March 18, 2018

Exam: Final, 3 hours

Ivo Welch. UCLA Anderson Finance MFE 404, Winter 2018. March 18, 2018

READ THIS FIRST:

- Paraphernalia: One US-Letter sized sheet (any notes on front and back that you wish). One calculator. No computers, notes, or textbooks allowed.
- You have 180 minutes to answer questions on 10 pages, which is not a whole lot. If you do not know the answer, *just move on*.
- **If you do not put down your pen when the TA states you have to do so, then we may reduce your score and/or assign you a 0. Everyone is to follow the rules to the letter.**
- The number in parentheses in front of each question is the number of points.
- For a clearly wrong question, you can receive negative points. If you have no clue about the answer, you are probably better off leaving the answer blank. If you have some clue, give it your best shot. We will liberally subtract points for wrong answers—in particular, we do not like the idea of 3 different answers, one of which is correct, two of which are incorrect. So, if you show us two different solutions, you can at best only get half credit and more likely 0, unless you clearly outline assumptions that you have to make because my question is ambiguous. If you show us 2 wrong answers and 1 right answer, you will get negative points. The point is to stop you from wild-guessing or showering us, not to stop you from writing what you really know.
- Your *final answer* must be in the right units, so make sure to distinguish between raw numbers and percent, between dollars and dollars-squared, etc.
- We will try to give partial credit, so show your work.
- Write clearly. If we cannot understand what you mean, you lose. Generally, try to be concise. If you have the correct answer and an incorrect answer, you will get 0.
- If you believe a question is ambiguous, please make reasonable assumptions, and spell them out in your answer. The TA is not allowed to answer questions about specific questions. I may also deliberately include questions that cannot be answered. If you believe this is the case, please explain why you cannot answer a question.
- **Assume a perfect market, unless otherwise indicated.**
- You must turn in this exam itself together with your answers in it. Use only the blank rear of the pages for your calculations. We want to be able to check that you did the work in cases of doubt. Usually, we just ignore everything on the rear pages.

1. (1) What is your name and section (morning or afternoon)? Who sits to the left of you? Who sits to the right of you? (Yes, we do give points here, too.)

2. (0) What is the name of Harrison Ford (the protagonist) in Bladerunner?

3. (4) When two firms merge, is the weighted P/E ratio equal to the P/E ratio of the resulting company?

4. (4) When two firms merge, is the weighted E/P ratio equal to the E/P ratio of the resulting company?

5. (4) What are the advantages and disadvantages of NPV relative to Comps? For what kind of valuations do practitioners usually prefer one or the other?

6. (4) Is FD/TA a common and good measure of leverage? Explain.

7. (4) What is the biggest determinant of year-to-year market-based leverage ratio changes?

8. (4) Can the growth rate of earnings be negative forever?

9. (4) Can the book value of equity be negative?

10. (4) Can a share price be negative?

11. (4) What is the penultimate value of bitcoins in a world that has a terminal horizon?

12. (4) Is a convertible more like debt or more like equity?

13. (4) When can an acquiror add value to the target (and the combined firm) if there are zero synergies?

14. (10) Firm X has earnings of $10. Its peers, A, B, and C, have –$0.3, $0.3, and $3 as their earnings, and prices of $100, $80, and $500. If you were set on using comps, what are your choices and what would they result in? Which one do you like and why?

15. (20) Your public financials look the following way:

Income Statement	Y1	Y2	Y3	Y4
= Sales–COGS–SG&A	$150	$450	$250	
– Depreciation	$83	$100	$100	$17
= EBIT (Oper Inc)	$67	$350	$150	–$17
– Interest	$20	$20	$20	
= EBT	$47	$320	$130	–$17
– Tax	$16	$107	$43	–$7
= Net Income	$31	$213	$87	–$7

Balance Sheet	Y1	Y2	Y3	
A/R	$100	$200	$100	$0
Accum Deferred Taxes	$10	$50	$20	$0

Cash Flow Statement	Y1	Y2	Y3	
Debt Issue	$200	0	–$200	
Cap Exp	–$250	–$50	0	
– Depreciation	$83	$100	$100	$17

Estimate the economic cash flows of this firm and the cash flows of the equity. Explain your logic and why certain operations should always go together

16. (10) Assume a perfect market world. The firm will be worth $200 with probability 10%, $100 with probability 80% and $50 with probability 10%. The risk-free rate is 6%. If the firm wants to raise $60 in debt, it must promise to pay an interest rate of 8%. The expected rate of return on the equity is 10%. What is the expected rate of return of the equity?

17. (5) Continued. Show that the risk of the firm sits between the risk of the debt and the risk of the equity.

18. (5) Continued. Show that the WACC of the firm is the same, regardless of ≈100% equity finance or the above debt-equity capital structure.

19. (20) Assume that the market is perfect, and that the world is risk-neutral, with an interest rate of 0%. The firm will be worth $100 or $200, with equal probability.

