's main cities that enabled forces opposing the Mahathir government to confer, plan and act in unison"[46] against the Mahathir-led government at the center (Sloane 1999; Milne and Mauzy 1999).

More interestingly, as predicted by our theory, Malaysia's Defense Minister in 2010—Ahmad Zahid Hamidi—who also served under Mahathir during the 1980s remarked in an interview that the "growth of phone services that accompanied urbanization in Sabah's cities like Kota Kinabalu, Tawau and Sandakan helped the anti-national, anti-government elements to conspire to openly oppose Mahathir's government and arouse the sentiments of other anti-nationalist elements."[47] Hence, it is hardly surprising that in response to the 1986 riots in Sabah, Malaysia's security forces were quick to cut all phone services within Sabah's cities to prevent the anti-Mahathir protesters from further organizing and mobilizing against the government (Roff 1994; Raslan 1996; Rashid 1997; Hwang 2003).

Finally, scholars have also hypothesized that urban development in Malaysia, including in Sabah, produced a sizable group of educated middle-class and upper-middle-class citizens in cities like Kuala Lumpur, Ipoh, and Kota Kinabalu (Roff 1994; Sloane 1999; Andaya and Andaya 2001; Siong 2008). The concentration of educated middle-class and upper-middle-class citizens who were "acutely aware of political liberalism and the benefits of democracy"[48] was absolutely crucial in fomenting the seeds of anti-regime movements such as the 1986 Sabah opposition (Sloane 1999; Andaya and Andaya 2001; Hwang 2003).

The anti-Mahathir regime protests of 1986 in Kota Kinabalu, Tawau, and Sandakan were viewed by Mahathir and his party as inimical to

Malaysia's sovereignty and as an existential threat to the regime (Sloane 1999; Hwang 2003; Case 2010). Ministers in the Mahathir cabinet such as Musa Hitam (Minister of Home Affairs) and Ghazali Shafie (Minister of Foreign Affairs) were worried that the Sabah riots may create a crisis of governance for the regime, and that this in turn may bring a premature end to the government (Andaya and Andaya 2001, 103–104; also see Roff 1994; Raslan 1996; Rashid 1997). Mahathir Mohamad also suggested in an interview to *The Diplomat* (a prominent Malaysian current affairs magazine) in late June 1986 that the Sabah riots would have to be "quickly bought under control" as it endangered the government and the country's security.[49] Recent research shows that top military officers also emphasized to Mahathir's cabinet that the Sabah riots posed a clear and present danger not just the country's political stability, but to the regime's ability to stay in power (Sloane 1999, 76–77; also see Milne and Mauzy 1999; Tan and Lee 2008). Thus, to resolve the problem, the military advised the Mahathir government to move swiftly and decisively crush the anti-regime elements that were openly opposing the government in Kota Kinabalu and other cities in Sabah (Kasim 1992; Roff 1994; Ahmad 1999; Milne and Mauzy 1999).

The Mahathir regime accepted the military's advice without any hesitation whatsoever. As a result, it launched an operation in late June 1986 to aggressively repress the anti-regime protesters and in Kota Kinabalu, Tawau, and Sandakan in a "desperate bid to establish political control"[50] and preempt threats to its rule (Kasim 1992; Roff 1994; Raslan 1996; Hwang 2003). This operation involved civilian killings and repression, which were designed to intimidate the civilians and deter any future challenges to the Mahathir government (Ahmad 1999; Sloane 1999; Andaya and Andaya 2001). This operation started with a series of mass incarcerations, which targeted citizens and political figures that voiced their opinions on the Mahathir regime openly during the riots. According to one study, "it was estimated that 1763 people were arrested during that period as part of the government's campaign to repress"[51] opposition to its rule.

The violent repression by the Mahathir regime against the Sabah protesters, however, did not merely end with unjustified and unlawful incarcerations. Rather, it quickly evolved into organized civilian killings in Kota Kinabalu and other urban centers in Sabah (Sloane 1999; Ahmad 1999; Hwang 2003; Tan and Lee 2008). Reliable figures on the number of civilians killed in Sabah by the Mahathir regime are hard to procure. But the foreign print media at the time made it quite clear that the Mahathir-led government was undoubtedly engaging in extrajudicial killings and systematically targeted killings of opposition figures as well as civilians in the cities of Sabah who posed a threat to the nondemocratic regime.

For instance, in the fall of 1986, an op-ed in the *Singapore Straits Times* noted that those "who bravely challenged Mahathir's government in Sabah were routinely rounded up, tortured and killed by the country's security apparatus"[52] to ostensibly promote domestic political stability in Malaysia. Another article printed in September 1986 in a reputed foreign business magazine (the *Far Eastern Economic Review*) that focused on the lack of freedom of the print media in Malaysia suggested that the Malaysian government did not permit reporters to go to Kota Kinabalu so that it could "cover-up the mass arrests and routine killings of innocent civilians"[53] that it had committed in the summer of 1986.

Subsequent studies and reports on the violence carried out by the Mahathir regime in the cities of Sabah in 1986 have, for example, stated that "Sabahans were punished with weeks of mayhem that resulted in deaths – because they had exercised their democratic rights."[54] Another study emphasized that in the urban centers of Sabah during the summer of 1986,

> Unjustified shootings, mistreatment and deaths in custody, and excessive use of force in dispersing public assemblies was routine and persisted because of an absence of meaningful accountability for Malaysia's military and police force, the Royal Malaysia Police.[55]

It is important to emphasize here that killings of civilians by the Mahathirregime were not on the same scale as the mass killing campaigns carried out by Suharto in Indonesia during the late 1990s or by Zia-ul-Haq in Pakistan in the mid-1980s. However, as we stated in our second corollary in Chapter "Food Crises, Urban Development, and Mass Killing in Nondemocratic States," we nevertheless expect some violence against protesters will emerge in developed urban areas in nondemocratic states simply because protests are easier to stage in these centers, assuming the right trigger exists. The violence employed by the authoritarian Mahathir-led government and the ruling BN in the cities of Sabah was strategic in nature, even if the levels of the killings were (thankfully) lower (for this, see, e.g., Kasim 1992; Roff 1994; Sloane 1999; Ahmad 1999; Milne and Mauzy 1999).

The Bersih Rally

The word Bersih means "clean" in Malay and is thus refers to the Coalition of Free and Fair Elections. The first Bersih rally that was held in Kuala Lumpur (the capital of Malaysia) in 2007 was essentially a civilian-led movement organized by as many as 84 domestic nongovernmental organizations (NGOs). The protesters demanded that the electoral process in Malaysia would be reformed (see Case 2010, 2011; Tajuddin 2012; Rodan 2013). Numerous studies discuss the causes and main features of the first Bersih rally[56] in Kuala Lumpur in 2007 (see, e.g., Nair 2007; Guan 2008; Gatsiounis 2008; Lee 2010).

The 2007 Bersih rally was formed to demand the resignation of Abdullah Badawi's government (leader of BN). Primarily, it was driven by three main factors. First, after Abdullah Badawi was appointed as prime minister of Malaysia in September 2003, he promised to make changes in his administration and to the electoral process that was always won by the ruling BN party (Weiss 2006; Lee 2010). As a result, the BN won the 2004 General Elections by winning 90.4% of the parliamentary seats in Malaysia's national legislature (Nair 2007; Lee 2010). However, four years into his reign, Abdullah Badawi implements no significant changes to the electoral process, which in effect ensured the hegemonic single-party rule of the BN. This caused immense dissatisfaction among the civilians and become one of the key driving factors of the 2007 Congress (Nair 2007; Guan 2008; Gatsiounis 2008; Lee 2010).

