

## **Has the Affordable Care Act (OBAMACARE) Been an Effective Prescription for Biotech Firm Financial Health?**

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**Abstract:** On March 23, 2010, health care in American experienced one of the most significant reforms, perhaps the most significant reform that occurred during the history of the United States. On that date the Patient Protection and Affordable Care Act (ACA), which is popularly referred to as Obamacare, was officially signed into law. Since then, many people have speculated about its effect on the healthcare industry. In this report, we study the impact of this reform on financial health of the biotechnology sector. We evaluate the Affordable Care Act's (ACA) impact on the financial ratios of a sample of leading biotechnology companies. Changes in direction and varieties of significance levels are reported for 11 financial characteristics. Findings are examined with consideration of their implications for the effect of the Affordable Care Acts on Biotech companies.

*Keywords:* Obamacare, financial statements, pharmaceuticals, profitability, asset utilization, debt financing

*JEL Classification:* G38 Government Policy impacts on Corporate Finance

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### **1. Introduction**

The numeric aspect of business transactions is the yardstick to measure the success or failure of corporate enterprises. Financial numbers are also the means to quantify the impact of external events on a business. One prime example of an exogenous, macroeconomic event is the passage of the Affordable Care Act (ACA) in 2010. This legislation, which is widely referred to as Obama Care because of the efforts put forth by President Obama to get it passed, impacted a wide array of firms. One of the greatest impacts is presumably in the biotechnology industry. The increased demand for products produced by this industry is perceived as being a boon for the biotechnology industry. However, to date, there has not been a thorough, rigorous study of its impact. This research is designed to fill in this gap.

Writing for the widely-followed website Motley Fool, Douglass (2014) notes the ACA will impact insurance companies, hospitals, and biotechnology firms. However, the effect is uncertain. As evidence of this he points to the 10-K, Celgene observed this reality by stating that

"The Affordable Care Act will affect our profitability." Unfortunately, how much and in what way is difficult to predict, as the U.S. cancer drug manufacture's 10-K continues,

"We expect that the rebates, discounts, taxes and other costs resulting from the Affordable Care Act will have a significant effect on our profitability in the future. In addition, potential reductions of the per capita rate of growth in Medicare spending under the Affordable Care Act, could potentially limit access to certain treatments or mandate price controls for our products. Similarly, the promulgation of new regulations concerning rebates, discounts, taxes and other costs, or the interpretation and enforcement of new or existing regulations by government agencies could affect our profitability in ways that are difficult to predict."

Five years have now passed since the ACA became law, providing sufficient time to make a rigorous analysis of its impact. We do this by comparing key financial ratios of twenty biotechnology firms before and after passage of the ACA.

## **2. Literature Survey**

### **2.1 The Affordable Care Act's Impact on the Biotechnology Sector**

With its voluminous length, discussion of the ACA is well beyond the scope of this paper. Even today, candidates seeking statewide office and national office (Pear and Haberman, 2016) continue to argue about whether it should be repealed. Instead, this report will focus on a few aspects by which the ACA directly impacted the biotechnology industry. Several sector-specific impacts are identified by Gayle (2010), the Founder of SpreadingScience, which was identified by Forbes (2003) as one of the three best medical blogs. They are:

#### **2.1.1 Therapeutic Discovery Project Credit.**

This ACA provision provides a tax credit for 50 percent of the development and clinical trials related to new pharmaceutical drugs. The credit is limited to firms with only 250 employees and \$1 billion dollars. Although that seems like a lot, researchers at the renowned Tufts Center for the Study of Drug Development now place the cost of bringing a new drug through clinical trials at \$2.5 billion (Mullin, 2016).

#### **2.1.2 Approval Pathway for Biosimilar Biological Products**

This section of the law provides patent protection for twelve years after FDA approval of the drug. This regulation applies to biologics, which are the complex medications produced by the typical firm in the biotech industry. While President Obama wanted seven years of protection (Ventola, 2013), the biotech industry's lobbying arm requested and got 12 years of patent protection.

#### **2.1.3 Follow-on Biologics Maker Disclosure**

This regulation ends up helping the initial pharmaceutical drug manufacturer by placing a significant roadblock in the way of follow-on product (i.e., more complex than generic drug) manufacturers. This portion of the ACA requires those making the follow-up products provide all relevant documents regarding development to the initial drug manufacturer. Before this portion of the ACA, generic drug manufacturers frequently had to go through the same clinical trials with their similar products.

Offsetting some of these advantages are the requirements that pharmaceutical companies expose financial relationships with doctors. For a detailed analysis of the impact of the ACA on biotech companies, readers are directed to Harvard Business School's working paper on this issued authored by Daemmrich (2011).

