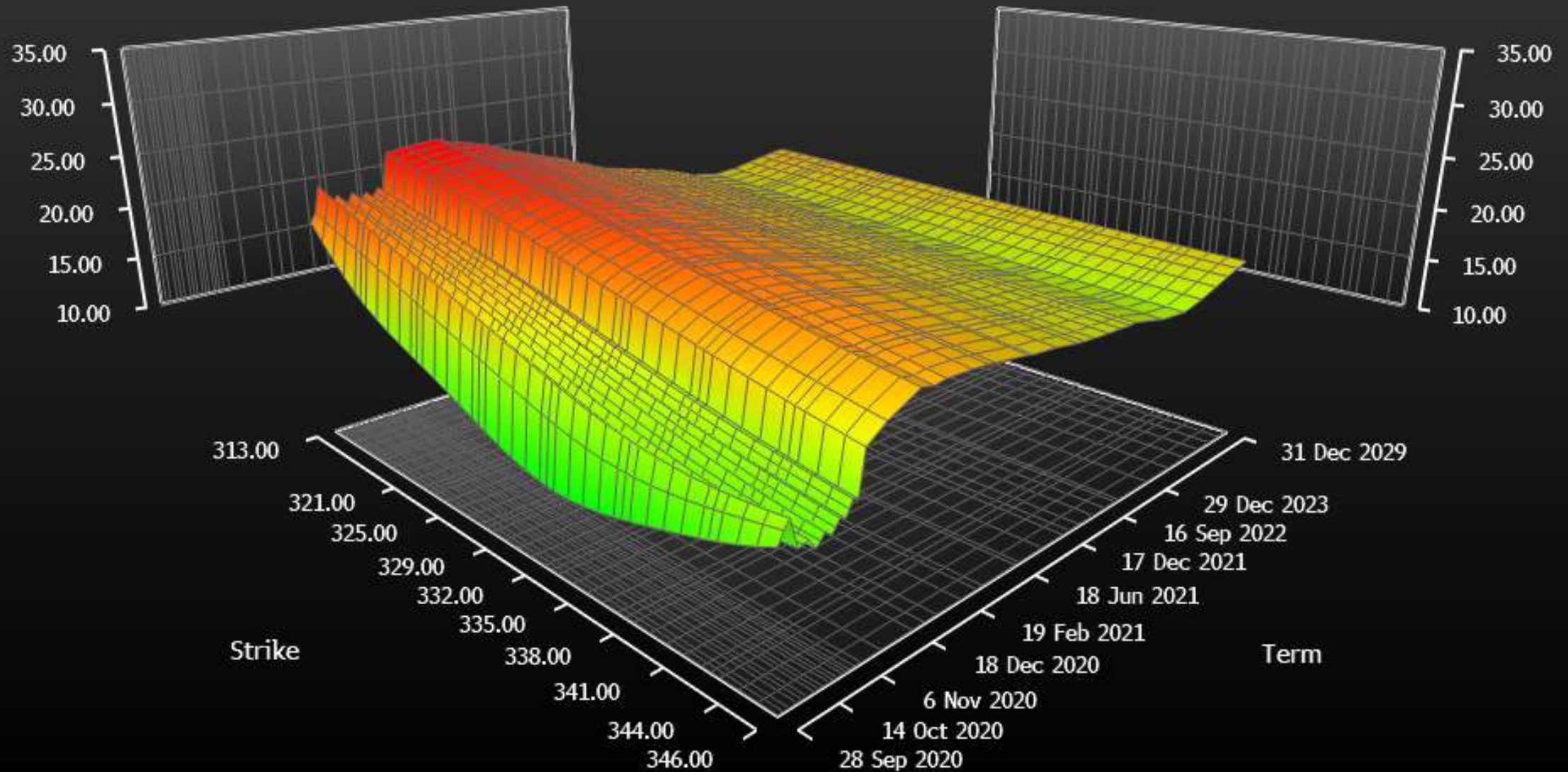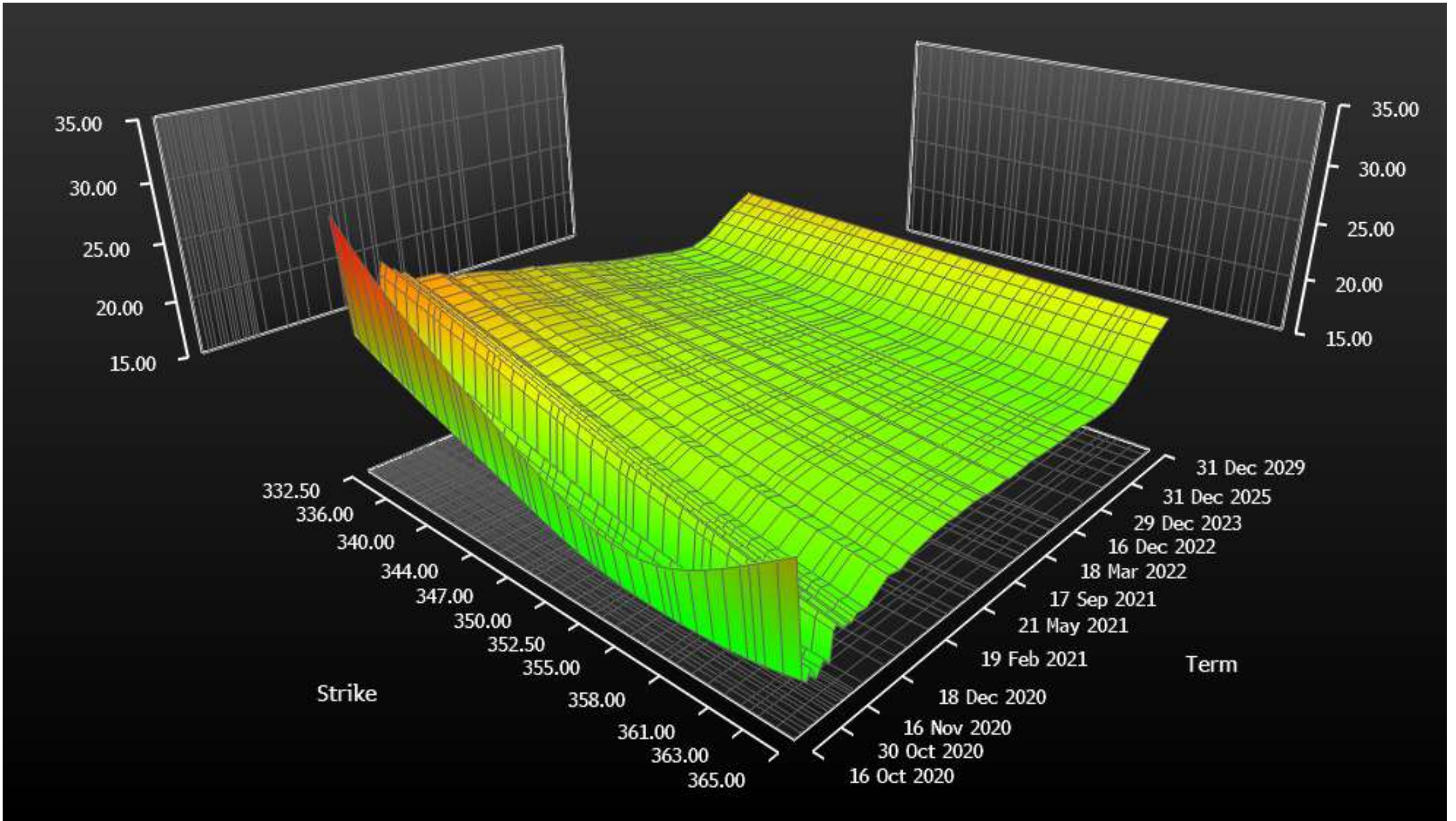# Options Trading