Second, there were long-lasting concerns among citizens in Malaysia about endemic corruption and poor governance by the authoritarian ruling BN (Gomez and Jomo 1999; Weiss 2006; Case 2010, 2011). Prime Minister Badawi had made promises to eradicate corruption and improve governance. Yet, four years after he assumed office, there was little change in corruption levels, especially in the highest ranks of the government (Weiss 2006; Case 2010; Lee 2010). Indeed, numerous corruption scandals shook the government between 2005 and 2007, thereby raising additional concerns that little had improved with respect to corruption and government malfeasance in the country (Weiss 2006; Case 2010, 2011). Hence, it is hardly surprising that complaints about government corruption were another key factor in engendering the anti-government Bersih rally of 2007 (Weiss 2006; Nair 2007; Lee 2010).

Third, the 2007 Bersih rally was also, at least in part, influenced by the earlier sacking of the charismatic BN leader in 1998—Anwar

Ibrahim—who later became a prominent opposition figure (Case 2010, 2011; Tajuddin 2012; Rodan 2013). The organizers of the Bersih rally strongly believed that the allegations of corruption and sexual misconduct levied against Ibrahim (and which were used to sack him) was false and that Anwar Ibrahim would serve as an ideal opposition leader or government official that could make the BN more accountable. Thus, the rally was in part also driven by the desire to reinstate Anwar Ibrahim's political standing (Nair 2007; Guan 2008; Gatsiounis 2008).

The 2007 Bersih rally was also characterized by three intriguing features. First, it was concentrated in *one urban location*—namely the country's capital city of Kuala Lumpur (Nair 2007; Case 2010; Rodan 2013). Second, it was immensely sizeable in order to serve as a show of force, targeted at the Badawi-led government (Nair 2007; Guan 2008; Gatsiounis 2008). Indeed, a recent study about social movements in Southeast Asia pointed out that,

> In the recent BERSIH rally on November 10, 2007, tens of thousands of Malaysians potentially risked prison sentences of up to two years to participate in a rally for electoral reform.

Another study emphasized that, "organisers estimated that between 30,000 and 40,000 people from various races and all walks of life took part in the rally."[57] The sheer scale of the 2007 rally was particularly important given that overt civilian opposition rallies in Malaysia were rather infrequent (Guan 2008; Case 2010, 2011; Rodan 2013).

The third feature of the 2007 Bersih rally was it was an "extremely well organized and effective mass movement" (Gatsiounis 2008, 73; Nair 2007; Lee 2010; Case 2011). Reports in the print media further suggested that the Bersih rally was "highly coordinated" and in effect, consisted of "coordinated activities in Kuala Lumpur and Penang"[58] by independent activist groups in the country (Lee 2010; Rodan 2013).

What explains the high level of organization and coordination that allowed for the overt Bersih protests? As predicted by our theory, evidence strongly suggests that high levels of urban development in Kuala Lumpur are the most important answer (Nair 2007; Lee 2010; Case 2010, 2011). Numerous studies have suggested that the "well developed urban infrastructure of Kuala Lumpur offered several geographic vantage points that the organizers of the Bersih rally could use"[59] to mobilize and bring together large numbers of residents in the city to protest against the Badawi-led government (see, e.g., Lee 2010). This is further confirmed by a report by the *New York Times* (that covered both the first and the second Bersih rally) which suggested that the “Dataran Merdeka Square” in the center of Kuala Lumpur provided the ideal “gathering point” for organizers of the Bersih rally to mobilize large bodies of urban residents to challenge the government.[60]

The availability and accessibility of communication technologies was another aspect of urban development that facilitated successful mobilization. The same *New York Times* report emphasized that, “[m]uch of the publicity for the rally was distributed through online media and blogs… The locations of the gathering points (for)…the protests were spread by word of mouth, mobile phones and emails.”[61] Indeed, Hishamuddin Rais—one of the leaders and key organizers of the Bersih movement—explained in numerous interviews that the organizers of the Bersih rally were able to successfully mobilize large number of citizens to challenge the government precisely because urbanization and rapid urban growth allowed both the organizers and the citizens,

> The use of technology. That means using Facebook, blogs, and social media. That is clear. Second, we hold speeches (*ceramah*). I went all over the country from small meetings to large meetings to campaign this way. For two whole months…we went to big towns such as Johor Bahru, Batu Pahat, and Seremban. Then we went to smaller ones, like Felda. Third is what we call ‘publicity by accident.’[62]

Other analysts have also suggested that the successful mobilization of individuals in the Bersih rally occurred at least partly due to “the diffusion effect of social media”[63] spurred by rapid urban development (Guan 2008; Lee 2010; Rodan 2013). Indeed, other studies find that the high levels of urban concentration in Kuala Lumpur contributed to the successful mobilization of the citizens against the ruling elite (Nair 2007; Lee 2010; Case 2010, 2011; Rodan 2013). Therefore, there is little ambiguity that—as suggested by our theoretical argument—high levels of urban development facilitated organization and coordination, which were necessary for the Bersih rally to take place.

Importantly, this Bersih rally sent a strong signal to Malaysia’s ruling elite that their days in office may be numbered if they did not heed the calls for reform of the country’s electoral system—a key demand of the rally’s organizers (Nair 2007). This seemingly spontaneous and sudden mass mobilization against the Malaysian government—and particularly the country's single ruling party, the BN —made it clear to Badawi's cabinet that the government would "struggle to remain in office if it did not respond positively"[64] to address at least some of the causes underlying the Bersih movement. Put differently, the Badawi regime and more broadly, the incumbent leaders of BN were acutely aware that the overt anti-regime Bersih movement would not end with just this rally and that it posed a clear and present danger to the government's ability to stay in power in the near future (Lee 2010; Case 2010, 2011). As suggested in an op-ed in the *New Sarawak Tribune* in December 2007,

> …The most important lesson that the Badawi government learned from the Bersih rally was that their power in office was not as secure as they thought…a growing realization has dawned among Badawi's cabinet that they may not stay in office for long if they do not make a sincere attempt to meet the demands of the Bersih rally supporters.[65]

How did the Badawi-led nondemocratic regime respond to the popular challenge to its rule posed by the Bersih rally of 2007? Our model predicts that when anti-regime protests occur in urban areas within nondemocracies—even in the absence of a food crisis—incumbents in nondemocratic regimes might respond by some levels of capital violence, although not a sustained mass killing campaign, which we hypothesized, occurs in the context for anti-regime riots provoked by a food crisis. The response by the Badawi-led regime to the 2007 Bersih rally, however, does not fully corroborate this prediction. While the Badawi government did openly criticize the movement,[66] they took four main steps to address at least some of the main critiques raise by the Bersih rally.

First, Badawi's cabinet relaxed restrictions against the media by allowing more privately owned firms (both print and television) to operate (Lee 2010; Case 2010; Abbott 2011). This was an important step as the media had been tightly regulated and controlled by the state for more than four decades (Nair 2007). Second, the Badawi-led government allowed public protests, even those that targeted the government, which were previously banned in Malaysia (Nair 2007; Lee 2010; Abbott 2011). By doing so, Prime Minister Badawi, has "loosen the reins of power just enough to suggest his administration was becoming more responsive to citizens' democratic aspirations."[67]

Third, a few months after taking office, Badawi embarked on a high-profile anti-corruption campaign and canceled one of Mahathir's most cherished pet projects: the $3.7 billion cross-Malaysia railroad project, Malaysia's largest infrastructure program, whose contract had been awarded to a Mahathir crony (Guan 2008; Lee 2010; Case 2011). This was an important step given that concerns about corruption at the highest levels of government was one of the key factors that galvanized the Bersih movement of 2007. Fourth, senior political figures, now free from prison, served as a catalyst of protests. For instance, "the release from prison of former Deputy Prime Minister Anwar Ibrahim, who marshaled street protests against Mahathir in 1998 and was subsequently arrested and sentenced to prison" served as a strong motivator for protest.[68] As a result, "Abdullah (Badawi) has buoyed his popularity by avoiding Mahathir's penchant for belligerently berating his political rivals."[69]

In short, unlike nondemocratic incumbents in Pakistan and Indonesia, the Badawi government in nondemocratic Malaysia adopted a more conciliatory approach in dealing with the anti-regime 2007 Bersih protests in Kuala Lumpur. This should not be taken to mean that no violence against civilians took place. For instance, a report released by Human Rights Watch in 2008 suggested that police-led violence against the Bersih protesters was brutal and substantial, and that "police officers also kicked and beat at least seven people."[70] There was also a substantial amount of incarcerations of protesters at Bersih although many of these protesters were released shortly (Nair 2007; Guan 2008; Lee 2010). However, it is important to note that violence in 2007 was significantly lower than 1986, and that in both cases the scale of the killings was much lower than that observed in developed urban areas in Pakistan and Indonesia during food crises.

