Food-Sector Company Stocks:

Should Investors watch out for USDA Announcements?

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USDA Announcements and the Stock Prices of Food-Sector Companies[1]

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1. INTRODUCTION

A large body of work in financial economics establishes empirically that U.S. macroeconomic announcements impact equity and bond prices significantly—see Kurov *et al*. (2019) for a recent review. For agricultural (*resp*. energy) commodities, a related literature likewise shows that commodity futures and options markets react significantly to USDA (*resp*. EIA) news.

In agricultural markets, the extant research focuses on what scheduled USDA reports do to commodity prices (*e.g*., Adjemian, 2012; Karali *et al*., 2019; Ying, Chen, and Dorfman, 2019) and to volatility expectations (*e.g*., McNew and Espinosa, 1994; Isengildina-Massa *et al*., 2008; Cao and Robe, 2022). Here, we ask instead whether USDA news ripple *beyond* commodity markets. Specifically, we investigate—to our knowledge, for the first time—whether USDA news also affect the stock prices of companies in the "food" sector.

Equity prices are net present values of future company cash-flows, discounted at the appropriate risk-adjusted required rates of return. USDA news could therefore affect share prices through the stream of expected future cash-flows or through the discount rate. Insofar as food-sector firms make up a small fraction of Standard and Poor's S&P 500 stock market index,[3] though, there is little reason to anticipate that news regarding agricultural markets should have more than a trivial impact on the broad U.S. stock market.[4] We therefore ignore the discount rate channel, and we focus on the cash-flow channel.

On the cash-flow side, intuition suggests several reasons why one could expect agricultural prices to impact future earnings of companies in the food sector. On the one hand, for companies

[3] In 2019, for example, less than one sixteenth (6.5 percent) of all the firms that make up the S&P 500 belonged to the "food" sector (as defined by the SIC codes used to delineate the sample in the present paper).
[4] In contrast, for the energy sector, there is evidence of feedback between crude oil and equity index prices—see, e.g., Huang (1996) and Kilian and Park (2009).

that make production factors for the agricultural sector (*e.g.*, fertilizer producers, farm machinery manufacturers, etc.), demand for their products may be affected if a USDA report has implications for planted acreage—either directly (in the annual Prospective Plantings or Acreage reports) or indirectly (for example, if the news' price implications of a World Agricultural Supply and Demand Estimates or WASDE report are sufficient to bring about a change in market expectations of future acreage allocated to food production). Regardless of acreage considerations, suppose that financial constraints limit farmers' ability or willingness to purchase capital goods. Then, insofar as the USDA news' implications for commodity prices also imply a relaxation of those constraints, one should expect durable purchases to increase as those constraints are relaxed—thus boosting those good manufacturers' earnings. On the other hand, for companies in the food transformation sector such as mills, beverage makers, biofuel producers, etc. (*resp*. for restaurant chains or grocery stores), agricultural commodities (*resp*. products derived from them) are an input. USDA news would thus be expected to affect their expected future cash-flows in the opposite direction of the first set of companies.

Assuming that USDA news impact stock returns, one would expect the magnitude of that impact to vary with the extent to which managers hedge against commodity price fluctuations, as well as with the degree to which a firm's competitive position allows it to pass through an increase in input costs to its own customers. Our question, then, is an empirical one. Thus, we ask whether the share prices of publicly traded companies from different sub-sectors (grain merchandisers like ADM and Bungee; food processors such as Coca Cola and Kraft-Heinz; farm machinery producers like John Deere and Caterpillar; fertilizer manufacturers; ethanol producers; restaurants chains; grocery stores; etc.) react to USDA announcements.

Answering this question requires teasing out the news content from each USDA report, as well as accounting for the extent to which the changes in companies' share prices on USDA event days might simply be echoing broad U.S. stock market movements that have nothing to do with the USDA news. For the first task, we exploit the fact that, ahead of all major scheduled USDA announcements, companies like Bloomberg and Reuters have for over a dozen years published surveys of commodity analysts' expectations regarding the upcoming reports. Those news organizations typically release the details of their surveys in the week before a USDA news event, which allows us to compute the market surprise on the event day and the analyst dispersion prior to the release. For the second task, we compute, for each stock, the excess returns on the USDA announcement-days using the CAPM. We estimate that market model using a rolling multi-month window leading up to ten days before a major USDA announcement (WASDE, Grain Stocks, Prospective Plantings, Acreage).

Our sample comprises 164 publicly traded companies between 2009 and 2019. The starting year reflects the availability of Bloomberg data on commodity analyst surveys. We choose the ending year is to predate the start of the COVID pandemic. The sample is carefully constructed to account for mergers, acquisitions, spin-offs, and de-listings.

