

The G-20's error: Food price volatility is not the problem

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World food prices rose sharply at the end of 2010 and at the beginning of 2011 to hit an all-time high in February 2011. Such unprecedentedly high food prices have attracted the attention of global policymakers and the press, but much of the prevailing rhetoric conflates food price volatility with high food price levels. While higher food price levels increase both food insecurity and poverty and are strongly associated with increased political instability, food price volatility is not. The difference matters for the design of appropriate policy interventions.

Earlier this year the monthly food price index reported by the Food and Agriculture Organization of the United Nations (FAO) since January 1990 hit an all-time high (1). As in the previous high in 2007-2008, this food price spike arises from a perfect storm of increased consumer demand due to rapid economic growth, and nutritional transition in emerging markets in Asia, growing diversion of crop for biofuels production in the United States and elsewhere, poor harvests due to bad weather in key surplus zones of Australia, Russia and South America, and agricultural

commodity market speculation by investors fleeing a weak dollar and low interest rates exacerbated by controversial government policies such as export bans.

It is well known that higher food prices hurt food consumers, especially the poorest who routinely spend half or more of their meager incomes on food. The World Bank estimates that recent food price hikes have pushed 44 million people into extreme poverty (2). Likewise, the FAO estimated that the previous food price spike in 2007-8 drove the number of undernourished people worldwide over one billion, the highest headcount of food insecure people in more than 40 years (3).

As a result of the hardship they induce, rising food prices often sow discontent in developing countries. The 2008 food price spike helped bring down governments in Haiti and Madagascar. Recent political unrest in North Africa and the Middle East coincides strikingly with this most recent period of rising food prices. In Tunisia, protesters in the initial demonstrations in December 2010 brandished loaves of bread as they launched political unrest that toppled a dictatorial regime that had been in place for almost 25 years (4).

Food price spikes rightly concern global leaders. So what has their response been? World Bank President Robert Zoellick correctly warned that “Global food prices are now at dangerous levels and it is also clear that recent food price rises are causing pain and suffering for poor people around the globe” (2). But he goes on to worry about “rising and volatile food prices” together, as if they are the same thing. This echoes the remarks of other world leaders, most notably French President Nicolas Sarkozy, who said that under his leadership, the G-8 and G-20’s priority would be to push for policies aimed at curbing food price volatility, cautioning that “if we don't do anything we run the risk of food riots in the poorest countries” (5).

These leaders err by conflating rising food price levels with greater food price volatility, which is best defined as variance around that level. The error is understandable because the two phenomena are indisputably correlated. If demand outstrips current production, food prices rise and sellers draw down carry-over stocks, which stabilize prices over time. But if carry-over stocks get drawn down excessively during periods of unusually high prices, storage become less effective in stabilizing prices and greater volatility occurs. The result is natural positive correlation among food price levels and volatility (6,7,8).

By conflating high food price levels and high price volatility, global leaders make three important errors. First, while it is clear that food price levels are at historic highs, food price variability, although high these past few years, is not out of line with historical experience and is generally lower than in the 1970s (6,7,9). Although it is clear that the world faces historic food price highs, it is unclear that there is a similarly unprecedented food price volatility problem.

Second, the effects on the well-being of the poor of price levels and of price volatility differ. Rising food price levels hurt food consumers by reducing their purchasing power while benefitting food producers by increasing farm profits. By contrast, food price volatility hurts food producers, who make irreversible investments in crop inputs at the start of the growing season and routinely reduce such investments as food price risk increases (10,11). Because food commodities are often substitutes for one another, however, and because changes in the prices of foodstuffs are not perfectly correlated, food consumers can adjust their food purchases so as to take advantage of relative price discounts. As a result, they commonly benefit from increased volatility around a price level (9,11,12). Throughout the world, but especially in low-income countries, the poor are overwhelmingly net food buyers, so poverty increases as food price levels rise. But losses due to food price volatility fall mainly on relatively better-off large farmers.

