

International Food Prices, Regime Type, and Protest in the Developing World

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ABSTRACT

Anecdotal evidence from the international food price crises of 2007-8 and 2010-11 raises the more general question of whether international food prices have bearing on patterns of contentious politics in developing countries. Drawing on a data set of protest in 55 major cities in 49 Asian and African countries for the period 1961-2006, we find that international food prices are associated with an increase in protests and riots. However, we find that the effects of world food prices on urban unrest are contingent on the level of income and regime type. While economic development dampens the effects of international food prices on protest, we find that democracies are more prone to urban unrest during periods of high food prices. These findings support an open-economy approach to the study of contentious politics in the developing world.

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“We will take to the streets in demonstrations. Or else we will steal,” a 30-year-old woman said as she stood in line outside a bakery in Egypt in 2008. Responding to the domestic price shock that followed a worldwide doubling of wheat prices, President Hosni Mubarak even ordered Egypt's army to bake bread for the public. These concerns were not misplaced: food prices rose again over the course of 2010 and were among the stated grievances of Arab Spring protesters in early 2011.

The rapid inflation in international food prices since 2000, and the acceleration of that increase in 2007-8 and 2010-11, has shown that price shocks can pose significant threats to political stability in the developing world. Demonstrations and riots related to food prices took place in over thirty countries in 2007-8 (Bush 2009). The region of the world most dependent on wheat imports, the Middle East, witnessed food riots in Egypt, Jordan, Yemen, and Morocco. In the Ivory Coast, thousands marched on the home of then-president Laurent Gbagbo. Similar demonstrations took place in Ethiopia, Burkina Faso, Senegal, Mozambique, Mauritania, Cameroon, and Guinea. In Asia, people also took to the streets in Bangladesh, India, Philippines, Cambodia, and Thailand; even North Korea experienced a protest by market women over a ban on food trade. In 2010-2011, food price-related protests occurred in a number of African countries including Algeria, Egypt, Guinea-Bissau, Kenya, Libya, Mauritania, Mozambique, Senegal, Somalia, Sudan, Togo, and Uganda (Salehyan et al. 2012), as well as Bangladesh, China, and India, among others.

These problems are not only a function of short-run price movements. Structural changes in world agricultural production, trade and even climate are also at work. In 1960, developing countries were net exporters of food, with an overall agricultural trade surplus of almost \$7 billion per year. By 2001, this surplus had been transformed into a deficit of more than \$11 billion (United Nations Development Fund for Women 2008). The forces at work are multiple and complex. Ill-designed development policies have favored industrialization—and urban constituencies—at the expense of agriculture and the rural areas (Bates 1981). Urbanization and rising incomes increased the demand for food. More recently, trade liberalization has displaced small-scale agricultural producers at the same time as protectionist policies in the advanced industrial states have dampened agricultural export opportunities for developing countries.

Over the longer run, global warming could fundamentally alter the distribution of world agricultural output and exacerbate volatility in prices. The 2007 Intergovernmental Panel on

Climate Change Assessment Report identifies increased climatic variability as one of the main consequences of global warming. The implications for food prices are clear: decreased climatic stability will be associated with more frequent spikes in food costs (IPCC 2007). These pressures are likely to be greatest in poor countries, where substantial shares of the population already face food insecurity (Cline 2007).

Political elites and the development policy community are amply aware of these challenges. An influential report by the Asian Development Bank (2008, 1) noted, “Food price inflation severely stresses the most vulnerable groups” and threatened to “reverse the gains in poverty reduction in the Asia and Pacific region.” Jean Ziegler, the United Nations Special Rapporteur on the Right to Food, offered a depressing prognosis: “We are heading for a very long period of rioting, conflicts (and) waves of uncontrollable regional instability marked by the despair of the most vulnerable populations.”

These policy findings have been paralleled by a small but growing academic literature on the topic, including lively historical debates about the causes of food riots in Britain and France (Rose, 1961, Tilly 1971, Snyder and Tilly 1972, Booth 1977). A generation of work on so-called IMF riots only tangentially addressed international trends in food prices, but did underscore the political effects of withdrawing subsidies to basic consumer goods, including food (Bienen and Gersovitz 1986, Walton and Sneddon 1994, Abouharb and Cingranelli 2007).

More recently, however, attention has focused more explicitly on international price trends as well. Bellemare (2011) finds that food prices are a significant determinant of protests and riots in which food security was among the stated motivations of demonstrators. However, he does not address the broader relationship between food prices and unrest; the possibility that food prices might be related not only to food riots per se but to other forms of social unrest as well. The Arab Spring provides a powerful example. Arezki and Bruckner (2011) find that higher international food prices are associated with an increase in anti-government demonstrations and riots, but that the effect is isolated to low-income countries because of the greater sensitivity of poor households to price increases, a finding that we confirm as well.

In modeling the political response to international price shocks, however, it is important to be attentive to the mediating effects of political conditions as well. In an earlier debate on Europe, Tilly (1971) and Snyder and Tilly (1972) challenged the presumption that there was a direct relationship between food prices and protest; rather, they focused on both wider political

demands and the political opportunity structure that permitted protest to flourish. Keohane and Milner state the point in a general way in the introduction to an influential collection on international-domestic linkages: “[I]nternationalization affects policies and institutions differently from country to country: the existing institutional context conditions the incentives facing interest groups and politicians” (Keohane and Milner 1996, 5). This observation on the conditional effects of globalization has also motivated a variety of discrete literatures, including those on the policy responses to world depressions (Gourevitch 1986, Simmons 1994), on the welfare state in both advanced and developing countries (Garrett 1998, 2005, Rudra 2002, Haggard and Kaufmann 2008), and on a variety of possible international influences on protest and civil conflict as well (Walton and Ragin 1990, Walton and Sneddon 1994, Abouharb and Cingranelli 2007, Bussman and Schneider 2007).

There are number of causal routes through which domestic political factors might mediate between international price shocks and protest; we focus on two. The first is the opportunity structure. As a wide-ranging literature on contentious politics has shown (McAdam, Tarrow and Tilly 2001; Snyder and Tilly 1972 on food in particular), the capacity of groups to mobilize is function of political institutions and organizations that facilitate—or impede—collective action. In the face of any given shock, adversely affected groups may have stronger or weaker capacity to respond, and may face more or less permissive political conditions for protest as well.