We consider the stock price reactions for each firm individually and for seven sub-sector portfolios (grain merchants; fertilizer and chemical producers; farming equipment manufacturers; biofuel producers; restaurant chains; food processors; food retailers and supermarket chains;). Our results yield insights for agribusinesses and financial analysts in the food sector, and they provide a novel measure of USDA reports' value to market participants.

Section 2 proposes testable hypotheses. Sections 3 describes the data. Section 4 discusses our empirical methodology. Section 5 presents our findings. Section 6 concludes.

2. HYPOTHESIS DEVELOPMENT

In this Section, we propose several hypotheses of how USDA news regarding the corn and soybean markets could affect the stock prices of firms in various compartments of the food industry, broadly defined:

1 – On average, after controlling for the component of individual stocks' price movements that is due to overall equity-market conditions, the (excess) returns of food-sector companies are statistically significantly different on USDA event days than on non-USDA announcement days.

2 – The magnitude of food-sector companies' excess returns on USDA announcement days depends on the magnitude of the news contained in the USDA reports (with the news component measured relative to the consensus forecast of market experts' prior to the report), as well as pre-report uncertainty (proxied by the dispersion of individual expert forecasts around that consensus).

3. DATA

Our analysis requires financial market data and information on USDA announcements. Section 3.1 describes the construction of our sample of food-sector firms and the information that we gather for each firm, as well as other financial market data. Section 3.2 describes the data that we gather regarding USDA announcements.

3.1 Stock Market Data

We use Compustat to identify all the food-sector companies that were listed on the NYSE, AMEX or NASDAQ markets at some point between September 2009 and October 2019. After considering such of those companies that have pertinent SIC codes, we create a sample that comprises a wide range of companies—grain traders and merchandisers, companies that use agricultural products as inputs (food processors, livestock producers, biofuel refiners, beverage manufacturers,…), companies that produce inputs for the sector (farm machinery, ag technology, fertilizer, pesticide manufacturers,…), catering firms or restaurant chains, and grocery chains or food distributors. We eliminate from that initial sample all companies for which not all quarterly reports or reporting dates are available during the period when they are publicly listed.[5] Finally, we carefully account for mergers, acquisitions, spin-offs, and de-listings (for example, if two firms merge, then they are considered separately before the merger and jointly thereafter). There are 164 distinct stock tickers in the final sample.[6]

We collect the daily stock returns for the chosen stocks from CRSP between January 2009 and October 2019. For benchmarking using a 3-month or 6-month CAPM model, we also extract between January 2009 and October 2019 (i) CRSP data regarding the daily returns on the S&P 500 stock market index (SPX) and (ii) Bloomberg daily data on the 90-day and 180-day T-bill rates.

3.2 Data on USDA Announcements

We examine four sets of periodic USDA reports for the three main US commodities, corn soybeans, and wheat: World Agricultural Supply and Demand Estimates (WASDE, monthly), Grain Stocks (GS, quarterly), Prospective Plantings (PP, annual) and Acreage (AR, annual).

These four sets of reports are released on 15 pre-announced dates each year (except in 2013 and 2019, when there were only 14 announcement days due to U.S. government shutdowns). As

[5] We employ Compustat for the earnings announcement dates for the period 2006-2019. We match Compustat and Bloomberg information to obtain a list of firm-quarter observations with earnings announcement time stamps.
[6] We use SEC fillings, as well as data gathered from Wikipedia, Investopedia, and Google searches, to reconstruct a continuous time series for the current tickers regardless of mergers, acquisitions, splits, and other corporate events.

tallied by Cao and Robe (2022), "from September 2009 to October 2019, there are 120 WASDE reports, 41 GS reports (of which 10 overlap with the January WASDE), 10 PP reports, and 10 AR reports."

For each of report, we also collect the results of a Bloomberg pre-event survey of corn and soybean market analysts. Bloomberg has conducted such expert surveys since September 2009. Bloomberg News typically publishes the results of its surveys one week before the corresponding USDA event.[7] The Bloomberg survey information contains detailed information about the forecasters who participated in each survey. A typical survey summarizes the opinions of about 20 commodity analysts regarding an upcoming USDA announcement.

The Bloomberg information allows us to assess the distribution of analyst forecasts and to compute both a "consensus" value (which we set as the median analyst forecasts) and the dispersion of individual analyst forecasts around the consensus (which we set as the ratio of the interquartile range to the mean forecast). Table A1 in the Appendix, reproduced with permission from Cao and Robe (2022), summarizes the characteristics of the 151 reports in our sample—including their coverage, frequency and timing, and key information surveyed by Bloomberg.[8] Appendix Table A2 provides summary statistics regarding the consensus, dispersion, and USDA "news" for each event.

