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Climate Change, Global Food Markets, and Urban Unrest

### **ABSTRACT**

Though only 15 percent of world food production is traded on international markets, prices for the remaining 85 percent – which circulates in local, regional, and national markets – are increasingly aligned with world prices. Local climate conditions in major exporting countries can thus have dramatic effects on food prices continents away. Despite seemingly frequent food-related protests and riots over the past five years, it is clear that food prices do not lead to unrest in all places. Why do high global food prices give rise to urban unrest in some places and not in others? This research argues that the very features of democracy that make it better suited to address the issues of the rural sector – where chronic food insecurity is most prevalent – also make democracies more likely to see unrest in times of high food prices. In particular, developing democracies – where households spend a larger proportion of their income on food – are more prone to urban unrest in times of high prices.

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# RESEARCH BRIEF – FEBRUARY 2013

## CLIMATE CHANGE, GLOBAL FOOD MARKETS, AND URBAN UNREST

### EXECUTIVE SUMMARY

Though only 15 percent of world food production is traded on international markets, prices for the remaining 85 percent – which circulates in local, regional, and national markets – are increasingly aligned with world prices. Local climate conditions in major exporting countries can thus have dramatic effects on food prices continents away. Despite seemingly frequent food-related protests and riots over the past five years, it is clear that food prices do not lead to unrest in all places. Why do high global food prices give rise to urban unrest in some places and not in others? This research argues that the very features of democracy that make it better suited to address the issues of the rural sector – where chronic food insecurity is most prevalent – also make democracies more likely to see unrest in times of high food prices. In particular, developing democracies – where households spend a larger proportion of their income on food – are more prone to urban unrest in times of high prices.

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Despite climate change being a global phenomena, most studies of the climate-conflict nexus focus on how local manifestations of climate change – such as droughts, flooding, and higher temperatures – affect local manifestations of social stress: armed conflict, social conflict, and interpersonal violence.<sup>1</sup> That is, when analysts assess the impact of global climate change on political stability in Kenya, they typically focus on climatic conditions in Kenya. Yet just as El Niño in the tropical Pacific can lead to colder and wetter winters on the U.S. Eastern Seaboard, world markets can propagate local climate shocks throughout the international system. Though only 15 percent of world food production is traded on international markets, prices for the remaining 85 percent – which circulates in local, regional, and national markets – are increasingly aligned with world prices. Local climate conditions in major exporting countries can thus have dramatic effects on food prices continents away. In 2008, extended drought in Australia significantly constricted global supply. Two years later, heat waves and wildfires in Russia led then-President Dmitry Medvedev to impose export restrictions on wheat, barley, and rye.

Food security is fundamental to human security. Prior to 2007, there were two decades of consistent progress in reducing the number of people facing food insecurity. Since 2007, however, progress has stopped. The *State of Food Insecurity in the World* report notes that each individual lifted out of chronic poverty and food insecurity in East Asia is replaced by another hungry person in Sub-Saharan Africa, in part due to decreased access to food as a result of high prices.<sup>2</sup> During that same period, concerns about high food prices and political unrest have crept back on to the state security agenda, particularly after the events of the Arab Spring. While explanations citing a single cause for these mass protests should be discarded, it is clear that grievances associated with food prices were key motivators. A similar dynamic was at play in 2007-08, when then near-record prices led to food-related protests and riots in 48 countries, and led to the ouster of Haitian Prime Minister Jacques-Edouard Alexis and Malagasy President Marc Ravalomanana.<sup>3</sup>

Yet despite seemingly frequent food-related protests and riots over the past five years, it is clear that food prices do not lead to unrest in all places. Why do high global food prices give rise to urban unrest in some places and not in others?

