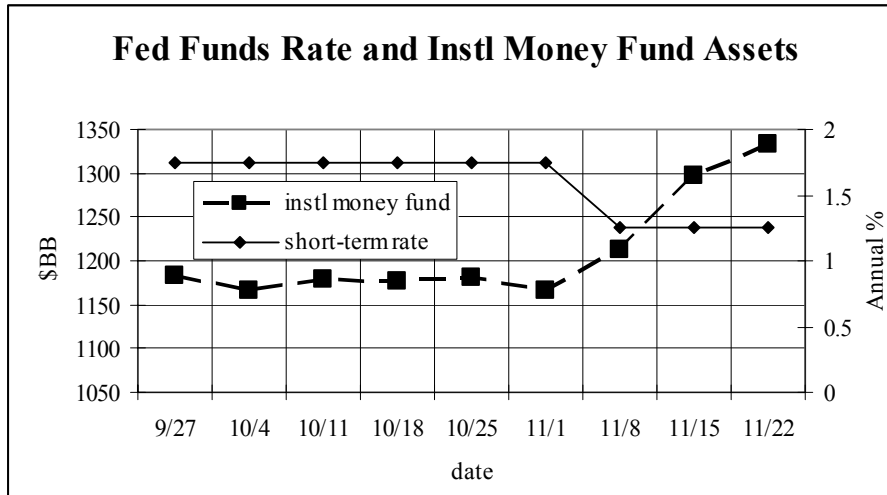


**FUNDING INVESTMENTS**  
**FINANCE 238/738, D. Musto**  
**SECOND TEST**  
**80 MINUTES / 80 POINTS**

*Your Name:* \_\_\_\_\_

*Section you are registered for:* \_\_\_\_\_

- (10 pts) This graph tracks two statistics over the past two months: the short-term interest rate (i.e., the Fed Funds target set by Alan Greenspan, on the right axis), and the money invested in institutional money-market funds (i.e., money funds for large institutional investors, on the left axis):



What is a plausible causal connection between the movements of these lines?

*Money funds follow the straight-line amortization accounting standard, by which investments within 60 days to maturity are **not** marked to market but rather booked at purchase price, with the return to maturity spread evenly over the time to maturity. As a result, they pay relatively higher yields, compared to the spot market, when rates drop, making them temporarily more attractive investments. Investors respond with strong inflows during this period. When short rates dropped, this is what we saw.*

- You are securitizing a pool of fixed-rate home mortgages which all have an 8% interest rate and which have a total principal amount of \$500MM.
  - (5 pts) How could you construct a \$75M tranche paying LIBOR+50bp, up to 20%? Be precise.
  - (5 pts) Suppose you sold interest-only and principal-only tranches. Which would do better if the current mortgage rate dropped substantially?

*a.) Here's one way to do it: Create two tranches, call them 1 and 2, that each start with principal amount \$75M, and that collectively get 20% interest on \$75M, i.e., \$15M of the \$40M of interest coming in. Tranche 1 gets LIBOR+50bp, up to 20%, and Tranche 2 gets the remainder. Tranche 3 has the remaining principal amount, \$500M-\$150M = \$350M, and has coupon rate  $\$25M/\$350M = 7.143\%$ . As principal comes in, pay it proportionately to the three tranches.*

*Here's another: 20% is 2½ times the 8% interest coming in, so create three tranches: A has principal amount \$75M, B has principal amount \$112.5M, and C has the rest, \$312.5M. I've chosen these numbers so that the principal amount of A+B is \$187.5M, 2½ times \$75M, so 8% interest on A+B equals 20% interest on A. Now take that 20% and give LIBOR+50bp to A, up to 20%, and the remainder to B. C gets 8%. As principal comes in, all you have to do is make sure you pay down A and B proportionately.*

*b.) As mortgage rate drops, prepayment rate will increase. Outstanding mortgage principal will decrease, which in turn will reduce or even wipe out the IO tranche. From holders' point of view, IO will suffer most as people pay back their principal faster and won't pay as much interest. IO issuers, however, will benefit. From PO holders' point of view, they get principal back faster, but will have to invest at a lower rate.*

3. (10 pts) You are making a market for the equity of GE, which announces earnings tomorrow. You and all other uninformed traders calculate a 90% probability that the earnings will be on target, in which case GE will trade for \$30/share, and a 10% probability that it will be below target, in which case GE will trade for \$22/share. You also know that informed traders already know today what GE will announce tomorrow. You have to post a Bid and an Ask for the next order to sell or buy one share. Assuming that there is a 5% probability that the next order comes from an informed trader (whether this order is a buy or a sell), and assuming that competition forces you to post prices at which you just break even, what prices do you post?

