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The Response of Wheat, Corn, and Soybeans Futures Prices to the USDA Export Inspection Report

by

Phil L. Colling Scott H. Irwin Carl R. Zulauf[1]

There is a growing amount of literature on the effects of major USDA inventory reports on cash and futures price movements.[2] These reports are released monthly and quarterly by the National Agricultural Statistics Service (NASS). Results of these studies generally indicate that these reports do provide new information to markets and that prices react in response to that information.

There has been little work regarding USDA reports which are released by USDA agencies other than NASS and which are released quite frequently. This is true despite the fact that market participants may be very interested in those reports. The one study of a weekly USDA report was recently conducted by Patterson and Brorsen examined the effects of USDA's Export Sales report, which is released weekly by the Foreign Agricultural Service, on cotton, soybean and wheat futures prices. Results of Patterson and Brorsen's study found that futures markets generally anticipated the information in the report and that the report did not provide new information to the market.

The USDA Export Inspection report lists quantities of wheat, corn and soybeans that are loaded on ships at U.S. ports for export. The Federal Grain Inspection Service (FGIS) determines the amounts of the commodities that are loaded at various ports. That information is relayed to Washington D.C. where the Agricultural Marketing Service (AMS) compiles the information and releases the report. The Knight-Ridder Financial News Service releases this report over its wire services. In addition, Knight-Ridder queries analysts on their expectations of the report. These facts suggest that Knight-Ridder believes that the report is of value to its subscribers.

The purpose of this research is to determine if the wheat, corn and soybean futures markets respond efficiently to the USDA Export Inspection

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[2]Gorham, Fackler, Milanos, Sumner and Mueller, and French, et al examined the effects of USDA's Crop Production report on cash and futures prices for major crops. Hoffman investigated the effect of the Cattle on Feed report on prices for cattle, while Carter and Galopin, Colling and Irwin, Hudson et al, Miller, and USDA (1977) analyzed the effects of USDA's Hogs and Pigs report on hog prices. Schroeder, et al investigated the effects of USDA's Cattle on Feed and Hogs and Pigs reports on live-cattle, feeder-cattle, and live-hog futures prices while Colling, et al examined how all livestock futures contract prices react to the Hogs and Pigs report.

report. The sample period is 1988 through 1991. Survey data of expected quantities of exports will serve as a proxy for market expectations of actual exports, subsequently given in the Export Inspection report. This allows expected and unexpected exports to be distinguished. This is important because, in an efficient market, prices should respond only to new information (Fama). Since expected information is known information, prices should respond to new information only to the extent that it is unexpected.

DATA

Expectations Data

Knight-Ridder surveys about five traders in each of the wheat, corn and soybean futures markets regarding their expectations of exports given in the Export Inspections report. Traders are selected based on their knowledge of cash market transactions. The survey is generally conducted each Monday between 10:00am and 12:00pm central time. At approximately 1:00pm, Knight-Ridder releases the range of the expectations over its wire service.

Data for weekly exports of wheat, corn and soybeans are collected from the Knight-Ridder new service. Expectations of the report are also collected from Knight-Ridder. Unfortunately, the individual expectations are not available. Therefore, the proxy for the market's expectation is taken as the mean of the range of the expectations.

Expectations should satisfy two properties. First, they should be unbiased predictors, a necessary condition for rationality (Muth). Second, the forecast errors should be uncorrelated. The null hypothesis of unbiasedness in the expectations is tested in the following framework:

$$(1)\ WHEAT_t = \beta_0 + \beta_1 WHEAT_t^e + \mu_t,$$

$$(2)\ CORN_t = \beta_0 + \beta_1 CORN_t^e + \mu_t, \text{ and}$$

$$(3)\ SOYBEANS_t = \beta_0 + \beta_1 SOYBEANS_t^e + \mu_t.$$

where: WHEAT = weekly exports of wheat,
CORN = weekly exports of corn,
SOYBEANS = weekly exports of soybeans
e = expected information proxied by the mean of the survey data (absence of e indicates that the variable is actual Exports Inspection report information),
t = report release date, and
μ_t = residual term.

