THE IMPACT OF PROPRIETARY–PUBLIC INFORMATION ON PORK FUTURES

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INTRODUCTION

Private sources frequently gather information about an economic event and release it to the public. This collection of information is not done out of altruism. Ultimately, there is a profit motive. Pre-release trader estimates of impending government reports collected by news services and disseminated over their transmission system certainly fall into this category. This information is referred to here as proprietary–public information. It is private information released to the public domain with a potential to change investor beliefs about the value of financial assets. In an era of reduced government budgets for data collection and dissemination, private sector resources are suggested as a replacement for government resources [Just (1983)]. For example, if proprietary–public surveys contain, on average, the same information as the government data, then presumably, government crop and livestock inventory reports may be redundant as to both frequency and timeliness. However, the motives and accuracy of private data gathering for public consumption present additional issues. First among these issues is investor confidence in the credibility of the proprietary–public data.

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This study examines one example of proprietary–public information which is made available to the market prior to the release of government prepared information on the same topic. Measuring the impact of this information on the market provides an indication of market confidence in the information. Live hog futures and frozen pork belly futures are used as the setting for this analysis. The government prepared information is the United States Department of Agriculture (USDA) *Hogs and Pigs Report* (HPR). The proprietary–public information is expectations data representing traders' estimates of important aspects of the upcoming HPR which is collected by the Knight–Ridder News Service (K–R) two days prior to release of the USDA report and released after the close of the futures market on that day.

Specifically, this study (1) estimates the impact of the K–R survey data as it influences futures prices and trading volume during the two trading days after release but prior to the availability of the government information, and (2) compares the informational content of the two reports. If the K–R data is an unbiased expectation of the government data, then, on average, it contains the same information. If the two reports contain the same information, on average, but the market reacts only to the government-sponsored report, then there is a market anomaly requiring explanation. The analysis first tests the K–R data for unbiasedness relative to the USDA–HPR release data. Does the K–R data satisfy the requirements of a rational expectation of the actual data? Second, a series of parametric and non-parametric tests are implemented on excess returns, price dispersion, and level of trading volume on the release day and subsequent trading days. Do the K–R surveys contain information which alter investor beliefs as measured by increases in excess returns, price variability, and trading volume?

The USDA releases a *Hogs and Pigs Report* once every three months. These reports are the results of surveys taken by USDA to determine the hog inventory in various states and farmer intentions to breed and farrow sows. USDA surveys hog producers at approximately the first of the month four times per year: December, March, June, and September. USDA then releases the results near the end of the month. Typically, there is a strong reaction to the release of the USDA report. Over the 25-year period, 1970:1 to 1994:4 (i.e., 100 HPR releases), live hog futures have closed at the institutional price limit the trading day following release 38 times, while frozen pork belly futures have closed at their constrained price limit 48 times.[1]

[1]Chicago Mercantile Exchange rules permit prices to change during a day's trading session from the previous day's close only by a given amount. For live futures, this change is 1 1/2 cents per pound and for pork belly futures it is 2 cents per pound.

LITERATURE REVIEW

Most studies analyzing the impact of HPR releases on live hog futures consistently conclude that the market is efficient and prices adjust quickly to new information contained in these reports. Examining short-term price movements prior to and after the release of HPRs, Miller (1979), USDA (1977), Hoffman (1980), and Hudson, Koontz, and Purcell (1984) find live hog futures generally react quickly to the new information contained in HPRs. Using a methodology proposed by Pearce and Roley (1985), Colling and Irwin (1990) find live hog futures react sharply and quickly to the unanticipated information contained in an HPR. Schroeder, Blair, and Mintert (S–B–M) (1990) find no significant abnormal returns in live hog, live cattle, and feeder cattle markets following quarterly inventory releases. Mann and Dowen (1996a) find increased price variance and trading volume after release of an HPR indicating new information arriving in the live hog futures and frozen pork belly futures markets. Using a different criterion, Carter and Galopin (1993) find that HPRs do not contain new information. Using a willingness-to-pay test, they find that a trader with advance knowledge of the report could not make statistically significant risk-adjusted profits. Colling and Irwin (1995), with a different risk adjustment approach, find that a trader could make statistically significant profits over the same period. Thus, with the exception of Carter and Galopin study, the question of a response of live hog and pork belly futures to the information contained in HPRs is seemingly well established.

