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Investment Principles

Merger and Acquisition Valuation

Objective: The purpose of this project is to reinforce the concepts that you have been exposed to through readings, lectures, and mini-cases as well as financial concepts that you should have learned in your prior finance classes. In essence, you will learn how value a merger using discounted cash flow techniques. The data for this project can be downloaded from my website. The file is called ip_merger2003.xls. The data is current as of December 2001.

The Deal: Reports of Immunex's (IMNX) acquisition by Amgen (AMGN) first surfaced on Thursday, December 13, 2001. Amgen, in its initial announcement of the merger said that it would purchase Immunex for $16.7 billion and offered .44 shares of Amgen for every one share of Immunex in addition to $4.50 in cash per share. With the merger, Amgen would become one of the top ten drug makers in the world in terms of market capitalization. American Home Products (NYSE: AHP), which owns 41% of Immunex, has agreed to support the deal, and will be an 8% owner of the combined entity. In connection with the acquisition, Amgen and Immunex filed with the Securities and Exchange Commission (SEC), a joint proxy statement/prospectus dated March 22, 2002 and other relevant materials. The joint proxy statement/prospectus was first mailed to the stockholders of Amgen and Immunex on or about March 26, 2002. The merger was completed on July 16, 2002. Terms of the deal are in Appendix A of this case.

Amgen shareholders get Immunex, which currently consists mainly of Enbrel, an injectable rheumatoid arthritis treatment. Enbrel is projected to sell $750 million this calendar year(2001), with growth limited only by manufacturing capacity. Immunex is addressing this overcapacity issue with facilities that it purchased from American Home Products. These facilities will be on line in 2002. Immunex says that Enbrel is on track to provide $750 million in year 2001 sales, and between $900 million to $1.3 billion in 2002 and be worth $4 billion a year by 2004. Amgen also sees strong sales for Enbrel stating that they “firmly believe that, as a result of this combination, ENBREL(R) -- the fastest growing biologic drug ever -- will reach its peak of $3 billion or more in annual sales.” We will assume that patents on Enbrel are good to 2011, after which generic competition will reduce its revenues significantly.

Amgen maintains that "With the acquisition, Amgen expects to accelerate its five-year annual percentage growth in product sales to the low 30s from the low 20s, and accelerate its annual growth in cash EPS to the mid-20s from the low 20s."

In the company's conference call regarding the merger, Amgen CEO Sharer focused on "size synergies", arguing that Amgen's marketing muscle will drive sales of Immunex's Enbrel higher, and that the two companies can wring cost savings out of their corporate structures. Estimated cost synergies are expected to total more than $200 million in 2003, and more than $250 million in 2004, representing approximately 5% of the combined company's operating expenses. Synergies will be derived primarily from reductions in redundant program expenses and employee related costs, and avoidance of future headcount needs.

The Participants:

Amgen (The Acquirer): "Amgen is a leading global biotechnology company that discovers, develops, manufactures and markets important human therapeutics based on advances in cellular and molecular biology. Founded in 1980 with a staff of seven, Amgen has grown into a global corporation with more than 7,000 employees worldwide. As the world's largest biotechnology company, Amgen discovered and markets the two most successful biotechnology products -- EPOGEN(R), which treats anemia, and NEUPOGEN(R), which fights infection in cancer chemotherapy patients. In the past two months, Amgen launched Aranesp(TM), which requires fewer injections than current anemia therapy, and Kineret(TM), for the reduction in signs and symptoms of rheumatoid arthritis."[1]

Immunex (The Target): "Immunex Corporation is a leading biopharmaceutical company dedicated to improving lives through immune system science innovation. The company has received numerous awards for both its scientific achievements and its overall workplace environment since its inception in 1981. Immunex is an innovator in the biopharmaceutical industry, and is responsible for the production of the world's fastest growing biotechnology product, ENBREL(R), used to treat rheumatoid arthritis. The company recently broke ground in Rhode Island and began construction of a new, large-scale manufacturing facility to help ensure the long-term supply of ENBREL(R)."[2]

Competitors: Biogen (BGEN), Chiron (CHIR), Genentech (DNA), Genzyme (GENZ), IDEC Pharmaceuticals (IDPH), Medimmune (MEDI)

"These 12,500-liter vats regulate the life-sustaining conditions for the cells producing ENBREL. Facilities like these take more than 4 years to build and must be approved by the FDA." (Source: http://www.enbrel.com/aae/aae06.jsp?fvar=0)

