July 14, 2011

Trading Events: Earnings volatility (part 1)

Options Research

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Study of stock and options trades on 30,000 earnings events

In our "Trading Events" series, we study the behavior of stocks and options around events. In this report, we focus on the most closely followed stock events and corporate earnings reports. We studied stock and options price moves from five days before to one day after 30,000+ corporate earnings reports for 1,000+ companies since 1996. Our goal was to calculate the average returns of passive strategies and understand the profitability patterns in the context of transaction costs.

Select findings of our earnings event study

Our results support a bias towards buying calls on stocks ahead of their earnings events, conditional on recent underperformance. This strategy earned an average of +18% return-on-premium per trade over the past 15 years, before transaction costs.

(1) DIRECTION: Stocks traded up on earnings events in our study. We estimate the average stock was up 0.8% and outperformed the S&P 500 by 0.6% in the 6 days around earnings since 1996. Average stock returns are notable, but Sharpe ratios are not compelling, in our view. Asymmetry in stock moves and options prices drove average call buying returns of +13% before transaction costs. Call buying ahead of earnings had positive returns in all 15 years and outperformed stock alone in 9 of 15 years.

(2) VOLATILITY: Option buying ahead of earnings outperformed option selling. Strangle buying outperformed strangle selling around earnings events in 10 of 15 years for a modest average gain of +1.5% (before transaction costs). We believe these results go against many investors' assumptions that selling options in the days leading up to earnings events is highly profitable. In the presence of transaction costs, both passive strangle buying and selling had negative average returns.

(3) CONDITIONAL: Call buying on stocks that underperformed the S&P 500 in the 2 weeks ahead of earnings led to an +18% average gain before transaction costs, outperforming call buying on outperformers.

Current option buying candidates ahead of earnings

We screen for call and put buying candidates based on out/underperformance vs. the SPX over the past 2 weeks, analyst ratings/estimates and implied volatility. We identify 15 call buying candidates, including TER, DOW, FITB, BLK, KEY, DHI; and 12 put buying candidates, including WYNN, OSK, LVS, CHK, and MSFT.

Overview: Option buying around earnings events

In our "Trading Events" series of reports, we study the behavior of stocks and options around events. Our goal is to better understand where systematic biases have existed in stock and options event trades. We believe that an awareness of market biases, and their evolution through time, has the potential to improve the performance of stock and option trade recommendations.

Why focus on earnings announcements? Earnings announcements provide a key source of volatility for single stocks on known dates. As such, they are particularly conducive to short-term stock and options trading. In this study we looked at passive strategies using stock, calls, puts and strangles around 30,000+ earnings events since 1996 on 1,000+ stocks.

What core strategy did we study? Throughout this study we show the returns for (1) buying stock 5 business days prior to the earnings event and selling 1 day after the event, and (2) buying the first out-of-the-money listed option of the nearest maturity that included the event day. The option was held from 5 days before the event to one day after. Throughout this study, we will refer to this 6 day period as the "earnings event period". We use OptionMetrics listed options data for our options calculations. 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. While we list transaction cost estimates in each exhibit, we show average mid-ask spreads for each year in the Appendix on page 10. We believe our bid-ask spread estimates are conservative due to the tendency for bid-ask spreads to be wider at the close than during the middle of the trading day.

What notable trading patterns did we find? Our study resulted in three key findings that we believe are important for both stock and options investors.

(1) DIRECTION: We found that stocks rose and outperformed the S&P 500 on their respective earnings day. We estimate the average stock in our study was up 0.8% and outperformed the S&P 500 by 0.6% in the 6 days around earnings from 1996 to present. Earnings day outperformance was consistent across 14 of 15 years. Call buying produced an average profit of 13% (before transaction costs) and was profitable in all 15 years. While average returns are notable, Sharpe ratios are not compelling for passive strategies, in our view.

(2) VOLATILITY: Option buying has outperformed option selling on average. Over the period that we analyzed, option buying outperformed option selling around earnings events. Strangle buying strategies from 5 days before earnings to 1 day after earnings were profitable in 10 of 15 years at mid-market prices for a small average profit of +1.5%. While option buying outperformed option selling, the results were within the bid-ask spread and not compelling for passive strategies.

(3) CONDITIONAL: Set-up ahead of earnings matters; we see mean reversion around earnings. We found that those stocks that underperformed in the 2 weeks ahead of the earnings trade tended to have stronger positive reactions on earnings day (on average). This asymmetry led to higher profitability for call buying strategies ahead of earnings. On average, call buying on stocks that underperformed ahead of earnings profited 18%, which was 5% greater than without the condition.

What trades would this analysis suggest this quarter? We screen for call and put buying candidates based on out/underperformance vs. the S&P 500 over the past 2 weeks, analyst ratings/estimates and 1 month implied volatility. We identify 15 call buying candidates, including TER, DOW, FITB, BLK, KEY, DHI; and 12 put buying candidates, including WYNN, OSK, LVS, CHK, and MSFT.

