**Online Appendix to**

**Do Extreme CIT Position Changes Move Prices in Grain Futures Markets?**

This appendix presents results supplementing the manuscript entitled, “Do Extreme CIT Position Changes Move Prices in Grain Futures Markets?” In section 1, we plot the net long positions of the four grain futures markets from the *Index Investment Data* (IID) report from December 2007 to October 2015, and from the *Supplemental Commitment of Traders* (SCOT) report from January 2004 to December 2020. In section 2, we present the standard Granger casusality test results and the long-horizon regression test results from the percentage growth in commodity index traders (CIT) net long positions to returns. The Box-Ljung version of portmanteau tests from the level growth and the percentage growth in commodity index traders (CIT) net long positions to returns, and the other way around, for four agricultural futures markets over the full sample periods, the growth stage of financialization, and the post-financialization period are presented in Section 3. In section 4, we plot the CQ estimates for the level growth of CIT net long positions over two subsample periods, and the percentage growth of CIT net long positions over the full sample period and two subsample periods.

**1. Additional results about the development of CIT net long positions**

Figure A1 shows the net long positions in the four markets from the CFTC Index Investment Data (IID) report and the Supplemental Commitment of Traders (SCOT) report. As can be seen, the net long positions computed from the SCOT report behaved very similarly to that from the IID report during the period when both datasets were available. This suggests that the netting effect from swap dealers is likely minimal and remains so in the latter part of the sample. Overall, the CIT positions from the SCOT data should provide a reasonable approximation of investment trading activities.

**2. Additional results about the linear Granger Causality tests for percentage change in CIT net long positions**

Table A1 summarizes the tests results from the standard Granger causality test and the long-horizon regression test for the percentage change in CIT net long positions. In Table A1 Panel A, test statistics are significant for CBOT wheat during the full sample period and the second half of the sample period, that is two out of eight cases. However, the direction of the estimated relationship is negative, suggesting that lagged CIT position percenrage changes negatively correlate with price changes. In Table A1 Panel B, we fail to reject the null hypothesis of no Granger causality fro CIT position percentage changes to futures return for all the four grain futures markets over the three sample periods.

**3. Additional results about the portmanteau test for change/percentage change in CIT net long positions**

Table A2 and Table A3 report the portmanteau test statistics for directional predictability from the level change in CIT net long positions in returns. In the main manuscript, we present the results in Figures 8-9, where we use heat maps to provide a more straightforward visualization of test results. With overall very few significant cases, we fail to find supporting evidence that large CIT position increases drove up commodity prices.

Table A4 reports the portmanteau test statistics for directional predictability from the percentage change in CIT net long positions to returns. For the full sample and two subsample periods, there are only 10 cases out of 192 with a significant portmanteau statistic. Only four of the 10 significant cases suggest that a large drop in CIT net long positions predicts the subsequent large drop in futures returns.

Table A5 reports the portmanteau test statistics for directional predictability from returns to the percentage change in CIT net long positions. For the full sample and two subsample periods, there are only 10 cases out of 192 with a significant portmanteau statistic. These significant cases fail to show a systematic pattern that index traders are trend-followers—only 5 cases out of 10 show a large drop in returns predicts the subsequent large drop in percentage change in CIT net long positions.

**4. Additional results about CQ estimates**

We have shown the CQ estimates for the full sample period in the paper. In this section, we first present the CQ estimates from the level growth in CIT net long positions to returns for the two subsample periods. Figures A2-A5 present the CQ estimates from the level growth in CIT net long positions to returns for the growth stage of financialization. In general, most CQ estimates are insignificant. For the few significant cases, they do not show a systematic lead-lag relationship from positions to prices. Figures A6-A9 present the CQ estimates from the level growth in CIT net long positions to returns for the post-financialization stage. Only in a very small portion of cases the CQ estimates are significant, yet they fail to provide evidence for the Master Hypothesis.

For the CQ estimates from the percentage change in CIT net long positions to returns, Figures A10-A13 present the CQ estimates for the full sample period, Figures A14-A17 present the CQ estimates for the growth stage of financialization, and Figures A18-A21 present the CQ estimates for the post-financialization stage. Similar to the findings with the change in CIT net long positions, we fail to find evidence supporting the directional predictability from the percentage change in CIT net long positions to returns.



Post-financialization

(2012 – 2019)

Growth stage of financialization

(2004 – 2011)

Figure A1. Net long positions of index traders in four grain futures markets using SCOT and IID data

Notes: SCOT refers to the *Supplemental Commitment of Traders* report published by the CFTC. IID refers to the *Index Investment Data* provided by CFTC. The growth and post-financialization stages are defined as in Irwin, Sanders, and Yan (2022).