[1] http://news.stockselector.com/newsarticle.asp?symbol=AMGN&article=20450270
[2] http://news.stockselector.com/newsarticle.asp?symbol=AMGN&article=20450270

Assignment/Tasks: Download the file ip_merger2003.xls and then given the assumptions on page 6 of this mini-case, perform the following tasks using this spreadsheet. Please refer to the section entitled “Valuation Assumptions” (page 6 of this case) for assumptions in doing your calculations. Observe that we are valuing the merger using adjustments to EBITDA rather than using Free Cash Flow to the Firm. The primary reason for this is that Amgen's press release indicates that Amgen is looking at the deal in terms of "cash earnings" which is similar to EBITDA net of taxes and interest. Given the relatively nominal interest payments and low taxes regarding our firms, we will use EBITDA as our cash flow proxy with adjustments to EBITDA when necessary.[3]

1. Co-movement of Prices for Amgen and Immunex (5 points): Plot the daily price of Amgen against the daily price of Immunex starting from 10/9/2001 until 6/27/2002 using the Lines of 2 Axes Graph located under Custom Types. Discuss what happens to the price movement of Immunex relative to the price movement of Amgen after the announcement of the merger on December 17, 2001. In addition to this, explain why is there a difference between the price of Immunex and the price of Amgen once the merger is announced e.g., why doesn't the price of Immunex equal the price of Amgen? Draw a chart using Excel to prove your point.

2. Dilution Effect from Merger (5 points): What is the dilution effect to Amgen's existing shareholders in terms of the increase in the number of shares outstanding once the merger goes through? What must the increase in value be in percentage terms to make up for the dilution?

3. Cost of Debt (5 points): Calculate the before tax and after tax cost of debt for Amgen and for Immunex using information contained in the worksheets labeled “Bond Spreads” and “Treasury Rates”. Amgen’s outstanding long-term debt was rated A2 by Moody’s and A by Standard and Poor’s at the time of the merger announcement. Since Immunex did not have any debt as of 12/14/2001 based on their 9/30/01 10Q, use the Altman EM score model to calculate an imputed bond rating for Immunex[4]. Appendix B of this case contains a discussion of the Altman EM score model and how to use it. A template is provided for your Altman EM score calculations in the worksheet named “3. Altman Z-Score (Template)”.

4. Present Value of Operating Leases (5 points): Calculate the present value of the operating leases for Immunex using the information provided in the worksheet labeled “Operating leases”. In addition to this, calculate Immunex’s imputed interest on its operating lease. Amgen has no operating leases and as such the present value of operating leases for Amgen is zero.

5. Built-Up Beta: (5 points): Calculate the built-up beta for Immunex and also for Amgen using the "Returns" worksheet in your workbook. Use the book value of debt and the

[3]I personally do not like using EBITDA as a substitute for FCFF in general since you are assuming that CapEx = 0 and Change in non-cash working capital = 0.

[4]We need to use the Altman model since the interest coverage ratio model of Professor Aswath Damodaran is not applicable in this situation.

market value of equity in calculating the debt-to-equity ratio for the comparable firms (your comparables firms should not include either Immunex nor Amgen). Round your answer to two decimal places. Use the marginal tax rate for the last twelve months for Immunex (Amgen) in calculating Immunex's (Amgen's) built-up beta. The debt for Immunex and Amgen should include the present value of operating leases, if any. However, we will not include the present value of operating leases in the debt for the comparable firms[5]. If any cell in a financial statement has an "NA", assume that NA is equal to zero. Use the numbers in the financial statement for 9/30/2001 since the numbers for 12/31/2001 would not have been reported as of the date of your analysis (12/14/200). Do Amgen and Immunex have similar built-up levered betas? Are the built-up betas for both firms similar to their historical betas?

6. <u>Cost of equity and weighted average cost of capital</u> (5 points): Calculate the cost of equity for Amgen and also for Immunex using their respective built-up betas. Next, calculate the before-tax WACC and also the after-tax weighted average cost of capital for Amgen and Immunex.

7. <u>Margin analysis</u> (10 points): Do a margin analysis for Amgen and also for Immunex using the Margin Analysis worksheets in your workbook. In addition to this, calculate the EBITDA margin (EDITDA/Sales) for each competitor using the last 12 months of data (remember that the most recent data is 9/30/01) and also for the year 2000. As a part of the EBITDA margin analysis, compute the median and mean. If a firm has a negative margin, put an “NMF” in that cell for not meaningful figure. A template labeled “Margin analysis (Comps)” is provided to aid you in your EBITDA margin calculations. This analysis is a prelude to forecasting the cash flows.