A second route is through policy. Food policy has long been viewed as a means of securing political stability; as early as 100 CE, the roman poet Juvenal noted that “bread and circuses” were effective means of calming potentially restive urban populations. Virtually all governments intervene in agricultural and food markets. In developed countries, these interventions have tended to protect farmers. In developing countries, however, such interventions have more typically protected urban consumers, often at the expense of the rural sector. The responsiveness of governments to these competing demands—essentially for higher vs. lower food prices—is also likely to influence patterns of contentious politics.

In this paper, we explore the relationship between international food prices and urban unrest, drawing on data on urban unrest in 55 major cities in 49 Asian and African countries for the period 1961-2006. The effects of rising food prices are complex and cross-cutting, bringing benefits to some producers while imposing costs on net consumers of food, whether urban or

rural. Indeed, poor rural consumers of food may be more vulnerable than urban-dwellers who typically have higher incomes and greater access to markets. Yet there are good theoretical reasons to focus on urban consumers, as they are more concentrated, more likely to engage in collective action, and more likely to garner the attention of political elites.

Given the political heterogeneity of the countries in our sample, we focus on the mediating effect of both level of development and regime type, which operates through both the opportunity structure for protest as well as the responsiveness of governments to theoretically-relevant constituencies. We consider not only the differences between democracies and authoritarian regimes but also the behavior of publics in anocracies, or semi-competitive regimes that limit political competition and civil liberties but nonetheless permit some contestation and opportunity for independent collective action.

We find the effect of food prices to be conditional on both regime type and level of development: food prices are associated with an increase in protest and rioting in democracies, but do not exert an impact on unrest in autocracies. However, this relationship is conditional on level of development, with higher levels of economic development effectively decoupling urban unrest from international food prices.

The remainder of the paper proceeds as follows. The first section considers the effects of international food price shocks and the mediating effects of political institutions. Section 2 presents our hypotheses, section 3 discusses data, estimation, and findings, and section 4 concludes.

International Shocks and Domestic Response: Food Prices, Regime Type and Protest

Our dependent variable encompasses protests, demonstrations and riots. These forms of contentious politics should be distinguished from armed rebellion by irregular forces aimed at the overthrow of the government, and from revolutions, which overthrow the political regime and even the class structure. Although we explore some important differences across these various forms of collective action in more detail below, there is a growing recognition of some similarities in the underlying causal mechanisms that generate contentious politics (McAdam, Tarrow and Tilly 2001, 4). As a result, it is possible to draw on two major theoretical approaches that have motivated the literature: relative deprivation theory, which focuses on the effect of

grievances, and the political opportunity structure approach, which looks at institutional and organizational determinants of collective action.

The relative deprivation hypothesis was initially formulated in psychological terms and defined in terms of a perceived entitlement or expectation (Gurr 1968, 1970a, 1970b, 1993); it is thus consonant with prospect theory and more contemporary psychological models that have informed behavioral economics (Tversky and Kahneman 1991). The initial psychological model was that unfulfilled material expectations cause anger, frustration and resentment that ultimately manifest themselves in public unrest.

Feelings of relative deprivation can arise from *inter-personal*, *inter-group* or *temporal* comparisons (Sayles 1984). Inter-personal and inter-group deprivation stems from comparison of an individual's or group's political and economic circumstances with those of more advantaged individuals or groups and have generated a literature on the effects of inequality.¹ However, a sense of relative deprivation might also arise from temporal changes in income and other measures of well-being that generate a sense of loss. Food is the most basic of all necessities and as a result is the one commodity most likely to be seen as embodying an explicit or implicit political entitlement (Dreze and Sen 1989).

If we think of grievance as arising out of an unfavorable comparison between present conditions and either the *status quo ante* or some expectation, then higher food prices would seem a particularly appropriate indicator. First, food prices have particular influence on the welfare of poor households that are net purchasers of food. The share of food in total household expenditure in developing countries averages 49.4 percent and can exceed 70 percent in poor households (for example, in Ghana, but also in Pakistan and Tajikistan) (Brinkman and Hendrix 2011, FAO-WFP 2011). Recent estimates by the FAO demonstrate clearly the adverse effects of food price shocks. Household-level data reveal that the increases in food prices from 2000 through 2008 contributed to expanding the share of hungry people in the world from around 800 million to 900 million, reversing a long-term, albeit slow progress in the reduction of the world's hungry. The largest increases in the number of undernourished people took place in Asia and the Pacific and in sub-Saharan Africa: the FAO estimated that rising prices plunged an additional 41

¹ This model of contentious politics bears a family resemblance to modernization theory as well. In Huntington (1968), for example, political instability is unleashed by rapid social change, unfulfilled expectations, and the resulting mobilization of disaffected groups into politics. This is also the view that motivates two of the most influential studies of democracy, dictatorship and revolution (Acemoglu and Robinson 2006 and Boix 2003). In a dynamic framework, we might similarly expect changes in the income distribution should act as triggers for protest.

million people in Asia and the Pacific and 24 million in sub-Saharan Africa into hunger (FAO 2008). The FAO report notes that the impact of soaring food prices is particularly negative in “countries with structural deficits in food production, where incomes are low, and most households spend a high percentage of their low budgets on food.” Thus, we expect that the grievances associated with higher food prices will be more substantial when aggregate incomes are lower and a larger share of households are thus at risk.

Yet even though the effects of food price increases on consumers are widespread and relatively rapid, these effects are not constant across households - even poor households (Bates 1981). High prices are not necessarily an unalloyed blessing for the rural sector. While they help rural producers, they may have particularly devastating effects on poor rural households that are net consumers of food. Nonetheless, while urban dwellers typically have higher incomes, the effects of rising prices are likely to be more uniformly adverse. Moreover, the capacity of urban residents to engage in collective action is clearly much more substantial than rural dwellers.