Table A1. Standard Granger causality test results and long-horizon regreesion test results for weekly commodity index traders (CIT) positions percentage changes and returns in four grain futures markets, January 6, 2004 to December 31, 2019

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Full Sample | | 2004-2011 | | 2011-2019 | |
|  | **Panel A: Standard Granger Causality Test Results** | | | | | |
| Commodity | Dependent variable: returns, independent variable: % growth in CIT net long position | | | | | |
|  | F-statistic (p-value) | | | | | |
| CBOT corn | 1.976 | | 3.471 | | 0.017 | |
|  | (0.160) | | (0.063) | | (0.895) | |
| CBOT soybean | 0.214 | | 0.942 | | 0.020 | |
|  | (0.644) | | (0.332) | | (0.888) | |
| CBOT wheat | 5.366\*\* | | 2.044 | | 3.931\*\* | |
|  | (0.021) | | (0.154) | | (0.048) | |
| KCBOT wheat | 0.235 | | 0.453 | | 0.061 | |
|  | (0.628) | | (0.501) | | (0.805) | |
|  | **Panel B: Long-Horizon Regression Test Results** | | | | | |
| Commodity | Dependent variable: return, independent variable: % growth in CIT net long position | | | | | |
| Horizon (k) | Slope | Rescaled t-statistic | Slope | Rescaled t-statistic | Slope | Rescaled t-statistic |
| CBOT corn |  |  |  |  |  |  |
| Monthly (k=4) | 0.0000289 | 0.0825 | 0.0000337 | 0.0557 | 0.0000237 | 0.0615 |
| Quarterly (k=12) | 0.0000498 | 0.156 | 0.0000660 | 0.129 | 0.0000248 | 0.0653 |
| CBOT soybean |  |  |  |  |  |  |
| Monthly (k=4) | 0.000150 | 0.252 | 0.000366 | 0.295 | 0.0000613 | 0.107 |
| Quarterly (k=12) | 0.000238 | 0.440 | 0.000507 | 0.520 | 0.0000928 | 0.170 |
| CBOT wheat |  |  |  |  |  |  |
| Monthly (k=4) | 0.0000106 | 0.0110 | -0.0000346 | -0.0218 | 0.0000547 | 0.0473 |
| Quarterly (k=12) | 0.0000333 | 0.0400 | -0.0000395 | -0.0308 | 0.000135 | 0.118 |
| KCBOT wheat |  |  |  |  |  |  |
| Monthly (k=4) | 0.000476 | 0.222 | 0.000622 | 0.126 | 0.000426 | 0.199 |
| Quarterly (k=12) | 0.000468 | 0.204 | 0.000452 | 0.0962 | 0.000452 | 0.201 |

Notes: 1. Standard Granger causality test results are presented in Panel A.\* indicates statistical significance at 5%. F-test statistics are reported in the table, with the corresponding p-values in the parenthesis below. The null hypothesis is that no Granger causality exists from CIT positions percentage changes to futures returns. The estimated coefficients associated with the position variable are negative for cases with significant test statistics.

2. Long-horizon regression test restuls are presented in Panel C. \* indicates statistical significance at 5%. Critical values for the rescaled t-statistics shown in the table (-0.672, 0.727) are available in Valkanov (2003) table 4 for case 2, c=0, δ=0, T=750. The null hypothesis is that no Granger causality exists from CIT positions percentage changes to futures returns.

3. The full sample period consists of 835 weekly observations. For the growth stage of financialization, there are 417 weekly observations from January 3 to December 27, 2011. The post-financialization period runs from January 3, 2012 to December 31, 2019, resulting in 418 weekly observations.

Table A2. Cross-quantilogram portmanteau test results for weekly commodity index traders (CIT) positions and nearby futures prices in four grain futures markets, positions leading returns, January 6, 2004 to December 31, 2019

