1. During the period included in the study there were several strong increases in food prices (see Fig. 1, Fig. 2 below), which, however, were not always synchronized. Joint growth took place in 2008. High prices were sustained for corn, soybean and wheat between 2010 and 2014. In addition, soybean had high prices in 2004. In addition, relatively high prices of soybean were observed in 2004.

We agree with the point raised in the comment that price increase had an impact on the transmission of volatility. Well, volatility spillover was greater when the instrument was floating - this was the case of the increase in price of rice in 2009. For this reason it can be argued that the first and second moments are not independent. In the period of strong price increases or declines of a given commodity, market for it becomes "more important", and prices of other commodities are more sensitive.

The robustness check based on data of regular times only could be a bit controversial because of two reasons. First, there is no definition of regular times. For example the period before 2004 can also hardly be considered as regular times, because of: Gulf War 1900-1991, Iraq War 2003, financial crises in emerging market economies (Mexico, East Asia, Argentina). Second, the sample period was selected in such a way that enables us to verify the importance of two relatively recent phenomena, i.e. financialization and biofuels boom (corn), on volatility spillovers.

Moreover, in rolling windows analysis (see subsection 5.2) we use windows covering approximately one year of observation. Thus, the first 400 windows, about 10 percent, analyse data before 2004.

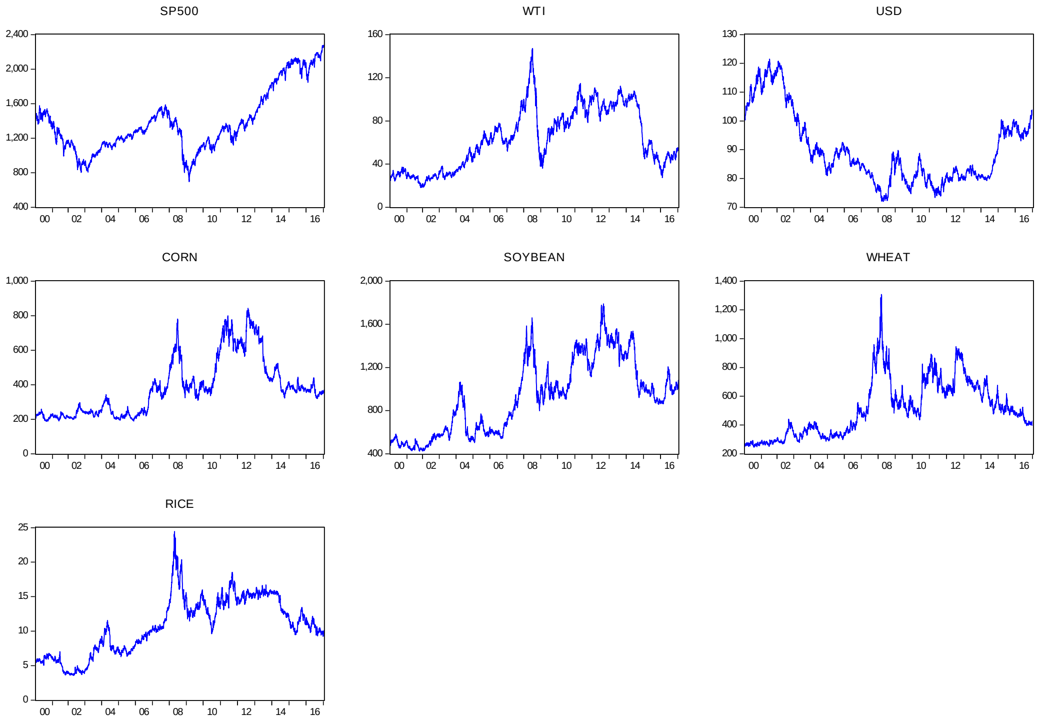


Figure. 1 S&P500 index, price of oil, USD index, commodity prices, 2000-2017

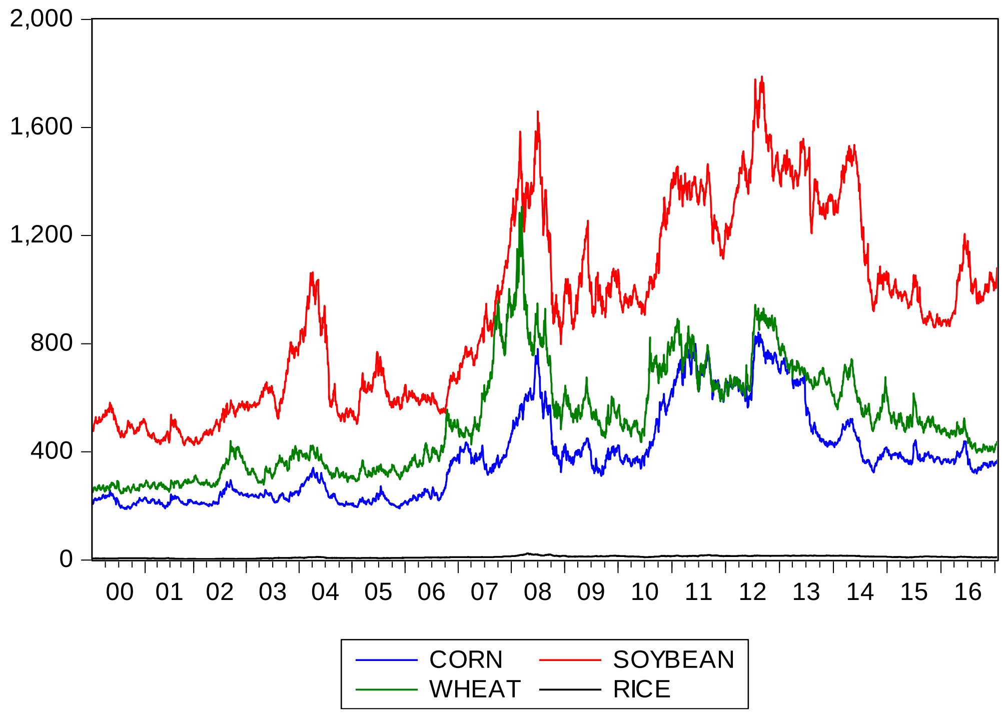


Figure 2. Food prices 2000-2017

2. We used the index of the US dollar provided by the Intercontinental Exchange Company (https://www.theice.com/products/194/US-Dollar-Index-Futures). It is defined as follows:

"The ICE U.S. Dollar Index (USDX) futures contract is a leading benchmark for the international value of the US dollar and the world's most widely-recognized traded currency index. In a single transaction the USDX enables market participants to monitor moves in the value of the US dollar relative to a basket of world currencies, as well as hedge their portfolios against the risk of a move in the dollar. US Dollar Index futures are traded for 21 hours a day on the ICE platform."