However, the question of a market response to proprietary–public information is not well established. In an analysis of trader expectations data in the money markets, Cunningham and Cunningham (1991) find that the release of market expectations concerning the Federal Reserve's weekly money supply announcements produce a measurable impact in European currency markets and a weak response in the stock market. Garcia, Leuthold, Irwin, and Yang (1996, forthcoming) analyze and find value in USDA corn and soybean production forecasts over the period, 1971–1992. Using a willingness-to-pay and other tests, they find that traders would be willing to pay for advance knowledge of USDA forecasts. They also find that private forecasts of USDA forecasts of grain production are accurate. They reconcile these findings by observing that market participants view USDA and private forecasts with different perceptions of risk.

This article extends previous studies of proprietary–public information by analyzing the informational impact of a specific set of pre-release trader estimates on live hog and frozen pork belly futures.

METHODOLOGY AND DATA

The international wire service, Knight–Ridder (K–R), collects trade estimates of the many upcoming USDA reports and releases them after the close of trading over their wire service.[2] K–R collection and release of trader estimates of an upcoming HPR occurs two days prior to the release of the government report. Designating the government report release day as day $t = 0$, the survey of traders begins on day $t = -4$ and generally concludes by noon of day $t = -2$. The K–R data is released after the close of the livestock markets on day $t = -2$. The event days to be studied are day -1 and day 0.

Data from 28 quarterly pre-release surveys over the period, January, 1988 to December, 1994 are collected. Futures prices, volume, and open interest for the same period is from Techtools, Boca Raton, Florida. Analysis of the informational impact on price uses the rate of return for live hog and pork belly futures defined as:

$$R_{(t)} = \{\ln[FP_{(t)}] - \ln[FP_{(t-1)}]\} \cdot 100$$

where: R is the rate of return, t is the day, and FP is the close of the futures price. Analysis of the impact on volume uses relative volume, which is created by dividing volume for the particular day by the open interest for that day. Open interest varies from day to day and year to year depending on the viewed importance of the futures by traders. This approach permits comparison of volume day to day and especially cross-sectionally year to year.

Are the Expectations Data Unbiased?

K–R publishes traders' pre-release estimates on market hog, breeding stock, and total hog inventory.[3] Anecdotal history suggests that these are the variables upon which most traders typically focus. This study analyzes the impact of K–R survey data on nearby futures only. Anecdotal history again suggests that the vast majority of traders take positions in the very nearby futures because of the lack of liquidity in distant futures. Following a research design suggested by Hudson et al., nearby live hog and

[2]Several wire services collect information on trader estimates of upcoming livestock and grain reports to be issued by USDA. Knight–Ridder is chosen because of (1) its extensive survey for the *Hog and Pigs Report,* 15 to 21 traders per release, (2) its acknowledged widespread use throughout the industry, and (3) the availability of a continuous one source history.

[3]Market hog inventory includes those hogs from 1 pound up which are being fed for eventual slaughter. Breeding stock inventory includes boars and sows which are retained by the producer specifically for breeding purposes.

TABLE I

Determination of Impact of Hogs and Pigs Report Information on Nearby Live Hog and Frozen Pork Belly Futures

HPR Release Calendar Year	*Estimated Impact Upon*
Mar 1 HPR	June futures
Jun 1 HPR	August futures
Sep 1 HPR	December futures
Dec 1 HPR	February futures[a]
Panel B: Impact on Nearby Frozen Pork Belly Futures	
Mar 1 HPR	May futures
Jun 1 HPR	August futures
Sep 1 HPR	N/A
Dec 1 HPR	February futures[a]

[a]Contract matures the next year.

pork belly futures are matched in Table I to market hog inventory for each HPR. Information in this variable should strongly impact nearby futures while information contained in the breeding stock inventory variable would most likely impact futures 7 to 12 months out.[4]

