Solvay Business School

Université Libre de Bruxelles
Faculté SOCO
2005-2006

Final Exam

1st session
Form A

Monday 23 January 2006

Indications

Please follow these indications:

1. The exam lasts 3 hours.
2. Please verify that your document contains exactly 13 pages.
3. Sub-questions have different weights (provided for each).
4. **Answer in the spaces provided for.**
5. Please write your firstname and lastname on all pages.
6. Good work!!!

Questions

Q1 Various sub-questions on valuation (3 points each)

Please comment on the following sub-questions:

(a) "In some countries, announcing the issuance of convertibles has a lower negative impact on the stock price than in other countries. The pecking order suggests that this impact is lower than for equity issuances but higher than for debt issuances." Comment.

Answer :

First Name : _____ Last Name : _____

(b) Imagine that a firm may allocate 1€ either to the remuneration of debtholders or to the remuneration of shareholders. In this firm, half of equity income is paid out as dividends (taxed at the personal level based on the personal income tax rate) and half is paid out through capital gains (not taxed). The tax rate on corporate income is 34%. What investor (from which tax level) would be indifferent to that allocation? Otherwise said, which tax-kind of investor would be indifferent between the firm spending 1€ as interest (to you as a debtholder) or 1€ as equity (to you as a shareholder) ?

Answer :

(c) Mention three (3) elements of the financing strategy considered/operated by Reed Elsevier when buying back Harcourt.

Answer :

(d) Why would the use of the WACC be critical in a firm where the capital structure comprises a lot of convertibles?

Answer :

(e) Why would you choose the APV method instead of a WACC/NPV method?

Answer :

Q2 Standard project valuation vs. the use of real options

Freshly graduated from the Solvay Business School, you decide to create a joint company with some friends from Polytech. The idea is to launch a new media product. More precisely, you would like to install user-friendly computing terminals in malls and specialized stores that allow the user, for a given fee or forfeit, to create a copy-protected DVD with a choice of desired programs out from an impressive library.

Thanks to a market study and an analysis of the costs, it appears that these devices should be installed first in private places open to the public like media stores and libraries. 100 first terminals would therefore be installed. This would allow to take advantage of the clientele coming to these places while benefiting from the security and the existing wiring. Thanks to that, **earnings before interest, depreciation and taxes** (EBITDA) can be estimated around € 1'500'000 per year. The initial investment, around € 5'000'000 is quite heavy since these equipments would be very expensive to develop at the beginning.

We have the following additional information:

- The corporate tax rate is 30%.
- The riskfree rate is 5%.
- The target leverage rate is 50% (D/V).
- The depreciation of the investment is linear over 10 years.
- The cost of capital if the firm was 100% equity-financed would be 14%.

(a) Compute the WACC with the information you have available (simple MM's framework) (2 points)

Answer :

(b) What is the yearly cash-flow for the project? (2 points)

Answer :

IMPORTANT: The following questions present a "chronological" computation of the elements of valuation. But in order to avoid interdependence between subquestions, i.e. a subquestion based on the result of the previous one, use the "preferred" value indicated for each previous subresult in each subquestion. The value indicated is a round value to make things simple and to allow you to continue the exercise in any case. This value is never equal to the real solution of the previous subquestion(s).

(c) What is the NPV of the project? (3 points)

Values to be used for this question and the following ones:

- **WACC = 13%**
- **Annual cash-flow = € 1'500'000**

Answer :

(d) To stimulate the managers of the places where these machines will be installed, you would propose them with the following covenant in their contract:

"At the end of the first 5 years of activity of the terminal, you are granted with a right of buying back the terminal at a fixed price of € 30'000 **each** (the remaining life of the terminal being 5 years then since it has a total life of 10 years)."

In fact, the present value of cash-flows over the last 5 years is subject to some volatility. The volatility of relative changes in this value is estimated to be 15%.

Do you think managers will find this right valuable?
What is the value of the project if we now add the effect of this right?