8. <u>Value of each firm without synergies: Standalone valuation</u> (30 points): Calculate the standalone value of the firm for Immunex by performing a discounted cash flow valuation on the adjusted EBITDA[6].

a. <u>Value of Immunex</u> (Perspective: management of Immunex): Based on the management of Immunex projections reported in the press, assume that sales (in thousands) of Enbrel are $1,100,000 (Year 2002), $2,550,000 (Year 2003), $4,000,000 (Year 2004 through Year 2011), $750 (Year 2012), $500 (Year 2013), and $250 (Year 2014). In calculating the terminal value (enterprise value) in year 2014, use the TEV/EBITDA multiple applied to the adjusted EBITDA in year 2014. What is the value of the operating assets? What is the value of the firm? What is the justified price per share? Do a sensitivity analysis using the data table command in Excel by completing the one-way table in the worksheet. This sensitivity table shows how the justified price per share for IMNX changes with a change in the assumption regarding the EBITDA/sales margin.

[5] In actual practice, the present value of operating leases should be included in the debt for comparable firms. We exclude them in this case to save you some time.
[6] Adjusted EBITDA = EBITDA + Imputed Interest on Operating Leases (if any)

b. Value of Immunex (Perspective: management of Amgen): Based on the management of Amgen's projections for Immunex reported in the press, assume that sales (in thousands) of Enbrel are $1,000,000 (Year 2002), $1,250,000 (Year 2002), $1,500,000 (Year 2003), $2,000,000 (Year 2005), $2,250,000 (Year 2006), $3,000,000 (Year 2007 through Year 2011), $750 (Year 2012), $500 (Year 2013), and $250 (Year 2014). In calculating the terminal value (enterprise value) in year 2014, use the TEV/EBITDA multiple applied to the adjusted EBITDA in year 2014. What is the value of the operating assets? What is the value of the firm? What is the justified price per share? Do a sensitivity analysis using the data table command in Excel by completing the one-way table in the worksheet. This sensitivity table shows how the justified price per share for IMNX changes with a change in the assumption regarding the EBITDA/sales margin.

c. Value of Amgen (Perspective: management of Amgen): Based on the assumptions given in the Valuation Assumptions section of this case, calculate the value of the operating assets, the value of the firm, and the justified price per share for Amgen using an adjusted EBITDA valuation model. Assume that the sales growth is equal to the growth in EBITDA for purposes of calculating the terminal value.

9. Cash Flows of the Combined Firm with Synergy (10 points): Calculate the cash flow of Amgen on a post merger basis with cost saving synergies included using the template provided in your workbook.

10. Weighted average cost of capital of the Combined Firm (10 points): Calculate the beta of the combined firm. Using this new levered beta, calculate the cost of equity for the combined firm. Next calculate the cost of debt and then the weighted average cost of capital on a before-tax WACC and after-tax WACC for the combined firm.

11. Value of the Combined Firm with Synergy (10 points): Calculate the value of the combined firm with cost saving synergies using the valuation template provided. Be sure to adjust the cash and equivalents of the combined firm for the $4.50 per share cash payment to Immunex shareholders. Also, make sure to adjust the number of shares outstanding for dilution effects. What is the firm value and justified price per share of Amgen post-merger assuming Amgen's projected cash flows for Immunex? What is the firm value and justified price per share of Amgen post-merger using Immunex management's projected cash flows for Enbrel? How do your justified prices per share compare to the market price of Amgen on December 14, 2001 of $56.03 per share?

Please turn in a hard copy of your solutions together with your disk showing all your spreadsheet calculations. This is an individual project. As such, anyone caught cheating will be given an F on this assignment.

