



Interpreting the Risk Measures

Material prepared by
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stock price = 99.50 time to May expiration = 8 weeks

volatility = 35% interest rate = 4.00% dividend = 0

	th. <u>value</u>	<u>delta</u>	<u>gamma</u>	<u>theta</u>	<u>vega</u>
May 95 call	8.22	67	2.6	-.0505	.140
May 100 call	5.49	53	2.9	-.0539	.155
May 105 call	3.47	39	2.8	-.0508	.150
May 95 put	3.14	-33	2.6	-.0402	.140
May 100 put	5.39	-47	2.9	-.0430	.155
May 105 put	8.33	-61	2.8	-.0393	.150

sell 10 May 95 calls @ 8.40

buy 7 underlying contracts @ 99.50

total delta

$$\begin{array}{r} -10*67 = -670 \\ +7*100 = +700 \\ \hline +30 \end{array}$$

total gamma

$$\begin{array}{r} -10*2.6 = -26 \\ +7*0 = 0 \\ \hline -26 \end{array}$$

total theta

$$\begin{array}{r} -10*-.0505 = +.505 \\ +7*0 = 0 \\ \hline +.505 \end{array}$$

total vega

$$\begin{array}{r} -10*.140 = -1.40 \\ +7*0 = 0 \\ \hline -1.40 \end{array}$$

Buy 20 May 100 puts @ 5.30

Sell 20 May 95 puts @ 3.20

total delta

$$+20 * -47 = -940$$

$$\underline{-20 * -33 = +660}$$

$$-280$$

total gamma

$$+20 * 2.9 = +58.0$$

$$\underline{-20 * 2.6 = -52.0}$$

$$+6.0$$

total theta

$$+20 * -.0430 = -.860$$

$$\underline{-20 * .0402 = +.804}$$

$$-.056$$

total vega

$$+20 * .155 = +3.10$$

$$\underline{-20 * .140 = -2.80}$$

$$+.30$$

Positive Delta – You want the underlying price to rise

Negative Delta – You want the underlying price to fall

Positive Gamma – You want the underlying market to make a big move, or move very quickly

Negative Gamma – You want the underlying market to sit still, or move very slowly