The expectations data is tested for unbiasedness and efficiency following procedures suggested by Pearce and Roley (1985), Colling and Irwin (1990) and others. To test for unbiasedness, the model is specified as:

$$\text{MKT}a_{(t)} = \beta_0 + \beta_1 \text{MKT}e_{(t)} + \varepsilon_{(t)} \qquad (1)$$

where $\text{MKT}a_{(t)}$ is the actual market hog inventory published by USDA in time period t, $\text{MKT}e_{(t)}$ is the trader estimate released by K–R in time period t, and $\varepsilon_{(t)}$ is the error term for time period t. The model is estimated by ordinary least squares. The K–R survey expectations are deemed to be unbiased if $\beta_0 = 0$ and $\beta_1 = 1$, and the forecast errors are uncorrelated. The null hypothesis is specified as:

$$\text{Ho: } \beta_0 = 0 \qquad \text{and} \qquad \text{Ho: } \beta_1 = 1$$

[4]Most traders believe that of all government reports, HPRs provide the most information to both the hog and pork belly futures markets. This is shown in the history of price response, i.e., number of days of limit price moves in both markets to these reports. No other reports, e.g., monthly cold storage reports, monthly slaughter and production reports, weekly CME pork belly cold storage reports, etc., produce the dramatic and extensive price changes. For an analysis of the impact of monthly cold storage reports issued by USDA on live hog and pork belly futures, see Colling and Irwin (1994) and Mann and Dowen (1996b).

using a two-tail t-test. The Durbin–Watson statistic tests if the error terms are first-order correlated. Application of White's 1980 general test examines the squared residuals for heteroskedasticity.

To determine if new information has entered the market after release of the K–R pre-release estimates, but prior to release of the HPR, a second test of unbiasedness is performed. Roley (1983) suggests that new information entering the market can be modeled by the percentage change in closing futures prices from the day $(t - 2)$ the K–R data is released to the day (t) the HPR data is released. In effect, this variable represents the cumulative rate of return over the period, $(t - 2)$ to (0). This variable is added to eq. (1) to produce the following model:

$$\text{MKT}a_{(t)} = \beta_0 + \beta_1 \text{MKT}e_{(t)} + \beta_2 \Delta\text{FP}_{(t-2,0)} + \varepsilon_{(t)} \qquad (2)$$

where: $\Delta\text{FP}_{(t-2,0)} = \{\ln[\text{FP}_{(t-2)}] - \ln[\text{FP}_{(t)}]\} \cdot 100$. Nearby live hog futures capture the influence of additional information entering the market. If β_2 is not significant, then no new information has entered the market.

Finally, to test for efficiency of the survey data, the following model is specified:

$$\text{MKT}u_{(t)} = \beta_0 + \beta_1 \text{MKT}a_{(t-1)} + \varepsilon_{(t)} \qquad (3)$$

where $\text{MKT}u_{(t)}$ is the unexpected information component of the actual market hog inventory contained in the official HPR data and is defined as $\text{MKT}a_{(t)} - \text{MKT}e_{(t)}$. If the K–R survey data is efficient, one should not be able to forecast the unexpected component from lagged actual data. Therefore, the coefficient on lagged actual data should not be statistically different from zero. Again, the Durbin–Watson statistic tests for first-order correlation in the errors and White's general test examines the squared residuals for heteroskedasticity.

Do the Expectations Data Contain New Information?

Three tests are used to demonstrate robustness of results. They are (1) excess returns tests, (2) tests of changes in price dispersion, and (3) tests of changes in level of trading volume. In each category, both parametric and nonparametric methodologies are used to test for information arrival.