Valuation Assumptions:

Item	Assumption
TTM or LTM (Trailing twelve months)	Use the last twelve months of data (LTM)/last 4 quarters of data in the 10Q. Remember that only "flow" items are added for the last 4 quarters while only the most current quarter is used for "stock" items.
Expected growth rate in sales per year	Amgen (pre-merger): 22% per year (Year 2002 to Year 2005) 4% per year (Year 2011 and onwards) Sales growth declines by 3% per year from year 2006 to year 2010. Thus in year 2006, the sales growth is 19% (22%-3%).
EBITDA Margin (EBITDA/Net sales)	<u>Immunex</u>: 50.4% per year (due to patent) Enbrel provides a 50% net margin to Amgen, because all of its expenses are behind it except selling, general, and administrative. Amgen (pre-merger): 50.4% per year (Year 2002 – 2005) 27.0% per year[7] (Year 2011 and onwards) EBITDA margin declines by 4% per year from year 2006 to year 2010. Thus in year 2006, the EBITDA margin is 46% (50.4% - 4%).
Marginal tax rate (τ)	35% (for both Amgen and Immunex)
Terminal Value	Immunex : Use the Total Enterprise Value (TEV)/EBITDA of 25x. Amgen (pre-merger) : Use the constant growth model Adjusted $EBITDA_{2014}$/(WACC – Growth Rate in $EBITDA_{2014}$) Amgen (post-merger): Use the constant growth model Adjusted $EBITDA_{2014}$/(WACC – Growth Rate in $EBITDA_{2014}$). Note: we assume that the growth rate in EBITDA is equal to the growth rate in sales.

[7] This EBITDA margin is the average of the big pharma companies (ABT, BMY, LLY, GSK, JNJ, MRK, PFE, and SGP). Over time, Amgen's margin should be mean reverting e.g., the margin should revert to the mean of the older, established firms in its industry.

Item	Assumption
Market risk premium (R_M-r_F)	5.5%
Firm's Bond Rating	Use Altman's EM model; See Appendix B of this case
Maturity of Long Term Debt	10 years
Market Value of Debt	Assume that the Market Value of Debt = Book Value of Debt[8]; Total debt includes the PV of Operating Leases.
Percentage of Sales (Use this in calculating cost savings in calculating cash flows for the combined firm) Note: (COGS + R&D + SGA) /Sales = Operating Expenses/Sales	<u>Immunex</u>: COGS (xclu Depreciation)/Sales = 24% R&D/Sales = 20% Selling, General & Admin/Sales = 42% <u>Amgen</u>: COGS (xclu Depreciation)/Sales = 4% R&D/Sales = 23% Selling, General & Admin/Sales = 23%
Cost Savings: Synergy (Use this in calculating cost savings in calculating cash flows for the combined firm)	Cost Savings (Year 2002) = $0 Cost Savings (Year 2003) = $200,000 Cost Savings (Year 2004) = $250,000 Cost Savings (Year 2005 - 2014) = 5% of Combined Operating Expenses All cost savings are stated in (000s) of dollars. This means that the cost savings for Year 2003 is $200 million.
Shares Outstanding	<u>Amgen (post-merger)</u>: .44 shares of Amgen for every one share of Immunex in addition to $4.50 in cash per share

[8]This isn't the case from a theoretical perspective although many analysts make this assumption.

Appendix A

Combined Company Fact Sheet (http://amgen.acquisitioninformation.com/factsheet/)

Strategic Rationale

- Amgen's acquisition of Immunex brings together the world's most successful biotech companies, significantly accelerating Amgen's long-term growth.
- The new Amgen will have an unparalleled, diversified portfolio of 3 blockbuster drugs with long patent lives, including Amgen's EPOGEN® and NEUPOGEN® and Immunex's ENBREL®, along with Amgen's potential blockbuster Aranesp™.
- The new Amgen will have leadership in three targeted therapeutic areas -- nephrology, oncology, and inflammation -- with a rich pipeline and R&D focus in proteins and antibodies.
- Acquisition of Immunex will increase Amgen's long-term product sales growth rate to the low 30s and cash EPS growth rate to the mid-20s, driven by potential ENBREL® sales of $3 billion or more by 2005.

Transaction Summary	
Structure	Tax-free reorganization (Immunex shareholders will not be taxed to the extent that they exchange their Immunex stock for Amgen stock)
Terms	Immunex shareholders receive 0.44 shares of Amgen common stock and cash of $4.50 for each Immunex share
Total value	Approximately $16 billion
Ownership	Amgen shareholders 81%; Immunex shareholders 19% Amgen will purchase AHP's 41% stake in Immunex, giving AHP an 8% stake in the new company, which is expected to be reduced over time
Accounting	Purchase
Expected Closing	Second Half 2002