Individual t-tests of the estimated parameters are performed to test the null hypothesis that $\beta_0 = 0$ and $\beta_1 = 1$ for wheat, corn and soybeans. In addition, a paired F-test is used to test the joint null hypothesis that $\beta_0 = 0$ and $\beta_1 = 1$. Rejection of the null hypotheses would indicate that bias exists in the mean value of the surveyed analysts' expectations. Properties of the error term are examined to determine if forecast errors are autocorrelated.

Results of the test for unbiasedness are presented in Table 1. Expectations for soybeans are unbiased. However, with both wheat and corn, the constant is significantly greater than zero and the slope is significantly less than one, which suggests that those expectations are biased. This result might suggest that the market as a whole is biased in its expectations of the Export Inspection report. It is also possible that only the observed expectations are biased and that the market itself anticipates the report in an unbiased fashion. Unfortunately, this is an intestable hypothesis. Therefore, in the following section of this paper, price reactions are tested for using the expectations as they are observed and with expectations for wheat and corn which are adjusted to reflect unbiasedness. The adjustment was made using the regression parameters from equations (1) and (2). The Durbin-Watson statistics indicate that the error terms, or forecast errors, are not first-order autocorrelated. This indicates that the forecasters use information from their previous forecast errors to make their current forecast, another condition for rationality.

Futures Prices

Closing wheat, corn and soybean futures prices are collected on the days that the weekly Export Inspection report is released for the years 1988 through 1991. The report is usually released each Monday, but is sometimes released on Tuesday. Opening and closing futures prices are collected for each trading day following the release of the report. To determine if the Export Inspection report affects futures prices differently across various spectrums of time, three "time-horizons" of futures contracts are specified according to the approximate number of months from the time the report is released until the futures contracts expire. Nearby contacts expire one to two months following the release of the report and distant contract expire seven to eight months following the report's release. An intermediate time-horizon is also defined. Those contracts expire four to five months following the release of the report. With all commodities and time-horizons, the contract was rolled over to the next nearby contract just prior to the delivery month.

FUTURES PRICE REACTIONS TO THE EXPORT INSPECTION REPORT

If markets are efficient, all available information should be reflected in prices. Since anticipated information is known information, expectations of the Export Inspection report should be reflected in futures prices. Therefore, prices should not respond to the expected information. This hypothesis can be tested by regressing price changes on expected wheat, corn and soybean exports as follows:

$$(4) \quad (FP_t^i(O^1)) - (FP_t^i(C^0)) = \beta_0 + \beta_1(WHEAT_t^e) + \beta_2(CORN_t^e) + \beta_3(SOYBEANS_t^e) + \mu_t.$$

where FP_t^i denotes the futures price (dollars per bushel) for commodity i (wheat, corn or soybeans) and date t on which the report is released, C

notes close of trade, O denotes open of trade, the superscripted number 0 fers to the day of a report release (day 0) and the superscripted 1 refers the day following the report. Since the price change is from the close of ade on the day of the report to the open of trade the following day, this ation tests for an "immediate" price change. A superscript e denotes pectations as proxied by the mean of the survey data. All of the mmodities were included as explanatory variables to account for the ssibility of cross-price effects.

As mentioned previously, the expectations for wheat and corn are biased edictors. Therefore, equation (4) is estimated for the observed pectations and for expectations in which wheat and corn are adjusted based the parameter estimates from the tests for bias to reflect unbiasedness. rbin-Watson statistics from four of the six regressions indicated that rst-order autocorrelation existed. Those models were re-estimated using the chran-Orchutt procedure to estimate the models with a first-order toregressive error term. Results of these regressions are presented in ble 2. None of the coefficient estimates are significantly different from ro at the ten-percent level suggesting that prices to not respond to ticipated information in the Export Inspection report. Therefore, in that ase, anticipated information in the report is reflected in prices.