Positive Theta – The passage of time will increase the value of your position

Negative Theta – The passage of time will reduce the value of your position

Positive Vega – You want implied volatility to rise

Negative Vega – You want implied volatility to fall

Positive Rho – You want interest rates to rise

Negative Rho – You want interest rates to fall

Positive Delta

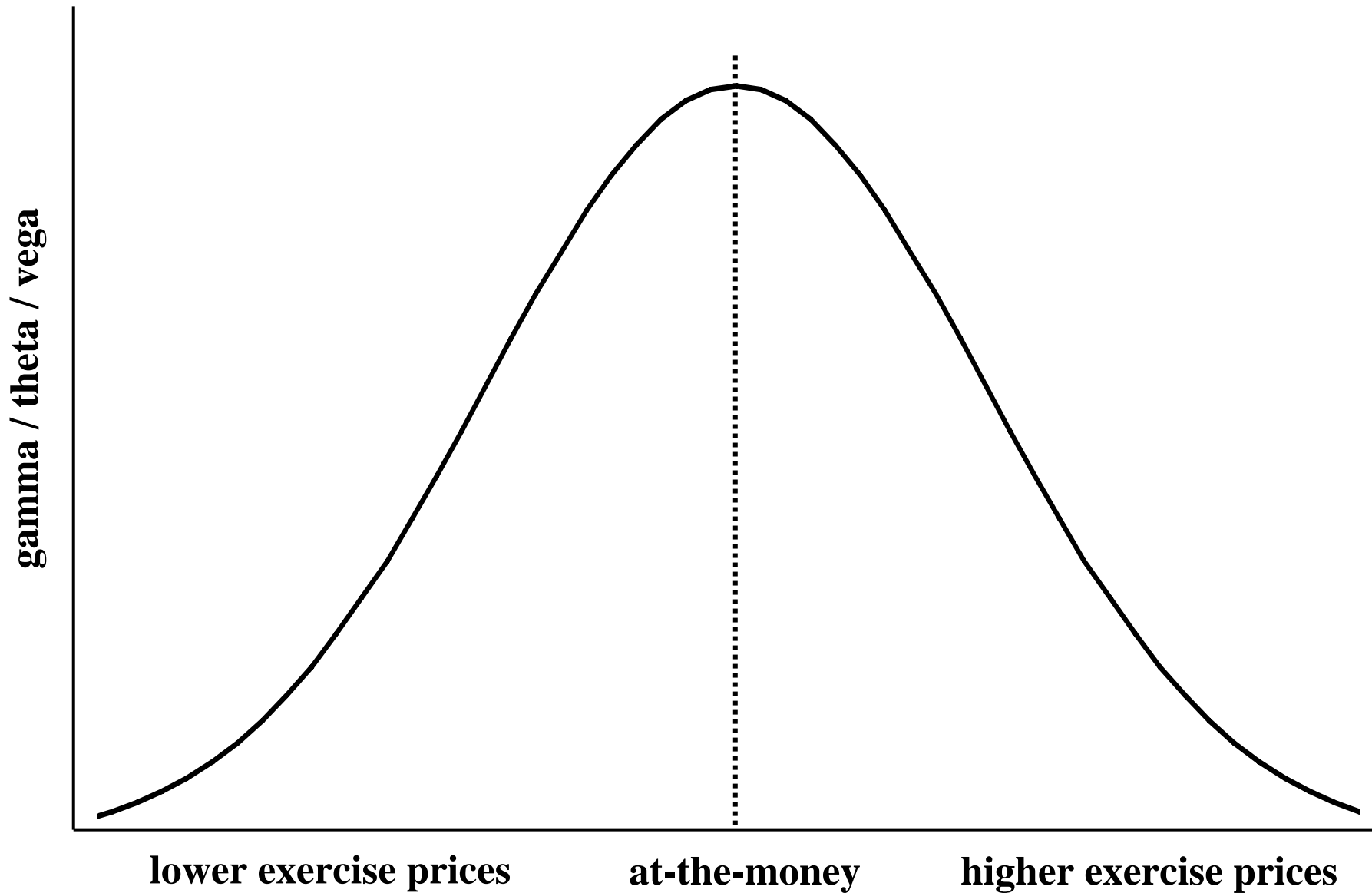
Negative Gamma

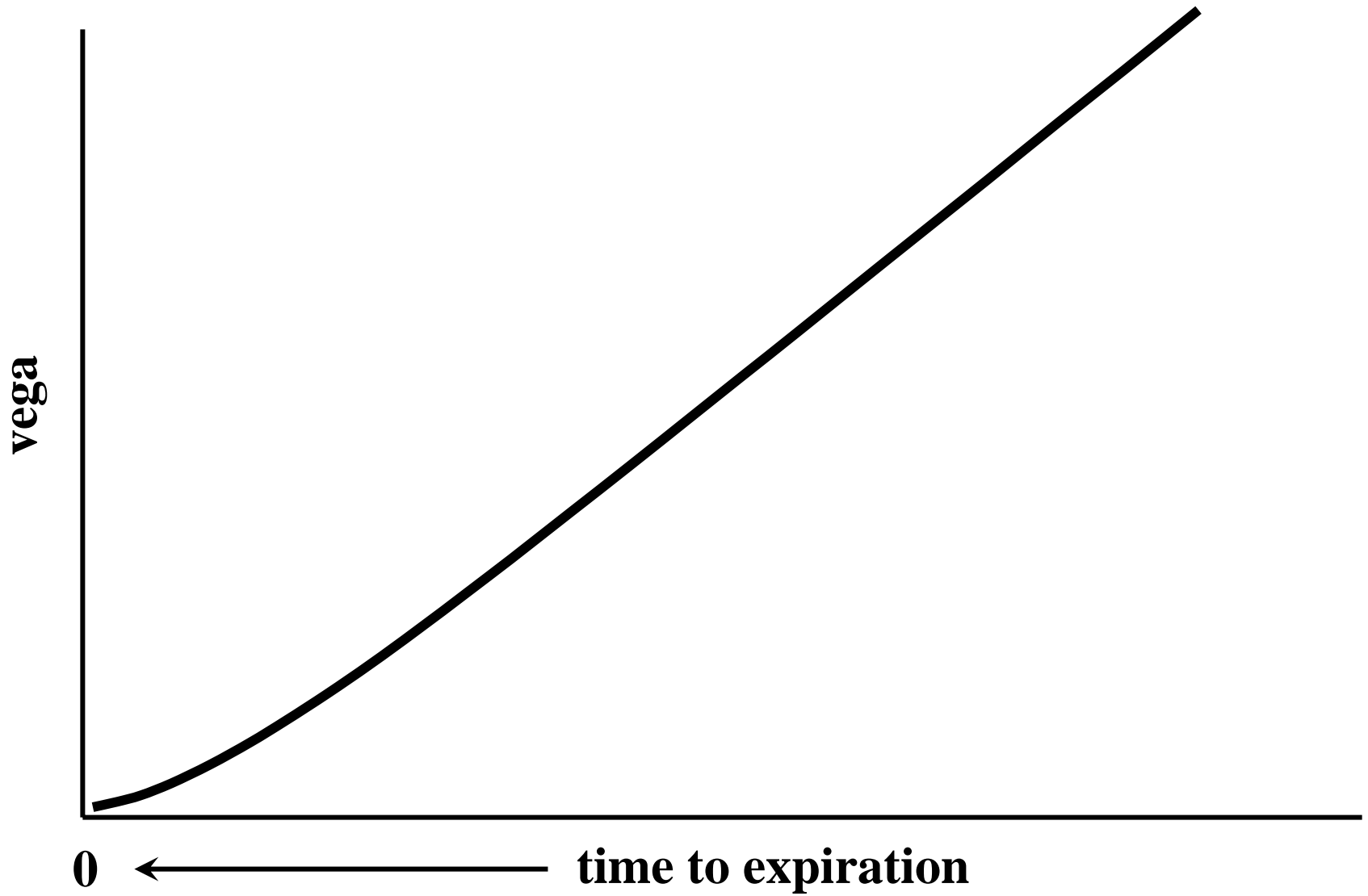
Positive Theta

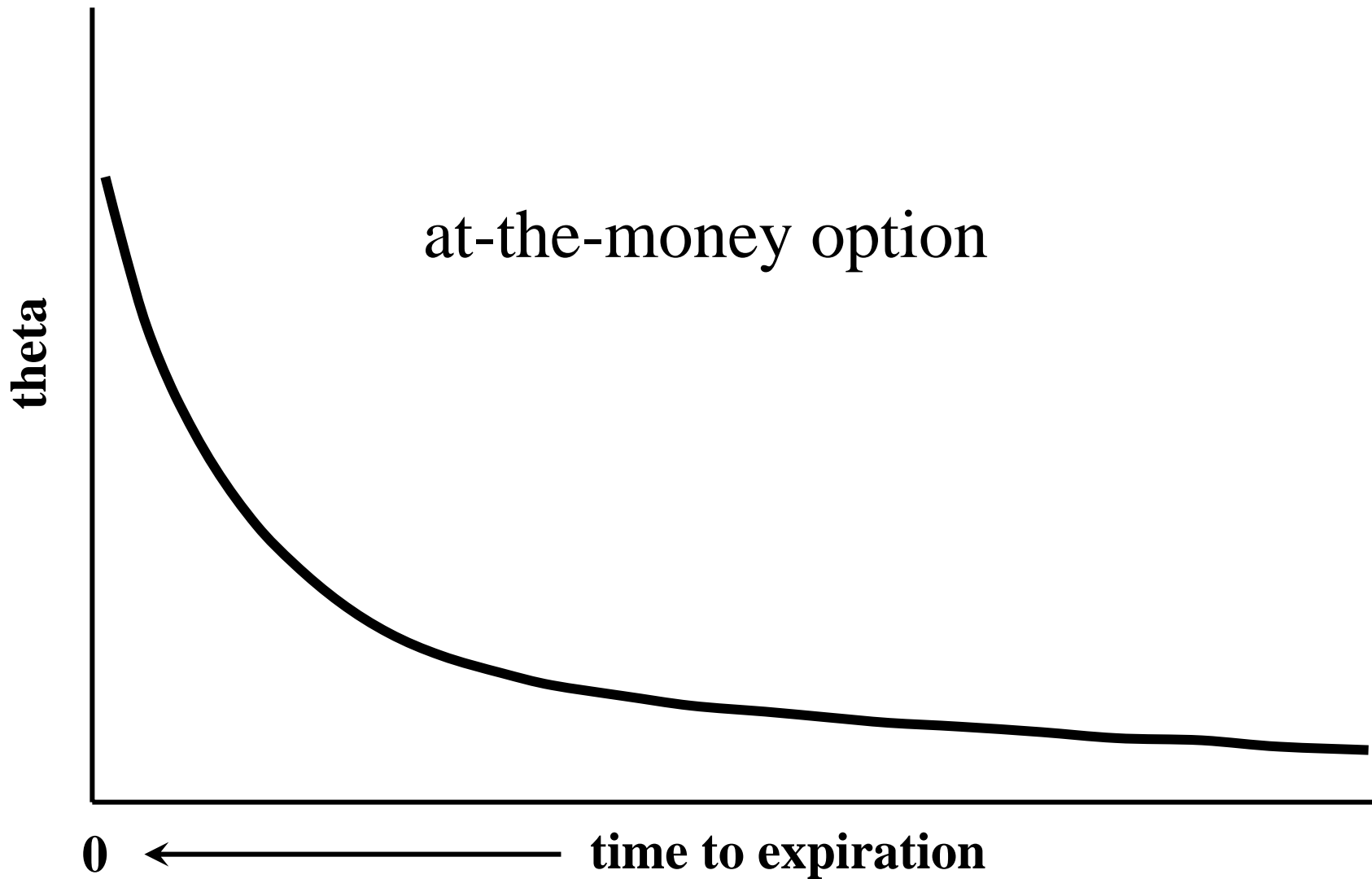
Positive Vega

Negative Rho

What combination of market conditions will most help this position?







1. An at-the-money option always has a greater gamma theta vega than an equivalent in-the-money or out-of-the-money option.
2. A long-term option always has greater vega value than an equivalent short-term option
3. For at-the-money options, as time passes the theta value (rate of decay) increases.
