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The Case for High Returns: A Study of the U.S. Pharmaceutical Industry

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I. Introduction

In recent years, the pharmaceutical industry has undergone intense criticism from a myriad of opponents from President Clinton to the common citizen. In fact, Bill Clinton included comprehensive health care reform in his election platform, and the pharmaceutical industry with its high profits has emerged as a scape goat in this debate. Recent developments, including Congress' delay of any legislative health care reform and the election of a Republican majority in both houses of Congress, have decreased the short run potential of any comprehensive health care reform. However, because of the rising costs associated with health care, some sort of comprehensive legislation is likely to occur within the next decade.

The effects that such legislation would have on the pharmaceutical industry are not certain, but such legislation could ultimately hurt economic growth in the industry. The industry has faced opposition from the government before. Between 1959 and 1961, Senator Estes Kefauver chaired hearings on the industry's pricing policies (Scherer 97). Since that time, the pharmaceutical industry has faced few problems, but, by 1992, overall health care costs had risen to 14% of GNP, the highest of any industrialized nation. Due to the maturing baby boom generation, these costs will continue to rise in the coming years. As a result, the health care industry, and especially the pharmaceutical manufacturers, have again attracted the attention and contempt of the U.S. government as it looks for ways to curb these rising costs.

The criticism of the pharmaceutical industry results primarily from the high prices of some brand name prescription drugs and the consistently high profits that these pharmaceutical companies have

experienced. Indeed, much of the proposed legislation stresses the use of generics over name brand drugs. This preference would not only hurt the economic growth and potential profits of the industry, especially those companies that produce brand name drugs, but it would also slow the technological progress made by these pioneering firms. In the pharmaceutical industry, research and development (hereafter referred to as R&D) costs, those costs associated with the development of new medicines, have been significantly higher than the R&D costs in other industries. **A danger of** comprehensive health care legislation is **that** it would discourage the development of new drugs.

It can be argued that because of the nature of the industry these abnormal returns (those returns which vary from the market return) that the pioneering pharmaceutical firms experience are justified. Indeed, the risk involved in the pharmaceutical industry is higher than most industries. A firm could spend billions of dollars developing a new drug only to fail to gain approval from the FDA. This represents a substantial risk to capital, and utility theory states that for increased risk, an investor (in this case the pharmaceutical firms) requires a higher rate of return as compensation for the increased risk. This factor in addition to some other historical differences of the pharmaceutical industry from other industries might explain the unusually high profits.

Because of the issues of high prices and abnormal returns, the pharmaceutical industry has generated enough attention to warrant further study. This paper will focus primarily on the factors that contribute to the abnormal returns that firms in the industry experience.

II. Literature   Review

Historical   Differences

Two studies serve as the primary references for my work. The first was a study by F.M. Scherer (1993) which served primarily as a source of background and historical data, and the second was a study by Henry Grabowski and John Vernon (1987). In the 1993 study, Scherer noted that the pharmaceutical industry has differed from other industries for three reasons. Each of these factors lend explanation to why the pharmaceutical industry has experienced such high growth and profitability.

1.) <u>Physician   Decision-Making</u>: In most cases of consumption, the consumer and the decision-maker are the same person, but this does not occur in the pharmaceutical industry. "Since the 1930's most high potency drugs have been available in the United States only by prescription. Thus, the consumer and the consumption decision maker (the prescribing physician) are not the same" (Scherer 98). If a consumer purchases an automobile, said person would decide what car to buy, and only two parties exist in the decision-making: the consumer and the producer. With pharmaceuticals, an intermediary, the prescribing physician, exists between the producer and the consumer.

The distinction of physician decision-making has certain implications for the pharmaceutical industry. First of all, as mentioned above, it does eliminate the consumer from the consumption decision. In addition, in a 1991 study by Richard Caves, the author addressed the issue of price sensitivity. "When the choice lies between a branded pioneer drug and its generic competitors, the physician may not be sensitive to price differences"(Caves 5). When it comes to prescribing drugs, the physician

does not generally decide on a drug because of price but rather because of its treatment capacity and brand loyalty. As a result, physician decision-making can have a major effect on the consumption process.

2.) Imperfect Information: Since the 1940's, more than 1200 new drugs have been introduced into the United States (Scherer 98). In the 1991 study by Caves, Whinston, and Hurwitz, the authors noted that physicians lack "ready and well-organized" information on the "effectiveness and riskiness" of substitutes, generic drugs (Caves 5). The authors further stated that physicians rely upon customary behavior and habit when prescribing drugs (Caves 5). These two factors result in imperfect information in the pharmaceutical industry. Because of the wide range of choices, physicians cannot possibly have complete knowledge of all the alternatives, and as a result, they cannot accurately inform patients about the alternatives available. Instead they rely on habit and custom. Information failures result.