Under the efficient markets hypothesis, prices should respond to new formation. Since unanticipated information is new information, prices ould respond to unanticipated levels of exports if market participants are are of that information and if the markets deem that information to be of ue. To test this notion, price changes are regressed on unanticipated orts of wheat, corn and soybeans as proxied by the difference between the ues given in the Export Inspection report and the expectations. Again, th unadjusted and adjusted expectations are used. The regression equations e as follows:

$$(5)\quad (FP_t^i(O^1)) - (FP_t^i(C^0)) = \beta_0 + \beta_1(WHEAT_t - WHEAT_t^e) + \beta_2(CORN_t - CORN_t^e) + \beta_3(CORN_t - CORN_t^e) + \mu_t \text{ and}$$

$$(6)\quad (FP_t^i(C^1)) - (FP_t^i(C^0)) = \beta_0 + \beta_1(WHEAT_t - WHEAT_t^e) + \beta_2(CORN_t - CORN_t^e) + \beta_3(CORN_t - CORN_t^e) + \mu_t$$

ere all terms are as defined earlier. Equation (5) determines the effects unanticipated information on the "immediate" price change, or that from the se of trade on the day of the report to the open of trade the following . Equation (6) estimates the impact on price from the close of trade on e day of the report to the close of trade the following day, which is more a "delayed" price change. If the exports of a commodity are greater than ected, the futures price of that commodity should rise to reflect the fact at supplies in the U.S. are now smaller than expected. The opposite would d true if exports are lower than expected. Therefore, the signs of the imated coefficients for the own-price effects (i.e., unexpected wheat orts when the dependent variable is wheat-price changes) should be

positive. If wheat, corn and soybeans are to some degree substitutes, the cross-price coefficient estimates should also be positive.

It is also possible that there is a delay in the time in which information responds to the report. For example, there may not be a significant immediate price response (equation 5) or a significant response between the close of trade from the report date to the following day (equation 6). There might, for some reason, be a response during the day following the report (i.e. from the open of trade one day following the report to the close of trade that same day.) To test this hypothesis, the following equation is also estimated:

$$(7) \quad (FP_t^i(C^1)) - (FP_t^i(O^1)) = \beta_0 + \beta_1(WHEAT_t - WHEAT_t^e) + \beta_2(CORN_t - CORN_t^e) + \beta_3(CORN_t - CORN_t^e) + \mu_t.$$

Some of the regressions yielded error terms with first-order autocorrelation as revealed by Durbin-Watson statistics. As before, those models were re-estimated with the error term estimated as an AR(1) process. An under-reaction to the report would yield a positive coefficient estimate while an overreaction would yield a negative coefficient estimate. However, since there is no theoretical notion on whether prices overreact or under-react, there is no a priori knowledge about the sign of the coefficient estimates.

Results for wheat futures prices are presented in Table 3. All of the own-price coefficients are positive, as expected. In addition, many of the coefficient estimates for the models (5 and 6) run with the unadjusted information are significantly greater than zero at least at the ten-percent level. This result suggests that the wheat futures market finds the Export Inspection report information to be of some value in that prices respond to new (unanticipated) information. There is some cross-price response with unanticipated corn exports. Results for the corn futures prices are presented in Table 4. There appears to be no own-price response from the day of the report to the day following the report. However, the coefficient estimates for unanticipated wheat exports for equation (7) are significantly different from zero for both unadjusted and adjusted expectations data in all time-horizon contracts. This suggests that price movements during the day following the report are explained by unanticipated information regarding wheat. Results are very similar with soybean futures prices (Table 5). There is also evidence that soybean futures prices respond to unanticipated soybean exports in the time-horizon 7-8 months contracts. Therefore, the USDA Export Inspection report appears to be of some value to the wheat and soybean futures markets, but not the corn futures market. However, the general lack of significant coefficient estimates and the very low adjusted R-squares suggest that the Export Inspection report is not as valuable to markets as the monthly and quarterly USDA National Agricultural Statistics Service reports.

