



FOOD CRISES,  
CIVIL UNREST,  
AND THE  
POLITICAL  
ECONOMY

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## INTRODUCTION

The world still remembers the self-immolation of the Tunisian fruit vendor as a protest against the abuses and corruption of the government authorities, who would regularly and arbitrarily harass him and confiscate his property. The December 2010 event set in motion a series of widespread protests and civil unrest that eventually gave rise to the Tunisian Revolution and catalyzed the wider Arab Spring. In a similar vein, protesters in Egypt and Yemen from 2011 onward commonly wore loaves of bread strapped to their heads—so-called bread helmets—to protest the rising costs of staple foods.<sup>1</sup> These events encapsulated the salience of increasing food prices as one of the principal grievances among the protesters of the Arab Spring, even though other political factors such as economic stagnation and widespread opposition to authoritarianism were commonly seen as the preeminent motives of the uprisings. In fact, the crisis of rising food prices in 2007 and 2008 extended beyond the Arab World to a range of countries in the developing world and Africa in particular; in these countries, rising food prices were often followed with widespread protests and civil unrest as well.<sup>2</sup>

This paper expands on the premise that food prices can serve as a proximate cause to civil unrest worldwide, especially in developing countries. In order to examine the specific conditions that prompt food price rises to result in civil unrest, this paper first outlines the mechanisms of the 2007-2008 food crisis and the historical context from which it emerged.

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<sup>1</sup> Sutton, Naguib, Vournelis, & Dickinson, 2013

<sup>2</sup> McMichael, 2009

Second, this paper reviews an array of existing research that connects changes in food prices with the incidence of civil unrest while presenting explanations for why such riots occurred in some countries and not others. This research reveals that food prices are a complex phenomenon with a close correlation to a variety of economic, social, and political factors and that even rapid changes are not always associated with unrest.<sup>3</sup> Third, this paper presents a set of empirical measures that attempt to quantify the specific characteristics of a political economy that capture variation between the developing economies in Africa. These quantitative measures relate conceptually to previous literature, but the combination of these measures as a means to quantitatively operationalize the development economy in particular is currently untested in previous literature. In turn, Africa was chosen as the research sample since the continent experienced significant cases of civil unrest that coincided with the price crisis and since reliable conflict data were readily available for the continent. Fourth, this paper tests those measures of the political economy with measures of food-related civil unrest to expose any statistical correlation between the two. Finally, this paper examines Egypt's experience over the course of the 2007-2008 price crisis as a case example and evaluates the response of the government to that crisis to place the quantitative models within a concrete, qualitative context. Above all, Egypt was chosen as an example due to the prominence of the widespread civil unrest it experienced and the clear connections of that unrest to the food price crisis; hence, any successful statistical model ought to relate to Egypt's experience at least in part.

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<sup>3</sup> Lagi, Bertrand, & Bar-Yam, 2011

Therefore, the empirical model that ensues from the statistical testing seeks to determine the factors of the political economy in which food price volatility and subsequent food riots are most likely to occur. Put simply, this paper endeavors to offer alternative explanations to why food price riots occurred in some countries but not others in the years surrounding the 2007-2008 price spike. Understanding this context may significantly improve the predictive power of food price volatility as a precursor to civil unrest as well as present opportunities for policy proposals to reduce the incidence of food-related civil unrest. Using empirical data on African countries between 2005 and 2011, when the most recent and most dramatic price hikes in global food prices occurred, I hypothesize that countries with more stable political economies, which is operationalized through the measures selected for the empirical model, are less likely to experience food-related civil unrest.

## **BACKGROUND AND PRIOR RESEARCH**

In the past century, a number of new circumstances fundamentally altered the significance of food as an economic and political force.<sup>4</sup> Whereas malnourishment and famine are persistent human experiences and continue to plague many parts of the world today, the commodification of agricultural products on a global scale has gradually rendered price over scarcity as the primary factor determining access to nourishment.<sup>5</sup> In other words, the question raised is increasingly not whether food is available, but rather at what price. At the same time, the international development community has promoted the commodification and globalization of food: development initiatives encouraged a movement from subsistence

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<sup>4</sup> Friedmann, 1995

<sup>5</sup> Magdoff, 2008

farming to export-oriented commercial farming, which promised a stream of currency that could be used to reduce debt, purchase goods and, most notably, replace the farm output that was now producing export crops with imports of cheaper staple foods from abroad.<sup>6</sup> At face value, the importation idea is noble: developing countries could rely on a steady supply of cheap food from efficient agricultural operations in the industrialized countries rather than risk famine due to weather or conflict at home. However, importing basic necessities effectively enmeshed developing countries into a dependence on foreign supplies and global markets, which are volatile and unpredictable.<sup>7</sup> The political economy of agricultural trade also entails a number of unaddressed inequities within the global supply chain, such as the heavy subsidies industrialized countries place on their agricultural products, the interruption of agricultural development in the developing world, and the intertwining of trade liberalization with neoliberal structural adjustment programs.<sup>8</sup> Finally, the mounting strain on worldwide food production in the face of the massive increase in world population over the course of the past century remains unaddressed.

Sweeping changes in the patterns of worldwide agriculture in the 1970s and 1980s prompted an intensified academic focus on the political economy of food. Researchers began to examine the notion of the access and availability of food as food security, which transcended scarcity to include the concepts of self-sufficiency and external dependency in food procurement in the context of globalized commodity markets.<sup>9</sup> Harriet Friedmann provides a compelling

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<sup>6</sup> Patnaik, 1996

<sup>7</sup> Ivory, 1990

<sup>8</sup> Friedmann, 1993

<sup>9</sup> McMichael, 1994

account of this transition in her article *The Political Economy of Food: a Global Crisis*.<sup>10</sup> She characterizes the postwar food regime as one that favored the maintenance of national farm programs through protectionist policies, such as tariffs and state agricultural regulations. In addition, the system enabled the subsidized export of the chronic surpluses in American agricultural production. Dependency theorists such as T. N. Srinivasan and Kevin Watkins note that dumping surplus agricultural production in the United States as cheap exports to developing countries protected American agriculture from price crashes,<sup>11</sup> but that the practice also created a dependence on cheap world wheat supplies in countries that were previously self-sufficient in food.<sup>12</sup> The food crisis of the early 1970s showcased the cataclysmic effects of rapid rises in agricultural prices as a result of sudden scarcity rather than surpluses: unable to restart the domestic production of staple foods, unable to replace domestic drought losses with imports, and unable to outbid industrialized countries for scarce resources on the global market, severe famine appeared around the developing world.<sup>13</sup> This pattern was particularly prominent in perilous famines in Ethiopia and Bangladesh during this time.<sup>14</sup> To ease the post-crisis strains on agricultural production, the agricultural markets of the world experienced a process of rapid liberalization and an end to regular surplus dumping over the course of the 1970s. In consequence, the behavior of profoundly volatile food

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<sup>10</sup> Friedmann, 1993

<sup>11</sup> Watkins, 1995

<sup>12</sup> Srinivasan, 1989

<sup>13</sup> Friedmann, 1993

<sup>14</sup> Schnittker, 1973

markets began to govern access to food in the developing world, which still lacks the means for adequate indigenous agricultural production.<sup>15</sup>

The emergence of the contemporary food regime as a product of these trends made sudden and sizable shifts in consumer food prices prevalent worldwide. In fact, the liberalization of agricultural trade in the wake of the 1970s crisis increased world agricultural imports by 34 percent by 1980; when only developing countries were measured, that figure was an astonishing 122 percent.<sup>16</sup> Even though the crisis prompted a reorientation away from export cropping to domestic food production in many developing countries, that trend was never sufficient to unshackle the developing world from a dependency on agricultural imports and market prices.<sup>17</sup> Another price crisis occurred in 2007 and 2008 when international prices for staple commodities rose to their highest levels in nearly three decades: corn prices doubled from 2006 to 2008 while wheat reached its highest price in 28 years.<sup>18</sup> Skyrocketing prices resulted in a 25 percent increase in food import expenditures in developing countries, which were quickly passed along to consumers in those countries. Developing countries are affected more severely when food commodity prices rise not only because they import a larger share of their staple foods, but also because their citizens spend a more sizeable proportion of their income on food as compared to households in developed countries. For example, even the poorest fifth of Americans spend only 16 percent of their budget on food while an average Nigerian family spends up to 73 percent.<sup>19</sup> Whereas crises in previous years were often

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<sup>15</sup> Clapp, 2012)

<sup>16</sup> Ivory, 1990)

<sup>17</sup> Friedmann, 1993)

<sup>18</sup> "Editorial: The World Food Crisis," 2008

<sup>19</sup> "Editorial: The World Food Crisis," 2008

associated with outright food shortages, the impacts of structural adjustment, uneven growth, and rapid urbanization have rendered food insecurity a problem of access and affordability for the urban poor, who rely much more on markets for food supplies as compared to rural populations.<sup>20</sup> For example, the urban population of Ghana purchases 92 percent of consumed food while more than 97 percent of the global urban poor are net food purchasers.<sup>21</sup> It is no wonder that the World Bank estimates as many as 130 to 155 million people plunged into poverty in 2008 as a result of the recent food crisis.<sup>22</sup> With scant options for substituting expensive imports with local produce, urban households throughout Africa were pushed to malnourishment and to trade spending on other necessities, such as health care and education.<sup>23</sup> Although policy solutions to a problem of access seem more elusive than solutions to a scarcity problem, the transformation places unprecedented opportunity for central governments to intervene.