Imperfect information affects profitability as well. Pharmaceutical firms use this industry characteristic to their advantage. Pharmaceutical firms rely heavily on cultivating and maintaining good relationships with doctors through free samples and merchandise. These relationships develop into firm loyalty by doctors. The doctors become an agent, in a sense, of the pharmaceutical firm. They rely on certain firms for certain drugs, and as a result, they market these drugs to the consumer. The brand loyalty that develops offsets the cheaper price of generics and enables these pioneering firms to enjoy steady growth and profits.

3.) Third-Party Reimbursements: "Third party reimbursement plans operated by the government and private insurers have expanded to cover an estimated 44% of prescription drug outlays in 1987 up from 28% in

1977 (Scherer 99).   With these third-party reimbursements, the consumer often does not pay the full costs of the prescription drugs.   Third-party reimbursements from insurance companies and the government along with physician decision-making eliminate the consumer from much of the consumption process.   It also lowers the price actually paid by the consumer for the drugs which would lead to increased demand for the product.

These three differences distinguish the pharmaceutical industry and make it unique from other industries.   Scherer noted that the combination of these three major differences results in stronger drug demand and less price elasticity of demand.   With this in mind, he noted that this can result in considerable monopoly power for certain companies which have well-accepted drugs.

R&D Expenditures

A further difference between pharmaceuticals and other industries can be associated with its high R&D expenditures relative to other industries.   Before the 1962 passage of the Kefauver-Harris Act, the costs associated with developing a new drug were on average around $6 million after conversion to 1990 price levels (Scherer 99).   At present, the average costs associated with the development of a new drug exceed $50 million (Scherer 99).   These costs are relatively higher than those in other industries.   Indeed, these figures support the fact that R&D is an essential part of the industry, and in fact, these expenditures are probably necessary to remain competitive in the industry.   When used effectively, R&D increases the demand for drugs because it increases the quality of the drugs produced.   If legislation switched focus from brand names to generics, it could ultimately discourage R&D and the development of new

and improved drugs. The high costs associated with developing new and improved drugs would no longer be worth the risk that it might not become FDA approved. In the long run, this would hurt profits and discourage research into better drugs. As a result, the quality of drugs would decline, and this would affect both the consumer because of the decreased quality and the pharmaceutical firms because it would lower profits.

Relevant Legislation

Since the 1960's, Congress has passed certain significant pieces of legislation which have affected the pharmaceutical industry. With each piece of legislation, Congress has attempted to balance concerns over prescription drug price levels while still encouraging innovation (Frank 165).

1.) <u>The Kefauver-Harris Act</u>: Because of the information failures that result because of the large number of prescription drugs, Congress passed this Act in 1962. The Act granted the Food and Drug Administration more regulatory power. As a result, the FDA increased the stringency associated with the approval of a new drug. This Act with its increased regulation and testing time of new drugs led to some of the increases in R&D expenditures that occurred after its passage. Since the passage of the Kefauver-Harris Act, it now takes an average of eight years for a new drug to go from the start of clinical trials to FDA approval, and the more stringent regulation imposed on the industry has resulted in only 23% of developed drugs receiving FDA approval.

In effect, this Act has turned the development of new drugs into a high return yet high risk game. This Act can account for increased R&D and an increased chance that new drugs will not receive FDA approval.

This has added risk to the industry, and the only way to encourage investment in an industry with increased risk is to offer the possibility for increased returns. The Kefauver-Harris Act had a significant impact on the returns of the pharmaceutical industry.

2.) The Waxman-Hatch Act: Many lobbyist for the pharmaceutical industry, noted that the lengthy approval procedures in essence limited the benefits of patent protection. "The 1984 Act increased returns to innovation by extending the period of patent protection to take into account the time between receipt of a patent and FDA approval of a drug for sale in the market" (Frank 165). Patent life lasted 17 years, but when calculating in an average of 8 years for approval, the firm that develops the new drug would actually have only 9 years of exclusive rights to the drug. As costs of R&D continued to rise and patent protection stayed the same, the firms found it difficult to recoup these costs. In response, Congress passed the Waxman-Hatch Act in 1984. This Act provided for an extension of the drug patents by up to five years to compensate for the potential revenue lost by the lengthy approval process.