In total, our sample encompasses information about 164 companies on 2,560 trading days; 151 USDA news events; and 181 Bloomberg market sentiment data related to those events for 4 types of reports: WASDE, Grain Stocks, Acreage, and Prospective Plantings.

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[7] As noted by Cao and Robe (2022), "the exact timing of the result release is not documented in the survey dataset, so (one must) recover it by tracing back each release on Bloomberg News manually."
[8] For more details about the figures of interest in each report, see Cao and Robe (2022).

4. METHODOLOGY

In this section, we describe our approach to achieve three main tasks: (i) tease out the excess returns of food-sector company stocks using the CAPM model, so as to isolate sample-firm returns due to the USDA report release from the part of the returns due to overall stock market price movements; (ii) – constructing proxies for the news component in USDA report, as well as for pre-report uncertainty; and (iii) testing our hypotheses using these measures.

4.1 Estimating excess returns using CAPM models

An asset's returns are determined by two types of risk: systematic risk and idiosyncratic risk. While systematic risk affects every stock in the market and thus cannot be diversified, idiosyncratic risk is specifically related to certain asset and can be diversified by combining different asset into a portfolio. Since food-sector companies only account for a small fraction of the US stock market in general and of the S&P500 in specific[9], the risk premium coming from USDA-announcement can be considered sector- or individual-specific, idiosyncratic risk reward which is orthogonal to market risk.

According to the Capital Asset Pricing Model (CAPM) (Sharpe 1964; Treynor 1961a, 1961b), the expected asset returns as a reward for non-diversifiable market risk can be estimated using the relationship

$$R_i = R_f + \beta_i(R_M - R_f) + \varepsilon_i \qquad (1),$$

where:

R_i is returns of asset i

[9] Which is often used as a proxy "the market" among financial literature.

R_f is the periodic risk-free interest rate

R_M is the return on the market portfolio

ε_i is a residual or excess return component which is orthogonal to market risk.

Therefore, to separate any potential price movements due to (undiversifiable) market risk before considering the potential impact of the (sector-specific) USDA announcement on stock returns, we estimate equation (1) for each stock and each trading day in our sample using a rolling window of either 90 days or 180 days leading to that given day. Then, we use the resulting estimates of β_i (as well as the risk-free interest and market returns) to predict each stock's expected return on that given day, and finally we subtract the expected from the actual stock returns to generate a time series of excess returns for each stock. To that effect, we use T-bill rates[10] as proxies for the risk-free interest rates, and S&P 500 index returns as proxies for the expected market returns.

Another important component of stock returns is the price change due to the company's earning announcement (EA) (Kross and Schroeder 1984; Nichols and Wahlen 2004). In theory, therefore, for each stock, those USDA date which overlap with the EA date should be excluded. These overlapping observations, however, generally account for a very small fraction of the observations in our sample (typically ranging from 0-2%, with maximum 7% of the active sample of a stock).

[10] 3-Month T-bill for the 90-day window, and 6-Month T-bill for the 180-day window

4.2 Measuring the news component and pre-report dispersion of USDA reports

Like macroeconomic and corporate announcements, scheduled USDA reports contain anticipated and unanticipated (*i.e.*, news or "surprise") components. Including the part of its content that had been expected by market participants could bias the estimate of a report's market impact. Therefore, to unbiasedly assess the effect of a report on stock returns, we must first extract that report's news component.

As noted in Section 3, we use the Bloomberg analyst surveys before each USDA report to assess market experts' expectations regarding the upcoming report. Specifically, for each report-date, we follow Cao and Robe (2022) and Fernandez-Perez *et al*. (2019) and compute the surprise as the log-difference of the actual USDA announced figure from the median ("consensus") Bloomberg forecast. The dispersion of analysts' opinion is calculated as the interquartile range of the forecast distribution across all analysts, normalized by the mean forecast. The same procedure is applied for three commodities: corn, soybean and wheat, which are the most important crops grown in the US. Appendix Table A2 provides summary statistics regarding the consensus, dispersion, and USDA news for each USDA event.

4.3 Testing methodology

Testing hypothesis 1: compare excess returns on USDA announcement days vs. non-USDA announcement days

Assuming the estimated excess returns are normally distributed, this hypothesis can be tested using two-sample t-test on the USDA-day excess returns *vs.* non-USDA ("normal") excess returns. Alternatively, the non-parametric Kruskal-Wallis test can also be applied to account for the case of non-normal excess returns. For each stock, the null hypothesis is that there is no difference in mean excess returns between USDA days and "normal" days.

