

Do Economic Statistics Leak Out Before Their Official Announcements?

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Abstract

The finding of this study is that most of the 14 economic data examined in this study appear to not leak out before the official announcement. However, it appears that three of the 14 may indeed become available to some traders. This statement is based on the facts that for each of the three the number of positive observations are considerably above the halfway mark, and the net positive weighted values for each of the three are fairly high. These three variables are the Producer Price Index, Consumer Credit, and the Purchasing Managers Survey.

Introduction

All who follow the bond markets are aware of how much they are affected by economic events. For example, when announcements of significant increases in the producer and consumer price indices are made, the bond market declines. The reason for the decline is because if the producer and consumer price indices increase, this points to past and possibly future inflation. Inflation causes bond prices to decline because bonds are fixed-return investment vehicles, and inflation results in loss of purchasing power for fixed-return investments. Conversely, if unemployment rates increase, bond prices usually increase, due to less economic activity and thus possibly less pressure on prices.

Very frequently, the bond futures markets move immediately, many times within just a few minutes, after these announcements. Furthermore, when the numerical values of the released data are far from what economists and financial analysts were expecting, the market's movements are usually very large.

Obviously, if someone knew what the results were before they were released, one could make huge profits from this inside information.¹ Supposedly, these economic data are well guarded before their release. However, there are some who argue that it is impossible to keep thousands of pieces of economic data secret month after month.²

The Study

Thus, one purpose of this study is an attempt to determine if data are leaked before the official release. The

procedure of this study was to observe the price movements of a certain financial instrument the day before and the day of the announcement of various economic data.

The hypothesis is that if the data were leaked, then those who received the inside information would act on it the day before the announcement because this would almost guarantee a profit. For example, if the news was bad, the market would go down on the day of the announcement.³ However, if the news was leaked and if enough people received and acted on the news the previous day, then the financial instrument affected by that particular news would probably move in the same direction the day before as it would move the day of the announcement. That is, if the news was leaked and acted upon, then the movement, (of that particular investment vehicle), would be in the same direction one day before the announcement and on the day of the announcement.

Thus, it is hypothesized that if the movement of the investment vehicle moved significantly and in the same direction on the day before the announcement as it did on the day of the announcement in a large majority of situations, this would indicate that leakage of information was occurring. Therefore, this study will examine movements on the day before and the day of the announcement to determine if there were significant changes and in the same direction in order to test the above hypothesis.

The reason why one day was chosen instead of two or more days is because the recipient of the inside

information would not want to take a chance that some economic data would come out in between his sale and the day of the announcement. That is, if the announcement were to be made on a Thursday and if the trader sold short on Tuesday, then if strong favorable news came out Wednesday, the investor would lose immediately.

Furthermore, if the negative news which the insider was acting on was only moderately negative, then the large loss incurred on Wednesday would be greater than the moderate gain on Thursday. Thus, those acting on inside information would not trade until one day before the announcement.

The financial instrument chosen for this study was the nearest - expiration future of the long-term treasury bond which is traded on the Chicago Board of Trade. It was chosen because it is one of the most heavily traded interest rate futures. An interest rate future was chosen because it is extremely sensitive to economic events and announcements. The fourteen economic data chosen were:

Purchasing Managers Survey
 Employment - Unemployment
 Retail Sales
 Producer Price Index
 Industrial Production
 Housing Starts
 International Trade Report
 Consumer Price Index
 Durable Goods Orders
 Personal Income/Personal Spending
 Leading Economic Indicator Index
 Consumer Credit (Installment Cr)
 Gross Domestic Product
 Federal Reserve Beige Book Report

The time period covered was from May 1989 through July of 1990 - a total of 15 months and 203 observations. For each economic datum for each month, a plus was recorded if the futures moved in the same direction the day before the announcement and the day of the announcement. If the futures moved in opposite directions on those two days, a negative sign was recorded for that economic datum for that month.

In addition, a qualitative measure from -5 to +5 was also utilized to help gauge the hypothesis. If the direction was the same both days and the market had a considerably large movement both days, then a strong positive designation would be recorded for that movement. For example, if the day before the announcement the futures increased 20/32nds and the day of the announcement revealed an increase of 22/32nds, then a +4 would be

given that particular economic data for that particular month.

Conversely, if on the day before, the futures movement was an increase of 2/32nds in the future, and on the day of the announcement, there was a decrease of 3/32nds, this would be recorded as a -1. The negative sign was given because of the opposite direction, and the value of only one was due to the fact that the signal was off by only 5/32nds. If the second-day's movement had been a decrease of 34/32nds, then a -3 would have been recorded because the first-day's movement missed being close to the second day's movement by a larger amount (that is, an increase of 2 and a decrease of 34.)

After the results from each pair of days were recorded for the entire 15-month period, a recapitulation of all of these 203 results was prepared, and these are shown in Table 1.