SPY Vol Surface 28 sep

SPY vol surface 14 Oct

SPY options table for Nov 20 expiry
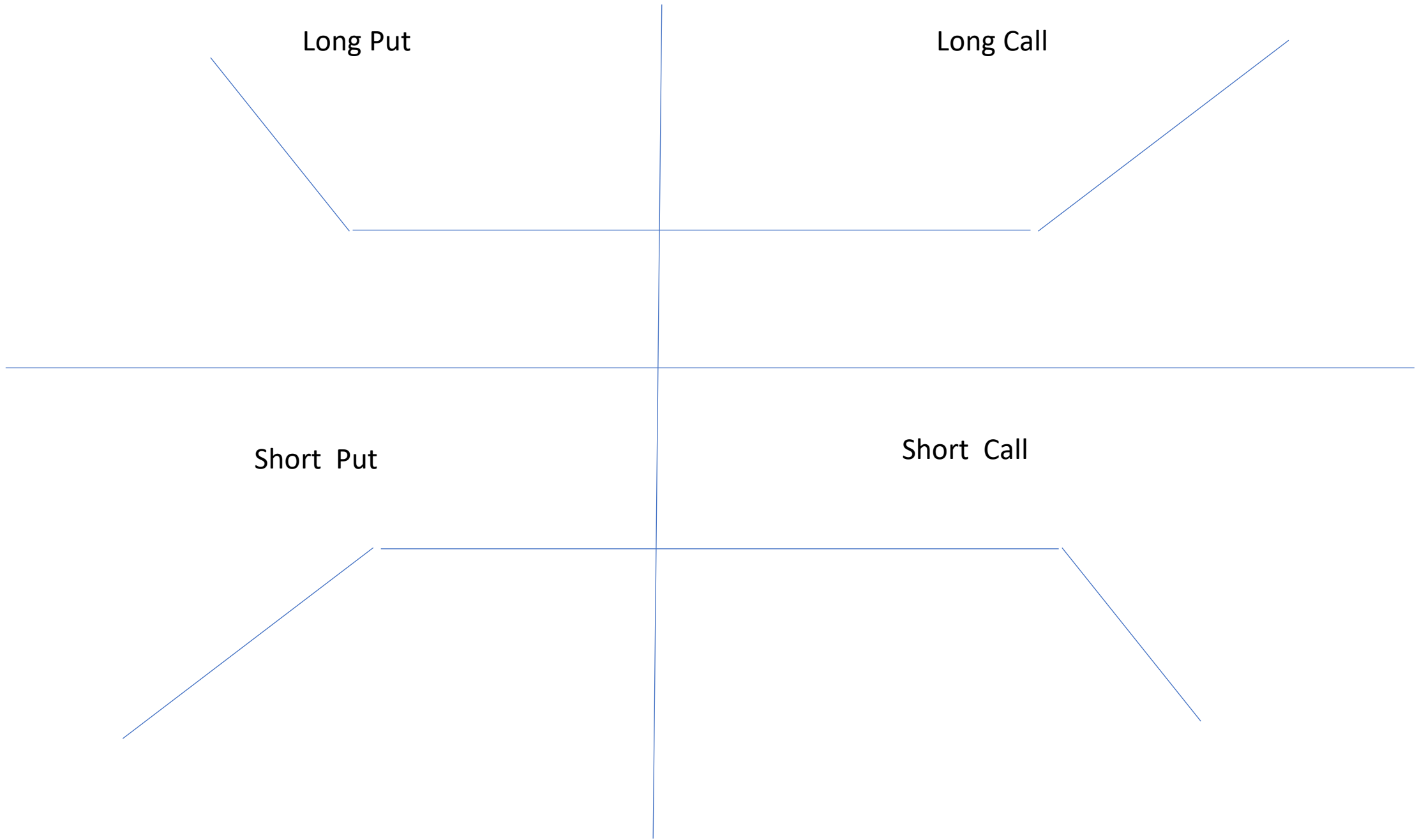
NOV 16 '20   NOV 18 '20   **NOV 20 '20 37 DAYS**   NOV 27 '20   MORE ▾

