

## Sanofi-aventis: Acquiring Genzyme<sup>1</sup>

So-called “orphan drugs” target rare illnesses. While the demand for an orphan drug is relatively small, sales can be highly profitable. Founded in 1981, Genzyme applies biotechnology to manufacture orphan drugs that target rare genetic diseases. Cerezyme is a treatment for Gaucher disease, which is caused by a deficiency in the enzyme glucocerebrosidase, while Fabrazyme is a treatment for Fabry disease, which is caused by deficiency of the enzyme alpha-galactosidase A.

By 2010, Genzyme employed 10,000 staff worldwide and its worldwide sales revenues exceeded \$4 billion. However, in 2009, failure in manufacturing processes resulted in drugs that were contaminated with metal, glass, and other particles. The Food and Drug Administration levied a fine of \$175 million. To add further woes, a bioreactor used to produce basic ingredients was contaminated, and so, Genzyme had to suspend production temporarily. As of May 2010, Genzyme met about 50 per cent of the demand for Cerezyme and 30 per cent for Fabrazyme.

### Genzyme Corporation: Financials (\$ million)

	2010	2009	2008	2007
Revenue	4,048.71	3,977.29	4,605.04	3,813.52
Cost of goods	1,191.54	1,070.35	1,148.56	927.33
Gross profit	2,857.17	2,906.94	3,414.44	2,856.77
Operating expenses	4,012.88	3,443.53	4,023.56	3,159.65
Operating income	35.83	533.76	581.48	653.87
Income after tax	32.06	426.93	421.08	480.19

Source: Google Finance

In July 2010, the French pharmaceutical group, Sanofi-aventis, announced an offer to acquire Genzyme at \$69 a share, or about 20 times forecast earnings for the year 2011. On July 22 and 23, two days and the day before news of the offer respectively, Genzyme shares closed at \$54.17 and \$62.52 per share. Genzyme’s board rejected the offer and sought a price of \$75 a share.

Sanofi’s offer diverged from Genzyme’s demand because of differences in views over two issues. The more important issue was the future prospects for Genzyme’s drug, Lemtrada, a new treatment for multiple sclerosis. The other issue was progress in restoring the production of existing drugs.

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<sup>1</sup> This case study is based on: Genzyme fined \$175m over manufacturing failures”, *Financial Times*, May 24, 2010; “Sanofi steps up Genzyme pursuit”, *Financial Times*, August 29, 2010; Sanofi-aventis and Genzyme Corporation, Media Release: “Sanofi-aventis to Acquire Genzyme for \$74.00 in Cash per Share Plus Contingent Value Right”, February 16, 2011; “Investors place discount on Sanofi’s offer”, *Financial Times*, February 18, 2011. I thank Evan Starr for help with this case.

Sanofi chief executive, Chris Viehbacher, criticized Genzyme as having performed poorly for years. Justifying the takeover, he remarked, “We have the savoir faire to help Genzyme get back on track faster” (“Sanofi steps up Genzyme pursuit”, *Financial Times*, August 29, 2010). Typically, the competitive advantage of large pharmaceutical companies over smaller competitors is in sales and marketing.

In August 2010, with Genzyme refusing a friendly offer, Sanofi began preparations for a hostile takeover. After months of wrangling, in February 2011, Sanofi and Genzyme agreed on a deal at a price of \$74 in cash plus a Contingent Value Right (CVR) for each Genzyme share. The cash element was worth approximately \$20.1 billion based on 272.5 million outstanding Genzyme shares.

Sanofi would pay various amounts on the CVR upon specified milestones:

- \$1 if production of Cerezyme and Fabrazyme met specified levels in 2011, plus
- \$1 upon final approval of Lemtrada by the Food and Drug Administration, plus
- \$2 if net sales of Lemtrada exceed \$400 million within specified periods per sales territory, plus
- \$3 if global net sales of Lemtrada exceed \$1.8 billion, plus
- \$4 if global net sales of Lemtrada exceed \$2.3 billion, plus
- \$3 if global net sales of Lemtrada exceed \$2.8 billion.

If all milestones were met, the total payout would be \$14 per CVR. Sanofi pledged to invest “diligent efforts” to develop and market Lemtrada. Various investment analysts estimated that sales of Lemtrada would range from \$2.4-\$2.5 billion and valued the CVR at between \$3.74-\$4.00. In the “when issued” grey market, the CVR traded at prices of up to \$2.25.

## Questions

1. Suppose that Sanofi-aventis values Genzyme at \$95 per share. It must decide whether to make a high offer at \$69 per share or a lower offer at \$60 per share. The objective of the high offer is to pre-empt competitors from making competing offers for Genzyme. The competitors would value Genzyme at \$80 per share. If Sanofi makes the high offer, the competitor would infer that Sanofi's value for Genzyme is \$90 per share. If Sanofi makes the low offer, the competitor would infer that Sanofi's value for Genzyme is \$70 per share.
  - a. Draw the following game in extensive form. In the first round, Sanofi must decide whether to offer \$60 or \$69 per share. In the second round, competitor must decide whether to make an offer (at its belief of Sanofi's valuation of Genzyme) or make no offer. Finally, in the third round, Sanofi must decide whether to make an offer (at its belief of the competitor's valuation of Genzyme) or make no offer. Sanofi and the competitor must incur a cost of \$1 per share for each offer that it makes. At each branch of the game tree, write down the expected profits for Sanofi and the competitor.
  - b. Identify the equilibrium/equilibria of the situation.
2. Identify the critical asymmetry(ies) of information between Sanofi and Genzyme. Explain how the Contingent Value Right (CVR) would resolve the asymmetry. Given that the market valued the CVR at no more than \$2.25, comment on any possible asymmetry of information between Genzyme and investors.
3. Suppose that Sanofi has acquired Genzyme, and global sales of Lemtrada are expected to be \$1.9 billion.
  - a. If global sales were to increase from \$1.9 billion to \$2.4 billion, how much *more* would Sanofi be required pay to CVR holders? (Assume that Sanofi acquires all 272.5 million outstanding Genzyme shares.)
  - b. Generally, how does the payout on the CVR depend on efforts by (i) management and personnel of Genzyme, and (ii) management and personnel of Sanofi after the acquisition?
  - c. Suppose that key Genzyme managers and scientists own large number of Genzyme shares and accept the Sanofi offer. How would their ownership of the CVRs affect their incentives to meet the CVR milestones?