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Does Food Security Matter for Transition in Arab Countries?

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Contents

Abstract	v
Acknowledgments	vi
1. Introduction	1
2. Is the Arab World Different?	2
3. Is There an Arab Exceptionalism When It Comes to Conflict?	7
4. The Food Security Channel in Arab Conflicts	11
5. Conclusions	14
Appendix A: Variable Description	16
Appendix B: Supplementary Tables and Figures	18
References	23

Tables

2.1—Comparing determinants of conflicts between the Arab region and the rest of the world 3
3.1—The importance of food security 9
4.1—Identifying the Arab-specific food security channel to major conflicts 13
B.1—Descriptive statistics 18
B.2—Revisiting the Arab exceptionalism 19
B.3—Other potential drivers of conflicts 20

Figures

B1: Food aid (FAO 2011) and price changes between 1970 and 2006 22
B2: Food aid (WFP 2012) and price changes between 1988 and 2010 22

ABSTRACT

Expectations are high that transition in Tunisia, Egypt, Libya, and Yemen will bring about more freedom, justice, and economic opportunities. However, experiences from other world regions show that countries in transition are at high risk of entering conflicts, which often come at large economic, social and political costs. In order to identify options on how conflict may be prevented in Arab transition countries, this paper assesses the key global drivers of conflicts based on a dataset from 1960 to 2010 and improved cross-country regression techniques. Results show that unlike in other studies where per capita incomes, inequality, and poor governance, among other factors, emerge as the major determinants of conflict, food security at macro- and micro-levels emerges as *the* main cause of conflicts in the Arab world. This "Arab exceptionalism in conflict" suggests that improving food security is not only important for improving the lives of rural and urban people; it is also likely to be the key for a peaceful transition.

Keywords: Arab Awakening, transition, conflict, food security

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1. INTRODUCTION

The Arab Awakening has sparked political and economic transition in several Middle Eastern and North African countries. During 2011 and 2012 this historic event has brought new governments to power in Tunisia, Egypt, Libya, and Yemen and initiated reform processes in other countries such as Jordan and Morocco. The Arab Awakening thus provides great opportunities for governments and civil society to address the region's long-standing economic challenges, including a lack of inclusive growth, high levels of inequality and unemployment, and high levels of food insecurity (World Bank 2004; UNDP 2009; Nabli 2011; Breisinger et al. 2012). However, experiences from other world regions show that countries in political transition are at high risk of entering conflict (Hegre et al. 2001; Collier and Rohner 2008). In Eastern Europe and Sub-Saharan Africa power vacuums have often led to a disruption of the transition process, an increase in civil wars, and imposed high costs and losses on countries and people (Duffield 2001; Kaldor 2006; Keen 1998). Collier (2007) estimates that for each year of conflict, economic growth may fall by 2.3 percent and that it may take a total of 17 years before the country catches up with its preconflict position. In addition to lost economic output, conflict has a severe impact on human health, education, and nutrition (Chamarbagwala and Moran 2011; Akresh and de Walque 2008; Shemyakina 2011) and often destroys physical as well as political capital (Collier 1999). This developmental cost is likely to be even higher in the Arab world (ESCWA 2011). One year of civil war in an ESCWA country leads to an average loss of 3.5 percent of per capita GDP.[1] The non-income-related effects of conflicts are also substantial. One year of conflict may throw countries 5 to 10 years back in social outcome indicators such as life expectancy and immunization rates (ESCWA 2011).

Given the elevated risk of conflict during transition and the related high costs, it is important to understand why conflicts may arise. The most commonly cited causes of conflict are related to socioeconomic factors, geography, and institutions. More specifically, many studies show that poverty; underemployment of young men (Collier and Hoeffler 2004 De Soysa et al. 1999; Taeb 2004); inequalities in income, land, and natural resources (Auvinen and Nafziger 1999; Macours 2011; Stewart 2000), often combined with population pressures (Ostby et al. 2011), geographic characteristics (for example, mountainous terrain), and poor governance (Collier and Hoeffler 2004; Fearon 2010), are all key drivers of conflict. Brinkman and Hendrix (2011) and Pinstrup-Andersen and Shimokawa (2008) also cite food insecurity as a cause for conflict. Whereas all these findings are based on global or country case studies, Sørli, Gleditsch, and Strand (2005) focus specifically on the Arab world, using Collier and Hoeffler's cross-country regression framework. The authors conclude that the sources of conflict in the Arab world can be narrowed down to: (lack of) economic growth, length of the peace periods, ethnic dominance, and regime type (authoritarian and democratic regimes are less prone to conflict than regimes that are somewhere in the middle). They also find that the same factors drive conflicts in the rest of the world; that is, the results suggest that the causes of conflict may not differ between the Arab world and the rest of the world. However, this finding is surprising given that many Arab countries are significantly different from most other countries in the world in economic and political structures, a fact known in the literature as "Arab exceptionalism" (Aarts 1999; Sørli, Gleditsch, and Strand 2005).

Thus, the ongoing transition in Arab countries raises important questions on what drives conflict in Arab countries and what measures may be most suitable to support peaceful transition in countries such as Tunisia, Egypt, Libya, and Yemen. This paper contributes to the discussion by identifying the key drivers of conflicts in the Arab world using improved cross-country regression techniques. In particular, the paper uses an updated dataset, better control for country unobserved and observed heterogeneity, and identifies the causal relationship between food security and conflicts by exploiting the high exposure of Arab countries to variations in international food prices. It also offers recommendations on how conflicts may potentially be prevented in the particularly risky transition period by drawing on the relevant literature. The paper is structured as follows. Section 2 provides a comparative analysis of major conflict-related development indicators as identified by the literature and following three aggregate determinants of conflict: motivation, opportunity, and polity. Sections 3 and 4 present the main results based on the panel data analysis. Section 5 concludes and formulates policy recommendations.

[1] These countries include Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, the Sudan, the Syrian Arab Republic, the United Arab Emirates, and Yemen.

2. IS THE ARAB WORLD DIFFERENT?

To compare potential determinants of conflict as identified by the literature between the Arab world and other world regions and within the group of Arab countries, we first group the main drivers of conflict in three areas: motivation, opportunity, and polity (Table 2.1). *Motivation* is embodied in the grievance of some groups and more broadly relates to inequality and discrimination. Whether or not individuals/groups engage in conflict also depends on their *opportunity* cost of doing so, which is largely determined by the socioeconomic conditions prior to the onset of conflict, including levels of unemployment, the education deficit, or poverty. Food insecurity has been singled out as a source of conflict by Brinkman and Hendrix (2011) and Pinstrup-Andersen and Shimokawa (2008), especially in the presence of ill-defined political regimes, a *youth bulge*, stunted economic development, slow or falling growth, and high inequality among groups. The *polity* dimension relates to the ability of the state to provide services to the people and includes them in the policy- and decisionmaking processes. At the other end of the spectrum, it is also related to the capacity of the state to repress any form of contestation or uprising. Although grouping of the determinates helps in guiding the discussion, it is important to note that some factors may not exclusively fall into one of these three categories and may interact with each other and make the categorical divide less clear. For instance, the lack of inclusion induced by institutional dysfunctioning (polity) feeds into grievances (motivation) and such grievances may lead to increasingly unstable political conditions given the increased economic openness to the rest of the world (opportunity).

Table 2.1—Comparing determinants of conflicts between the Arab region and the rest of the world

	Opportunity				Motivation					Polity	
Country	**Major intrastate conflicts (1960-2010)**	**GDP per capita (const. 2005 internat.$)**	**Oil exports (% of GDP)**	**Food imports/ total exports plus net remittances**	**Prevalence of child Stunting**	**Under-five mortality rate (per 1,000)**	**Youth unemploy-ment (% of labor force 15-24)**	**Population (avg. annual growth 2000-2010)**	**GINI coefficient (latest estimates)**	**Political Discrimi-nation index (2006)**	**Polity IV - Regime characteristics (2010)**
Sudan	0.61	2,024	13.2[a]	8.4	37.9[d]	108.2	-	2.5	-	4	-2
Iraq	0.31	3,194	64.8[e]	-	27.5[e]	43.5	-	2.8	-	1	3
Algeria	0.18	7,521	31.4[a]	7.3	15.6**	32.3	24.3[e]	1.5	-	2	2
Somalia	0.16	-	-	-	42.1[e]	180	-	2.3	-	0	-
Turkey	0.16	12,547	0.7[a]	2	13.9 **	20.3	25.3[a]	1.3	0.4[b]	-	7
Yemen	0.12	2,243[a]	19.6[a]	15.4	59.6[e]	66.4	-	3.1	0.38[g]	-	-2
Iran	0.08	10,496[a]	59.8[a]	2.4	16.6 **	30.9	23[b]	1.2	0.38[g]	4	-7
Lebanon	0.04	12,619	0.1[a]	16.5	15**	12.4	22.1[d]	1.2	-	4	7
Morocco	0.04	4,227	0.3[a]	8.2	21.6 **	37.5	21.9[a]	1	0.41[d]	2	-
Syria	0.02	4,741	2.6[b]	9.7	28.6[e]	16.2	19.1[d]	2.5	0.36[m]	4	-7
Bahrain	0	32,233[a]	59.7[d]	2.9 *	9.0**	12.1	20.1[k]	7.1	-	1	-8
Comoros	0	984	0[k]	49.2	47.0 **	104	-	2.7	0.64[m]	-	9
Djibouti	0	2,106[a]	0.5[a]	42.3	32.6[e]	93.5	-	2	0.4[ŋ]	1	2
Egypt	0	5,543	7.1[b]	8.7	30.7[b]	21	24.8[d]	1.8	0.32[g]	3	-3
Jordan	0	5,157	0.1[a]	13.9	8.3[a]	25.3	27[a]	2.3	0.38[e]	3	-3
Kuwait	0	45,539[a]	57[b]	2.4 *	3.8[a]	9.9	11.3[d]	3.5	-	-	-7
Libya	0	14985[a]	-	3.4	21[e]	18.5	-	2	-	-	-7
Mauritania	0	1,744	10.8[b]	20.6	24.2[b]	117.1	-	2.7	0.39[o]	3	-2
Oman	0	23,333[a]	47.4[a]	6.2 *	9.6 **	12	-	2.1	-	-	-8
Qatar	0	82,978[a]	47.9[b]	2.0*	4.0 **	10.8	1.6[d]	11.5	0.41[d]	-	-10
Saudi Arabia	0	20,374	44.8[a]	4.0 *	9.1 **	21	28.2[b]	3.2	-	2	-10
Tunisia	0	8,566	4.5[a]	6.5	9[e]	20.7	30.7[g]	1	0.41[o]	4	-4
UAE	0	42,353	59.3[b]	3.4 *	-	7.4	12.1[b]	9.5	-	-	-8
Arab+	0.07	8,675	18.4	7.9	23.5	38.5	24.3	1.9	0.37	3.1	-6.1
Asia & Pacific	0.1	6,087	1.7	14.7	26.8	41.7	11.4	1	0.39	3.7	0.7
Europe & Central Asia	0.01	21,436	6	5.9	7	10	20	0.2	0.35	2.5	5.3
Americas & Caribbean	0.02	21,906	2.4	4.6	9.8	16.1	16.5	1.1	0.48	2.4	3.9
Sub-Saharan Africa	0.05	2,053	7.8	18.1	40.6	125.5	21.6	2.5	0.43	2.2	0.5

Source: Based on WDI 2011; FAO 2011; Minorities at Risk Project 2009; Marshall, Gurr and Jaggers (2010).