The basket of currencies includes:

- Euro (EUR), 57.6% weight
- Japanese yen (JPY) 13.6% weight
- Pound sterling (GBP), 11.9% weight
- Canadian dollar (CAD), 9.1% weight
- Swedish krona (SEK), 4.2% weight
- Swiss franc (CHF) 3.6% weight

For more details see:
https://www.theice.com/publicdocs/futures_us/ICE_Dollar_Index_FAQ.pdf

3. Indeed, we draw four main conclusions (see page 3):

> "First, we find that volatility spillovers are observed mostly within the group of food markets and within the group of other markets and much less between these groups. Second, the susceptibility of food markets to volatility spillovers from "non-food" markets, i.e. the stock, energy and foreign exchange markets, is larger during crisis periods. Third, the market for corn seems to be the most important source of volatility within food markets, as it is found to be the net volatility transmitter in most of the analysed subperiods. One may conjecture that the reason for this is that a large part of corn output is used to produce biofuels, and that there is an indirect relation between the food and energy markets. Fourth, the price of rice is detached from the developments in other markets, i.e. the sources of its volatility can hardly be found outside the market for rice."

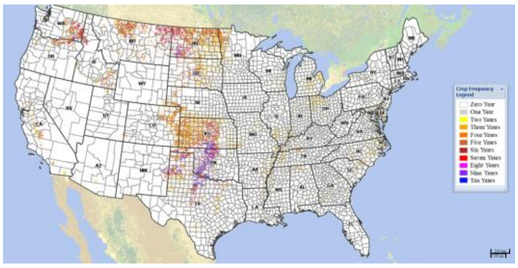
The two groups of markets, which are to some extent independent, in terms of volatility spillover is a quite surprising result. What we expected before the study was conducted, was the effect of financial market and energy market on food markets. What we find out was quite opposite, as food market seems to be separated from financial markets. Three food markets: corn, wheat, soybean seems to be tightly related. We tried to reduce speculations in the main text, but in comments, why not (thank for the opportunity):

As far as first, and four conclusion are concern, the explanation can be based on common supply shocks. The crops that share the same area, could be vulnerable to the same supply shocks, that is why corn and soybean are so highly related.

