

Final Exam: Corporate Finance **1 hour**

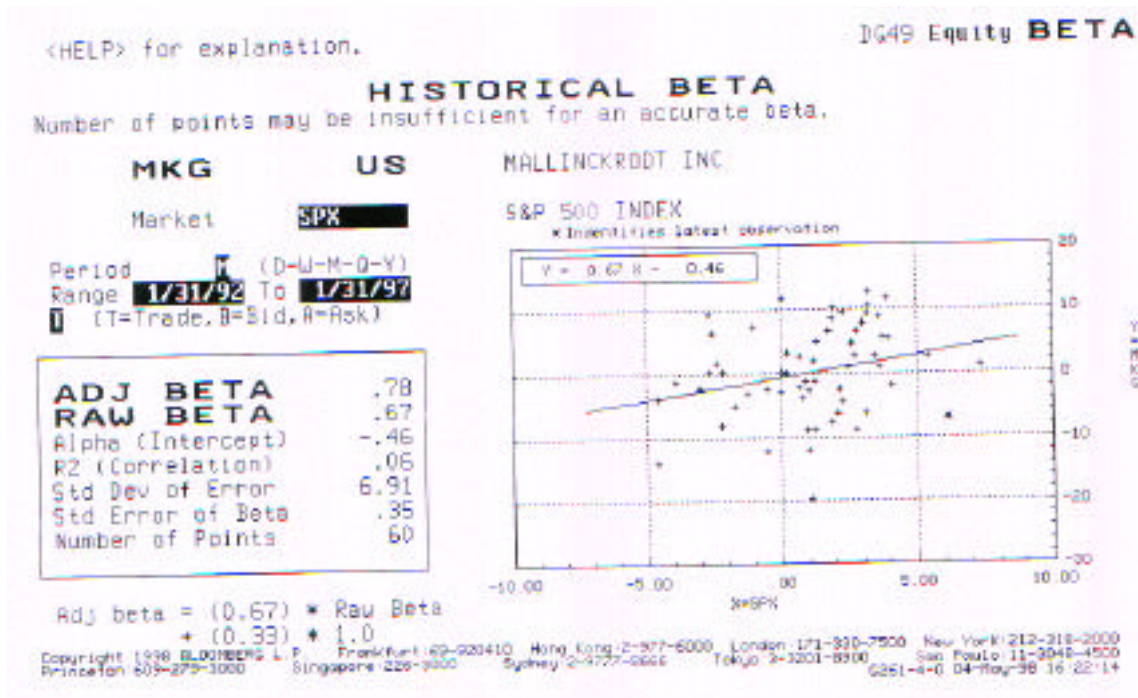
All of the questions in this exam relate to a company called Mallinckrodt, which is headquartered in St. Louis, Missouri, and is a company involved in pharmaceuticals and specialty chemicals. The stock of the company, traded on the NYSE, is at a 52-week low of \$ 32 per share. The CEO of the company, Mr. Ray Holman, has invited you to come in and do a corporate financial analysis of the firm, and has offered to pay you handsomely for your services.

- Page 8 of this exam has the income statements and balance sheets for the last 2 years
- Page 9 of this exam has the statement of cash flows for the last 4 years
- Page 10 has a summary table of interest coverage ratios, ratings and default spreads that you might find useful.
- Page 11 has industry averages for betas, debt ratios, returns on equity and capital, capital expenditure/depreciation and working capital as % of revenues for the two segments that Mallinckrodt is in - pharmaceuticals and specialty chemicals.

Additional Notes

- You can ignore the preferred stock in the firm for your calculations.
- Use a market risk premium of 5.5% throughout this analysis.
- The long term treasury bond rate through out this analysis can be set at 6%.

- The following is the Bloomberg regression output, using returns from 1992 to 1997 for Mallinckrodt.