## WHEN DO HIGH FOOD PRICES LEAD TO UNREST?

Economists investigating this question have focused on the role of income in moderating the effect of high prices on unrest. Higher food prices for consumers erode real incomes, increasing the gap between expectations of welfare and actual welfare, thus generating grievances. Households with lower incomes spend a larger proportion of their income on food. Thus, the proportional loss of welfare due to food price increases will be larger in poor countries and generate more grievances. A recent IMF working paper by economists Rabah Arezki and Markus Bruckner, as well as work by Duke agricultural economist Marc Bellemare, found the relationship between food prices and urban unrest is strongest in countries with low per capita incomes.<sup>4</sup>

Political scientists and sociologists, on the other hand, have analyzed this question by focusing on how high prices interact with loss of entitlements like subsidies and other market interventions that artificially reduce consumer prices.<sup>5</sup> In this line of argument, it is not so much high prices, but rather the government's abdication of its role as a guarantor of lower prices that generates grievances and protests. That is, past policy choices have created the expectation that the government will continue to provide low prices in the future, and removal of this entitlement is the cause of a sudden shift in welfare.

The economic perspective has been confirmed by recent research, but it is also oddly apolitical. Food is a highly political commodity and has been recognized as such for millennia. The Roman poet Juvenal noted nearly 2,000

years ago that *panem et circenses* – bread and circuses – were effective means of securing urban stability. The entitlement argument acknowledges the political nature of food, but raises the question of why governments would create these entitlements in the first place.

Exploring these gaps in understanding the political links between food prices and urban unrest, this brief focuses on the role of political institutions. In particular, democracies and autocracies differ markedly in both: a) the incentives and deterrents they pose for popular mobilization and b) their responses to food price shocks via public policy. These represent two potential mechanisms through which political institutions may mediate the relationship between food prices and urban unrest. Somewhat counterintuitively, this brief argues that the very features of democracy that make it better suited to address the issues of the rural sector – where chronic food insecurity is most prevalent – also make democracies more likely to see unrest in times of high food prices. In particular, developing democracies – where households spend a larger proportion of their income on food – are more prone to urban unrest in times of high prices.

Following the causal chain leading from global food markets to urban unrest, politics likely intervene at multiple levels. First, governments often disrupt the transmission of prices from global markets to local markets, particularly through the use of consumer subsidies. Second, whether or not higher food prices translate into political grievances is likely a function of the regime's past commitments to subsidies and pro-consumer market interventions. Finally, the political opportunity structure – opportunities for civil society to organize and mobilize – plays a key role in whether grievances express themselves in popular mobilization. Famine in North Korea may have claimed as many as 3.5 million lives during the late 1990s, but no rioting or demonstrations occurred in Pyongyang. Meanwhile, food-related protests are routine in more open systems like India, where comparatively small price movements

in the presence of ample food stocks in 2011 brought trade unions into the streets of Delhi.

This study thus examines how political institutions affect the costs and benefits associated with popular mobilization and how they structure ruler incentives to use public policy to shield urban consumers from higher food prices – or not.

## INSTITUTIONS AND INCENTIVES

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 autocrats that do not face electoral constraints, these political threats are most likely to arise from urban dwellers and the middle and upper classes. These groups are closest, in physical proximity, to the seat of power, and face comparatively low costs of acting collectively. Moreover, their support (or at least acquiescence) is central to the maintenance of order.

This basic insight suggests that rulers in general, but autocratic rulers specifically, have strong incentives to cater to the political preferences of urban dwellers at the expense of rural dwellers – i.e., *urban bias*.<sup>6</sup> As the price of food increases in global markets, high prices help the rural sector but harm urban consumers. Conversely, as the price of food decreases, urban consumers experience a net increase in welfare at the expense of eroded real incomes in the rural sector.