Perhaps not coincidentally, these same large farmers enjoy tremendous taxpayer-funded support programs from G-20 governments presently expressing concern about food price volatility.

Third, since volatile food prices – as distinct from high price levels – do not necessarily harm the poor, does it make sense to blame food price volatility instead of rising food prices for political unrest? We could find no rigorous evidence on this point. In order to answer this question, we therefore exploit variation in the FAO’s food price index as well as in a proxy measure of political unrest worldwide (13). Figure 1 plots our proxy measure of political unrest, labeled “news count,” as well as the FAO’s food price index and three-month food price volatility (the standard deviation of the food price index over the current and previous two months). No clear pattern emerges from figure 1. Indeed, although the spikes in the food price level that occurred in the late spring and early summer of 2008 and at the end of 2010 appear to coincide with spikes in the number of news stories of food-related political unrest, increases in food price volatility often seem to occur after spikes in our proxy for political unrest.

Because figure 1 fails to control for potential confounding variables, we regressed the count of news stories on food-related political unrest on the number of such news stories in the previous month so as to account for inertia effects in reporting, on the FAO’s food price index, and on food price volatility (14). Table 1 presents our estimation results. These ordinary least squares regression estimates can be interpreted as the change in the count of news stories on food-related political unrest associated with increasing the explanatory variable by one unit. Rising food prices are strongly and statistically significantly associated with an increase in news stories reporting political unrest. By contrast, an increase in food price volatility is strongly and statistically significantly associated with a *decrease* in the number of news stories relating to political unrest. If one decomposes the food price index into constituent commodity groups, it

becomes apparent that the observed effects are largely driven by the price of cereals, the main source of carbohydrates in the diets of the poor (SOM).

Although commentators and politicians frequently blame food price volatility for human suffering and political unrest in developing countries, global leaders seem to either misunderstand or misrepresent the problem. The root issue is unprecedentedly high food price levels that cause human suffering and are strongly associated with political unrest, not increased variance in food prices that happen to be correlated with price levels.

The way in which leaders cast the food price problem matters because it shapes policy response. Policies aimed at curbing food price volatility are misguided if policymakers' goal is to increase the welfare of the poor or to avert political unrest in developing countries. Policies such as export bans, price controls and price stabilization schemes, although much discussed today, have a poor track record. Instead, policy makers should consider instead policies that prevent sharp increases in food prices, such as removing barriers to international agricultural trade, and increased investment in scientific research on crop productivity improvement, on soil and water conservation, on reducing post-harvest losses that run to nearly 50 percent in many low-income countries, and on renewable energy sources that do not compete with food for land and harvests. Indeed, these measures are the best long- and short-run policy response not only to high price levels, but also to price volatility. While it is true that food price volatility today encourages farmers to reduce inputs as a hedge against price risk and thereby helps drive higher price levels tomorrow, it is equally true that expanded production – or reduced harvest loss to spoilage, waste and diversion to biofuels production – drives down prices and encourages stockbuilding that stabilizes prices. The current high food price regime poses serious challenges to science and to society at large. Policymakers need to accurately identify the problem they need to combat.

References and Notes

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13. Our proxy measure is a monthly worldwide count of news stories indexed in LexisNexis, January 1990 – March 1990 that include one of these terms – cereal, commodities, commodity, dairy, food, grain, staple or sugar – and one of these words: demonstration, mob, protest, riot, strike, unrest or violence. Other measures of political instability, such as those in

the International Country Risk Guide, are not available at the monthly level, which is essential to generate a sample size sufficient to disentangle the effects of price levels and variance. To ensure the robustness of our results, we also estimated specifications with six-month (instead of three-month) food price volatility, and also used the FAO component -- meat, dairy, cereals, oils, and sugar – price indices (SOM). All regressions include controls for a linear time trend to account for changes in media coverage in LexisNexis (and other unobserved trends) over the period, month-specific dummy variables to account for seasonality, and year-specific dummy variables to account for broader political phenomena that often bunch in particular years, such as elections and war.