This increase in patent protection was important to the industry as it encouraged the continuing development of new drugs. By extending patent protection, Congress encouraged both innovation and extended monopoly power for those firms which produce these drugs. This, in essence, increases the potential to earn abnormally high returns over a longer time period, and this would increase profitability for the firms.

Increasing Generic Competition

The Waxman-Hatch Act also included a section concerning the production of generic drugs. "A 1983 U.S. Supreme Court decision held that even when patent protection ended, most generic imitations had to

undergo clinical trials nearly as rigorous and costly as the originally approved molecule" (Scherer 100). This kind of regulation discouraged the growth of generics. The Waxman-Hatch Act changed that. "The Act allows a generic entrant to submit an Abbreviated New Drug Application (ANDA) that demonstrates only the bioequivalence of its drug to the original" (Caves 10). This significantly reduced the barriers to entry for the generic drugs.

This loosening of restrictions encouraged growth of the generic market. As a result, generics gained an increasing market share, thus reducing the demand for brand-name drugs. This decrease in demand would affect the profitability of the pioneering firms. As generic competition increases, their monopolistic power over that drug would decrease, and their profits would probably return to more normal levels.
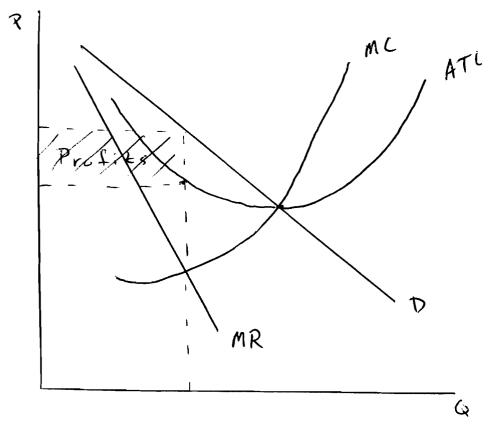
III. Theoretical   Framework

The nature of my study requires a two part theoretical framework: an explanation of the microeconomic model the industry most closely resembles and a valuation model. The pharmaceutical industry is an interesting and complex industry. The firms in the industry do not compete in perfect competition, but unlike the automobile industry, they do not exist as an oligopoly. The firms in the pharmaceutical industry compete in a monopolistic competition type of atmosphere.

Theory of Monopolistic Competition

The theory of monopolistic competition is based on three assumptions:

1.)   Differentiated but highly substitutable products

2.)   Free Entry

3.)   Free Exit

Graph of Monopolistic Competition

The shaded area under the demand curve represents the profits that the firm receives. In a monopolistically competitive industry, **product differentiation is a dominant feature of the market just as in oligopoly.** However, in an oligopoly, free entry does not exist as it does in monopolistic competition. It is the assumption of free entry which distinguishes monopolistic competition from other industries. When a firm in the industry develops a monopoly over a certain product, free entry allows other firms to enter the industry, thus eliminating the profits. When it no longer becomes profitable to produce this product, firms would leave the industry. **Increases in demand would generally cause an**

increase in profits as it shifts the demand curve upward. In addition, increases in marginal costs, perhaps from increased R&D expenditures, would cause a decrease in profits because an upward shift in the marginal cost curve would decrease the shaded area under the demand curve.

Pharmaceutical Industry and Monopolistic Competition

The pharmaceutical industry does not perfectly display the characteristics of monopolistic competition, but its workings most closely resemble this theoretical framework.

Differentiated Products

This is a definite characteristic of the pharmaceutical industry. Pharmaceutical firms produce drugs that may be effective treatment against the same disease. These drugs may be similar, but they most likely produce different results when combating the virus or disease and probably have different side effects. For example, currently, a number of firms produce drugs that treat heart attack patients in order to prevent future heart attacks. Each drug has different characteristics such as basic chemical components, but each is similar enough, that they can be substituted for each other. The same is true for many of the drugs produced by pharmaceutical firms: they are differentiated but highly substitutable.

Free Entry

Free entry is not clearly a characteristic of the pharmaceutical industry. Is entry really free? High costs of R&D and recruitment of qualified personnel would seemingly create a barrier to entry. New firms cannot freely enter the pharmaceutical industry due to these high costs, and therefore, new firms would not enter the industry to drive profits

down. This barrier would contradict the theory of monopolistic competition. However, the theory does not define "new" firms. After the patent expires on a particular drug, existing firms (acting as new firms) would enter into that drug producing firm's market (the industry) and eliminate that firm's monopoly profits.