SUMMARY AND CONCLUSIONS

Weekly, the Agricultural Marketing Service of the USDA releases the Export Inspection report which provides levels of exports of wheat, corn and soybeans. The Knight-Ridder news service releases this report and analysts' expectations of the report which suggests that the report might be of interest to participants in various markets. This research analyzed the effects of the report of wheat, corn and soybean futures prices to determine if it indeed does have an impact on prices.

This research used survey data, collected by Knight-Ridder, to proxy expectations of the wheat, corn and soybeans exports as given in the Export Inspection report. Results indicated that price changes are not explained by expected exports as proxied by the survey data, suggesting in that sense that anticipated information is reflected in prices. Wheat and soybean prices did respond to some degree to unanticipated wheat and exports, suggesting that the report is of some value to market participants. However, a general lack of significant coefficient estimates and very low R-squares suggest that the Export Inspection reports does not impact the futures markets nearly as significantly as the monthly and quarterly reports published by the USDA National Agricultural Statistics Service.

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Table

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Table 1. Test for Unbiasedness of the Survey Data

	Tests for Bias[a]		
Variable	Wheat	Corn	Soybeans
Constant	6.39***	7.02***	0.54
	(4.27)	(3.30)	(1.24)
Mean of Analyst's Range	0.75***	0.83***	0.99
	(4.13)	(3.05)	(0.29)
Summary Statistics:			
Adj. R^2	0.45	0.54	0.81
D.W.	1.95	2.06	2.15
F-Bias[b]	17.09***	5.59***	2.50

[a]t-statistics appear in parentheses below the estimated coefficients. The null hypotheses are that the intercept terms equal zero and the slope parameters equal one. Significance is represented at the ten-, five- and one-percent levels by one, two and three asterisks, respectively.

[b]F-Bias is the F-statistic for the joint null hypothesis that the intercept is equal to zero and the slope is equal to one. Significance is represented at the ten-, five- and one-percent levels by one, two and three asterisks, respectively.

Table 2. Response of Wheat, Corn, and Soybean Futures Prices to Expected Export Inspection Report Information

	Commodity Futures Contract					
	Unadjusted Information			Adjusted Information		
Variable	Wheat	Corn	Soybeans	Wheat	Corn	Soybeans
-- Time-Horizon 1-2 Months --						
Constant	78.43	76.92	219.97	21.37	42.84	101.12
	(56.68)	(130.02)	(413.59)	(33.06)	(55.17)	(175.82)
Wheat	-0.87	-1.19	-2.62	3.49	4.76	10.48
	(1.56)	(3.27)	(10.39)	(6.25)	(13.07)	(41.58)
Corn	-0.84	-0.09	-1.26	4.95	0.52	7.39
	(1.10)	(2.43)	(7.77)	(6.48)	(14.30)	(45.73)
Soybeans	-2.91	-3.15	-9.28	-2.91	-3.15	-9.28
	(2.09)	(4.04)	(12.81)	(2.09)	(4.04)	(12.81)
Sum. Stats.[a]:						
F-XSS	1.27	0.29	0.25	1.27	0.29	0.25
Adj. R^2	-0.00	0.02	0.04	-0.00	0.02	0.04
D-W	1.95	1.92	1.86	1.95	1.92	1.86
Method	OLS	AR1	AR1	OLS	AR1	AR1
-- Time-Horizon 4-5 Months --						
Constant	133.46**	37.02	165.95	41.35	33.76	60.32
	(61.55)	(124.36)	(345.55)	(38.57)	(52.79)	(146.50)
Wheat	-1.94	-0.11	-3.21	7.78	0.46	12.86
	(1.59)	(3.13)	(8.69)	(6.35)	(12.51)	(34.75)
Corn	-1.03	-0.01	-0.57	6.04	0.05	3.34
	(1.18)	(2.33)	(6.43)	(6.95)	(13.69)	(37.87)
Soybeans	-3.70	-3.30	-7.24	-3.69	-3.30	7.24
	(2.49)	(3.86)	(10.76)	(2.49)	(3.86)	(10.76)
Sum. Stats.:						
F-XSS	1.80	0.27	0.24	1.80	0.27	0.24
Adj. R^2	0.01	0.02	0.01	0.01	0.02	0.01
D-W	2.12	1.88	1.92	2.12	1.88	1.92
Method	OLS	AR1	AR1	OLS	AR1	AR1