Conclusion

In this chapter, we conducted a thorough mixed qualitative and quantitative of authoritarian Indonesia, and a detailed historical analysis of nondemocratic. A key similarity between these two cases is the fact that both were characterized by relatively high levels of urban development per capita over their respective nondemocratic regime spells. However, unlike Malaysia, which experienced no food crises over the 1979–2009 period, Indonesia did experience food crises—which involved severe food shortages—in the mid-1990s. In both cases, as well as in the Pakistan case, high levels of urban development facilitated the ability of urban residents to undertake collective action against the ruling elite by. In particular, high levels of urban development generated a set of positive externalities, e.g., relatively well-developed communication networks in both aforementioned Southeast Asian countries.

An important consequence of this urban development is in fostering coordination and facilitating organization capacity among urban civilians who harbored strong anti-regime sentiment in both countries. However, in Indonesia, this anti-regime resentment and urban capacity were complemented by a number of severe food crises. This provided a strong incentive for mass civilian mobilization, which posed a severe challenge to Suharto's rule. In contrast, opposition to the BN's grip on power in Malaysia involved lower levels of mobilization. Indeed, the analysis of both Indonesia and Malaysia also revealed how central food crises are to the probability of a state-led mass killing campaign in nondemocratic regimes. As the analysis of Indonesia illustrates, the combination of high urban development and severe food crises repeatedly led to serious and effective opposition to Suharto within the country's developed urban areas. This, in turn, generated violent reprisals against civilians by the Suharto regime, which included high levels of civilian killings.

In contrast, although regime-sponsored repression did occur in Malaysia in response to domestic opposition against the authoritarian regime, such repression did not reach the scale and scope of the mass killing campaigns employed by Suharto in Indonesia. Thus, the evidence from the three country case studies presented in this chapter, and Chapter "Urban Development, Food Shortages and Mass Killing in Authoritarian Pakistan" strongly suggests that food insecurity engendered by sudden sharp drops in crop output combined with the lack of ability or will on the part of autocrats to make credible promises *ex ante* to resolve these issues can cause escalating levels of violence. Such violence is much more likely when exogenous conditions, resulting from high urban development per capita levels, facilitate collective mobilization against autocrats Nevertheless, it is important to emphasize that due to the contextual of our theory and analysis, this book also has some potentially important limitations. In the next chapter, the conclusion, we discuss some of these limitations. We also explore some theoretical and practical implications of our findings to the field's current understanding of the politics of mass killing in nondemocratic regimes.

Notes

1. As estimated by the IMF in 2015, the size of the Indonesia's economy in nominal GDP terms is US$560 billion, while the size of Pakistan and Malaysia's economy is US$1.6 trillion and US$1.3 trillion, respectively.
2. Due to space constraints, the sources used to compile this figure are listed in the book's online appendix.
3. The food price volatility index illustrated in Fig. 1 does not change substantively when we use another commonly used measure of food price variability such as the standard deviation of returns in nominal prices of these six main staples (this "return" is measured as the difference in the logarithm of prices for these six crops from one year to the next).
4. Food and Agricultural Organization (FAO). 1998. "Drought and Financial Crisis Leave Indonesia Facing Record Food Deficit," New York: United Nations, FAO, see http://www.fao.org/NEWS/GLOBAL/GW9810-e.htm.
5. Data to create this measure were available from 1976 onward.
6. Hence, in terms of our city year analysis, P_i is the total residing population for each city year (this is for the cities in our Indonesia city year sample), and l_i provision/supply of electricity per household for each city year (again, this is for the cities in our Indonesia city year sample).
7. "Editors' Note," Indonesia 25 (April 1978) (Ithaca, NY: Cornell Modern Indonesia Project), p. 151.
8. "White Book of the 1978 Students' Struggle," Indonesia 25 (April 1978) (Ithaca, NY: Cornell Modern Indonesia Project), pp. 151–182.
9. Also see Widodo (1988) and Murphy and Welsh (2008).
10. For more details, see Ramage (1995) and MacFarling (1996).
11. For this claim, see, for instance, Prasetyo and Hasibuan (1996), Bhakti (2004), and Hidayat (2008).
12. Ramage (1995, 34). For more discussions on this, see, e.g., Cribb (1995) and Hidayat (2008).
13. There exists a long-standing debate on how many civilians in East Timor was killed by Indonesia's military forces from 1977–1978 to around 1993. Some suggest that the number is around 50–60,000 while others suggest a much higher number of at least 110,000 (see, e.g., Cribb 1995; Hill 2002; Vickers 2005; Ulfelder and Valentino 2008).
14. Pontianak is located in the province of West Kalimantan and is the provincial capital.
15. More specifically, Tangerang is located in the province of Banten in West Java.
16. For more details on this, see the IMF program for Indonesia in https://www.imf.org/external/np/loi/101998.htm.
17. For this claim, see, for example, Robison (1990), Mulder (1996), Philpott (2000), and Tanuwidjaja (2010).
18. Also see Philpott (2000) and Vickers (2005).

19. See “Rising Prices and Protests in Indonesia’s Cities,” *Kompas*, op-ed, 23 April 1998, p. 11.
20. Rini Winardi, “Indonesia’s Future Hangs in the Balance,” *The Jakarta Post*, 27 January 1998, p. 7.
21. Siti Haridiyanti, “Confronting the Government in Jakarat,” *Kompas*, 12 March 1998, p. B.2.
22. Cited from “Suharto Pledges to Quit, but Clings to Power Military Backs Indonesian Dictator’s Call for Orderly Transition,” World Socialist Website, 19 May 1998, see https://www.wsws.org/en/articles/1998/05/ind1-m19.html.
23. Mark Landler, “Unrest in Indonesia: The Overview; Indonesian Capital Engulfed by Rioting,” *The New York Times*, 15 May 1998, see http://www.nytimes.com/1998/05/15/world/unrest-in-indonesia-the-overview-indonesian-capital-engulfed-by-rioting.html?mcubz=1.
24. Ibid.
25. Ibid.
26. Also see Philpott (2000) and Tanuwidjaja (2010).
27. Additionally, see Boudreau (2004) and Bhakti (2004).
28. For more details on civilian-targeted killings perpetrated by the Indonesian military in the country’s cities in especially 1998, see, for example, Turmudi (2004, 2007), Vickers (2005), and Sidel (2006).
29. These cities were chosen as the focus of analysis due to their large size, importance, and data availability.
30. The augmented Dickey–Fuller test and the Phillips–Perron test strongly rejected the null of a unit-root process for the within-city “food price volatility” measure in Indonesia.
31. This result remains robust when the negative binomial models are each estimated with city and year fixed effects.
32. The results are robust to the use of higher thresholds: 75, 100, 125, and 150 deaths.
33. See Ariff (1991) and Economic Planning Unit, Prime Minister’s Department. “Eighth Malaysia Plan, 2001–2005.” Kuala Lumpur: Government Printers, 2001.
34. The food price volatility index illustrated in Fig. 3 does not change substantively when we use another commonly used measure of food price variability such as the standard deviation of returns (measured as the difference in the logarithm of prices for these six crops from one year to the next) in nominal prices of these four crops.
35. For example, between 1970 and 2004, the number of urban dwellers in Malaysia went from 2.96 million to 16.44 million (Ahmad 1999; Tan and Lee 2008; Liew 2009). Migration accounted for 40% of urban growth in Selangor and Kuala Lumpur (Ahmad 1999; Milne and Mauzy1999). The inflow of migrants from the rural to the urban areas accounted for about

30% of urban population growth in Malaysia from the 1970s to the early 2000s (Ariff 1991; Tan and Lee 2008; Liew 2009).

