Trading Events: Earnings (Part 3); Conditional on VIX

Options Research

John Marshall
(212) 902-6848 john.marshall@gs.com
Goldman, Sachs & Co.

Katherine Fogertey
(212) 902-6473 katherine.fogertey@gs.com
Goldman, Sachs & Co.

Krag Gregory, Ph.D.
(212) 357-3770 krag.gregory@gs.com
Goldman, Sachs & Co.

VIX level impacts earnings event trades

In our "Trading Events" series, we study the behavior of stocks & options around 30,000 earnings events in the past 15 years for all US stocks with liquid options at any time during the period. In this edition, we investigate the extent to which the level of macro implied volatility impacts the profitability of stock and option trades around earnings. We use the VIX as a proxy for macro implied vol. We find that call buying in stocks ahead of their respective earnings events produced an average +37% return-on-premium when the VIX was between 35 and 45. These strong returns were driven by a relief rally in stocks that was underestimated by calls.

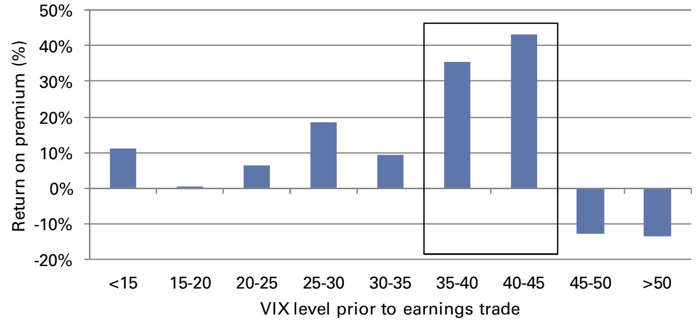
Stock and options trade profitability by VIX level

VIX below 35: Call buying, strangle buying modestly profitable. We find that in lower volatility environments call buying and strangle buying strategies were modestly profitable as stocks were up 52% of the time for an average return of +0.8% during their earnings event period.

VIX between 35-45 (where we are now): Call buying produced a +37% return-on-premium. When the VIX was 35-45, stocks rose 60% of the time on their earnings reports for an average return of +2.9% (outperformance of +1.7% vs SPX). We find options prices, though elevated along with the VIX, underestimated stock volatility on earnings (delta hedged call buying averaged +6%). We hypothesize the strong performance of stocks and calls was driven by a relief rally when earnings, guidance, or data released along with the report reversed macro fears that built prior to earnings.

VIX above 45: Sell options. On average, strangle selling on single stocks ahead of their earnings reports yielded a +8% return-on-premium. This profitability was driven by both put and call selling as options frequently overestimated stock volatility around earnings.

Buying calls ahead of earnings shows strong returns when VIX is 35-45



Source: Goldman Sachs Research estimates.

Overview: Stock & options profitability based on starting VIX level

We find the level of macro uncertainty has important implications for the profitability of stock and options trades around earnings events. When the VIX has been between 35 and 45, we estimate that call buying on single stocks ahead of their earnings reports has yielded a +37% average return. With the VIX at 41 ahead of earnings, we recommend investors focus on call buying in stocks where they expect company management to reassure worried investors on their earnings calls. Our ideas along this theme will be highlighted in the Weekly Options Watch as earnings events approach.

Key conclusions:

1. VIX less than 35: Small positive moves on earnings in the context of inexpensive options have led call buying strategies to return +10% on average. We find strangle buying was also modestly profitable in most low VIX buckets. Puts showed no compelling pattern.

2. VIX between 35 and 45: Call buying on single stocks for earnings events yielded a +37% average return on premium when VIX was 35-45. We find call buying profits were driven both by positive stock moves on earnings in this environment (+2.9% in their earnings period on average, outperforming SPX by +1.7%) and a tendency for stocks to realize a larger move than was priced in (strangle buying profit was +8% on average).

> a) Stocks in **Discretionary** and **Tech** sectors were up the most on earnings when the VIX was 35-45.
>
> b) Call options on **Financials, Staples** and **Energy** outperformed most during the earnings event period when the VIX was 35-45.

3. VIX above 45: When the VIX was above 45, strangle selling strategies on single stocks ahead of their respective earnings event period yielded +8% on average. We find that both call and put selling have been profitable strategies on average.