Essentially, each of the pioneering firms, those that spend money on R&D to discover and patent new drugs, would have a monopoly until patent protection expires. During the patent life of a drug, the firm that produces that patent protected drug would have a monopoly over the market for that particular drug. They can charge whatever price they choose and earn monopolistic profits. Once the patent expires, existing firms in the industry can now produce either brand name or generic copies of that drug. These products (drugs in this case) produced by existing firms as opposed to "new" ones would be differentiated but highly substitutable, a characteristic of monopolistic competition. How much market share for that particular drug that the original patent holder maintains depends on brand loyalty *and* , with the advent of new entrants, competitive pricing. The entrance of "new" firms into the market created a competitive atmosphere that reduces the profits of the original patent holder (the monopoly).

During the patent life of a drug, "the original patent holder typically acquires brand loyalty after making the product exclusively during the patent life" (Kurdas 113). This is the result of extensive marketing and education efforts made by the manufacturer's representatives. Because of these efforts, market share of the name brand product does not erode as much as would be the case in other industries (Kurdas 113). Therefore, free entry into the pharmaceutical industry is slightly different from a

typical monopolistically competitive industry. Although any firm can produce copies of the original drug after patent protection expires, will the profits of the original firm actually go to zero in the long run? This may occur with some drugs, but certain firms specialize in a certain class of drugs (i.e. cardiovascular drugs) and as a result may produce a better known or higher quality of that drug than its competitors. Because of this better quality, each firm's relationship with doctors, and inelasticity of demand, profits may not fall to zero. Thus, this allows individual firms to earn above market profits.

<u>Free Exit</u>

Free exit is somewhat of an illusion in this industry as well. Firms do not leave the industry necessarily, just as new firms do not enter the industry. Firms would most likely do one of two things if profits fell: either leave the market for that particular drug or merge with another firm. Sometimes, for reasons such as technological disadvantage or shortages of capital, the market for a particular drug may become unprofitable for a particular firm. The firm would not leave the entire pharmaceutical industry, but rather, it would leave the market for that particular drug. If on the other hand, if a particular firm found the industry unprofitable due to high costs, the firm would probably not leave the industry but would merge with another company. This would in a sense be "leaving" the industry. Mergers appear to be more prevalent in the pharmaceutical industry as opposed to firms leaving the industry completely (i.e. free exit). Mergers are probably more popular because leaving the industry would result in a significant and costly loss of both technology and capital. The assumption of free exit is more likely in the

industry than is the assumption of free entry. Exit, though possible, is costly.

Theory of Stock Valuation

Stock prices are traditionally thought to lead economic activity. The rationale is that stock prices reflect future profitability of corporations. If a stock's price is high now or rising steadily, then it is considered that company's future profitability is expected to be high.

The Model of Stock Price Valuation shows how current stock prices can show future profitability. Stock prices equal the present value of a firm's expected profitability.

$$\text{Stock Price} = \sum_{t} \frac{\text{Expected Profits}}{(1+k)^t}$$

In traditional stock valuation models, the value of a company's stock should equal the present value of the firm's future profits. In the case of the pharmaceutical industry, profits can vary widely from year to year depending on external factors such as the economy as a whole and on internal factors such as the success of drug development projects. Over the time period, the pharmaceutical industry has generated higher returns than the market. In order for the stock price to outperform the market, investors must expect higher profits which would result in increases in the stock price.

IV. Empirical Model

The preceding theoretical framework directly leads to the development of my hypotheses.

Hypothesis 1: Abnormal returns generated by the pharmaceutical industry are the result of certain variables: R&D expenditures, the aging population, and earnings per share growth.

Hypothesis 2: Of these significant factors, R&D expenditures when adjusted for inflation, will have a significant effect on abnormal returns, and when it is lagged , it should have a positive effect. However, when a firm initially incurs R&D expenditures, the effect could either be positive or negative because R&D expenditures can shift both a supply and demand for the product.

Regression Model

My regression model was loosely based on the model developed by Grabowski and Vernon in a 1987 study. They developed a Schumpeterian competition model based on 1970's data from the pharmaceutical industry. Their model attempts to predict future growth in a hypothetical industry based on real historical data (Grabowski 491). My model used historical data from the pharmaceutical industry and attempted to predict what factors have led to the abnormal returns that the pharmaceutical industry has generated.