Notes: * High-income countries. ** Predicted for 2008. Polity IV score: -10 strongly autocratic; +10 = strongly democratic.
Latest estimates: 1[a]= 2009; [b] = 2008; [d] = 2007; [c] = 2006; [g] = 2005; [m] = 2004; [k] = 2001; [ŋ] = 2002; [o] = 2000.

The Arab+ region has shown high levels of conflicts and is second only to the Asia-Pacific region, which shows the highest number of major conflicts between 1960 and 2010 (Table 2.1).[2] The number of conflicts has further increased with the Arab Awakening, yet due to data limitations we focus the following discussion on the period of 1960–2010.[3] According to the World Bank definition, all the top seven Arab+ conflict countries (Sudan, Iraq, Algeria, Somalia, Turkey, and Yemen) are middle-income countries with *per capita income levels* of between 2,024 international dollars (Sudan) and 10,496 international dollars (Iran).[4] However, none of the high-income countries has experienced a major conflict, including Bahrain, Kuwait, Oman, UAE, Qatar, and Saudi Arabia. Interestingly, all these high income countries and the top seven conflict countries are *oil-exporting countries*, with the exception of Turkey. Minerals, including oil and gas, make up between 45 and 60 percent of GDP in Gulf countries, whereas the top oil-exporting and conflict-prone countries' share of minerals in GDP ranges between 13 and 65 percent. The literature provides several explanations for the relation between conflicts and natural resource wealth. On the one hand, oil revenue is likely to increase the capacity of the state to reduce the risk of conflict, either by strengthening repression or redistributing resources to pay for peace, which may explain the absence of conflicts in rich, oil-exporting countries. On the other hand, the finding that poorer oil-exporting countries show high levels of conflict may be explained by Collier and Hoeffler (2004), who show that natural resource wealth is one of the main correlates of war and by Fearon (2005) who finds that oil production tends to be associated with rent seeking behavior and bad governance.

In addition to income levels, opportunity costs of individuals or groups for engaging in conflict can also depend on their food security, unemployment levels, and poverty status. In this paper, we focus on food security and nutrition as the main indicators rather than poverty as official poverty rates are only available in 11 out of 22 countries and those available may underestimate the actual poverty levels (Breisinger et al. 2011). In addition, Pinstrup-Andersen and Shimokawa (2008) argue that in developing countries, health and nutritional status may be a better measure for deprivation than income per capita. Thus we use the ratio of food imports to total exports plus remittances as an indicator for macro food security (Breisinger et al. 2012) and child stunting as an indicator for nutrition[5]. Table 2.1 shows a pattern among Arab+ countries where more food-secure countries tend to experience fewer conflicts. On the macro level conflict countries tend to use more foreign exchange for importing food than the average Arab+ country and countries without conflict spend less foreign exchange on food imports (Table 2.1). While all Arab countries are highly dependent on food imports, those that spend a higher share of their foreign exchange earnings on food are more vulnerable to high and volatile world market prices. Spikes in import prices tend to reduce real incomes and can thus trigger conflicts (Besley and Persson 2008) and recent evidence suggests that food price hikes have been one factor contributing to the Arab Awakening (Breisinger, Ecker, and Al-Riffai 2011; Zurayk 2011; Harrigan 2012). A similar pattern can be observed between conflicts and nutrition. For child stunting, Table 2.1 shows that six out of 10 countries with a major conflict have above Arab+ average stunting rates, whereas only four out of 13 countries without major conflict have above Arab+ average stunting rates.

[2] As pointed out in the variable description in Appendix A, the Arab+ region includes all 22 members of the Arab League of States plus Iran and Turkey. The rationale to include Iran and Turkey is that the former is included in the Middle East and North Africa (MENA) region defined by the International Monetary Fund (IMF) and the World Bank, whereas the latter is included in the Near East and North Africa (NENA) group used by the United Nations organizations. However, empirical results presented in Sections 3 and 4 are largely unaltered when Iran and Turkey are excluded from the Arab group of countries. For consistency reasons with the empirical analysis presented in Sections 3 and 4, major intrastate conflicts are defined using the Armed Conflict Dataset of the Uppsala Conflict Data Programme (UCDP) for the incidence conflict events with more than 1,000 deaths a year (Themner and Wallensteen 2011).

[3] Data for 2011 are not available, but preliminary analysis suggests that incorporating the Arab Awakening into the UCDP conflict database would potentially increase the average of 7 percent to about 30 percent in 2011; the region has experienced the largest number of conflicts by far for this particular year.

[4] All income numbers are at 2005 international prices to adjust for purchasing power differences.

[5] Anthropometric-based indexes are preferred to the estimates of prevalence of hunger (undernourishment) provided by the Food and Agriculture Organization (FAO 2011), criticized for some time for lacking accuracy for both cross-sectional and overtime comparison (Gabbert and Weikard 2001, Nube 2001, Smith 1998).

Youth unemployment as one of the potentially motivating factors is about twice as high in the Arab+ region compared to Latin America and Asia. Youth unemployment rates in Arab+ countries that experienced conflict are between 19.1 percent (in Syria) and 25.3 percent (in Turkey), compared to an Arab average of 24.3 percent. However, youth unemployment levels in countries without major conflict are also high, suggesting no clear association between unemployment and conflict. Also, there are some exceptions. Youth unemployment is relatively low in Qatar, Kuwait, and the UAE (1.6, 11.3, and 12.1 percent, respectively), but above 20 percent for all the other countries.

Given the continued high population growth rates, the number of young people will continue to rise rapidly. The only region where population growth is even higher than in the Arab+ region is Sub-Saharan Africa. Within the Arab region, population growth is highest in the oil-rich Gulf countries, which can be mainly explained by immigration. Population growth driven mainly by the number of local births is highest in Yemen, Iraq, Syria, Mauretania, and Comoros (between 2.7 and 3.1 percent) and lowest in Morocco, Tunisia, Iran, Turkey, and Algeria (between 1 and 1.5 percent). The high share of young people combined with falling population growth rates can provide opportunities and challenges for Arab countries.

Inequality is also often mentioned a key motivation for joining conflicts, but evidence is mixed and limited to a few case studies (Macours 2011; Ostby et al. 2011). Inequality may be unequal distribution of income or assets among individuals (vertical inequality) or between groups (horizontal inequality). Horizontal inequality defines imbalances among different groups in society who agglomerate according to their common ethnicity, culture, religion, race, region of residence, or even social class (Stewart 2000). There are strong indications that both vertical and horizontal inequalities are high in the Arab world; however, official numbers do not always reflect that (Breisinger et al. 2012). Inequality as measured by the Gini coefficient suggests that wealth is distributed fairly equally in all Arab+ countries, with Gini coefficients between 0.32 and 0.41 (Table 2.1) with the exception of Comoros[6].

The third broad cause of conflict revolves around *polity*, which we represent with political discrimination index and the polity IV - regime characteristics. The political discrimination index is coded on a five-point scale (ranging from 0 to 4, 4 representing the highest level of discrimination) and indicates the degree to which a minority group faces political discrimination as a result of formal or informal government neglect and social exclusion and whether there are adequate remedial policies in place to offset discriminatory practices (Minorities at Risk Project 2009). Table 2.1 indicates that the Arab+ region along with Asia and the Pacific regions exhibited the highest levels of political discrimination. Many countries that have experienced major civil conflict also obtained the highest scores on the index (for example, Iran, Lebanon, Sudan, and Syria). Using the Political Regime Characteristics and Transitions dataset from the Polity IV project (Marshall, Gurr, and Jaggers 2011), Table 2.1 shows that the Arab region is by far the most autocratically ruled region in the world with a score of -6.1 (score ranks from -10 = strongly autocratic to +10 = strongly democratic), compared to 5.3 in Europe and Central Asia, 3.9 in Latin America and the Caribbean, 0.7 in Asia and the Pacific, and 0.5 in Sub-Saharan Africa. With few exceptions, most Arab countries have negative scores, and the oil-rich Gulf states tend to be the most autocratic. The UNDP (2009: 4) sums up well the polity that has existed throughout the region: "The majority of [Arab] states failed to introduce democratic governance and institutions of representations that ensure inclusion . . . [and] respect for cultural diversity." Add to that, and especially more so in recent years, many states failed to ensure a broader participation of their citizens in the policymaking process.

[6] The officially reported numbers leave doubt about their reliability, and therefore are treated with caution in the quantitative analysis in Sections 3 and 4 of this paper. For example, Egypt ranks 19th out of 128 countries globally in income distribution equality, putting it ahead of countries like Canada, Belgium, and Switzerland; Syria ranks 38th, above Italy and Vietnam (WDI 2011).