We expect that regime type should mediate the effect of grievances on urban unrest through two mechanisms. The first relates to the effect of regime type on the political opportunity structure and the relative costs to expressing grievances publicly (Tilly 1978, McAdam, Tarrow and Tilly 2001). For any given level of grievance emanating from international price shocks, highly repressive autocratic regimes should be better positioned to deter public protest and demonstrations and repress them if they transpire (Goodwin 1991).² These particular forms of collective action should be more common where aggrieved citizens are either legally allowed to engage in protest and public manifestations are considered legitimate mechanisms for expressing grievances, as in democracies, or where semi-authoritarian governments choose to tolerate such acts of dissent, as in intermediate or anocratic regimes.

The second mechanism relates to how regime type influences the responsiveness of governments to different constituencies (Cameron 1978, Ruggie 1982). Urban bias – the tendency for governments in developing countries to be more responsive to the concerns and preferences of urbanites at the expense of rural dwellers – is well documented (Lipton 1977, Bezemer and Headey 2008). One of the clearest manifestations of urban bias has been in food policy. Governments in the developing world have, through mixtures of export controls,

² Goodwin's (2001) analysis, in this sense, would be compatible with ours. The reason why repressive regimes seem to be more vulnerable to revolution is precisely because they do not tolerate other less violent forms of contestation.

marketing boards, and consumer subsidies, suppressed food prices for urban consumers (Bates 1981, Wodon and Zaman 2009).

We might expect these dynamics to carry over into government responses to food price shocks. International prices have relatively straightforward welfare implications for urban and rural sectors in an open, developing economy. Higher prices harm urban consumers and help rural producers, while low prices placate urban consumers and depress rural incomes.

But the responsiveness of governments to urban vs. rural interests may be endogenous to regime type. In all political systems, rulers risk removal from office, whether by force, popular upheaval or the ballot box. Rulers thus invest in policies that favor those segments of society that pose the most credible political threats. For autocracies that do not face electoral constraints, these political threats are most likely to arise from mobilized urban dwellers, and even from the middle and upper classes. In times of rising prices, autocracies thus face relatively stronger incentives to intervene in markets to protect urban consumers, thus dampening protest through concession as well as repression and control. These protections, whether taking the form of direct consumer subsidies (which crowd out other forms of social spending) or price controls and export bans (which distort demand signals and suppress farm-gate prices), amount to transfers from the rural sector to urban consumers.

In democracies, by contrast, leaders also risk removal from office but by losing elections as well as from contentious politics. Democratic institutions thus generate somewhat more complex political incentives. While leaders in new, and sometimes fragile, democracies must pay attention to the risks arising from contentious politics they should also have marginally greater incentives to be responsive to the rural sector as well. Thus, democracies may witness more protest, not only as a result of the political opportunity structure, but also because of the cross-cutting incentives with respect to farmers and urban consumers. Democratic governments may face political limits on repressing food prices, at least to the extent that such interventions and controls have adverse effects on rural constituencies.

The preceding discussion informs two conditional hypotheses we seek to test in the remainder of the paper:

H1: International food prices will be positively associated with protest and rioting, but conditional on per capita income. We expect higher food prices to have greater effect on protest when average incomes are lower than when they are higher.

H2: International food prices will be positively associated with protest and rioting in democratic regimes, but not in autocratic regimes.

4. Data, Estimation and Results

Our theoretical model relates international food prices to the level of political protest and rioting in developing countries, conditional on income and regime type. An important feature of our analysis is that the data is not limited to food riots per se, as in Bellemare (2011). Rather, we seek to link food prices to contentious politics that may have altogether different stated aims but may nonetheless be caused by perceived losses associated with rising prices.

The dependent variable, *protests and riots*, is derived from the PRIO Urban Social Disturbance in Africa and Asia (henceforth USDAA) database.³ The USDAA data were coded from Keesing's *Record of World Events* and cover different forms of both violent and non-violent politically motivated disorder, including violent riots, non-violent demonstrations, armed attacks by militant groups, acts of terrorism, and government repression. The data cover 55 major cities in 49 countries across Africa and Asia over the period 1960-2006. Our coding, *protests and riots*, uses the event narratives to parse the total country-year count to only include riots and non-violent demonstrations. The cities display significant heterogeneity with respect to the prevalence of protests and riots: New Delhi saw an average of 2.4 protests per year, while Ashgabat, the capital of Turkmenistan, and Singapore saw none over the 47 year period. The mean value is 0.7, while the modal value is zero (68.9 percent of city-year observations). More than one event occurs in 15.3 percent of observations, while more than ten events occur in less than one percent. Appendix 2 presents descriptive statistics for all variables, while Appendix 3 presents a list of cities included in the analysis.

To model international food prices, we use the United Nations Conference on Trade and

³ The USDAA can be accessed at <http://www.prio.no/CSCW/Datasets/Economic-and-Socio-Demographic/Urban-Social-Disturbance-in-Africa-and-Asia/>.

Development (UNCTAD) food price index.⁴ The index includes staple grains, sugars, meat, and vegetable oilseeds. Figure 1 displays the UNCTAD food price index for 1960-2011, as well as the annual percentage changes (in constant dollars).

Despite media reports to the contrary, the recent spikes in international food prices are not unprecedented: the data indicate a number of shocks over the time period, both positive and negative. These shocks have been caused by a variety of factors: demand-side pressures associated with the behavior of major buyers (the Soviet Union/Russia and China in earlier periods, panic buying across a number of importers in the most recent crisis); crop failures due to droughts; and the policy responses, most notably export restrictions or bans, intended to shield domestic consumers from higher prices in international markets.

While food prices were declining through the 1960s, the early 1970s witnessed the highest food prices on record, peaking in 1974. This spike was due to significant increases in oil prices, but also to reductions in production by major food exporters – the United States, Canada, Australia, and Argentina – just as the Soviet Union entered world markets with massive purchases. The effects of these changes in supply and demand were sharply exacerbated – as they were during the 2007-8 and 2010-2011 crises – by increasing speculation in commodity futures. Subsequent periods of high prices occurred in 1979-80 (again, partly a result of Soviet buying), in 1988-9 and 1996 (weak US crops), and finally in the gradual increase in prices during the worldwide economic boom of the first half of the 2000s, capped by the spiraling price increases and international food crises of 2007-8 and 2010-11.