The spectrum of academic literature on the 2007-2008 crisis presents an enormously wide range of possible causes to the crisis. For example, the director of the International Food Policy Research Institute (IFPRI) Shenggen Fan and researcher Derek Headey consider international market speculation, widespread crop failures, and a surge of biofuel production (which prompted a renaissance in export cropping in the developing world) as causes to the crisis.<sup>24</sup> In contrast, Cornell Professor Philip McMichael views the wider context of the

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<sup>20</sup> Maxwell, 1999

<sup>21</sup> J.Cohen & arrett, 2010

<sup>22</sup> UN. *The Global Social Crisis*. 2011

<sup>23</sup> Maxwell, 1999

<sup>24</sup> Headey & Fan, 2008

contemporary food regime as a central catalyst for the crisis.<sup>25</sup> Whereas my paper does not participate in this debate *per se*, it assumes a common premise within this literature—that international markets command enormous weight in determining consumer prices for food in the developing world—in grounding the hypothesis that specific properties of the political economy are responsible for promoting the incidence of food-related riots. In addition, this paper assumes a clear correlation between food prices and food riots, which was prominently investigated in the context of the recent crisis by Yaneer Bar-Yam, a physicist at the New England Complex Systems Institute, who coauthored a study that was widely cited in academia and major media outlets around the time of the Arab Spring. In that paper, Bar-Yam connects a range of protests and other events within the recent uprisings in Africa and the Middle East to concurrent trends in global food prices.<sup>26</sup> In particular, the study claims that civil unrest is significantly more widespread when a specific cost threshold for staple foods is exceeded. Unfortunately, Bar-Yam ignores cases where price increases failed to translate into riots, which impedes any attempts to draw causal correlations between prices and riots.

Marc Bellemare (2011) expands on this research in an attempt to empirically show a causal relationship between food prices and civil unrest. Bellemare's article searches media reports on civil unrest to determine which instances of unrest are associated with food-related grievances, and such instances are then correlated with data on food prices over the course of

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<sup>25</sup> McMichael, 2009

<sup>26</sup> Lagi et al., 2011

the past two decades.<sup>27</sup> The article finds a statistically significant relationship between the two, which Bellemare considers as a reliable indicator of a causal relationship: the results are robust, the methodology accounts for the endogeneity problem of price hikes and civil unrest occurring concomitantly, and the source data is both complete and reasonably reliable. Interestingly, the article concludes that unlike price rises, price volatility with food commodities is negatively correlated with political unrest. Together with Bar-Yam's paper, Bellemare's work provides the essential empirical foundation for the grounding assumption of this paper, which assumes a correlation between food prices and civil unrest.

More recently, academics have attempted to answer the underlying academic question of this paper: why riots occurred in some countries and not others. However, this research remains relatively scant. This paper responds most directly to Julia Berazneva and David Lee (2013), who were among the first to explore some of the more ultimate causes of the 2007-2008 food crisis with an empirical model that focuses on socio-economic and political factors.<sup>28</sup> With this model, the authors attempt to show that food riots were more probable in countries with specific configurations of these variables. Their independent variables center on a variety of political variables, such as the Political Rights Index, the Civil Liberties Index, and a measure on urban agglomeration. The authors find that higher rates of poverty, urbanization, oppressive political regimes, and wider civil liberties are associated with a higher likelihood of riots in Africa. These variables are statistically significant, even though the article retreats from establishing causality. Also, it is important to notice that the article considers a very

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<sup>27</sup> Bellemare, 2011

<sup>28</sup> Berazneva & Lee, 2013

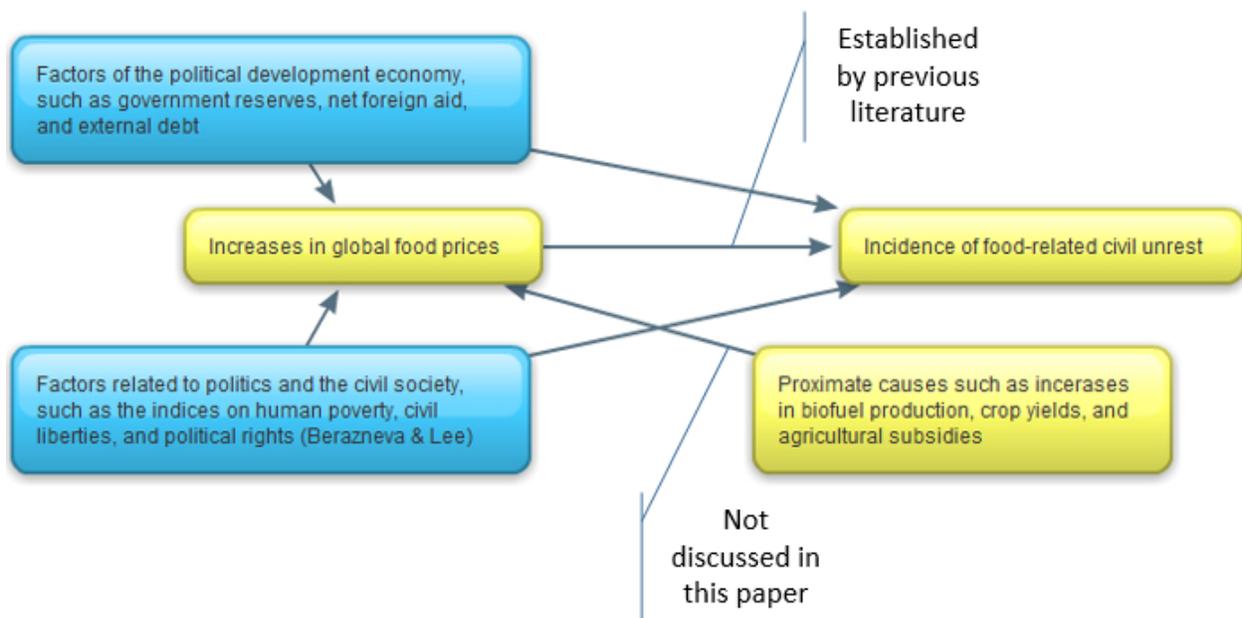
narrow subset of riots and protests that excludes cases upon cases of civil unrest that did not result in casualties or were otherwise too minor for the authors to consider.

Above all, this paper ventures to parallel the work of Berazneva and Lee by researching alternative realms of variables that characterize countries where food riots were more probable to occur. Importantly, this paper does not seek to disprove the political variables of Berazneva and Lee; instead, this paper considers alternatives to complement the work of these authors. It strives to contribute to the wider sphere of academic work that searches for statistically significant characteristics to differentiate countries that were more likely to experience riots around the 2007-2008 crisis from those that were not. Thus the variables examined this paper are an attempt to quantitatively operationalize the notion of a political economy in a developing country; in other words, this paper employs variables that characterize dissimilarities in the political economies of African countries.