(7 points)

Answer :

Q3 IPOs & Firm Valuation

"LVSC Consultants Inc." is a company dedicated providing consulting in the selection of tobacco leaves for the production of cigars. Tobacco leaves can be categorized into: ligero, volado, seco and leaves for the wrapper (capa). That's where company's name comes from.

Since the blend of these leaves and the ability to select the best leaves for each category is essential for the quality of cigars, LVSC had a tremendous success. Subcontracting this work to LVSC is a guaranty of quality. Moreover, LVSC has become a tobacco rating agency and it centralizes all the information on the grow-up locations, year after year.

The original owner-managers of LVSC have decided to go public. Going public seems to be a good way of exit for them, at least for part of their shares. And the market seems quite hot for the time being.

As a consultant in IPO and other restructurings, LVSC managers ask you to help them in managing the IPO process and answer some of their questions.

Remark: here we value a firm, not a project.

(a) Please advise them on 3 main advantages of going public. Comment briefly. (3 points)

Answer :

1)

2)

3)

(b) Cite 2 typical new requirements, constraints or efforts that have to be beard by the firm when going public? (2 points)

Answer :

LVSC's owner-managers are quite interested in the price they could get for their shares. Replying that you need some data to be able to fix a price, here are their answers:

- The firm expects an average (constant) EBIT of € 300'000 during the first 5 years. From year 6 onwards, the EBIT is expected to be at € 400'000 (year 6) and to grow at a 3% rate thereafter.
- The firm has a debt burden of € 950'000 (the debt already exists and will be maintained in the future at that level. No flotation costs have to be considered)
- The corporate tax rate is 34%.
- After asking to different sources, it came out that the marginal borrowing rate could be fixed at 9% for long-term projects.
- There are 100'000 shares.
- The current debt-equity ratio (in market values) is 1/3.
- They estimate that, since this is a private company with a lot of asymmetric info, the amount of potential "informed investors" in the case of an IPO would be around 20%.

In addition to that, login yourself to a market data provider, you find the following information:

- The current price of a 5-year 0-coupon European government bond is 76%.
- The market premium is 6%.
- The volatility of market returns is 20%. The volatility of returns on prices of similar companies is 32% and their correlation with market returns is 0.75.

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(c) What should be the required return on equity for the shareholders of LVSC? (2 points)

Answer :

(d) What is the required rate of return on the assets of this firm and the WACC? (3 points)

Values to be used for this question and the following ones:

- **k_e = 14%**

Answer :

(e) What is the (total) unlevered value of LVSC? (4 points)

Values to be used for this question and the following ones:

- **WACC = 11%**
- **k_a = 13%**

Answer :

(f) What is the (total) present value of tax shields? (4 points)

Values to be used for this question and the following ones:

- **Vu = € 3'000'000**

Answer :

(g) What is the price per share? (1 point)

Values to be used for this question and the following ones:

- **Vts (Present value of tax shields) = € 800'000**

Answer :

(h) LVSC's owner-managers ask you if that is the price per share you would really recommend as the offering price? After some sensitivity analysis on prices in the industry and in the valuation of the shares of LVSC, you estimate that the price per share could be in a range of [-25,+25] around the price/value per share estimated earlier (please use the "preferred" value here below) and that any value in this interval is equiprobable. What is your final offering price to the market? (4 points)

Values to be used for this question and the following ones:

– **Average value per share = € 40**

Answer :

(i) Is you answer to subquestion (h) enough to explain the evidenced underpricing of IPOs? Comment. (3 points)

Answer :

N(x) & N(-x)=1-N(x)