In summary, many of the comparisons of major indicators between the Arab world and other world regions suggest strong differences, hypothesizing the existence of an *Arab exceptionalism*. Within Arab countries there are also big differences, in particular between resource-rich and resource-poor countries. In the next sections, the paper will quantitatively assess the main drivers of conflict in the Arab world and how they may or may not differ from other world regions. Given the findings of this section, the analysis will mainly focus on factors related to opportunity (income levels, oil resources, and food security); motivations (youth unemployment, population growth, and inequality); and polity (proxied by political regime characteristics and group discrimination).

3. IS THERE AN ARAB EXCEPTIONALISM WHEN IT COMES TO CONFLICT?

Descriptive statistics in the previous section suggest that the causes of conflict in the Arab world may differ from the rest of the world. To test this hypothesis, we start the analysis with a standard framework as developed by Collier and Hoeffler.[7] Replicating the methodology and updating the data with most recent versions of the corresponding databases (regression [2] of Table B.2) and to the year 2010 (regression [3] of Table B.2) show significant weaknesses of this model and scope for improving previous estimates.[8] We find that a dummy variable defined as being part of the Middle East or part of the Arab+ world is significantly (or close to) different from zero.[9] Said differently, the Collier and Hoeffler framework appears to be a poor predictor of conflicts in the Arab region and has low predictive power for the Middle East and North Africa (MENA) region (compared with the model applied to Sub-Saharan Africa). Another reason for expanding the model is our goal of drawing causal inferences. Even using lags would not solve that omitted factors may blur the relationships between economic variables and conflicts. For example, the growth literature has pointed to the importance of institutions (Acemoglu, Johnson, and Robinson 2001, 2002), which could itself be an important determinant of conflict resilience. As pointed out by Blattman and Miguel (2010), there are likely permanent fixed differences between countries that are correlated with income levels, economic growth, and civil war. According to Djankov and Reynal-Querol (2011) and as discussed by Brückner (2011), the introduction of a fixed effect may weaken the relationship between economic variables and conflict. Similarly, the size of the population is an endogenous variable, as conflict is often related to mass killings and massive displacement (Brückner 2010). Adding a fixed effect will also allow controlling for the importance of the historical roots of conflicts in the Arab region.[10]

To take these considerations into account, we develop a new model to explain conflict in the Arab world between 1960 and 2010. First, we adopt a reduced version of the specification used by Collier and Hoeffler (2004), by focusing on the economic and demographic factors. We then introduce time dummies and country fixed effects. Thus, we control for any time-constant, country-specific unobserved factors (such as historical grievances or inherited institutions) or time phenomena common to all countries (end of the Cold War, oil shocks, and so on). Time-constant variables are dropped from the regressions. The dependent variable is defined as conflict incidence and takes the value of one for each country-year with an active internal armed conflict with more than 1,000 battle-related deaths.[11] The binary nature of the dependent variable in a panel framework can generate incidental parameter problems. However, the consistency of the estimates is preserved by using a conditional fixed effect model (Wooldridge 2002).

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[7] This framework has been applied to the MENA region before by Sørli, Gleditsch, and Strand (2005: 142). Findings of that study suggest that "conflict in the Middle East [including Northern Africa] is quite well explained by a general theory of civil war, and there is no need to invoke a pattern of 'Middle Eastern exceptionalism.'"

[8] Regression (1) of Table B.2 replicates the baseline model from Collier and Hoeffler, based on the same sample of countries and the same time period (1960–2000). The only difference with Collier and Hoeffler (2004) is we use yearly data, known to avoid the problem of five-year aggregation inherent to duration models (Sørli, Gleditsch, and Strand 2005). Regression (1) of Table B.2 indicates that both GDP growth and the level of GDP per capita significantly decrease the likelihood of civil conflict. The size of the population seems to have the opposite effect. Similar to the findings of Collier and Hoeffler (2004), our results show that the longer a country is at peace, the lower the likelihood of that country being at war is. As shown by Fearon (2005), using yearly data is enough to downplay the importance of natural resource dependency defined as primary commodity exports over GDP.

[9] Regressions (4) and (5) of Table B.2 are similar to regressions (2) and (3) but use an alternative definition of the MENA region (Arab).

[10] Although it does not alter the main results, we reduce the importance of unobserved confounding factors by dropping the high-income Organization for Economic Cooperation and Development (OECD) countries from the sample. Similar results are found when such a sample restriction is not applied. Although less efficient, this is also the case when the sample is restricted to the Arab world.

[11] As pointed by Brückner (2011, n. 4), civil war onset is a rare-vent variable (for example, King and Zeng 2001), which requires special econometric techniques that are (computationally) difficult to implement (due to convergence problems) with country fixed effects. Nevertheless, the criticisms addressed to the incidence variable is much less relevant as we are working now in differences (time-demeaned variables) and not in levels anymore.

We also lag all explanatory variables to reduce the standard problems of simultaneity. The description of the variables used in the empirical analysis and the descriptive statistics are provided in Appendix A and Table B.1. To explore whether something is specific to the Arab world, we interact the main explanatory variable with a dummy variable indicating whether or not a country is part of the Arab world (Arab+) in the following way:

$$P(conflict_{i,t}) = \Phi(c + \alpha_i + \phi_t + \eta\, X_{i,t-1} + \varphi\, X_{it-1} * Arab_i + \varepsilon_{i,t}). \quad (1)$$

Regression (1) of Table 3.1 shows a significant negative relationship between economic growth and conflict. On the contrary, population is positively associated with conflict incidence. We then reassess the question of Arab exceptionalism. An Arab dummy variable similar to Sørli, Gleditsch, and Strand (2005) cannot be introduced in our framework as it is time-constant. But another way to assess the relevance of the Collier and Hoeffler (2004) framework is to see whether the most robust determinants of conflicts (economic growth and the size of the population) have different effects on conflict in the Arab world. Regression (2) of Table 3.1 suggests that economic growth in the Arab region has a puzzling and increasing effect on the likelihood of major conflicts, even though these conflicts are more frequent in highly populated countries. Adding an additional lag of economic growth has a negative and significant global effect but does not alter the Arab-specific positive effect. In a further improved specification compared to the previous section, the presence of an Arab exceptionalism suggests that the Collier and Hoeffler framework needs to be enhanced to explain conflicts in the Arab world.

To further improve the model we build on the differences between the Arab world and the rest of the world as identified in Section 2.[12] Results of the improved model show that among the Arab-specific factors hypothesized in Section 2, food security emerges as the main and unambiguous driver of conflicts in the Arab world. Consistent with the review of Brinkman and Hendrix (2011), the lack of access to food is strongly associated with major conflict events, and particularly so in the Arab world. When the micro dimension of food security proxied by child stunting in regression (3) of Table 3.1 is introduced,[13] child stunting has a positive and significant effect on major conflicts in the Arab region. Regression (4) uses child mortality as a possible alternative indicator to child stunting. The resulting coefficient is positive but nonsignificant, which may be explained by the relatively small size of the sample. The macroeconomic dimension of food security, which is measured as the ratio between food imports and total exports (excluding or not excluding remittances, respectively, in regressions [5] and [6]), also positively affects the risk of major conflicts in Arab countries. Child stunting also has an effect at the global level in contrast with the macroeconomic dimension of food insecurity, which is not surprising given the high dependency of Arab countries on food imports. We also note that introducing these food security indexes completely absorb the puzzling effect of economic growth found in regression (2) of Table 3.1. This is in line with recent evidence showing the nutrition- and poverty-neutral nature of economic growth in the Arab world (Breisinger, Ecker, and Al-Riffai 2011). It is also in line with findings of Pinstrup-Andersen and Shimokawa (2008), who show that income poverty and poor health and nutritional status are more significantly associated with armed conflicts than GDP per capita, annual GDP growth, and the ratio of primary commodity exports over GDP. The authors conclude that when a majority of the food insecure reside in rural areas and depend on agriculture, investments in public goods for agriculture and rural areas can be effective tools to achieve the multiple goals of reduced poverty, food insecurity, and armed conflict (Pinstrup-Andersen and Shimokawa 2008).

[12] Note that our paper also differs from Pinstrup-Andersen and Shimokawa (2008) in the way we specify a nonlinear conditional fixed effect model and a fixed effect two-stage least squares linear probability model, much more likely to capture causal relationships.

[13] Regression (3) presents the result when missing values of child stunting are interpolated based on the growth–nutrition elasticities found in Breisinger et al. (2012). Without such interpolation, the maximization procedure of the log-likelihood function does not converge due to a lack of data. The interpolation exercise is further documented in the description of variables in annexes.

Table 3.1—The importance of food security

Regressions	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Incidence of major intrastate conflict					
Model	Logit fixed effect					
GDP growth (t-1)	-3.757***	-6.259***	-3.539*	-4.644***	-8.644***	-8.625***
	[0.980]	[1.429]	[1.877]	[1.85]	[1.850]	[1.849]
GDP growth (t-1)*Arab+		5.919***	4.409	3.056	3.056	3
		[1.978]	[2.784]	[4.091]	[4.091]	[4.074]
Log of population (t-1)	2.419**	1.667	5.922**	3885	-0.418	-0.392
	[1.107]	[1.161]	[2.703]	[2.437]	[1.446]	[1.445]
Log of population (t-1)* Arab+		2.331***	-0.688	1.445	1.093	1.097
		[0.795]	[2.591]	[165.]	[1.001]	[0.995]
Peace duration	-0.099***	-0.097***	-0.067***	-0.142***	-0.09***	-0.089***
	[0.011]	[0.011]	[0.014]	[0.028]	[0.011]	[0.011]
Child stunting (t-1)			0.052**			
			[0.023]			
Child stunting (t-1)* Arab+			0.307***			
			[0.099]			
Child mortality (t-1)				-0.001		
				[0.003]		
Child mortality (t-1)* Arab+				0.001		
				[0.006]		
Macro Food Insecurity (t-1)					-0.011*	
					[0.006]	
Macro Food Insecurity (t-1)* Arab+					0.029**	
					[0.012]	
Macro Food Insecurity , including remittances (t-1)						-0.011*
						[0.006]
Macro Food Insecurity , including remittances(t-1)* Arab+						0.0253**
						[0.013]
Time dummies	incl.	incl.	incl.	incl.	incl.	incl.
Observations	1,474	1,474	630	412	1,219	1,219
Pseudo R-square	0.18	0.2	0.23	0.36	0.23	0.23
Wald Chi2	208***	229.2***	119.8***	105.9***	219.6***	218.1***
Log pseudolikelihood	-465.3	-454.7	-197	-92.88	-362.9	-363.6

Source: Authors' estimations.