TABBED VIEW ▾   5.0 SD ▾   SMART ▾   SPY ▾ 100

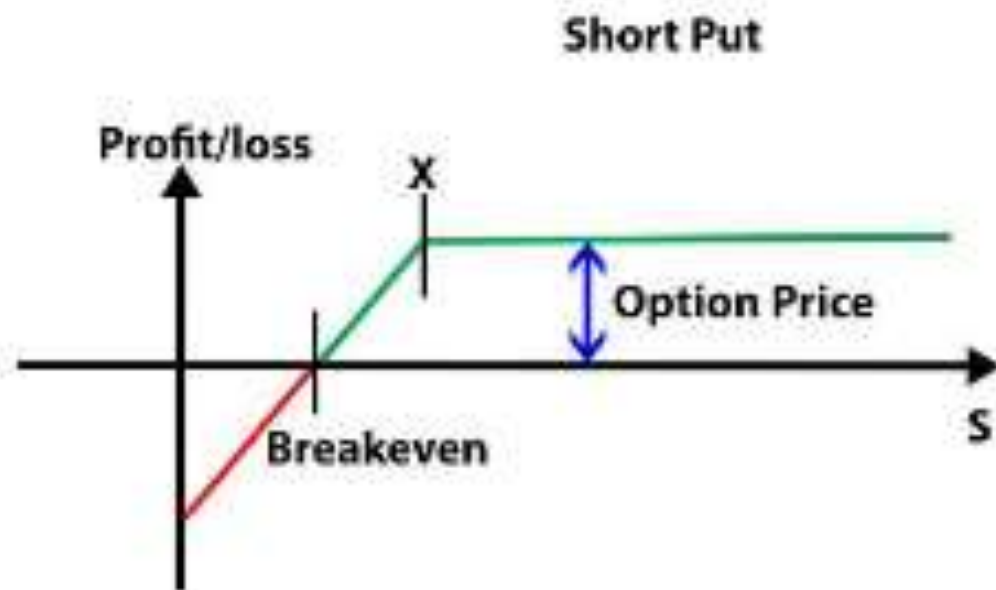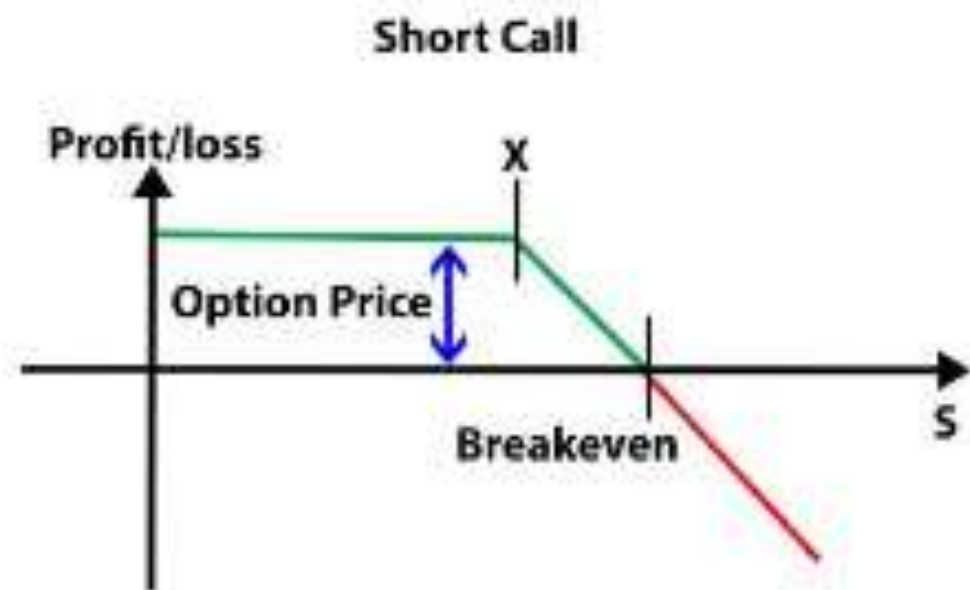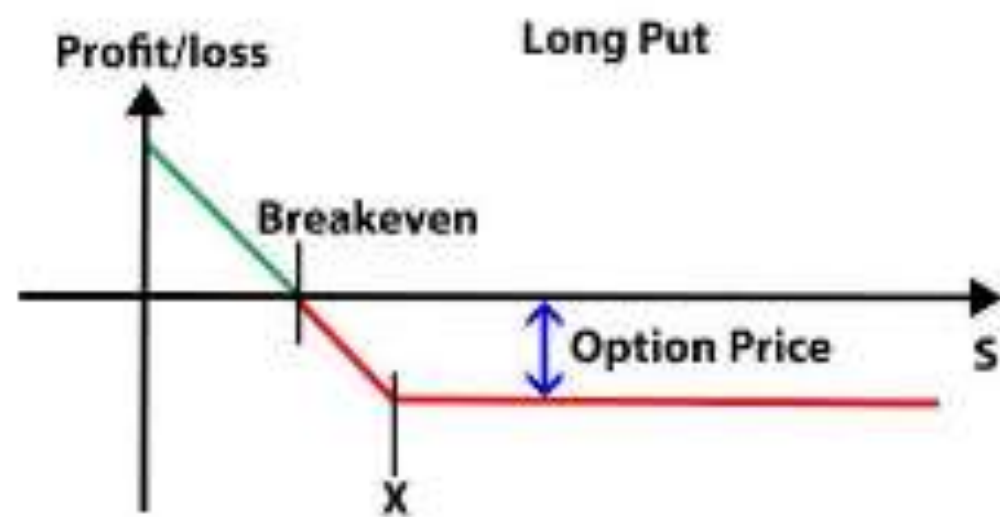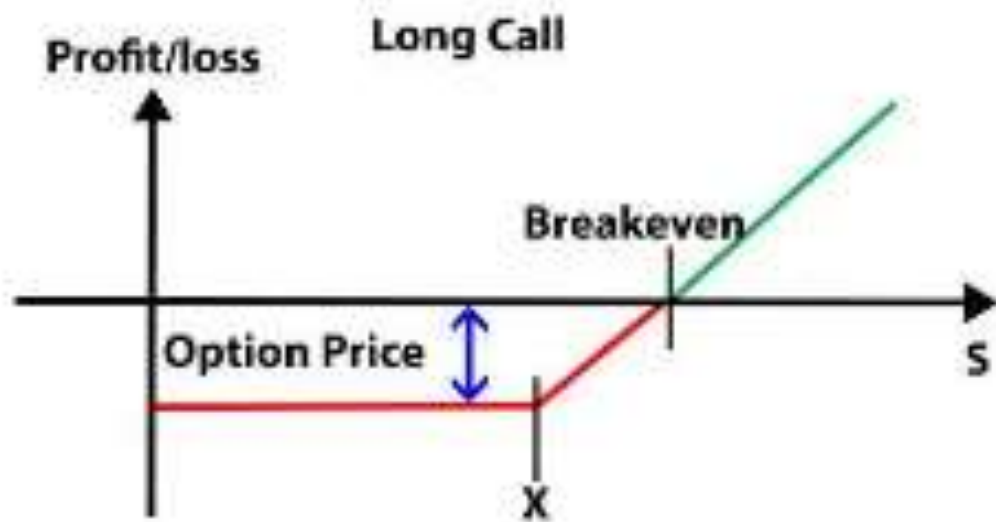|				CALLS								STRIKE						PUTS					
IMPLD	OPTN OPN I	VOLUME	BID SIZE	BID	LAST	ASK	ASK SIZE	DELTA	GAMMA	VEGA	THETA		IMPLD	OPTN OPN I	VOLUME	BID SIZE	BID	LAST	ASK	ASK SIZE	DELTA	GAMMA	VEGA	THETA
28%	8.26K	831	47	23.08	23.18	23.16	104	0.744	0.011	0.362	-0.137	330	27.8%	59.6K	2.75K	362	5.04	5.07	5.08	412	-0.256	0.011	0.362	-0.136
27.5%	2.20K		53	22.27	c24.36	22.36	50	0.734	0.011	0.377	-0.138	331	27.4%	4.94K	14.1K	326	5.24	5.24	5.28	1,313	-0.266	0.011	0.377	-0.137
27.3%	2.97K	20	53	21.46	c23.55	21.57	77	0.724	0.011	0.377	-0.138	332	27.2%	14.1K	788	277	5.45	5.46	5.49	378	-0.276	0.011	0.377	-0.137
27%	14.1K	50	53	20.70	20.77	20.79	131	0.714	0.012	0.378	-0.139	333	27%	22.8K	13.2K	526	5.66	5.62	5.71	438	-0.286	0.012	0.378	-0.138
26.7%	9.99K	59	53	19.90	20.60	20.01	106	0.703	0.012	0.379	-0.140	334	26.6%	7.55K	841	172	5.89	5.84	5.93	275	-0.297	0.012	0.379	-0.139
26.5%	4.85K	84	98	19.16	19.61	19.24	100	0.692	0.012	0.379	-0.141	335	26.4%	24.2K	7.79K	172	6.12	6.14	6.16	220	-0.308	0.012	0.379	-0.140
26.1%	9.25K	33	52	18.40	19.23	18.48	108	0.681	0.013	0.380	-0.143	336	26.1%	5.48K	970	171	6.36	6.38	6.40	205	-0.319	0.013	0.380	-0.142
26.1%	4.04K	31	95	17.65	18.14	17.73	108	0.669	0.013	0.412	-0.144	337	25.8%	8.25K	911	151	6.61	6.65	6.65	213	-0.331	0.013	0.412	-0.143
25.6%	14.2K	7	26	16.92	17.38	16.99	142	0.657	0.013	0.413	-0.143	338	25.6%	6.27K	3.32K	56	6.87	6.75	6.91	256	-0.343	0.013	0.413	-0.142
25.4%	14.7K	61	52	16.18	16.51	16.26	171	0.645	0.013	0.413	-0.143	339	25.3%	8.46K	1.02K	394	7.13	7.17	7.18	299	-0.355	0.013	0.413	-0.142
25.1%	16.7K	531	111	15.46	15.46	15.53	79	0.632	0.014	0.414	-0.143	340	25%	28.6K	2.18K	272	7.41	7.39	7.45	15	-0.368	0.014	0.414	-0.142