- If the long term treasury bond rate today is 6%, estimate the cost of equity for Mallinckrodt, based upon the raw beta for the firm. (3 points)

Spring 1998

Name:

b. Mallinckrodt operates in two different business segments - pharmaceuticals and specialty chemicals. In 1997, the two businesses had the following operating income:

<i>Business Segment</i>	<i>Operating Income</i>
Pharmaceuticals	\$ 255.4 Million
Specialty Chemicals	\$ 51.5 Million
Total	\$ 306.90 Million

Based upon the industry averages reported on page 12 for the two segments, estimate the bottom-up unlevered beta for Mallinckrodt. (5 points)

Spring 1998

Name:

c. Mallinckrodt has 73 million shares outstanding today, trading at \$ 32 per share. Assuming that the book value of debt on its books, which is \$ 556.90 Million, is equal to market value (of debt), estimate the bottom-up levered beta for Mallinckrodt. The firm has a marginal tax rate of 40%. (4 points)

d. Estimate the return on equity earned by Mallinckrodt in the 1997 financial year, based upon average book value of equity between 1996 and 1997. (2 points)

2. You have estimated the optimal debt to capital ratio for Mallinckrodt, based upon minimizing the cost of capital, to be 40%.

a. Estimate the current cost of capital for Mallinckrodt, assuming that the beta for the stock is correctly estimated at 0.67, the cost of debt is based upon the rating estimated from the interest coverage ratio and the long term treasury bond rate is 6%. Mallinckrodt has 73 million shares outstanding today, trading at \$ 32 per share and \$ 556.90 million in debt outstanding (book as well as market). (5 points)

b. At the optimal debt to capital ratio of 40%, Mallinckrodt has an interest coverage ratio of 3.54. Estimate the cost of capital at the optimal debt ratio. (You can still use that the current regression beta of 0.67 to arrive at the new beta) (6 points)

3. a. To look at the firm's dividend policy, you look at Mallinckrodt's financial statements for the last year. Mallinckrodt, in 1997, had net income of \$ 190.10 million, capital expenditures of \$ 169.70 million, depreciation of \$127.70 million and its non-cash working capital increased by \$ 33.70 million. If it financed 25% of its external financing needs with debt , estimate its FCFE in 1997. (5 points)

- b. Using the statement of cash flows provided, estimate the percentage of the FCFE that was returned to stockholders (in the form of dividends and stock buybacks) in 1997.

(Stock Buybacks = Decr in Capital Stock)

(5 points)

4. In my attempt to value Mallinckrodt, I have projected the following cash flows for the firm for the next 3 years, which are expected to be high growth years (with a growth rate of 10%), and for year 4, which is assumed to be the first year of stable growth (when the growth rate is expected to drop to 3%).

	<i>Base</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>Terminal Year</i>
EBIT (1-t)	\$ 184.20	\$ 202.62	\$ 222.88	\$ 245.17	\$ 252.53
+ Deprecn	\$ 128.00	\$ 140.80	\$ 154.88	\$ 170.37	\$ 175.48
- Cap Ex	\$ 170.00	\$ 187.00	\$ 205.70	\$ 226.27	\$ 193.03
- Chg in WC		\$ 50.30	\$ 55.33	\$ 60.86	\$ 20.08
FCFF		\$ 106.12	\$ 116.73	\$ 128.41	\$ 214.89

Using the cost of capital estimated in problem 2a, value the firm. (If you had trouble getting the cost of capital in 2a, assume a cost of capital and value the firm). (15 points)

Page
Hit 1 <GO> for more income statement information (CH2).

DG49 Equity D E S

I N C O M E S T A T E M E N T (Mil of \$) Page 8 /10

M K G U S MALLINCKRODT INC

	6/1994	6/1995	6/1996	6/1997
Net sales	1940.10	2043.20	1754.40	1861.20
Cost of goods sold	1037.30	1102.80	956.80	1017.60
Sell, gen & adm exp	617.30	650.60	506.90	536.70
Operating inc(loss)	285.50	289.80	290.70	306.90
Interest expense	39.80	55.50	51.30	48.10
For exchange L (G)	4.20	-.70		.00
Net non-op L (G)	70.10	-27.20	-4.30	-29.20
Income tax expense	64.00	98.30	90.00	102.30
Reserve charges (cr)	.00	.00	.00	.00
Income bef XO items	107.40	163.90	153.70	185.70
XO L(G) pretax	3.60	-16.40	-58.20	-4.40
Tax effect on XO items				
Minority interest	.00	.00	.00	.00
Net income (loss)	103.80	180.30	211.90	190.10
Tot cash pref. dvd	.40	.40	.40	.40
Tot cash comm. dvd	37.30	41.80	45.70	48.20
Avg # shares for EPS	77.61	77.46	76.34	75.06
EPS before XO items	1.38	2.11	2.01	2.47
EPS aft XO items	1.33	2.32	2.77	2.53

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Page
Hit 1 <GO> for more balance sheet information (CH3).