36. Usman Yaakob, Tarmiji Masron, and Fujimaki Masami, 2011. "Ninety Years of Urbanization in Malaysia: A Geographical Investigation of Its Trends and Characteristics." Working Paper, Section of Geography, School of Humanities, Universiti Sains Malaysia, p. 94.
37. The BN is in effect a national right-wing political party that was founded in 1973 and which in turn has evolved into a coalition of (largely) right-wing and center parties. It is, however, primarily comprised of *United Malays National Organisation* (UMNO), the Malaysian Chinese and the Malaysian Indian Association, and (more recently) a few regional parties. Overall, however, the BN is an umbrella right-wing political party that has ruled and continues to rule Malaysia over the last four to five decades.
38. Furthermore, see Ariff (1991), Gomez and Jomo (1999), Slater (2009), and Tajuddin (2012).
39. Kamal Amaruddin, "How Can the Mahathir Government Resolve the Sabah Imbroglio?" *New Strait Times*, 23 May 1986, p. 6.
40. Ibid.
41. Ibid.
42. Roff (1994, 179).
43. Noor Zafira, "Challenging the Government in Kuala Lumpur," *New Sabah Times*, 10 June 1986, pp. 1–2.
44. For this viewpoint, see, for example, Gomez and Jomo (1999), Andaya and Andaya (2001), Hwang (2003), and Tan and Lee (2008).
45. Siong (2008, 17). For more details on this, also see Rashid (1997), and Rodan (2013).
46. Drawn from Shamsul (1988, 193). Additionally, see Roff (1994), Rashid (1997), and Hwang (2003).
47. Cited from interview of Ahmad Zahid Hamidi in Awanis Abdullah, "Protecting Malaysia's International Security," *The Borneo Post*, 29 March 2010, B.2.
48. Siong (2008, 22).
49. See Interview of Mahathir Mohamad in Nazrul Anwar, "Tackling the Problem in Sabah," *The Diplomat*, 17 June–30 June 1986 Issue, 18–19.
50. Milne and Mauzy (1999, 203). For more details about this operation, see Andaya and Andaya (2001) and Tan and Lee (2008).
51. Milne and Mauzy (1999, 203–204). Also see Ahmad (1999), Sloane (1999), and Andaya and Andaya (2001).
52. "Reacting to the Demand for Rights in Sabah," *Singapore Strait Times*, op-ed, 21 August 1986, p. 8.
53. Suhaini Azna m, "What Is Fit to Print?: Mahathir Attacks Foreign Press Which He Says Is Against Him," *Far Eastern Economic Review*, 4 September 1986, p. 13. Also see Philip Bowring, "No Dilemma About

Mahathir's Directions: Power to the Center," *Far Eastern Economic Review*, 14 April 1988, p. 23.

54. Justin Sunam-Wong, "The Silent Riot," *Loyarburok*, 24 January 2013, see http://www.loyarburok.com/2013/01/24/silent-riot/. Furthermore, see Kasim (1992), Ahmad (1999), and Sloane (1999).
55. Andaya and Andaya (2001, 117). See also Ariff (1991), Gomez and Jomo (1999), and Tajuddin (2012).
56. Three additional anti-government Bersih rallies have been held (all in Kuala Lumpur) in 2011, 2014, and 2016. We only focus on the 2007 rally as our analysis of the Malaysian case ends in 2009.
57. Cited from "What You Need to Know About Malaysia's Bersih Movement?" *The Straits Times*, 27 August 2015, see http://www.straitstimes.com/asia/se-asia/what-you-need-to-know-about-malaysias-bersih-movement.
58. Manuel Höller-Fam, "Malaysia's Civil Society in Light of the Bersih Movement," HBS South-East Asia, 16 December 2015, see https://th.boell.org/en/2015/12/16/malaysias-civil-society-light-bersih-movement.
59. Guan (2008, 61).
60. See Liz Gooch, "Thousands of Malaysians Rally for Changes to Elections," *The New York Times*, 9 July 2011, see http://www.nytimes.com/2011/07/10/world/asia/10malaysia.html?mcubz=1.
61. Ibid.
62. Cited from Interview of Hishamuddin Raisin in Khoo, Y. H. (2014). "Mobilization Potential and Democratization Processes of the Coalition for Clean and Fair Elections (Bersih) in Malaysia: An Interview with Hishamuddin Rais." *Austrian Journal of South-East Asian Studies*, 7(1), 114.
63. Carmen Leong, "Malaysia's Bersih Movement Shows Social Media Can Mobilise the Masses," 26 August 2016, see http://www.globalpolicyjournal.com/blog/26/08/2016/malaysia%E2%80%99s-bersih-movement-shows-social-media-can-mobilise-masses.
64. Guan (2008, 67). Further, see Nair (2007) and Leong (2016).
65. "Lessons from the Bersih Movement," *The New Sarawak Tribune*, 14 December 2007, p. 7.
66. See, for example, Lee (2010) and Leong (2016).
67. Smeltzer and Paré (2015, 132).
68. Citation from: "Malaysia Under Prime Minister Abdullah Ahmad Badawi (Facts and Details)," see http://factsanddetails.com/southeast-asia/Malaysia/sub5_4a/entry-3629.html.
69. Ibid.
70. Human Rights Watch, "Malaysia: Investigate Use of Force Against Peaceful Rally," 15 November 2007, see http://pantheon.hrw.org/legacy/english/docs/2007/11/15/malays17345.htm.

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Conclusion

Summary of Findings

This book sought to explain why and when nondemocratic states perpetrate mass killing campaigns against their own citizens. Focusing on two actors, the authoritarian elite and the civilians living under its rule, we hypothesized that a major incentive for the former to perpetrate mass killing might occur during severe food shortages. We also posited that this violence is more likely to arise in developed urban areas, because in these locations the civilians are more able to pose a serious and sustainable threat to the regime. While higher urban development levels give the civilians the ability to wage an effective campaign, the occurrence of a food crisis—among other shocks—gives them the willingness to mobilize. Thus, in large cities, protests and riots in the wake of a food crisis are a highly credible threat to the regime's ability to stay in power. The regime is thus significantly more likely to wage a mass killing campaign in these areas to prevent protests and demonstrations from gaining momentum and becoming a serious threat.

To explore these theoretical dynamics, we created a formal model that incorporates the role of food production and localized material capability. Using this mode's equilibrium results, we generate several comparative static Propositions that reflect the different mechanisms at play in nondemocracies. In the first stage, the model shows that—unsurprisingly—when a food production shock occurs, the civilians' consumption levels sharply decrease. We draw on anecdotal evidence and extant

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research to show that nondemocratic elites not only often lack the ability or the will to address the effect of these shortages on consumption, but also that they are likely to continue their rent extraction activities during these shortages. We termed this phenomenon broadly as "food production crisis" or more simply "food crisis."

The second stage of the model then examined the range of civilian responses to such food crises. Our second comparative static results show that in many cases the civilians are unable to mobilize against the regime to depend on effective responses even during a food crisis because they lack the material or social capabilities to do so. However, we also found that when such material or social capabilities are available, then the civilians become much more likely to successfully mobilize and protest. Building on extant research, we decided that a very effective way to model such capacities is using development levels in urban areas and their distribution over the population residing in these locations. Thus, we theorized that more mobilization and a higher frequency of anti-government protests are more likely in regions within nondemocratic countries where urban development per capita levels are relatively high (i.e., above a certain, unobserved threshold), and especially during crisis, specifically—for our purposes—a food crisis, which gives the civilians the *willingness* to mobilize.