## **2.2 Past Financial Research**

Analysis of firm fundamentals undoubtedly goes back to the dawn of business. The advent of the computer has enhanced the rigor of these investigations. Our research is based upon financial numbers published online by Morningstar, Inc. Morningstar ratios have frequently been used to assess the corporate performance. For example, Sivakuma and Sarkar (2015) use Morningstar profitability, growth, and efficiency ratios to assess the financial condition of an Indian company over the 2002-2012 decade. Wang (2012) employs Morningstar data to demonstrate that the limited-service (i.e., "fast food") restaurants and full-service restaurants were largely immune from the economic challenges facing other firms during the 2008 economic recession. Within the restaurant industry, Ayrapetoya (2014) uses the Morningstar data to compare McDonald's and Yum! Brands.

The financial press frequently relies upon Morningstar statistics as a means to support propositions. For instance, as the stock market rose in 2007, Cordeiro (April 29, 2007) proposed that Morningstar-supplied ratios be used to pick shares that still had value. Recent examples of the use of fundamental analysis to assess company financial health and predict future share price has been published by many authors. As an illustration of this line of research, Ashraf et al. (2015) use fundamental financial ratios obtained from Morningstar to explain how L'Oreal built and maintained market leadership, while Peterson (2011) explains how changes in firm fundamentals can be used to assess a firm's board of directors. Krueger and Wrolstad (2012) initially demonstrated the value of using Morningstar-published fundamental information to forecast returns, followed up by an assessment of the importance of assessing the changes in financial ratios and especially free cash flow ratios [Krueger and Wrolstad (2013)].

## **3. Ratios Discussion**

Ratio analysis is an important and frequently completed process by which firm financial health is assessed. In the case of evaluating the ACA's influence on biotech companies, we are evaluating whether a wide assortment of financial ratios have improved subsequent to ACA passage. Stakeholders will pay varying attention to individual financial ratios due to the varying impact of the reported information on their personal financial well-being. For instance, managers will spend more time focused on efficiency ratios, while investors are worried about firm profitability.

Eleven financial ratios were initially examined, with six being chosen for additional study. Those not covered during the remainder of this report include three growth rates (sales, net income, and cash flow) and two efficiency ratios (accounts receivable turnover and inventory turnover). The influence of break-out formulations had firm-specific changes in sales and income that were hard to carry over to the industry overall, while the other three ratios had findings that were far from

being significant. Hence, the following discussion is limited to six ratios, two dealing with firm profitability, two with asset utilization, and two with firm financing.

### **3.1 Profitability Ratios**

Profitability ratios address a company's ability to handle business conditions. Profitability is the "bottom line" of business, because unless a company is profitable it is simply wasting investor money. In this research the question is one of whether a company is more or less profitable after the advent of the Affordable Care Act.

#### **3.1.1 Net Profit Margin**

Net Profit Margin identifies what percentage of revenues a company has left after sales. All else equal, we want as high a net "profit" margin as possible. Unfortunately, there is a lot of "noise," or extraneous expenditures, which impact the bottom line including inclusion of "sales" which may be a billing and not a cash receipt and depreciation of assets purchased many years earlier. Hence, it makes sense to consider multiple profitability measures.

#### **3.1.2 Free-cash flow/Sales**

Free-cash flow/Sales is a ratio that compares the operating profit augmented by the depreciation expense, plus adjustments for investments/disinvestments in assets relative to sales. Free cash flow is more important than dividends in that it considers not only the profitability of the firm but also the amount of money that has to be plowed back into a firm by investors. The term "investors" here include both stockholders and bondholders. Profitable companies have higher operating incomes, or EBIT. This value is not impacted by whether a company tends to use an abnormally high or low level of debt financing. This is important in our case because the focus in this segment of the report is on the impact of the ACA, not the extent to which a firm uses debt financing. A latter section will examine changes in biotech firm financing. Interest expense is reduced by the corporate tax rate because if the company had not paid interest, taxes would be paid on earnings before interest and taxes. Hence, the net profit margin discussed above is dependent upon firm financing. Free cash flow per dollar of sales avoids this issue. By dividing the amount by sales, one captures what percentage of every sales dollar is returned to investors.

### **3.2 Asset Utilization Ratios**

Biotech companies have to effectively and efficiently use their assets if they want to prosper over time. Ineffective asset utilization will result in excessive asset expenditures and financing, dragging down returns to investors. And, companies that go bankrupt will not help anyone, no matter how supportive the ACA provisions may be for an industry!

#### **3.2.1 Total Asset Turnover**

Total Asset Turnover is a catch-all efficiency ratio, because it considers sales relative to total corporate assets. Sales are a function of product and/or service demand. Meanwhile, efficient use of assets, limits the level of assets needed to generate those sales. Higher total asset turnover ratios

are preferred. If firms do not replace assets, total asset turnover should rise as firms depreciate assets in place.