Table 1 reveals that the economic datum of Producer Price Index had ten instances where the two-day movements of the futures was in the same direction both days and had a total positive quantitative value of 27. It also reveals that the Producer Price Index datum had five instances where the movements of the two consecutive days were in opposite directions. The total of the values of these reverse movements was eleven.

The next step in Table 1 was to add the total positive value to the total negative value. The result of this step is shown in the last column. This gave a net value for the Producer Price Index of a positive 16. By combining the numbers, this calculation allows two different measurements to be considered. Firstly, the number of times the movement was in the same or opposite directions is taken into consideration. Secondly, the degree of correlation (or reverse correlation) is also considered.

Both aspects (a) the number of times and (b) the degree are taken into consideration, because both are important. For example, suppose an economic variable had eleven direct (positive) correlations out of 15 times; at first glance, this would imply that the news did leak out most of the time. However, if each of these eleven direct correlations had degree-values of only one each, and the four negative instances had degree values of 4 each, then it could be argued that at least some of the positive movements were due to chance, due to the low degree-values.

Another viewpoint of why the number of instances and the degree of correlation (or negative correlation) are both important is if an investor was "trading on the news." Using the above example again of the eleven positive

Table 1

Indicator	Positive Correlations	Negative Correlations	Total +	Total -	Net Amt
1. Purch. Mgr. Surv.	4,4,2,3,2,2,2,4,2	3,2,3,3,2,2	25	15	10
2. Emplmt./Unempl.	3,2,4,2,2,3	3,3,3,3,3,1,3,3,3	16	25	-9
3. Retail Sales	3,2,2,4	2,3,3,2,3,3,2,2,4,3,3	11	30	-19
4. Prod. Price. Ind.	2,2,2,4,3,3,2,2,3,4	3,2,2,2,2	27	11	16
5. Indust. Product.	2,3,4,4,3	2,4,3,1,2,2,3,2,4,1	16	24	-8
6. Housing Starts	3,2,3,2,2,1,4	0,3,3,4,2,3,2,3	17	20	-3
7. Intern'l. Trade	2,1,4,1,5,1	4,3,3,2,2,2,3,4,1	14	24	-10
8. Consmr. Pr. Ind.	3,2,2,3,1,4	3,2,4,3,4,4,3,4,3	15	30	-15
9. Durable Goods	3,3,3,4,3,2,2,2	3,3,4,1,3,1,3	22	18	4
10. Personal Income/Spend.	2,2,0,4,2,2	2,3,2,3,2,3,3,1,2	12	21	-9
11. Lead. Eco. Indi.	4,3,1,3,2,1,3,4	1,2,3,2,4,4,1	21	17	4
12. Consumer Cred.	2,3,2,2,3,2,1,4,3	1,2,2,4,2	22	11	11
13. G N P	1,3,2,4,2	2,2,1,4,1,3,2,3	12	18	-6
14. F. R. Beige Bk.	2,1,1,0	2,3,5,4,1,2	4	17	-13

Note: The GNP estimates and FR Beige Book reports are not issued every month, so less than 15 observations are available for these two items.

correlations, a trader might think that the odds were heavily in favor of the futures moving in the same direction two days in a row. Thus, on the day before the announcement, if the futures were up, a trader could buy a future on that day. His reasoning would be that since in the past the futures followed suit eleven times out of 15, the odds are in his favor that the futures would increase again the next day and thus make this a profitable trade.

If the four negative instances also had only one point degree-values, then the investor would probably have an overall profit over a long period of time. (This, of course, assumes that the "11 out of 15" relationship continues to a large degree).

However, because the four negative instances had large degree-values of 4, 4, 4, and 4, then on the days where there were negative relationships, the investor would lose heavily. In fact, using the numbers above, the trader's losses during only these four times should be considerably greater than his more numerous small gains from the direct relationships. Thus, both (a) the number of times and (b) the degree of positive (or negative) correlation need to be considered.

Returning to the specific variable Producer Price Index, Table 1 reveals that it has the highest positive net value of 16. One implication of this finding is that it appears that

this variable may well leak out. This is due to the observation that there were ten instances out of a total of fifteen observations where the direction of the future moved in the same direction on the day before the announcement and the day of the announcement. For example, if the variable was bullish for bonds, then traders who received advance information would buy the future on the day before the release of the news; *Ceteris Paribus*, this would cause the bond future to increase. On the day of the announcement, the bonds would again rise due to the same favorable news; thus, there would be two consecutive days of increases.⁴

A practical usage of this finding is that if (a) the bond futures were up the day before the announcement and if (b) an investor purchased a T-Bond future contract before the futures stopped trading on the day before the Producer Price Index was announced, in the majority of the times, the future would not only be up the next day (day of announcement) but it would be up considerably due to the weighing procedure. Thus, this would make the investment very profitable. Of course, if the day before the announcement futures moved down, then the proper procedure would be to sell a future short.