Three select findings from our study

Our study of 30,000+ earnings events since 1996 resulted in three key findings that we believe are important for both stock and options investors. First, we found that stocks on average trade up and outperform the S&P 500 during the 6 days around their respective earnings events. Second, we found that passive option buying strategies ahead of earnings outperformed option selling strategies. Third, we found that stocks that underperformed the S&P 500 in the 2 weeks ahead of their earnings event period had stronger performance on their earnings event.

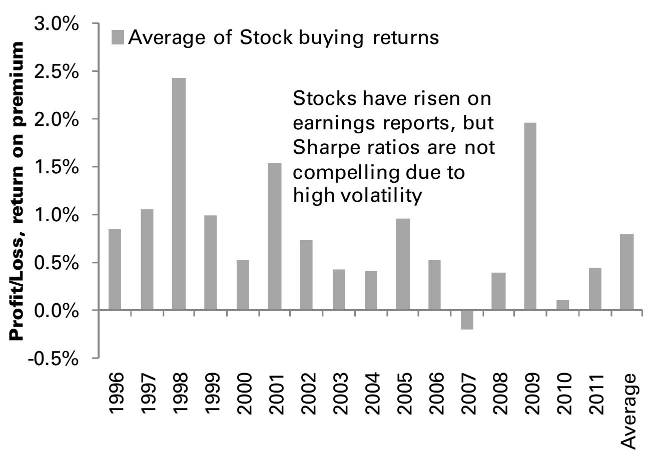
These observations appear consistent with the idea that investors reduce stock positions ahead of event to avoid risk and reinvest in the stock when the uncertainty of the earnings report is removed. Those stocks that underperform the most ahead of earnings may have lower expectations, explaining their stronger positive reaction on earnings. From an options perspective, we believe that the majority of systematic covered-call sellers sell calls in both non-earnings and earnings months. While these strategies may produce yield on average over the quarter, they may unduly pressure call prices ahead of earnings.

(1) DIRECTION: Earnings events have been bullish on average

Stocks: We found that stocks tended to rise and outperform the S&P 500 around their respective earnings events. On average stocks were up 0.8% during their earnings period (5 days before to 1 day after) and outperformed the S&P 500 by 0.6%. We find this outperformance vs. the S&P 500 was consistent over 14 of the past 15 years. Stocks were up on 53% of the earnings event periods and down on 47%. This result is consistent with prior studies that we have performed.

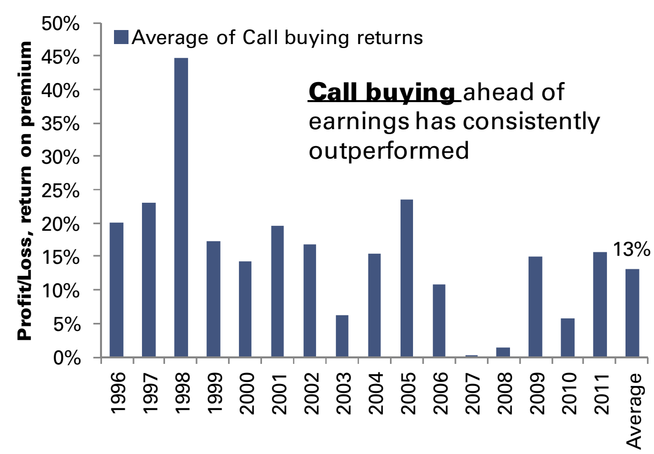
Call buying: Passive call buying ahead of earnings has been profitable in 15 of the past 15 years with an average mid-market profit of 13% per trade before transaction costs. We find that call buying outperformed call selling across 11 of 12 months of the year and across 8 of 9 major sectors. We estimate bid-ask spreads would have reduced the profit by 9% (4.5% on entry, 4.5% on exit on average over the time period). Even after transaction costs, we found the average return to be more than 3 times the standard error.

Exhibit 1: Stocks have traded up during their earnings period on average
Avg. stock return from 5 days prior to earnings to 1 day after



Source: Goldman Sachs Research estimates; 30,295 observations.

Exhibit 2: Call buying has been profitable in 15 of 15 yrs
Call buying Profit/Loss as a % of premium mid-market; average mid-ask spread over the period was 4.5%