4. In-the-money options have greater rho values than at- or out-of-the-money options. Long-term options have greater rho values than short-term options.

Exercise: Below are several different option positions as indicated by the signs of the delta, gamma, vega, and rho. From the choices on the following page, match each position with the most favorable and most unfavorable market scenario.

<u>position</u>	<u>delta</u>	<u>gamma</u>	<u>vega</u>	<u>rho</u>	most <u>favorable</u>	most <u>unfavorable</u>
1	+	-	+	-		
2	-	+	+	+		
3	0	+	-	-		
4	0	-	-	+		
5	-	-	0	+		
6	+	0	+	0		

- A.** rapidly rising price; falling interest rates
- B.** rising price; rising implied volatility
- C.** rapidly falling price; rising implied volatility; rising interest rates
- D.** large price moves; falling implied volatility; falling interest rates
- E.** large price moves; rising implied volatility; falling interest rates
- F.** steady price; rising implied volatility; rising interest rates
- G.** steady price; falling implied volatility; rising interest rates
- H.** slowly rising price; rising implied volatility; falling interest rates
- I.** rapidly falling price; falling implied volatility; rising interest rates
- J.** falling price; falling implied volatility
- K.** slowly falling price; rising interest rates
- L.** slowly rising price; falling implied volatility; falling interest rates

Exercise: Below are several different option positions as indicated by the signs of the delta, gamma, vega, and rho. From the choices on the following page, match each position with the most favorable and most unfavorable market scenario. (answers)

<u>position</u>	<u>delta</u>	<u>gamma</u>	<u>vega</u>	<u>rho</u>	<u>most favorable</u>	<u>most unfavorable</u>
1	+	-	+	-	H.	I.
2	-	+	+	+	C.	L.
3	0	+	-	-	D.	F.
4	0	-	-	+	G.	E.
5	-	-	0	+	K.	A.
6	+	0	+	0	B.	J.