The third part of the model analyzed the spectrum of regime responses to food crises and civilian mobilization in urban areas. We showed that while the regime can choose between providing different levels of concessions and implementing different levels of repression, the civilians' greater capacity to pose a threat in developed urban areas strongly constrains the regime's response. This threat pushes the authoritarian regime to strongly prefer implementing mass repression, its most extreme variant being mass killing, in developed areas if a sudden (food) crisis occurs to demonstrate its credible ability to take punitive action, offset the costs of using "lesser" forms of violence, and disperse the civilians, thus harming their social cohesion and reducing their material capabilities. We also identified two situations where mass killing will not occur, namely when food crises occur but where urban development per capita levels are relatively low, and where urban development levels are high but when no food crises occur (although in this case violence is still likely in response to other potential triggers).

The rest of the book was dedicated to evaluating these hypotheses and the main mechanisms postulated by our theory. In Chapter "Urban

Development and Mass Killing: A First Look at the Data," we conducted a high-resolution cross-sectional analysis examining the propensities of different areas within nondemocratic countries to experience mass killing by state forces. We discussed theories of urban development and showed the different steps taken to derive our urban per capita variable. We then tested whether localized mass killing is more likely in (i) urban, (ii) developed urban, and (iii) higher urban development per capita, areas, accounting for a large number of controls measured at both the 0.5-degree number of controls measured and the country levels.

In Chapter "Statistical Analysis of Food Crises and Mass Killing," we added the second part of our interactive hypothesis, food crisis, into the model. We rely on a large body of research into food price volatility and climatic variations to derive three distinct indicators of food crisis and illustrate that all three have a statistically significant and strong substantive impact on increasing the probability of state-led mass killing in more developed urban areas. Chapters "Urban Development and Mass Killing: A First Look at the Data" and "Statistical Analysis of Food Crises and Mass Killing" thus validate our general hypothesis on a high-resolution, cross-national sample. However, due to the granular nature of these data and limited information availability on specific factors, we are unable to validate the specific mechanisms at work in these contexts.

We use the remaining two chapters to do that. In Chapter "Urban Development, Food Shortages and Mass Killing in Authoritarian Pakistan," we conduct a combined qualitative and quantitative analysis of urban development, food crises, anti-government demonstrations, and mass killing in Pakistan. We rely on a large number of primary and secondary sources to examine in detail, from a historical perspective, how these factors interacted in this country during two distinct authoritarian regime spells. Considering that the variation in urban development levels in Pakistan provides us with a quasi-natural experiment—by increasing from low to high levels during the early 1980s—we also analyze urban development and food trends in Pakistan over the last four decades to show whether these support our argument. Finally, we use original data on 12 cities in Pakistan to quantitatively evaluate the two specific mechanisms hypothesized by our model's second and third propositions, namely that food crises in cities with higher urban development per capita levels should increase (i) the frequency of anti-government demonstrations and (ii) mass killing by the regime.

We begin Chapter "Food Riots, Urbanization and Mass Killing Campaigns: Indonesia and Malaysia" by repeating the same analysis for Indonesia. The Indonesian case provides us with a second quasi-natural experiment, only this time it is the occurrence of food crisis that provides the "treatment" variable, while urban development per capita levels are constantly high over the entire nondemocratic regime spell. In the second part of this chapter, however, we turn to analyze a corollary case, that of nondemocratic Malaysia. The Malaysian case is interesting because over the last four decades urban development levels per capita trends in the country were relatively high, but it also did not experience any severe food crises over the period. Using historical process tracing, we show that, as suggested by our theory, at least in one case, severe regime repression—including targeted killings—did occur in the country in response to anti-government protests, although this violence never deteriorated into full-scale mass killing. However, we also found that, interestingly, more recent and more substantive protests—which, again, arose without the occurrence of a food crisis—were met with concessions rather than repression. The findings of the Malaysian case are thus instrumental in that they highlight the importance of food crises in generating grave threats to the regime, and correspondingly mass killing; in their absence, regime violence levels were noticeably lower.

The rest of this conclusion revolves around four themes. We first discuss this book's theoretical and empirical contributions, especially in respect of the reliance on high-resolution data, which allows us to evaluate cross-nationally how violence varies *within* nondemocratic countries. We then elaborate on the policy implications of our analysis, as well as our findings' contribution to extant research on repression, mass killing, civil disobedience, and economic development. In the third section, we discuss potential extensions of this research, including future directions of analysis and how it can relate to other research on economic and political crises. Finally, we conclude with a brief illustration of how our findings can be used to *forecast* political violence.

Theoretical and Empirical Contributions

Our findings have a number of important implications for the study of repression, civil disobedience, and mass killing. Anecdotal narratives, historical analyses, and the quantitative empirical evidence suggest that in nondemocratic countries, more developed urban areas should attract a substantive degree of violence by the regime, especially during food crises. In recent decades, the study of mass political violence by the state and its operatives has benefited from numerous studies that emphasize the strategic logic behind mass political violence (see, e.g., Straus 2015; Valentino 2004; Valentino et al. 2004; Kalyvas 2006; Poe and Tate 1994; Fjelde and Hultman 2014). Other studies provided useful explanation for regime survival and repression by autocratic regimes (see, e.g., Geddes et al. 2014; Davenport 2007a; Wallace 2013; Chenoweth and Stephan 2011).

Importantly, specific geographical patterns of violence within autocracies are also empirically understudied (Davenport 2007b; Balttman and Miguel 2010). These contributions represent an important step forward in advancing our understandings of repression, mass killing, and the factors governing their variation, especially in respect of development, urbanization, and sudden economic shocks. However, as we mentioned in the introduction, the vast majority of these arguments suffer from a level-of-analysis problem. Specifically, these studies are either focused on the country level, which means they do not capture how violence varies *within* the state; or they are too theoretically and empirically focused on dynamics occurring at the microlevel, which limits their ability to draw inference into a wide variety of cases and contexts.

Our main contributions to this impressive research are threefold. First, we create a theory that, while being focused on microlevel dynamics of violence, also has testable macrolevel implications. From a microlevel perspective, we first build on existing studies mentioned earlier (e.g., Tilly 1971, 1978; Wallace 2013) by acknowledging that civilians in nondemocratic regimes are likely to face collective action problems when seeking to challenge the ruling elite in the context of crises such as food crisis. But our theory clearly identifies a key factor—namely high levels of urban development per capita—and posits a clear set of mechanisms that explain why and how this factor facilitates anti-regime collective action by civilians in nondemocracies. As such, this is important considering that extant studies to our knowledge have not theoretically focused on how urban development may facilitate collective anti-regime mobilization by civilians in nondemocracies. Our microlevel theoretical analysis also led us to argue that efforts to understand violence used by brutal regimes should take into consideration the importance of urban areas and their high sensitivity to food crises and—consequentially—to threats faced by the nondemocratic elite. This is consistent with previous research that suggests that the killing of civilians that accompanies repression is likely to be aimed at centers of political power (see, e.g., Franz and Taylor 2014; Kalyvas 2006; Koren 2017a). Yet, our microlevel focus allows us to also systematically explain *why and how* negative consumption shocks engendered by the food crisis concatenate with urban development levels to generate *credible* threats to the regime. Focusing on interactions between the regime and the civilians using game-theoretic tools yields a rigorous explanation for mass state violence that was also subject to comprehensive empirical evaluation.

The mixed-methods approach that we adopted in analyzing the cases of Pakistan and Indonesia and the historical analysis of Malaysia verifies these theoretical linkages and, importantly, the specific mechanisms at work via detailed process tracing. Combined with our game-theoretic model, we are thus able to offer a well-backed explanation of how violence might arise endogenously within nondemocratic countries in the wake of an exogenous shock. Importantly, we are also able to test the viability of these microlevel findings across a large number of countries by focusing on the expected macrolevel outcome: mass killing. Here, the reliance on a global 0.5-degree-resolution grid provides a major advantage. Our microlevel theory identifies specific contexts where food crises can generate violence under the right conditions: in areas with more urban development per capita within nondemocratic countries. Using our high-resolution grid data, we are able to test how this contextualized dynamic of violence compares with other areas within nondemocratic states, urban or rural. We focus on the geographical manifestations of specific types of political violence by state forces, and how these relate to theoretical expectations. In doing so, we unpack how some specific features of nondemocratic regimes that may vary over time and space, such as urban development levels and economic production, as well as factors that might hinder state access such as mountains and distance from centers of power, impact civilian victimization and other human rights violation globally.