With regard to food policy, this pronounced urban bias in autocratic systems manifests itself in two key ways: consumer subsidies and export bans in times of crisis. First, consumer subsidies artificially reduce the food prices paid by consumers, benefiting urban consumers at the expense of rural producers. While these subsidies ostensibly provide benefits for broad segments of society, they are a particularly

crude means of addressing household-level food insecurity, and studies support the claim that the primary beneficiaries of these policies are not the poor and chronically food-insecure, but rather comparatively well-off households.<sup>7</sup>

*As the price of food increases in global markets, high prices help the rural sector but harm urban consumers.*

Second, export bans in times of high prices constitute a direct transfer of welfare from the rural to the urban sector, increasing food availability in the domestic market but preventing rural producers from benefitting from higher prices. If the goal were really poverty alleviation, this policy would make little sense: globally 75 percent of people living on less than a dollar a day live in rural areas, compared to 25 percent in urban areas.<sup>8</sup>

In contrast, democracy should affect urban unrest in response to high food prices in two ways: via lower constraints on popular mobilization and via policy. First, democracy should lower the costs associated with popular mobilization in response to high food prices. In democracies, civil societies and opposition parties have political incentives and opportunities to mobilize their partisans around political grievances, and generally do not face high costs – in the form of state repression – for doing so. Popular mobilization – especially nonviolent popular mobilization – is relatively unlikely to be met with repression in democracies, where such mobilizations are not inherently threatening to the political leadership.

Second, democratic leaders should be less likely to intervene in markets in ways that shield consumers from higher prices. Rulers in democratic political systems face removal from office not just via urban unrest but also via elections. Representative democratic institutions should thus increase the



political influence of the rural sector since, in developing countries, the median voter is likely to be a rural dweller. Whereas rural dwellers are only 22 percent of the population in high-income countries, they account for 61 to over 70 percent in lower- and low-income countries.<sup>9</sup> Rulers in democratic systems should thus have greater incentives to enact policies benefitting the interests of the rural sector, who benefit from higher food prices. Developing democracies should be less likely to intervene in ways that clearly transfer welfare away from rural producers to urban consumers, as consumer subsidies and export bans do. Avoiding such interventions may be good policy in terms of poverty alleviation, but it does little to shield the urban sector. Thus, in democracies, the welfare effects of a food price increase should increase grievances in urban areas, leading to an expectation of more urban unrest in democracies than in autocracies, all else being equal.

This theoretical discussion yields two observable implications that this study has sought to test. First, if global food prices go up, incidents of protest and rioting should also go up in democratic regimes, but not in autocratic ones. This empirical observation would affirm the role of political institutions in mediating the relationship between food prices and urban unrest; however, it would not clarify whether they do so more through their incentives for political mobilization or their policy interventions. Second, if the latter argument is true, then one would expect to see differences in the policy responses that democracies and autocracies implement during food price crises. In particular, democracies should be less likely to use consumer subsidies and export bans in times of high prices. This study finds significant support for both arguments.<sup>10</sup>

*This study found that high global food prices are associated with urban unrest in democratic regimes, but not in autocratic ones.*

## FINDINGS ON INSTITUTIONS' IMPACT

This study examined unrest – defined as protests and rioting – in a sample of 55 urban centers in Africa and Asia from 1960-2006.<sup>11</sup> The study found that higher global food prices are associated with more urban unrest in democracies, but unrelated with urban unrest in autocracies.<sup>12</sup> Between 2003 and 2008, the UNCTAD food price index – the study's measure of global food prices – increased by nearly 100 points, the largest five-year increase in food prices since the 1970s. The estimated effect of international food prices on protests and rioting is relatively small, with such an increase being associated with an increase of 0.26 protests per city per year. The core insight – that global food prices will influence urban unrest in democracies, but not in autocracies – is substantiated.