*Market making for GE shares:*

*Expected value of GE shares for an uninformed trader =  $0.9 * \$30 + 0.1 * 20 = \$29.2$*

*Solve for the bid, and ask prices by the following equations:*

$$0.95 * (ask - 29.2) + 0.05 * (ask - 30) = 0$$

$$0.95 * (bid - 29.2) + 0.05 * (bid - 22) = 0$$

*These two equations yield;*

$$Ask = \$29.24$$

$$Bid = \$28.84$$

4. (10 pts) Your bank is underwriting the IPO of Cosi, and after initially announcing a price range of \$8-\$10 you have learned on the road show that Cosi will trade for \$30. The CEO of Cosi, Fred Cosi, concludes you should price it at \$30. You say what?

*We have received a positive response from the potential investors. We can not abuse their trust in us by taking full advantage of their positive response to raise the offer price to \$30. If we were to do so, the investors would not be willing to show us their true valuations of companies during the road show. The investment bank needs to maintain a good relationship with potential investors, and we can not abuse their honesty in revealing a higher value of the firm than we thought. Given the strong positive response, we can afford to increase the offer price somewhat, but we should not increase it all the way to \$30.*

5. (10 pts) Amazon currently sells for 23 and in a year it will be either 15 or 25, each with probability  $\frac{1}{2}$ , and you can borrow or lend for a year at 2%. Consider a European put on Amazon with strike price 20. An investor is willing to buy or sell

this option for \$2.45 because the expected payoff in a year is 2.5, and  $2.5/1.02 = \$2.45$ .  
Is this an opportunity for you to make money? If so, how, and how much?

$$N * Sup + B * (1 + Rf) = Pup$$
$$N * Sdown + B * (1 + Rf) = Pdown$$

$$M = (Pup - Pdown) / (Sup - Sdown)$$
$$= (0 - 5) / (25 - 15)$$
$$= -0.5$$
$$B = 12.5/1.02 = 12.255$$

So value of put is:  
 $-0.5 * 23 + 12.255 = .755$

Therefore, one can profit by selling the put, short  $-0.5$  share stock, lend \$12.25 cash.  
You get \$2.45 from this investor and you spend only \$0.755, so you take in  $\$2.45 - 0.755 = \$1.695$ , and cash flows in the future exactly offset.

6. (10 pts) This is from a Thursday 11/21/02 press release:

Sweetheart Cup Company Inc. ("Sweetheart") announced today that it filed a registration statement on Form S-4 relating to a proposed offer to exchange new Senior Subordinated Notes due 2007 for all its outstanding 12% Senior Subordinated Notes due 2003 ("Sweetheart Notes") and a consent solicitation to eliminate and/or amend certain restrictive covenants and other provisions in the indenture governing the Sweetheart Notes. The proposed offer will be conditioned on, among other things, the receipt of tenders from holders of at least 90% of the principal amount outstanding of the Sweetheart Notes...

How do the elements of this Sweetheart deal affect its chances for success?

*Two things to notice: minimum participation, and covenant removal. By requiring tenders from 90%, the issuer makes it harder for investors to benefit from buoying-up, because it is less likely the deal goes through without their tender. The consent solicitation for covenant removal also reduces the benefit from holding out, because if the deal goes through, holdouts will have weakened bonds.*

7. (10 pts) This is from the Monday 11/25/02 WSJ, describing a sale on 11/22/02:

**Boeing Capital Corp** - \$150 million of medium-term notes was priced through lead managers Credit Suisse First Boston Corp. and Barclays Capital, according to MCM CorporateWatch. Terms: maturity: Nov. 30, 2009; coupon: 5.4%; price: 99.780; yield: 5.438%; spread: 170 basis points above Treasurys; settlement: Nov 27, 2002 (flat); call: make-whole call at Treasurys plus 35 basis points; ratings: A3 (Moody's Investor Service Inc.), single-A-plus (Standard & Poor's Ratings Group).