continued

Table 2. continued

Variable	Dependant Variable: Unadjusted Information			Adjusted Information		
	Wheat	Corn	Soybeans	Wheat	Corn	Soybeans
-- Time-Horizon 7-8 Months --						
Constant	78.39	25.31	206.54	30.28	22.96	49.18
	(55.80)	(121.57)	(252.15)	(32.40)	(51.59)	(116.39)
Wheat	-1.38	0.34	-4.87	5.51	-1.36	19.50
	(1.36)	(3.06)	(4.09)	(5.46)	(12.23)	(16.35)
Corn	-0.31	-0.27	-0.79	1.84	1.57	4.67
	(1.13)	(2.27)	(4.23)	(6.66)	(13.37)	(24.90)
Soybeans	-2.39	-2.32	-5.86	-2.39	-2.32	-5.86
	(2.10)	(3.78)	(7.18)	(2.10)	(3.78)	(7.18)
Sum. Stats.:						
F-XSS	1.01	0.16	0.72	1.00	0.16	0.72
Adj. R^2	-0.00	0.02	-0.01	-0.00	0.02	-0.01
D-W	1.91	1.86	1.77	1.91	1.86	1.77
Method	OLS	AR1	OLS	OLS	AR1	OLS

Note: Standard errors are presented in parentheses below the respective estimated coefficients. Significance is represented at the ten-, five- and one-percent levels by one, two and three asterisks, respectively.

[a]F-XSS denotes the F-test for the extra-sum-of-squares test for the null hypothesis that the coefficient estimates for wheat, corn and soybeans are jointly equal to zero.

Table 3. Response of Wheat Futures Prices to Unexpected Export Inspection Report Information

Variable	Price-Change Regimes: Unadjusted Information — Close 0 to Open 1 (Eqn. 5)	Unadjusted Information — Close 0 to Close 1 (Eqn. 6)	Unadjusted Information — Open 1 to Close 1 (Eqn. 7)	Adjusted Information — Close 0 to Open 1 (Eqn. 5)	Adjusted Information — Close 0 to Close 1 (Eqn. 6)	Adjusted Information — Open 1 to Close 1 (Eqn. 7)
-- Time-Horizon 1-2 Months --						
Constant	-8.36	12.32	20.95	-23.31	-1.09	-5.90
	(11.90)	(32.27)	(33.35)	(46.29)	(128.56)	(145.63)
Wheat	3.11*	9.02*	5.57	0.72	3.30	3.41
	(2.27)	(6.00)	(4.80)	(1.20)	(3.03)	(3.63)
Corn	2.03*	-0.62	-2.36	0.00	-1.66	-1.46
	(1.27)	(4.40)	(3.83)	(0.73)	(2.28)	(2.69)
Soybeans	0.51	-12.21	-12.34	1.73	-10.81	-11.94
	(3.28)	(11.94)	(10.95)	(3.17)	(11.37)	(10.85)
Sum. Stats.[a]:						
F-XSS	1.71	1.01	1.11	0.22	1.14	0.96
Adj. R^2	0.00	0.00	0.02	-0.01	-0.00	0.02
D-W	1.92	1.87	1.98	1.92	1.86	1.98
Method	OLS	OLS	AR1	OLS	OLS	AR1
-- Time-Horizon 4-5 Months --						
Constant	4.69	23.53	19.01	6.35	22.41	-3.30
	(13.07)	(29.82)	(30.86)	(51.02)	(121.07)	(132.82)
Wheat	4.05**	9.48**	4.82	0.33	4.20*	4.58*
	(2.43)	(5.58)	(4.31)	(1.14)	(2.72)	(3.32)
Corn	1.90*	-2.91	-4.49	-0.18	-2.64	-2.38
	(1.43)	(3.74)	(3.43)	(0.83)	(2.10)	(2.46)
Soybeans	2.46	-3.58	-4.83	3.60	-2.61	-4.96
	(3.54)	(11.57)	(9.82)	(3.45)	(10.85)	(9.71)
Sum. Stats.:						
F-XSS	1.86	1.18	1.22	0.41	1.97	1.29
Adj. R^2	0.01	0.01	0.03	-0.01	0.00	0.03
D-W	2.09	1.84	1.98	2.08	1.82	1.97
Method	OLS	OLS	AR1	OLS	OLS	AR1