Turning to the policy mechanisms, this study uses data from a World Bank survey of specific policy responses that lower and middle income countries enacted to cope with higher prices during the 2007-08 food price crisis.<sup>13</sup> These policy levers ranged from economy-wide policies, like consumer subsidies and export bans, to much more targeted, means-tested interventions like cash transfers and food-for-work programs, where food is traded for labor on public works projects. Democracies were significantly less likely to respond to the global price crisis with price controls and consumer subsidies. Controlling for a host of other factors, a highly authoritarian regime, like Syria, was almost three times more likely to use price controls and consumer subsidies than a comparatively democratic country, like South Africa. Similarly, a government like Syria was over twice as likely an export ban as South Africa.<sup>14</sup>

Taken together, what do these findings tell us? First, overall, high global food prices are associated with urban unrest in democratic regimes, but not in autocratic ones. This finding is consistent with this study's

argument that democracy creates incentives and opportunities for political mobilization that may manifest as unrest. However, democracies and autocracies tend to respond to high food prices in different ways. Thus, some of the differences in the levels of urban unrest across democracies and autocracies in times of high food prices could be a function of the policies these regimes enact to either protect urban consumers from high global prices – or not.

## SHEDDING LIGHT ON THE ARAB SPRING

What of the Arab Spring? Contrary to the general trends seen in these findings, food prices were among the grievances that initially motivated mass demonstrations against these highly autocratic regimes and led to the ouster of governments in Tunisia, Egypt, and Libya as well as the 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.

Consumer subsidies have long been part of the “authoritarian bargain” between the state and citizens in the Middle East and North Africa, and attempts to withdraw them have been met with protest before, as during the bread *intifada* (uprising) that came in response to Egyptian President Anwar Sadat’s decision in 1977 to roll back food subsidies in order to court World Bank development financing. The resulting unrest killed 800 people, and the subsidies were quickly reinstated. These subsidies explicitly encouraged citizens across the region to evaluate their governments’ effectiveness in terms of its ability to maintain low consumer prices, which those governments could no longer sustain. When food prices were relatively low, as in 2002, these subsidies were relatively easy for the Egyptian government to sustain, comprising 1.4 percent of GDP. In 2011, however, when prices had more than doubled, they accounted for over 8 percent of GDP in Egypt.<sup>15</sup>

These findings point to the difficult circumstances facing governments in developing countries, as they attempt to pursue two different definitions of food security simultaneously: food security as an element of human security, and food security as a means of ensuring leader survival and quelling urban unrest. Most governments, regardless of regime type, are at least

*While recent food price spikes have led to widespread acute food insecurity, most of the policy measures directed at shielding consumers from rising prices are not geared toward addressing more fundamental causes of chronic food insecurity.*