DG49 Equity D E S

B A L A N C E S H E E T (Mil of \$) Page 9 /10

M K G U S MALLINCKRODT INC

	6/1996	6/1997	6/1996	6/1997
Cash & near cash	496.10	808.50	Accounts payable	147.00
Marketable sec	.00	.00	ST borrowings	109.40
Acct & notes rec	336.80	356.00	Other ST liab	637.00
Inventories	341.60	315.90	Cur liabilities	893.40
Other cur assets	78.00	136.40	LT borrowings	558.00
Current assets	1252.50	1616.80	Other LT liab	387.50
LT inv't & LT rec	2.50	4.20	Noncur liabilities	945.50
Depr fixed assets	1148.50	1213.10	Total liabilities	1838.90
Non-depr fixed ass	116.90	117.00	Preferred equity	11.00
Accum depreciation	434.50	502.20	Minority interest	.00
Net fixed assets	830.90	827.90	Share cap & APIC	370.60
Other assets	985.20	538.80	Retained earnings	850.60
Total assets	3071.10	2987.70	Shareholder equity	1232.20
Shares out	74.18	72.37	Tot liab & equity	3071.10
			ST part of LT debt	.00
			# treasury shares	12.84
			Ant treasury stock	284.80
				395.50

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Page DG49 Equity D E S

Hit 1 <GO> for more cash flow information (CH6).

CASH FLOW SUMMARY (Mil of \$) Page 10/10

M R G U S MALLINCRODT INC

	6/1994	6/1995	6/1996	6/1997
Net income (loss)	103.80	180.30	211.90	190.10
Deprec & amort	104.60	125.00	149.10	127.70
Other non-cash adj	74.10	54.80	-38.70	-47.50
Chg in non-cash wc	-55.20	-76.40	-151.90	33.70
Cashflow-operating act	227.30	283.70	170.40	304.00
Disp of fixed asst	8.60	21.20	120.50	412.80
Capital expenditures	-172.30	-160.80	-169.20	-169.50
Sale LT invest	.00	.00	.00	.00
Purchase LT invest	.00	.00	.00	.00
Other investing acts	-36.40	-134.30	-148.80	-23.50
Cashflow-investing act	-200.10	-273.90	-197.50	279.80
Dividends paid	-37.70	-42.20	-45.70	-48.20
Inc(dec) ST borrow	-58.60	19.90	511.70	-103.80
Increase: LT borrow	196.40	3.20	199.50	1.10
Decrease: LT borrow	-101.60	-10.30	-103.70	-10.20
Inc capital stock	10.90	8.00	31.00	39.60
Dec capital stock	.00	-15.40	-130.50	-149.90
Other financing acts	.00	.00	.00	.00
Cashflow-financing act	9.40	-36.80	462.30	-271.40
Net changes in cash	36.60	-27.00	435.20	312.40

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Interest Coverage Ratios, Ratings and Default Spreads

<i>If interest coverage ratio is</i>		<i>Rating is</i>	<i>Spread is</i>
<i>></i>	<i>≤ to</i>		
-100000	0.199999	D	10.00%
0.2	0.649999	C	7.50%
0.65	0.799999	CC	6.00%
0.8	1.249999	CCC	5.00%
1.25	1.499999	B-	4.25%
1.5	1.749999	B	3.25%
1.75	1.999999	B+	2.50%
2	2.499999	BB	2.00%
2.5	2.999999	BBB	1.50%
3	4.249999	A-	1.25%
4.25	5.499999	A	1.00%
5.5	6.499999	A+	0.80%
6.5	8.499999	AA	0.50%
8.50	100000	AAA	0.20%

Industry Averages

	Pharmaceuticals	Specialty Chemicals
Beta (Levered)	1.15	0.70
Debt/Equity Ratio (Market)	10%	35%
Return on Equity	18%	14%
After-tax Return on Capital	15%	12.5%
Capital Expenditures/Depreciation	110%	110%

The marginal tax rate for all firms is 40%.