Figure 1. News stories about food-related political instability, the FAO’s food price index (2002-2004 mean=100) and the three-month standard deviation in the FAO food price index, 1990-2011.

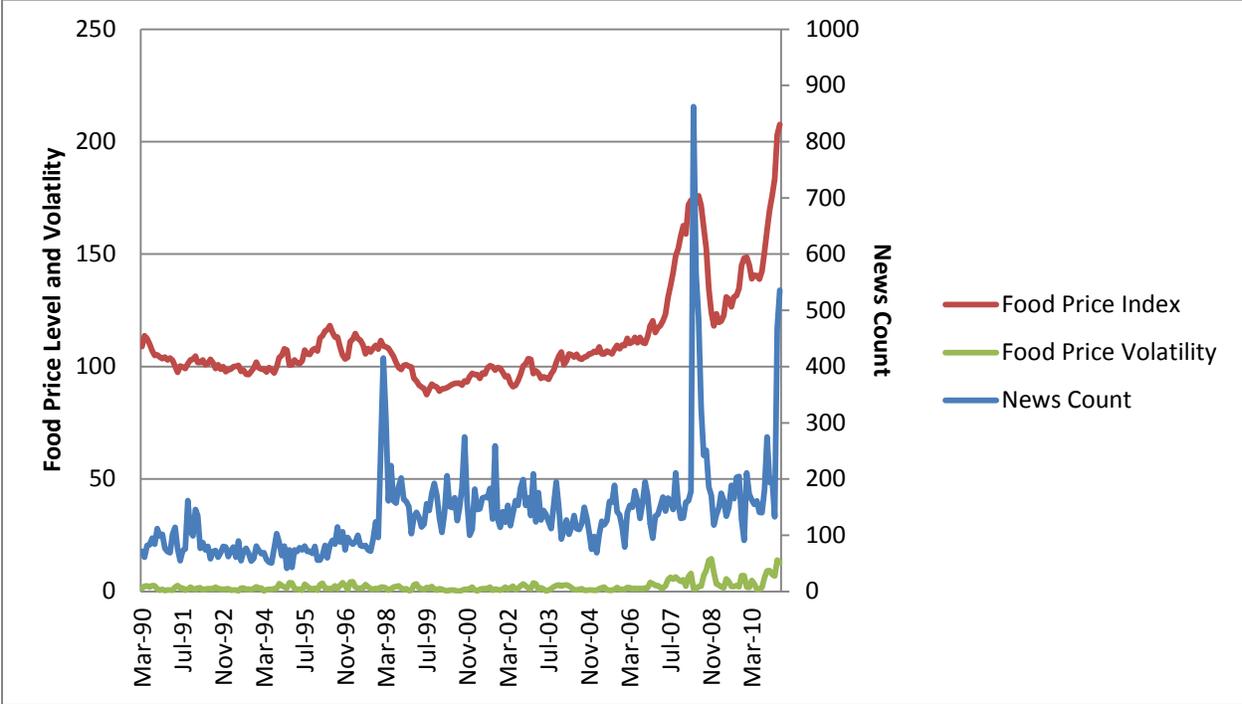


Table 1. Ordinary least squares estimation results for the count of news stories on food and political unrest as a function of lagged news count, the FAO food price index level, and the three-month standard deviation in the FAO food price index. (N=249, R²=0.659).

Variable	Coefficient		(Std. Err.)
News Count in $t - 1$	0.236	***	(0.061)
Food Price Index	1.781	***	(0.461)
Food Price Volatility	-10.826	***	(2.273)
Intercept	-113.1635	**	(51.706)

Note: The sample covers observations from March 1990 to February 2011 due to the use of two lagged terms for computing the three-month (i.e., current and previous two months) food price volatility regressor. Coefficient estimates for the trend as well as month and year dummy variables are not shown but are available upon request. The symbols ** and *** denote statistical significance at the five and one percent levels, respectively.