FIGURE 1 HERE

We use the Polity IV dataset to model regime type. Our core specifications use a tripartite classification of regimes: democracy, anocracy, and autocracy. This classification is based on the revised combined Polity2 score, which ranges from -10 (“fully institutionalized autocracy”, characterized by little citizen participation, routine transfer of authority within the political elite and the absence of effective checks on executive power) to 10 (“fully institutionalized democracy,” with open political participation and electoral competition and meaningful checks

⁴ Because the index is based on prices in current US dollars, we deflate the index using the US GDP deflator (Heston, Summers and Aten 2012).

on executive power) (Marshall and Cole 2011). We follow the Polity Project's recommendations and emerging norms by coding a country as democratic if $\text{Polity2} \geq 6$, anocratic if $-5 \leq \text{Polity2} \leq 5$, and autocratic if $\text{Polity2} \leq -6$.⁵ As we are interested in the conditional effects of continuous variables as mediated by regime type, this dummy coding renders interpretation of results clearer.⁶ As Figure 2 demonstrates, there are general temporal trends in the data, with the proportion of autocratic governments in the sample highest during the 1970s and 80s and with democracies relatively more prevalent at earlier and later periods. For this reason, it is important to control for linear trends in the data.

FIGURE 2 HERE

To model level of development or mean income, we use log-transformed real GDP per capita. The sample is quite heterogeneous in this regard, including high-income Asian countries (Japan, South Korea, Singapore), post-Soviet Central Asian republics, and low-income African and Asian countries (Nepal, Tanzania, Zimbabwe). Data are from the Penn World Tables (Heston, Summers, and Aten 2012).

In addition to our theoretical variables of interest, we include several controls. We control for GDP growth in order to isolate the effects of international prices from more general economic conditions. Prior research indicates that political unrest is less prevalent in times of economic prosperity (Hegre and Sambanis 2006, Blattman and Miguel 2010). We control for trade openness in order to isolate the effect of international prices from any more general effects of economic openness that may operate (Bussman and Schneider 2007). We include a time trend in order to mitigate the risk that we are capturing general linear trends in the protest and riot data, perhaps due to changes in reporting on protest and rioting in the developing world (Salehyan et al. 2012). Finally, we include a dummy indicator for the cold war period (up to 1991), during which the United States and Soviet Union were less likely to punish their allies for engaging in repression and even provided aid that could be used to repress dissent (Dunning 2004). We lag

⁵ The results discussed below are robust to an alternate coding of democracy/non-democracy created by Cheibub, Gandhi and Vreeland (2010).

⁶ The results are robust to the use of the underlying continuous measure as well.

all independent and control variables in order to mitigate concerns about endogeneity.⁷

As discussed earlier, there is significant unit heterogeneity with respect to average levels of protests and riots. Because the dependent variable is collected at the city-year level while control variables are only available at the country-year level, the inclusion of controls only partially mitigates this issue. Thus, we estimate our models using fixed-effects ordinary least squares (OLS) and conditional fixed-effects negative binomial regression. These estimators eliminate the cross-sectional elements from the data, and reported coefficients thus reflect longitudinal changes within units. This specification is ideal given our theoretical focus on how grievances are associated with inter-temporal changes in food prices that are associated with declining welfare, and increased perceptions of loss and grievance.

Table I reports results for our base specifications. Odd-numbered models are OLS; even-numbered are negative binomial.⁸ Models 1 and 2 include food prices, political regime variables, GDP per capita, and controls. We start with the unconditional effects of the main variables of interest. In contrast to stimulus-response economic models of protest, models 1 and 2 show no evidence of a *general* relationship between international food prices (FPI) and protest and rioting: while the coefficient estimates are positive, neither approaches statistical significance. Coefficient estimates on the regime variables, anocracy and autocracy, reflect changes in the level of protest and riots in those regimes relative to what occurs in democracies, the excluded category. Protests and riots are generally less frequent in authoritarian regimes, but semi-competitive anocracies are not statistically significantly different from democracies. Economic growth dampens protest, though the coefficient estimates are small and only weakly significant ($p < 0.10$).

TABLE 1 HERE

In order to test whether the effects of international food prices on protest and rioting are mediated by regime type, models 3 and 4 introduce interaction terms between international food prices and the measures of regime type. Interaction terms complicate interpretation of

⁷ Results are robust if contemporaneous measures are used as well, though the coefficient on economic growth is much larger, negative, and statistically significant. This is likely due to the endogenous nature of economic growth to political unrest (Blattman and Miguel 2010).

⁸ Three city panels that did not experience protests and riots during the sample period (Almaty, Ashgabat, and Singapore) are excluded from the conditional fixed-effects analysis.

coefficients, as levels of statistical significance are conditional on the mediating variable taking on a value of zero (Braumoeller 2004). The dummy specification of regime type, however, simplifies interpretation somewhat. The coefficient on FPI represents the effect of international food prices in democracy, while the coefficients on the anocracy and autocracy represent the effect of regime type on protest and rioting when food prices are zero. In order to assess the impact of international food prices in autocracies and anocracies, one must calculate the conditional slope as an additive function of the coefficients on FPI and the interaction terms.

In both models 3 and 4, the coefficients on FPI are positive and significant, indicating that protest and rioting increases with food prices in democracies. However, the coefficient on FPI*Autocracy is negative and significant in both specifications. In both models, the three coefficients (FPI, Autocracy, and FPI*Autocracy) are jointly statistically significant at $p < 0.01$. The coefficient on the interaction term is equal to or slightly larger than the coefficient on the un-interacted term, indicating that the net effect of international food prices in autocracies is close to zero or negative: higher food prices are not associated with an increase in protest and rioting.

