Rose-Hulman Institute of Technology

Team Case Study Project

Eli Lilly and Company

SV351-01 Managerial Economics

Instructor: Professor Christ

November 18, 2013

Michael Barrett, Cody Bostic, and Neven Frazee

**Background and Description**

Eli Lilly and Company was founded in 1876 by Colonel Eli Lilly in Indianapolis, Indiana. His motivation for creating the business was the lack of effectiveness of medicines during his day in both society and in the Civil War. To improve the testing of Lilly’s products, Eli Lilly brought in Lilly’s first scientist to lay the foundation for Lilly’s tradition of improving the quality of current products and expanding that tradition into developing new and improved pharmaceuticals. As management was passed down in the family, a culture was established that viewed the employees as the most valuable asset to Eli Lilly and Company’s firm (“Heritage”).

As a result, Lilly has developed into the tenth largest pharmaceutical company in the world with about thirty-eight thousand employees worldwide and research and development facilities in eight countries. While Lilly’s headquarters are located in Indianapolis, Indiana, Lilly has manufacturing plants in thirteen countries, and clinical research is conducted in over fifty-five countries. John C. Lechleiter is the current chairman of the board of directors, and he has held the position since 2009. He is also the president and chief executive officer of Lilly, and he has held these positions since April 2008. Eli Lilly’s ticker symbol is LLY (“Key Facts”).

**Economic Returns**

Since 2003, Lilly’s annualized returns were about 4.70% with an annualized volatility of about 21.02% in the stock market (“Historical Prices”). The average return on equity was 22.26%, the average net profit margin was 14.74%, the average asset turnover was 67.57%, and the average financial leverage was 2.53. According to this information, Lilly maintains its return on equity by keeping a high asset turnover and high degree of financial leverage with its low profit margin (shown in Figures 2-5).

Some of Lilly’s competitors in the pharmaceutical industry include Merck & Company, Incorporated and Pfizer Incorporated. Since 2003, Merck’s annualized returns were about 6.82% with an annualized volatility of 25.43% (“Historical Prices”). The average return on equity was 20.69%, the average net profit margin was 21.69%, the average asset turnover was 46.91%, and the average financial leverage was 2.07. According to this information, Merck maintains its return on equity by keeping a high asset turnover, moderately high profit margins and moderately high degree of financial leverage. Pfizer’s annualized returns were about 5.58% with an annualized volatility of 19.82% since 2003. The average return on equity was 13.74%, the average net profit margin was 18.88%, the average asset turnover was 37.79%, and the average financial leverage was 1.98. According to this information, Pfizer maintains its return on equity by keeping a moderately high asset turnover and a moderately high degree of financial leverage with its low profit margin[[1]](#footnote-2) (shown in Figures 2-5).

Comparing these three companies, Lilly has the highest average financial leverage, highest average asset turnover, and highest average return on equity since 2003 even though it has the lowest annualized returns (shown in Figure 6). Merck has the highest average net profit margin and the highest annualized returns, but it also has the highest annualized volatility. Pfizer has the lowest annualized volatility of the three companies, but it also has the lowest average return on equity. Even though these companies compete in the same industry, they have different ways to maintain their returns on equity.

**Porter’s Five Forces Analysis**

For Eli Lilly and Company, the threat of new entrants is low compared to the other forces of industry structure. In the research industry of pharmaceuticals, there are large barriers of entry. There are high start-up costs to acquire the equipment needed to begin researching. In addition, testing products requires more time and money to be spent in order to be a successful drug producer like Lilly. Another barrier to entry would be creating good supplier relations in order to make the drugs. Some of these chemical producers have good relations with other pharmaceutical makers, which would make it hard for new entrants to find a reliable producer to sell them chemicals.