Excess Returns Tests

The mean standardized excess returns test is described and analyzed in detail by Brown and Warner (1981, 1985) (B–W) who find it to be well

specified for detecting abnormal returns. If the event is news to the market, presumably traders will adjust their positions in an attempt to either earn an additional return from the news or to reduce their loss. Thus, the price impact of a specific event produces an abnormal excess return. The test examines the standardized excess rate of return for the day under consideration as compared to some "normal" or benchmark period. The test is implemented as follows. Define the excess return, $A_{(t)}$, for event i (the release of a particular HPR) as:

$$A_{(i,t)} = R_{(i,t)} - \bar{R}_{(i,t)} \tag{4}$$

where: $R_{(i,t)}$ is the return on the event day, and

$\bar{R}_{(i,t)}$ is the average rate of return over the "normal" period for ith event. Following the convention of S–B–M, the normal period is defined over days -14 to -7, i.e., 14 to 7 trading days prior to the release of the government report. Anecdotal history suggests that traders do not adjust positions in the market this far in advance of the release of an HPR. Using the standard deviation of the normal period, mean standardized excess returns for any day t are constructed as:

$$A'_{(i,t)} = A_{(i,t)}/S[A_{(I,T)}] \tag{5}$$

where:

$$S[A_{(I,T)}] = \sqrt{\sum_{t=-14}^{-7} (A_{(i,t)} - \bar{A}_{(i,t)})^2/8} \tag{6}$$

and

$$\bar{A}_{(t)} = \sum_{t=-14}^{-7} A_{(i,t)}/8 \tag{7}$$

Brown and Warner then define the test statistic, designated $T2$ in this study, for any given day t as:

$$T2(t) = \sum_{t=-14}^{N} A_{(i,t)}/\sqrt{N_{(t)}} \tag{8}$$

where N is the number of events in the sample. The value of the test statistic may be positive or negative. A statistically significant positive statistic indicates a positive trading bias for that day. The normality assumption is important to this test statistic. Because of small sample size,

$N = 28$ for live hog futures and $N = 21$ for frozen pork belly futures, there may be nonnormality.

To deal with this issue, a nonparametric test for abnormal excess returns developed by Corrado (1989) is implemented and designated the uniform distribution excess returns test. Here, excess returns are those in excess of the average over the period of day -14 to day 0. This test is based on transforming the excess returns data into ranks. Under the null hypothesis, an event day excess return rank is a drawing from a uniform distribution. Define the rank K for each excess return across the time series of excess returns from day -14 to day 0 for each ith event (release of the ith HPR) as: $K_{(i,t)} = \text{rank}[A_{(i,t)}]$. Define the average rank as the median of the number of days, which for 15 days yields an average rank of 8. The test statistic, designated $T3$, for the event day "t" under consideration is constructed as:

$$T3(t) = 1/N \sum_{t=1}^{N} [K_{(t)} - 8]/S(K) \tag{9}$$

where $S(K)$ is the standard deviation calculated over the entire period under consideration, which in this case is from day -14 to day 0. Specifically,

$$S(K) = \sqrt{1/15 \sum_{t=-14}^{0} \left\{ 1/N \sum_{t=1}^{N} [K_{(i,t)} - 8]^2 \right\}} \tag{10}$$

Although B–W find the mean standardized excess returns test to be well specified in the face of nonnormality, the use of this nonparametric test confirms the t-test results.

Price Dispersion Tests

Many studies point to information arrival by an increase in price dispersion after the event, e.g., French, Leftwich, and Urhig (1989), Sumner and Mueller (1989), Fortenberry and Sumner (1993), and Mann and Dowen (1996a). If new information changes investor beliefs, then a measure of the impact is the magnitude of price change. The greater the surprise, the larger the price change. Defining a given period of day(s) as "normal," the cross-sectional dispersion in the rates of return for the event day (days $t = -1$ and $t = 0$) are compared to some normal or benchmark period. In this study, the benchmark periods are defined as day $t = -7$ and $t = -3$. Use of the day $t = -7$ as a benchmark allows

for the testing of the arrival of information outside the survey collection time frame utilized by K–R. Use of the $t = -7$ benchmark permits the testing of leakage of the K–R releases on day $t = -2$. Tests on dispersion are typically accomplished using *F*-tests which are employed in this study. However, because an *F*-test assumes normality and due to small sample sizes in this study, a nonparametric test of dispersion is also deemed advisable. Mean absolute deviations are utilized as a measure of dispersion. Application of the Mann–Whitney–Wilcoxon (M–W–W) Rank Sums Test detects if a change in location of the dispersion measure occurs. The procedure allows for a nonparametric counterpart to the F-test.[5]