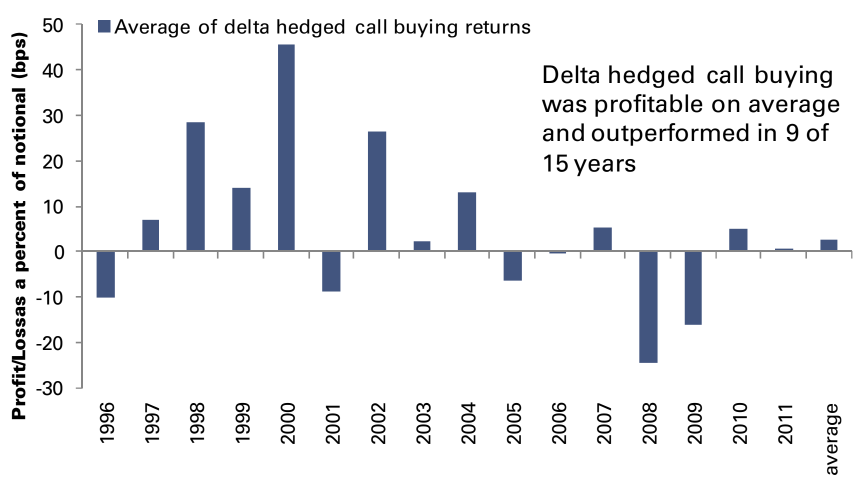


Source: Goldman Sachs Research estimates; 14,916 observations.

Call buying outperformed buying stock alone. While both stock buying and call option buying strategies appear to have outperformed over the period analyzed, it is natural to ask which produced higher returns. While a direct comparison is difficult due to a difference in risk profiles, we estimate the outperformance of the option strategy by calculating the delta hedged returns of calls. We estimate delta hedged call buying (buy a call and sell stock based on the "delta" of the option) has also outperformed in 9 of 15 years. We estimate delta hedged call buying would have added an average of +3 bp per event to a stock position before transaction costs. This result leads us to the conclusion that the outperformance of call buying comes from both the positive move in shares and the underestimation of upside volatility by the options market.

Skew may also play a role: Systematic existence of skew (out-of-the-money put implied volatility higher than out-of-the-money call implied volatility) likely contributes to the disparity between call and put buying strategies. Lower premiums for calls increase the percent return on average, while higher premiums for puts lowers the potential percent return. On the day of trade initiation, we found the average 1-month 25 delta call implied volatility of 38% was 3-4 points below the average 25 delta put implied volatility of 42%. This implied volatility difference, combined with the higher likelihood of a positive stock move on earnings likely combines to improve call buying profitability over puts.

Exhibit 3: Call buying returns were positive on average, even if initial delta was hedged
Delta hedged return on notional 1996-present

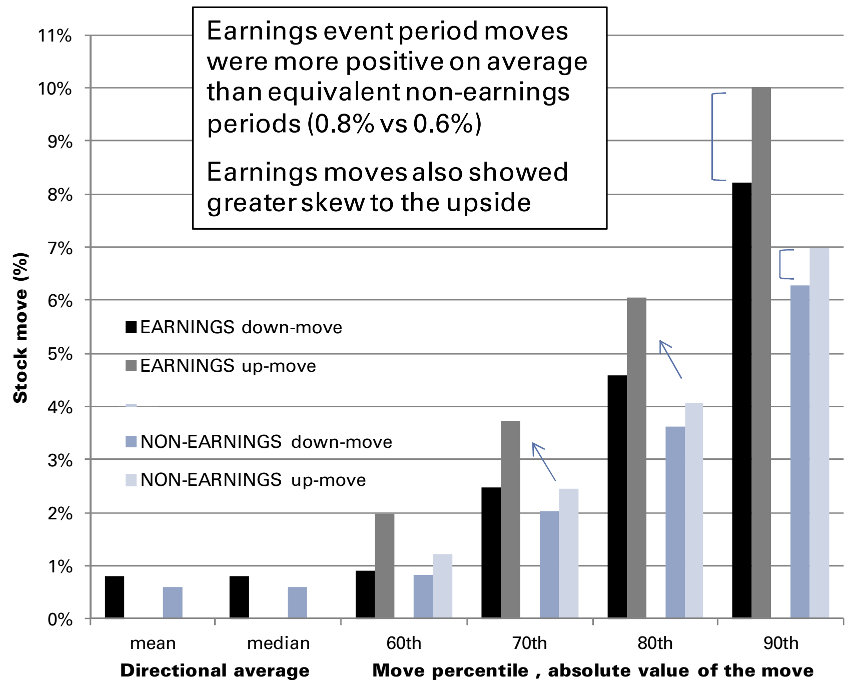


Source: Goldman Sachs Research estimates; 14,916 observations.

We found that moves during earnings event periods are substantially different than non-earnings periods of the same length. We test this hypothesis by looking at moves over a six day period that is offset from the earnings date by 1 month. We find that stock returns during these non-earnings periods are lower on average and less skewed to the upside. We find that stocks averaged a +0.8% return during their earnings event period, but only averaged +0.6% in an equivalent non-earnings period. When we compare the distribution of upside and downside returns, we find that the distribution is skewed even more toward the upside for earnings event periods. In Exhibit 4, we show the distribution. When comparing the 10th percentile of moves (clearly a down move) with the 90th percentile of moves (clearly an up move) we find the difference is much larger for earnings event periods. We believe this indicates a stronger upside skew to the earnings move distribution than we would otherwise expect.