Table 1 also reveals that the economic datum of consumer credit also had nine instances of positive relationships. This indicates that this particular economic

indicator may also leak out. Table 1 also reveals that the economic datum of consumer credit had the second highest positive net value of 11. If future sequences were similar to the time period examined, then the purchase of a future if they were up (or selling short, if the market was down) on the day before consumer credit was announced should also be profitable most of the time. However, it probably would not be as profitable as using the Producer Price Index variable.

The economic variable with the third highest net positive value was the purchasing managers survey, which had a net value of ten. Because it had 9 out of 15 instances of positive correlation, this may indicate some leakage of this variable. Utilizing this variable as a trading guidance device, as described above, should be profitable over an extended period, but it would probably not be as profitable as the previous two variables.

Table 1 also reveals that some economic variables, for example retail sales, consumer price index, and the Federal Reserve's Beige Book report had significant indirect relationships during the two-day sequences examined. The implications for the negative net values are different from those that possessed positive relationships.

In these inverse cases, it can be argued that the details of these economic data did not leak out because if they had been available, traders would have used the data for their own benefit and would have caused the futures to move in the same direction both days, as discussed in the previous section.

As far as using those negative observations for trading or investing purposes, if traders assumed that the future would reveal the same indirect relationships (as revealed in this 15-month study) for these specific variables, then they could use a contrarian approach. For example, since retail sales had a significant negative net-value of -19, traders could buy or sell opposite of what the "day-before's" movement happened to be. For example, if on the day before retail sales was announced bond futures were down, then traders would buy a future. If the indirect correlation held the next day, then the future would go up, and the trade would be profitable. If the significantly negative correlation for this variable continued in the future close to what is shown in Table 1, then over a period of time the profits from these trades should be significantly greater than the losses, due to the large number of opposite movements and the degree of the opposite movements.

Again, if the future relationships held close to what this 15-month study revealed, then using the contrarian procedure (described above for retail sales) would also

work for the Consumer Price Index and the FR Beige Book report which had net negative results of -15 and -13, respectively. However, these indicators would probably be less profitable than using retail sales as the guiding variable.

Table 1 also reveals that the variables of housing starts, durable goods, leading economic indicators, and gross national product have low net values of only -3, 4, 4, and -6. These observations point to the belief that the news did not "leak out" for these particular variables. This conclusion is reached by observing that the final (net) figure is not too far from zero. This results in an approximate 50-50 situation because the data demonstrate that there was no predominant pattern. As before, if the data had leaked out there would be a positive pattern. Furthermore, investments using the signals from these economic data would be close to just flipping a coin. This statement is also based on the fact that the total of the positive values was very close to the total of the negative values, thus almost canceling each other out.

Table 1 also reveals that the remaining variables of employment, industrial production, international trade report, and personal income/personal spending had less positive correlations than negative correlations. Thus, it appears that these four economic indicators also did not leak out. Furthermore, because the net values of these four items were only -9, -8, -10, and -9 they would probably not be good to use as a trading device, even using a contrarian approach. This observation is due to two reasons: (a) the number of positive and negative instances are close to the 50-50 state, and the net values are not far enough from zero. Due to the above reason, as pointed out earlier, this would not be too different from a coin-flipping chance situation, and (b) due to the approximate 50-50 situation, any possible small gains from utilizing the contrarian view would probably be more than offset by transaction costs.

To test the findings in Table 1 and the implications of the findings discussed above, several statistical tests were performed.

One was the Spearman Rank Correlation Coefficient. This procedure ranks each set of data (for example, the price movements on the day before the announcement) from lowest to highest. Ranking was then done for the price movements on the day of the announcement. For each month, the difference in the rankings was calculated and then squared. These data were then used to calculate the Spearman Rank Correlation Coefficient.

Because only three economic statistics showed much direct correlation (as observed in Table 1), only these three were studied statistically. The statistical findings agreed

with the findings in Table 1. Specifically, in Table 1 the economic variable with the highest net positive value was the Producer Price Index which had a value of 16. Similarly, the PPI had the highest Spearman Rank Correlation Coefficient of .482, thus confirming the highest ranking given the PPI in Table 1.

The economic indicator ranking second in Table 1 was consumer credit with a net positive value of eleven. Similarly, it ranked second with a Spearman Coefficient value of .299. The third highest ranked variable in Table 1 was the Purchasing Managers Survey, and it also ranked third with a Spearman Coefficient value of .153.

Another statistical test performed was regression analysis where the price movement on the day before the announcement was used as a predictor variable for the price movement on the day of the announcement. Regression studies were performed on only those three variables that showed significant direct correlations in Table 1.

