

**Valuation: Final Exam**

Answer all questions and show necessary work. Please be brief. This is an open books, open notes exam.

1. Loman Enterprises reported the following numbers in its financial statements for the most recent year:

<i>Income Statement (2018)</i>	
Revenues	\$500.00
EBITDA	\$150.00
DA	\$50.00
EBIT	\$100.00
Interest Expense	\$20.00
EBT	\$80.00
Taxes	\$20.00
Net Income	\$60.00

<i>Balance Sheet (end of 2017)</i>			
Fixed Assets	500	Debt	200
Non-cash Working Capital	125	Equity	550
Cash	125		
Total	750	Total	750
<i>Other information from 2018</i>			
Capital Expenditures	\$ 90.00		
Increase in non-cash WC	\$ 10.00		

Assuming that Loman continues to reinvest at the same rate as it did in the most recent year and generate the same return on invested capital it earned in 2018, for the next three years, **estimate the expected free cash flows to the firm each year for the next 3 years.** (4 points)

2. You are an entrepreneur with a promising tech start up and you have projected expected free cash flows to the firm for the next five years:

	1	2	3	4	5
EBIT (1-t)	\$2.00	\$12.50	\$37.50	\$80.00	\$100.00
- Reinvestment	\$25.00	\$37.50	\$62.50	\$75.00	\$50.00
FCFF	-\$23.00	-\$25.00	-\$25.00	\$5.00	\$50.00

- After year 5, you expect the firm to be mature, growing at 2.5% a year in perpetuity and earning a return on capital of 25% forever.
- You are the sole owner of start-up today and completely undiversified, and you expect that to be true for the next two years. At the **start of year 3**, you expect to raise capital from venture capitalists and at the **end of year 5**, you plan to do an initial public offering and list on public markets. The correlation of the firm with the market is 0.25 and the correlation of the VC's portfolio with the market is 0.40. The unlevered market beta for the company is 0.80.

Assuming that the firm stays all-equity funded and that it has no cash or debt today, **estimate the value of equity today**. (The risk free rate is 3% and the ERP is 5%) (4 points)

3. You have been given the following information on Callaway Bank, a small regional bank, and a peer group of larger national banks:

	<i>Callaway Bank</i>	<i>Large banks</i>
PBV	2.50	2.00
Return on equity	18%	12%
Expected growth rate forever	3%	2%

You can assume that Callaway Bank and the large bank peer group are both fairly priced, given their fundamentals. Callaway Bank is currently holding the regulatory capital minimum and it is considering voluntarily increasing its regulatory capital by 20% and it believes that if it does so, investors will view it as less risky and give it the same cost of equity that they demand of larger banks. Assuming that book equity is equal to regulatory capital, **estimate the price to book ratio for Callaway Bank, if it does increase its regulatory capital.** (4 points)

4. You are trying to price a company that operates in multiple businesses and have been provided the following information (with all dollar values in millions):

	Revenues	EBITDA	EBIT	Net Income	Cap Ex	Change in WC
Electronics	\$1,000.00	\$150.00	\$100.00	\$60.00	\$75.00	\$25.00
Software	\$1,500.00	\$300.00	\$240.00	\$150.00	\$100.00	-\$4.00
Retail	\$500.00	\$60.00	\$40.00	\$20.00	\$25.00	\$5.00

You have also run regressions, using peer group companies in each business.

Electronics	$EV/Sales = 2.0 + 25.0 (EBIT/Sales) - 3.0 (Reinvestment Rate)$
Software	$EV/Sales = 0.6 + 30.0 (EBIT/Sales) - 2.0 (Reinvestment Rate)$
Retail	$EV/Sales = 1.24 + 12 (EBIT/Sales) - 0.6 (Reinvestment Rate)$

(In the regressions, percentages are entered as decimals; 16% would be input as .16)

The company also expects to have corporate expenses of \$20 million next year; you can assume that these expenses will grow 2.5% a year in perpetuity and that the cost of capital for the company is 7.5%. If the company has \$1.2 billion in debt outstanding and \$600 million in cash, **estimate the value of equity in the firm today**. (The marginal tax rate, if you need it, is 25%) (5 points)

5. You have been asked to value the synergy accruing from the merger of two private businesses, each owned by individuals who have all of their wealth tied up in their company. You have the following information:

	Pavlov Inc	Cronos Inc
EBIT (1-t) in \$ millions	\$ 70.00	\$ 120.00
Invested Capital in \$ millions	\$ 350.00	\$ 500.00
Expected growth rate in perpetuity	3.00%	3.00%
Correlation with market	0.3	0.4
Unlevered Market Beta	1.2	1.2

Neither firm has any debt. After the merger, there will be two changes:

- The combined company plans to sell assets that generate \$15 million in after-tax operating income and account for \$150 million in invested capital for book value.
- The combined company will remain all equity funded, but the correlation with the market will rise to 0.5.