4. VIX as a capitulation signal. The VIX has risen above the 35 level 13 times over the past 15 years. The S&P 500 was up over the subsequent 6 months in 10 of 13 instances for an average return of +11%. We show S&P returns over a variety of time horizons on page 6.

Methodology:

We studied stock and options price moves around earnings events. Throughout this study we show the returns for (1) buying stock 5 business days prior to their earnings event and selling 1 day after the event, and (2) buying the first out-of-the-money listed put and/or call of the nearest maturity that included the event day. The option was held for the same period. Throughout this study, we refer to this 6 day period as the "earnings event period."

We analyzed the performance of trading strategies based on the VIX level at the start of each company's earnings event period. For example, if IBM reported earnings on Oct 18, we would define our earnings event period as Oct 11 to Oct 19. If the VIX was at 41 on October 11, then the stock and options price returns would be included in the 40-45 VIX bucket.

We use OptionMetrics listed options data for our options calculations and screen for liquidity. We show the results for strategies at mid-market prices. A consistently positive bar on subsequent charts indicates a profitable stock/option buying strategy and a consistently negative bar indicates a profitable stock/option selling strategy. We screen our list of 30,000 earnings events to isolate those events where bid-mid spreads were less than 10% of the option premium. Over the period of our study, we find that the average bid-mid spread has been 4.5% and more recently has dropped below 3%. We believe our spread estimates are conservative due to the tendency for bid-ask spreads to be wider at the close (the data we use) than during the middle of the trading day (when most investors trade).

Stock returns on earnings based on starting VIX level

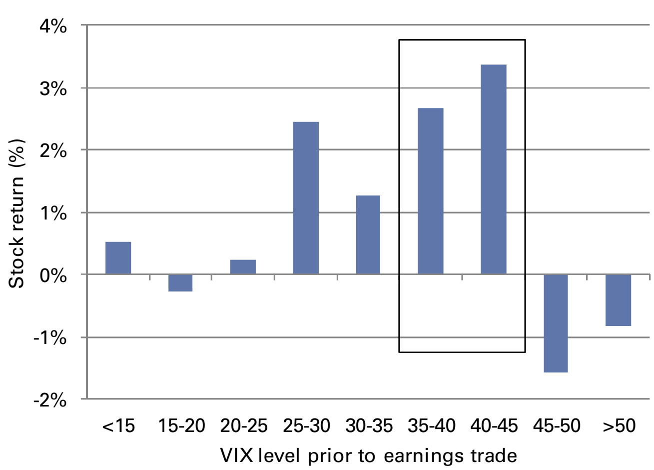
We find the VIX level has correlated strongly with stock returns during their respective earnings event period. Low VIX levels have been associated with small earnings event moves, with little directional bias. VIX levels in the 35-45 range have been associated with large positive stock moves. Extremely high VIX levels that occurred during the 2008 crisis were associated with modest negative stock moves on earnings.

Stocks outperform strongly on earnings when VIX is 35-45 as management has the opportunity to reassure investors. When the VIX was between 35 and 45, stock moves on their respective earnings events were positive 60% of the time for an average return of 2.9% and an average outperformance of 1.7% vs the S&P 500. The earnings report provides an opportunity for management teams to reassure investors about future fundamental stability in periods of high macro uncertainty. This reassurance may drive a relief rally in shares that exceeds relief in the broad market. While the tendency for stocks to be more volatile than the market likely plays a role in the outperformance around earnings, we believe they cannot fully explain the outperformance in these environments or the outperformance across almost every bucket.

Stock direction on earnings was less predictable when VIX is less than 35, but stocks consistently outperformed. Stocks made positive moves on 52% of the events in our study when the VIX was below 35. Stocks were up 0.8% on average, outperforming the S&P 500 by 0.5% on average.