Notes: *** Significant at 1 percent. ** Significant at 5 percent. * Significant at 10 percent. Standard errors in square bracket. All regressions cover the time period between 1960 and 2010 and exclude high-income OECD countries. All the variables are described in Appendix A.

Table B.3 extends Table 3.1 by investigating other potential determinants of conflict highlighted in the literature. The only other significant coefficients are related to the importance of the youth population and oil dependency. Similar to the definition of urban youth bulges given by Urdal and Hoelscher (2009), when the youth population is proxied by the share of urban males aged 15–24 over the urban male population aged 15 years old and more,[14] we do find a region-specific pattern that describes a positive relationship between the size of the male urban bulge and the likelihood of conflict (regression [1] of Table B.3). We also follow Sørli, Gleditsch, and Strand (2005) in defining oil and other resource dependency as a value of resource exports to GDP and as a dummy equal to one when such a variable is larger than a cutoff point of 40 percent. Although the gas, ores, and mineral distinction does not show any

14 The population data used to derive the youth bulge variable were only available once every five years from 1960 to 2005. Since population data are usually not subject to large variability, we imputed the missing data with a linear interpolation of the existing observations.

Arab-specific pattern, Table B.3 (regressions [3] to [5]) indicates that oil dependency measured by oil exports to GDP significantly increases conflicts at a global level but has a decreasing effect in the Arab world. The Arab-specific effect follows an inverted U-shaped relationship, as it is only beyond a threshold of 19 percent that it decreases the risk of major conflicts. Consistent with the literature, such structural characteristics potentially affect the opportunity cost to participate in violence and the financing capacity of the state to repress any form of uprising or redistribute resources. However, in the Arab context, we remain extremely cautious about the interpretation of these results. The relationships between these variables and conflicts have indeed proven to be confounded by the quality for institutions, the rule of law, or the inclusive nature of political and economic systems (Brückner 2010; Fearon and Laitin 2003; Humphreys 2005). Such (possibly time-varying) omitted factors are known to be of major concern in the Arab world. It is therefore difficult to establish any causal inference. Nevertheless, although potentially endogenous, these two factors will remain crucial points of discussion when the time comes to conjecture the meaning of our results for the transitioning Arab countries (see Section 5). We also explore other opportunity-based factors of conflicts, in particular whether the puzzling economic growth effect found in regression (1) of Table 3.1 may be due to a lack of sectoral disaggregation. As shown by dal Bo and dal Bo (2011), the sectoral contribution of economic growth may predict different opportunity-related mechanisms for conflict. However, we do not find any significant relationship from sector-specific economic growth to conflicts (Table B.3, regression [2]).

Other explanatory variables presented in Section 2 do not seem to depict any Arab-specific explanatory power for major conflicts (Table B.3). For motivation-based factors, Section 2 has underlined the importance of inequality between groups.[15] The systematic exclusion of some minorities from economic powers may be argued to be a proxy for theory of relative deprivation between groups (Piazza 2011; Gurr 1970, 1993). From a global perspective, we indeed found that economic discrimination against minorities (see description in Appendix A) results in additional conflicts. But, as reported in Table B.3 (regression [6]), economic discrimination against minorities has no Arab-specific effect on major conflicts. Political discrimination, which is more related to the polity dimension of conflicts described in Section 2, provides nonsignificant results (regression [7] of Table B.3). The polity dimension is further investigated by using the Political Regime Characteristics and Transitions dataset from the Polity IV project (Marshall, Gurr, and Jaggers 2010) to define changes in political regimes. Countries receive a POLITY score along a 21-point continuum from -10 (most autocratic) to +10 (most democratic). We assess how past changes in political regimes may affect the risk of conflicts. We construct three variables for that purpose. Following Brückner and Ciccone (2011), we consider the changes in Polity IV as reflecting changes in democratic institutions.[16] Based on the several papers by Persson and Tabellini (2003, 2006), the same authors also suggest looking at transitions to democracy and autocracy. Results in Table B.3 (regressions [8] and [9]) suggest that past democratic improvements, proxied as a difference in the Polity2 index or past transitions into autocracy or full democracy, do not have a specific impact in the Arab countries.

[15] Although not shown, vertical inequality measured by the Gini coefficient has no global or Arab-specific effects on the likelihood of major conflicts. Although Collier and Hoeffler (2004) point to that result as a sign that grievances do not matter, the contrast with food insecurity can be viewed as a sign of poor ability of the Gini coefficient to capture time-varying sources of grievances.

[16] Expecting asymmetric effects for positive or negative changes, Burke and Leigh (2010) also propose to introduce both a positive and negative change of a three or more points increase in the polity score over three years or less (see REGTRANS score in the dataset). These additional variables are not significant.

4. THE FOOD SECURITY CHANNEL IN ARAB CONFLICTS

As food insecurity emerges as the main explanation for the limitations of other models for describing major conflicts in the Arab world, we focus on food insecurity when exploring causality in this section. Although the introduction of a country fixed effect along with lagged variables strongly reduce the endogeneity problems encountered in previous studies, we conduct further checks to ensure that the main variables of interest are exogenous to conflict events or other (omitted) correlates of war. We limit the sample to the Arab+ countries and turn to a two-stage fixed effect framework. This has the advantage of improving the ability of drawing causal inferences and also potentially identifying future sources of vulnerabilities to global food price shocks in the Arab region. Given the high dependency of many Arab countries on food imports, variations of international food prices have been found to transmit directly into domestic food markets within a year (Ianchovichina, Loening, and Wood 2012). In our fixed effect framework, we therefore investigate whether the exogenous price shocks ($Price\ Index_{i,t}$) on the food insecurity indexes ($FI_{i,t}$) may in turn affect the probability of conflict ($conflict_{i,t}$). A linear specification is adopted as nonlinear methods in a two-stage framework imply strong specification assumptions (Angrist and Krueger 2001). Accordingly, our estimating equations are the following:

$$Conflict_{i,t} = c + \alpha_i + \phi_t + \eta\, \widehat{FI_{it}} + \partial\, X_{i,t-1} + \varepsilon_{it} \quad (2)$$

$$FI_{it} = c + \alpha_i + \phi_t + \beta\, Price\ Index_{i,t} + \gamma\, X_{i,t-1} + \varepsilon_{i,t}. \quad (3)$$

Since Brückner and Ciccone (2010), there is a growing practice in the economics of conflict of introducing international prices as a source of variation to construct exogenous instruments (Angrist and Kugler 2008, Dube and Vargas 2007 , Nunn and Qian 2012). Besley and Persson (2008), as well as dal Bo and dal Bo (2011), give the theoretical foundations for using international prices as an exogenous variation for economic variables in explaining conflicts. Given our focus on food insecurity, we adapt Arezki and Brückner's (2011) food price index.

$$Price\ Index_{it} = \sum_{j=1}^{4} w_{ij} P_{jt}, \quad (4)$$

where w_{ij} is a time-constant weight for country i and commodity j, computed over the period 1988–2010; and P_{jt} is the international price for commodity j at time t. Data on annual international prices are taken from the UNCTAD (2012) Commodity Statistics. The export and import data are taken from the NBER-United Nations Trade Database. The food commodities include the main imported food items in the Arab world, beef, maize, rice and wheat. Arab countries are net importers of these four items, with the exception of Egypt for rice, Saudi Arabia for wheat, Sudan and Turkey for Beef, Syria for beef and wheat. Data are unavailable for Iraq and Somalia. Excluding the weight for the few exported items does not change the main results. A positive change in the international prices of the imported commodities should negatively affect food security, given the expected large price transmission in the Arab world (Ianchovichina, Loening, and Wood 2012), and help identify the causal relationship between food insecurity and the risk of major conflicts in the Arab world. To avoid the introduction of redundant instrumental variables, we restrict the sample to Arab countries. Nevertheless, similar results are obtained when Arab-specific interaction terms are introduced with a sample similar to Table 3.1. The addition of economic growth as a control variable seeks to reduce the threat of violation of the exclusion restriction by controlling for potential other channels through which global food prices may affect the likelihood of conflicts. Adding the lagged value of population does not alter the main results, while increasing the threat of endogeneity. One concern may be that food prices reflect changes in the supply of food aid and in turn, increase the likelihood of conflicts. Nunn and Qian (2012) recently show that food aid tends to increase the risk of conflicts in recipient countries. However, the same authors show that there is no

correlation between US wheat aid and world wheat prices. That can be further illustrated for the Arab world in Figures B1 and B2. Figure B1 plots food aid shipments to the Arab+ region from both the US and all donors (expressed in metric tons of wheat) from 1970 to 2006 (FAO 2011), against the international price of wheat and the weighted food price index for the Arab+ countries, described in (4). Figure B1 does not show strong signs of correlation between our constructed price index and the delivery of food aid from the US and all donors and correspond to coefficients of correlation of 0.006 and 0.04, respectively. The absence of correlation is confirmed when the comparison is applied to the WFP (2012) data on food aid deliveries to Arab+ countries from the US, expressed in metric tons from 1988 to 2010, with a corresponding coefficient of correlation of 0.067 with our constructed instrument. Given the disconnection between the delivery of food aid and the evolution of the constructed price index, we strongly believe that such an omitted factor does not constitute a credible threat to our identification strategy.