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Dependent variable: returns, independent variable: CIT Net Long Change | | | | | | | | | |
|  | Returns Quantile Level | | | |  | Returns Quantile Level | | | |
| CIT Net Long Change Quantile Level | 0.1 | 0.25 | 0.75 | 0.9 | CIT Net Long Change Quantile Level | 0.1 | 0.25 | 0.75 | 0.9 |
| Full sample: 2004 - 2019 | | | | | | | | | |
| Panel A: CBOT Corn |  |  |  |  | Panel B: CBOT Soybean |  |  |  |  |
| 0.1 | 14.696 | 8.382 | 16.902 | 13.818 | 0.1 | 16.027 | 21.238 | 20.012 | 17.588 |
| 0.25 | 6.558 | 13.742 | 8.83 | 16.982 | 0.25 | 16.350 | 21.836 | 17.382 | 10.200 |
| 0.75 | 9.044 | 10.408 | 15.002 | 19.715 | 0.75 | 12.115 | 13.051 | 12.311 | 10.016 |
| 0.9 | 14.793 | 9.388 | 11.803 | 7.915 | 0.9 | 17.077 | 15.167 | 23.623 | 6.825 |
| Panel C: CBOT Wheat |  | | | | Panel D: KCBOT Wheat |  | | | |
| 0.1 | 26.306 | 20.02 | 22.123 | 31.059 | 0.1 | 12.627 | 8.782 | 22.295 | 14.923 |
| 0.25 | 19.723 | 14.367 | 31.918\*(-) | 26.411 | 0.25 | 10.151 | 9.578 | 5.167 | 4.548 |
| 0.75 | 20.299 | 7.924 | 19.906 | 11.742 | 0.75 | 15.508 | 8.598 | 11.476 | 5.327 |
| 0.9 | 24.085 | 8.181 | 27.142 | 7.944 | 0.9 | 31.224 | 8.386 | 13.363 | 9.604 |
| Growth stage of financialization: 2004 - 2011 | | | | | | | | | |
| Panel A: CBOT Corn |  | | | | Panel B: CBOT Soybean |  | | | |
| 0.1 | 33.952 | 21.98 | 16.405 | 21.96 | 0.1 | 61.417\*(+) | 36.780\*(+) | 13.836 | 28.311 |
| 0.25 | 11.059 | 17.225 | 22.603 | 18.313 | 0.25 | 31.591 | 27.531 | 14.437 | 22.619 |
| 0.75 | 14.251 | 7.82 | 17.027 | 36.734\*(+) | 0.75 | 16.737 | 23.009 | 9.837 | 18.608 |
| 0.9 | 19.438 | 14.157 | 11.508 | 14.341 | 0.9 | 12.425 | 17.715 | 12.694 | 5.516 |
| Panel C: CBOT Wheat |  | | | | Panel D: KCBOT Wheat |  | | | |
| 0.1 | 24.058 | 33.127\*(+) | 18.146 | 24.211 | 0.1 | 11.996 | 9.92 | 23.353 | 20.377 |
| 0.25 | 35.379 | 38.026\*(+) | 41.714\*(-) | 31.944 | 0.25 | 12.105 | 17.746 | 8.849 | 9.176 |
| 0.75 | 12.972 | 11.383 | 10.239 | 12.092 | 0.75 | 12.846 | 14.904 | 11.813 | 7.952 |
| 0.9 | 21.654 | 10.602 | 25.324 | 7.375 | 0.9 | 13.178 | 9.455 | 11.749 | 10.329 |
| Post-financialization stage: 2012 - 2019 | | | | | | | | | |
| Panel A: CBOT Corn |  | | | | Panel B: CBOT Soybean |  | | | |
| 0.1 | 16.443 | 14.257 | 17.503 | 11.078 | 0.1 | 18.461 | 21.019 | 8.895 | 9.584 |
| 0.25 | 13.724 | 16.065 | 7.057 | 4.225 | 0.25 | 15.887 | 16.915 | 16.198 | 18.809 |
| 0.75 | 12.124 | 15.192 | 14.21 | 16.211 | 0.75 | 12.85 | 6.735 | 6.562 | 7.078 |
| 0.9 | 7.149 | 11.058 | 15.096 | 12.283 | 0.9 | 9.699 | 11.842 | 17.141 | 10.333 |
| Panel C: CBOT Wheat |  | | | | Panel D: KCBOT Wheat |  | | | |
| 0.1 | 19.802 | 34.054\*(-) | 26.624 | 29.637 | 0.1 | 15.054 | 15.226 | 26.481 | 34.934 |
| 0.25 | 11.049 | 18.288 | 30.470\*(-) | 12.305 | 0.25 | 14.334 | 11.551 | 21.385 | 19.391 |
| 0.75 | 10.592 | 12.088 | 14.66 | 15.66 | 0.75 | 31.934 | 7.347 | 9.162 | 12.869 |
| 0.9 | 11.031 | 9.163 | 12.301 | 19.458 | 0.9 | 21.349 | 10.567 | 9.73 | 19.403 |

Notes: \* indicates statistical significance at 5%. Box-Ljung test statistics for 13 lags are in the table. The sign (+/-) next to the test statistics indicates the dominant sign of the underlying CQ estimates for the Box-Ljung test statistics.