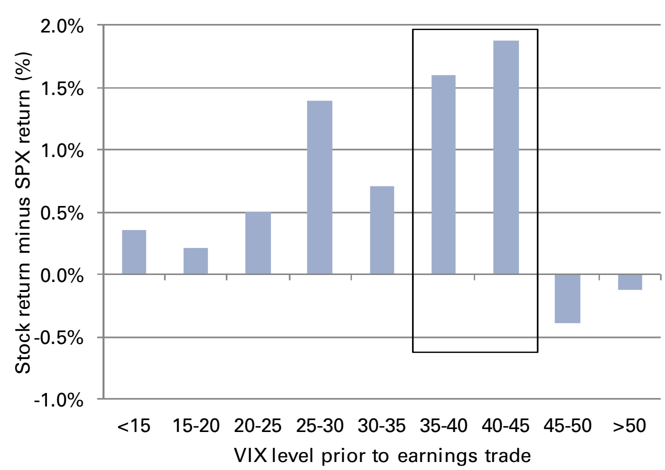
Stocks fell and underperformed when the VIX was above 45 ahead of earnings event. The VIX spent 88 days above 45 in the past 15 years. About 5% of the observations in our study fall into this period. We find that stocks fell 51% of the time on their respective earnings event for an average decline of 1.0% when the VIX was above 45. The stocks underperformed the S&P 500 modestly by 0.3%. It is our hypothesis that the extreme level of the VIX in this period indicated more than just capitulation by markets, it indicated systemic damage that would have such a lasting effects on stock values that management could not reassure investors.

Exhibit 1: Stocks were up on earnings when the VIX was between 35 and 45 ahead of their earnings report
Stock performance in the earnings event period by VIX level



Source: Goldman Sachs Research estimates.

Exhibit 2: Stocks outperformed the SPX on earnings when VIX was less than 45 ahead of their earnings report
Stock outperformance in earnings event period by VIX level



Source: Goldman Sachs Research estimates.

Options returns on earnings based on starting VIX level

We find that the VIX level had a strong correlation with option buying profitability. Low VIX levels have generally been associated with modest option buying profitability around earnings. Option buying (particularly call buying) when the VIX level was between 35 and 45 has shown strong profitability on average. When the VIX has been above 45 ahead of an earnings report, option selling has been profitable on average, with both put and call selling strategies performing well.

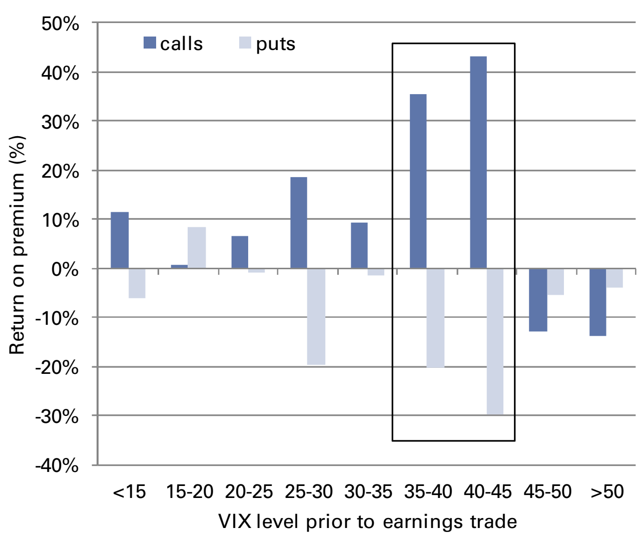
Stocks rise more sharply than options prices decline when the VIX is between 35-45. Our results show that even when the VIX is at high levels (between 35-45) investors that buy strangles ahead of their respective earnings releases make money on average. The stock moves on earnings events are enough to more than overcome the volatility decline experienced over the 6 day earnings event period. As we discussed on the prior page, these stock moves tend to be positive on average, driving much higher profitability for call buyers than strangle buyers.

Options selling had strong performance when the VIX was above 45; our analysis suggests selling puts, calls and strangles ahead of earnings when the VIX is above 45. The VIX was above 45 for 88 days during the 2008-2009 crisis. During this period of extreme macro stress, stock moves on earnings events were much smaller than implied by the options market. Investors that sold options ahead of these earnings events (puts +4%, calls +11% or strangles +8%) profited on average.

VIX levels below 35 were associated with small option buying gains. While strangle buying and call buying were also profitable on average when the VIX was below 35 ahead of the earnings report, there was less consistency in results than in the other two categories.