24.8%	11.0K	168	95	14.75	15.35	14.82	50	0.618	0.014	0.415	-0.144	341	24.7%	14.4K	880	151	7.70	7.64	7.75	189	-0.382	0.014	0.415	-0.143
24.5%	7.14K	100	53	14.05	14.43	14.12	50	0.605	0.014	0.415	-0.144	342	24.4%	12.0K	795	159	8.00	8.01	8.05	181	-0.395	0.014	0.415	-0.143
24.2%	18.1K	392	56	13.37	13.36	13.43	130	0.591	0.015	0.433	-0.144	343	24.1%	3.62K	661	238	8.31	8.36	8.36	139	-0.409	0.015	0.433	-0.143
23.8%	13.0K	382	23	12.70	12.91	12.76	139	0.577	0.015	0.434	-0.143	344	23.8%	3.57K	941	370	8.63	8.67	8.69	216	-0.423	0.015	0.434	-0.142
23.7%	24.2K	4.21K	23	12.04	11.99	12.10	309	0.562	0.015	0.434	-0.142	345	23.6%	39.1K	14.0K	291	8.97	9.00	9.02	37	-0.438	0.015	0.434	-0.140
23.4%	5.86K	779	23	11.39	11.47	11.45	392	0.547	0.016	0.435	-0.141	346	23.3%	5.86K	1.00K	290	9.32	9.35	9.37	32	-0.453	0.016	0.435	-0.140
23%	17.8K	1.51K	103	10.75	10.70	10.81	356	0.531	0.016	0.436	-0.140	347	23%	7.40K	1.46K	133	9.69	9.74	9.74	64	-0.469	0.016	0.436	-0.139
22.9%	8.76K	1.59K	26	10.14	10.09	10.19	178	0.515	0.016	0.436	-0.139	348	22.9%	4.03K	1.76K	135	10.07	10.09	10.12	32	-0.485	0.016	0.436	-0.138
22.5%	5.45K	1.69K	71	9.53	9.51	9.59	513	0.499	0.016	0.437	-0.137	349	22.4%	3.30K	1.06K	335	10.46	10.54	10.52	72	-0.501	0.016	0.437	-0.136
22.2%	64.7K	7.44K	35	8.95	9.03	9.00	263	0.482	0.016	0.437	-0.135	350	22.2%	49.0K	3.49K	491	10.87	10.90	10.94	178	-0.518	0.016	0.437	-0.134
22%	5.39K	987	19	8.38	8.37	8.43	264	0.465	0.017	0.438	-0.133	351	21.9%	7.95K	1.01K	379	11.30	11.36	11.37	128	-0.535	0.017	0.438	-0.131
21.7%	6.65K	2.09K	19	7.83	7.88	7.88	390	0.448	0.017	0.439	-0.131	352	21.6%	5.42K	888	135	11.75	11.32	11.82	219	-0.552	0.017	0.439	-0.130
21.6%	3.63K	1.98K	35	7.30	7.56	7.35	608	0.430	0.017	0.422	-0.129	353	21.5%	1.94K	533	51	12.22	12.06	12.28	60	-0.570	0.017	0.422	-0.128
21.1%	4.95K	933	60	6.78	6.87	6.83	536	0.412	0.017	0.423	-0.125	354	21.1%	3.64K	481	92	12.70	12.39	12.77	110	-0.588	0.017	0.423	-0.124