Figure 3 plots quantities of interest (expected number of protests and riots) against FPI, using coefficient estimates from model 3. This exercise demonstrates that the relationship is positive for democratic regimes—as food prices increase, so does protest and rioting—but essentially flat for autocratic regimes.⁹ Evidence for anocratic regimes is mixed: only one coefficient on the interaction term is significant (model 4, $p < 0.10$). Nonetheless, the results are suggestive that despite their competitive elements, anocracy may resemble autocracy more than democracy in attenuating the effect of international prices on urban unrest.

What about the substantive effects? In democracies, the estimated effect of international food prices on protests and rioting is relatively small. Between 2003 and 2008, the FPI increased by nearly 100 points, the largest five-year increase in food prices since the 1970s; model 3 forecasts an increase of 0.26 protests per city-year. While this proportional effect, on a per country-year basis, may not appear large, it is important to recall that the mean level of protest is only 0.7, suggesting a 37 percent increase. Moreover, the cumulative effect of this price increase, across major cities, would be an additional five protests and riots across the 21 democracies in the sample, equivalent to roughly 40 percent of the standard deviation of sample-wide protests

⁹ Protests and riots are relatively rare events. Treating the dependent variable as dichotomous (taking a value of 1 whenever there is one or more protests and riots) and estimating models using logistic regression, a similar price spike increases the probability of a city experiencing a protest or riot by 33.3%.

and riots on an annual basis.¹⁰ These findings support our core theoretical proposition: that the effect of international food prices on protest and rioting in the developing world is mediated by regime type.

FIGURE 3 HERE

The results also lend support to the importance of income effects in mediating the relationship between international food prices and unrest. As can be seen in Models 1-4, GDP per capita does not have a significant effect in the full sample; higher mean income does not moderate—nor exacerbate—tendencies to protest and riot. However, Models 5-8 split the sample at the median for GDP per capita (\$1190); models 5 and 6 are for the lower-income sample, 7 and 8, the higher. The regime type results discussed above are evident in the lower-income sample, both in terms of statistical and substantive significance. However, none of the coefficients on FPI, the regime variables, or their product terms are significant in the higher-income sample. As expected, higher average incomes attenuate the effects of international food prices on political unrest, confirming the earlier results of Azreki and Brückner (2011). Lower average incomes, by contrast, increase the likelihood that food prices will trigger contentious politics.

5. Discussion

Despite considerable interest in the politically destabilizing effects of higher food prices, systematic research on the issue is in its infancy. To date, researchers—primarily economists—have focused on income as the factor determining whether higher international food prices catalyze political unrest: lower average incomes imply greater average household risk and thus greater instability in the face of shocks.

While income is obviously important, we reframe the discussion around the political-institutional factors conditioning the onset of protest and rioting. Recent events, ranging from the ouster of Haitian Prime Minister Jacques-Édouard Alexis in 2008 following food riots to the

¹⁰ Calculated by multiplying the coefficient on FPI (0.00261 prior to rounding) by 100, and then multiplying the product by the number of democracies in the sample (21) at the end of the sample period (2006).

drama of the Arab Spring demonstrate that food prices have the potential to be extremely politically destabilizing. Yet the effects of higher international prices on urban unrest are not uniform across regime type. Across a sample of major cities in Africa and Asia, we find that high international food prices are more likely to lead to urban unrest in democratic regimes than autocratic ones.

Rather than reprising our findings, we point forward here to some lines for future research in this area that are currently beyond the reach of existing cross-national data or that would profit from more micro-level treatment. First, our analysis does not discriminate fully between competing causal mechanisms that would account for the observed differential effects across countries at different levels of economic and political development. For example, higher GDP per capita may decouple urban unrest from international food prices because the proportional effects of food prices on real incomes are smaller, and thus less of a motivating loss or grievance. Alternately, higher average incomes may reflect greater fiscal capacity on the part of states to shield consumers from higher prices or the more developed social safety nets that are associated with higher levels of development. To explore the income findings requires more nuanced understanding of why countries at different levels of development develop social contracts that reduce the risks associated with higher food prices.

Our findings with respect to regime type also invite closer scrutiny. We took regime type as a proxy for the political opportunity structure, looking at how variation in broad characteristics of the political order might create opportunities and even incentives for protest and rioting. But the regime coefficients may also be capturing something more akin to partisanship and the *responsiveness* of governments to distress. Under this interpretation, authoritarian and semi-authoritarian regimes may not simply be more repressive; rather, they may be more responsive to the concerns of urban consumers who constitute a more pronounced political threat to regime survival. Democratic regimes, similarly, may not simply provide a more permissive legal environment for protest but may also be torn between the cross-cutting pressures coming from urban consumers and rural producers. As with the analysis of the income effect, a closer scrutiny of the political economy of food and protest would have to examine the types of social contracts that exist across regime types and how these social policies affect the propensity to engage in contentious politics (Wintrobe 1998, Bueno de Mesquita et al. 2003, Haggard and Kaufmann 2008).

Reflecting on the Arab Spring can reveal some of these complexities. Contrary to our findings, food prices were among the grievances that motivated mass demonstrations against these highly autocratic regimes and led to the ouster of governments in Tunisia, Egypt, Libya, and ongoing conflict in Syria. However, the dynamics of the Arab Spring may also reflect some of the risks authoritarian regimes face when attempting to repress protest or insulate urban consumers from world market prices. Commitments to broad consumer subsidies across the Middle East and North Africa created entitlements that were increasingly expensive to maintain but also increasingly difficult to withdraw even as fiscal pressures mounted. In 2002, Egyptian government food and fuel subsidies equaled 1.4% of GDP. By 2011, they accounted for more than 8% of GDP (Author's calculations, IMF Survey 2012). Moreover, standing commitments to interventions in markets explicitly encouraged evaluation of the effectiveness of authoritarian governments in terms of consumer prices that governments could not, in the end, control. When protest broke out, the well-known dynamic of repression actually fueling rather than dampening protest kicked in, increasing incumbent risk that they would be displaced altogether.

