Financial Instruments

Winter 2024

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Homework 6

Due at the beginning of class 8

1 Implied Volatility

Replicate the Implied Volatility of Teaching Note 6, using current options data on S&P500 maturing in June (3 months or one quarter from now). Please state the assumptions you make, if any, to compute the time to maturity of the options, that is the value of T that you use in your formulas. (No need to use many options. Choose just a few ITM, OTM and ATM. Note that the current SP500 index value is on the top right corner of the table.) The spreadsheet "Options.xls" provides an example of the implied volatility calculation. See the worksheet "Implied Volatility."

- Current Options Data can be found at CBOE. The ticker is SPX.
  `http://www.cboe.com/DelayedQuote/QuoteTable.aspx`

  NOTE: I have downloaded all of this data for you! Please see the file "QuoteData_2024.xls."

- You can use federal reserve website (link below) to retrieve the value of the risk free rate. Use the Treasury Constant Maturity rate that most closely matches the maturity of the options. Note that TCM are compounded annually, so be sure to make the relevant adjustments. Please report the value of the rate that you use.
  `http://www.federalreserve.gov/releases/h15/Current/`

- The dividend yield can be estimated using the data collected by Robert Shiller which are available at the link below. You can estimate the dividend yield as the average dividend yield over the last available 12 months. Be sure to make the relevant compounding adjustments and report the dividend yield that you use.

`http://www.econ.yale.edu/~shiller/data.htm`

You should use the data in the "Excel file" used in his book. This gives monthly prices, dividends, earnings and other information.

2 Valuing and analyzing a structured security

(1) A wealthy investor hires you to help her evaluate a recent security issued by Morgan Stanley, called PLUS (see prospectus: The security was issued by Morgan Stanely in April 2008. Assume the same security is issued today and has one-year to maturity, but it is otherwise identical). To assess its fair value, you decide to use the appropriate implied volatility from the options markets as in Exercise (1).

  (a) How can you decompose the PLUS into more basic securities? (*Tip: The solution to the Mock Midterm might be helpful...*)

  (b) Use the decomposition obtained in point (2.1.a) and the information obtained in exercise (1) to value the PLUS.

  (c) If the value you obtain is not at par, what might you modify to make sure the value of the security is par as of today? (Words only, but for a bonus, see if you can actually set the value to par by changing one of the terms.)

(2) What is the sensitivity of this security to changes in the underlying stock price? How can you compute its market "beta", namely, the **percentage** sensitivity of the security to **percentage** changes in the underlying? Compute the "beta" of the PLUS for several stock prices "S" as of (a) today, (b) 6 month from now, (c) 1 year from now. Discuss your findings.

Morgan Stanley

March 2008

Pricing Supplement No. 528
Registration Statement No. 333-131266
Dated March 20, 2008
Filed pursuant to Rule 424(b)(2)

STRUCTURED INVESTMENTS

Opportunities in Equities

PLUS based on the Value of the S&P 500® Index due April 20, 2009

Performance Leveraged Upside Securities℠

The PLUS are senior unsecured obligations of Morgan Stanley, will pay no interest, do not guarantee any return of principal at maturity and have the terms described in the prospectus supplement for PLUS and the prospectus, as supplemented or modified by this pricing supplement. At maturity, you will receive for each stated principal amount of PLUS that you hold an amount in cash that may be more or less than the stated principal amount based upon the closing value of the underlying index on the valuation date.

FINAL TERMS			
Issuer:	Morgan Stanley		
Maturity date:	April 20, 2009		
Underlying index:	S&P 500® Index		
Aggregate principal amount:	$47,500,000		
Payment at maturity:	If final index value is *greater than* initial index value, $10 + leveraged upside payment *In no event will the payment at maturity exceed the maximum payment at maturity.* If final index value is *less than or equal to* initial index value, $10 x (final index value / initial index value) *This amount will be less than or equal to the stated principal amount of $10.*		
Leveraged upside payment:	$10 x leverage factor x index percent increase		
Index percent increase:	(final index value – initial index value) / initial index value		
Initial index value:	1,329.51, the index closing value of the underlying index on the pricing date		
Final index value:	The index closing value of the underlying index on the valuation date		
Valuation date:	April 16, 2009, subject to adjustment for certain market disruption events		
Leverage factor:	300%		
Maximum payment at maturity:	$11.90 (119% of the stated principal amount) per PLUS		
Stated principal amount:	$10 per PLUS		
Issue price:	$10 per PLUS (see “Commissions and Issue Price” below)		
Pricing date:	March 20, 2008		
Original issue date:	March 31, 2008		
CUSIP:	61747W166		
Listing:	The PLUS have been approved for listing on the American Stock Exchange LLC under the ticker symbol “SKE,” subject to official notice of issuance. It is not possible to predict whether any secondary market for the PLUS will develop.		
Agent:	Morgan Stanley & Co. Incorporated		
Commissions and Issue Price:	**Price to Public[(1)]**	**Agent’s Commissions[(1)(2)]**	**Proceeds to Company**
Per PLUS	$10	$0.15	$9.85
Total	$47,500,000	$712,500	$46,787,500

(1) *The actual price to public and agent’s commissions for a particular investor may be reduced for volume purchase discounts depending on the aggregate amount of PLUS purchased by that investor. The lowest price payable by an investor is $9.95 per PLUS. Please see “Syndicate Information” on page 4 for further details.*

(2) *For additional information, see “Plan of Distribution” in the accompanying prospectus supplement for PLUS.*

The PLUS involve risks not associated with an investment in ordinary debt securities. See “Risk Factors” beginning on page 7.

The Securities and Exchange Commission and state securities regulators have not approved or disapproved these securities, or determined if this pricing supplement or the accompanying prospectus supplement and prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

YOU SHOULD READ THIS DOCUMENT TOGETHER WITH THE RELATED PROSPECTUS SUPPLEMENT AND PROSPECTUS, EACH OF WHICH CAN BE ACCESSED VIA THE HYPERLINKS BELOW.

Amendment No. 2 to Prospectus Supplement for PLUS dated October 24, 2007

Prospectus dated January 25, 2006