This paper proposes and empirically examines three models with varying approaches in operationalizing the political economies of African countries around the 2007-2008 crisis. The variables in the first model were chosen to represent the dependence of an economy on foreign financial support as well as the quantity and liquidity of any financial assets available to the government at the time of civil unrest. These variables are associated with the aforementioned notion that governments maintain an unsurpassed opportunity to safeguard vulnerable populations from global price spikes so long as they command the assets and the financial independence to do so. It follows, then, that this model explores variables that relate to constraints in the political economy with which governments in Africa must contend. The

second model attempts to operationalize the quality of governmental institutions and their efficiency with managing the political economy. This model is conceptually aligned with the previous model in recognizing the role of government in buffering the effects of price spikes and is conceptually complementary in examining the extent to which governments can implement such policies in the first place. Finally, the third model considered in this research paper also attempts to measure the capacity and quality of governance but with an emphasis on the characteristics of the wider political environment. This model is motivated by the notion that the capacity of governments to enact and enforce policy during price crises is checked by the nature of the political environment even when governments command sufficient resources and maintain robust and effective institutions.

Because of the considerable conceptual departure from the quantitative measurements of Berazneva and Lee, who emphasize variables measuring the relationship between governments and the civil society, this paper does not attempt to control for any of the variables they explore. In addition, this paper assumes the empirical association between food prices and food riots as explored in previous literature and attempts to remove itself from the academic debate surrounding some of the more proximate causes for the 2007-2008 food crisis. For these reasons, this paper only controls for the size of the economy to make sure that the issue of scale is taken properly into account. This diagram sums these relationships to previous literature in this paper:



The following sections of this paper introduce the data, the variables, and the empirical methodology that are employed to establish correlation between specific properties of the development political economy and the incidence of food-related civil unrest in the years surrounding the 2007-2008 food crisis.

## QUANTITATIVE METHODOLOGY

The scope of this research project includes every country in Africa with annual data starting from 2005 and ending in 2011 (see annex). Importantly, this time horizon comprises the 2007-2008 food crisis, which was associated with widespread civil unrest in the developing world; the years surrounding the crisis are included in order to measure changes as compared to the pre-crisis period and the post-crisis period when no new acute food price crises occurred on the world scale.

The dependent variable of this research project is the *occurrence of food-related civil unrest*, which counts every case of civil unrest that was mentioned in written media and is positively associated with food-related grievances. The dependent variable is common across each of the three models explored in this paper. For the purposes of the variable, civil unrest includes protests, riots, strikes, inter-communal conflict, and government violence against civilians; in every instance, a strict association with food prices or expense-limited availability is required as identified in the dataset. The dependent variable is sourced from the Social Conflict in Africa Database (SCAD), which systematically catalogues social conflicts at a level of detail much beyond other conflict datasets while also counting conflicts that do not involve casualties or armed encounters. SCAD is an outstanding set of conflict data that does not yet exist in other continents with considerable numbers of developing countries, such as Asia or South America. Since collecting new conflict data is unequivocally outside the scope of this paper, the accessibility and reliability of SCAD rendered researching Africa much more feasible than other continents with significant civil unrest at the time of the 2007-2008 food price crisis. The dependent variable of this paper considers every instance of civil unrest that occurred between 2005 and 2011 and where either the primary, secondary, or tertiary source of tension was recognized by SCAD research staff as related to food and subsistence. The resulting data was pruned manually to exclude cases where the case commentaries written by the research staff were not strictly related to food prices in particular.

Each country in the dataset was then given a “1” for every year that it experienced at least one instance of a qualifying event of civil unrest, and coded with a “0” for years when such events were not recorded. That means that the dependent variable in this research paper does not

consider the relative intensity or frequency of the various instances of civil unrest aside from annual changes, because such datasets were simply unavailable or unreliable. Nonetheless, the dependent variable conveys considerable variation from one country and one year to another; for example, some countries experience food-related unrest around the price crisis while other experience no such unrest at any point.

All three models examine the statistical correlations between their respective sets of independent variables and the common dependent variable through logit regressions, which express a statistical probability for the positive outcome of the dependent variable, or the occurrence of civil unrest prompted by food prices over the course of a given year. The logistic regression equations of the three models can be expressed as follows:

Model 1

$$\Pr(Y = 1|X_1, X_2, X_3, X_4, X_5) = F(\beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5)$$

Model 2

$$\begin{aligned} \Pr(Y = 1|X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8) \\ = F(\beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + \beta_8X_8) \end{aligned}$$

Model 3

$$\Pr(Y = 1|X_1, X_2, X_3, X_4, X_5) = F(\beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5)$$

...where  $X_1$  through  $X_n$  refer to the independent variables described in the following sections.

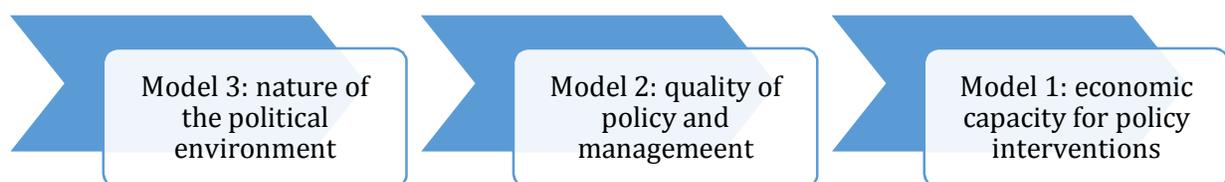
Logistic regression was chosen as the method of statistical analysis because the method is especially suited for the continuous nature of the independent variables and the binary nature of the dependent variable, whereby each country either experienced, or did not experience,

food-related civil unrest over the course of any given year. Because the logistic regression considers panel data with fixed effects, dummy variables were created for each country and each year in the dataset. The regression models also accounts for the effects of the other independent variables within the same model so as to eliminate any confounding impacts of those variables if they were considered separately. Therefore, any conversations about the associations of independent variables with the dependent variable in this paper make the assumption that other variables within the same model are kept constant. In this approach to regression analysis, positive coefficients represent a higher probability of civil unrest when the value of the independent variable rises in parallel, and negative coefficients represent this relationship in inverse. Furthermore, the magnitude of the coefficients represents the strength of the effects of a given independent variable in producing changes in the occurrence of a positive outcome in the dependent variable, or with the occurrence of civil unrest.

Several shortcomings in the quantitative dataset are important to acknowledge so as to delineate the limitations in predictive power and statistical inference in this analysis. First, two of the three models experience missing data points from when countries either stopped reporting relevant data to the World Bank or when experts at the World Bank refused to complete their evaluations due to missing primary source data (see the following sections). This skews the scope of statistical inferences since missing data points elevate the chance of making either type I or type II errors. Second, the scattershot nature of the most of the independent variables means that the logistic regressions do not fit the data especially well. Third, this study does not control for a sufficient number of factors to rule out neither

confounding nor intervening variables or the possibility of a reverse direction of association. In other words, this approach does not provide guarantees that the independent variables bring about change in the dependent variable rather than the other way around. For that reason, causal conclusions cannot be made on the basis of the quantitative approach here. Nonetheless, statistically significant correlations are extraordinarily important to guiding further research and the direction of academic conversation, which is what this paper aims to accomplish.

In terms of accounting for intervening variables, the three models considered in this paper are constructed in such a way that following models consider less proximate causes to the occurrence of civil unrest than the previous models. That is to say that the second model considers the conceptual underpinnings of the first model, and the third model considers more underlying causes than either of the other two models. The purposes and mutual relationships of the models can be visualized in the following manner:



## **MODEL 1: ECONOMIC CAPACITY FOR POLICY INTERVENTIONS**

This model employs a range of quantitative measurements of a political economy as independent variables. The purpose of these variables is to capture variance in the nature of the political economies of the countries in the dataset. In the context of this paper, a political

economy refers to a macroeconomy within the framework of the political institutions that shape its structure through policy choices; again, this paper hypothesizes that certain macroeconomic characteristics guided by these policies change the preponderance of a country to food-related civil unrest. An association between this class of variables and the dependent variable remains to be tested in any preexisting literature. Each of the independent variables are sourced from the database of World Development Indicators at the World Bank and capture each metric annually. The independent variables were chosen as conceptually valid measurements of the state of a political economy and so that the variables represent as a wide range of political economic properties as possible, which range from debt stocks to budgetary balance. However, it is important to realize that some variables include missing data on certain years in certain countries when such data was not reported by local authorities to the World Bank. For that reason, any independent variable with a significant amount of missing data was not considered in the empirical analyses for this paper, which may inadvertently exclude countries without systematic annual data collection from the results. The following independent variables were included in the empirical analysis:

1. *External debt stocks (% of GNI)* – refers to the amount of external debt owed to nonresidents repayable in currency, goods, or services. The amount of total external debt is the sum of public, publicly guaranteed, and private nonguaranteed long-term debt, use of IMF credit, and short-term debt. This amount is considered as a percentage of the Gross National Income (GNI), which is the sum of value added by all resident producers to the national economy. This variable constitutes a measure of the extent to which a country maintains borrowing capacity from international

lenders, which is one way for governments to acquire additional assets to continue importing food in times of price spikes.