One key issue for the test is the choice of the "normal", non-USDA benchmark. To avoid any potential lead or lag in the price movement around the announcement day t, we compute the average excess returns of 3 days before day t-2 (that is, from day t-5 to day t-3) and 3 days after day t+2 (*i.e.* from day t+3 to day t+5). When any of these normal days happens to be an EA day as well, it will be replaced by one day further backward (forward).

Testing hypothesis 2: regression analysis

As our starting point, we apply standard panel data analysis to assess the role of USDA news and pre-announcement forecast dispersions on the excess returns of stocks on USDA days. The general regression equation is given by:

$$ER_{it} = \mu + \beta S_t + \gamma DP_t + \delta Control_{it} + \alpha_i + v_{it} \qquad (2),$$

where:

ER_{it} is the excess returns of stock i on USDA announcement day t;

μ is the overall intercept;

S_t is a vector of the news components, or surprises, of all commodities of interest for all USDA announcements released on day t. Since we are interested in three commodities reported in four main groups of USDA reports, S_t has 12 elements in total, and are cross-sectionally invariant (*i.e*. for each day t, all stocks have the same vector S);

DP_t, likewise, is the common vector of 12 USDA report-commodity forecast dispersions;

β is the vector of coefficients that measure the marginal effect of the USDA surprises on stock excess returns;

γ is the vector of coefficients that measure the marginal effect of the USDA forecast dispersion on stock excess returns;

$Control_{it}$ is a vector of control variables to capture other time-varying characteristics of firms;

$\alpha_i + v_{it} = \varepsilon_{it}$ is a composite error that contains a firm-specific, time-invariant unobserved effect α_i and a mean-zero, homoscedastic, non-serial-correlated disturbance v_{it}.

We are interested in the estimates of the influence of USDA report surprises and pre-report forecast dispersions on food-sector stocks, which are captured in the vector $\hat{\beta}$ and $\hat{\gamma}$.

Since not all the companies in our samples have full-length return observations throughout the sample period between September 2009 and October 2019,[11] they constitute an unbalanced panel of stock returns with active sample length varying from stock to stock[12].

When it comes to the question whether firm fixed-effect (FE) or random-effect (RE) estimators should be used to estimate equation (2), there are two justifications in favor of FE. First of all, as discussed, we hypothesize that the extent to which a company's stock price reacts to USDA information depends on the sub-industry in which the company operates. For example, the implication of an increase in wheat acreage will be different for fertilizer producers *vs*. mills or restaurant chains. If we assume that the sub-industry to which it belongs is a time-invariant characteristic of a company, then its effect therefore can be captured in α_i. Consequently, it is

[11] Due to the fact that some were only founded/traded at some point after September 2009, some were taken over or merged in between.
[12] There are 86 out of 186 companies with full-length sample, i.e. 2560 trading day without any missing values.

plausible to allow for the correlation between α_i and other time-varying USDA-related explanatory variables in the models, which is the key motivation of FE models. Secondly, for unbalanced panels, FE estimators usually produce more robust estimates (Wooldridge 2020, p. 447). Nevertheless, just for the purpose of robustness check, we estimate both FE and RE models and apply the Hausman (1978) and Mundlak (1978) tests to support our choice of estimator.

The panel methodology applied for this task draws heavily on Wooldridge (2020). We carry ouu our empirical analysis using the MATLAB Panel Data Toolbox developed by Álvarez, Barbero and Zofío (2017).

5. PRELIMINARY RESULTS

In this section, we present preliminary results for each task described above.

5.1 CAPM model estimates of excess returns

We estimate the CAPM models with two different rolling windows: 90 and 180 trading days. For each model, we apply OLS and maximum-likelihood estimation with expectation maximization algorithm to account for missing data (Dempster, Laird and Rubin 1977). Figure 1 plots the resulting excess returns, averaged across USDA days (blue) *vs.* non-USDA days (orange) of these four models.