However, the prognosis for both autocratic and democratic regimes facing high food prices is not uniformly grim. Bucking the recommendations of the World Bank and IMF, China, India and Indonesia did not follow orthodoxy in 2007–2008 and allow price changes to be passed through to most consumers. Rather, they were largely able to insulate urban consumers from higher prices through a mixture of export bans/restrictions (China, India) and consumer subsidies (all three), as well as more targeted interventions directed at insecure households. These interventions exacerbated problems in international markets; consumer subsidies artificially inflated demand while export bans/restrictions drove up prices. But these policy interventions permitted each country to maintain relatively stable food prices, with advantageous political results: the incumbents in India and Indonesia were both re-elected in 2009, partly because of their success in keeping food prices stable, and China was able to avoid widespread unrest at a time of intense international scrutiny (Timmer 2010). These cases highlight the importance of understanding the policy choices adopted by countries at different levels of development and of different political type.

Finally, there is more to be done to fully model the economic conditions that are likely to give rise to protest. We have focused on international food prices, which recent events have revealed to be potentially significant. Our research confirms the value of an open-economy

approach to contentious politics. However, we need better information on country-specific characteristics that might influence the food price-protest nexus. For example, poor countries vary in their dependence on external sources of supply but are also vulnerable to a variety of unmodeled domestic shocks. Poor countries also vary on underlying ecological and climatic vulnerability. Climate change is forecast to decrease global yields per hectare of major food crops between 6 and 18 percent by 2080 (Cline 2007). This aggregate forecast masks significant regional gaps in agricultural production potential: some major exporting countries at higher latitudes, including the United States, Canada, Kazakhstan, and Russia are forecast to see increased yields, while many developing countries will see yields decrease. While increasing area under cultivation can offset some of these losses, many countries, especially in Asia, North Africa, and the Middle East, are already very land-constrained. Thus, despite calls for increased food self-sufficiency in the developing world, imports are likely to account for a rising share of total consumption in the future, potentially increasing vulnerability to international price shocks. Modeling the causal connections between climatic conditions and their proximate manifestations – temperature, precipitation, and humidity – food prices, and protest could be the next step in fully specifying a model of vulnerability to food price-related urban unrest.

Due to population growth and rising incomes in the developing world, increased presence of institutional investors in commodity markets, climate change, and demand for biofuels, food prices are likely to remain high and comparatively volatile for the foreseeable future. The price shocks of the 2000s, and the political instability to which they contributed, have put food back on the development agenda in a major way. The events of 2008 catalyzed USAID's \$3.5 billion Feed the Future program and the EU's €1 billion Food Facility investment and reinvigorated debate over whether food trade should be more fully into the WTO's dispute settlement mechanisms. Extant research on the political effects of higher food prices has emphasized domestic economic conditions as the most important factor in whether or not higher prices catalyze domestic unrest. Our findings suggest domestic factors, particularly political institutions, mediate these effects as well.

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Table 1: International Food Prices and Urban Unrest in Africa and Asia, 1961-2006

VARIABLES	(1) Full Sample OLS w/FE	(2) Full Sample NB w/CFE	(3) Full Sample OLS w/FE	(4) Full Sample NB w/CFE	(5) <Median Income OLS w/FE	(6) <Median Income NB w/CFE	(7) >Median Income OLS w/FE	(8) >Median Income NB w/CFE
DV _{t-1}	0.243*** (0.021)	0.090*** (0.010)	0.240*** (0.021)	0.092*** (0.010)	0.221*** (0.030)	0.101*** (0.020)	0.219*** (0.031)	0.077*** (0.013)
FPI _{t-1}	0.001 (0.001)	0.000 (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.003** (0.001)	0.003*** (0.001)	0.002 (0.002)	0.002 (0.001)
Anocracy _{t-1}	0.126 (0.113)	0.154 (0.104)	0.418* (0.252)	0.523** (0.229)	0.176 (0.349)	0.351 (0.333)	0.487 (0.402)	0.574 (0.354)
FPI*Anocracy _{t-1}			-0.001 (0.001)	-0.002* (0.001)	-0.001 (0.002)	-0.001 (0.001)	-0.002 (0.002)	-0.002 (0.002)
Autocracy _{t-1}	0.017 (0.119)	-0.236** (0.115)	0.628** (0.248)	0.708*** (0.240)	0.929*** (0.342)	1.213*** (0.372)	0.572 (0.420)	0.258 (0.353)
FPI*Autocracy _{t-1}			-0.003*** (0.001)	-0.004*** (0.001)	-0.004** (0.001)	-0.005*** (0.001)	-0.003 (0.002)	-0.002 (0.001)
log GDP per capita _{t-1}	0.098 (0.096)	0.079 (0.072)	0.105 (0.097)	0.085 (0.073)	0.128 (0.200)	0.412** (0.208)	0.488*** (0.167)	0.223* (0.117)
GDP Growth _{t-1}	-0.010* (0.005)	-0.009* (0.005)	-0.010* (0.005)	-0.009* (0.005)	-0.003 (0.006)	-0.006 (0.007)	-0.018** (0.009)	-0.015 (0.009)
Openness _{t-1}	0.001 (0.001)	0.000 (0.002)	0.001 (0.001)	0.001 (0.002)	0.002 (0.002)	0.005*** (0.002)	-0.001 (0.003)	-0.006** (0.003)
Time Trend	0.006 (0.005)	0.003 (0.005)	0.007 (0.005)	0.005 (0.005)	0.003 (0.006)	-0.006 (0.008)	0.007 (0.009)	0.017* (0.009)
Cold War	0.023 (0.132)	-0.157 (0.142)	-0.008 (0.133)	-0.181 (0.140)	-0.494*** (0.181)	-0.719*** (0.218)	0.214 (0.208)	0.063 (0.190)
Constant	-11.752 (10.156)	-7.386 (10.756)	-15.642 (10.240)	-11.084 (10.692)	-7.084 (12.713)	8.618 (14.963)	-18.276 (18.320)	-36.306** (17.827)
Observations	2,171	2,100	2,171	2,100	1,080	1,068	1,091	992
R ²	0.069		0.073		0.082		0.072	
Number of Panels	54	51	54	51	38	36	40	34

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 1: International Food Prices and Price Changes, 1960-2011