The findings of this statistical test were similar to those found visually and via the Spearman Ranking procedure. That is, the PPI had the highest correlation of the three variables tested via regression analysis. Specifically, although R^2 of the PPI was not very high with a figure of only .272, it was higher than the R^2 's of the purchasing managers survey of .049 and consumer credit of .001.

The regression equation for the PPI was $y = -2.4172 + 1.6880X$. Considering the visual method and the Spearman Ranking procedure, it appears that there is probably some leakage of information, particularly for the PPI, because the price movements on the day of the announcement is similar in direction to the price movements on the day before announcement.

However, the regression analysis tests illustrate that little can be predicted in the way of numerical values the following day utilizing the previous days data. That is, although the direction can be estimated most of the time, especially for the PPI, the amount of movement on the day-of-the announcement cannot be predicted accurately, especially for the variables of consumer credit and purchasing managers survey.

Caveats

Firstly, and as stated previously, the findings and practical usages described earlier obviously are based on the assumption that what occurred between May 1989 and July 1990 will be repeated, closely at least, in the future.

Secondly, occasionally more than one economic datum was released on the same day. Thus, unless one economic datum was way out of line with what was estimated, then one cannot be sure which datum affected the market. However, when one economic indicator was considerably far out of line with what was estimated, a small adjustment was made in the other economic indicator.

Thirdly, it is possible that news can be leaked to only a very few, and thus those traders' actions might not be enough to influence the market on the day before the announcement.

Fourthly, for the three economic statistics that did have positive correlations, it could be that they occurred due to the anticipation effect. Anticipation probably was a very minor factor, if at all, because if traders were going to use it as a decision-making procedure, they would have used other indicators also. However, of fourteen indicators tested, only three showed strong positive relationships.

Summary

The findings of this study include the following. Most of the 14 economic data examined in this study appear to not leak out before the official announcement. However, it appears that three of the 14 may indeed become available to some traders. This statement is based on the facts that for each of the three the number of positive observations are considerably above the half-way mark, and the net positive weighted values for each of the three are fairly high. These three variables are the Producer Price Index, Consumer Credit, and the Purchasing Managers Survey.

As to practical applications of this study, there are two main ones. Firstly, utilizing the three economic indicators of Producer Price Index, Consumer Credit, and Purchasing manager's survey, which had high positive correlations, these could probably be used to secure an overall profitable trading procedure. For example, if on the day before the announcement treasury bond futures rose, then if a trader purchased a bond future on that day, then over the long run the profits would be greater than the losses. Conversely, if the bond futures on the day before went down, then futures should be sold short. Secondly, utilizing the three economic indicators of retail sales, the Consumer Price Index, and the Beige Book Report (which had large negative net values) as contrary indicators could probably be used as a profitable trading device. For example, if the bond future rose on the day before the announcement for these indicators (with negative net values), then futures should be sold short, and visa versa. Following the above procedures should result in a net

profit over an extended period of time. Of course, and as stated previously, the profitability of such timing devices would depend on how closely the future follows the patterns observed during the 15 month period examined.

Suggestions for Future Research

One area where additional study might well be profitable is to expand the time period from 15 months to perhaps 30 months. Anytime the sample is increased, the reliability of the findings is enhanced. Furthermore, although only three indicators showed significant positive correlation, the enlargement of the number of observations could include the other eleven variables also. By using more observations, it might be that some of these eleven indicators would reveal significant correlations. Another avenue of additional research could be to study other variables. Although the fourteen indicators in this study are most of the more important economic and financial data, there are a few other economic variables that could be examined. Another area of future research could be to utilize a more exact weighting system. although, the somewhat arbitrary weighting procedure used in this study adequately served the purpose of measurement for which this study was intended, a more precise method of calibration might provide improved findings. 📖

*** Footnotes ***

1. Meyerowitz, Steven A., "Do New Insider Rules Imperil Markets?" *Business Marketing*, p. 25.
2. Welles, Chris and Norman, James, "The Case of the Purloined Magazines," *Business Week*, 8-15-88, p. 42.
3. Ibid. p. 42.
4. Welling, Kathryn, "John Sturges Finds A New Way to Follow Insiders." *Barrons* 9-12-88, p. 32.

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2. Focer, Ada, "Bank Insiders Who Bend to Greed." *Bankers Monthly* 105: 15-19, Spring 1988.
3. Meyerowitz, Steven A., "Do New Insider Rules Imperil Markets?" *Business Marketing* 4-88, p. 25.
4. Welles, Chris and Norman, James, "The Case of the Purloined Magazines." *Business Week* 8-15-88, p. 42.
5. Welles, Chris, "Just How Corrupt is Wall Street?" *Business Week* p. 34-36, January 9, 1989.
6. Welling, Kathryn, "John Sturges Finds a New Way to Follow Insiders." *Barron's* p.32.