2. *Cash surplus/deficit (% of GDP)* – refers to the balance between the revenue and expenses of the central government as a percentage of Gross National Product (GDP), which is a measurement of the size of a national economy that is closely related to the aforementioned GNI. The presence of a surplus or a deficit operationalizes the amount of discretionary expendable funds that the government commands over the course of a year, and which a government may choose to spend to account for price spikes.
3. *Total reserves* – refers to the sum of monetary reserves held by the central government, including assets in gold as well as foreign exchange reserves. The reserves are expressed in current U.S. dollars, which puts the reserves into perspective with the cost of goods, services, or debt servicing on any given year. This measurement differs conceptually from the measurement of budgetary surpluses and deficits in that reserves are typically less liquid and reserves accumulation reflects longer-term trends in national finances.
4. *Gross savings (% of GDP)* – represents the difference between disposable income and consumption within a national economy as a whole. The measurement is calculated simply as gross national income less total consumption, plus net transfers. The gross savings rate operationalizes the notion where consumers accumulate savings that they may use in times of financial hardship.
5. *Net ODA received (% of gross capital formation)* – refers to the amount of net official development assistance (ODA) per capita received as a proportion of gross capital

formation in a given country. ODA comprises of grants and loans made on concessional terms that are coordinated via a number of international intergovernmental institutions. Gross capital formation refers to changes in the fixed assets and inventories of a national economy as reported by enterprises and industries. The ratio of aid to gross capital formation provides a measure of a country's dependency on foreign aid, which is operationalized as a relationship between both aid and capital formation.

Together, these variables attempt to capture characteristics of a developing macroeconomy with a significant capacity to affect the capacity of a government to respond to food price crises and safeguard the vulnerable populations to an extent that suppresses any predispositions for rioting and unrest.

The regression model reveals statistically significant associations with three of the independent variables and no significant associations with the two remaining variables. Debt stocks, cash surpluses or deficits, and total reserves were all significant at the standard alpha of 0.05. Neither the ODA nor gross savings variables were significant at that alpha, although the ODA variable would be significant with more lenient alphas. An abridged version of the statistical output is presented in the table below:

<i>Independent variable</i>	<i>Odds ratio</i>	<i>Coefficient</i>	<i>P-value</i>
External debt	1.0067	2.67	0.007
Surplus/deficit	0.8546	-2.55	0.011
Total reserves	1.0000	2.25	0.024
Gross savings	0.9614	-1.43	0.154
Net ODA	0.9930	-1.80	0.072

According to the results above, the following observations can now be made:

- Larger external debt stocks are associated with a higher probability of food-related unrest.
- Budgetary surpluses are associated with a smaller probability of experiencing civil unrest. In turn, budgetary deficits are associated with larger probabilities of civil unrest.
- When governments command larger total reserves, they are more likely to experience civil unrest. Total reserves are distinct from budgetary surpluses in that they incorporate non-liquid monetary possessions in addition to cash reserves.
- When countries receive more overall foreign aid—including grants and subsidized loans—they are less likely to experience civil unrest. However, the statistical significance of this observation is unclear.

The results of the statistical model give rise to a number of interesting inferences regarding the way in which certain properties of the national political economy may empower civil unrest when food prices skyrocket. The association with external debt stocks is particularly germane, because so many African countries owe significant amounts to foreign lenders. Unlike debt stocks owned by domestic actors, the interest payments associated with loans leave the country and presumably get spent elsewhere; in other words, there is no circulation of money and the money multiplier effect gets cut short. That external debt stocks are associated with civil unrest gives credence to the notion that indebted countries cannot muster the financial leverage to borrow more money to meet unexpected rises in worldwide

food commodity prices. In consequence, these countries cannot subsidize staple foods or provide indigenous food aid to the most needy as well as countries with better access to borrowing. This variable seems like a prime example of the way in which the political economy can affect the extent to which food price crises can translate into hardship among consumers, which can elicit people to take to the streets in protest.

The size of the governmental cash surplus or deficit signifies another variable with a statistically significant correlation with civil unrest as well as a variable that makes conceptual sense. In fact, the conceptual framework of the variable is similar to that of external debt stocks in that this variable also expresses the extent to which a government has access to extra funding. The main difference is that cash surpluses can be spent on very short notice on food imports, price subsidies, or food aid. In addition, a cash surplus is generally viewed as a short-term indicator of effective government and the state of the political economy.<sup>29</sup> Hence it makes sense that surpluses are negatively correlated with civil unrest, because governments can quickly employ monetary resources to buffer the societal costs of sudden price rises on staple goods. An interview with Samya Beidas-Strom, a senior economist at the International Monetary Fund (IMF), emphasizes that governments can play pivotal roles in safeguarding the public from price shocks by using “fiscal space if available to reduce taxes on food, and if needed draw on external finance to support the balance of payments and international reserves.”<sup>30</sup> The combination of this variable as well as previously mentioned variable on the

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<sup>29</sup> Pessoa & Williams, 2012

<sup>30</sup> "Policy Options for Riding Out Food, Fuel Price Spikes," 2012

size of the external debt stock provides a great measure of the *fiscal space* that Beidas-Strom mentions.

The statistical significance of the third variable is perhaps the most conceptually confusing result of the regression model. In a similar vein to cash surpluses and debt stocks, monetary reserves are one measure of the fiscal capacity of a government, albeit arguably the most oblique of these three variables. At first, it seems to make no sense that countries endowed with extensive monetary reserves would be more susceptible to civil unrest. Indeed, foreign exchange reserves in particular (a component of total reserves) are often cited in literature as a source of macroeconomic stability and resistance to exogenous crises, including sudden food price rises.<sup>31</sup> For example, news articles regularly mention the lack of adequate foreign exchange reserves in Egypt as a correlate to continued distress associated with food prices.<sup>32</sup> Limited reserves of foreign exchange may also prevent the procurement of key import commodities required in agricultural production, such as fertilizer and fuel. However, the composition of the foreign exchange reserves in each country varies significantly by the extent to which the reserves are composed of Foreign Direct Investment (FDI) and the economic sectors that receive such investments.<sup>33</sup> In practice, monetary reserves often comprise comparatively fixed assets, which may not readily convert into the fiscal space needed to contain the damage of food price crises. These considerations encumber the conceptual validity of the variable (or underscore an extraneous factor that is not controlled) and may

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<sup>31</sup> Patel, 2012

<sup>32</sup> Goldman, 2012

<sup>33</sup> "Foreign Direct Investment in Africa: Performance and Potential," 1999

explain why the sign of the coefficient is positive rather than negative. But since the variable remains statistically significant, more experimentation with other versions of the variable—such as one that only accounts for foreign exchange reserves while excluding more fixed assets—is in order.

Finally, neither of the remaining variables appeared statistically significant in the regression model. Even though the notion of national gross savings as a measure of protection against sudden economic hardship makes conceptual sense on a cursory level, it is probably too circuitous to correlate directly with the incidence of food-related civil unrest. Firstly, gross savings are often too minor to actually provide sufficient purchasing power when food prices rise, especially since such price crises are often associated with major inflation that renders savings useless. Secondly, the variable does not take the distribution of the savings within the population into account. Indeed, most developing countries are characterized by extensive income inequality, which means that most savings are concentrated among the commercial sector and the rich. Further research ought to develop a measure of gross savings rate that takes income inequality into account; unfortunately, reliable and consistent data on income inequality is often difficult to come by. The last variable—the quantity of ODA received—is susceptible to comparable conceptual shortcomings, even though the variable is close to achieving statistical significance. For example, the variable does not take the allocation of aid into account, which means that the ODA under consideration might comprise of unrelated expenditures, such as highway construction or sanitation systems. In addition, ODA is often characterized by long-term projects rather than short-term crisis responses. Further research

ought to consider a variable that only measures short-term crisis aid as long as such metrics are available.