Tests for Changes in Level of Trading Volume

Many studies also document that changes in the level of trading volume provide evidence of information processing by investors [e.g., Beaver (1968); Foster (1973); Morse (1981); Karpoff (1987); French, Leftwich, and Urhig (1989); and Mann and Dowen (1996a)]. Volume is thought to reflect changes in individual trader expectations. Analyzing volume changes of corn, wheat, and soybean futures from USDA crop reports, French et al., point out that:

> Volume will increase after the announcement if postponed trades are consumed, if investors rebalance their portfolios because of wealth or risk effects of the announcement, if the bid–ask spread declines as the (previously) uninformed investors resume trading, or if traders disagree about the implications of the announcement (p. 2).

These notions are implemented by comparing relative volume after the event again with some "normal" or benchmark period. This is accomplished with simple parametric and nonparametric tests. Again, the benchmark periods are defined as trading days $t = -7$ and $t = -3$. A *t*-test is used to examine if a change in relative volume occurs between the means of the benchmark days and days -2, -1, and 0. The M–W–W Rank Sums Test applied to the same data provides nonparametric confirmation to the results of the *t*-test.

[5]Although not as powerful as the squared ranks test for variances suggested by Conover (1980, pp. 239–241), the Mann–Whitney–Wilcoxon Rank Sums Test applied to mean absolute deviations (as a measure of dispersion) is utilized for computational ease.

RESULTS

Are the Expectations Data Unbiased?

Table II presents the test results for eqs. (1), (2), and (3). The results suggest the K–R survey data is unbiased, confirming Colling and Irwin.[6] If the survey estimate of market hogs is an unbiased estimator of the actual market hogs, then b_0 should not be significantly different from zero and b_1 should not be significantly different from one. Analysis of the results in Panel A indicate that the null hypotheses cannot be rejected. The D–W statistic of 1.86 rejects the null hypothesis of first-order serial correlation and application of White's general test rejects the hypothesis of heteroskedasticity (results not reported here). Second, testing of the additional variable to account for new information entering between the time the K–R survey results are released and the release of the HPR is a test of the null hypothesis that $\beta_2 = 0$ in eq. (2). With a p-value of .63 for b_2, the null hypothesis cannot be rejected. Finally, in testing for efficiency of the K–R survey data with eq. (3), the null hypothesis is $\beta_1 = 0$. With a p-value of .74 for significance, the null hypothesis is again not rejected. Further, the D–W statistic of 1.80 in eq. (3) suggests no first-order serial correlation and White's general test suggests no heteroskedasticity.

Do the Expectations Data Contain New Information?

Neither excess returns test confirms information arrival from K–R pre-release estimates of USDA HPRs on the two days after the pre-release and prior to the USDA release of an HPR. Table III summarizes the t-test results from the mean standardized excess returns tests on both live hog futures and pork belly futures. The assumption that the mean standardized excess returns are independent and identically distributed is crucial to the t-test statistic. Examination of autocorrelation and partial autocorrelation functions of the cross-sectional data for days $t = -2$, $t = -1$, and $t = 0$ up to 16 lags reveals no statistical significance. Therefore, the assumption appears reasonable. Examination of results from the uniform distribution excess returns test (Table III) indicates no impact on event days $t = -2$, $t = -1$, and $t = 0$. Analysis of the distribution of

[6]The Colling and Irwin sample period for survey data covered March, 1981 to February, 1988 from two different survey sources while the sample period in this study covers January, 1988 to December, 1994 using only Knight–Ridder data.

TABLE II

Regression Tests for Unbiasedness and Efficiency of Knight–Ridder Expectations Data

Panel A: Regression to Determine the Unbiasedness of K–R Market Hogs Expectations Data (1988:1–1994:4; 28 obs.). $MKTa(t) = b_0 + b_1\ MKTe(t) + e(t)$

Coefficient Estimates		Summary Statistics				
b_0	b_1	Adj R^2	S.E.	D–W	F(1,28)	p-Value
−6.99	1.072	79.7%	1.67	1.86	106	0.0000
(10.58)	(0.104)					
[0.52]	[0.000]					

