

Research Notes

Does Stock Market Volatility Rise on the Release of the Monthly US Employment Report?

September 27, 2007

Monthly employment is a very closely watched indicator but very difficult to forecast. So it seemed possible that there are enough surprises generated by the monthly employment report that it could change the market volatility. This note presents some analysis of the closing values of the VIX index on days when the employment report is released compared to other days. Based on this analysis, the short answer to the question in the title is yes. The details are explained below.

Figure 1 shows the distribution of daily closing values for VIX from 1990 to present. The mass of the distribution (the interquartile range) is between 14 and 23, with a mean of 18.9 and a median of 17.6.

Figure 1 Histogram of VIX Closing Values
Jan 2, 1990 to Sept. 25, 2007

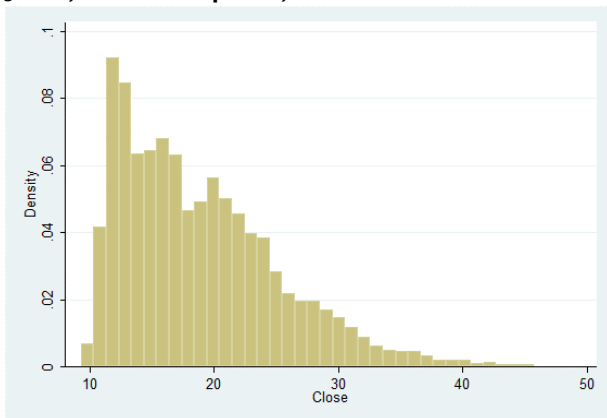


Figure 2 shows the 1-day change from the previous close. The distribution is tightly clustered around zero, with a mean of -0.004

and median of -0.04 . Nothing too exciting there, but most of these days are not days when the employment report was released. Figure 3 makes that comparison.

Figure 2 Change in VIX from Previous Close

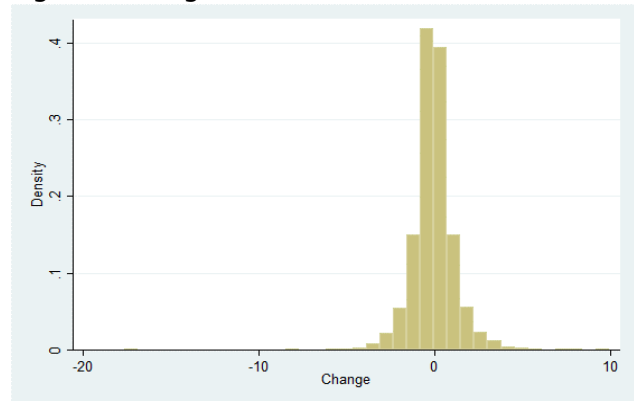
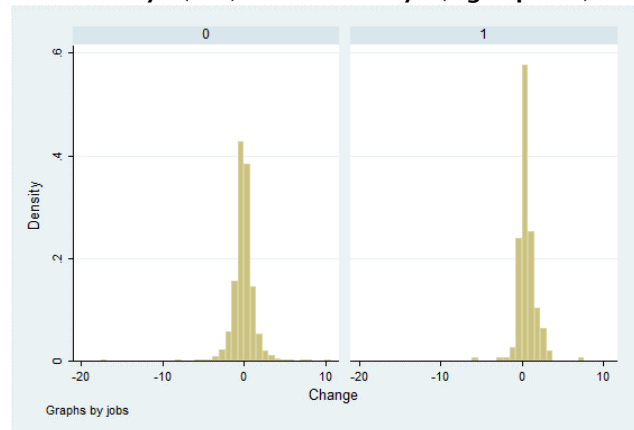


Figure 3 Change in VIX from Previous Close: Non-Release Days (left) v Release Days (right panel)



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The monthly employment release days are much more likely to have a positive change in VIX than the non-jobs-report days. This can be seen by the much larger bulk of the distribution on the positive side of the right panel compared to the left. The interquartile range (25th to 75th percentile) for the change in VIX on non-release days straddles the median of -0.06 almost perfectly symmetrically, ranging from -0.6 to 0.51. By contrast, the interquartile range for the 202 jobs report days is completely positive, from 0.05 to 1.02, with a median of 0.475. The mean change in VIX on release days is 0.58 compared to -0.03 on non-release days.

The above comparisons show large differences in VIX movements on release days versus non-release days. A regression test can be used to confirm if jobs report release days correspond to statistically significant increases in volatility.

The change in VIX is a stationary variable, based on a unit root test, so we can use it in regression without further transformation. The right hand side variable is simply a dummy variable that takes a value of one on days when the employment report is released, and zero otherwise. In some regressions I also included a lags of the change in VIX to make sure that the jobs release really corresponded to a large change in VIX after controlling for these other influences. The table summarizes the results of these regression models with and without lags.

The variable *RELEASE DAY* is statistically significant in all three models, with a coefficient value of 0.58 to 0.61. Other regressions (not shown) with fewer or more lags of the change in VIX gave very similar results. Therefore, the data from 1990 to present certainly suggest that the release of the US employment report does correspond to more volatility in stock prices.

Rose Cunningham, Ph.D.
Independent Economic Advisers
rcunningham@iearesearch.com

Summary of Regression Model Estimates
(t-statistics in parentheses)

	Model 1	Model 2	Model 3
<i>RELEASE DAY</i>	0.609 (6.86)*	0.577 (6.65)*	0.604 (6.83)*
<i>VIX Change t-1</i>	-	-	-0.057 (-3.74)*
<i>VIX Change t-2</i>	-	-	-0.113 (-7.36)*
<i>VIX Change t-3</i>	-	-	-0.069 (-4.46)*
<i>VIX Change t-4</i>	-	-	-0.051 (-3.31)*
<i>VIX Change t-5</i>	-	-	-0.043 (-2.81)*
<i>VIX Change t-6</i>	-	-	-0.071 (-4.61)*
<i>VIX Change t-7</i>	-	-	-0.031 (-2.01)
<i>VIX Change t-8</i>	-	-	-0.046 (-2.96)*
<i>VIX Change t-9</i>	-	-	0.015 (0.99)
<i>VIX Change t-10</i>	-	-	0.029 (1.89)
<i>Constant</i>	-0.031 (-1.66)	-	-0.033 (-1.77)
Observations	4469	4469	4459
F stat	47.01	44.27	14.69
Prob. > F	0.00	0.00	0.00
Adj. R-squared	0.01	0.01	0.03

**Indicates statistical significance at 1% level.*

