Food Prices, Yields, and State Fragility

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**Introduction & Motivation:**

Volatility in food prices and food supply shocks can have serious implications for both individual’s access to needed food and nutrition as well as state stability in politically insecure regions. Food price swings and supply shocks can occur due to various reasons and are an intrinsic challenge present in global food markets. As a result of the 2008 financial crisis, for example, world prices of cereals such as maize, wheat, and rice experienced a significant and sudden rise[[1]](#footnote-1). This rise in global food prices occurred due to a variety of reasons that include supply and demand side factors, poor policies, and financial mechanisms. For developing countries, the rise in food prices impacted poor citizen’s ability to access and afford necessary food. Secondly, beyond access issues, the sudden rise in prices caused food related riots that occurred throughout the world including Sub Saharan Africa and developing countries in Asia[[2]](#footnote-2). Furthermore, the food price shock may have even impacted some of the world’s current civil wars. Considering the significant link between food security and political stability, it is likely that some of the world’s most severe civil conflicts have in been exacerbated by inadequate food access and price volatility. Accordingly, the principle question explored in this analysis is whether there is a significant correlation between cereal yields, nominal food prices, and state stability in the Middle East. Specifically, this analysis looks at the correlation between state stability decline in the Middle East and changes in food prices and cereal yields. The primary countries of interest in this analysis are Yemen, Iraq, Syria, and Egypt. All four countries have experienced significant increases in state fragility and violence in recent years, some of which may be linked to food security challenges.

Before exploring the link between food accessibility, price volatility, and state stability it is important to discuss the terms and mechanisms which this analysis explores. Food access refers to an individual’s ability to acquire food and nutrition required to live a productive life. As discussed by Amartya Sen, serious food access issues, such as famines, can occur as a result of two, broad, causes: food availability declines and entitlement declines[[3]](#footnote-3). Food availability declines (FAD) refer to declines in the supply or availability of food in a given region at a given time. In other words, a lack in the supply of food. Sen discusses that FADS are often not the principle cause of inadequate access to food. Instead, Sen notes that entitlement issues are often the true cause of famines and serious food security issues. Entitlements are a person’s ability to have a right to food or another “commodity bundle.” Sen discusses that a person’s “entitlement set,” or set of tradable items and skills, impacts their ability to procure food. One’s entitlement set can work through several mechanisms including growing food, buying food, working for food, or being given food[[4]](#footnote-4). Sen coins this lack of adequate ability to trade either labor or money for food as the “exchange entitlement decline.”

Although Sen specifically relates both FADs and exchange entitlement declines to famines, these two mechanisms are also correlated with increases in civil conflict and state fragility. Relatedly, an important mechanism working through FADs and entitlement declines are food price shocks. Food price shocks can occur as a result of supply and demand shocks, and policy choices pursued by state governments. Two relevant examples of supply shocks are poor harvests and rises in the price of key inputs. Poor harvests of important cereals, caused by blights or droughts, impact food prices through an acute reduction in supply. As for input shocks, the price of agricultural inputs and other commodities impacts the price of food through an increase in the marginal cost of production. For example, in the early 2000s, a large increase in the price of oil caused the price of soybeans and wheat to increase by 30%-40%[[5]](#footnote-5). Demand shocks, on the other hand, refer to mechanisms that impact prices through the demand for a given commodity. This kind of shock is illustrated in the example where the demand for biofuels causes an increase in food prices due to the fact that certain staple foods are also key inputs to biofuel production[[6]](#footnote-6). The increase in demand for biofuel causes an increase in production and, through the laws of supply and demand, increases the price of biofuel inputs such as corn. Finally, policy choices pursued by governments such as export bans, food stock piles, and tariffs can also directly and indirectly impact food prices. One example are export bans, which are often pursued by governments to keep food from leaving local markets[[7]](#footnote-7). Although export bans are pursued with good intentions, they do not always result in good outcomes. In Africa, for example, export bans have increased food prices and led many rural poor to be more rather than less food insecure[[8]](#footnote-8).

The following analysis explores the two identified factors, food availability and price volatility, in the context of the state fragility of four countries in the Middle East: Egypt, Syria, Yemen, and Iraq. The state fragility level of these four countries is analyzed using the State Fragility Index dataset from the Center for Systemic Peace[[9]](#footnote-9). This dataset is comprised of several index measures of state fragility and government effectiveness as well as outside data from the World Bank and Food and Agriculture Organization of the United Nations (FAO). More details of this unique dataset are provided in the **Data Construction** section of this analysis. The four countries focused on in this paper are selected over other regions of the world due to both the high degree of conflict currently present in these nations and because of the volume of past research that has been completed on the topic. In the following analysis, I discuss some of the relevant and recent literature on the relationship between food security and civil conflict in the middle east and also perform a brief data exploration exercise and statistical analysis on a macro level dataset of food prices, agricultural data, and state fragility indicators. To perform the analysis, I use a fixed effects estimator, controlling for year and country fixed effects, to assess how changes in nominal prices and cereal yields correlate with decreases in state stability. The following sections are comprised of a literature review, an explanation on the dataset construction, a discussion of the methods and specifications, an explanation of the results, and a discussion on threats to validity and take away points from the analysis.

**Literature Review:**

There have been several recent papers that have examined the relationship between food security and civil conflict. These studies have examined different regions of the world and have used various econometric and data analytic methods.

**Data Construction:**

**Methodology & Specifications:**

**Results:**

**Robustness Analysis & Heterogeneity:**

**Discussion & Conclusion:**

1. (Wiggins, Keats and Compton 2010) [↑](#footnote-ref-1)
2. (Greenberg 2016) [↑](#footnote-ref-2)
3. (Sen 1981) [↑](#footnote-ref-3)
4. (Deveruex 2001) [↑](#footnote-ref-4)
5. (The Economist 2015) [↑](#footnote-ref-5)
6. (Robinson 2011) [↑](#footnote-ref-6)
7. (Abbott 2010) [↑](#footnote-ref-7)
8. (Sanogo 2014) [↑](#footnote-ref-8)
9. (Marshall and Elzinga-Marshall 2015) [↑](#footnote-ref-9)