20.9%	13.0K	1.24K	22	6.30	6.29	6.34	966	0.394	0.017	0.424	-0.122	355	20.9%	6.40K	524	184	13.20	13.25	13.28	168	-0.606	0.017	0.423	-0.121
20.6%	7.54K	1.12K	144	5.81	6.00	5.86	352	0.376	0.017	0.424	-0.119	356	20.5%	1.20K	143	51	13.73	13.91	13.81	52	-0.624	0.017	0.424	-0.118
20.5%	7.93K	871	47	5.36	5.40	5.41	836	0.358	0.017	0.425	-0.116	357	20.5%	761	67	51	14.28	14.34	14.35	50	-0.642	0.017	0.425	-0.115
20%	6.32K	1.23K	35	4.93	4.91	4.98	959	0.340	0.017	0.393	-0.112	358	20.2%	358	46	52	14.84	14.92	14.92	50	-0.660	0.017	0.393	-0.111
19.9%	3.61K	487	47	4.52	4.57	4.57	1,088	0.321	0.017	0.393	-0.108	359	19.8%	363	18	51	15.43	14.64	15.52	52	-0.679	0.017	0.393	-0.107
19.6%	36.4K	2.79K	25	4.14	4.19	4.18	605	0.303	0.016	0.394	-0.104	360	19.6%	4.45K	422	154	16.04	16.09	16.13	136	-0.697	0.016	0.394	-0.103
19.5%	4.71K	904	84	3.77	3.96	3.81	425	0.285	0.016	0.394	-0.101	361	19.5%	148	8	53	16.66	17.02	16.77	52	-0.715	0.016	0.394	-0.100
19.3%	3.00K	612	290	3.42	3.52	3.47	774	0.268	0.016	0.350	-0.096	362	19.2%	247	9	52	17.33	17.40	17.44	53	-0.733	0.016	0.350	-0.095
19%	3.27K	862	426	3.10	3.15	3.15	1,288	0.250	0.015	0.351	-0.092	363	18.9%	203	11	52	18.01	17.10	18.15	29	-0.750	0.015	0.351	-0.091
18.8%	4.25K	519	201	2.81	2.81	2.85	1,032	0.233	0.015	0.351	-0.087	364	18.7%	42	1	3	18.70	18.88	18.81	52	-0.767	0.015	0.351	-0.086
18.7%	8.68K	4.70K	448	2.53	2.58	2.57	648	0.217	0.014	0.338	-0.083	365	18.5%	600	105	71	19.44	19.06	19.53	74	-0.784	0.014	0.337	-0.082
18.4%	4.12K	460	280	2.28	2.29	2.32	1,431	0.201	0.014	0.300	-0.078	366	18.2%	75		2	20.16	c18.44	20.28	52	-0.800	0.014	0.300	-0.077
18.3%	4.21K	337	206	2.05	2.09	2.08	392	0.185	0.013	0.301	-0.074	367	18.1%	69		24	20.91	c19.16	21.05	52	-0.815	0.013	0.300	-0.073
18.2%	1.77K	216	136	1.84	1.87	1.87	834	0.170	0.013	0.301	-0.070	368	18%	80	2	23	21.70	21.62	21.84	52	-0.830	0.013	0.301	-0.069