Most products patented by Lilly and other pharmaceutical companies do not have a shelf life the full length of their patent. After a drug has been discovered, it takes about fifteen years for the drug to hit the market (*Will the Pipeline Deliver for Lilly?*). Each year spent on product testing before approval by the FDA reduces the period before a generic product can be introduced into the market. These generics are produced when the patent life of a product runs out and the formula can be reproduced for sale by other firms at a lower price. In 2013, Lilly is expected to report $0.40 of every $1.00 in sales exposed to generic competition (Lilly.com, *Supply Chain*). In general, patents limit Lilly’s threat of substitutes in the legal market, but cannot account for the $75 billion in losses due to counterfeit drugs produced in the black market (Lilly.com, *Supply Chain*). To help combat this market loss Lilly is teaming up with government agencies and other pharmaceutical companies in an effort to clean the streets of these dangerous and unregulated counterfeit drugs.

In managing its supply chain, Lilly’s main goal is to maintain a safe and uninterrupted supply of their medicines. In order to accomplish this goal Lilly buys from thousands of suppliers of materials and services, ten percent of which are small and diverse suppliers. In 2011, they managed to spend $522 million on supplies from these smaller suppliers (*Supply Chain*). Doing this reallocates some supply market power back to Lilly. The remaining 90 percent are larger, more concentrated companies that add to the risk associated with the supply chain. These larger companies being less diverse enforce more supply power onto Lilly into the form of higher input costs. In the supply of chemicals to produce pharmaceutical drugs there are little to no substitutes for inputs. This being said there is a lot of associated risk accredited to Lilly’s supply chain.

In the pharmaceutical market in the United States, wholesale pharmaceutical distributers have a high level of buying power when buying drugs from pharmaceutical companies like Eli Lilly and Co. This can be said because, “Three companies generate about 85% of all revenues from drug distribution in the United States” (“Top Pharmaceutical Distributors”). Because only a few customers make up most of the market, each of the three large wholesale drug companies has significant buying power. These wholesale pharmaceutical distributors then sell to pharmacies, where consumers purchase drugs.

There is a high level of rivalry among existing pharmaceutical companies such as Eli Lilly and Co. This is probably best demonstrated by the advertising expenditures made by firms in the pharmaceutical market. Pharmaceuticals are the second largest group of products in terms of advertising expenditure in 2010 (Neilson, “Trends in Advertising Spend and Effectiveness”). This is also demonstrated by competition to invest in research and development of new drugs. Eli Lilly and Co. currently has four different new ten-year drugs under research and development this year, each costing, on average, $6,678 million (Herper, “How Much Does Pharmaceutical Innovation Cost?”).

**Challenges Faced by Eli Lilly**

Eli Lilly is involved in the research and development of pharmaceutical products. The development techniques and drug recipes are made by Lilly while still following FDA regulations. Some technological constraints that inhibit this process are the machines they use to test new drugs to put out on the market. If machines start to become worn down, they will need to be replaced or upgraded to maintain a certain standard of quality of products.

Eli Lilly and Co., along with other companies in the drug industry, tries to increase demand for its drugs through two main methods: advertising to the public and sending drug representatives out to convince doctors to prescribe drugs produced by Eli Lilly and Co. The old practice was for drug representatives to try to convince doctors to prescribe the companies medications by any means necessary, but doctors began to cite this “high-pressure, car sales-type approach” (Rockoff, “Drug Reps Soften Their Sales Pitches”) as a reason for not prescribing medications made by Eli Lilly and Co. This caused the company to make a new policy of having drug reps act as more of a resource of information for physicians, rather than as aggressive sales people. “Surveys of doctors show that 85% are satisfied with Lilly, up from the 60% before the company changed ways” (Rockoff, “Drug Reps Soften Their Sales Pitches”).

A pricing strategy incorporated by Eli Lilly and Co. is the use of rebates to large insurance companies. In 2012, Eli Lilly and Co. reported paying $3,563.5 million (SEC, “LLY-2012 Form 10-K”). This essentially separates the market of insured consumers from that of uninsured consumers. The idea behind this might be that insurance companies have more elastic demand than uninsured individuals do, so the profit-maximizing strategy is to lower prices for large insurance companies.