Exhibit 3: Buying calls has been most profitable when the VIX is between 35 and 45

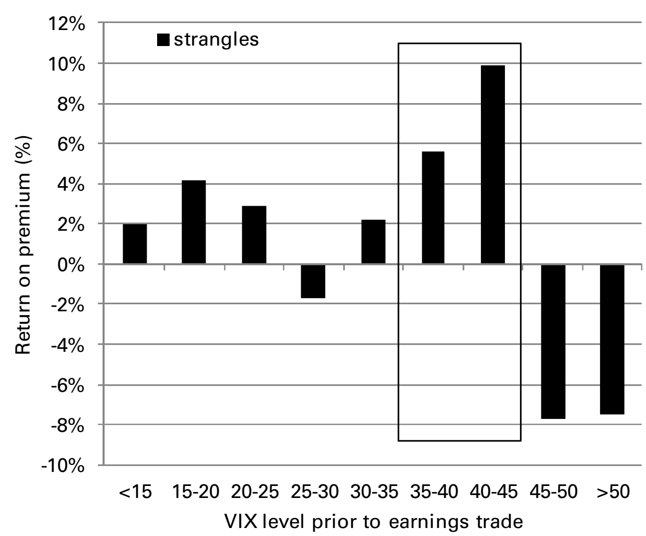
Average return on premium for buying options for the earnings event period



Source: Goldman Sachs Research estimates.

Exhibit 4: Buying strangles is most profitable when VIX is between 35 and 45

Average return on premium for buying options for the earnings event period



Source: Goldman Sachs Research estimates.

Sector stock and option performance when VIX is 35-45

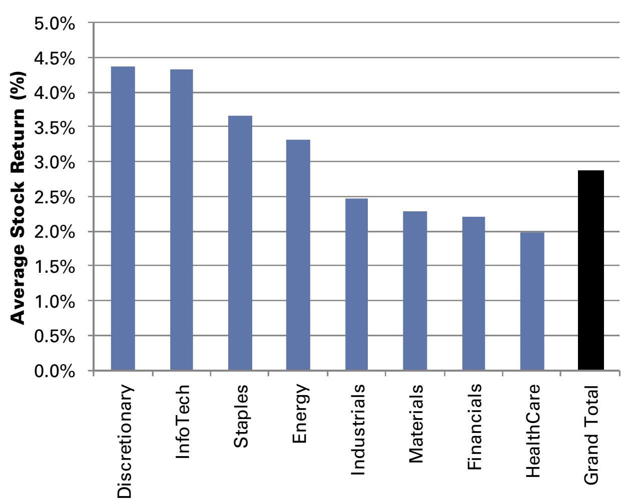
The average stock rises on their earnings report when the VIX is between 35-45, but not all sectors participate equally.

From a stock perspective, Discretionary, Tech, Staples, and Energy have made the most positive earnings event period moves in a VIX 35-45 environment.

From a call option perspective, Financials, Staples, Energy, and Technology stocks have outperformed other sectors through the earnings period.

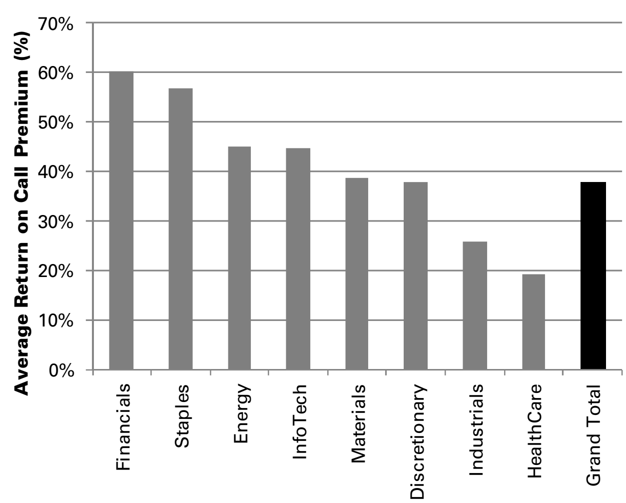
We have excluded the Telecom and Utilities sectors from these charts because they only have 18 and 8 observations in this VIX bucket and therefore the averages (which happen to be negative), could be misleading. The others sectors have an average of 90 observations in this bucket.

Exhibit 5: Discretionary, Tech, Staples, and Energy see above average increases on their respective earnings events when the VIX is 35 to 45
Average stock price moves in the earnings event period when VIX is between 35-45



Source: Goldman Sachs Research estimates.

Exhibit 6: Buying calls on Financials, Staples, and Energy performed well when VIX was 35 to 45 ahead of earnings
Average return on call premium in the earnings event period when VIX is between 35-45



Source: Goldman Sachs Research estimates.