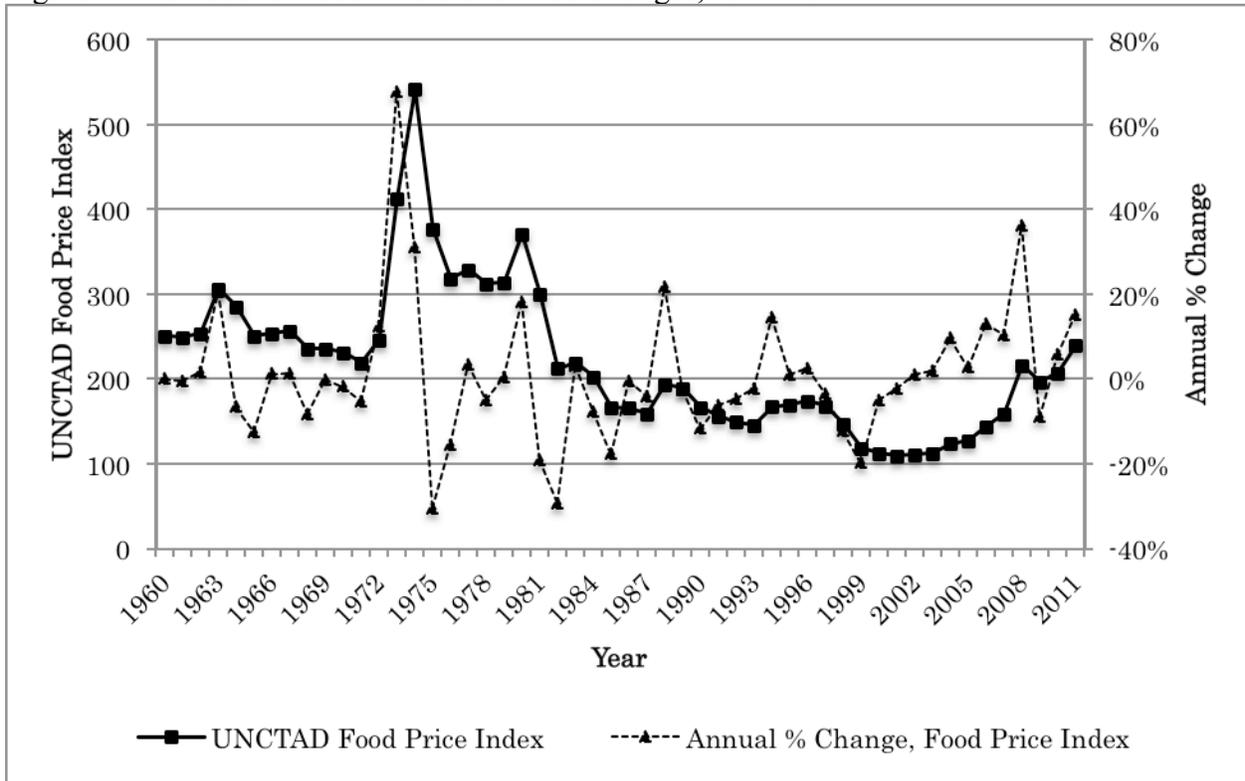


Figure 2: Democracy, Anocracy and Autocracy, 1960-2006

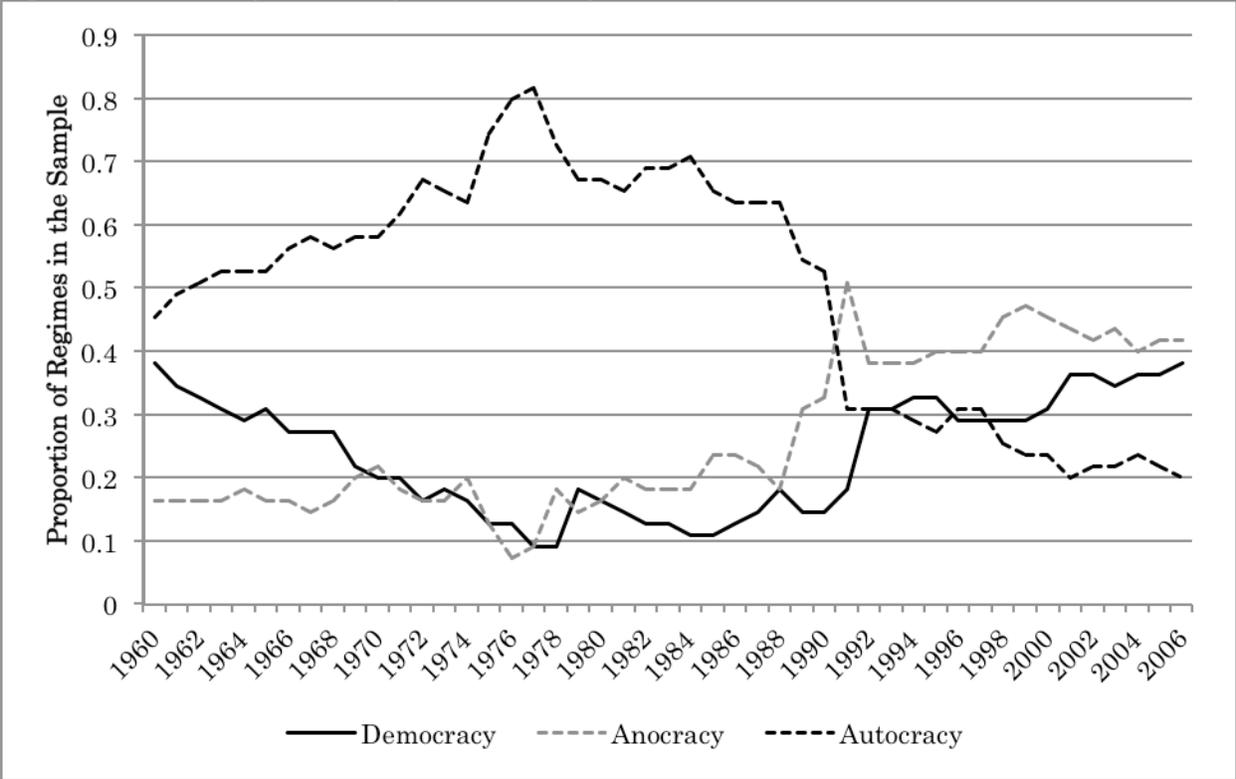
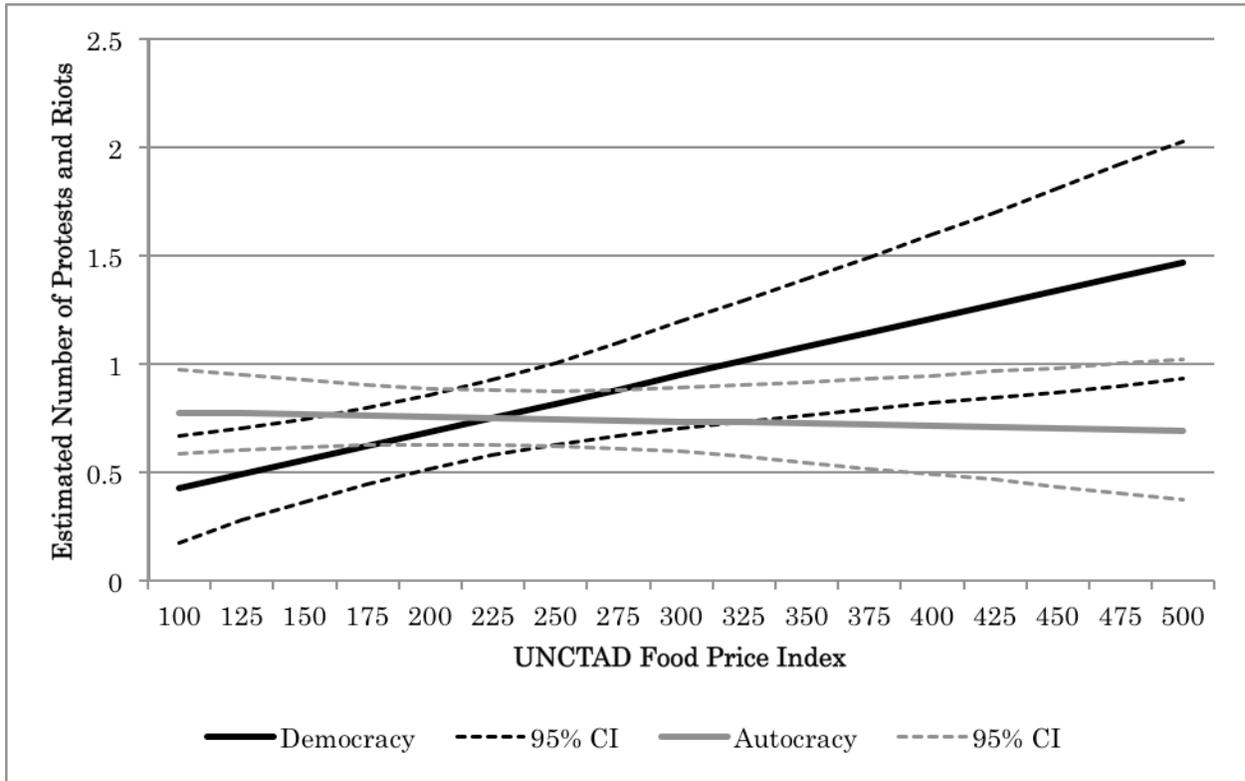


Figure 3: Marginal Effects of International Food Prices and Protests and Riots in African and Asian Urban Centers



Appendix 2: Descriptive Statistics

Variable	Source	N	Mean	σ	Min	Max
Protests and Riots	Urdal (2008)	2585	0.7	1.6	0	32
FPI	UCTAD	2585	222.2	89.7	109.2	541.1
Democracy	Polity Project	2585	0.2	0.4	0	1
Autocracy	Polity Project	2585	0.5	0.5	0	1
Polity2	Polity Project	2499	-2.1	6.4	-10	10
Anocracy	Polity Project	2585	0.36	0.4	0	1
Democracy (CGV coding)	Cheibub, Gandhi and Vreeland (2010)	2503	0.2	0.4	0	1
log GDP per capita	Penn World Tables	2257	7.3	1.0	4.8	10.7
GDP Growth	Penn World Tables	2225	2.1	6.9	-33.9	63.5
Openness	Penn World Tables	2257	59.8	52.9	1.0	441.2
Cold War	Author	2585	0.7	0.5	0	1
Year	Author	2585	1983	13.6	1960	2006

Appendix 3: List of Cities in USDAA Dataset