continued

Table 3. continued

Variable	Price-Change Regimes: Unadjusted Information — Close 0 to Open 1 (Eqn. 5)	Unadjusted Information — Close 0 to Close 1 (Eqn. 6)	Unadjusted Information — Open 1 to Close 1 (Eqn. 7)	Adjusted Information — Close 0 to Open 1 (Eqn. 5)	Adjusted Information — Close 0 to Close 1 (Eqn. 6)	Adjusted Information — Open 1 to Close 1 (Eqn. 7)
-- Time-Horizon 7-8 Months --						
Constant	6.26	27.21	20.95	-5.79	-25.16	-19.37
	(11.23)	(28.63)	(27.12)	(40.34)	(120.53)	(115.48)
Wheat	2.51*	6.06	3.55	0.01	3.48	3.47*
	(1.84)	(5.63)	(5.28)	(1.06)	(2.77)	(2.65)
Corn	1.88*	-1.29	-3.18	0.38	-0.79	-1.17
	(1.25)	(3.24)	(3.08)	(0.62)	(1.98)	(1.89)
Soybeans	-1.84	0.29	2.13	-1.07	0.96	2.04
	(3.33)	(10.56)	(9.68)	(3.23)	(10.18)	(9.48)
Sum. Stats.:						
F-XSS	1.86	0.46	0.59	0.15	0.74	0.98
Adj. R^2	-0.00	-0.01	-0.01	-0.02	0.01	0.01
D-W	1.89	1.84	1.76	1.89	1.82	1.74
Method	OLS	OLS	OLS	OLS	OLS	OLS

Note: Standard errors are presented in parentheses below the respective estimated coefficients. Significance is represented at the ten-, five- and one-percent levels by one, two and three asterisks, respectively. One-sides tests are performed on the slope coefficient estimates for equations 5 and 6 while two-sides tests are performed on the slope coefficient estimates for equation 7.

[a]F-XSS denotes the F-test for the extra-sum-of-squares test for the null hypothesis that the coefficient estimates for wheat, corn and soybeans are jointly equal to zero.

Table 4. Response of Corn Futures Prices to Unexpected Export Inspection Report Information

Variable	Price-Change Regimes: Unadjusted Information: Close 0 to Open 1 (Eqn. 5)	Unadjusted Information: Close 0 to Close 1 (Eqn. 6)	Unadjusted Information: Open 1 to Close 1 (Eqn. 7)	Adjusted Information: Close 0 to Open 1 (Eqn. 5)	Adjusted Information: Close 0 to Close 1 (Eqn. 6)	Adjusted Information: Open 1 to Close 1 (Eqn. 7)
-- Time-Horizon 1-2 Months --						
Constant	8.54	3.38	-3.99	10.67	-176.78	-159.81**
	(22.94)	(37.25)	(18.60)	(97.25)	(141.63)	(69.55)
Wheat	1.09	2.34	4.21	-0.32	3.99	4.35**
	(3.10)	(3.96)	(3.24)	(2.43)	(3.57)	(1.88)
Corn	0.91	3.51	1.88	0.17	2.41	1.51
	(2.47)	(3.14)	(2.29)	(1.80)	(2.65)	(1.26)
Soybeans	2.56	11.38	3.68	2.99	12.63*	5.06
	(7.06)	(8.96)	(6.32)	(7.00)	(8.87)	(6.11)
Sum. Stats.[a]:						
F-XSS	0.15	1.28	1.09	0.77	1.38	2.42*
Adj. R^2	0.02	0.10	-0.00	0.02	0.10	0.01
D-W	1.92	1.91	1.78	1.93	1.92	1.76
Method	AR1	AR1	OLS	AR1	AR1	OLS
-- Time-Horizon 4-5 Months --						
Constant	-4.51	8.11	13.43	-8.97	-182.36	-152.05**
	(22.07)	(36.14)	(17.81)	(93.03)	(137.72)	(66.66)
Wheat	-0.38	2.60	5.26	-0.39	4.60*	4.85***
	(2.94)	(3.87)	(3.26)	(2.33)	(3.47)	(1.77)
Corn	1.41	2.26	0.14	0.39	2.28	1.43
	(2.34)	(3.07)	(2.09)	(1.72)	(2.57)	(1.24)
Soybeans	3.38	8.66	1.79	3.83	9.44	2.46
	(6.68)	(8.76)	(6.18)	(6.63)	(8.64)	(5.94)
Sum. Stats.:						
F-XSS	0.26	0.77	0.94	0.16	1.22	2.94**
Adj. R^2	0.02	0.10	0.00	0.02	0.10	0.02
D-W	1.88	1.88	1.75	1.88	1.89	1.73
Method	AR1	AR1	OLS	AR1	AR1	OLS