Second, focusing on geospatial variations in violence allows us to generalize our theory about the causes of mass killing to contexts that do not involve civil war. By viewing elite behavior as a by-product of their autocratic nature or the conditions of war, many studies on the causes of political violence, and especially mass killing, provide relatively few insights into why mass killing occurs at specific moments or particular locations. The focus on civil war, which is fought primarily in rural areas

(Kalyvas 2004), also means that these studies often ignore how features specific to urban areas might also attract significantly higher levels of violence. Granted, civil war is an especially strong motivation for mass killing, and as a result, we made sure to account for it empirically, both in our cross-national models and in our case studies.

The findings that a large portion of this most extreme form of violence, mass killing, transcends civil war contexts have both theoretical and normative implications. Theoretically, it points to the fact that some types of social conflict short of civil war—such as civil disobedience, protests, and riots—are as strong as determinants of mass violence by the nondemocratic regime if the latter comes to view them as a similarly dangerous threat. Indeed, according to extant theories of strategic targeting, mass killing in these contexts should be especially unlikely considering that violence frequently “backfires” on the regime, hastening its removal (Stephan and Chenoweth 2008). By showing that mass killing can arise *endogenously* in urban areas with high levels of development per capita if the right opportunity, conceptualized here as a food crisis, occurs, we are able to explain this seemingly illogical pattern, while still relying on the strategic violence approach.

Third, while in this book we use sudden, negative decreases in food output to conceptualize an exogenous shock, our theory and analysis can be readily expanded to incorporate other conceptualizations. For instance, inflation crises have been shown to generate mass mobilization and regime change in numerous Third-world countries (Gasiorowski 1995), which suggests that—assuming that a nondemocratic regime comes to view these protests as an existential risk—the interaction of rapid inflation and urban development can be another important cause of violence.

This book also has implications for scholars studying the effect of climatic variations, especially in respect of food availability and access, and social conflict. Recent research into the relationship between climatic variability and conflict identifies factors such as prolonged heat waves and droughts with a higher frequency of conflict and violence (see, e.g., Burke et al. 2009; Miguel et al. 2004; Bagozzi et al. 2017; Van Uexkull et al. 2016). However, some scholars rightfully highlight the potential pitfalls of placing too much responsibility for conflict and political violence, with all their complexities, on broad climatic trends (see, e.g., Buhaug et al. 2014). Thus, as we argue repeatedly in the book, our findings, especially when drought-based variables are used to approximate food crises, should not be taken to argue that negative rainfall shocks and their associated effects *uniformly* drive the risk of violence. Nor do we claim that droughts are a *universal* cause of the violence. Indeed, we echo the warning advanced by Buhaug et al. (2014) that making such brushstroke argument can lead to problematic interpretation of the true causes of conflict.

Yet, we do believe that completely ignoring the potential effect of climatic variations would be a case of throwing out the baby with the bathwater. Indeed, as we have shown repeatedly throughout this book, anecdotal accounts and primary sources offer ample evidence that naturally occurring droughts can generate incentives for violence *under the right conditions.* The theory and analyses advanced in this book identify one specific context where droughts can generate violence, by creating a strong incentive for mobilization and violent regime response: in highly developed urban areas. This finding is in line with previous studies that link naturally occurring or manmade variations in food availability to protests and riots in large urban areas (see, e.g., Hendrix and Haggard 2015; Bellemare 2015; Weinberg and Bakker 2015; Tilly 1978). Our main contribution in this regard is in drawing a direct linkage between the effect of variations in food availability (due to climatic or financial reasons), large urban areas, food riots, *and mass killing by the state*. Thus, our theory and analysis are in line with Theisen, Gleditsch, and Buhaug's contention that "more work needs to be put into the geographical disaggregation of the effects of climate change since these effects will not follow national boundaries," especially considering that "[a]ctors and agency tend to be vaguely portrayed, or outright ignored, in the relevant empirical literature" (2013, 621–622).

Finally, our analysis also has implications for research concerned with economic development and development policy advanced by institutions such as the World Bank, OECD, and UNHCR, as well as nongovernmental organizations such as Human Rights Watch and Amnesty International. Our finding regarding linkages between development, violence, and food policies suggests that these policy analyses should be cognizant that the expansion of infrastructure and the opening of nondemocratic regimes to free markets, which are generally viewed as positive, can also have strong negative impact. Indeed, these policy implications are so important that we discuss them in detail in the next section.

Policy Lessons and Broad Implications

Our main finding that food price volatility and droughts concatenate with rising levels of urban development to increase the prospects of state-led mass killing campaigns not only has numerous broad substantive implications, but also provides us with three main valuable policy lessons. First, numerous studies that have examined the link between food insecurity and violent conflict[1] have suggested that designing domestic food price stabilization measures and social safety nets is absolutely vital for prevention of domestic civil conflict generated by exogenous food price shocks (e.g., Kahl 2006; McGovern 2008; Hendrix et al. 2009). This is emphasized by Brinkman and Hendrix (2011, 2) who state that, "[f]ood price stabilization measures and safety nets are critical instruments to prevent violent conflict. Food assistance can contribute to peace-building, restore trust in governments and rebuild social capital." Our findings are indeed in line with these policy recommendations, but they also suggest that governments in *especially nondemocratic regimes* need to do much more than simply establish food stabilization programs and safety nets. Given that the ruling elite in nondemocracies is rarely politically accountable, we believe that such regimes should also design formal domestic economic and political institutions that allow them to make credible promises to citizens *ex ante* to stabilize food supplies in the event of food crises.

This is important considering that in countries such as Indonesia and Pakistan (two cases we examined in great detail) often do have food stabilization programs in place.[2] But authoritarian incumbents are still unable to either provide credible promises to replenish consumption during times of severe food shortages, or convincingly demonstrate to their citizens that are resolved to solve the crisis. Thus, we believe that it may be worthwhile for nondemocratic regimes to establish a politically autonomous bureaucratic body—a good example of this is the Food Corporation of India (FCI), an example of an instrument founded by a more accountable government. This bureaucratic body should have sufficient institutional resources and political independence to stabilize domestic food prices, distribute food in a timely manner, and even devise solutions to help boost crop output during food shortages. Having such an organization at the regime's disposal provides the institutional mechanism to credibly signal to domestic audiences that the regime is making efforts to stabilize food prices and provide sufficient food supplies during a food crisis.

Another institutional design option is to *co-opt* domestic citizens, or even opposition figures, making them an integral part of the policy-making process to solve the problems associated with diminishing food supplies and consumption during periods of crises. This can be done in numerous ways. One possible route is to allow the civilians to organize and set up grassroots welfare or relief organizations to assist the government during a food crisis. An alternative option is to allow citizens to *directly participate* in crisis management under the regime's institutional confines to assist in relief and welfare efforts when food crises occur. Doing so may also help the ruling elite to credibly signal its intentions to resolve the consumption problems, the main burden of which is carried by the civilians, when food price volatility increases sharply or food output falls drastically due to natural causes.

Second, in addition to domestic institutional designs, it may be necessary for international economic institutions such as the World Bank and the International Monetary Fund to financially assist nondemocratic states (e.g., via concessionary loans) in situations where food price volatility sharply increases or food output substantially diminishes. Doing so serves two purposes. It provides ruling elites in nondemocratic states with the necessary *financial capacity* to address the serious challenges that emerge during a food crisis. Providing direct financial support can be critical in helping nondemocratic regimes to engage in (food) consumption smoothing, thus preventing overt anti-regime opposition.

Moreover, once an authoritarian incumbent agrees to receive assistance from international financial institutions, they might find that "their hands are tied" with respect to both financial and food-aid relief efforts. The fact that they become de facto committed sends a credible signal to domestic citizens, illustrating the regime's resolve to address the food crisis and "smooth" consumption.[3] Note that our focus on the potentially important role of international financial institutions differs from the arguments made by other scholars who argue that international development and aid organizations should assist developing states during times of food insecurity (see, e.g., Von Vraun 2008; Brinkman and Hendrix 2011). Indeed, unlike these studies, we strongly believe that international financial institutions have the material resources to adequately support nondemocratic regimes financially during a food crisis, and the necessary institutional leverage to bind the elite, forcing it to genuinely try and resolve the conflict.