Panel B: Regression to Determine Information Arrival Between K–R Release Day and Actual HPR Release Day (1988:1–1994:4; 28 obs.) $MKTa(t) = b_0 + b_1\ MKTe(t) + b_2\ \Delta FP(t\text{-}2,0) + et$

Coefficient Estimates			Summary Statistics				
b_0	b_1	b_2	Adj R^2	S.E.	D–W	F(1,28)	p-Value
−5.58	1.062	−.104	79.0%	1.70	1.85	51	0.0000
(10.93)	(0.107)	(.212)					
[0.59]	[0.000]	[0.63]					

Panel C: Regression to Determine the Efficiency of K–R Market Hogs Expectations Data (1988:1–1994:4; 28 obs.). $MKTu(t) = b_0 + b_1\ MKTa(t\text{-}1)$

Coefficient Estimates		Summary Statistics				
b_0	b_1	Adj R^2	S.E.	D–W	F(1,27)	p-Value
−2.61	0.029	0.0%	1.63	1.80	0.11	0.74
(8.94)	(0.088)					
[0.77]	[0.74]					

Notes: Value in parenthesis under coefficient estimate is the standard error.
Value in brackets is the *p*-value for the *t*-statistic.
Adj R^2 is the adjusted *R*-squared.
S.E. represents standard error for the equation.
D–W represents the Durbin–Watson statistic.
MKT*a*(*t*) is the actual market hog inventory estimate published by USDA and released in the HPR.
MKT*e*(*t*) is the K–R pre-release estimate of the market hog inventory released two days prior to the release of the HPR.
MKT*u*(*t*) is the unexpected component or "surprise" in the actual market hog inventory estimate released by USDA, and is defined as MKT*u*(*t*) = MKT*a*(*t*) − MKT*e*(*t*).
ΔFP(*t*-2,0) is the percentage change in nearby futures from day *t*-2 to day 0.

the data generally cannot reject normality. (See Appendix A, available from the authors.)

Second, results from *F*- and *t*-tests on price dispersion and changes in the level of trading volume, respectively, (Tables IV and V) also indicate no impact from the release of K–R pre-release estimates on both live hog futures and pork belly futures for days $t = -2$, $t = -1$, and $t = 0$.

TABLE III

t-Test Values from Excess Returns Tests: 1988:1–1994:4

Panel A: Excess Returns Tests on Live Hog Futures; 28 Observations	*Day-2*	*Day-1*	*Day 0*
Mean standardized excess returns test	−0.966	−1.466	0.919
Uniform distribution excess returns test	0.551	1.309	−1.171
Panel B: Excess Returns Tests on Frozen Pork Belly Futures, 21 Observations	*Day-2*	*Day-1*	*Day 0*
Mean standardized excess returns test	0.379	−0.241	0.324
Uniform distribution excess returns test	−0.022	0.472	−0.157

[a]Significant at the 10% level, two-tail test.
[b]Significant at the 5% level, two-tail test.
[c]Significant at the 1% level, two-tail test.

Outcomes from nonparametric test counterparts to the *F*- and *t*-test confirm results.

CONCLUSIONS

This study finds that pork futures market participants do not react to the information contained in K–R survey data released after the market close on day $t = -2$. In contrast, in a study of proprietary–public information released to the financial markets, Cunningham and Cunningham (1991) do find a reaction to the release of financial survey data on foreign exchange markets and the stock market.

Specifically, this study finds that the K–R survey expectations of market hog inventory data are unbiased and efficient estimators of the actual USDA data. Further, this study finds no evidence of information arrival from K–R releases of trade estimates of the market hog inventory data in HPRs for the live hog or frozen pork belly futures on the two trading days following release. Finally, this study finds no evidence of information leakage on the day K–R releases the trader estimates. The results of no informational impact are evidenced by the lack of statistical significance of the tests contained in Tables III–V.

The first finding suggests that, on average, the expectations survey data accurately reflects the actual USDA forecasts contained in an HPR. The second and third results indicate no market response to survey releases. This apparent inconsistency points to issues of credibility and risk reduction.