The first-stage results suggest that food price hikes worsen food insecurity in net-food-importing Arab countries but in a non-monotonic fashion. Price hikes increase food insecurity either when countries are sufficiently exposed to such price variations or when price variations are large enough. The composite index does not allow us to distinguish the two possible threshold effects. However, possible explanations for that non-linearity may be related by the presence of food subsidies, food reserves or substitution effects between staple food. The relevance of our instruments is confirmed by the highly significant coefficients of the first-stage regressions for regressions (1), (3), (5), and to a lesser extent (7) of Table 4.1, whereas the weak identification test indicates limited risk of weak instruments (with the exception of regression [7]). Given the units used in the food security indicators provided in Table B.1 and based on regressions (1) to (6) of Table 4.1, a price-induced increase by a standard deviation of the child stunting, the mortality rate, and the macroeconomic food insecurity index increase the risk of conflict by 10.19, 11.02, and 0.04 percentage points. Thus, our results in Table 4.1 reveal that both microlevel and macrolevel food insecurity are among the determinants of civil conflict in the Arab world. Note that these results are robust to computing the weight in equation (4) as the share of total exports instead of real GDP, only including the weights for net-imported items, adding a proxy that turns out insignificant for price volatility where P is replaced by the annual standard deviation in monthly prices in equation (4), adding or not population data. We can also show the robustness of our results when Arab-specific interaction terms are introduced with a sample similar to Table 3.1. Our results are also robust to the exclusion of beef from the price index given the importance of livestock trade with Eastern Africa could be argued to proxy for other omitted factors.

Table 4.1—Identifying the Arab-specific food security channel to major conflicts

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	**Child stunting**	**Incidence of major intra-state conflicts**	**Child mortality**	**Incidence of major intra-state conflicts**	**Food Insecurity Index**	**Incidence of major intra-state conflicts**	**Macro Food Insecurity incl. remittances**	**Incidence of major intra-state conflicts**
Model	**FE2SLS**	**FE2SLS**	**FE2SLS**	**FE2SLS**	**FE2SLS**	**FE2SLS**	**FE2SLS**	**FE2SLS**
Stage	**1st**	**2nd**	**1st**	**2nd**	**1st**	**2nd**	**1st**	**2nd**
Peace duration	-0.273***	0.003	0.295*	-0.009***	0.003	-0.005***	-0.015	-0.005***
	[0.042]	[0.006]	[0.176]	[0.003]	[0.046]	[0.002]	[0.041]	[0.002]
GDP growth (t-1)	-4.610*	0.196	16.32	-0.312	6.123	-0.178	5.428	-0.184
	[2.395]	[0.213]	[14.20]	[0.283]	[12.05]	[0.163]	[12.41]	[0.195]
Price index	-0.062***		-0.200***		-0.164***		-0.121***	
	[0.014]		[0.063]		[0.042]		[0.044]	
Price index squared	5.14e-05***		1.38e-04**		2.04e-04***		1.6e-04***	
	[1.12e-05]		[5.66e-05]		[5.41e-05]		[5.77e-05]	
Child stunting		0.0420***						
		[0.016]						
Child mortality				0.011***				
				[0.004]				
Macro Food Insecurity						0.011***		
						[0.004]		
Macro Food Insecurity incl. remittances								0.013**
								[0.006]
Country Fixed Effects	incl.	incl.	incl.	incl.	incl.	incl.	incl.	incl.
Time dummies	incl.	incl.	incl.	incl.	incl.	incl.	incl.	incl.
Observations	433	433	246	246	685	685	685	685
Number of countries	22	22	23	23	22	22	22	22
F-test	17.3***	2.731**	5.459***	4.603***	4.49***	5.335***	2.336*	4.484***
Underid test		15.23***		13.76***		17.14***		8.819**
Weak id stat		10.83		6.85		7.74		3.99
P-value Hansen test		0.52		0.24		0.66		0.46
F-test on excl. IV	10.83***		6.85***		7.74***		3.99**	
Root MSE	4.03	0.25	15.58	0.26	13.76	0.24	14.01	0.26

Source: Authors' estimations.

Notes: *** Significant at 1 percent. ** Significant at 5 percent. * Significant at 10 percent. Robust standard errors are in square brackets. All regressions cover the period between 1960 and 2010. The country sample is limited to Arab+ countries only (see list of countries in the description of variables in Appendix A).

5. CONCLUSIONS

The Arab Awakening provides a window of opportunity for new governments and civil society to foster political and economic transition. But experience from other world regions shows that the transition periods in Tunisia, Egypt, Libya, and Yemen also carry a high risk of escalating conflict. In order to identify potential focus areas for reducing this risk of conflict escalation, this paper has drawn on historical data to inform current and future policymaking. Specifically, the paper has used a global dataset on conflict from 1960 to 2010 to assess major causes of conflict in the region. By improving previous models using fixed effects and adding relevant explanatory variables, results first show that, like in many other economic and political dimensions, the Arab world differs from other world regions in terms of conflict. This Arab exceptionalism manifests itself in the finding that food security, both measured at the macrolevel (the ratio of food imports to total exports plus remittances) and at the household level (child stunting), emerges as the main driver of conflicts in the region. These results are robust, and we use global food prices as an instrument to disentangle the potential conditionality of food insecurity to other policies. Results confirm that the high exposure of Arab countries to global food prices variations proves to be an important source of vulnerability for a peaceful Arab transition.

If history is also a guide to the future—and there is strong reason to believe so since several authors have identified high food prices as one of the contributing factors for the Arab Awakening—then these results have important policy implications. The findings of this paper strongly suggest that improving food security is not only key for economic development, but also for managing the transition successfully. Among the countries in transition, Libya performs well at the macro dimension of food security (mainly due to its oil wealth), but faces food security challenges at the micro level, with 21 percent of its children malnourished. Tunisia may focus more on policies that improve macro level food security given its relatively good performance on the micro level. Egypt and Yemen will need to focus on both macro and micro dimensions: Egypt shows serious levels of food insecurity at both the macrolevel and household level. Yemen's food insecurity is alarming and extremely alarming at macro- and micro-levels, respectively.

The literature provides important guidance on how to improve food security at all levels. In the short run, public stocks and (private) imports can be effective complementary policies to safeguard against excessive global price volatility for net-food-importing countries and thus improve macrolevel and microlevel food security (Larson et al. 2012). However, if Arab countries choose to create/expand their public stocks it is important to maintain (a) incentives for domestic production and private-sector trade; (b) transparent and consistent government policy to provide clear signals to farmers, traders, and consumers; and (c) effective monitoring and market analysis to enable governments to adjust policies when needed (Dorosh and Rashid 2012). Enhancing food security at the microlevel requires the expansion/creation of social safety nets to protect the poorest people against excessive food price volatility (Fan, Torero, and Headey 2011). In addition, children need specific nutritional programs to support their healthy development during the "window of opportunity" that begins during pregnancy and extends through their first two years. Experts have identified several highly cost-effective interventions to reduce undernutrition in the areas of promotion of behavior change, micronutrients and deworming, and complementary and therapeutic feeding (Bhutta et al. 2008; Olney, Rawat, and Ruel 2012).

In the longer run, enhancing food security requires export-led growth in agricultural and nonagricultural sectors to improve the balance of payment position and generate foreign exchange revenues for financing food imports. The limited agricultural potential in Arab countries in combination with continued high population growth suggest that Egypt, Tunisia, and Yemen should focus on a mix of policies to leverage the remaining agricultural potential and measures that help foster export-led growth, including improvements in the business climate and matching education with job market requirements, should be explored. This growth has to be inclusive to include rural and urban areas and generate jobs and incomes for the food insecure and poor.

In addition, although we remain cautious that our results on the importance of oil dependency and youth population may be conditional on the authoritative nature of the former regimes, the risk of conflict is also reflected in the lack of opportunities for an increasingly educated young populace that does not find adequate jobs. In fact, unlike in most regions, unemployment rates are highest among more educated youth, and education systems in many Arab countries have produced a large volume of graduates with high career aspirations who do not have skills matched to the labor markets. Given that education is the foundation for achieving inclusive growth, policymakers will have to prioritize education to address existing skill gaps, better respond to labor market signals, and stimulate knowledge-based capabilities, matching opportunities in the global as well as regional and local economies (UNDP 2009). Including the youth in the transition process and reducing high youth unemployment in the region are also instrumental in reaping the benefits of a demographic dividend. Because the proportion of people who are too young or too old to work is falling and there are more working people relative to dependents, the economy could benefit from this (potential) drop in the dependency ratio. In addition to giving more attention to young people, this paper also stresses the importance of managing oil revenues well for any transition strategy in oil-exporting countries. For Libya, as the only oil-exporting country among the countries currently in transition, this stresses the importance of directing oil rents to food-security-enhancing investments in a transparent and effective way.

APPENDIX A: VARIABLE DESCRIPTION

Agricultural sector growth: We constructed the agricultural sector growth variable as the annual percentage in the agricultural sector's added-value (source: UNSTAT 2011).

Arab+: Dummy variable that takes the value 1 for the following countries : Algeria, Bahrain, Comoros, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauretania, Morocco, Oman, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, Turkey, United Arab Emirates, and Yemen.

Child mortality: The under-five mortality rate is the probability per 1,000 that a newborn baby will die before reaching age five, if subject to current age-specific mortality rates (source: WDI).

Child stunting: This variable represents the prevalence of child stunting calculated as the percentage of children under age five whose height-for-age z-score is more than two standard deviations below the median for the international reference population ages 0–59 months (source: WDI). Due to the high number of missing values, we interpolate the data based on the nutrition-growth elasticities estimated in Breisinger et al. (2012).

Ethnic dominance: Dummy variable that takes the value of one if one ethnolinguistic group constitutes from 45 percent to 90 percent of the total population. This variable has been taken directly from Collier and Hoeffler (2004); we assume the value to be constant through time.

Ethnolinguistic fractionalization: The ethnolinguistic fractionalization index (EFL) measures the probability that two randomly selected individuals in the total population belong to different ethnolinguistic groups, and does not take into account the distances between the different groups. Cross-country data of the EFL were retrieved directly from Appendix B in Desmet, Ortuño-Ortin, and Weber (2009). We assumed country values to be constant through time.

Food Insecurity Index : The macroeconomic FSI calculated as the ratio of food imports to total exports. Food imports data were retrieved from the FAOSTAT website, whereas data on total exports were retrieved from the WDI database. An alternative FSI variable was constructed that includes net remittances from the WDI database, as an additional term at the denominator. More details on how the index is calculated can be found in Breisinger (2012).

GDP per capita: Per capita GDP in 2005 constant international dollars (UNSTAT 2011).

GDP growth: Annual percentage change in per capita GDP between t and t-1. This variable was calculated from the UNSTAT (2011) database.