Supporting Online Material for

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In order to study the relationship between food prices and political instability, we exploit the monthly variation in the food price index published by the Food and Agriculture Organization (FAO) of the United Nations and in a count of the news stories on LexisNexis involving at least one of the terms “cereal,” “commodities,” “commodity,” “dairy,” “food,” “grain,” “staple” or “sugar,” and at least one of the words “demonstration,” “mob,” “protest,” “riot,” “strike,” “unrest” or “violence.”

Although there exist arguably more accurate measures of political instability than the count of news stories we use in this paper (e.g., the measures published by the International Country Risk Guide), those measures vary only annually. Because an annual measure of food prices would mask too much heterogeneity in food prices, however, we need a measure of political instability that varies at the monthly level. And although one would ideally use a measure of worldwide food prices that varies at the weekly level, no such measure is available.

The first empirical specification we estimate in this paper (table S1, columns 1 and 2) regresses the count of news stories on the aggregated food price level, a three- or six-month measure of the standard deviation of the food price level (i.e., the standard deviation over the current and previous two or five months), as well as monthly indicators, yearly indicators, and a time trend. The monthly dummies are included to control for month-specific phenomena such as crop cycles and agricultural seasons. The yearly dummies are included to control for year-specific phenomena such as elections and wars. Lastly, the time trend is included to reflect changes that take place over long periods of time, such as changes in the food supply due to climate change, possible increases in the number of media outlets covered by the LexisNexis data base, and other trends in food prices and news stories between January 1990 and February 2011.

We then estimate a second empirical specification (table S1, columns 3 and 4) in which we substitute meat, dairy, cereals, oils, and sugar price levels for the aggregate food price level so as to explore which of the constituent categories of the FAO food price index drives political instability.

Table S1. OLS Estimation Results for the Count of News Stories as a Function of Lagged News Count, Aggregated and Disaggregated Food Prices, and Three- and Six-Month Food Price Volatility

Variable	Aggregated Food Prices and Three-Month Volatility			Aggregated Food Prices and Six-Month Volatility			Disaggregated Food Prices and Three-Month Volatility			Disaggregated Food Prices and Six-Month Volatility		
	Coefficient		(Std. Err.)	Coefficient		(Std. Err.)	Coefficient		(Std. Err.)	Coefficient		(Std. Err.)
Dependent Variable: Count of News Stories												
News Count in $t - 1$	0.236	***	(0.061)	0.272	***	(0.063)	0.230	***	(0.062)	0.269	***	(0.064)
Food Price Index	1.781	***	(0.461)	1.677	***	(0.482)						
Meat Price Index							0.293		(0.956)	-0.537		(1.000)
Dairy Price Index							-0.155		(0.314)	-0.124		(0.328)
Cereals Price Index							0.977	**	(0.423)	1.006	**	(0.450)
Oils Price Index							0.223		(0.404)	0.224		(0.426)
Sugar Price Index							0.186		(0.148)	0.119		(0.156)
Food Price Volatility	-10.826	***	(2.273)	-4.005	**	(1.667)	-11.082	***	(2.381)	-4.282	**	(1.727)
Intercept	-113.164	**	(51.706)	-98.357	*	(54.313)	-92.635		(134.399)	30.991		(140.066)
Number of Observations	252			249			252			249		
Trend	Yes			Yes			Yes			Yes		
Month Dummies	Yes			Yes			Yes			Yes		

Year Dummies	Yes	Yes	Yes	Yes
p-value (All Coefficients)	0.000	0.000	0.000	0.000
Adjusted R ²	0.659	0.633	0.660	0.635

Note: The sample covers observations from March 1990 to February 2011 and from June 1990 to February 2011 due to the lagged terms used to compute three- and six-month food price volatility as regressors. The symbols *, **, and *** denote statistical significance at the 10, 5, and 1 percent level.