And these are some closing prices from 11/22/02:

RATE	MATURITY		BID	ASKED	CHG	ASK
	MO/YR					YLD
10.375	Nov	09	115:18	115:19	-3	2.25
0	Nov	09	74:21	74:24	-4	4.22

(These bonds mature 11/15/09, and 11/22/02 is 7 days after 11/15/02 and 5/15/03 is 181 days after 11/15/02. For simplicity, assume the Boeing Capital bond also matures 11/15/09, not 11/30/09).

- (5 pts) How much would it have cost Boeing Capital to defease this bond on 11/22/02?
- (5 pts) How would you calculate the cost to Boeing Capital of calling back the bond on 11/22/02, rather than defeasing it? Be precise (but don't bother actually running the calculations).

(a)

*To defease this bond on 11/22/02, Boeing Capital should buy a portfolio of two bonds, which would generate the same cash flow.*

*The proportion of the 10.375-rate bond:  $\frac{5.4\%}{10.375\%} = 0.52048$*

*The proportion of the 0-rate bond:  $1 - 0.52048 = 0.47952$*

*The price of the 10.375-rate bond: The Ask + Accrued Interest =  $115\frac{19}{32} + \frac{10.375}{2} \times \frac{7}{181}$*

*The price of the 0-rate bond: The Asked =  $74\frac{24}{32}$*

*The cost:  $0.52048 \times \left\{ 115\frac{19}{32} + \frac{10.375}{2} \times \frac{7}{181} \right\} + 0.47952 \times 74\frac{24}{32} = 96.11245$*

*However, the total amount of the bond is \$150 million, NOT \$100.*

*The total cost to defease:  $96.11245 \times \frac{\$150,000,000}{\$100} = \$144,168,675$*

*(b) To calculate the cost to Boeing Capital of calling back the bond on 11/22/02, we would discount the cash flow of this bond with the discount rate of Treasurys + 35 basis points. In this case, the discount rate is  $5.438\% - 170\text{bps} + 35\text{bps} = 4.088\%$ .*

8. This is from a press release early this month, announcing a credit-card securitization (analogous to those we have seen) by Bank One:

Bank One Issuance Trust's issuance of \$850 million ONEseries class A (2002-5) notes are rated 'AAA' by Fitch Ratings. The class A (2002-5) notes accrue interest at one-month LIBOR plus 0.12% payable monthly with an expected maturity date of Oct. 15, 2007.

- a. (5 pts) To a potential investor, how do the payments by this bond compare to those of a regular bond paying LIBOR+12bp monthly, maturing 10/15/07? Are they the same, and if not, what drives the differences?

*One difference is that the issuer is not legally obliged to pay all principal on the scheduled maturity date. If insufficient principal comes in during the accumulation period then investors get whatever came in, and then more trickles to investors as it trickles into the trust. Another difference is that there could be early amortization, in which case principal comes in early.*

- b. (5 pts) Adding in the subordinated pieces, the trust sold \$1B of bonds. Should regulators and rating agencies view this securitization as moving \$1B of debt off of Bank One's balance sheet until 10/15/07?

*The possibility of early amortization means that investors could stop financing the \$1B of receivables prior to the end of the revolving period, bringing that financing back onto Bank One's balance sheet.*

# Score Distribution

## MBA

<20	1
20-29	10
30-39	38
40-49	58
50-59	59
60-69	21
70-80	3

low:	14
median:	48
high:	76
25 <sup>th</sup> :	39
75 <sup>th</sup> :	55
std. dev.:	11

## Undergrad

<20	1
20-29	2
30-39	5
40-49	15
50-59	12
60-69	10
70-80	1

low:	18
median:	50
high:	71
25 <sup>th</sup> :	43
75 <sup>th</sup> :	58
std. dev.:	11