Exhibit 4: Earnings event period moves were larger on average and more skewed to the upside than equivalent non-earnings periods

6 day percent move in earnings periods vs. non-earnings periods



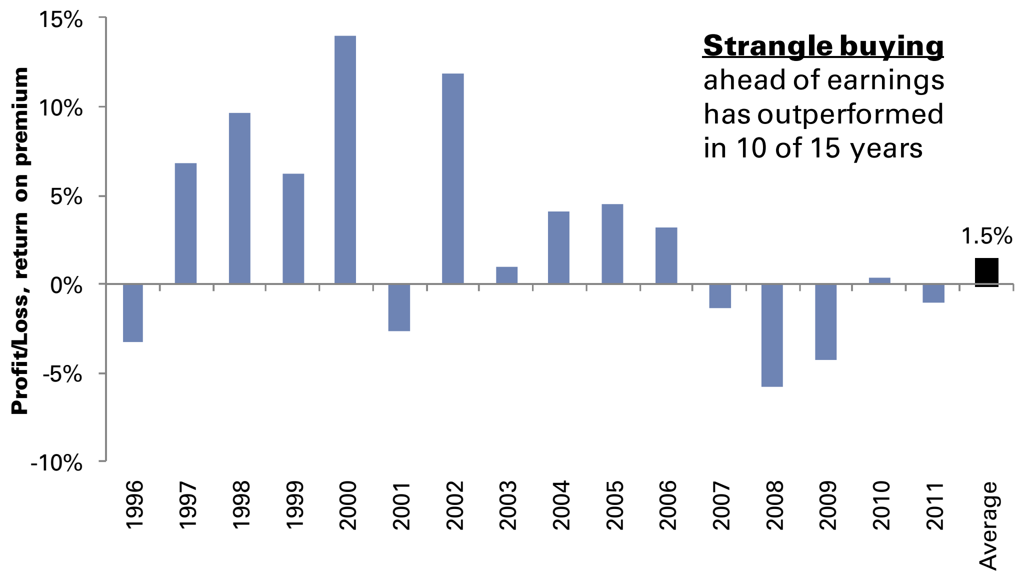
Source: Goldman Sachs Research estimates; 30,295 observations.

(2) VOLATILITY: Option buying has outperformed option selling

Option buying outperformed option selling around earnings events over the period we analyzed. Strangle buying strategies from 5 days before earnings to 1 day after earnings outperformed selling in 10 of 15 years at mid-market prices for an average gain of +1.5%. While small, we find this average to be significant at 2X the standard error. We do not see this as an attractive passive strategy as transaction costs would overwhelm this small systematic profit. This finding is consistent with prior studies that we have performed, but we believe this is counter to the prevailing assumption among investors. While our analysis of index options (see our 2007 report, *Volatility as an Asset*) shows systematic overpricing of options at the index level, our analysis of trading the first out-of-the-money puts and calls on stocks ahead of earnings events show a small systematic under-pricing.

Average breakevens and average earnings event period moves: At trade initiation, strangle breakevens ahead of earnings were +/-10% on average over the period analyzed for options with a maturity of 6-22 business days. The average stock move (absolute value) in the earnings event period (6 days) was +/-6%. Given there was still time value left in the strangle after the earnings event, a 6% move was big enough for strangles to profit on average.

Exhibit 5: Strangle buying has outperformed in 10 of 15 years
Profit/Loss as a % of premium mid-market; average mid-ask spread over the period was 4.5%



Source: Goldman Sachs Research estimates; 10,563 observations.

(3) CONDITIONAL: Set-up ahead of earnings matters; we see mean reversion around earnings

Stocks that underperformed in the 2 weeks ahead of their earnings event period tended to outperform by more during their earnings event period than stocks that outperformed in this prior period. Consequently, earnings event call buying opportunities have been more profitable for these stocks. As a reminder, we define the earnings event period as beginning 5 days before the earnings announcement. We define three categories:

(1) Underperformance ahead of earnings: If stock's underperformance relative to the market over the two weeks prior to the earning event period was more than 3%;

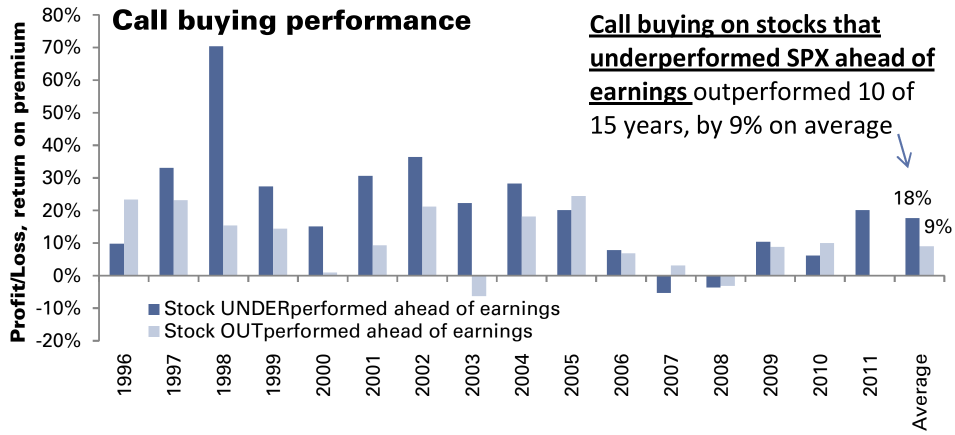
(2) Outperformance ahead of earnings: If stock's outperformance relative to the market over the two weeks prior to the earning event period was more than 3%.