Estimate the value of synergy in this merger.

(4 points)

6. You have been asked to value Justin Enterprises and have estimated the following cash flows for the next 3 years (with existing management in place)

	Base	1	2	3
Expected growth rate		6%	6%	6%
EBIT (1-t)	\$ 50.00	\$ 53.00	\$ 56.18	\$ 59.55
FCFF		\$ 10.60	\$ 11.24	\$ 11.91

- After year 3, the company is expected to be mature, growing 3% a year in perpetuity, while maintain the return on capital it earned in the first 3 years.
- You believe that if you ran the company, you could double its return on immediately (and hold it in perpetuity), though you will have to give up a high growth period and settle for a stable growth of 3% starting now.

If the cost of capital is 9%, estimate the value of control in this firm. (4 points)

7. You are considering acquiring an apartment building for \$70 million and have the following information on its income potential:
- You expect to generate \$4 million in rental income next year, after taxes and expenses, but before interest costs, and this income to grow 2% a year in perpetuity. (You can assume rental income = cash flow)
  - The risk free rate is 3%, the cost of debt (after-tax) is 4% and the cost of capital for income-generating real estate is 8%.
  - If you acquire this building, you will get the zoning rights to triple the size of the building and triple your rental income any time over the next 10 years, and you estimate the cost of this expansion to be \$120 million. Assume that someone (me) has estimated the  $d_1$  and  $d_2$  for the value of this option to expand:  
 $d_1 = 0.40$        $d_2 = -0.50$

Would you acquire this building?

(5 points)

$d$	$N(d)$	$d$	$N(d)$	$d$	$N(d)$
-3.00	0.0013	-1.00	0.1587	1.05	0.8531
-2.95	0.0016	-0.95	0.1711	1.10	0.8643
-2.90	0.0019	-0.90	0.1841	1.15	0.8749
-2.85	0.0022	-0.85	0.1977	1.20	0.8849
-2.80	0.0026	-0.80	0.2119	1.25	0.8944
-2.75	0.0030	-0.75	0.2266	1.30	0.9032
-2.70	0.0035	-0.70	0.2420	1.35	0.9115
-2.65	0.0040	-0.65	0.2578	1.40	0.9192
-2.60	0.0047	-0.60	0.2743	1.45	0.9265
-2.55	0.0054	-0.55	0.2912	1.50	0.9332
-2.50	0.0062	-0.50	0.3085	1.55	0.9394
-2.45	0.0071	-0.45	0.3264	1.60	0.9452
-2.40	0.0082	-0.40	0.3446	1.65	0.9505
-2.35	0.0094	-0.35	0.3632	1.70	0.9554
-2.30	0.0107	-0.30	0.3821	1.75	0.9599
-2.25	0.0122	-0.25	0.4013	1.80	0.9641
-2.20	0.0139	-0.20	0.4207	1.85	0.9678
-2.15	0.0158	-0.15	0.4404	1.90	0.9713
-2.10	0.0179	-0.10	0.4602	1.95	0.9744
-2.05	0.0202	-0.05	0.4801	2.00	0.9772
-2.00	0.0228	0.00	0.5000	2.05	0.9798
-1.95	0.0256	0.05	0.5199	2.10	0.9821
-1.90	0.0287	0.10	0.5398	2.15	0.9842
-1.85	0.0322	0.15	0.5596	2.20	0.9861
-1.80	0.0359	0.20	0.5793	2.25	0.9878
-1.75	0.0401	0.25	0.5987	2.30	0.9893
-1.70	0.0446	0.30	0.6179	2.35	0.9906
-1.65	0.0495	0.35	0.6368	2.40	0.9918
-1.60	0.0548	0.40	0.6554	2.45	0.9929
-1.55	0.0606	0.45	0.6736	2.50	0.9938
-1.50	0.0668	0.50	0.6915	2.55	0.9946
-1.45	0.0735	0.55	0.7088	2.60	0.9953
-1.40	0.0808	0.60	0.7257	2.65	0.9960
-1.35	0.0885	0.65	0.7422	2.70	0.9965
-1.30	0.0968	0.70	0.7580	2.75	0.9970
-1.25	0.1056	0.75	0.7734	2.80	0.9974
-1.20	0.1151	0.80	0.7881	2.85	0.9978
-1.15	0.1251	0.85	0.8023	2.90	0.9981
-1.10	0.1357	0.90	0.8159	2.95	0.9984
-1.05	0.1469	0.95	0.8289	3.00	0.9987
-1.00	0.1587	1.00	0.8413		