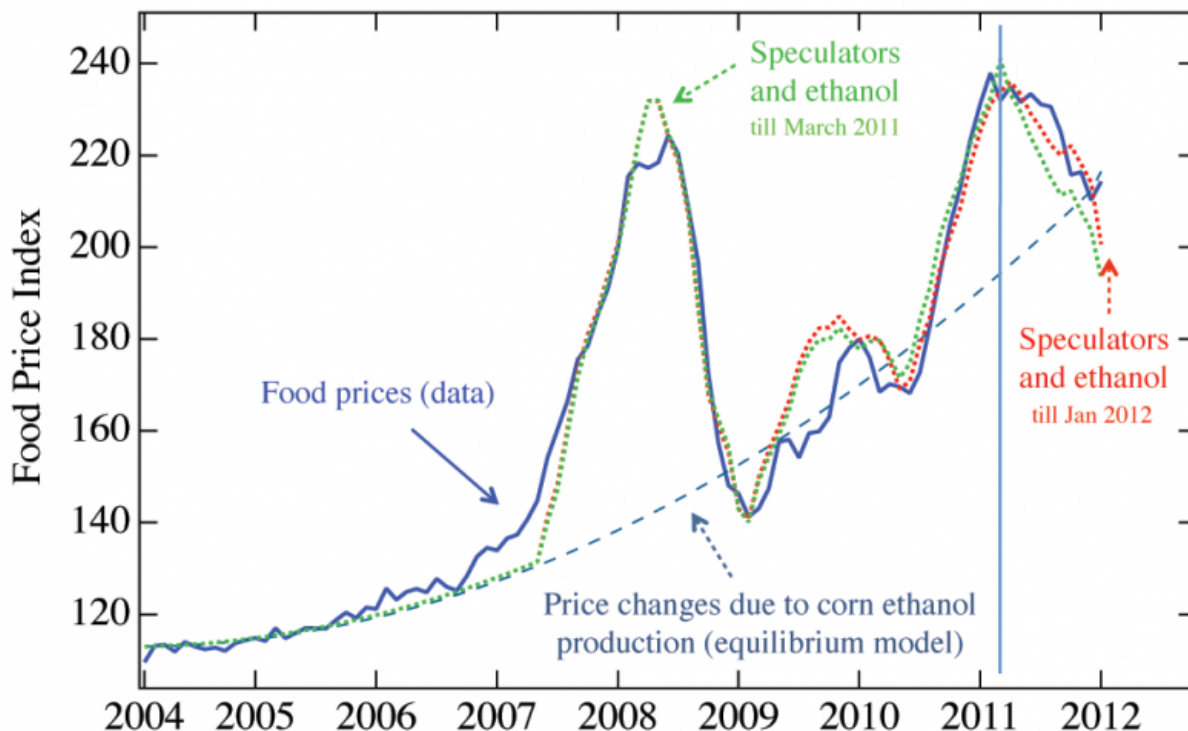


# The role of food prices in the Syrian crisis, and the way forward

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The FAO Food Price Index (blue solid line), the ethanol supply and demand model (blue dashed line), where dominant supply shocks are due to the conversion of corn to ethanol so that price changes are proportional to ethanol production and the results of the speculator and ethanol model (green and red dotted lines), that adds speculator trend following and switching among investment markets, including commodities, equities and bonds. The green curve is fit till March 2011 (vertical blue bar), the red curve is fit till Jan 2012. Thus the matching of the former to data after March 2011 is an out of sample fit.

The disintegration of Syria and Europe's refugee crisis are only the latest tragic consequences of two spikes in food prices in 2007/08 and 2010/11 that triggered waves of global unrest, including the Arab Spring.

Researchers at the New England Complex Systems Institute (NECSI) have traced these spikes and spiraling crises to their root causes: deregulated commodity markets, financial speculation, and a misguided U.S. corn-to-ethanol fuel policy that removes nearly 5 billion bushels of corn from markets each year. With world food prices currently in retreat, now is the time to change policies.

In a paper published in the *Proceedings of the National Academy of Sciences*, NECSI researchers explain how the Arab Spring was triggered by sudden spikes in global [food prices](#). When food becomes scarce, desperate people riot. Riots destabilized Syria and other poor countries, testing governments and sometimes leading to their fall. Many causes for the rapid rises in food prices have been suggested, but NECSI quantitatively determined that speculation caused these sharp rises in price. Additionally, the mandated conversion of corn into ethanol was linked to a steadier rise in food prices that has a serious impact on hunger worldwide.

Remarkably, the paper uses fundamental physical methods, invented for [quantum field theory](#) and developed in statistical physics and [complex systems](#) science, to determine the implications of policies intended to alleviate world hunger. This paper also provides strong validation for the role of nontraditional behavioral agents in large deviations from equilibrium market prices. This is evidence that speculation and trend following causes bubbles and crashes, a long standing controversy in economic theory.

Physical methods can be used to identify the most important behavior-affecting factors in a complex system. In this case, they point to the role of speculators and ethanol in world food prices. The fitting of actual

prices to theory has a p value of  $10^{-60}$ , and the out of sample fit is as good as many theories' in-sample fit, p

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