It is important to note that the statistical correlations expressed in these results must be qualified with the relatively low number of included observations as well as the relatively low pseudo R<sup>2</sup> score. The former is a consequence of missing data, a phenomenon that occurs often when complex statistical data is sourced in developing countries. On the other hand, the latter refers to the extent to which the source data follows the statistical model, and a low score is probably a consequence of the scattershot nature of data associated with such a large set of heterogeneous cases, or countries. Nevertheless, the three statistically significant variables of the regression model achieve a large confidence score, which gives much credence to the conceptual argument that those variables are associated with the framework of the political economy framework that enables food riots to occur. Indeed, these results underscore the importance of sound macroeconomic policy as a guarantor of safety and stability.

## **MODEL 2: QUALITY OF POLICY AND MANAGEMENT**

This model aims to evaluate the performance of governments in managing their political economies, which serves as a proxy to their capacity to respond effectively to contemporary food crises. Whereas the previous model emphasizes the financial capacity of governments, this one pays attention to the quality of national macroeconomic policy and governmental institutions. The guiding concept of this model is the notion that even financially capable governments may experience considerable challenges in safeguarding their populations from

sudden rises in food prices when systemic shortcomings in policy, management, and institutions are present. In other words, this model proposes that the most significant shortcomings in the capacity and performance of governments in responding to price crises are made possible by unsound or ineffective practices of economic governance, which in turn promote food-related civil unrest. In this sense, the second model is an antecedent to the quantitative variables of the first model.

Governments are most regularly and prominently evaluated by the Country Policy and Institutional Assessments (CPIAs) of the World Bank. CPIAs rate countries quantitatively against a range of criteria chosen and assessed by experts in macroeconomics; the scores are reviewed annually and offer direct comparisons between the management of the political economies. CPIAs are considered so significant that they are used by the World Bank and affiliated organizations to determine eligibility for development initiatives and lending programs. Although CPIAs cover a range of evaluations of governmental performance, only those with a direct relation to the political economy were included. It is important to realize that a couple countries in the dataset are missing CPIAs either because these countries are ineligible for International Development Association (IDA) programs or as a result of missing data. The following independent variables were included in the empirical analysis:

1. *CPIA debt policy rating* – scores countries according to the extent to which their public debt management policies are conducive to minimizing budgetary risks and ensuring the sustainability of long-term debt. Countries with poor scores are unlikely to maintain the borrowing capacity required to buffer price spikes when large treasury

reserves or budgetary surpluses are unavailable. This variable is conceptually related as a pretext to the variable on external debt stocks in the previous model.

2. *CPIA economic management cluster average* – scores countries according to an average of assessments on macroeconomic management, fiscal policy, and debt policy. As such, this score is the most general of the CPIAs in this research project with regard to the management of a political economy. Although this score is conceptually similar to every independent variable used by the previous model, save for the variable on development assistance, this score serves as a general pretext for the debt stocks, surplus/deficit, and total reserves variables in particular.
3. *CPIA equity of public resource use rating* – scores countries according to the extent to which standard patterns of public expenditures and revenue collection affect the poor and are consistent with poverty reduction priorities. Because the poor usually spend more of their income on subsistence and because the poor are more often readily undernourished, taxation and public expenditures overlooking the poor render this group especially vulnerable to food price spikes and motivated to participate in civil unrest. This variable gives a more nuanced pretext to the gross savings variable in the previous model.
4. *CPIA financial sector rating* – scores countries according to an assessment of the structure of the financial as well as the quality of the policies and regulations enacted to regulate the sector. Robust financial sectors provide investment opportunities for businesses and savings opportunities for consumers, which can contribute to government revenues and private savings. Since both private and public capital are

essential to repelling the effects of food price spikes, this variable is conceptually most similar to the gross savings variable in the previous model.

5. *CPIA macroeconomic management rating* – scores countries according to an assessment of macroeconomic management, which includes the framework of monetary, exchange rate, and aggregate demand policies. Although the scoring criteria of are similar to the aforementioned measure on the economic management cluster, this variable underscores the quality of policy over institutional structure.
6. *CPIA policy and institutions for environmental sustainability rating* – scores countries according to the extent to which environmental policies manage pollution as well as support conservation and the sustainable use of natural resources. Sound environmental policies can safeguard domestic crop production as well as pave the way for sustainable economic growth in the long term.
7. *CPIA quality of budgetary and financial management rating* – scores countries according to an evaluation of the economic planning and budgetary structure of the central government. In particular, this rating rewards countries that enact comprehensive and credible budgets motivated by clear policy priorities, governed by effective management mechanisms, and supported by accurate accounting and fiscal reporting. This variable is conceptually most similar to the surplus/deficit variable in the previous model, which connects significant surpluses and deficits to the capacity of governments in minimizing food crises during price spikes.
6. *CPIA trade rating* – scores countries according to the extent to which their trade policies promote transnational trade in goods. For example, free trade agreements and

other consistent efforts to reduce trade barriers are rewarded in this assessment. The conceptual significance of this variable is the notion that prior integration with the structures of international trade render food imports more reliable and affordable during price spikes, tempering the consequences of food crises.

Together, these variables attempt to capture expert evaluations of the quality of macroeconomic policies and the patterns of economic management that shape the capacity and performance of governments in responding to food price crises.

The regression analysis for the second model reveals statistically significant correlations with five of the nine independent variables considered in the model. The assessment scores on the use of public resources, debt policy, fiscal policy, and both scores on economic management were significant at the standard alpha of 0.05. In contrast, the assessment scores on environmental policies and institutions, budgetary planning, and trade policies were not significant at any reasonable alpha in this regression analysis. A summary of the statistical output is presented in the table below:

<i>Independent variable</i>	<i>Odds ratio</i>	<i>Coefficient</i>	<i>P-value</i>
Debt policy	39041	2.46	0.014
Overall econ mgmt	7.18 <sup>-14</sup>	-2.34	0.019
Public resources	0.2480	-2.25	0.024
Fiscal policy	75953	2.63	0.009
Financial sector	1.0230	0.04	0.970
Macroecon mgmt	9858.1	2.05	0.041
Env policy & instit	1.1304	0.27	0.785
Budget planning	1.1755	0.28	0.776
Trade policy	0.9491	-0.11	0.913

According to the results above, the following observations can now be made:

- When countries enact debt policies and fiscal policies that attract strong assessment scores, they usually experience food-related civil unrest more frequently than other countries in the dataset.
- When countries manage their political economies and allocate their public resources in ways that earn strong assessment scores, they tend to experience civil unrest less frequently than other countries.
- There appears to be no statistically significant association between the quality of the private financial sector, environmental policies and institutions, trade policies, and the budgetary planning of the central government with the occurrence of food-related civil unrest.

The results of the regression analysis of the second model point towards numerous intriguing insights on the relationship between the quality of economic policies and the performance of governments in managing the political economy. In addition, the results offer several parallels and points of comparison with the results of the previous model. Perhaps the most striking pattern among the results of the second model is that the quality of the direct management of the political economy is associated with significantly rarer food-related civil unrest, whereas the quality of wider economic policies are either not statistically significant or produce results in the opposite direction. The contrast between the associations of management over policy with the occurrence of civil unrest relates to the very nature of food crises and the challenges that such crises create for central governments. In other words, the

conceptually most straightforward explanation for these patterns in the regression analysis is the notion that food crises require quick and assertive action from central governments to minimize the consequences of such crises for the public. For such actions to reach results in significantly tempering the public impetus to riot on the streets, the governments initiating the actions must work with a robust institutional structure as well as maintain a strong grip on the political economy that conveys the crisis to the public. That is, an effective response occurs in the short term rather than the long term, provided that sufficient governmental capacity to that end exists in the first place.

This is why the results of the policy assessments are confusing and where the results of the first model can assist in explaining the results of the second. According to the second model, superior debt and fiscal policies actually elevate the chance of food-related civil unrest among the countries in the dataset. At first, there is no conceptual explanation that would validate this correlation with ease, especially when one of the central assumptions of this paper—and one supported by the first model—is that properly managed fiscal environments ought to support governments in their endeavors to provide for the public even when price spikes render food unmanageably expensive for portions of the population.