To test my hypotheses, I used a simple OLS regression model utilizing data from the pharmaceutical industry from 1979 to 1990. The regression equation is as follows:

Abnormal = a1 + a2%R&D + a3%R&DLag2 + a4AgingPop + a5EPSG
Returns

My variables, their expected signs, and the data source are listed in Table 1 followed by a more detailed explanation.

Table 1 - Model Variables

Variable	Definition and Data Source
Abnormal Returns	The difference between the percentage gain or loss by each firm and the percentage gain or loss by the market, the S&P 500. (Source: Wall Street Journal; various issues)
% R&D (?)	The % of sales that R&D expenditures account for each firm (Source: Standard & Poors Industry Survey; various issues)
% R&DLag 2 (+)	The same as % R&D except this variable is lagged two years. (Source: S&P's Industry Survey; various issues)
Aging Population (+)	The percentage of U.S. citizens over age 45. (Source: U.S. Census)
Earnings Per Share Growth (+)	The percentage growth in earnings per share for each of the firms studied. (Source: S&P's Stock Reports)

Variables

1.) <u>Abnormal Returns</u>: My dependent variable measures the difference between the percentage return on the stock of each firm and the percentage return on the market. Recent criticism of overpricing by the pharmaceutical industry has cited these high, positive abnormal returns. Abnormal returns were gathered from 1981 to 1990 for nine pharmaceutical firms listed in the Appendix. These firms were chosen on

the basis of their relative position in the industry as leading firms in both sales and returns, and they were also chosen because they are primarily involved in the development of brand name prescription drugs. In addition, data was more readily available for these nine firms. For each of these, data was gathered on percentage return on that firm's stock and on the percentage return on the S&P 500 index. The percentage difference (either above or below the market return) represented the abnormal return on that stock.

2.) R&D: R&D expenditures as a percentage of sales were gathered for each of the nine firms. R&D poses an interesting problem regarding how it will affect abnormal returns. Contemporaneously, it could prove to positively affect abnormal returns because it represents opportunity for the development of new drugs, and thus, it would increase returns. Also, R&D expenditures could cause increases in the marginal revenue and demand curves which would lead to increased abnormal profits. However, because it is an additional expense, it could also lead to shifts in the marginal and average total cost curves. Increased expenses and operating costs incurred because of R&D could lower current net profits. **If a greater percentage of sales is devoted to R&D, then it could adversely affect a company's profits.** If investors view the increase in current R&D expenditures as a decrease in short run profits and if they have short run intentions regarding their investment in a pharmaceutical firm, then they might sell, thus driving the price down. If an investor is looking at the long run, an increase in **the percentage of sales devoted to R&D** expenditures could ultimately mean an increase in future profitability. The long run investor would probably **anticipate** increased demand for **drugs produced by** the pharmaceutical firm, and the price of

the stock would increase to reflect increased expected future profitability. Because of this conflict, the effect of current R&D expenditures could either have a positive or negative effect on abnormal returns.

3.) R&D Lagged: Because of the conflict in theory, an additional R&D variable that is lagged was used to possibly resolve this potential conflict. Data restrictions and degrees of freedom problems limited the lag to only two years. However, this should be sufficient to determine whether previous R&D expenditures as a percentage of sales significantly affect abnormal returns. Lagged R&D expenditures should have a positive affect on abnormal returns, because as various projects mature, investors are better able to predict the profitability of certain drug development efforts.

4.) Demographics: As the baby boomer generation ages, the population of the U.S. becomes increasingly older. The median age continues to rise, and this will definitely affect economic growth. Data on the aging population was gathered as the percentage of people over the age of 45. By their mid-forties, the use of pharmaceuticals tends to increase as the demand increases for such common problems as diabetes and high blood pressure. Data was found in two Census studies: State Population Estimates by Age and Sex: 1980-1992 and Summary Population and Housing Characteristics-U.S. Because an aging population should increase demand for pharmaceuticals, the profits generated by these companies should increase. Increases in profits would lead to abnormal returns, and therefore, its expected effect on abnormal returns is negative.

5.) Earnings Per Share Growth: Earnings per share growth was measured as the percentage change from year to year on individual firm's earnings per share. This variable was gathered from Standard & Poors Stock

Reports. This variable is important because it shows certain characteristics about individual firms and how they distribute their earnings. Positive earnings per share growth would mean increased profits, and therefore, its effect on abnormal returns should be positive.

V. Results

After the tests of my empirical model were run, the results were the opposite of what was expected.