Table A3. Cross-quantilogram portmanteau test results for weekly commodity index traders (CIT) positions and nearby futures prices in four grain futures markets, returns leading positions, January 6, 2004 to December 31, 2019

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Dependent variable: CIT Net Long Change, independent variable: returns | | | | | | | | |  |
|  | CIT Net Long Change Quantile Level | | | |  | CIT Net Long Change Quantile Level | | | |
| Returns Quantile Level | 0.1 | 0.25 | 0.75 | 0.9 | Returns Quantile Level | 0.1 | 0.25 | 0.75 | 0.9 |
| Full sample: 2004 - 2019 | | | | | | | | | |
| Panel A: CBOT Corn |  |  |  |  | Panel B: CBOT Soybean |  |  |  |  |
| 0.1 | 10.965 | 15.793 | 17.586 | 30.847 \*(+) | 0.1 | 19.468 | 16.947 | 24.280 \*(+) | 9.061 |
| 0.25 | 18.625 | 17.175 | 17.414 | 22.69 | 0.25 | 13.381 | 18.636 | 18.341 | 11.876 |
| 0.75 | 16.102 | 18.174 | 7.292 | 7.666 | 0.75 | 17.855 | 13.487 | 21.334 | 12.803 |
| 0.9 | 15.922 | 17.321 | 12.7 | 11.683 | 0.9 | 14.016 | 8.316 | 8.761 | 8.494 |
| Panel C: CBOT Wheat |  |  | |  | Panel D: KCBOT Wheat |  |  |  |  |
| 0.1 | 28.253 | 17.624 | 12.26 | 9.607 | 0.1 | 15.269 | 12.492 | 20.846 | 15.167 |
| 0.25 | 11.002 | 22.932 | 17.1 | 17.531 | 0.25 | 15.087 | 23.241 | 15.497 | 14.437 |
| 0.75 | 24.846 | 13.878 | 13.715 | 10.709 | 0.75 | 17.181 | 17.759 | 15.269 | 7.543 |
| 0.9 | 31.025 | 18.937 | 8.128 | 20.215 | 0.9 | 14.654 | 14.634 | 17.523 | 8.096 |
| Growth stage of financialization: 2004 - 2011 | | | | | | | | | |
| Panel A: CBOT Corn |  | | | | Panel B: CBOT Soybean |  | | | |
| 0.1 | 9.129 | 8.654 | 13.778 | 23.934 \*(+) | 0.1 | 57.767 \*(+) | 49.56 \*(+) | 18.089 | 4.943 |
| 0.25 | 21.342 | 9.917 | 14.718 | 19.629 | 0.25 | 28.917 | 26.240 | 23.573 | 15.417 |
| 0.75 | 11.98 | 14.241 | 7.379 | 8.12 | 0.75 | 32.921 \*(-) | 17.368 | 15.897 | 7.270 |
| 0.9 | 16.692 | 6.971 | 18.737 | 13.692 | 0.9 | 20.317 | 7.457 | 8.127 | 12.885 |
| Panel C: CBOT Wheat |  |  | |  | Panel D: KCBOT Wheat |  |  |  |  |
| 0.1 | 12.513 | 14.255 | 27.695 | 20.689 | 0.1 | 13.91 | 8.621 | 17.088 | 15.278 |
| 0.25 | 6.569 | 19.882 | 24.256 | 25.37 | 0.25 | 13.87 | 16.705 | 12.767 | 9.107 |
| 0.75 | 37.02 \*(-) | 25.503 | 16.24 | 17.313 | 0.75 | 19.317 | 19.617 | 13.947 | 10.424 |
| 0.9 | 21.543 | 23.11 | 21.714 | 30.078 | 0.9 | 15.731 | 17.396 | 11.868 | 11.472 |
| Post-financialization stage: 2012 - 2019 | | | | | | | | | |
| Panel A: CBOT Corn |  | | | | Panel B: CBOT Soybean |  | | | |
| 0.1 | 11.470 | 8.762 | 13.696 | 11.082 | 0.1 | 29.250 \*(-) | 36.448 \*(-) | 14.505 | 6.986 |
| 0.25 | 11.396 | 9.172 | 19.546 | 14.857 | 0.25 | 11.194 | 23.157 | 18.155 | 9.767 |
| 0.75 | 13.891 | 17.085 | 6.331 | 6.407 | 0.75 | 11.551 | 11.793 | 23.743 | 16.455 |
| 0.9 | 19.059 | 20.057 | 9.893 | 16.304 | 0.9 | 13.258 | 9.55 | 20.099 | 20.056 |
| Panel C: CBOT Wheat |  |  | |  | Panel D: KCBOT Wheat |  |  |  |  |
| 0.1 | 31.157 | 23.023 | 12.623 | 12.714 | 0.1 | 16.593 | 11.461 | 24.700 | 20.069 |
| 0.25 | 13.377 | 27.779 \*(+) | 20.501 | 15.769 | 0.25 | 21.15 | 8.219 | 17.220 | 27.112 |
| 0.75 | 12.473 | 24.576 | 16.978 | 8.097 | 0.75 | 29.309 | 16.392 | 13.124 | 11.271 |
| 0.9 | 28.042 | 19.352 | 15.083 | 11.494 | 0.9 | 17.361 | 19.085 | 8.303 | 11.376 |