The third policy implication we identify is that both researcher and policymakers should be cognizant of the critical role played by international security institutions such as the United Nations and NATO, as well as by powerful states such as the USA, during food crises in non-democratic countries. Severe food crisis episodes that generate spontaneous challenges to the authoritarian regime by domestic citizens should be viewed with concern to the latter's safety by international security organizations and the international community more generally. As we show in this book, such overt anti-regime mobilization in relatively urbanized nondemocratic states can serve as a potential trigger for violent state repression and can rapidly deteriorate into systematic mass killing campaigns. We thus suggest that international security organizations and powerful state actors should develop a set of guidelines on how to address the potential and grave human security implications of overt civilian mobilization in nondemocratic countries in the wake of a food crisis. With such guidelines in place, international organizations will be able to respond with alacrity if and when the ruling elite in nondemocratic states reacts violently to such sudden domestic challenges. Taking concrete steps in this direction can help preventing or preempting repression during food crises from escalating into large-scale mass killings. It can also send a powerful signal to nondemocratic leaders that the international community can and will respond with strong economic sanctions and even direct intervention if they escalate the degree of violence against their subjects.

While these policy lessons are important, our book also has several normative and substantive implications. Some of these theoretical and empirical implications have been discussed in the previous section, but it is worth mentioned two additional key substantive implications of our research. The first relates to the fact that urbanization level—and by extension, urban development—is increasing rapidly in developing countries, including nondemocratic (Fay and Opal 2000; UN 2006; World Bank 2014) Indeed, the World Bank states that:

> Nearly all of the increase in urban population is now happening in developing countries where more than 5 million people, or about the population of Suzhou, migrate to urban areas *every month*. (World Bank 2014)

The fact that urbanization and urban development are growing rapidly certainly signifies some degree of economic growth and positive economic health (UN 2006; World Bank 2014; Mellander et al. 2015). But our findings suggest that this growth can have some negative implications. Indeed, such rapid increases in urbanization levels, when combined with food crisis episodes (which may become more frequent due to climate change), can increase both the probability of mass killing and its intensity.

A second substantive implication suggested by our findings is that nondemocratic elites seem to intentionally target dense urban areas to maximize the amount of civilians that they can kill when threatened. Indeed, as recently as 2016, the Assad regime in Syria often dropped "barrel-bombs" in the most densely populated parts of the nation's capital, Damascus, to maximize the number of civilians that could be killed by such crude methods.[4] To our mind, this might indicate that as the pace of urbanization in nondemocracies across the developing world increases, so is the possibility that killing campaigns under these regimes—if and when they occur—will likely involve very high casualty rates. We believe that this should increase the urgency with which international organizations such as the United Nations and the international community should devise concrete political—and military—plans to deter such killing campaigns from occurring in the first place.

Further Research Extensions

This book sought to unpack the link between urban development, food crises, anti-regime mobilization, and the political and economic calculations behind nondemocratic regimes' decision to perpetrate mass killing in detail. As with most academic work, our theory and analysis also suggest several fruitful directions of future research that we lacked the space to pursue in this book. A key feature of this study is its focus on state-led mass killings that nondemocratic regimes might use when a serious threat to their rule emerges. Yet in terms of repressive strategies, authoritarian ruling elites have, in theory, a variety of repressive strategies they might employ in the place of mass killing.

For instance, leaders in nondemocratic states often resort to mass incarceration or extra-judicial killings to spread fear among domestic citizens and prevent challenges for their rule to emerge (Brownlee 2007; Davenport 2007b; Escribà-Folch and Wright 2015). They can also use other strategies of deterrence, for instance placing prominent opposition figures under long-term house arrest or exiling them, or depriving their subjects from employment, housing, and basic consumption items, including food (Moore 1998; Davenport 2007a, b; Bellin 2012). Therefore, a potentially fruitful direction of future research would be to explore *when* authoritarian elites will prefer mass killing to these alternative strategies of repression if a threat for their rule emerges.

This line of research also raises several related questions. Do these less severe repressive strategies serve as a substitute to mass killing in nondemocratic states or as their complement? Does urban development affect repressive strategy substitutions in these states, and if so, why? Answering these questions can help uncovering new, more nuanced linkages between regime characteristics, agency, and political violence. In addition to exploring how mass killing arises in nondemocratic states, a key objective of this study has been to understand how these killings are distributed *geographically within* nondemocratic countries. To achieve this objective, we sacrificed a more aggregate country-year level of analysis for a high-resolution 0.5-degree grid cell design in order to identify specific geospatial patterns in mass killing across nondemocratic states.

Our grid cell-year analysis helped us to uncover regularities in this extreme violence, namely that within authoritarian countries such killings often occur in developed urban areas. Importantly, we complemented this grid cell-year sample with careful historical and time-series analyses of specific nondemocratic countries to illuminate the specific *mechanisms* that often drive mass killing campaigns in nondemocratic states. Nevertheless, relying on this 0.5-degree grid-resolution level constrained our ability to identify if and when aggregate-level domestic political institutions influence the propensity of mass killings. Extending our hypothesis and conclusions to evaluating how domestic institutions may mediate the effect of food crises on protests and the prospects of mass killing under authoritarian regimes may thus be an important avenue for future work to explore.

Another key goal of this book was to understand why and when mass killing might arise within nondemocratic states. To this end, we focused in particular on the events *leading to* state-led mass killings in order to understand the precise theoretical mechanisms that explain this extreme policy choice and evaluating their viability. What we did not examine in this book—again due to space constraints—is the economic and political *aftermath* of systematic mass killing campaigns in nondemocratic states.

Do authoritarian regimes become more politically and socially stable in the wake of a mass killing campaign or more unstable? What explains the durability of regimes that keep their political power even after perpetrating mass killings? Finally, do mass killing campaigns in nondemocracies have long-term deleterious economic consequences? These are all substantively interesting questions with policy relevance that deserve careful theorization and empirical testing.

Another salient direction of future research relates to the role of international actors. Our theory and analysis are focused on domestic actors and local factors, and as a result did not involve a serious and detailed examination of the role international organizations and foreign states might play in these contexts. Yet, numerous studies have shown that the process of "naming and shaming," i.e., pointing out regime's human rights abuses, can mitigate violence levels (e.g., Krain 2012; Demerrit 2012; Hendrix and Wong 2013). Putting sanctions on a nondemocratic regime and creating international pressures otherwise can mitigate—at least to some extent—even extreme forms of violence, such as genocide (Krain 2012). Considering that some organizations—such as the UN or the IMF—and some states—such as the USA or the UK—enjoy significant political and economic leverage in specific contexts, evaluating whether this influence extends to violence during food or other crises could yield important insights, from both academic and policymaking perspectives.

Forecasting Localized Mass Killing Campaigns

What does the research presented in this book tell us about the future probability of mass killing in nondemocratic (i.e., autocracies and anocracies) states? To answer this question, in this section we use forecasting approaches using the model estimates from Chapter "Statistical Analysis of Food Crises and Mass Killing." In recent years, numerous studies have highlighted the importance of *prediction* to the study of civil war and political violence. First, beyond statistical significance, a valid benchmark model of social conflict must also be able to reasonably forecast its onset (Ward et al. 2010; Goldstone et al. 2010; Brandt et al. 2011; Koren 2017b). Statistical inference is not very useful if it cannot be applied to out-of-sample situations. Indeed, as Ward, Greenhill, and Bakke argue:

> The whole point of estimating risk models is to be able to apply them to specific cases. You wouldn't expect your physician to tell you that all those cancer risk factors from smoking don't actually apply to you. Predictive heuristics provide a useful, possibly necessary, strategy that may help scholars and policymakers guard against erroneous recommendations. (2010, 364)

Second, prediction has proven useful in the past in improving our *theoretical* understanding of different phenomena and testing their viability across certain forms of conflict (Ward et al. 2010; Brandt et al. 2011; Koren 2017b). If the purpose of a given theory is to infer to future situations, then it logically follows that, from an empirical perspective, it should be similarly verified in out-of-sample contexts.