continued

Table 4. continued

Variable	Price-Change Regimes: Unadjusted Information — Close 0 to Open 1 (Eqn. 5)	Unadjusted Information — Close 0 to Close 1 (Eqn. 6)	Unadjusted Information — Open 1 to Close 1 (Eqn. 7)	Adjusted Information — Close 0 to Open 1 (Eqn. 5)	Adjusted Information — Close 0 to Close 1 (Eqn. 6)	Adjusted Information — Open 1 to Close 1 (Eqn. 7)
-- Time-Horizon 7-8 Months --						
Constant	-3.82	12.63	17.10	11.84	-160.61	-162.49*
	(21.44)	(35.33)	(20.18)	(90.85)	(133.56)	(85.41)
Wheat	-0.68	3.08	4.55*	-0.20	4.40	4.37**
	(2.89)	(3.72)	(2.76)	(2.27)	(3.37)	(2.14)
Corn	0.31	1.18	0.56	-0.30	1.93	2.13
	(2.30)	(2.94)	(2.20)	(1.68)	(2.50)	(1.58)
Soybeans	4.55	11.64*	5.71	4.75	12.08*	6.01
	(6.57)	(8.42)	(6.28)	(6.51)	(8.30)	(6.19)
Sum. Stats.: F-XSS	0.20	1.04	1.26	0.18	1.47	2.09*
Adj. R^2	0.02	0.11	0.04	0.02	0.11	0.05
D-W	1.86	1.88	1.98	1.86	1.88	1.98
Method	AR1	AR1	AR1	AR1	AR1	AR1

Note: Standard errors are presented in parentheses below the respective estimated coefficients. Significance is represented at the ten-, five- and one-percent levels by one, two and three asterisks, respectively. One-sides tests are performed on the slope coefficient estimates for equations 5 and 6 while two-sides tests are performed on the slope coefficient estimates for equation 7.

[a]F-XSS denotes the F-test for the extra-sum-of-squares test for the null hypothesis that the coefficient estimates for wheat, corn and soybeans are jointly equal to zero.

Table 5. Response of Soybean Futures Prices to Unexpected Export Inspection Report Information