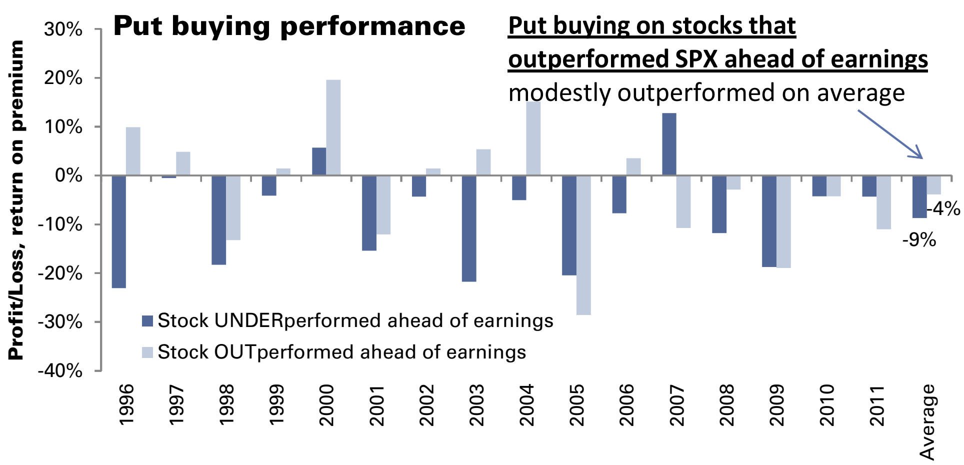
(3) In-line performance: If a stock's performance relative to the market over the two weeks prior to the earning event period was between -3% and +3%.

Underperforming stocks ahead of earnings are not particularly common, but worth noting as they tend to outperform on earnings. Stock performance tends to be in line with the market in the 2 weeks prior to the earnings event period for about half of the observations in our study. We found that stocks underperformed the SPX by 3% or more in the 2 weeks prior to the earnings event period in only 26% of the cases. Stocks in this underperforming category showed stronger positive performance during their earnings event period than those that outperformed ahead of earnings. As one would expect, call buying on these underperformers showed stronger profitability. Conversely, stocks that outperformed ahead of earnings showed weaker performance on earnings day and modestly better performance on put-buying strategies.

We tested several different timeframes and magnitudes of out/underperformance and found generally consistent results.

Exhibit 6: Buying calls on the underperformers ahead of earnings was more profitable than buying calls on stocks that outperformed in the 2 weeks ahead of earnings event period
Profit/Loss as a % of premium mid-market; average mid-ask spread over the period was 4.5%





Source: Goldman Sachs Research estimates; 14,916 observations for calls, 14,640 observations for puts.

These systematic results help explain our Weekly Options Watch trade recommendations. We look back at the 1,400 trade recommendations we have made over the past 7 years to understand the directional and volatility bias inherent in our process and overall positioning. Call buying trades have dominated our recommendations at 40% of the total. The results of this study help to confirm our event trade bias is reasonable.

Exhibit 7: WOW recommendations are dominated by upside volatility buying strategies
% of trades by type 2005 to present

	LONG VOL	SHORT VOL	NEUTRAL VOL	total
UPSIDE	40%	8%	4%	51%
DOWNSIDE	17%	11%	2%	31%
NEUTRAL	8%	10%	0%	18%
total	64%	29%	6%	

Source: Goldman Sachs Research estimates.

Current option buying candidates

Based on our study, we focus on option buying opportunities in stocks that have significantly outperformed or underperformed where our analysts' fundamental views are counter to the recent stock movement. We screen based on:

- Stock performance over the past two weeks vs. the S&P 500
- Our analysts' stock ratings and EPS estimates vs. consensus for the next 4 quarters
- 1 month implied volatility below 75th percentile vs. the past year to screen out unusually high implied volatility stocks.

We identify 15 call buying candidates where the stocks have on average underperformed the S&P 500 by 6% over the past two weeks. Our analysts are Buy or Neutral rated on each of these stocks and see an average of 16% upside to consensus EPS estimates (next 4 quarters). Investors who buy calls risk losing premium paid if shares close below the strike price on expiration.