Geographic dispersion: Dispersion index constructed by Collier and Hoeffler (2004) that takes the value of zero if the population is evenly distributed across the country and the value one if the population is concentrated in one area. We assumed this variable to be constant through time.

Incidence of a major intrastate conflict: Dummy variable that takes a value of one for each country-year with an active internal armed conflict or an internationalized internal armed conflict with more than 1,000 battle-related deaths. (Source: UCDP Onset of Intrastate Armed Conflict dataset).

Middle East: Dummy variable that takes the value 1 for the following countries: Algeria, Bahrain, Egypt, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, Turkey, United Arab Emirates, and Yemen.

Nonagricultural sector growth: We constructed the non-agricultural sector growth variable as the annual percentage in the combined added-values for the manufacturing and other industries and service sectors (source: UNSTAT 2011).

Onset of a minor intrastate conflict: Dummy variable that takes a value of one for each country-year in which a new internal armed conflict or an internationalized internal armed conflict with more than 25

battle-related deaths has started. (Source: UCDP Onset of Intrastate Armed Conflict dataset. See Gleditsch et al. 2002).

Peace duration: Measures the number of consecutive years a country has been at peace since 1946. Missing values were attributed to each country-year in which a country did not yet exist. We constructed two versions of this variable according the level of intensity of the conflict prescribed by the dependent variable. This variable was constructed using the "btscs" command in STATA.

Political and economic discrimination indexes: The political discrimination index measures the degree to which a minority group faces political or economic discrimination. Each index is coded on a five-point scale (ranging from 0 to 4, 4 representing the highest level of discrimination). Data are provided by the Minorities at Risk Project (2009) from the Center for International Development and Conflict Management at the University of Maryland.

Political transformation to autocracy and democracy: Using the polity2 indicator, we constructed a dummy variable that takes the value 1 when a change in the polity2 score subsequently leads to an autocratic regime (polity2 score lower than zero) from time (t-1) to time (t). Similarly, we constructed another dummy variable that takes the value 1 when a change in the polity2 score subsequently leads to a fully democratic regime (polity2 score greater than 6) from time (t-1) to time (t).

Polity2: Refers to the change in polity scores between time (t) and (t-1). Countries receive a POLITY score along a 21-point continuum from -10 (most autocratic) to +10 (most democratic). The POLITY score is an institution-based measure of regime type that reflects the competitiveness and regulation of political participation, the openness and competitiveness of executive recruitment, and constraints on the chief executive.

Population: The size of the population (source: WDI).

Post–Cold War: Dummy variable that takes the value of one each year after the end of the Cold War (1990 and onward).

Price index: Our price index is calculated from UNCTAD and the NBER-United Nations Trade database. This index is a weighted sum of the normalized international prices of the following food items: wheat, maize, rice and beef. The time-constant weights were constructed by calculating the average share of net imports of these items by country between 1988 and 2010.

Primary commodity exports: Share of mining, oil and gas exports to total GDP. Data were retrieved from the WDI (2011) database.

Oil dependency: Dummy variable that takes the value of one for each year a country has a fuel export to GDP ratio greater than 0.4.

Oil exports (as a share of GDP): This variable is calculated as the ratio of fuel exports to GDP using both WDI and UNSTAT data.

Urban male youth bulge: This variable is calculated as the ratio of urban males aged 15–24 to the total male urban population aged 15 years and above (source: UN 2008). Given that data were only available every five years from 1960 to 2005, we imputed the missing values with a linear interpolation of the existing data.

APPENDIX B: SUPPLEMENTARY TABLES AND FIGURES

Table B.1—Descriptive statistics

	All countries					MENA+ countries				
Variables	**Obs.**	**Mean**	**S.D.**	**Min**	**Max**	**Obs**	**Mean**	**S.D.**	**Min**	**Max**
Incidence of major intrastate conflicts (dummy)	9,078	0.043	0.203	0	1	1,173	0.074	0.262	0	1
Annual GDP growth	6,188	0.017	0.069	-0.66	0.901	878	0.012	0.092	-0.574	0.826
Population size (1,000,000)	8,567	28.1	104	0.045	1330	1,127	13.4	17.500	0.045	83
Peace duration (in years)	7,680	14.28	13.682	0	50	1,105	10.98	11.831	0	50
Child stunting (% of children under 5)	2,885	29.389	17.959	1	76.7	433	25.885	13.321	3.6	59.6
Food imports/total exports	5,472	0.149	0.281	0.003	8.612	712	0.197	0.228	0.004	2.018
Food imports/total exports + net remittances	5,432	0.133	0.264	-3.817	8.612	712	0.182	0.222	0.003	2.018
Under-five child mortality (per 1,000)	2,819	65.785	74.128	2.6	417.9	301	85.303	71.004	7.4	393.7
Economic discrimination index	4,742	2.53	1.335	0	4	675	2.526	1.317	0	4
Political discrimination index	4,721	2.849	1.313	0	4	675	3.059	1.399	0	4
Political transformation toward democracy (dummy)	6,870	0.107	0.975	-4	16	1,031	0.055	0.684	-1	12
Political transformation toward autocracy (dummy)	6,870	-0.085	1.149	-18	13	1,031	-0.07	1.211	-14	10
Change in Polity2 score	7,030	0.082	1.726	-18	16	1,053	0.036	1.532	-14	12
Urban male youth/total urban male population	1,424	0.31	0.078	0.127	0.516	198	0.327	0.067	0.14	0.441
Agricultural sector growth	6,188	0.081	0.273	-0.868	16.516	878	0.109	0.230	-0.579	2.042
Nonagricultural sector growth	6,188	0.097	0.274	-0.868	16.487	878	0.129	0.229	-0.568	2.233
Oil exports/GDP	4,311	0.132	0.251	3.41E-07	1	535	0.386	0.386	9E-07	1
Oil dependency dummy	4,311	0.121	0.326	0	1	535	0.432	0.496	0	1

Source: Authors' estimations.
Note: Obs. = Observations; S.D. = Standard Deviations; Min. = Minimum; and Max. = Maximum.

Table B.2—Revisiting the Arab exceptionalism

Regressions	(1)	(2)	(3)	(4)	(5)
Model	**LOGIT**		**RELOGIT**		
Dependent variable			**Onset of minor intrastate conflicts**		
Log of GDP per capita	-0.221***	-0.246***	-0.209***	-0.235***	-0.194***
	[0.078]	[0.079]	[0.069]	[0.081]	[0.071]
GDP growth	-2.438*	-2.689*	-0.573	-2.680*	-0.562
	[1.463]	[1.381]	[1.519]	[1.37]	[1.53]
Log of population	0.278***	0.276***	0.303***	0.282***	0.309***
	[0.055]	[0.057]	[0.048]	[0.056]	[0.047]
Primary commodity exports/GDP	1.646	0.836	-6.346***	0.891	-6.953***
	[2.353]	[2.349]	[1.315]	[2.364]	[1.262]
Primary commodity exports/GDP, squared	-3.373	-1.27	13.98***	-1.534	15.39***
	[5.616]	[5.282]	[2.052]	[5.368]	[1.862]
Ethnic fractionalization	0.694**	0.720**	0.765**	0.786**	0.8**
	[0.338]	[0.351]	[0.331]	[0.364]	[0.34]
Ethnic dominance	-0.119	-0.142	-0.205	-0.158	-0.214
	[0.192]	[0.194]	[0.169]	[0.196]	[0.17]
Geographic dispersion	0.697	0.645	0.748	0.601	0.762*
	[0.524]	[0.538]	[0.464]	[0.535]	[0.463]
Peace duration	-0.022***	0.107	0.156**	0.106	0.155**
	[0.007]	[0.074]	[0.063]	[0.074]	[0.063]
Post–Cold War	0.465***				
	[0.173]				
Middle East dummy		0.449*	0.381		
		[0.260]	[0.237]		
P-value		(0.084)	(0.108)		
Arab+ dummy				0.532**	0.357
				[0.245]	[0.227]
P-value				(0.029)	(0.115)
Constant	-6.728***	-6.350***	-7.029***	-6.570***	-7.252***
	[1.294]	[1.396]	[1.152]	[1.394]	[1.146]
Cubic splines		incl.	incl.	incl.	incl.
Observations	3,452	3,452	4,600	3,452	4,600
Pseudo R-square	0.096				
Wald Chi2	114.1***				
Log pseudolikelihood	-549.4				

Source: Authors' estimations, following Sørli, Gleditsch, and Strand 2005.

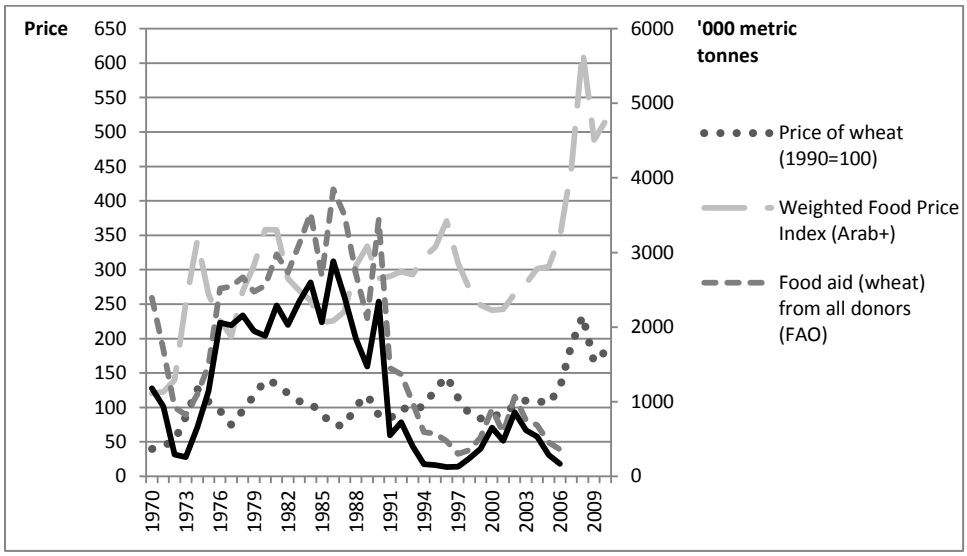
Notes: *** Significant at 1 percent. ** Significant at 5 percent. * Significant at 10 percent. Robust standard errors are in square brackets. Regressions (1), (2), and (4) cover the time period between 1960 and 2000. Regressions (3) and (5) cover the time period between 1960 and 2010. The country sample in equation (1) is limited to the one in Collier and Hoeffler (2004).