Notes: \* indicates statistical significance at 5%. Box-Ljung test statistics for 13 lags are in the table. The sign (+/-) next to the test statistics indicates the dominant sign of the underlying CQ estimates for the Box-Ljung test statistics.

Table A4. Cross-quantilogram portmanteau test results for impacts of percentage changes in CIT net long positions to futures returns in four grain futures markets for full sample, the growth stage of financialization, and the post-financialization stage

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Dependent variable: returns, independent variable: CIT Net Long % Change | | | | | | | | | |
|  | Returns Quantile Level | | | |  | Returns Quantile Level | | | |
| CIT Net Long % Change Quantile Level | 0.1 | 0.25 | 0.75 | 0.9 | CIT Net Long % Change Quantile Level | 0.1 | 0.25 | 0.75 | 0.9 |
| Full sample: 2004 - 2019 | | | | | | | | | |
| Panel A: CBOT Corn |  |  |  |  | Panel B: CBOT Soybean |  |  |  |  |
| 0.1 | 13.449 | 13.826 | 25.351 | 16.679 | 0.1 | 17.781 | 27.351 | 17.276 | 16.189 |
| 0.25 | 4.788 | 14.99 | 9.342 | 15.367 | 0.25 | 16.252 | 24.919 | 16.868 | 9.707 |
| 0.75 | 7.828 | 8.342 | 16.256 | 12.052 | 0.75 | 9.017 | 9.851 | 14.836 | 7.184 |
| 0.9 | 9.541 | 9.198 | 9.042 | 15.512 | 0.9 | 6.466 | 9.726 | 25.169 \*(-) | 8.33 |
| Panel C: CBOT Wheat |  |  |  |  | Panel D: KCBOT Wheat |  |  |  |  |
| 0.1 | 24.993 | 15.293 | 30.04 \*(-) | 27.164 | 0.1 | 9.100 | 6.357 | 15.009 | 20.261 |
| 0.25 | 21.599 | 8.025 | 20.952 | 15.213 | 0.25 | 11.800 | 11.192 | 9.117 | 6.000 |
| 0.75 | 22.95 | 8.332 | 18.689 | 15.004 | 0.75 | 24.987 | 7.593 | 8.607 | 7.656 |
| 0.9 | 22.762 | 8.352 | 20.317 | 6.549 | 0.9 | 26.697 | 9.761 | 6.963 | 9.431 |
| Growth stage of financialization: 2004 - 2011 | | | | | | | | | |
| Panel A: CBOT Corn |  | | | | Panel B: CBOT Soybean |  | | | |
| 0.1 | 27.24 | 26.772 | 17.915 | 25.053 | 0.1 | 37.219 | 39.794 \*(+) | 21.991 | 33.291 |
| 0.25 | 13.064 | 22.496 | 21.414 | 18.345 | 0.25 | 35.885 \*(+) | 35.938 \*(+) | 16.2 | 25.637 |
| 0.75 | 11.545 | 5.89 | 12.812 | 18.839 | 0.75 | 14.57 | 16.913 | 12.44 | 11.763 |
| 0.9 | 9.604 | 10.972 | 18.259 | 18.382 | 0.9 | 10.744 | 11.159 | 16.022 | 5.249 |
| Panel C: CBOT Wheat |  |  |  |  | Panel D: KCBOT Wheat |  |  |  |  |
| 0.1 | 40.535 | 34.081 \*(+) | 14.822 | 25.71 | 0.1 | 6.725 | 11.343 | 13.566 | 11.105 |
| 0.25 | 29.595 | 28.706 | 27.808 | 28.598 | 0.25 | 14.098 | 24.417 | 13.705 | 11.691 |
| 0.75 | 22.344 | 7.783 | 25.153 | 21.008 | 0.75 | 14.284 | 11.137 | 8.342 | 7.308 |
| 0.9 | 22.896 | 10.741 | 21.812 | 12.502 | 0.9 | 14.928 | 10.895 | 8.637 | 13.588 |
| Post-financialization stage: 2012 - 2019 | | | | | | | | | |
| Panel A: CBOT Corn |  | | | | Panel B: CBOT Soybean |  | | | |
| 0.1 | 14.799 | 14.29 | 13.274 | 9.493 | 0.1 | 22.444 | 13.883 | 17.286 | 12.096 |
| 0.25 | 14.069 | 20.406 | 4.873 | 8.686 | 0.25 | 13.541 | 13.345 | 15.209 | 16.196 |
| 0.75 | 12.023 | 18.083 | 12.415 | 16.775 | 0.75 | 13.527 | 6.328 | 9.501 | 6.501 |
| 0.9 | 8.898 | 14.188 | 13.131 | 10.791 | 0.9 | 12.939 | 7.403 | 12.456 | 7.435 |
| Panel C: CBOT Wheat |  | | | | Panel D: KCBOT Wheat |  |  |  |  |
| 0.1 | 17.224 | 28.496 \*(-) | 26.036 | 21.386 | 0.1 | 14.174 | 15.111 | 21.053 | 28.241 |
| 0.25 | 13.182 | 20.747 | 29.407 \*(-) | 7.853 | 0.25 | 10.708 | 11.255 | 20.907 | 18.533 |
| 0.75 | 9.107 | 15.148 | 14.77 | 15.304 | 0.75 | 31.541 \*(-) | 7.661 | 9.327 | 19.751 |
| 0.9 | 14.095 | 9.699 | 17.082 | 15.094 | 0.9 | 19.445 | 10.073 | 15.602 | 25.202 |