VIX 35-45 has historically signaled capitulation; buy calls, not stock

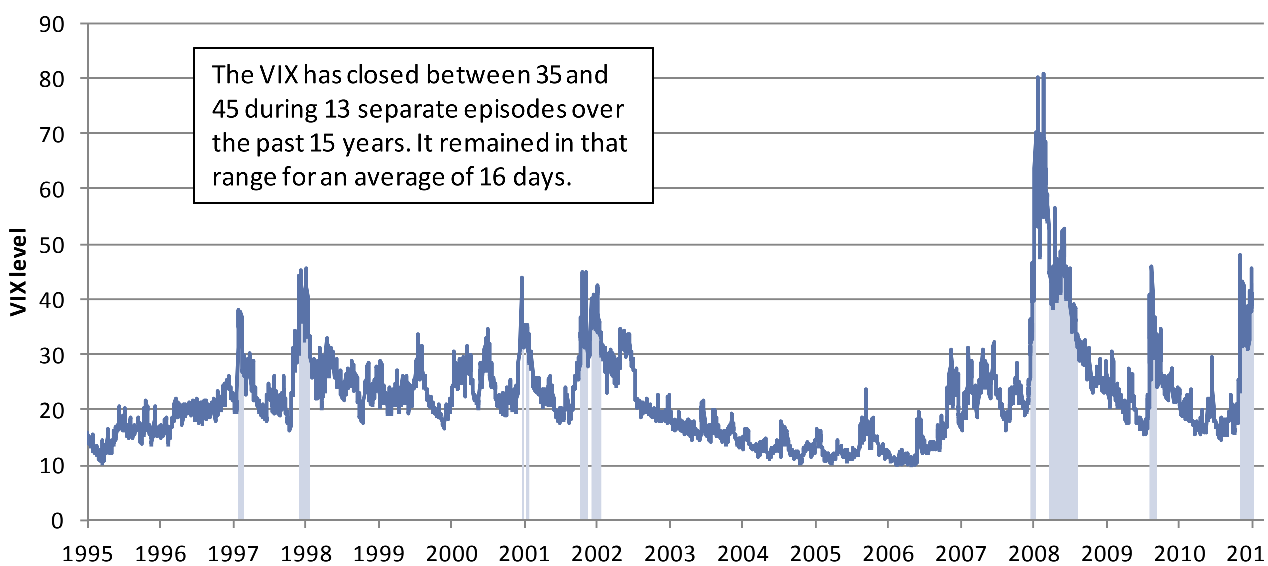
We believe the risk/reward is stronger for investors that buy calls on stocks ahead of earnings than those that buy stocks ahead of earnings in the current environment. The current VIX level has proven bullish for the market in 10 of the past 13 episodes for an average 6 month subsequent price return of +11%.

Exhibit 7: On average, the S&P has been up 11% in the subsequent 6 months after the VIX rises traded between 35-45
S&P 500 price changes and VIX levels

					SPX price return from first date			
First Date	Last Date	VIX Start	VIX End	# Days	1m	2m	3m	6m
30-Oct-97	13-Nov-97	38.2	36.6	11	8%	8%	11%	23%
27-Aug-98	14-Oct-98	38.6	39.0	34	1%	4%	13%	23%
17-Sep-01	26-Sep-01	41.8	35.3	8	4%	10%	11%	10%
8-Oct-01	17-Oct-01	35.1	35.1	8	5%	7%	8%	6%
15-Jul-02	13-Aug-02	35.0	35.8	22	0%	-3%	-6%	-4%
3-Sep-02	16-Oct-02	40.0	36.0	32	-7%	3%	3%	-5%
17-Sep-08	1-Oct-08	36.2	39.8	11	-19%	-26%	-23%	-29%
19-Dec-08	13-Jan-09	44.9	43.3	16	-6%	-14%	-8%	4%
27-Jan-09	13-Feb-09	42.3	42.9	14	-13%	-6%	4%	19%
25-Feb-09	26-Feb-09	44.7	44.7	2	7%	14%	23%	30%
10-Mar-09	1-May-09	44.4	35.3	38	19%	26%	31%	49%
7-May-10	7-May-10	41.0	41.0	1	-5%	-3%	-2%	8%
19-May-10	7-Jun-10	35.3	36.6	13	0%	-2%	-4%	7%
			average	16	-1%	2%	5%	11%

Source: Goldman Sachs Research estimates.

Exhibit 8: The VIX has risen to the 35-45 range 13 times over the past 15 years
Daily VIX level 1996 to present



Source: Goldman Sachs Research estimates.

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