Table B.3—Other potential drivers of conflicts

	Opportunity					Motivation/Polity			
Regression	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
X_1	**Youth bulge**	**Agri. sector growth**	**Oil exports (% of GDP)**	**Oil exports (% of GDP)**	**Oil depen-dency**	**Economic discrimination**	**Political discriminatio n**	**Pol. trans. democracy**	**Delta (Polity2)**
X_2		**Nonagri. sector growth**		**Oil exports squared (% of GDP)**				**Pol. trans. autocracy**	
Dependent variable						**Incidence of major intrastate conflicts**			
Model						**Logit fixed effect**			
GDP growth (t-1)	-6.425***	-6.490**	-7.139**	-7.429**	-6.968**	-5.582***	-6.204***	-5.897***	-7.131***
	[1.446]	[2.698]	[3.579]	[3.626]	[3.546]	[1.485]	[1.624]	[1.592]	[1.593]
GDP growth (t-1)*MENA	6.127***	10.87***	14.06**	14.48**	13.03**	5.117**	5.760***	4.517**	6.531***
	[1.989]	[4.152]	[5.896]	[6.075]	[5.733]	[2.110]	[2.202]	[2.245]	[2.263]
Log of population	1.024	1.587	-0.702	-1.237	-0.738	1.137	0.852	0.384	0.198
	[1.298]	[1.164]	[2.353]	[2.382]	[2.334]	[1.408]	[1.421]	[1.268]	[1.269]
Log of population (t-1)*MENA	4.461***	2.222***	3.062**	3.779***	2.852**	2.688***	2.915***	1.554*	1.306
	[1.207]	[0.800]	[1.270]	[1.363]	[1.222]	[0.969]	[0.970]	[0.847]	[0.850]
Peace duration	-0.099***	-0.097***	-0.096***	-0.093***	-0.097***	-0.096***	-0.09***	-0.09***	-0.092***
	[0.011]	[0.011]	[0.015]	[0.015]	[0.015]	[0.011]	[0.011]	[0.011]	[0.011]
X_1(t-1)	3.493	-0.304	5.836	34.90**	-2.036	0.364**	0.12	-0.151	-0.008
	[5.607]	[1.453]	[7.972]	[16.22]	[1.451]	[0.163]	[0.132]	[0.132]	[0.049]
X_1(t-1)*MENA	31.66**	0.697	-8.729	-46.30***		0.432	0.216	0.178	0.0002
	[14.55]	[1.402]	[8.152]	[17.12]		[0.330]	[0.213]	[0.236]	[0.101]
X_2(t-1)		-2.053		-98.32**				-0.029	
		[2.113]		[47.21]				[0.072]	
X_2(t-1)*MENA		-3.595		106.6**				0.054	
		[2.944]		[47.38]				[0.123]	
Time dummies	incl.	incl.	incl.	incl.	incl.	incl.	incl.	incl.	incl.
Observations	1,474	1,474	628	628	628	1,227	1,216	1,354	1,391
Pseudo R-square	0.208	0.204	0.226	0.239	0.225	0.219	0.2	0.19	0.201
Wald Chi2	236.8***	232.4***	118.8***	125.8***	118.7***	206.5***	184.7***	198.4***	212.7***
Log pseudolikelihood	-450.9	-453.1	-203.9	-200.4	-204	-369.3	-369.5	-422.5	-421.6

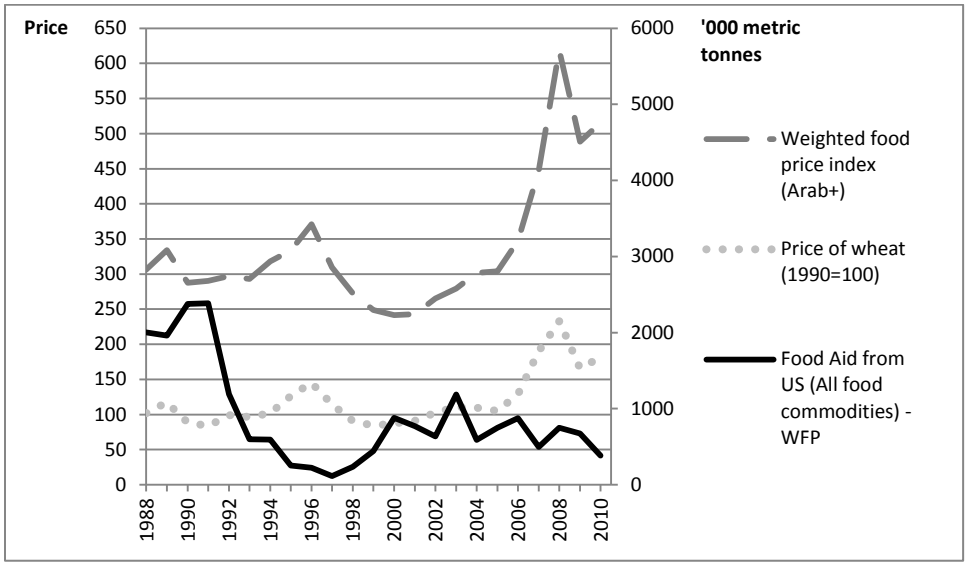
Source: Authors' estimations.

Figure B.1—Food aid (FAO 2011) and price changes between 1970 and 2006



Source: Authors'construction based on FAO (2011) and UNCTAD (2012).

Figure B.2—Food aid (WFP 2012) and price changes between 1988 and 2010



Source: Authors'construction based on WFP (2012) and UNCTAD (2012).

REFERENCES

Aarts, P. 1999. "A Region without Regionalism or the End of Exceptionalism." *Third World Quarterly* 20 (5): 911–925

Acemoglu, D., S. Johnson, and J. A. Robinson. 2001. "The Colonial Origins of Comparative Development: An Empirical Investigation." *American Economic Review* 91 (5): 1369–1401.

_____. 2002. "Reversal of Fortune: Geography and Institutions in the Making of the Modern World Income Distribution." *Quarterly Journal of Economics* 117:1231–1294.

Akresh, R., and D. de Walque. 2008. *Armed Conflict and Schooling: Evidence from the 1994 Rwandan Genocide*. HiCN Working Papers 47, Households in Conflict Network. University of Sussex. Brighton.

Angrist, J., and A. Krueger. 2001. "Instrumental Variables and the Search for Identification: From Supply and Demand to Natural Experiments." *Journal of Economic Perspectives* 15 (4): 69–85.

Angrist, J. and A. Kugler. 2008. Rural Windfall or a New Resource Curse? Coca, Income, and Civil Conflict in Colombia. *Review of Economics and Statistics* 90(2): 191-215.

Arezki, R., and M. Brückner. 2011. *Food Prices, Conflict and Democratic Change*. International Monetary Fund Working Paper 1162. February. Washington DC: International Monetary Fund.

Auvinen, J., and E. W. Nafziger. 1999. "The Sources of Humanitarian Emergencies." *Journal of Conflict Resolution* 43 (3): 267–290.

Besley, T., and T. Persson. 2008. "Wars and State Capacity." *Journal of the European Economic Association* 6 (2–3): 522–530.

Bhutta, Z. A., T. Ahmed, R. E. Black, S. Cousens, E. Dewey, E. Giugliani, B. A. Haider, B. Kirkwood, S. S. Morris, M. Sachdev, and M. Shekar. 2008. "What Works? Interventions for Maternal and Child Undernutrition and Survival." *Lancet* 371:417–440.

Blattman, C., and T. Miguel. 2010. "Civil War." *Journal of Economic Literature* 48 (1): 3–57.

Breisinger, C., E. Ecker, and P. Al-Riffai. 2011. *Economics of the Arab Awakening: From Revolution to Transformation and Food Security*. IFPRI Policy Brief 18. Washington, DC: International Food Policy Research Institute.

Breisinger, C., E. Ecker, P. Al-Riffai, and B. Yu. 2012. *Policies and Investments for Poverty Reduction and Food Security*. Food Policy Report 25. Washington, DC: International Food Policy Research Institute.

Breisinger, C., T. van Rheenen, C. Ringler, A. Nin Pratt, N. Minot, C. Aragon, B. Yu, O. Ecker, and T. Zhu. 2010. *Food Security and Economic Development in the Middle East and North Africa*. IFPRI Discussion Papers 985. Washington, DC: International Food Policy Research Institute.

Brinkman, H.-J., and C. S. Hendrix. 2011. *Food Insecurity and Violent Conflict: Causes, Consequences, and Addressing the Challenges*. Occasional Paper No. 24. Rome: World Food Programme.

Brückner, M. 2010. "Population Size and Civil Conflict Risk: Is There a Causal Link?" *Economic Journal* 120 (544): 535–550.

_____. 2011. *Country Fixed Effects and Unit Root: A Comment on Poverty and Civil War: Revisiting the Evidence*. http://sites.google.com/site/markusBrücknerresearch/comments. Accessed in May 2012.

Brückner, M., and A. Ciccone. 2010. "International Commodity Prices, Growth and the Outbreak of Civil War in Sub-Saharan Africa." *Economic Journal* 120:519–534.

_____. 2011. "Rain and the Democratic Window of Opportunity." *Econometrica* 29 (3): 923–947.

Brunnschweiler, C. N., and E. H. Bulte. 2008. "Linking Natural Resources to Slow Growth and More Conflict." *Science* 320:616–617.

_____. 2009. “Natural Resources and Violent Conflict: Resource Abundance, Dependence, and the Onset of Civil Wars.” *Oxford Economic Papers* 61 (4): 651–674.

Burke, P., and A. Leigh. 2010. “Do Output Contractions Trigger Democratic Change?” *American Economic Journal: Macroeconomics* 2:124–157.

Center for Systemic Peace. 2011. Polity IV–Major Episodes of Political Violence (MEPV).

Accessed August 2011.