Exhibit 8: Call buying candidates based on our analyst views where the set-up appears attractive for asymmetric upside
based on 2 week performance vs. S&P, stock ratings, GS vs. consensus EPS estimates for sum of next 4Q, 50 delta call implied volatility

Call Buying candidates

							1-month		
	Name	Rating	Stock Price	Stock 2-week Outperformance	Upside to consensus	Earnings Date	Imp Vol	%-ile Rank	Imp-Rlzd
MMI	Motorola Mobility Holdings Inc.	B	21.04	-10%	27%	28-Jul	43	58	2.8
USG	USG Corporation	N	13.50	-8%	10%	21-Jul	41	16	7.7
NE	Noble Corporation	B	36.14	-7%	5%	20-Jul	33	52	8.2
TER	Teradyne, Inc.	B	13.74	-7%	16%	27-Jul	42	53	5.7
BBD	Banco Bradesco (ADR)	B	18.70	-7%	5%	27-Jul	31	67	4.9
CMA	Comerica, Inc.	N	32.67	-6%	20%	19-Jul	29	51	3.2
DOW	Dow Chemical Company	B	34.05	-6%	2%	27-Jul	32	66	4.6
WLP	WellPoint, Inc.	N	75.95	-5%	9%	27-Jul	27	58	1.3
FITB	Fifth Third Bancorp	N	12.02	-5%	19%	21-Jul	32	36	4.5
HBAN	Huntington Bancshares Inc.	B (CL)	6.19	-5%	32%	21-Jul	35	41	5.2
BLK	BlackRock, Inc.	B	183.69	-4%	4%	20-Jul	29	72	-0.2
CCE	Coca-Cola Enterprises, Inc.	B	28.34	-4%	5%	28-Jul	22	59	0.0
HAS	Hasbro, Inc.	B (CL)	43.25	-4%	12%	18-Jul	27	66	3.7
KEY	KeyCorp	N	8.01	-3%	7%	19-Jul	30	22	5.6
DHI	D.R. Horton, Inc.	N	11.59	-3%	64%	28-Jul	35	28	7.8

Source: Goldman Sachs Research estimates.

We identify 12 put buying candidates where the stocks have, on average, outperformed the S&P 500 by 5% over the past two weeks. Our analysts are Sell or Neutral rated on each of these stocks and see an average of 10% downside to consensus EPS estimates (next 4 quarters). Investors who buy puts risk losing premium paid if shares close above the strike price on expiration.

Exhibit 9: Put buying candidates based on our analyst views where set-up appears attractive for asymmetric downside
based on 2 week performance vs. S&P, stock ratings, GS vs. consensus EPS estimates for sum of next 4Q, 50 delta call implied volatility

Put Buying candidates

							1-month		
	Name	Rating	Stock Price	Stock 2-wk Outperformance	Upside to consensus	Earnings Date	Imp Vol	%-ile Rank	Imp-Rlzd
WYNN	Wynn Resorts, Limited	N	156.83	14%	-2%	28-Jul-11	39	56	6.8
OSK	Oshkosh Corp.	N	31.38	10%	-6%	28-Jul-11	38	58	-13.4
LVS	Las Vegas Sands Corp.	N	43.35	5%	-20%	27-Jul-11	44	28	7.9
AKS	AK Steel Holding	S	15.37	5%	-5%	26-Jul-11	43	31	-0.6
JNY	Jones Apparel Group	S	11.09	5%	-8%	27-Jul-11	45	62	8.1
GT	The Goodyear Tire & Rubber Co.	N	17.15	4%	-3%	29-Jul-11	47	64	17.4
SWN	Southwestern Energy Co.	N	43.28	4%	-21%	28-Jul-11	30	23	5.2
CHK	Chesapeake Energy Corp.	N	29.77	4%	-24%	28-Jul-11	35	65	6.2
KIM	Kimco Realty Corp.	S	19.35	3%	-3%	26-Jul-11	28	37	11.4
RRC	Range Resources Corp.	N	54.88	3%	-22%	25-Jul-11	36	22	6.2
ROC	Rockwood Holdings, Inc.	N	55.79	3%	-8%	27-Jul-11	39	73	8.3
MSFT	Microsoft Corp.	N	26.54	3%	-3%	21-Jul-11	24	74	4.1

N = Neutral; S = Sell

Source: Goldman Sachs Research estimates.

Appendix: Methodology and annual results

Stock Universe: We started with a universe of 1,000+ unique stocks and 30,000+ unique earnings events in our study. We aimed to include all stocks with the potential to have liquid options over the time period, including all stocks that were part of the S&P 500 in each of the 15 years. To adjust for survivorship bias, we have included companies such as ABK, LEH and NT until their options liquidity declined to below our thresholds (discussed below). We included scores of companies that were actively traded in the options market, but were acquired or merged during the period, including companies such as BUD, BSC, DJ, FD, EDS, GDT, NXTL, and SEBL.

Event dates: We obtained the corporate earnings report dates from Streetevents, Compustat and company websites. We believe the accuracy of our earnings dates is a key advantage of our study. Over the past 7 years we have taken great care to verify earnings dates following each earnings season.