Abidjan, Cote D'ivoire	Accra, Ghana
Addis Ababa, Ethiopia	Almaty, Kazakhstan
Antananarivo, Madagascar	Ashgabad, Turkmenistan
Astana, Kazakhstan	Bamako, Mali
Bangkok, Thailand	Beijing, PRC
Bishkek, Kyrgyzstan	Brazzaville, Rep. Congo
Calcutta, India	Colombo, Sri Lanka
Conakry, Guinea	Dakar, Senegal
Dar es Salaam, Tanzania	Dhaka, Bangladesh
Dushanbe, Tajikistan	Hanoi, Vietnam
Harare, Zimbabwe	Islamabad, Pakistan
Jakarta, Indonesia	Johannesburg, South Africa
Kabul, Afghanistan	Kampala, Uganda
Karachi, Pakistan	Kathmandu, Nepal
Khartoum, Sudan	Kinshasa, Dem Rep. Congo
Kuala Lumpur, Malaysia	Lagos, Nigeria
Lhasa, PRC	Lomé, Togo
Luanda, Angola	Lusaka, Zambia
Manila, Philippines	Maputo, Mozambique
Mogadishu, Somalia	Mumbai, India
Nairobi, Kenya	New Dehli, India
Niamey, Niger	Phnom Penh, Cambodia
Rangoon, Myanmar	Saigon, Vietnam
Seoul, Rep. Korea	Singapore, Singapore
Taipei, Taiwan	Tashkent, Uzbekistan
Tehran, Iran	Tokyo, Japan
Ulan Bator, Mongolia	Vientiane, Laos
Yaoundé, Cameroon	