Long Put

Long Call

Short Put

Short Call

Long Call

Profit/loss

Breakeven

Option Price

S

X

Long Put

Profit/loss

Breakeven

Option Price

S

X

Short Call

Profit/loss

X

Option Price
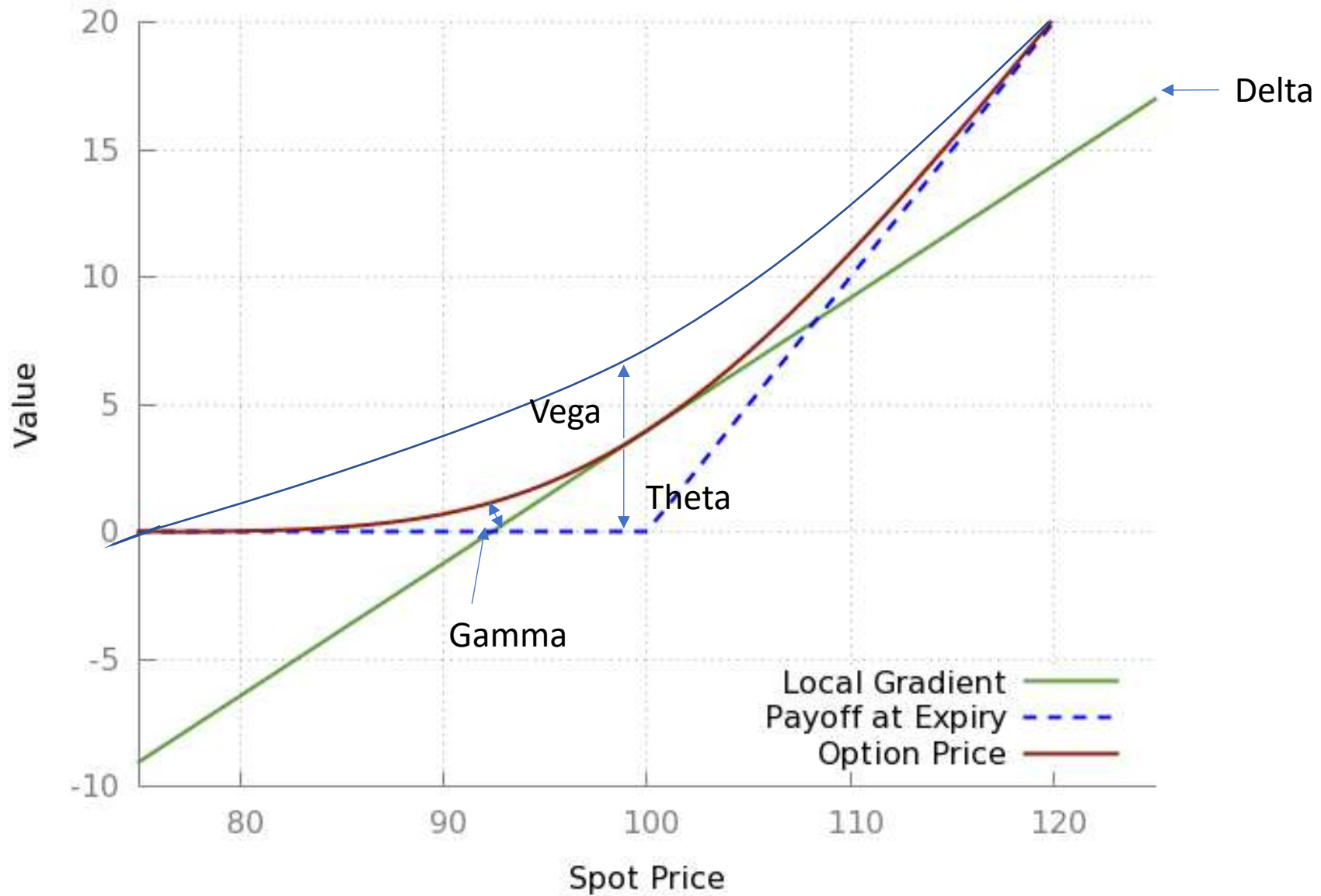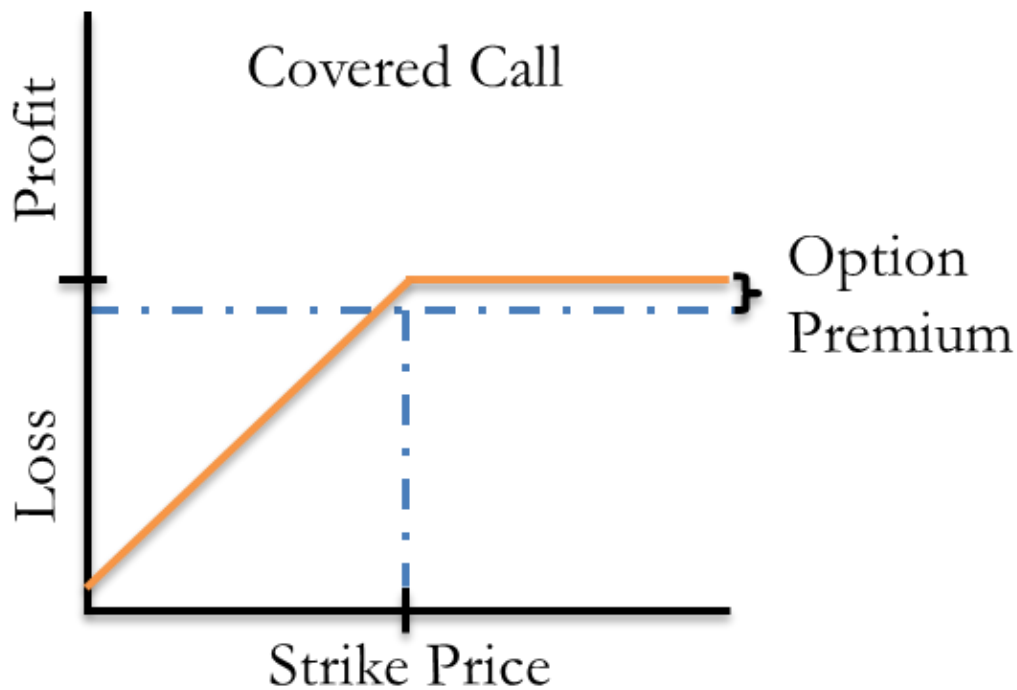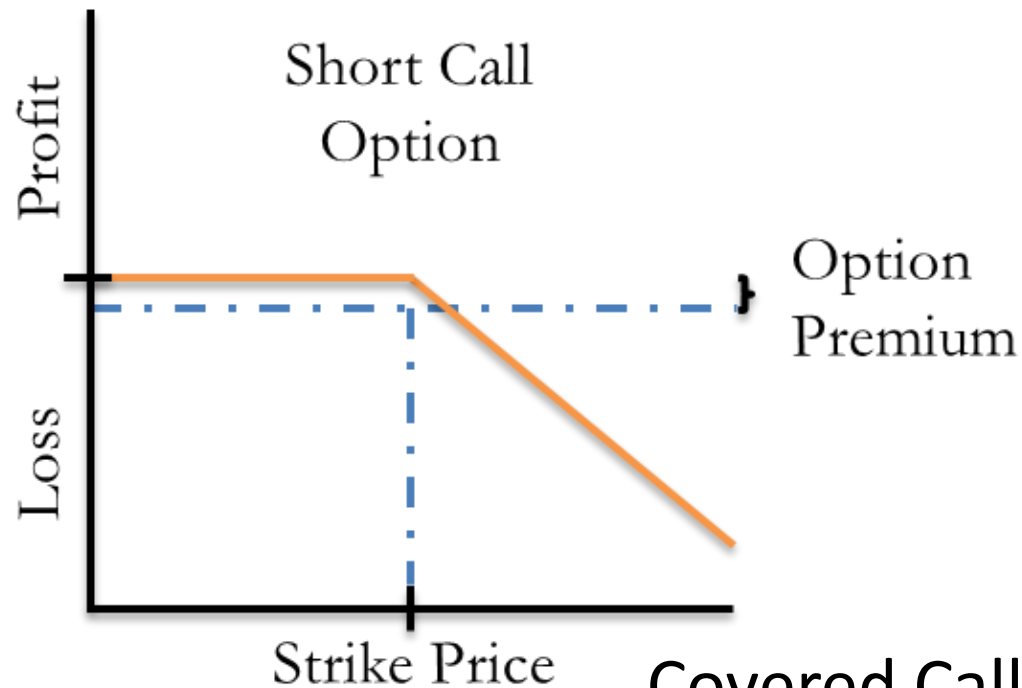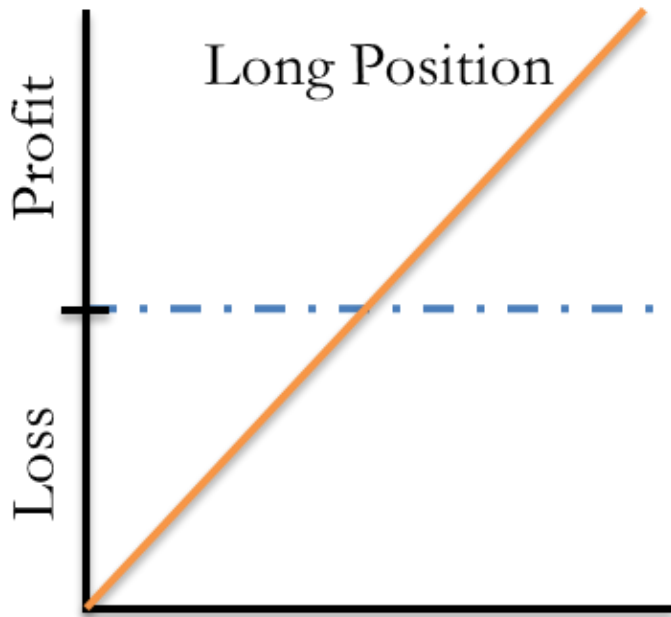
Breakeven