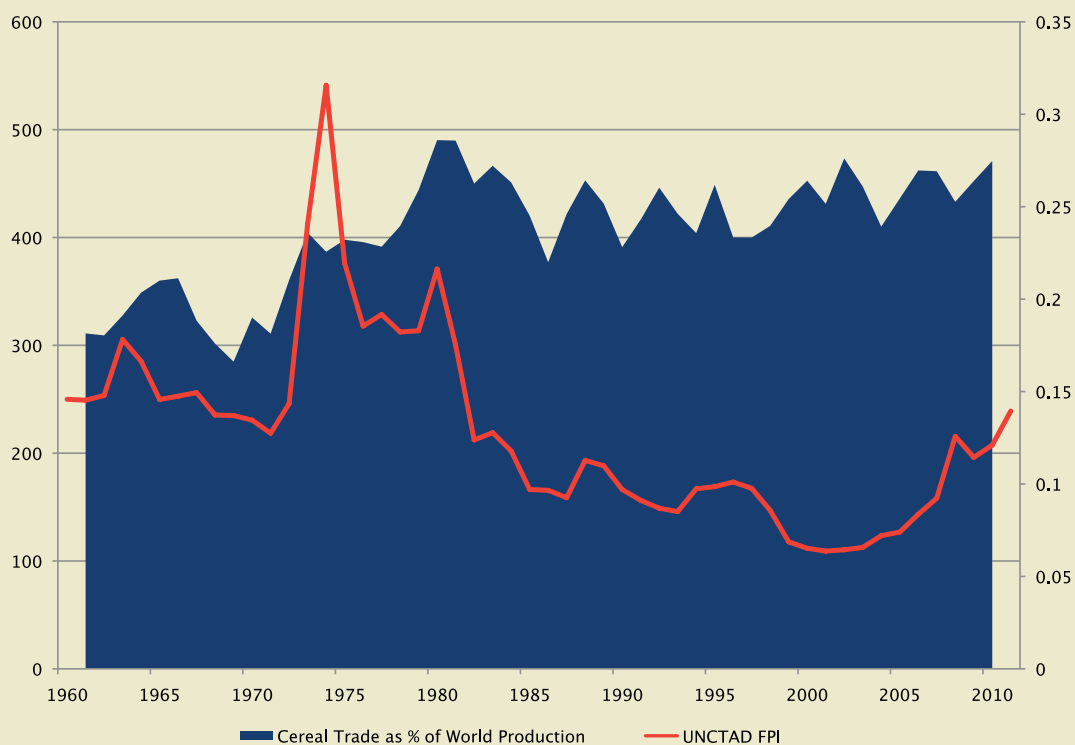
rhetorically committed to eradicating poverty and chronic food insecurity. Yet while recent food price spikes have led to widespread acute food insecurity, most of the policy measures directed at shielding consumers from rising prices are not geared toward addressing more fundamental causes of chronic food insecurity. These would include poverty, lack of market access, and high levels of subsistence agriculture coinciding with environmental degradation and marginal lands. Moreover, recent policy responses include the very pro-consumer policies that suppress food prices and incomes in rural areas – the very areas where chronic food insecurity is highest. While these policies may be bad policies from a human security perspective, it is apparent that they may be “good” policies from the perspective of autocrats focused on maintaining power. 🇳🇵



## GLOBAL FOOD PRICES AND CLIMATE CHANGE

Over the past five years, food has been more expensive than at any point in a generation. Figure 1 plots global food prices in constant dollar terms, as well as the proportion of cereal staples (maize, rice, wheat, etc.) traded as a percent of total cereal staples produced from 1960 to 2011. While global food prices have more than doubled since the early 2000s, they are still far lower than during their historic high in 1975 when poor harvests in traditional exporting countries, high oil prices, and the entrance of the Soviet Union as a major food purchaser in international markets created a perfect storm of high prices. The period 1975-1981 notwithstanding, the general trend from 1960 to 2000 was one of decreasing prices. The 2000s, however, have witnessed consistent and in fact accelerating increases in food prices, reaching crisis conditions in 2007-08 and 2010-11.<sup>16</sup>

*Figure 1: Global Food Prices, 1960-2011*



Sources: UNCTAD Food Price Index; FAO.

The causes of recent food price increases are multiple, and range from increasing demand due to economic growth in Asia and the use of food grains for biofuel production to commodity markets deregulation and the rise of food commodities as an asset class for institutional investors. While these factors are general trends pushing prices higher, climate shocks – such as droughts, flooding, and high temperatures – are often the proximate causes of rapid price increases, especially when they strike major exporting countries.

Since the 1980s, however, the share of cereals traded – by far, the most traded commodities – has been relatively stable: between 25 and 35 percent.<sup>17</sup> This stability, however, masks structural changes in the export position of the developing world. In 1960, developing countries had billions of dollars of agricultural export surpluses. Now, most of the developing countries of Africa and Asia are net importers of food. Of the 20 most populous countries in Africa – a continent where close to two-thirds of the population lives and works in the rural sector – all are net cereal importers, with some countries, especially in North Africa, running massive deficits. The same story holds for Asia, where roughly 50 percent

of the population is still in rural areas. While some of the most populous countries run large rice trade surpluses – such as Thailand and Vietnam – the region as a whole is import dependent.<sup>18</sup> Over time, Africa and Asia have become increasingly dependent on global markets to satisfy their domestic demand, and increasingly sensitive to price levels in those markets.