There are a couple important reasons why the second model produced these results. The first is a contrast in the temporal contexts of the independent variables of the two models: the first model uses concrete measurements of the political economy of each country, which captures conditions in the immediate short-term and conveys any dramatic changes verbatim. In comparison, the second model uses third-party assessments by the World Bank—though

considered reliable and accurate—that measure policies and performance, which are not meant to change abruptly in any particular direction and are not meant to measure governments in the short-term. In other words, the independent variables of the first model are more focused on *results* at a given time whereas the variables of the second are more focused on *intentions* and *trends* over a period of time. Hence, countries may enact superior policies and receive good assessment marks without actually realizing the results necessary—and the ones measured in the first model—to safeguard their populations from the effects of food crises.

Secondly, this avenue of reasoning also applies to the statistical significance and conceptual congruence of the economic management variables of the second model. Assessments of economic management reflect the performance of a government and the quality of institutions, which are products of the culture of governance and the competence of the bureaucracy. That is, strong management practices and effective means of governance are inherently the result of long-term trends and very much unlike the policies measured by the other variables in the second model, which are often enacted swiftly and frequently mimic the recommendations (or even demands, as was the case with the Structural Adjustment Programs) of world financial institutions such as the World Bank.

Nonetheless, one must carefully qualify the results of the second model with the properties of the statistical output. The strength of the second model over the first model is that the number of observations included in the regression analysis was markedly higher. This means that missing data was a significantly smaller problem, which is rooted in the origin of the

variables of the first model as self-reported statistics and the origin of those of the second model in centralized assessments produced within the World Bank. In this case, assessments were only omitted with countries where metrics on policies and management were so scant or unreliable that an accurate assessment could not be produced. On the other hand, the primary shortcoming of the second model was an exceedingly low pseudo R<sup>2</sup> score. As with the regression analysis for the previous model, the score conveys the extent to which the source data follows the statistical model and was a probably a product of the scattershot nature of the independent variable. However, such R<sup>2</sup> scores do not always mean that the model is unusable or unreliable; in this case, the score reflects the ordinal nature of the independent variable, where countries were scored on a six-point scale that necessarily produces scattershot results with no ready semblance to a statistical model.

### **MODEL 3: NATURE OF THE POLITICAL ENVIRONMENT**

The purpose of this model is to consider the significance of the wider political environment as a constraint to the performance and capacity of governments as measured in the two previous models. Rather than measuring the resources available to a government or evaluating the quality of policy or management, this model endeavors to capture the effects of corruption, instability, and government credibility on the occurrence of food-related civil unrest; hence the variables assessed in this model define the foundation in which the variables of the other models operate. This may point to more systemic causes as precursors to the characteristics of the political economy, which this research paper suggests as central to the success of governments in forestalling food-related civil unrest. To that end, this model uses

the Worldwide Governance Indicators of the World Bank, which report the perceptions of a wide range of citizen and expert respondents on the political environment. In that way, the variables considered in this model resemble the expert assessments used to create the CPIA scores in the previous model. However, unlike the other models, there are no missing response data for any of the countries or years considered in this research project. Each of the variables are scored in units of a standard normal distribution, which ranges from about -2.5 to 2.5, where higher scores denote more positive public perceptions. The following independent variables were included in the empirical analysis:

1. *Control of Corruption* – captures perceptions of the extent to which public power is exercised for private gain within governments by elites and private interests. This variable relates to the notion that rampant corruption in the political environment hampers every process of governance so that even superior policies and sound management endowed with sufficient resources may not translate into a robust political economy.
2. *Government Effectiveness* – captures perceptions of the quality of public services and the credibility of government commitments to the public good. Unlike the ratings on management and policy explored in the previous model, this variable emphasizes rapport between the public and the private, which contributes crucially to prospects of civil unrest.
3. *Political Stability and Absence of Violence/Terrorism* – captures perceptions of the possibility that the government is crippled or overthrown by unconstitutional or violent means, such as politically-motivated violence or terrorism. Such perceptions

are particularly significant when they occur prior to the onset of civil unrest since they reflect upon complex dynamics involved in the relationship of governments and civil unrest.

4. *Rule of Law* – captures perceptions of the prevalence of crime and violence as well as public confidence in the authority of law, ranging from property rights to the police and the courts. This variable is guided by the notion that a weak rule of law creates social inequities as well as a power vacuum that creates space for civil unrest to grow.
5. *Voice and Accountability* – captures perceptions of the extent to which the public enjoys the freedom of expression, freedom of association, and a free press, as well as the extent to which citizens are able to participate in selecting a representative government. This variable is most similar to the variables tested in Berazneva and Lee, and it is included in the model for the same conceptual reason: that restrictive governments limit options for dissent and channel public expression to outbursts of riots and unrest.

Together, these variables attempt to capture key characteristics of the political environment that may constrict the capacity of governments to properly manage their political economies, enact superior macroeconomic policy, and maintain a readiness in resources to respond to food price crises in ways that remove the impetus for civil unrest.

The logistic regression analysis for the third model reveals statistically significant correlations with two of the five independent variables considered in the model. The variables on corruption control and political stability were both significant at the standard alpha of 0.05.

The variables on rights of expression, government effectiveness, and the rule of law are not significant at that alpha. A summary of the statistical output is presented in the table below:

Independent variable	<i>Odds ratio</i>	<i>Coefficient</i>	<i>P-value</i>
Corruption	0.1537	-2.53	<b>0.011</b>
Gov't effectiveness	5.3325	1.82	0.069
Political stability	0.3152	-3.16	<b>0.002</b>
Rule of law	1.1522	0.12	0.905
Voice and account	0.7985	1.31	0.192

Given the results above, the following observations can now be made:

- Better public perceptions of corruption control and political stability were associated with smaller frequencies of food-related civil unrest. The strength of the coefficients, the odds ratios, and the small sizes of the p-values indicate strong statistical associations with the dependent variable.
- Public perceptions of the rule of law and the public voice were not statistically associated with the occurrence of food-related civil unrest. The variable on government effectiveness comes close to significance, but the coefficient suggests a rise in incidences of civil unrest as public perceptions of government effectiveness rise.

The results of the third statistical model provide several important observations about the nature of the wider political environment as a source of constraints to the capacity and performance of governments responding to food price crises as an alternative to the two prior models. Whereas those models emphasize various characteristics of the political economy in addition to the patterns of management and policy that shape that economy, this model investigates the environment in which the other models operate. While it is tempting to

conclude that the variables considered in this model constitute the true independent variables so that the variables in the two other models are merely intervening variables, one cannot run a logit regression with simultaneous variables across the three models to actually test that statement. For the sets of variable data in each of the models are sourced from mutually independent sources with entirely different measurements and sampling methods, it is improbable that such a statistical test would carry much construct validity at all. For that reason, the results of the third model ought to be considered as complementary rather than competing explanations.

In that context, the results point to two characteristics of the political environment that are strongly associated with the occurrence of food-related civil unrest and make much conceptual sense. The prevalence of corruption cripples effective governance by raising the transaction costs of government action and introducing private ulterior motives to decision-making processes. Governments that operate in corrupt political environments arguably contend with many more challenges in enacting policy and managing their political economies in ways that contribute to a readiness to respond to food price crises. When such crises occur, corruption may misguide resources and stonewall any public response to such an extent that rioting and violence against the government itself becomes more attractive. Granted, corruption in political environments is so rampant among the countries in the dataset that the prevalence of corruption alone cannot predict the occurrence of civil unrest during food price crises. However, the variable does underscore the importance of eradicating corruption to enable governments to work to correct policy shortcomings and properly manage their political economies as measured in the two previous models.

The results of the variable on public perceptions of political stability produce especially fascinating takeaways. In essence, this variable asks respondents to make their own predictions of the prospects of civil unrest, though not necessarily of civil unrest related strictly to food prices. While this is not to say that the variable inevitably measures the existence of a self-fulfilling prophecy, the variable does provide a conceptually robust measurement of the political environment in which civil unrest may or may not occur. Long-running traditions of taking to the streets conceivably decrease public thresholds for renewed unrest, and the statistical results show that the variable is strongly associated with exactly that behavior. Of course, what the model cannot show is whether the public predicts political instability due to civil unrest protesting a government failure to serve the people or due to other reasons, such as conflicts among elites or extraneous challenges to the regime. Nonetheless, the variable points to a pattern of food-related civil unrest where public perceptions of political stability are negative.