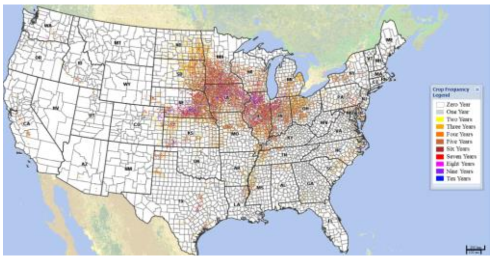
In particular food markets seem to be related to the area of crops. The crops that require similar conditions, share the same land are mostly related. The maps of US crops show that soybean and corn are grown in the same areas, mostly in the central states (see: Fig 3, below), while rice is grown in central south, wheat is to the west of corn and soybean crops.

As far as the second conclusion is concerned, the increase of volatility spillovers between financial markets and food markets could be related to the upsurge and collapse of most prices and indices in the run-up to global financial crisis and in its initial phase.

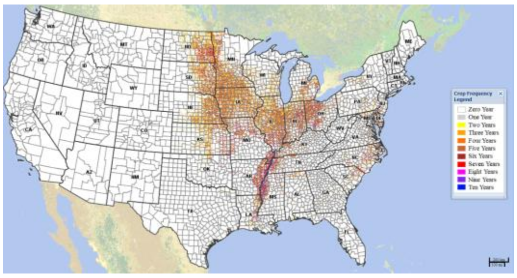
The third conclusion, has already been explained in the text.



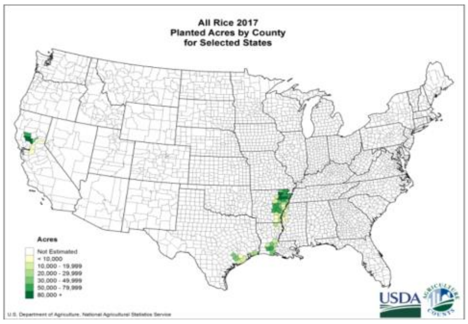
Wheat



Corn



Soybean



Rice

Fig 3. The area of crops cultivation in US, 2017

Source: https://www.nass.usda.gov/Charts_and_Maps/Crops_County/ar-pl.php

4. In general there are two popular proxies for volatility using in the context: range-based measures, and realised volatility measures. As pointed in Patton (2011) volatility measures are not perfect.

In the case of range based measures, alternative approaches are possible. One of them is mentioned in the comments, another one – proposed by Parkinson (1980) – was used in the seminal Diebold Yilmaz (2009) paper. We used the formula: log(log(maxPt) – log(minPt)), as we wanted to make the data as close to normality as possible, which is crucial for GIR and GFEVD.

In order to compare the results obtained in the paper we estimated DY spillover indices for Parkinson measure (we used the OLS, not the lasso, to estimate these results). The results obtained are to a large extent similar, yet since the OLS estimation, the Parkinson's version is less stable.

A.J. Patton Volatility forecast comparison using imperfect volatility proxies, Journal of Econometrics 160 (2011) 246–256.

5. The only numbers that can be obtained are the contribution of particular markets in the FEVD of a given market. It is not, possible, to calculate any volatility measures if the lasso approach is used.

6. All results presented in the paper utilize the system of 7 variables (S&P 500, WTI, the US dollar index, CORN, SOYBEAN, WHEAT, RICE). We decided, for clarity reasons, to present separately the results of the impact of other markets on food markets in Figure 6 and the impact of food markets on other food markets in Figure 7.

7. Figure 9 presents the impulse response function for rolling windows samples. Taking into account the number of pairs considered (24) and the number of windows (almost 4000), the usual impulse response function would have to be presented with/in 95736 separate figures! In order to reduce this number, and to present maximum information we proposed the heat maps. We think this is our original contribution.

What we find is that, the responses usually expire after one period, so it is relevant to present response after 1 day (period) only. So, figure 9 illustrates responses of (volatility of) one variable to (volatility) shock in another variable after 1 period. To be more precise, each row presents dynamics of responses that can vary over time. One can observe how the responses change in time. Interestingly, the responses are positive or neutral (shades of red), while the intensity/ strength of responses varies in time. We tried to figure out when the responses are stronger and to what markets is a particular market most vulnerable. As the shocks are standardized we can compare different aspects of responses.

8. Undoubtedly, sources of food price volatility are a critical issue in the study. The data collected and the Diebold-Yilmaz approach applied reveal that sources of food price fluctuations are in the food markets. Considering the close relations between some food markets (corn, soybean), exposed to the same natural conditions (use the same areas of cultivation), it should be presumed that the sources of price changes are of a supply nature. In general, of course, one cannot rule other sources of food prices dynamics out. What we found, however, is that volatility in food markets can hardly be explained with spillovers from volatility in stock market, energy market, and dollar exchange rate.