## CLIMATE CHANGE AND GLOBAL FOOD MARKETS

Climate change will affect global food markets in two important ways. First, climate change will affect both how much food is grown and where it is grown. Second, climate change will increase the frequency of localized crop failures due to more frequent extreme weather events such as droughts, flooding, extended cold and heat waves, and cyclonic storms.<sup>19</sup> The first mechanism challenges the notion of food self-sufficiency for much of the globe, while the second highlights the dangers of a world food system where production is highly geographically concentrated in a small number of producers.

Global climate change is forecast to decrease global output potential by between 6 and 18 percent on currently cultivated lands. However, these forecasts suggest a future of widening inequality between the haves – countries with favorable agro-climatic conditions – and the have nots – countries whose climates will become increasingly hostile to many food crops.<sup>20</sup> Some major exporting countries at higher latitudes, particularly the United States, Canada, Kazakhstan, New Zealand, Russia, and Ukraine, are forecast to increase agricultural yields. Yields in many tropical developing countries, including major rice exporters Thailand, India, and Vietnam, are forecast to decline. While expanding the area under cultivation will offset some of these productivity losses, many countries face significant land constraints, especially in Asia, North Africa, and the Middle East.

Extreme weather events always present significant challenges for local production and livelihoods, but these localized weather events can have global consequences when they strike in major food-exporting countries and regions. Greater concentration of production in countries with favorable climatic conditions would necessitate a robust trading system for the world to feed itself. At the same time, erratic climatic patterns mean that geographic concentration of production poses significant risks, and these risks are forecast to increase substantially. By posing risks to both geographic diversification of production *and* to concentration in productive countries, climate change thus poses two diametrically opposed risks that greatly complicate responses to food insecurity.

## ENDNOTES

- 1 For a recent review, see Solomon Hsiang, Marshall Burke, and Edward Miguel, “Climatic Influence on Human Conflict, Violence and Political Instability,” typescript.
- 2 FAO, WFP and IFAD, *The State of Food Insecurity in the World 2012: Economic Growth is Necessary but Not Sufficient to Accelerate Reduction of Hunger and Malnutrition* (Rome: FAO, 2012).
- 3 Henk-Jan Brinkman and Cullen S. Hendrix, “Food Insecurity and Violent Conflict: Causes, Consequences, and Addressing the Challenges,” *World Food Programme Occasional Paper No. 24* (Rome: World Food Programme, 2011).
- 4 Rabah Arezki and Markus Bruckner, “Food Prices and Political Instability,” *IMF Working Paper 11/62* (2011); and Marc F. Bellemare, “Rising Food Prices, Food Price Volatility, and Political Unrest” (2011), <http://ssrn.com/abstract=1874101>.
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- 6 Robert H. Bates, *Markets and States in Tropical Africa: The Political Basis of Agricultural Policies* (Berkeley: University of California Press, 1981); and Michael Lipton, *Why the Poor Stay Poor: A Study of Urban Bias in World Development* (Cambridge: Harvard University Press, 1977).
- 7 Quentin Wodon, and Hassan Zaman, “Higher Food Prices in Sub-Saharan Africa: Poverty Impact and Policy Responses,” *World Bank Research Observer* 25, 1 (2010): 157-176.
- 8 World Bank, *World Development Indicators*, 2012.
- 9 Ibid.
- 10 This briefs draws heavily on two working papers: Cullen S. Hendrix, “Democracy and Policy Responses to the 2007-08 Food Price Crisis” and Cullen S. Hendrix and Stephan Haggard, “International Food Prices, Regime Type, and Urban Unrest in the Developing World.”
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- 13 World Bank, “Double Jeopardy: Responding to High Food and Fuel Prices” (Paper prepared for the G8 Hokkaido-Toyako Summit, 2008).
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