Challenges may arise in forecasting Lilly’s performance. Changes in government regulation, supply chain problems as well as unexplained factors are just a few of the challenges faced by Lilly. As seen in 2009, outbreaks such as the swine flu can lead to the increase in demand of a particular product. Natural disasters and the state of the economy can also lead to forecasting problems. Modeling these challenges can be difficult which can lead to forecasting problems.

Lilly wants to maintain three core values during operation. These core values are integrity, excellence, and respect for people. In order to ensure that these core values are maintained throughout the company, Lilly has established a board of directors that varies in size depending on possible retirements or outstanding qualifications with candidates. Typically, the board of directors includes twelve to fourteen members. The board of directors meets six times annually, but may meet more times if there is a business matter that needs to be discussed. The board has a process to deal with members that have interests that conflict with the business interests to exclude these members on that particular topic. The main issue is that the board of directors is very diverse, which could lead to differences of opinion on certain business decisions. Since only a majority vote is needed for a decision to be approved, the board could be almost split on a topic and could still have a business decision approved or disapproved. Eli Lilly also has six board committees that have a committee chair. There can be a rotation to the committee chairs, but it is irregular, and the position is reviewed each year (“Board of Directors”).

The biggest cost for Lilly is trying to keep its employees working at a high level. Even though there are no known worker unions for Lilly, the agency costs of keeping the employees performing at their highest level are a challenge. Lilly also has to make sure that its employees are maintaining integrity. Since Lilly is big in the research and development of new drugs, it cannot let its employees leak out information about a new drug. This could lead to a different company obtaining a patent for the same drug and a loss in profits for Lilly.

A large amount of regulatory restrictions is present in the pharmaceutical market. Dealing with human lives is not something the FDA and other organizations take lightly. Restricting coverage of PET imaging agents is one example (*Drug Development Process*). Restricting these agents slows down research and diagnosis. When problems like this arise, Lilly is forced to innovate and find other ways to accomplish the task, which increase costs and slow down the process in general. FDA restrictions slow life of a product on the market as well. Long product testing for approval limits a product's market exposure and as well as the amount of revenue it can generate. On a global scale, foreign drug administrations and tariffs also affect Lilly’s overall revenue. Finally, lawsuits require a lot of attention.

**Lilly’s Strategy and Execution over the last 10 years**

As mentioned before, Lilly’s average return on equity was 22.26% over the last ten years. In order to maintain this level of return on equity, Lilly maintain a high degree of financial leverage and high asset turnover. In 2008, Lilly recorded a negative return on equity (-30.75%) due to a profit margin of -10.17%. Lilly rebounded strongly the next year by recording a return on equity of 45.45% when they hired John C. Lechleiter to the chairman of the board of directors. Since then, the return on equity has been declining, but it remains high with Lilly recording a return on equity of 27.67%. In the last ten years, Eli Lilly and Company has done well in terms of return on equity and annualized returns.

The decline in return on equity is mainly due to the recent patent losses on drugs, such as Zyprexa, a medicine that helped cope with schizophrenia. Eli Lilly is also going to lose its patents on Cymbalta and Evista at the end of 2013, which is expected to contribute to a 20% reduction in revenue in 2014. Lilly has anticipated these patent losses and currently has five drugs awaiting regulatory review. Three of these drugs are for diabetics, one is for people with cystic fibrosis, and the final one is for solid tumors (“Clinical Development Pipeline”). Lilly had previously laid off one thousand salespeople due to these patent losses. Once these new drugs are approved and can be sold, Lilly can hire back these employees to sell the new drugs.

Bibliography Pages

“Annual Reports.” Lilly Investors. Last modified 2013. Accessed October 30, 2013.

http://investor.lilly.com/annuals.cfm.