Neither the variable on public perceptions of civic freedoms nor the variable on the rule of law were anywhere near statistical significance in the statistical model. Although the two variables seem conceptually appropriate, neither carries as much relevance to the mechanisms of civil unrest as the other variables in the model and probably suffers from only a cursory connection to the food riots that occurred in Africa during the price crisis several years ago. For example, weak public safety and unequal courts surely channel dissent to the streets, but not when governments, beyond their role as guarantors of civil protection under the law, employ paramilitaries to stop riots. Such shortcomings surely create social inequities that stem social mobility, but probably not to the extent that food staples might get diverted as

they would in the hands of corrupt officials or under corrupt management practices. Similarly, restrictive governments surely elevate the chance of civil unrest in times of crisis, but then again most countries within the dataset ignore civil liberties to such an extent that other variables eclipse its significance in multiple logit regression analysis. At any rate, this model enjoys a more robust pseudo R<sup>2</sup> score than the other two models—perhaps due to more orderly response data in the independent variables—and the dataset suffers from no missing data. Nevertheless, it is important to remember that the variables in this model are sourced from survey samples rather than government-reported or expert-assessed metrics.

## **CASE EXAMPLE AND POLICY IMPLICATIONS**

The significance of the empirical survey conducted in this research project remains ambiguous until it is examined in the context of a case example. For one, exploring case studies enables assessments of quantitative models within a concrete, qualitative context. Because statistical research only considers set samples and aims to produce generalizable results, case examples can test the external validity of those models by comparing them to actual cases within the sample. That is, case examples evaluate the congruence of the general with the specific. Moreover, case examples serve to explain quantitative variables in qualitative terms, which assists in understanding the practical significance of the statistical models and the ways in which those models are generalizable. In other words, case examples complement the limitations of statistical models in explaining specific cases in their own contexts, and they offer opportunities to better understand their strengths and shortcomings. Finally, case examples complete the circle of the quantitative research process when it is

motivated by observations of patterns among cases, quantified into generalizable models, and then evaluated again in the context of those cases.

Among the countries in the statistical dataset, Egypt stands out as one of the more prominent examples of widespread civil unrest at least partially motivated by the 2007-2008 food price crisis. Egypt also makes for a particularly interesting case to examine as an example, because the central government was already established as a central actor in the national food economy for decades before the price crisis occurred. At the same time, the Egyptian government was confronted with protracted civil unrest that was so extensive and violent in nature that it profoundly jeopardized the capacity of the government to effectively execute policy to manage the availability and affordability of food necessities. Coupled with a continuous erosion of the economic viability of the central government over the course of many decades and thus the sustainability of the food assistance programs supported by that economy, Egypt emerges as an especially appropriate example at the confluence of government capacity and food-related civil unrest.

Based on the results of the statistical models considered in this research project, one would expect to see the Egyptian economy characterized by at least some of the properties evaluated in the statistical models, such as extensive external debt stocks and chronic budgetary deficits. At the same time, one can expect a pattern of economic mismanagement and weak governance regardless of any sensible, strong policies that the government may have enacted. What the statistical models cannot predict and what the case studies serve to elucidate is the specific structure of the central government prior to the crisis, the nature of the Egyptian

response to the crisis, and the preponderance of the Egyptian public to take to the streets to protest the price hikes in the first place. Hence, statistical models may present opportunities to predict the occurrence of civil unrest but they cannot completely explain the specific experience of Egypt (or any other case in the study) during the crisis.

The cornerstone of Egypt's food assistance strategy is a national subsidy program that is intended to grant low-income citizens access to otherwise unaffordable food items. The program is one of the primary components of the nation's social safety web as well as a mainstay of a wider political endeavor to promote social equity and political stability.<sup>34</sup> Accordingly, the proportions of the program are nothing short of stunning: in 2000, the program provided approximately 40% of the required minimum caloric intake among the low-income population while protecting as many as 730,000 people from extreme poverty.<sup>35</sup> The costs of the program are equally spectacular: as much as 10% of the national GDP is spent on subsidies each year.<sup>36</sup> The importance of the program means that it garners continuous political attention and receives recurrent reforms according to concomitant political trends. However, the core of the program remains unchanged ever since it was conceived after the Second World War.<sup>37</sup> Its primary component is the provision of significantly subsidized bread to everyone from public bakeries strewn across the country. In turn, the second component is a ration card program that enables low-income card recipients to purchase quotas of additional commodities from prearranged outlets at subsidized costs.

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<sup>34</sup> Ahmed, Bouis, Gutner, & Löfgren, 2001

<sup>35</sup> Ramadan & Thomas, 2011

<sup>36</sup> Trego, 2011

<sup>37</sup> Ahmed et al., 2001

The significance of the subsidy programs to the society meant that maintaining their sustainability through times of crisis was an unequivocally essential endeavor in minimizing the growth of hunger and poverty in the country. Even with the programs in place, the average Egyptian spends 40.6% of earnings on food purchases, which renders most citizens very vulnerable to any price increases and exceedingly reliant on the subsidy programs—particularly so among the 21% of the population below the national poverty line.<sup>38</sup> At the same time, the country as a whole grew exceptionally reliant on food imports when rapid population growth coincided with slow growth in wheat production in the 1960s. The continued allocation of foreign exchange reserves to food imports resulted in severe deficits and proliferating debt; both of these metrics are assessed in the first set of empirics and revealed as significant determinants of civil unrest. Egyptians have an extensive history of mass protests, and the escalating contradictions between mounting debt and continued subsidy programs translated into violent protests already during the reign of President Sadat, who announced major cuts to the subsidy programs in exchange for IMF assistance in financing the national deficit. Despite vast growth of expensive wheat imports, these riots set an enduring political precedent that favored the status quo over reforms and set the political context for the government's response to the 2007-2008 crisis. By the onset of the crisis, Egypt's domestic wheat production was so inadequate in satisfying demand that the country became the second largest importer of wheat in the world.<sup>39</sup> Since the crisis, Egyptian wheat

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<sup>38</sup> Breisinger et al., 2013

<sup>39</sup> Trego, 2011

imports have continued to grow so much that the country is now the world's largest wheat importer.<sup>40</sup>

The successes of the subsidy programs in guaranteeing the availability of affordable staples and contributing to declining rates of malnutrition and infant mortality are widely recognized. Indeed, national poverty estimates could rise to about 34% were the subsidy programs removed and equivalent commodities purchased at nonsubsidized prices.<sup>41</sup> Despite much evidence of success and the mounting costs of the program to the Egyptian government, the subsidy programs were unable to prevent rioting during the food price crisis in 2007 and onwards. In many ways, the failure of the subsidy programs to maintain a satisfied population was a culmination of fundamental shortcomings in the structures of the program along with an accumulation of crippling weaknesses in the Egyptian political economy. The cost of the subsidy program was a recurring concern of successive governments and international development organizations, but so was the specter of renewed rioting to protest any cuts to the program. In response, cycles of reform were enacted gradually but regularly, and persistent trends in downsizing the program meant that far fewer people were incorporated into the ration card system at the time of the food price crisis when compared to the decades that preceded it.<sup>42</sup> These trends were jumpstarted in the 1980s when President Mubarak's government removed many commodities previously covered by the ration cards, made ration

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<sup>40</sup> Mettetal, 2013

<sup>41</sup> Breisinger et al., 2013

<sup>42</sup> Trego, 2011

cards with partial subsidies available to high income citizens, and dropped the practice of adding newborns to the ration cards of their households.