Notes: \* indicates statistical significance at 5%. Box-Ljung test statistics for 13 lags are in the table. The sign (+/-) next to the test statistics indicates the dominant sign of the underlying CQ estimates for the Box-Ljung test statistics.

Table A5. Cross-quantilogram portmanteau test results for impacts of futures returns to the percentage change in CIT net long positions in four grain futures markets for full sample, the growth stage of financialization, and the post-financialization stage

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Dependent variable: CIT Net Long % Change, independent variable: returns | | | | | | | | |  |
|  | CIT Net Long % Change Quantile Level | | | |  | CIT Net Long % Change Quantile Level | | | |
| Returns Quantile Level | 0.1 | 0.25 | 0.75 | 0.9 | Returns Quantile Level | 0.1 | 0.25 | 0.75 | 0.9 |
| Full sample: 2004 - 2019 | | | | | | | | | |
| Panel A: CBOT Corn |  |  |  |  | Panel B: CBOT Soybean |  |  |  |  |
| 0.1 | 8.586 | 18.635 | 12.928 | 29.433 \*(+) | 0.1 | 17.959 | 23.64 | 12.465 | 4.945 |
| 0.25 | 19.736 | 20.748 | 12.198 | 24.686 | 0.25 | 15.048 | 24.334 | 13.77 | 6.53 |
| 0.75 | 20.023 | 26.130 | 8.209 | 5.605 | 0.75 | 19.324 | 16.573 | 23.638 | 16.09 |
| 0.9 | 16.200 | 17.824 | 12.995 | 12.112 | 0.9 | 10.748 | 16.04 | 6.694 | 7.336 |
| Panel C: CBOT Wheat |  |  | |  | Panel D: KCBOT Wheat |  |  |  |  |
| 0.1 | 32.49 \*(+) | 16.822 | 10.545 | 6.815 | 0.1 | 16.079 | 14.808 | 19.759 | 14.548 |
| 0.25 | 15.547 | 18.91 | 16.239 | 8.515 | 0.25 | 22.741 | 18.672 | 13.55 | 20.206 |
| 0.75 | 16.791 | 17.47 | 15.36 | 15.618 | 0.75 | 14.674 | 19.28 | 16.077 | 8.801 |
| 0.9 | 24.223 | 20.397 | 11.66 | 15.53 | 0.9 | 18.434 | 17.267 | 17.279 | 5.529 |
| Growth stage of financialization: 2004 - 2011 | | | | | | | | | |
| Panel A: CBOT Corn |  | | | | Panel B: CBOT Soybean |  | | | |
| 0.1 | 8.681 | 8.952 | 13.565 | 24.105 | 0.1 | 71.098 \*(+) | 51.831 \*(+) | 8.008 | 4.931 |
| 0.25 | 23.258 | 9.901 | 7.358 | 13.99 | 0.25 | 47.296 \*(+) | 28.169 | 23.505 | 21.537 |
| 0.75 | 10.38 | 17.637 | 12.771 | 11.235 | 0.75 | 27.484 | 20.052 | 18.206 | 12.917 |
| 0.9 | 13.941 | 9.726 | 20.594 | 14.573 | 0.9 | 21.698 | 11.887 | 6.368 | 12.58 |
| Panel C: CBOT Wheat |  |  | |  | Panel D: KCBOT Wheat |  |  |  |  |
| 0.1 | 24.331 | 14.927 | 17.995 | 11.269 | 0.1 | 12.084 | 12.226 | 18.486 | 19.558 |
| 0.25 | 8.175 | 19.379 | 29.811 \*(+) | 10.892 | 0.25 | 17.198 | 20.972 | 15.398 | 18.075 |
| 0.75 | 31.305 \*(-) | 21.467 | 15.438 | 19.219 | 0.75 | 8.423 | 16.776 | 14.458 | 8.342 |