    - If the firm has financed itself with a non-convertible bond promising $100, what is the value of the debt and of the equity, and of the firm?

- If the firm has financed itself with a convertible bond promising $100, convertible into 60% of the equity, what is the value of the debt and of the equity, and of the firm?
- Assume that the firm has already been financed. Now a surprise could happen. If a new independent project comes along that either loses $100 or gains $90 with equal probability, would managers of a firm financed as in (a), i.e., non-convertible debt, take this project?

  Thinking back, if creditors are aware of all incentives later on, if such projects were findable, what would the promised debt interest on the non-convertible have to be in order to lure creditors to participate? What would be the wealth of the entrepreneur if he chose non-convertible financing?
- Assume that the firm has already been financed. Now a surprise could happen. If a new independent project comes along that either loses $100 or gains $90 with equal probability, would managers of a firm financed as in (b), i.e., convertible debt, take this project?

  Thinking back, if creditors are aware of all incentives later on, if such projects were findable, what would the promised debt interest on the convertible have to be in order to lure creditors to participate? What would be the wealth of the entrepreneur if he chose non-convertible financing?

20. (3) How should Venture capitalists provide funding to startup firms? What kinds of features would you recommend? Consider both the situation of the VC and the situation of the startup.

YX Suppose you want to value your Y(ou) Corp by discounting cash flows at the appropriate weighted average cost of capital (WACC), and that:

- The corporate tax rate, τ, is 30%.
- There are no personal taxes.
- The target debt-to-value ratio is 20% (maintained in perpetuity)
- The cost of debt is 5%
- The cost of equity of Y(ou) Corp is unknown, but X(tern) Corp is an excellent comparable with similar assets, operating strategy, etc, but less equity in its capital structure. X(tern) Corp maintains a constant leverage ratio over time.

	E/V	Cost of equity, r_e	D/V	Cost of debt, r_d
Y(ou) Corp	Target: 0.8	no information available	Target: 0.2	5%
X(tern) Corp	Actual: 0.4	10%	Actual: 0.6	5%

where E is equity value; D is debt value; and V is firm value $V = E + D$.

21. (10) Refer to XY. WACC: Which is most close to your best estimate of the WACC of Y Corp?

(i) $(E/V)_Y \cdot r_e + (D/V)_Y \cdot r_d = 0.8 \times 10\% + 0.2 \times 5\% = 9.0\%$

(ii) $(E/V)_X \cdot r_e + (D/V)_X \cdot r_d = 0.4 \times 10\% + 0.6 \times 5\% = 7.0\%$

(iii) $(E/V)_Y \cdot r_e + (D/V)_Y \cdot r_d \cdot (1-\tau) = 0.8 \times 10\% + 0.2 \times 5\% \times (1-0.3) = 8.7\%$

(iv) $(E/V)_X \cdot r_e + (D/V)_X \cdot r_d \cdot (1-\tau) = 0.4 \times 10\% + 0.6 \times 5\% \times (1-0.3) = 6.1\%$

(v) $9.0\% - (D/V)_X \cdot r_d \cdot \tau = 9.0\% - 0.6 \times 5\% \times 0.3 = 8.1\%$

(vi) $7.0\% - (D/V)_Y \cdot r_d \cdot \tau = 7.0\% - 0.2 \times 5\% \times 0.3 = 6.7\%$

(vii) None of the above. (Please explain.)

22. (5) Refer to XY. VALUE: Using the WACC in part A, which is most close to your best estimate of the value of Y Corp given that the expected cash flows per year in perpetuity are as follows:

    - Pre-tax, under 100% equity financing: USD 2.0 million
    - After-tax, under 100% equity financing: USD 1.4 million

    What formula would you use to estimate Y Corp's value?

    (i) CF/WACC
    (ii) $(\text{CF} + \tau \cdot r_d \cdot D)/\text{WACC}$
    (iii) $(\text{CF}/\text{WACC}) + \tau \cdot D$
    (iv) $(\text{CF} + \tau \cdot r_d \cdot D)/\text{WACC} + \tau \cdot D$
    (v) None of the above. (Please explain.)

23. (5) Refer to XY. What cash flow, CF, in the formula above would you use?

    (i) CF = USD 2.0 mill
    (ii) CF = USD 1.4 mill
    (iii) CF = USD 2.0 mill $\times 0.8$ = USD 1.6 mill
    (iv) CF = USD 1.4 mill $\times 0.8$ = USD 1.12 mill

(v) None of the above

24. (8) Write a computer program that calculates an eventstudy mean return and T-stat (for significance testing), given one vector of permnos and another of event dates.

25. (10) HML and CSS

(i) How do you include a png image in html?

(ii) How does a form request web email text input from the browser?

(iii) How do you change the background color of the body?

(iv) How do you change the font color of all text inside an html tag with id “abc”?

(v) How do you change all th elements to be underlined?