But when market prices skyrocketed in 2007, the government actually reversed these trends and greatly expanded access to the ration cards: an unprecedented 22 million previously unqualified citizens were now given ration cards while the partial subsidies aimed at upper-income citizens were replaced with full subsidies.<sup>43</sup> At the same time, the number of commodities covered by the ration cards was augmented with pasta, fava beans, tea, and others. The combination of a growing population of ration card users and precipitously rising market prices meant that these reforms came at an enormous cost to the Egyptian government: in 2007-2008, expenditures related to the subsidy programs exceeded original budget allocations by an astonishing \$1.07 billion to account for a total of \$2.82 billion in costs.<sup>44</sup> To make up for the unexpected expenditures, the government raised numerous taxes while enacting deep cuts to public support systems such as fuel subsidies. For that matter, enacting such an array of rapid reforms to the subsidy programs as a response to the price crisis reflected equally upon Egypt's scores among the variables of the quantitative study as well. The scramble for money increased the deficit from 4.56% of GDP at the onset of the price crisis to 10.08% of GDP by 2010, and a considerable proportion of this increase is attributable to proliferating food subsidy expenditures, which rose from \$2.36 billion to \$4.69 billion within the same time period.<sup>45</sup> Therefore, the quantitative study accurately predicts

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<sup>43</sup> Ahmed et al., 2001

<sup>44</sup> Trego, 2011

<sup>45</sup> Rohac, 2013

the occurrence of riots in Egypt when the political economy is characterized by mounting deficits, and the case example reveals the context of the mounting deficits as a series of policy decisions to that end. Together, the quantitative results with the qualitative context create the opportunity to suggest more prudent fiscal policy.

The government's preference to pump more resources into an existing structure of a social safety net rather than embark on comprehensive reform programs was quintessential of a weak government without the managerial capacity necessary to allocate resources efficiently. The vast expansion of the subsidy programs to account for the crisis was arguably a populist policy of convenience that neglected to address underlying inequities and inefficiencies. In fact, such patterns of governance are prototypical of developing countries where inadequate institutions preclude carrying out efficient economic reform. Leila Frischtak of the World Bank points out that the seemingly unsurmountable paradox facing governments such as Egypt's is that comprehensive economic reforms often give rise to conflicts of interest within the very government campaigning for reform, because such platforms for reform usually aim to reduce the extent of government command of the national economy.<sup>46</sup> At the same time, enacting reforms always tests the capacity and efficiency of economic management, because activating such reforms requires an appropriate amount of government control in the first place. Robust economic reforms also preclude compromises with the narrow special interest groups that so often maintain profound power among weaker governments or partial democracies, let alone authoritarian regimes such as President Mubarak's. While good

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<sup>46</sup> Frischtak, 1994

economics sometimes make good politics only in the long term, authoritarian governments experiencing widespread political opposition rarely enact policy outside the range of the popular political memory.<sup>47</sup>

The conundrum surrounding the unsustainability of Egypt's response to the price crisis coupled with its failure to stop public outrage and violent unrest is not whether the subsidy system can serve as a buffer against worldwide price shocks. For that matter, the Egyptian public considers the subsidy programs as powerful symbols for the social contract between the population and any governing regime.<sup>48</sup> Instead, the conundrum was created when the government expanded the program without respect to maintaining the intended purpose of providing food staples to those who could not afford them. For example, the neediest could not benefit from expanding ration card ownership across society and instead suffered from excessive wait times at overburdened ration outlets, where waits regularly exceeded two hours. Likewise, extending complete subsidy benefits to upper-income citizens and incorporating non-essential items like tea into the realm of the subsidy programs were useless for providing the safety net that the program promised to provide. Because the wealthy consume more, subsidy spending benefits the rich much more than the poor, and caloric deprivation is closely correlated with poverty levels.<sup>49</sup> Furthermore, leakage of subsidized commodities to black markets represents as much as 31% of the supply of bread and 20% of the supply of sugar and cooking oil.<sup>50</sup> While the subsidy programs were exemplary endeavors

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<sup>47</sup> Rodrik, 1996

<sup>48</sup> Ghoneim, 2012

<sup>49</sup> Trego, 2011

<sup>50</sup> Rohac, 2013

of ensuring the availability of food necessities without the complexities and accounting challenges of income transfers to citizens, the mistargeted expansion of the programs fundamentally compromised their efficacy.

The experience of the food subsidy programs strongly corroborates the results of the quantitative models. For one, the Egyptian economy prior to the crisis was characterized by many of the same properties of a political economy that the first model associates with the occurrence of civil unrest. Most importantly, the subsidy programs rendered the country increasingly reliant on loan money to cover persistent government deficits.<sup>51</sup> Egypt may eventually reach a point where loan money is no longer as readily available from international institutions and more wealthy allies in the Arab World, which would constrain the government's capacity for any sort of response to future price crises. Second, the government enacted sound policy by maintaining the subsidy programs but mismanaged its response to the food crisis by mistargeting resources and assistance programs, which is a pattern that the second empirical model associated with civil unrest. However, the continued operation of the core of those programs surely dampened the consequence of the price crisis to fomenting more civil unrest. Finally, the political environment considered in the third quantitative model in pre-crisis Egypt was absolutely ripe for the type of mass riots that the country experienced during the food price crisis: the population maintains long-running traditions of food protests and the government was riddled in corruption.<sup>52</sup> Thus the empirical pathway charted in the quantitative models seems to corroborate Egypt's experience during the crisis.

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<sup>51</sup> Breisinger et al., 2013

<sup>52</sup> Ahmed et al., 2001

Unless sweeping changes to current patterns of food production and consumption in Egypt occur and unless transnational institutions work to radically alter the current configuration of the worldwide economy of food commodities, it appears very plausible to assume that global price shocks will continue to affect the accessibility and affordability of food staples in Egypt and other countries in similar situations. At the same time, climate change and changing patterns in demographics may potentially exacerbate the scope and frequency of such shocks. Therefore, drawing concrete and actionable lessons in policy is vital for the purpose of minimizing the human costs of such crises and maintaining political and social order.

## **CONCLUSION**

This research paper endeavors to contribute to the academic conversation on the occurrence of civil unrest and violent protests connected to food price crises by focusing on the crisis of 2007-2008, and both the quantitative models as well as the case example surely accomplish just that. Whereas the quantitative models are not strong enough to make causal claims as to the hypothesis of this project—that the presence of certain properties of the political economy increases the chance of civil unrest—the statistical associations are quite evident and are comprehensively corroborated by examining Egypt as a case example. Those associations create interesting new paths for academic study and raise important questions about the nature of government responses to price crises as well as the economic factors that deserve attention when safeguarding populations from those crises. As such, this paper does

not challenge alternative explanations presented in previous and parallel literature on the topic.

Since the phenomenon of civil unrest is astonishingly complex and controlling for every factor is virtually impossible, the tiered approach to the quantitative models in this paper provided more perspective to the research question than three separate models without any connections to define the relationships between the models. Although integrating independent variables from each of the three models into a combined model was not possible, the significance of the results combined with conceptual congruence with the case example point to findings that ought to be researched further in the future. Since the extreme weather associated with climate change and the uneven economic growth associated with globalization will likely continue to increase the frequency of food price crises, policymakers must pay more attention to the systemic causes promoting such price crises and adopt policies that minimize the cost of any such crises to the public. For when price crises affect significant swaths of populations, the chance of civil unrest grows, which stagnates economies and renders governments unstable. As the empirics and the case example of this research project suggest, policymakers ought to redouble their efforts in targeting assistance programs more effectively, maintaining financial capacity to enact short-term assistance programs, and embark on programs to improve the managerial effectiveness within the governments themselves. Alas, no efforts can produce satisfactory results when the political environments are marred by corruption and chronic instability; these can only be improved by prolonged efforts both within the political elites and the general public, which must demand better government. For example, it remains to be seen whether the Egyptian revolution translates

into an improved political environment that enables effective government and quality policies on food prices in the years to come.

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## **ANNEX: COUNTRIES INCLUDED IN THE DATASET**

Algeria	Guinea	South Africa
Angola	Guinea-Bissau	Sudan
Benin	Kenya	Swaziland
Botswana	Lesotho	Tanzania
Burkina Faso	Liberia	Togo
Burundi	Libya	Tunisia
Cameroon	Madagascar	Uganda
Cape Verde	Malawi	Zambia
Central African Republic	Mali	Zimbabwe
	Mauritania	
Chad	Mauritius	
Congo, Dem. Rep.	Morocco	
Cote d'Ivoire	Mozambique	
Djibouti	Namibia	
Egypt, Arab Rep.	Niger	
Equatorial Guinea	Nigeria	
Eritrea	Rwanda	
Ethiopia	Sao Tome and Principe	
Gabon	Senegal	
Gambia, The	Seychelles	
Ghana	Sierra Leone	