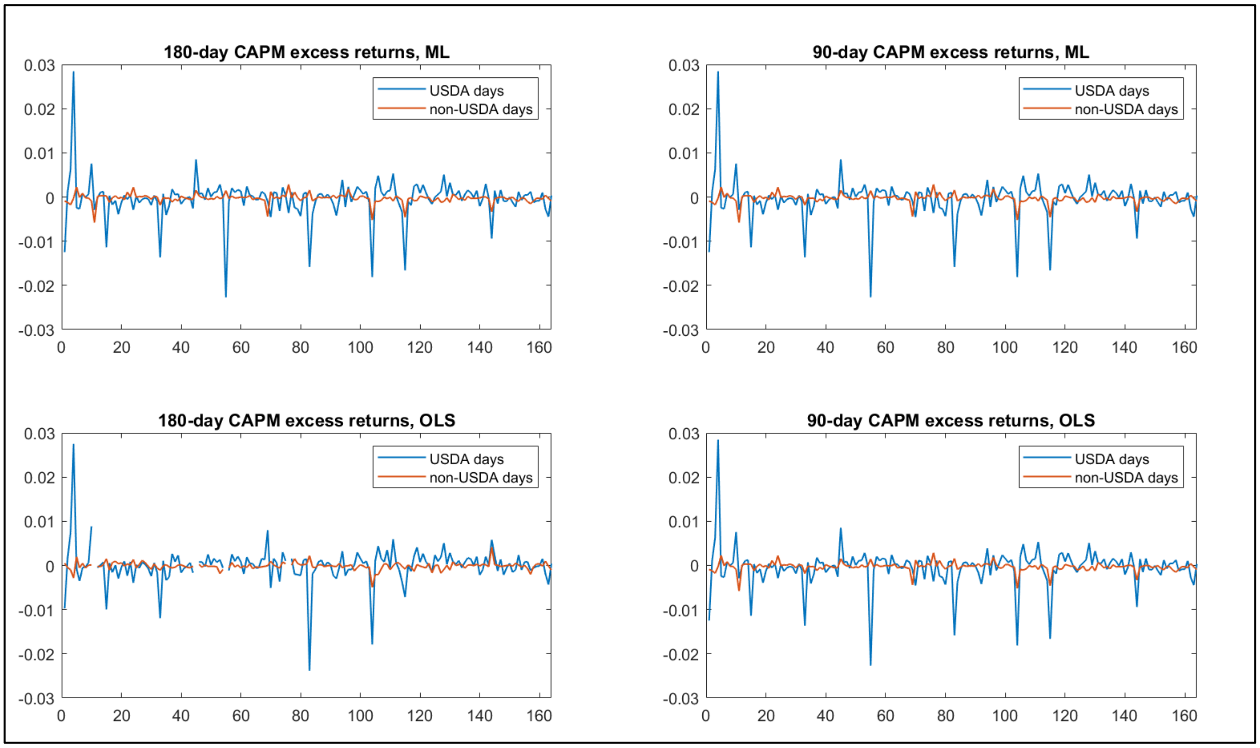

Figure 1. Alternative estimations for excess returns

The results are similar for four models, with a clear pattern that mean excess returns tends to be larger in absolute value on USDA days, whereas for non-USDA day they are concentrated closely around zero. Since empirical results of the following steps are also similar across these four specifications, hereafter we only discuss the results using excess returns coming from the 90-day OLS estimation.

Notwithstanding the clear pattern seen in Figure 1, when plotting the USDA excess returns averaged by sub-industry groups, Figure 2 shows that it is not obvious whether certain groups consistently have positive (negative) excess returns on USDA days.