TABLE IV

Results from Price Dispersion Tests: 1988:1–1994:4

Panel A: Live Hog Futures; 28 Observations	*Day-2*	*Day-1*	*Day 0*
F-test value using day-7 as benchmark (d.f., *p*-value)	1.39 (27,27,.20)	1.30 (27,27,.25)	1.61 (27,27,.11)
F-test value using day-3 as benchmark (d.f., *p*-value)	1.015 (27,27,.49)	1.089 (27,27,.41)	1.136 (27,27,.37)
Wilcoxon rank sums test value on MAD using day-7 as benchmark	$W = 762$	$W = 717$	$W = 835$
Wilcoson rank sums test value on MAD using day-3 as benchmark	$W = 797$	$W = 795$	$W = 728$
Panel B: Frozen Pork Belly Futures; 21 Observations	*Day-2*	*Day-1*	*Day 0*
F-test value using day-7 as benchmark (d.f., *p*-value)	1.44 (20,20,.21)	1.39 (20,20,.24)	1.19 (20,20,.35)
F-test value using day-3 as benchmark (d.f., *p*-value)	1.36 (20,20,.24)	1.13 (20,20,.40)	1.23 (20,20,.32)
Wilcoxon rank sums test value on MAD using day-7 as benchmark	$W = 500$	$W = 504$	$W = 477$
Wilcoxon rank sums test value on MAD using day-3 as benchmark	$W = 410$	$W = 446$	$W = 439$

[a]Significant at the 10% level, two-tail test.
[b]Significant at the 5% level, two-tail test.
[c]Significant at the 1% level, two-tail test.
MAD = Mean Absolute Deviation.

Since the market does react to the information contained in an HPR but not to the information in the K–R surveys, the market may not view the information from the K–R pre-release estimates as credible. Testing price and volume response to benchmarks based on trading days $t = -7$ to $t = -14$ supports this notion. However, this cannot be viewed as conclusive even though anecdotal history does suggest that traders generally do not concern themselves with the impact of HPRs that far in advance. Positioning for an HPR typically occurs within several days of the report. Also, it can be argued that the lack of measurable response is due to traders positioning themselves over several days, thus any specific response is dissipated. Again, the use of benchmarks outside of the period of collection and release of the K–R survey data attempts to account for this argument.

TABLE V

Results from Tests on Level of Relative Trading Volume: 1988:1–1994:4

Panel A: Live Hog Futures; 28 Observations	*Day-2*	*Day-1*	*Day 0*
t-test value using day-7 as benchmark	0.45	0.06	−0.14
t-test value using day-3 as benchmark	0.35	0.76	0.94
Wilcoxon rank sums test value using day-7 as benchmark	$W = 761$	$W = 741$	$W = 733$
Wilcoxon rank sums test value using day-3 as benchmark	$W = 791$	$W = 764$	$W = 756$
Panel B: Frozen Pork Belly Futures; 21 Observations	*Day-2*	*Day-1*	*Day 0*
t-test value using day-7 as benchmark	−0.06	−0.16	0.58
t-test value using day-3 as benchmark	0.49	0.65	−0.06
Wilcoxon rank sums test value using day-7 as benchmark	$W = 448$	$W = 433$	$W = 439$
Wilcoxon rank sums test value using day-3 as benchmark	$W = 427$	$W = 422$	$W = 442$

[a]Significant at the 10% level, two-tail test.
[b]Significant at the 5% level, two-tail test.
[c]Significant at the 1% level, two-tail test.
MAD = Mean Absolute Deviation.

An explanation of the view of market credibility must necessarily focus on the issue of risk reduction. Garcia et al. (1996) reason that traders perceive the USDA reports as containing less risk. McNew and Espinosa (1994) find reduced implied volatility in corn and soybean options after release of USDA crop forecasts. They observe that if market participants make their decisions on the basis of both risk and return, then any information which would reduce risk is valuable. If USDA reports reduce price uncertainty, then they are viewed as being more credible. Thus, while the K–R survey data of HPRs is unbiased and relatively accurate, the market apparently looks to the USDA HPR data as authoritative.

As a final note, the results of no market impact from release of K–R expectations data have been shown to be robust in spite of small sample size. The issue of small sample size suggests a need for nonparametric tests to corroborate parametric tests in event studies.

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