Table 2 - Results

Variable	Expected Sign	Actual Sign	Coefficient	T-Statistic
% R&D	?	+	.9804	.7048
Demographics	+	-	-.0660	.3683
EPS Growth	+	+	.0090	.7149
% R&D Lagged2	+	-	.3953	.2730
		R-squared:	.041748	
		Durbin-Watson:	1.471448	
		Degrees of Freedom:	8 5	

The results were below expectations. The signs of all but one of the variables were opposite of expected. None of the varaiables proved significant, and to say the least, these results were disappointing.

1.) Percentage R&D: Although I was unsure of which sign this variable would have, I hypothesized that it would have a

negative effect on the profitability of a pharmaceutical firm because it would be an additional expenditure. Theorizing that investors are generally short term minded, it would create a negative effect on the profitability of a company because it would be viewed as an additional expense. The results are insignificant and, therefore, cannot definitively make a case for whether an investor has long-run or short-run interests when investing in the stock of a pharmaceutical company. Additionally, the insignificance of this variable suggests that no relationship exists between R&D expenditures as a percentage of sales and the profitability of a pharmaceutical firm.

2.) Percentage R&D Lagged 2 Years: This variable the expected sign. I hypothesized that lagged R&D would positively affect the profitability of a company. However, the fact that this variable is insignificant indicates that R&D lagged for two years does not significantly effect on the profitability of a pharmaceutical firm.

3.) Demographics: Again, this variable had a sign opposite of the expected, and it, too, was insignificant. This would suggest that as the population becomes increasingly older pharmaceutical firms do not benefit as a result. Intuitively, this would not make sense because as the population ages it would seem logical that the need for pharmaceuticals would increase to help combat high-blood pressure and diabetes. However, because of the low r-squared and the insignificance of this variable, no definitive conclusions can be made regarding the effect that the aging population would have on the profitability of a pharmaceutical firm.

4.) Earnings Per Share Growth: Of the variables, this was the only one that the actual sign was the same as the expected sign. However, this variable, too, proved insignificant. Perhaps a relationship does exist between the profitability of a pharmaceutical firm and its earnings per share growth, but this project was unable to establish such a relationship.

1.) Hypothesis 1: The results from my regression would strongly suggest that none of these variables (R&D, R&D lagged, aging population, and earnings per share growth) affect the profitabiliy of a pharmaceutical firm. Perhaps some of these variables would significantly affect profitability if not for the incompleteness of the model (which the low r-squared suggests).

2.) Hypothesis 2.: The results from my model would reject this hypothesis. Current R&D expenditures do not significantly affecct the returns generated by the pharmaceutical industry. Further, R&D lagged two years does not significantly affect these returns, either. The opposite signs generated by these two variables also contradict the hypothesis' assumption of the long or short-run intentions of investors.

CONCLUSIONS AND IDEAS FOR FURTHER RESEARCH

In conclusion, these tests do not show significant support for my hypotheses. The results indicate that the certain variables did have the expected sign, but none of the variables were significant. The fact that the test results had such a low r-squared would suggest that the model is significantly incomplete. No definitive conclusions can be made regarding how these variables actually affect the profitability of a

pharmaceutical firm. These results would suggest that the percentage of sales devoted to R&D would present minimal risk to the firm, and that the amount invested in R&D would not affect individual investors preference for pharmaceutical stocks. These implications are not definitive because of the incompleteness of the model.

The results of the test highly suggest that a number of critical and significant variables are missing from my empirical model. Perhaps the time period studied is too short, and future research into this area should expand the time period. Further, an additional variable which would separate a pharmaceutical firm's brand name drug sales from over-the-counter drug sales would strengthen the model. Accurate data on the generic market share could further enhance the model. In addition, perhaps I could experiment with longer lags for the R&D variable to see if that would improve the model.

Althoug the results were poor, they do show that none of these variables by themselves significantly affect the returns generated by the pharmaceutical firms studied. This is a significant finding because it suggests that other variables need to be added to the model to show what variables do affect the returns generated in this industry. Further research which explores new variables and a longer time period for the study would significantly change this project and would most certainly strengthen it.

Appendix

Table of Pharmaceutical Firms Used in Study

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Name of Firm

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1.)   Bristol-Myers   Squibb

2.)   Eli Lilly & Co.

3.)   Merck & Co.

4.)   Pfizer Inc.

5.)   Schering-Plough

6.)   Smithkline   Beecham

7.)   Syntex   Corp.

8.)   Upjohn Co.

9.)   Warner-Lambert   Co.

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