

## Final Exam: Valuation

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

1. You have been asked to value Dexia Financials, a small, high growth bank, and are told that Dexia generated \$150 million in net income in the most recent year on a book value of equity of \$ 750 million; you can assume that the book value of equity is equal to the regulatory capital of the bank and that it has risk-adjusted assets of \$ 5 billion right now.
  - a. Dexia expects its risk adjusted assets and net income to grow 10% a year for the next five years and plans to increase its regulatory capital ratio to 20% of risk-adjusted assets by the end of year 5 (with the ratio changing in equal annual increments over the five years). Estimate the FCFE of Dexia each year for the next 5 years. (2 points)

- b. After year 5, Dexia expects to be a mature bank, growing 3% a year in perpetuity, while continuing to earn the return on equity that it had at the end of year 5. If the cost of equity for mature banks is 9%, estimate the value of equity at the end of year 5. (2 points)
- c. If Dexia expects to have a cost of equity of 12% for the next 5 years, estimate the value per share, assuming that Dexia has 50 million shares and 10 million options outstanding (with a strike price of \$20 each) today. (2 points)

2. PeopleMeet is a social media company that currently has 10 million users but reported an operating loss of \$5 million on \$10 million in revenues in the most recent year, mostly from advertising. The company expects revenues to grow 80% a year for the next 5 years and its pre-tax operating margin to improve to 20% of revenues by year 5. After year 5, you expect revenue growth to drop to 10% a year for the following 5 years and margins to stay stable. (The company has no debt and no cash balance.)
- a. You have run a regression across more established advertising companies to arrived at the following regression (with all percentage numbers entered as decimals, i.e., 20% will be entered as 0.20):
- $$\text{EV/Sales} = 0.80 + 45.0 (\text{Expected annual revenue growth in the next 5 years}) + 25.0 (\text{Pre-tax Operating Margin}) - 1.5 (\text{Earnings Loss Dummy})$$
- where the earnings loss dummy is set equal to one if the company is reporting an operating loss and zero if it is not. Using this regression and current numbers, estimate the value of PeopleMeet today. (2 points)

b. Using the same regression, estimate the enterprise value of PeopleMeet at the end of year 5, based upon your expectations for what the company will look like then. (2 points)

c. Now assume that the cost of equity for PeopleMeet is 15% for the next 5 years and 10% beyond. If there is no chance that the company will fail over the next 5 years and your estimates from parts a and b are both correct, estimate how much new equity (in PV terms) the company will have to issue over the next 5 years. (You can assume that the company will have a 20% debt to capital ratio at the end of year 5). (2 points)

3. You have been asked to look at a merger of two pharmaceutical companies, Griffin and Leblow Inc., and have been provided the following information on them (with all dollar values in millions of dollars):

	<i>Griffin</i>	<i>Leblow</i>
Revenues	\$2,000	\$1,000
Expected EBIT next year	\$200	\$150
Tax rate	40%	40%
Beta (Levered)	1.2	1.2
Debt to capital ratio	20%	20%
Cost of equity	9.20%	9.20%
Pre-tax cost of debt	4.00%	4.00%
Expected growth rate (& Risk free rate)	2%	2%
Invested capital	\$1,200.00	\$900.00

- a. Estimate the value of Griffin as a stand-alone company. (1.5 points)

- b. Estimate the value of Leblow as a stand-alone company. (1.5 points)

c. Now assume that the combined company will be able to cut S,G&A expenses by \$70 million next year, while keeping expected growth intact. In addition, the combined company will be able to use its larger size (and stability) to increase its debt to capital ratio to 30%, without affecting its pre-tax cost of debt. Estimate the value of synergy in this merger. (2 points)

4. You have been asked to assess a potential buyout of Dryden Inc., a manufacturer of condiments. The company currently is managed very conservatively, with no debt and \$400 million in invested capital, all in the United States. It also expects to generate \$60 million in pre-tax operating income on \$500 million in revenues, all in the United States, next year. The risk free rate is 2.5%, the marginal and effective tax rates for US income is 40% and the equity risk premium for the US is 6%. The beta for the stock is 1.00.
  - a. If the firm expects operating income to grow at 2.5% forever, estimate the value of the company's operating assets. (2 points)

b. GeoFund, a Brazil-based private equity fund is considering buying out Dryden and making significant changes to the company:

- The company plans to move its headquarters to Brazil, lowering the effective tax rate on earnings for the entire company to 30%.
- GeoFund expects to invest \$100 million immediately to expand into the Brazilian market. The expansion is expected to generate \$250 million in additional revenues in Brazil next year and these revenues are expected to grow 2.5% a year in perpetuity thereafter. The pre-tax operating margin on Brazilian sales is expected to be only 8%.
- The company plans to increase its debt to capital ratio to 20%, though it will keep all of its debt in the US (where the marginal tax rate is 40%). The pre-tax cost of debt is 4.5% and the country risk premium for Brazil is 3%.

What is the most that GeoFund can afford to pay for Dryden? (4 points)

5. IOL is an internet service provider that has hit a plateau in terms of users and revenues. In the most recent year, it had 10 million users, each of whom paid \$200/year for the service. The company's income statement and balance sheet are below (in millions).

	<i>Most recent year</i>		<i>Start of most recent year</i>
Revenues	\$2,000	Net Fixed Assets	\$1,300
EBITDA	\$500	Cash	\$100
EBIT	\$400	Non-cash Current Assets	\$200
Interest expenses	\$50	<b>Total Assets</b>	<b>\$1,600</b>
Taxable Income	\$350	Non-debt Current Liabilities	\$100
Taxes	\$105	Debt	\$500
Net Income	\$245	Equity	\$1,000
		<b>Total Liabilities</b>	<b>\$1,600</b>

The tax rate paid in 2014 is the effective tax rate. The risk free rate is 2%, the cost of capital for IOL is 8%

- a. If IOL expects to generate a 2% growth rate in perpetuity (from increasing user fees), while maintaining its existing return on capital, estimate the value of its operating assets.  
(2 points)

b. Now assume that if IOL has the rights (for the next 10 years) to a proprietary technology that it can use to provide streaming media services (a mini Netflix) to its current users. The initial investment needed in infrastructure and media content is \$4 billion, depreciable straight line over 10 years, and while the service will not attract any new users to IOL, it will allow IOL to charge more for its service. A market testing survey suggests that users will be willing to pay an additional \$50 a year for the service, but there is substantial uncertainty in this estimate (standard deviation is 30%). Estimate the value of the proprietary technology to IOL. (You can assume that there you will be able to generate ten years of revenues from the service, once initiated, and that there is no cost to delaying initiation.) How much would you willing to pay as a premium for IOL because it owns these rights? (4 points)

*Cumulative Normal Distribution table*

$d$	$N(d)$	$d$	$N(d)$	$d$	$N(d)$
-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		