Chamarbagwala, R., and H. E. Moran. 2011. “The Human Capital Consequences of Civil War: Evidence from Guatemala.” *Journal of Development Economics* 94 (1): 41–61.

Collier, P. 1999. “On the Economic Consequences of Civil War.” *Oxford Economic Papers* 51:168–183.

_____. 2007. *The Bottom Billion. Why the Poorest Countries Are Failing and What Can Be Done about It.* Oxford, UK: Oxford University Press.

Collier, P., and A. Hoeffler. 2004. “Greed and Grievance in Civil War.” *Oxford Economic Papers* 56:563–595.

Collier, P., and D. Rohner. 2008. “Democracy, Development and Conflict.” *Journal of European Economic Association* 6 (2-3): 531–540.

dal Bo, E., and P. dal Bo. 2011. “Workers, Warriors, and Criminals: Social Conflict in General Equilibrium.” *Journal of European Economic Association* 9:646–677.

Desmet, K., I. Ortuño-Ortin, and S. Weber. 2009. “Linguistic Diversity and Redistribution.” *Journal of the European Economic Association* 7:1291–1318.

De Soysa, I., N. Gleditsch, M. Gibson, and M. Sollenberg. 1999. “To Cultivate Peace: Agriculture in a World of Conflict.” *Environmental Change and Security Project Report* 5:15–25.

Djankov, S., and M. Reynal-Querol. 2010. “Poverty and Civil War: Revisiting the Evidence.” *Review of Economics and Statistics* 92 (4): 1035–1041.

Dorosh, P., and S. Rashid. 2012. Presentation at the IFPRI–UN-ESCWA international conference “Food Secure Arab World: A Roadmap for Policy and Research,” Beirut, Lebanon, February 6–7. http://fsaw2012.ifpri.info. Accessed March 2012.

Dube, O., and J. F. Vargas. 2007. *Commodity Price Shocks and Civil Conflict: Evidence from Colombia*. Mimeo, Harvard University and UCLA.

Duffield, M. R. 2001. *Global Governance and the New Wars: The Merging of Development and Security*. London: Zed Books.

ESCWA (Economic and Social Commission for Western Asia). 2011. *Trends and Impacts in Conflict Settings: Conflict and MDGs. Issue No. 2*.Beirut: United Nations.

Fan, S., M. Torero, and D. Headey. 2011. *Urgent Actions Needed to Prevent Recurring Food Crises*. IFPRI Policy Brief 16. March. Washington, DC: International Food Policy Research Institute.

FAO (Food and Agriculture Organization of the United Nations). 2011. FAOSTAT. Accessed September 2011. http://faostat.fao.org/.

Fearon, J. D. 2005. “Primary Commodity Exports and Civil War.” *Journal of Conflict Resolution* 49 (4): 483–507.

_____. 2010. *Governance and Civil War Onset*. World Development Report 2011. Background paper. August. Washington DC: World Bank.

Fearon, J. D., and D. Latin. 2003. “Ethnicity, Insurgency, and Civil War.” *American Political Science Review* 97 (1): 75–90.

Gabbert, S. and H.-P. Weikard. 2001. How Widespread is Undernoursishment? A critique of Measurement Methods and New Empirical Results. *Food Policy* 26: 209-228.

Gleditsch, N. P., P. Wallensteen, M. Eriksson, M. Sollenberg, and H. Strand. 2002. “Armed Conflict 1946–2001: A New Dataset.” *Journal of Peace Research* 39 (5): 615–637.

Gurr, T. R. 1970. *Why Men Rebel*. Princeton, NJ, US: Princeton University Press.

_____. 1993. "Why Minorities Rebel: A Global Analysis of Communal Rebellion and Conflict since 1945." *International Political Science Review* 14 (2): 161–201.

Harrigan, J. 2012. "Did Food Prices Plant the Seeds of the Arab Awakening?" Presentation at the IFPRI/ESCWA conference on a Food Secure Arab World. Beirut, Lebanon, February 6–7.

http://fsaw2012.ifpri.info/files/2012/01/JaneHarrigan_food-prices-arab-spring_abstract.pdf. Accessed March 2012.

Hegre, H., T. Ellingsen, S. Gates, and N. P. Gleditsch. 2001. "Toward a Democratic Civil Peace? Democracy, Political Change, and Civil War 1816–1992." *American Political Science Review* 95 (1): 33–48.

Ianchovichina, E., J. Loening, and C. Wood. 2012. *How Vulnerable Are Arab Countries to Global Food Price Shocks?* Policy Research Working Paper 6018. Washington, DC: World Bank.

Kaldor, M. 2006. *New and Old Wars*. Cambridge, MA, US: Polity.

Keen, D. 1998. *The Economic Functions of Violence in Civil Wars*. Adelphi paper 320. London: International Institute of Strategic Studies.

King, G., and L. Zeng. 2001. "Logistic Regression in Rare Events Data." *Political Analysis* 9 (2): 137–163.

Larson, D., J. A. Lampietti, C. Gouel, C. Cafiero, and J. Roberts. 2012. *Food Security and Storage in the Middle East and North Africa*. World Bank Policy Research Working Paper No. 6031. Washington, DC: World Bank.

Loefgren, H., and A. Richards. 2003. *Food Security, Poverty, and Economic Policy in the Middle East and North Africa*. Discussion Paper 111. Washington, DC: International Food Policy Research Institute.

Macours, K. 2011. "Increasing Inequality and Civil Conflict in Nepal." *Oxford Economic Papers* 63 (1): 1–26.

Marshall, M. G., T. R. Gurr, and K. Jaggers. 2010. *Polity IV Project Political Regime Characteristics and Transitions: Dataset Users' Manual*. Center for Systemic Peace. http://www.systemicpeace.org/polity/polity4.htm

Minorities at Risk Project. 2009. *Minorities at Risk Database*. College Park, MD: Center for International Development and Conflict Management. Accessed July 2011. www.cidcm.umd.edu/mar/data.aspx.

Nabli, M. 2011. "After the Arab Spring: What's Next for the Economies of the Middle East and North

Africa." Speech given at the Brookings Institution, Washington, DC, September 23.

Nube, M. 2001. Confronting Dietary Energy Supply with Anthropometry in the Assessment of Undernutrition Prevalence at the Level of Countries. *World Development* 29(7): 1275-1289.

Nunn, N. and N. Qian. 2012. Aiding Conflict: The Impact of U.S. Food Aid on Civil War. Harvard University. Mimeo.

Olney, D. K., R. Rawat, and M. Ruel. 2012. "Identifying Potential Programs and Platforms to Deliver Multiple Micronutrient Interventions." *Journal of Nutrition* 142:178S–185S.

Ostby, G., H. Urdal, M. Murshed, Z. Tadjoeddin, and H. Strand. 2011. "Population Pressure, Inequality and Political Violence: A Disaggregated Study of Indonesian Provinces, 1990–2003." *Journal of Development Studies* 47 (3): 377–398.

Persson, T., and G. Tabellini. 2003. *The Economic Effects of Constitutions*. Cambridge, MA, US: MIT Press.

_____. 2006. "Democracy and Development. The Devil in Detail." *American Economic Review* 96:319–324.

Piazza, J. A. 2011. "Poverty, Minority Economic Discrimination, and Domestic Terrorism." *Journal of Peace Research* 48:339–353.

Pinstrup-Andersen, P., and S. Shimokawa. 2008. "Do Poverty and Poor Health and Nutrition Increase the Risk of Armed Conflict Onset?" *Food Policy* 33 (6): 513–520.

Ross, M. 2006. "A Close Look at Oil, Diamonds and Civil War." *Annual Review of Political Sciences* 304 (5): 567–568.

Shemyakina, O. 2011. "The Effect of Armed Conflict on Accumulation of Schooling: Results from Tajikistan." *Journal of Development Economics* 95 (2): 186–200.

Smith, L.C. 1998. Can FAO's measure of chronic undernourishment be strengthened? *Food Policy* 23(5): 425-445.

Sørli, M. E., N. P. Gleditsch, and H. Strand. 2005. "Why Is There So Much Conflict in the Middle East?" *Journal of Conflict Resolution* 49 (1): 141–165.

Stewart, F. 2000. "Crisis Prevention: Tackling Horizontal Inequalities." *Oxford Development Studies* 28 (3): 245–262.

Taeb, M. 2004. *Agriculture for Peace: Promoting Agricultural Development in Support of Peace*. Tokyo: United Nations University–Institute of Advanced Studies.

Themnér, L., and P. Wallensteen. 2011. "Armed Conflict, 1946–2010." *Journal of Peace Research* 48 (4): 525–536.

UNDP (United Nations Development Programme). 2009. *Arab Human Development Report: Challenges to Human Security in the Arab Countries*. New York.

UN (United Nations). 2008. Urban and Rural Population by Age and Sex, 1950-2005. Version 1. New York: United Nations Department of Economic and Social Affairs, Population Division. CD-ROM.

UNCTAD (United Nations Conference on Trade and Development). 2012. UNCTADstat Commodities Database. Accessed January 2012. http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx?sCS_referer=&sCS_ChosenLang=en.

UNDP (United Nations Development Programme). 2009. *Arab Human Development Report: Creating Opportunities for Future Generations*. New York.

UNSTAT (United Nations Statistical Division database). 2011. National Accounts Main Aggregates Database. Accessed October 2011. http://unstats.un.org/unsd/snaama/Introduction.asp.

Urdal, H., and K. Hoelscher. 2009. *Urban Youth Bulges and Social Disorder: An Empirical Study of Asian and Sub-Saharan African Cities*. Policy Research Working Paper 5110. Washington, DC: World Bank.

WDI. World Bank Development Indicators. Accessed in September 2011. http://databank.worldbank.org/.

Wooldridge, J. 2002. *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA, US: MIT Press.

World Bank, FAO (Food and Agriculture Organization of the United Nations), and IFAD (International Fund for Agricultural Development). 2009. *Improving Food Security in Arab Countries*. Washington, DC.

WFP (World Food Programme). 2012. International Food Aid Information System (INTERFAIS). Accessed May 2012. http://www.wfp.org/fais/

Zurayk, R. 2011. *Food, Farming, and Freedom: Sowing the Arab Spring* in Beirut: Just World Books.

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