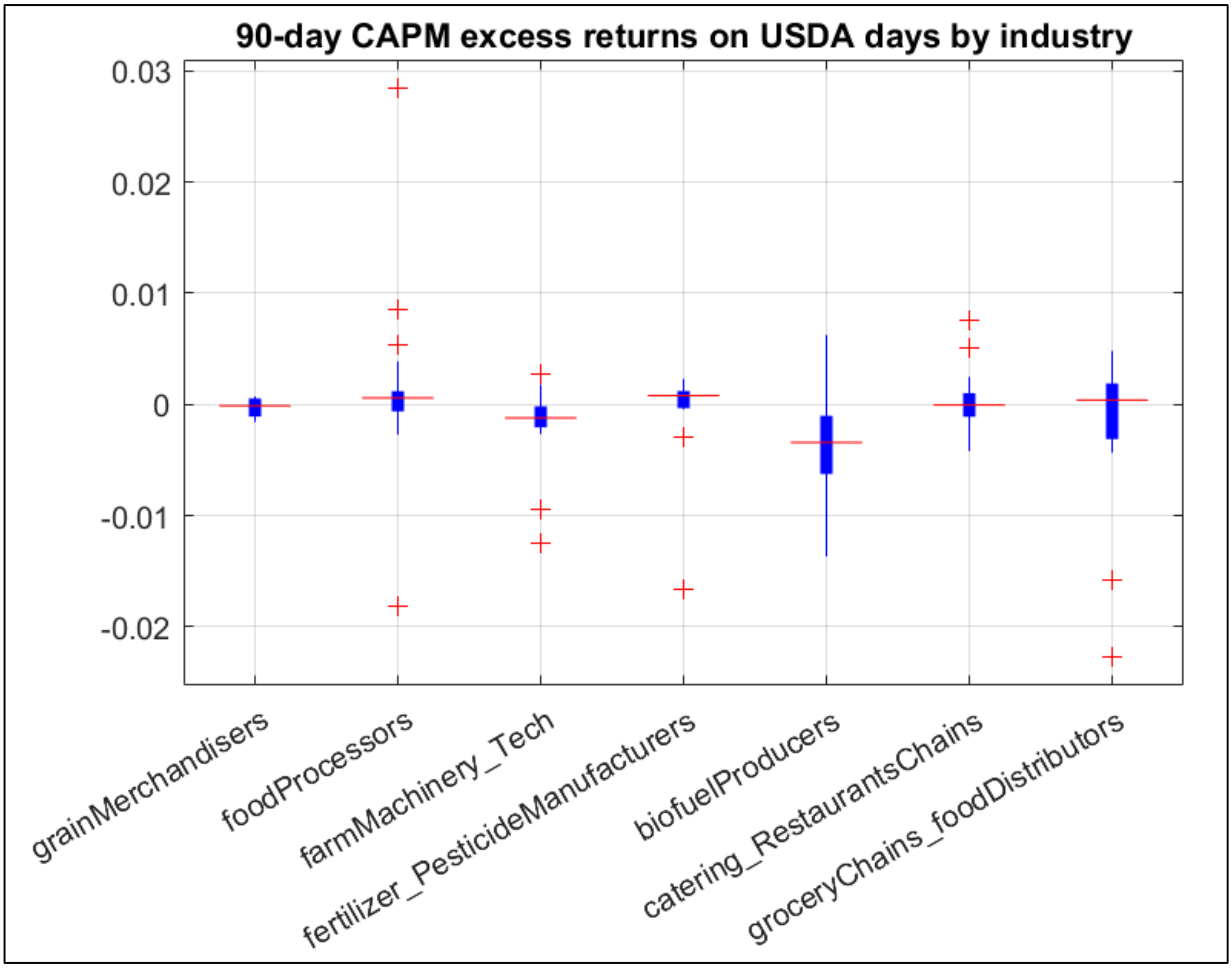

Figure 2. USDA excess returns by industry

5.2 Testing hypothesis 1: Two-sample t-test

Figure 3 plots the p-values of two-sample test-statistic of USDA excess returns against the "normal" average excess returns, as discussed previously. Here again, we plot the p-values by sub-industry groups.

Figure 3 shows that, indeed, the p-values are spread within each group, which does not provide a consistent implication of different behaviors of USDA excess returns across subcategories. When pooling all companies together, there are 77 stocks (out of 164) with p-value lower than 0.1[13].