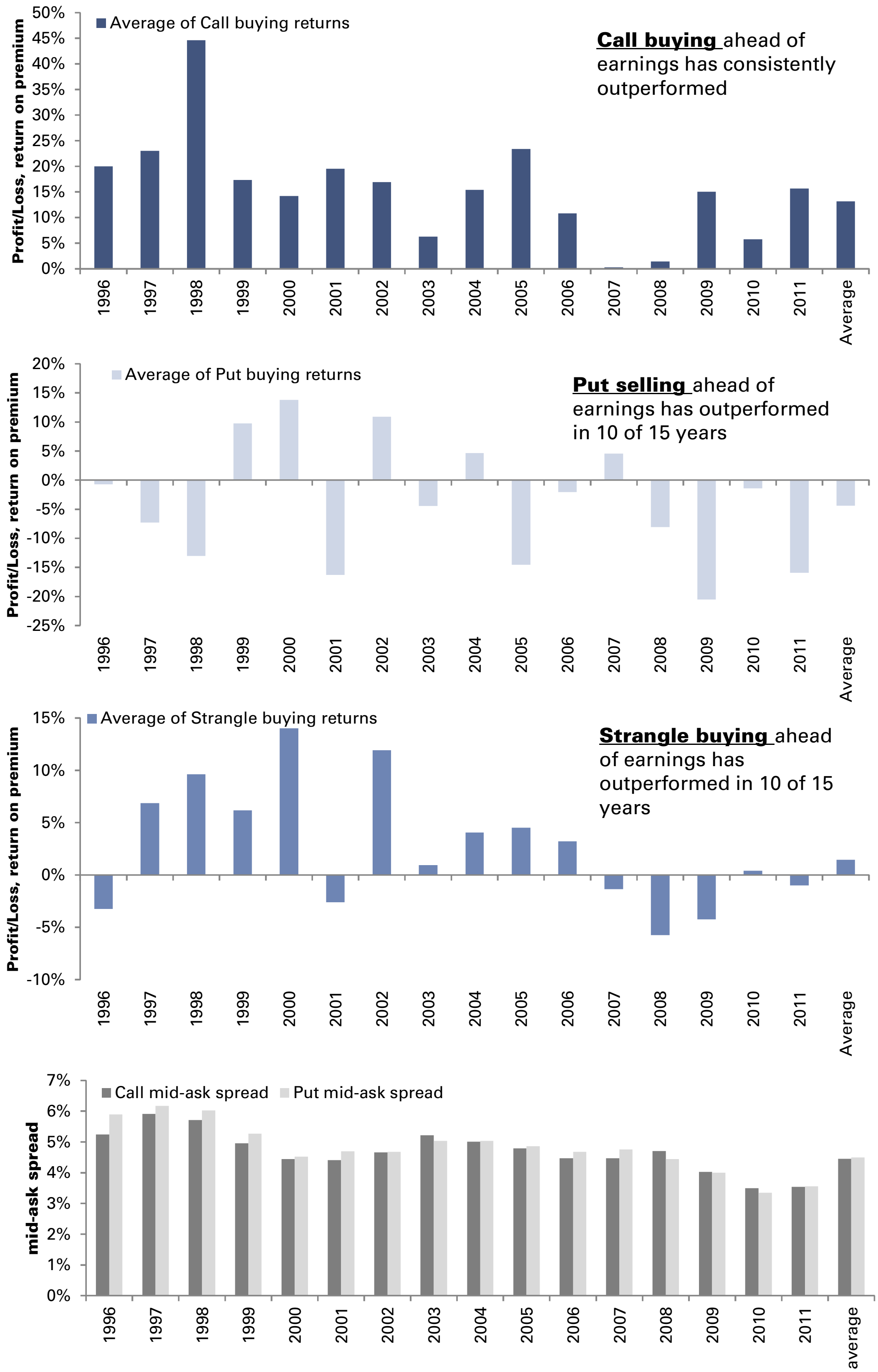
Options liquidity screening: In our study, we aimed to make the results as close to what an investor might have experienced if they only traded those events where the bid-ask spread was below some prohibitively large number. We chose a 10% bid/ask-to-mid spread of the put and the call option as the arbitrary cut-off beyond which an investor would not likely trade the option. While this may seem like a large spread, when you consider a 10% bid/ask-to-mid spread on the option may be only a 50 bp bid-ask spread on the notional value of the position (if you pay $0.50 from mid-market on a $100 strike call that costs $5, the transaction cost is only 50 bp of your notional exposure). We arrived at about 750 unique stocks and about 19,000 unique earnings events with liquid calls and/or puts for the options portion of our study. Liquidity in the options market has improved dramatically over the past 15 years. This improved liquidity has led to tighter bid-ask spreads for options investors and expanded the opportunity set for fundamental investors to use options.

Options data source: We back-tested passive options strategies over the past 15 years (62 quarters) using actual listed bid-ask pricing data from OptionMetrics. We used listed options data to mimic actual trading dynamics as closely as possible. We believe the end-of-day bid-ask spreads observed by our analysis are particularly conservative as bid-ask spreads tend to widen into the close each day.