| 0.9 | 24.392 | 20.056 | 14.852 | 28.442 \*(-) | 0.9 | 14.359 | 21.182 | 16.791 | 7.192 |
| Post-financialization stage: 2012 - 2019 | | | | | | | | | |
| Panel A: CBOT Corn |  | | | | Panel B: CBOT Soybean |  | | | |
| 0.1 | 11.762 | 9.516 | 15.824 | 13.135 | 0.1 | 28.896 \*(-) | 37.041 \*(-) | 15.441 | 12.786 |
| 0.25 | 13.616 | 10.172 | 22.837 | 13.826 | 0.25 | 12.359 | 19.769 | 19.782 | 9.605 |
| 0.75 | 17.795 | 18.747 | 9.355 | 9.509 | 0.75 | 13.111 | 9.846 | 23.758 | 19.025 |
| 0.9 | 9.624 | 19.697 | 14.972 | 20.386 | 0.9 | 12.439 | 8.928 | 22.797 | 18.437 |
| Panel C: CBOT Wheat |  |  | |  | Panel D: KCBOT Wheat |  |  |  |  |
| 0.1 | 27.132 | 18.719 | 14.85 | 11.449 | 0.1 | 21.826 | 14.236 | 24.764 | 25.4 |
| 0.25 | 16.68 | 22.269 | 18.255 | 13.514 | 0.25 | 25.678 | 11.677 | 15.478 | 24.189 |
| 0.75 | 13.53 | 19.36 | 17.689 | 5.766 | 0.75 | 26.76 | 19.337 | 10.033 | 12.271 |
| 0.9 | 19.71 | 10.446 | 13.516 | 10.553 | 0.9 | 16.829 | 17.71 | 6.55 | 11.611 |

Notes: \* indicates statistical significance at 5%. Box-Ljung test statistics for 13 lags are in the table. The sign (+/-) next to the test statistics indicates the dominant sign of the underlying CQ estimates for the Box-Ljung test statistics.



(a) Position change at quantile level 0.1 (b) Position change at quantile level 0.25



(c) Position change at quantile level 0.75 (d) Position change at quantile level 0.9

Figure A2. Cross-quantilogram from changes in CIT net long positions to returns in the CBOT corn futures market, 2004 – 2011



(a) Position change at quantile level 0.1 (b) Position change at quantile level 0.25



(c) Position change at quantile level 0.75 (d) Position change at quantile level 0.9

Figure A3. Cross-quantilogram from changes in CIT net long positions to returns in the CBOT soybean futures market, 2004 – 2011



(a) Position change at quantile level 0.1 (b) Position change at quantile level 0.25



(c) Position change at quantile level 0.75 (d) Position change at quantile level 0.9

Figure A4. Cross-quantilogram from changes in CIT net long positions to returns in the CBOT wheat futures market, 2004 – 2011



(a) Position change at quantile level 0.1 (b) Position change at quantile level 0.25



(c) Position change at quantile level 0.75 (d) Position change at quantile level 0.9

Figure A5. Cross-quantilogram from changes in CIT net long positions to returns in the KCBOT wheat futures market, 2004 – 2011



(a) Position change at quantile level 0.1 (b) Position change at quantile level 0.25



(c) Position change at quantile level 0.75 (d) Position change at quantile level 0.9