Key Product Lineup	
<u>Marketed Products</u>	**<u>Pipeline</u>**
***Oncology* –** NEUPOGEN®, Thioplex®	***Oncology* –** Aranesp™, KGF, Pegfilgrastim, Epratuzumab, Novantrone, ABX-EGF
***Inflammation* –** ENBREL®, Kineret®	***Inflammation* –** sTNF-RI, IL-1 r2
***Nephrology* –** EPOGEN®, Aranesp™	***Nephrology* –** Calcimimetics

Key Financials

	Amgen LTM*	Immunex LTM	Pro Forma 2002**
Annual Revenues	$3.8 Billion	$861 Million	$5.5 Billion
Net Income	$1.1 Billion	$154 Million	$1.5 Billion
Cost Synergies	Estimated cost synergies are expected to total more than $200 million in 2003, and more than $250 million in 2004.		

* Last Twelve Months as of September 30, 2001
** Based on H2 2002 close

Management

Chairman & CEO	Kevin Sharer	**EVP, Sales & Marketing**	George Morrow
EVP, R&D	Roger Perlmutter	**EVP, Operations**	Dennis Fenton
EVP, Finance/Strategy	Richard Nanula	**EVP**	Peggy Phillips

12/17/01

This document contains forward-looking statements which are based on management's current expectations and beliefs and are subject to a number of risks, uncertainties and assumptions that could cause actual results to differ materially from those described in the forward-looking statements. Risks, uncertainties and assumptions include those risks that are described in the Important Notice contained on this website and in the Securities and Exchange Commission reports filed by Amgen and Immunex, including their most recent filings on Form 10-Q. Amgen and Immunex assume no obligation and expressly disclaim any duty to update information contained in this document except as required by law.

Appendix B: Altman Z-Score Model

There are several versions of the Altman z-score model. We will use the EM version of his model. Professor Edward Altman of NYU developed this model using multiple discriminant analysis in conjunction with financial ratios to predict the probability of business failure leading to bankruptcy.

The EM-score (emerging markets) model is defined as

$$\text{EM Score} = 3.25 + 6.56(X_1) + 3.26(X_2) + 6.72(X_3) + 1.05(X_4)$$

where X_1 = Working Capital/Total Assets = (Current Assets - Current Liabilities)/TA
X_2 = Retained Earnings/Total Assets
X_3 = EBIT/Total Assets
X_4 = Book Value of Equity/Total Liabilities

Bond Rating	Altman Z-Score	Bond Rating	Altman Z-Score
AAA	8.15	BB+	5.25
AA+	7.60	BB	4.95
AA	7.30	BB-	4.75
AA-	7.00	B+	4.50
A+	6.85	B	4.15
A	6.65	B-	3.75
A-	6.40	CCC+	3.20
BBB+	6.25	CCC	2.50
BBB	5.85	CCC-	1.75
BBB-	5.65	D	0.00

Ed Altman, NYU

Appendix C: Preliminary Valuation by Amgen[9]

Note: This information is provided in Appendix C is for informational purposes only. Do not use the information in Appendix C to answer any of the questions.

The following summarizes the preliminary allocation of fair values to Immunex's net assets and the resulting accounting treatment in Amgen's and Immunex's combined financial statements.

Asset description	Preliminary Values Assigned (in billions)	GAPP accounting treatment
In-process research and development	$2.4	Recognize as an immediate expense during the period that the acquisition closes
Identifiable intangible assets (primarily developed technology related to ENBREL)	6.6	Capitalize and amortize over the estimated useful life of the product - 15 years (approximately $440 million per year). **Note**: *This is the estimated fair value of currently approved indications for ENBREL derived from preliminary estimates of discounted future cash flows performed for Amgen by a third party specialist*.
Deferred tax liability	(2.6)	Established to reflect the lack of tax deductibility of identifiable intangible assets acquired. This liability will be amortized in proportion to the related assets and, in essence, results in a benefit to future years' tax provisions (approximately $170 million per year)
Net tangible assets, principally Immunex's cash and investments acquired	1.9	Capitalize
Goodwill	9.4	Capitalize as an asset as of the acquisition date and periodically evaluate for potential impairment (at least once per year)
Total purchase price[10]	**$17.7**	

[9](Source: http://amgen.acquisitioninformation.com/s4/)

[10] The allocation of the purchase price is preliminary. The final determination of the allocation of the purchase price is expected to be completed as soon as practicable after the completion of the acquisition. As a result, the final allocation could differ significantly from the amounts presented in the table above.