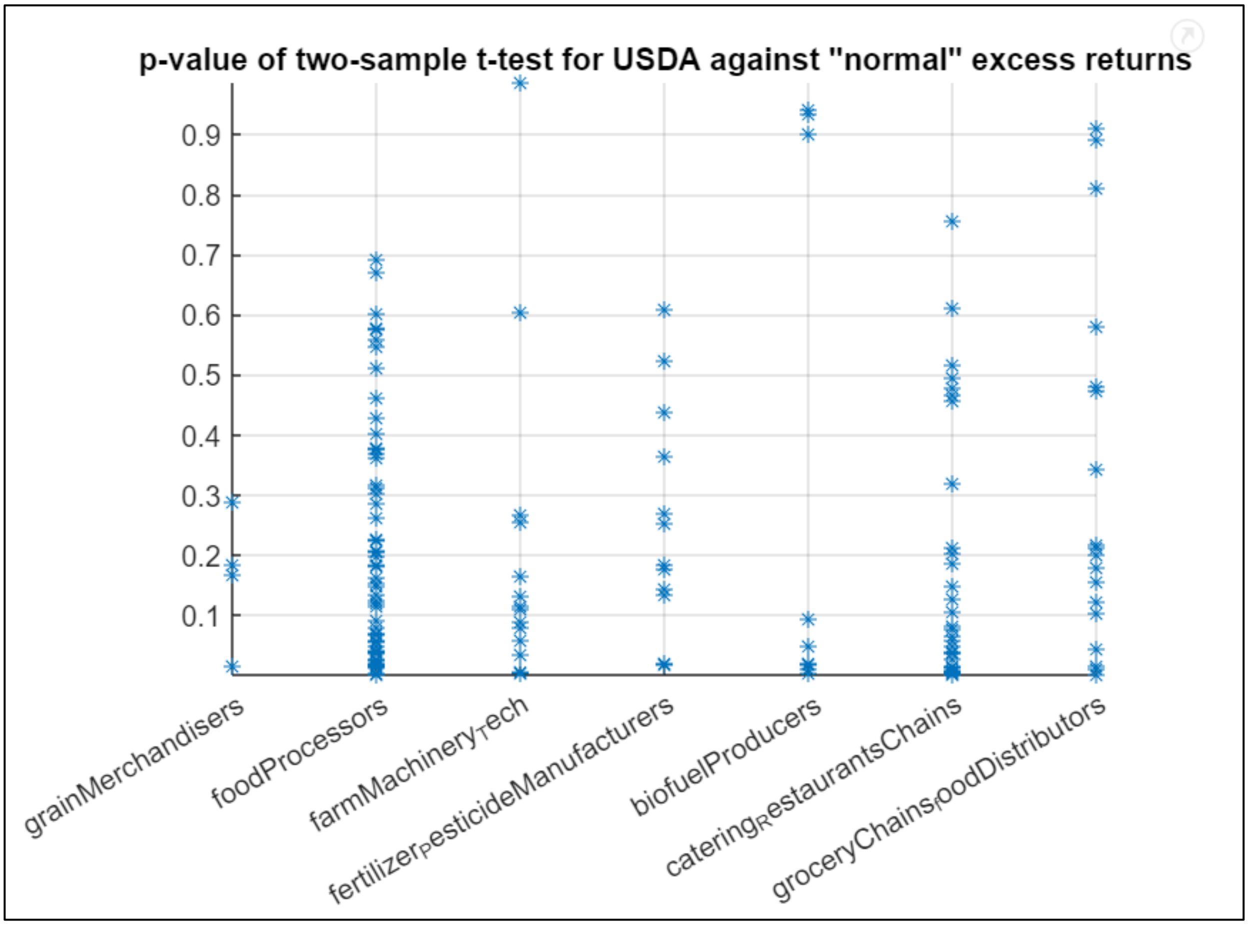

Figure 3. P-values of two-sample t-test statistics of USDA excess returns against the "normal" average excess returns.

5.3 Testing hypothesis 2: Unbalanced panel regressions

Table 1 reports the FE[14] estimations of the $\hat{\beta}$, *i.e.* the effect of different USDA reports' surprises and dispersions on the USDA day's excess returns of 164 stocks in our sample. Standard errors

[13] In addition, we also perform the test for the day before and the day after USDA day. Out of 164 tickers, the test rejects 13 (44) times the null that there is no significant different between the day before (after) USDA day and the normal baseline average.

[14] RE model yields coefficients of similar magnitude, and available up on request.

are reported in brackets. The diagnostic test results consistently suggested that the FE estimator should be preferred to the RE estimator. However, the results are very similar between the two.

Table 1 documents some significant relations between USDA news, the corresponding Bloomberg forecast dispersions, and food-sector exceed returns on USDA announcement days. However, the signs and magnitudes of the impact both vary across reports and commodities. For example, we see that reports (and surveys) about corn do not move stock prices so much, whereas for soybeans and wheat the impacts are much clearer.

6. DISCUSSION

We investigate the stock market's reaction to scheduled USDA reports. We first document that the prices of food-sector stocks respond significantly to USDA news. We then provide empirical evidence that the reaction varies depending on the commodity and the type of USDA report, on the strength of agricultural market experts' consensus expectations prior to the USDA report, and on the extent to which the USDA information surprises the market.

` In the next draft, we plan to investigate if a company's stock price response on USDA event days depends on the sub-sector to which the company belongs, and in particular on whether (i) the USDA news is price-bullish or price-bearish and (ii) agricultural commodities are an input or an output for that sub-sector.

Table 1. Unbalanced panel FE estimates of the effect of USDA surprise and dispersion on food-sector stock excess returns on USDA announcement days †

	Corn		Soybeans		Wheat	
	Coefficients	Robust standard errors	Coefficients	Robust standard errors	Coefficients	Robust standard errors
WASDE Surprise	-0.0004	0.0038	**0.0052****	**0.0023**	-0.0069	0.0043
Grain Stocks Surprise	**0.0107***	**0.0056**	0.0056	0.0044	-0.0072	0.0137
Prospective Planting Surprise	0.1118	0.0729	**0.3329*****	**0.0644**	**0.1135****	**0.0566**
Acreage Surprise	0.1388	0.1639	0.1202	0.0727	0.0634	0.1098
WASDE Dispersion	**0.0085***	**0.0047**	**-0.0119*****	**0.0037**	**0.0187*****	**0.0070**
Grain Stocks Dispersion	0.0029	0.0236	**-0.0401****	**0.0163**	**0.0560***	**0.0328**
Prospective Planting Dispersion	-0.2778	0.3207	**0.2648***	**0.1462**	0.1698	0.1767
Acreage Dispersion	-0.1081	0.4966	**-0.8397*****	**0.3050**	**-0.6155****	**0.2950**
No. stocks (N)	164					
No. USDA days (T)	151					
F Statistic of individual effects ‡	**1.5299*****					
Hausman test statistics§	10.6626					
Mundlak's test statistics§§	**40.0768****					

Note: Table 1 reports the unbalanced panel FE estimation results. Heteroskedasticity-consistent standard errors are reported in brackets.