Forecasting accuracy thus has important implications not only for the viability of a given theory, but also for policy purposes. After all, how can one convince policymakers in the viability of one's policy prescriptions if one cannot illustrate that the theoretical predictions underlying these policy recommendations are valid? Our aim in this section falls within this framework. We do not claim to provide a model that perfectly predicts the onset of localized mass killing, but rather highlight the improvement in prediction provided by accounting for the interaction between urban development and food crises.

To illustrate the improvement in our model's predictive accuracy provided by including food crises and interacting them with urban development per capita, and—more importantly—test this effect in out-of-sample situations, i.e., testing the model on data that were not used in its estimation, we follow a three-step approach. We begin by calculating the predicted probability of a mass killing event for each cell year in our sample based on the coefficient estimates obtained from the Full model presented in Table 1, Chapter "Statistical Analysis of Food Crises and Mass Killing," by subtracting an observation's full predicted probability of mass killing from one. We then repeat this exercise for a similar model that does not include the variable *Food Crisis (Volatility)*$_t$ and the interaction term *Urban Development PC*$_t$ × *Food Crisis (Volatility)*$_t$—but otherwise remains unchanged—and evaluate each set of predictions against a binary indicator of whether or mass killing (as defined in Chapter "Urban Development and Mass Killing: A First Look at the Data") occurred in each grid cell year in our nondemocratic country sample (1996–2009).

To generate out-of-sample predictions that illustrate the applicability of these models to external cases, this process is conducted using *k*-fold cross-validation, where $k = 5$.[5] Specifically, all of the country-year observations used in the Full model in Table 1 were randomly divided into five segments. Four of these segments were combined to create a "training set," which was used to re-estimate the model. The fifth segment, or "test set," was then utilized to assess the predictive power of the coefficients estimated obtained using the training set (Ward et al. 2010). The predictive power of the Full model from Table 1, with and without *Food Crisis (Volatility)*$_t$ and the interaction term *Urban Development PC*$_t$ × *Food Crisis (Volatility)*$_t$, was measured by calculating the area under the receiver operator characteristic (ROC) curve (Ward et al. 2010) for the *k*-fold cross-validation results.

As Fig. 1 illustrates, accounting for food crises and their interaction with urban development yields a predictive improvement of *approximately 5% in the model's accuracy*. This is a sizable effect considering the very large size of the sample (182,095 observations), which inevitably introduces a lot of noise into the analysis. For comparison, the effect of *GDP PC*$_t$ and *Conflict*$_t$, two benchmark indicators of political violence and mass killing (see, e.g., Valentino et al. 2004; Collier and Hoeffler 2005; Azam and Hoeffler 2002), yields an improvement of approximately 4% and 3%, respectively.[6]

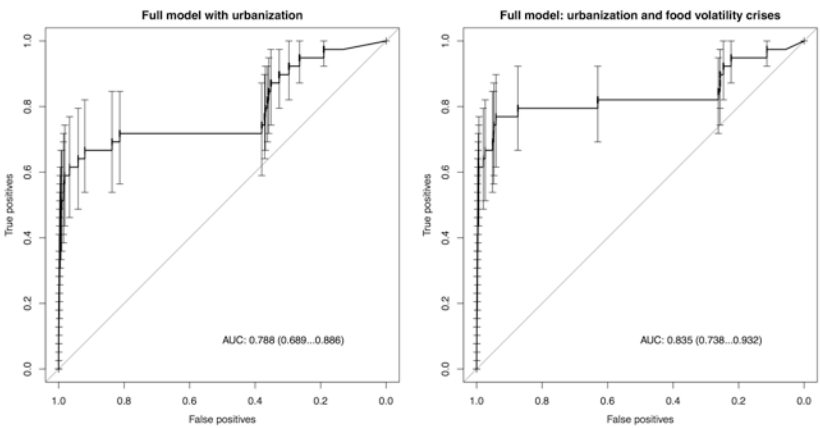

Fig. 1 Out-of-sample ROC curves for full mass killing model

What does our forecasting analysis teach us about the future prospects for mass killing campaigns in nondemocratic states? Unfortunately, the answer is not appealing from a normative viewpoint. In fact, our forecasting analysis suggests that there is a distinct possibility we will observe a *higher* frequency of civilian-targeted mass killing campaigns in nondemocracies over the coming decades. Despite the 1989 revolutions and the onset of a third wave of democratization, the number of nondemocratic states in the international system has remained fairly stable in the last three decades (Cheibub et al. 2010; Geddes et al. 2014). Additionally, the level of urban development in many developing states has also grown rapidly over the same period (e.g., Henderson et al. 2012). The impact of food volatility and climate change also means that many nondemocratic states have become more vulnerable to food crises and food insecurity, and might become even more so in the future (Vidal 2013). Since our forecasting analysis shows that including the combined effect of food crises and urban development per capita increases the predictive accuracy of mass killing onset models, at least in nondemocratic states, we thus conclude that—given the recent surge in urbanization and the deleterious consequences of food volatility and climate change—the frequency of state-led mass killing might increase in the near future.

This is a pessimistic yet important substantive conclusion. It illustrates that scholars and policymakers should take the effect of food crises and their moderating impact on urban development on mass political violence seriously, and give it the same consideration they give other of its important determinants such as state capacity and ongoing conflict. In an increasingly urbanizing world where food price volatility continues to rise and climate change is further straining food production, the detailed theory developed in this book and the vast spectrum of empirical evidence used to support it strongly suggest that we should do more, as scholars, policymakers, and members of the international community, to guarantee that these changes do not jeopardize the human security of billions of individuals worldwide.

Notes

1. For examples of these studies, see Urdal (2006), Hendrix and Glaser (2007), Hendrix et al. (2009).
2. Under Suharto's regime, for instance, Indonesia had established a national food program called *Bulog*, which goes as far back as 1974. Similarly,

Pakistan had established the "Emergency Food Security Program" during General Ayub Khan's reign in office in the 1960s to stabilize food prices and supply cheap food in times of severe food shortages. Yet as the two case study chapters demonstrated, the authoritarian regimes in neither Indonesia nor Pakistan were able to make honest promises to their citizens that they would resolve the food crises experienced by both countries.

3. The logic underlying this argument is partly drawn from Vreeland (2003) who argues that developing countries often voluntarily sign and accept "intrusive" IMF programs as a tool to "tie their hands" and carry out IMF-mandated economic reforms. The key difference between our claim and Vreeland's argument, however, is that according to Vreeland (2003) states self-select into IMF programs to signal their "helplessness" to domestic interest groups that may oppose reforms while in our policy prescription, financial assistance from international institutions to autocrats may help the latter to signal its "honest" intentions to citizens to resolve the food crisis.
4. Bethan McKernan, "Assad Dropped 13,000 Barrel Bombs on Syria in 2016," *The Independent*, 11 January 2017, UK, see http://www.independent.co.uk/news/world/middle-east/bashar-al-assad-syria-president-regime-13000-barrel-bombs-rebels-aleppo-douma-2016-a7521656.html.
5. This number of folds was chosen due to the large size of the dataset used in this specification (182,095 observations), which places heavy hardware requirements on the computational resources available to us.
6. While the substantive impact in the model's predictive accuracy is the most desired quantity of interest in forecasting, it is worth noting that the difference between the Full model and the model that did not include *Food Crisis (Volatility)*$_t$ and the interaction term *Urban Development PC*$_t$ × *Food Crisis (Volatility)*$_t$ was not statistically significant according to the DeLong et al. (1988) test ($Z = 1.552$). The only marginally significant difference (to the ten percent level) was provided by adding *Conflict*$_t$.

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