Figure A6. Cross-quantilogram from changes in CIT net long positions to returns in the CBOT corn futures market, 2012 – 2019



(a) Position change at quantile level 0.1 (b) Position change at quantile level 0.25



(c) Position change at quantile level 0.75 (d) Position change at quantile level 0.9

Figure A7. Cross-quantilogram from changes in CIT net long positions to returns in the CBOT soybean futures market, 2012 – 2019



(a) Position change at quantile level 0.1 (b) Position change at quantile level 0.25



(c) Position change at quantile level 0.75 (d) Position change at quantile level 0.9

Figure A8. Cross-quantilogram from changes in CIT net long positions to returns in the CBOT wheat futures market, 2012 – 2019



(a) Position change at quantile level 0.1 (b) Position change at quantile level 0.25



(c) Position change at quantile level 0.75 (d) Position change at quantile level 0.9

Figure A9. Cross-quantilogram from changes in CIT net long positions to returns in the KCBOT wheat futures market, 2012 – 2019



(a) Position change at quantile level 0.1 (b) Position change at quantile level 0.25



(c) Position change at quantile level 0.75 (d) Position change at quantile level 0.9

Figure A10. Cross-quantilogram from percentage changes in CIT net long positions to returns in the CBOT corn futures market, 2004 – 2019



(a) Position change at quantile level 0.1 (b) Position change at quantile level 0.25



(c) Position change at quantile level 0.75 (d) Position change at quantile level 0.9

Figure A11. Cross-quantilogram from percentage changes in CIT net long positions to returns in the CBOT soybean futures market, 2004 – 2019



(a) Position change at quantile level 0.1 (b) Position change at quantile level 0.25



(c) Position change at quantile level 0.75 (d) Position change at quantile level 0.9

Figure A12. Cross-quantilogram from percentage changes in CIT net long positions to returns in the CBOT wheat futures market, 2004 – 2019



(a) Position change at quantile level 0.1 (b) Position change at quantile level 0.25



(c) Position change at quantile level 0.75 (d) Position change at quantile level 0.9

Figure A13. Cross-quantilogram from percentage changes in CIT net long positions to returns in the KCBOT wheat futures market, 2004 – 2019



(a) Position change at quantile level 0.1 (b) Position change at quantile level 0.25



(c) Position change at quantile level 0.75 (d) Position change at quantile level 0.9

Figure A14. Cross-quantilogram from percentage changes in CIT net long positions to returns in the CBOT corn futures market, 2004 – 2011



(a) Position change at quantile level 0.1 (b) Position change at quantile level 0.25



(c) Position change at quantile level 0.75 (d) Position change at quantile level 0.9

Figure A15. Cross-quantilogram from percentage changes in CIT net long positions to returns in the CBOT soybean futures market, 2004 – 2011



(a) Position change at quantile level 0.1 (b) Position change at quantile level 0.25



(c) Position change at quantile level 0.75 (d) Position change at quantile level 0.9

Figure A16. Cross-quantilogram from percentage changes in CIT net long positions to returns in the CBOT wheat futures market, 2004 – 2011



(a) Position change at quantile level 0.1 (b) Position change at quantile level 0.25



(c) Position change at quantile level 0.75 (d) Position change at quantile level 0.9

Figure A17. Cross-quantilogram from percentage changes in CIT net long positions to returns in the KCBOT wheat futures market, 2004 – 2011



(a) Position change at quantile level 0.1 (b) Position change at quantile level 0.25



(c) Position change at quantile level 0.75 (d) Position change at quantile level 0.9

Figure A18. Cross-quantilogram from percentage changes in CIT net long positions to returns in the CBOT corn futures market, 2012 – 2019



(a) Position change at quantile level 0.1 (b) Position change at quantile level 0.25



(c) Position change at quantile level 0.75 (d) Position change at quantile level 0.9

Figure A19. Cross-quantilogram from percentage changes in CIT net long positions to returns in the CBOT soybean futures market, 2012 – 2019



(a) Position change at quantile level 0.1 (b) Position change at quantile level 0.25



(c) Position change at quantile level 0.75 (d) Position change at quantile level 0.9

Figure A20. Cross-quantilogram from percentage changes in CIT net long positions to returns in the CBOT wheat futures market, 2012 – 2019



(a) Position change at quantile level 0.1 (b) Position change at quantile level 0.25



(c) Position change at quantile level 0.75 (d) Position change at quantile level 0.9

Figure A21. Cross-quantilogram from percentage changes in CIT net long positions to returns in the KCBOT wheat futures market, 2012 – 2019