“Board of Directors.” About Lilly. Last modified 2013. Accessed October 26, 2013. http://

www.lilly.com/about/board-of-directors/Pages/board-of-directors.aspx.

“Clinical Development Pipeline.” Lilly Pipeline. Last modified October 16, 2013. Accessed

November 15, 2013. http://www.lilly.com/SiteCollectionDocuments/Pipeline/Clinical%

20Development%20Pipeline/11.html.

Eli Lilly and Company. “Form 10-K.” Securities Exchange Committee. Last modified December 31, 2012. Accessed November 10, 2013. http://www.sec.gov/Archives/edgar/data/

59478/000005947813000007/lly-20121231x10k.htm

“Heritage.” About Lilly. Last modified 2013. Accessed October 27, 2013. http://www.

lilly.com/about/heritage/Pages/heritage.aspx.

Herper, Matthew. “How Much Does Pharmaceutical Innovation Cost?” Forbes. Last modified August 11, 2013. Accessed November 10, 2013. http://www.forbes.com/sites/matthewherper/2013/08/11/the-cost-of-inventing-a-new-drug-98-companies-ranked/.

“Historical Prices.” Yahoo Finance. Last modified 2013. Accessed November 9, 2013.

http://finance.yahoo.com.

“Key Facts.” About Lilly. Last modified 2013. Accessed October 26, 2013. http://www.

lilly.com/about/key-facts/Pages/key-facts.aspx.

Lilly.com. 2013. *Drug Development Process*. [online] Available at: http://www.lilly.com/Responsibility/medicine-development/Pages/drug-development-process.aspx [Accessed: 18 Nov 2013].

Lilly.com. 2013. *Supply Chain*. [online] Available at: http://www.lilly.com/Responsibility/ethical-business/Pages/supply-chain.aspx [Accessed: 18 Nov 2013].

Lilly?, W. 2013. *Will The Pipeline Deliver For Eli Lilly?*. [online] Available at: http://seekingalpha.com/article/1690072-will-the-pipeline-deliver-for-eli-lilly [Accessed: 18 Nov 2013].

Modern Distribution Managers. “2013 Market Leaders.” MDM. Last modified 2013. Accessed November 10, 2013. http://www.mdm.com/2013\_pharmaceuticals\_mdm-market-leaders.

Nielson. “Trends in Advertising Spend and Effectiveness.” Nielson State of the Media. Last modified June, 2011. Accessed November 10, 2013. http://sharedvaluemedia.com/wp-content/uploads/2012/01/TrendsAdSpendanEffectiveness\_Spreads.pdf.

Rockoff, Johnathan D. “Drug Reps Soften Their Sales Pitches.” The Wall Street Journal. Last modified January 10, 2012. Accessed November 10, 2013. http://online.wsj.com/news/articles/SB10001424052970204331304577142763014776148

**Figures and Tables**

**Figure 1: Comparing Stock Prices from 2003 to August 2013 for Lilly, Merck, and Pfizer**

**Figure 2: Comparing Net Profit Margins for Lilly, Merck, and Pfizer**

**Figure 3: Comparing Asset Turnover for Lilly, Merck, and Pfizer**

**Figure 4: Comparing Financial Leverage for Lilly, Merck, and Pfizer**

**Figure 5: Comparing Return on Equity for Lilly, Merck, and Pfizer**

**Figure 6: Comparing Returns for Lilly, Merck, and Pfizer**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Lilly** | **Merck** | **Pfizer** |
| Average Monthly Returns | 0.38% | 0.55% | 0.45% |
| Standard Deviation of Monthly Returns | 6.07% | 7.34% | 5.72% |
| Annualized Returns | 4.70% | 6.82% | 5.58% |
| Annualized Volatility | 21.02% | 25.43% | 19.82% |

1. Return on equity, asset turnover, net profit margins, and financial leverage data was acquired on COMPUSTAT. [↑](#footnote-ref-2)