† For all report-commodity combination, the independent variables of interest are the surprise (percentage deviation of the actual USDA information from the Bloomberg median forecast), and the percentage dispersion (from the mean forecast). Given the way these independent variables are measured, their regression coefficients measure the "elasticity" of excess returns (also measured in the percentage terms) to the correspondent change in the interest variables on the day of USDA announcement.

‡ F-test for the null hypothesis that all unobservable individual effects, i.e. α_i, are not significantly different from zero.

§ Hausman tests are used to test the null hypothesis that there is no significantly different between RE and FE estimated coefficients. Thus, a rejection of the null means RE estimator is consistent. However, FE is estimator is consistent under both the null and the alternative hypothesis (Wooldridge 2020).

§§ Mundlak test tests the null hypothesis that individual means are zero, which imply that RE model should be preferred.

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Appendix Table A1. USDA Reports Overview

	WASDE	Grain Stocks (GS)	Prospective Plantings (PP)	Acreage (AR)
Frequency	Monthly	Quarterly	Yearly	Yearly
Timing	2nd week of the month	2nd week of January & End of 1st-3rd Quarters	End of March	End of June
Overlap	1st GS (January)	1st WASDE; PP; AR	2nd GS (March)	3rd GS (June)
Information surveyed by Bloomberg	Projected U.S. ending stock of the on-going marketing year	U.S. Ending stock estimates as of 1st Dec, 1st Mar, 1st Jun and 1st Sep	U.S. farmers' planting intention for upcoming crop season	Survey-based estimate of U.S. planted area for current crop season
Baseline for Forecast "Pessimism"	WASDE of previous month	GS of previous year's same quarter	AR of previous year	PP of current year

Note: Table A1, drawn from Cao and Robe (2022), describes the 151 USDA reports that we collect for our sample from September 2009 through October 2019. On some dates, the USDA releases more than one report: the third row in the table (labeled "Overlaps") explains which of the WASDE, GS, PP and AR reports overlap. For part of the empirical analysis (see Table 5), we include information regarding expert opinions prior to the USDA news release. The information regarding analyst opinions comes from periodic Bloomberg surveys of market experts. The last row of the table indicates the baseline that we use to characterize whether the analyst consensus about upcoming news is optimistic or pessimistic, as explained in Appendix 1 of Cao and Robe (2022).

Appendix Table A2. Summary Statistics – Bloomberg Surveys and USDA News

	Median	Mean	SD	Min	Max	No. Obs	Obs < 0
A. Corn							
WASDE surprise	0.004	0.006	0.077	-0.242	0.326	121	52
Grain Stocks surprise	0.002	0.011	0.068	-0.165	0.196	41	20
Planted Area surprise	0.004	0.007	0.018	-0.017	0.055	20	8
WASDE dispersion	0.065	0.083	0.058	0.006	0.253	121	N/A
Grain Stocks dispersion	0.021	0.029	0.024	0.009	0.131	41	N/A
Planted Area dispersion	0.008	0.009	0.004	0.005	0.022	20	N/A

	Median	Mean	SD	Min	Max	No. Obs	Obs < 0
B. Soybean							
WASDE surprise	0.000	0.000	0.101	-0.310	0.452	121	55
Grain Stocks surprise	-0.011	0.001	0.091	-0.346	0.265	41	26
Planted Area surprise	-0.004	-0.008	0.021	-0.078	0.034	20	15
WASDE dispersion	0.111	0.125	0.076	0.011	0.401	121	N/A
Grain Stocks dispersion	0.036	0.047	0.030	0.012	0.118	41	N/A
Planted Area dispersion	0.011	0.011	0.006	0.005	0.025	20	N/A

Note: Table 2 provides summary statistics for the event-day "USDA surprise" relative to analysts' consensus forecast prior to the USDA scheduled event and the "dispersion" of those forecasts around the consensus. The sample runs from September 2009 through October 2019 and covers 151 USDA reports in that period—see Table A1.

† Computed for all 151 Grain Stocks, Prospective Planting, Acreages and WASDE announcement days in the sample.

‡ Corn and soybean "Big-event" days include the WASDE reports in January, August, September, October, and November (not any other), as well as all Grain Stocks, Prospective Plantings, and Acreages report—see Adjemian & Irwin (2018).

§ "Forecast change" is the log difference between (a) the value forecasted by the analysts interviewed by Bloomberg for the upcoming USDA announcement and (b) the reference value. See Table 1 for a summary and Appendix 1 for details.