H. Pirotte - SBS/ULB - FinMetrics SA - Mai 2005

	0.000	0.005	0.010	0.015	0.020	0.025	0.030	0.035	0.040	0.045	0.050	0.055	0.060	0.065	0.070	0.075	0.080	0.085	0.090	0.095
0.0	0.5000	0.5020	0.5040	0.5060	0.5080	0.5100	0.5120	0.5140	0.5160	0.5179	0.5199	0.5219	0.5239	0.5259	0.5279	0.5299	0.5319	0.5339	0.5359	0.5378
0.1	0.5398	0.5418	0.5438	0.5458	0.5478	0.5497	0.5517	0.5537	0.5557	0.5576	0.5596	0.5616	0.5636	0.5655	0.5675	0.5695	0.5714	0.5734	0.5753	0.5773
0.2	0.5793	0.5812	0.5832	0.5851	0.5871	0.5890	0.5910	0.5929	0.5948	0.5968	0.5987	0.6006	0.6026	0.6045	0.6064	0.6083	0.6103	0.6122	0.6141	0.6160
0.3	0.6179	0.6198	0.6217	0.6236	0.6255	0.6274	0.6293	0.6312	0.6331	0.6350	0.6368	0.6387	0.6406	0.6424	0.6443	0.6462	0.6480	0.6499	0.6517	0.6536
0.4	0.6554	0.6573	0.6591	0.6609	0.6628	0.6646	0.6664	0.6682	0.6700	0.6718	0.6736	0.6754	0.6772	0.6790	0.6808	0.6826	0.6844	0.6862	0.6879	0.6897
0.5	0.6915	0.6932	0.6950	0.6967	0.6985	0.7002	0.7019	0.7037	0.7054	0.7071	0.7088	0.7106	0.7123	0.7140	0.7157	0.7174	0.7190	0.7207	0.7224	0.7241
0.6	0.7257	0.7274	0.7291	0.7307	0.7324	0.7340	0.7357	0.7373	0.7389	0.7405	0.7422	0.7438	0.7454	0.7470	0.7486	0.7502	0.7517	0.7533	0.7549	0.7565
0.7	0.7580	0.7596	0.7611	0.7627	0.7642	0.7658	0.7673	0.7688	0.7704	0.7719	0.7734	0.7749	0.7764	0.7779	0.7794	0.7808	0.7823	0.7838	0.7852	0.7867
0.8	0.7881	0.7896	0.7910	0.7925	0.7939	0.7953	0.7967	0.7981	0.7995	0.8009	0.8023	0.8037	0.8051	0.8065	0.8078	0.8092	0.8106	0.8119	0.8133	0.8146
0.9	0.8159	0.8173	0.8186	0.8199	0.8212	0.8225	0.8238	0.8251	0.8264	0.8277	0.8289	0.8302	0.8315	0.8327	0.8340	0.8352	0.8365	0.8377	0.8389	0.8401
1.0	0.8413	0.8426	0.8438	0.8449	0.8461	0.8473	0.8485	0.8497	0.8508	0.8520	0.8531	0.8543	0.8554	0.8566	0.8577	0.8588	0.8599	0.8610	0.8621	0.8632
1.1	0.8643	0.8654	0.8665	0.8676	0.8686	0.8697	0.8708	0.8718	0.8729	0.8739	0.8749	0.8760	0.8770	0.8780	0.8790	0.8800	0.8810	0.8820	0.8830	0.8840
1.2	0.8849	0.8859	0.8869	0.8878	0.8888	0.8897	0.8907	0.8916	0.8925	0.8934	0.8944	0.8953	0.8962	0.8971	0.8980	0.8988	0.8997	0.9006	0.9015	0.9023
1.3	0.9032	0.9041	0.9049	0.9057	0.9066	0.9074	0.9082	0.9091	0.9099	0.9107	0.9115	0.9123	0.9131	0.9139	0.9147	0.9154	0.9162	0.9170	0.9177	0.9185
1.4	0.9192	0.9200	0.9207	0.9215	0.9222	0.9229	0.9236	0.9244	0.9251	0.9258	0.9265	0.9272	0.9279	0.9285	0.9292	0.9299	0.9306	0.9312	0.9319	0.9325
1.5	0.9332	0.9338	0.9345	0.9351	0.9357	0.9364	0.9370	0.9376	0.9382	0.9388	0.9394	0.9400	0.9406	0.9412	0.9418	0.9424	0.9429	0.9435	0.9441	0.9446
1.6	0.9452	0.9458	0.9463	0.9468	0.9474	0.9479	0.9484	0.9490	0.9495	0.9500	0.9505	0.9510	0.9515	0.9520	0.9525	0.9530	0.9535	0.9540	0.9545	0.9550