S

Short Put

Profit/loss

X

Option Price

Breakeven

S

The Greeks

- Delta: 1st derivative of value by price, i.e. d(value)/d(underlying)
  - Measures the amount of equivalent stock the option gives you exposure to
  - Probability of the option being in the money
- Gamma: 2nd derivative of value by price, i.e. d2(value)/d2(underlying)
  - Measures the extra amount of stock exposure you get on top fo the delta when the price moves
- Theta: 1st derivative of value by time, i.e. d(value)/d(time)
  - How much option premium you lose every day if the stock price doesn't move at all
- Vega: 1st derivative of value by volatility, i.e. d(value)/d(vol)
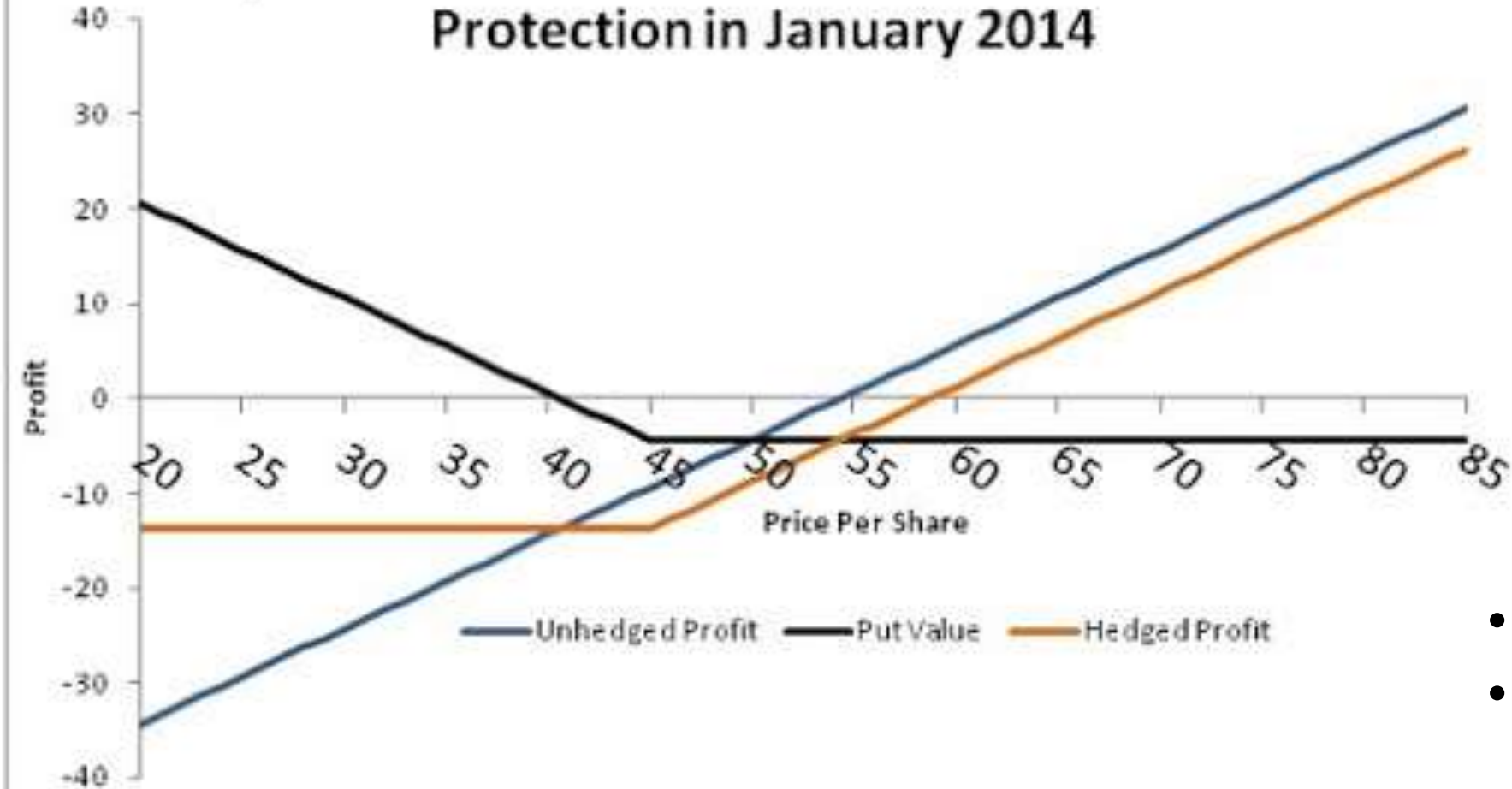 - How much option premium you make if the volatility goes up

Greeks on a graph

Covered Call
- Sell as many options as you have stock
- Remember that equity options trade in multiples of 100
- Pro: you get extra income
- Con: you give up upside

Payoff Structure For GDX With and Without Put Protection in January 2014

- Protective put
- Buy a put as insurance in case the market crashes
- Pro: less likely to lose money if there is a collapse
- Con: you are paying for the insurance

SPY 50 delta vol, VIX and VXX

How to choose which options to trade?

- Do your homework:
  - Look at the distributions over the time horizon you are interested in
  - Make sure you are trading a liquid market otherwise assess the value of the option
  - There is more risk when you sell than when you buy
- Look for liquid options & strike: reduces transaction costs
- Look at the delta to get a sense of what share exposure you are getting
- If selling covered calls: think of the strike in standard deviations from the current price
  - Never sell more than the amount of shares that you have
  - You can use a liquid proxy if your stock does not have liquid options: adds risk
- Collars can be effective at selling upside potential to protect downside risk

Reading list

- https://www.dallasfed.org/research/eclett/2013/el1312.aspx
- https://www.fidelity.com/learning-center/investment-products/options/selling-covered-calls-video
- https://www.lynalden.com/covered-calls/
- http://vixcentral.com/