Timing, strike and term of trade: In our base case scenario we simulated buying the option 5 business days before the event and simulated closing the position 1 business day after the event. We selected the nearest out-of-the money puts and calls from the closest available expiration capturing the earnings event.

Profit/Loss calculations: In many cases, we express Profit and Loss (P&L) as a % of initial premium. In the case of delta hedged results, the profit is shown as a % of the initial stock price. In each exhibit we indicate the average bid-mid spread over the observation period.

Exhibit 10: Performance of systematic option buying strategies 1996-present
Profit/Loss as a % of premium mid-market; average bid-mid spread over the period was 4.5%



Source: Goldman Sachs Research estimates.

Reg AC

I, John Marshall, hereby certify that all of the views expressed in this report accurately reflect my personal views about the subject company or companies and its or their securities. I also certify that no part of my compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in this report.

Investment Profile

The Goldman Sachs Investment Profile provides investment context for a security by comparing key attributes of that security to its peer group and market. The four key attributes depicted are: growth, returns, multiple and volatility. Growth, returns and multiple are indexed based on composites of several methodologies to determine the stocks percentile ranking within the region's coverage universe.

The precise calculation of each metric may vary depending on the fiscal year, industry and region but the standard approach is as follows:

Growth is a composite of next year's estimate over current year's estimate, e.g. EPS, EBITDA, Revenue. **Return** is a year one prospective aggregate of various return on capital measures, e.g. CROCI, ROACE, and ROE. **Multiple** is a composite of one-year forward valuation ratios, e.g. P/E, dividend yield, EV/FCF, EV/EBITDA, EV/DACF, Price/Book. **Volatility** is measured as trailing twelve-month volatility adjusted for dividends.

Quantum

Quantum is Goldman Sachs' proprietary database providing access to detailed financial statement histories, forecasts and ratios. It can be used for in-depth analysis of a single company, or to make comparisons between companies in different sectors and markets.

GS SUSTAIN

GS SUSTAIN is a global investment strategy aimed at long-term, long-only performance with a low turnover of ideas. The GS SUSTAIN focus list includes leaders our analysis shows to be well positioned to deliver long term outperformance through sustained competitive advantage and superior returns on capital relative to their global industry peers. Leaders are identified based on quantifiable analysis of three aspects of corporate performance: cash return on cash invested, industry positioning and management quality (the effectiveness of companies' management of the environmental, social and governance issues facing their industry).

Disclosure Appendix

Coverage group(s) of stocks by primary analyst(s)

Compendium report: please see disclosures at http://www.gs.com/research/hedge.html. Disclosures applicable to the companies included in this compendium can be found in the latest relevant published research.

Option Specific Disclosures

Price target methodology: Please refer to the analyst's previously published research for methodology and risks associated with equity price targets.

Pricing Disclosure: Option prices and volatility levels in this note are indicative only, and are based on our estimates of recent mid-market levels. All prices and levels exclude transaction costs unless otherwise stated.

Buying Options - Investors who buy call (put) options risk loss of the entire premium paid if the underlying security finishes below (above) the strike price at expiration. Investors who buy call or put spreads also risk a maximum loss of the premium paid. The maximum gain on a long call or put spread is the difference between the strike prices, less the premium paid.

Selling Options - Investors who sell calls on securities they do not own risk unlimited loss of the security price less the strike price. Investors who sell covered calls (sell calls while owning the underlying security) risk having to deliver the underlying security or pay the difference between the security price and the strike price, depending on whether the option is settled by physical delivery or cash-settled. Investors who sell puts risk loss of the strike price less the premium received for selling the put. Investors who sell put or call spreads risk a maximum loss of the difference between the strikes less the premium received, while their maximum gain is the premium received.

For options settled by physical delivery, the above risks assume the options buyer or seller, buys or sells the resulting securities at the settlement price on expiry.

Company-specific regulatory disclosures

Compendium report: please see disclosures at http://www.gs.com/research/hedge.html. Disclosures applicable to the companies included in this compendium can be found in the latest relevant published research.

Distribution of ratings/investment banking relationships

Goldman Sachs Investment Research global coverage universe

	Rating Distribution			Investment Banking Relationships		
	Buy	Hold	Sell	Buy	Hold	Sell
Global	32%	54%	14%	52%	41%	37%

As of July 1, 2011, Goldman Sachs Global Investment Research had investment ratings on 3,167 equity securities. Goldman Sachs assigns stocks as Buys and Sells on various regional Investment Lists; stocks not so assigned are deemed Neutral. Such assignments equate to Buy, Hold and Sell for the purposes of the above disclosure required by NASD/NYSE rules. See 'Ratings, Coverage groups and views and related definitions' below.

Price target and rating history chart(s)

Compendium report: please see disclosures at http://www.gs.com/research/hedge.html. Disclosures applicable to the companies included in this compendium can be found in the latest relevant published research.

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