Variable	Price-Change Regimes: Unadjusted Information — Close 0 to Open 1 (Eqn. 5)	Unadjusted Information — Close 0 to Close 1 (Eqn. 6)	Unadjusted Information — Open 1 to Close 1 (Eqn. 7)	Adjusted Information — Close 0 to Open 1 (Eqn. 5)	Adjusted Information — Close 0 to Close 1 (Eqn. 6)	Adjusted Information — Open 1 to Close 1 (Eqn. 7)
-- Time-Horizon 1-2 Months --						
Constant	1.75	-0.11	-1.80	128.10	-540.45	-602.50***
	(74.69)	(91.93)	(51.69)	(307.98)	(386.06)	(219.58)
Wheat	-1.90	13.88	18.80*	-3.19	14.24*	16.11***
	(9.43)	(12.09)	(9.86)	(7.72)	(9.67)	(5.72)
Corn	0.66	4.54	4.39	-1.39	5.74	6.22
	(7.50)	(9.63)	(6.58)	(5.72)	(7.16)	(3.69)
Soybeans	19.48	28.57	5.41	19.85	31.43	8.91
	(21.43)	(27.51)	(18.26)	(21.21)	(27.12)	(17.90)
Sum. Stats[a].:						
F-XSS	0.31	0.96	1.32	0.36	1.31	3.02**
Adj. R^2	0.04	0.04	0.01	0.04	0.04	0.03
D-W	1.86	1.92	2.04	1.86	1.92	2.03
Method	AR1	AR1	OLS	AR1	AR1	OLS
-- Time-Horizon 4-5 Months --						
Constant	-20.69	-6.65	14.23	-9.92	-543.85	-464.77**
	(60.52)	(87.74)	(50.68)	(259.78)	(370.51)	(222.78)
Wheat	1.10	13.66	15.12	-1.57	13.52*	13.93**
	(8.46)	(11.68)	(9.66)	(6.49)	(9.27)	(5.80)
Corn	3.53	7.90	3.78	0.79	6.17	4.25
	(6.75)	(9.30)	(6.43)	(4.80)	(6.87)	(3.68)
Soybeans	16.22	31.94	13.92	17.40	36.16	17.49
	(19.29)	(26.57)	(17.38)	(19.13)	(26.24)	(17.05)
Sum. Stats.:						
F-XSS	0.40	1.32	1.23	0.33	1.53	2.29*
Adj. R^2	0.01	0.04	0.00	0.01	0.04	0.02
D-W	1.91	1.93	1.96	1.92	1.93	1.95
Method	AR1	AR1	OLS	AR1	AR1	OLS

continued

Table 5. continued

Variable	Price-Change Regimes: Unadjusted Information: Close 0 to Open 1 (Eqn. 5)	Unadjusted Information: Close 0 to Close 1 (Eqn. 6)	Unadjusted Information: Open 1 to Close 1 (Eqn. 7)	Adjusted Information: Close 0 to Open 1 (Eqn. 5)	Adjusted Information: Close 0 to Close 1 (Eqn. 6)	Adjusted Information: Open 1 to Close 1 (Eqn. 7)
-- Time-Horizon 7-8 Months --						
Constant	-11.68	-5.35	8.47	89.89	-509.50	-521.89**
	(44.28)	(81.73)	(49.09)	(150.21)	(350.77)	(209.88)
Wheat	-1.64	13.28	17.00*	-4.23	12.54*	15.42***
	(7.96)	(11.33)	(9.48)	(3.52)	(8.77)	(5.58)
Corn	2.78	6.98	2.62	0.01	5.88	4.69*
	(4.20)	(9.03)	(5.92)	(2.51)	(6.49)	(3.51)
Soybeans	17.73**	35.82*	13.86	18.00**	39.65*	17.03
	(8.90)	(25.82)	(15.42)	(9.28)	(25.49)	(15.18)
Sum. Stats.: F-XSS	1.63	1.45	1.68	2.19*	1.68	1.82
Adj. R^2	-0.01	0.03	0.01	-0.01	0.03	0.03
D-W	1.76	1.94	1.57	1.77	1.94	1.82
Method	OLS	AR1	OLS	OLS	AR1	OLS

Note: Standard errors are presented in parentheses below the respective estimated coefficients. Significance is represented at the ten-, five- and one-percent levels by one, two and three asterisks, respectively. One-sides tests are performed on the slope coefficient estimates for equations 5 and 6 while two-sides tests are performed on the slope coefficient estimates for equation 7.

[a]F-XSS denotes the F-test for the extra-sum-of-squares test for the null hypothesis that the coefficient estimates for wheat, corn and soybeans are jointly equal to zero.