1.7	0.9554	0.9559	0.9564	0.9568	0.9573	0.9577	0.9582	0.9586	0.9591	0.9595	0.9599	0.9604	0.9608	0.9612	0.9616	0.9621	0.9625	0.9629	0.9633	0.9637
1.8	0.9641	0.9645	0.9649	0.9652	0.9656	0.9660	0.9664	0.9667	0.9671	0.9675	0.9678	0.9682	0.9686	0.9689	0.9693	0.9686	0.9699	0.9703	0.9706	0.9710
1.9	0.9713	0.9716	0.9719	0.9723	0.9726	0.9729	0.9732	0.9735	0.9738	0.9741	0.9744	0.9747	0.9750	0.9753	0.9756	0.9759	0.9761	0.9764	0.9767	0.9770
2.0	0.9772	0.9775	0.9778	0.9780	0.9783	0.9786	0.9788	0.9791	0.9793	0.9796	0.9798	0.9801	0.9803	0.9805	0.9808	0.9810	0.9812	0.9815	0.9817	0.9819
2.1	0.9821	0.9824	0.9826	0.9828	0.9830	0.9832	0.9834	0.9836	0.9838	0.9840	0.9842	0.9844	0.9846	0.9848	0.9850	0.9852	0.9854	0.9856	0.9857	0.9859
2.2	0.9861	0.9863	0.9864	0.9866	0.9868	0.9870	0.9871	0.9873	0.9875	0.9876	0.9878	0.9879	0.9881	0.9882	0.9884	0.9885	0.9887	0.9888	0.9890	0.9891
2.3	0.9893	0.9894	0.9896	0.9897	0.9898	0.9900	0.9901	0.9902	0.9904	0.9905	0.9906	0.9907	0.9909	0.9910	0.9911	0.9912	0.9913	0.9915	0.9916	0.9917
2.4	0.9918	0.9919	0.9920	0.9921	0.9922	0.9923	0.9925	0.9926	0.9927	0.9928	0.9929	0.9930	0.9931	0.9931	0.9932	0.9933	0.9934	0.9935	0.9936	0.9937
2.5	0.9938	0.9939	0.9940	0.9940	0.9941	0.9942	0.9943	0.9944	0.9945	0.9945	0.9946	0.9947	0.9948	0.9948	0.9949	0.9950	0.9951	0.9951	0.9952	0.9953
2.6	0.9953	0.9954	0.9955	0.9955	0.9956	0.9957	0.9957	0.9958	0.9959	0.9959	0.9960	0.9960	0.9961	0.9962	0.9962	0.9963	0.9963	0.9964	0.9964	0.9965
2.7	0.9965	0.9966	0.9966	0.9967	0.9967	0.9968	0.9968	0.9969	0.9969	0.9970	0.9970	0.9971	0.9971	0.9972	0.9972	0.9972	0.9973	0.9973	0.9974	0.9974
2.8	0.9974	0.9975	0.9975	0.9976	0.9976	0.9976	0.9977	0.9977	0.9977	0.9978	0.9978	0.9978	0.9979	0.9979	0.9979	0.9980	0.9980	0.9980	0.9981	0.9981
2.9	0.9981	0.9982	0.9982	0.9982	0.9982	0.9983	0.9983	0.9983	0.9984	0.9984	0.9984	0.9984	0.9985	0.9985	0.9985	0.9985	0.9986	0.9986	0.9986	0.9986
3.0	0.9987	0.9987	0.9987	0.9987	0.9987	0.9988	0.9988	0.9988	0.9988	0.9988	0.9989	0.9989	0.9989	0.9989	0.9989	0.9989	0.9990	0.9990	0.9990	0.9990
3.1	0.9990	0.9990	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993	0.9993	0.9993	0.9993
3.2	0.9993	0.9993	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995	0.9995	0.9995	0.9995	0.9995
3.3	0.9995	0.9995	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997	0.9997
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998	0.9998	0.9998
3.5	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998
3.6	0.9998	0.9998	0.9998	0.9998	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
3.7	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
3.8	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	1.0000
3.9	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
4.0	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000