### **3.2.2 Return on Assets**

Return on assets identifies a company's ability to convert assets into net income. It highlights how effective a management team is in using its long-term assets and efficient in using its short-term assets. Minimizing expenses maximized the income of the firm and hence the return on assets. The higher the return on assets value the more successful the company managers are in utilizing firm assets.

### **3.3 Debt and Liquidity Ratios**

To be proper and sustain over time, biotechnology firms have to develop new medications and medical techniques, as well as satisfy the demand for their medicines that are already available on the market. To do so, they used several means to finance their projects and activities such as obtaining borrowing money by issuing bonds and taking out loans. Debt is an important component of the financial health of a company and firm must be to meet their repayment obligations in the short-term and long run. In fact, debtholders have a claim on the revenues of a firm but also, on its assets in the event of bankruptcy. Hence, the more debts a firm has, the riskier it becomes. Therefore, it is valuable to assess the impact of the ACA on biotech firm financial health.

#### **3.3.1 Debt/Equity Ratio**

Debt/Equity ratio indicates how much debt a company uses to finance its assets compared to equity. A debt/equity ratio that exceeding 1.0 means that the firm is using more debt than equity to finance its growth. Conversely, a low ratio means the company has less debt and more equity. Dollars obtained through debt financing usually come at a cheaper cost. However, debt brings with it obligations to make both annual coupon payments and maturity face value payments. Therefore, *Ceteris paribus*, a firm with a high debt/equity ratio is riskier than a firm with a lower ratio.

#### **3.3.2 Current Ratio**

Current Ratio is a basic liquidity test that measures a company's ability to meet its short-term liabilities with its short-term assets. It is computed by dividing current asset by current liabilities. A current ratio that is greater or equal to one indicates that the company has enough current assets to cover its current liabilities. To the extent that current assets consist of illiquid inventory, higher current ratios are needed to provide a level of assurance that the firm will be able to make timely trade credit payments as well as pay salaries when due.

## **4. Research Method**

### **4.1 Sample**

Biotechnology firms were chosen for this study because their products are an integral part of the benefits that are being made available through the Affordable Care Act. For instance, Levitan (2012) notes that insurers will be providing additional preventative care, screening vaccines, and biotechnology processes because insurers are required to bring in 80 percent of their revenue from medical procedures rather than insurance premiums. The sample used in this research is the twenty largest biotech firms, with common stock traded in the United States, which are listed in Table 1. The largest of these is Johnson & Johnson, producer of important heart (Reopro), diabetes (Inovakana), and rheumatoid arthritis (Remicade) medications, among other medication. The market value of Johnson and Johnson was \$325 billion on October 4, 2016. Many household names are included on the list of the largest biotechnology firms, including Pfizer, Merck, and Lilly. Teva Pharmaceuticals, the Israeli company that is the largest generic drug company in the world, rounds out the top twenty biotech firms.

### **4.2 Data**

Ratios described above were obtained from Morningstar, the independent investment research company. Company financial statements and key ratios are available for ten-year periods at the Morningstar.com website. We chose to study the maximum period available (i.e., 10 years) running from January 1, 2006 to December 31, 2015. The ten-year period was split into two half-year periods. The “pre-passage” period runs from 2006 to 2010 and the “post-passage” from 2011 to 2015. Although the legislation was passed during the first five years, on March 23, 2010, it seems justified to split the available time frame into two equal five-year periods. First, with aspects of the ACA rolling out over time, it will take a while for its ramifications to show up in financial statements. Furthermore, firms not on a calendar year basis of reporting may have filed their 2010 statements prior to the ACA being signed.

### **4.3 Statistical Tests**

The pairwise t-test statistics was used. In this research, this measure is the ratio of the difference between the performances after ACA passage to before ACA passage to the standard error of that value across the 2006-2015 entire sample period. The greater the absolute value of the t-statistics, the greater the probability that the post-ACA passage value differs from the pre-ACA value. Five annual observations before and after ACA passage are used to estimate the average performance of the ratio in each sample time period. T-statistics are run on these paired values for our twenty biotech companies. T-statistics are a common means to assess the impact of events [see, for example, Capaul, Rowley, and Sharpe (1993)]

The Wilcoxon signed-rank test is a nonparametric test frequently used for paired data consisting of pre-event and post-event evaluation period. In our research, it helps measure the impact of the reform before and after ACA passage. Unlike the T-test that uses average values, the Wilcoxon test is practiced on median values. It is important to notice that medians are actual central values. They cannot be influenced by outliers such as extreme values. The Wilcoxon test results are

obtained on the average median values 5 years prior the reform, including 2010, and 5 years after for the 20 firms.

## **5. Findings**

### **5.1 Profitability**

The ACA's contribution to firm profitability is assessed using the net profit margin and return-on-assets ratios. Average annual values before and after 2010, the percentage change in these values, and measures of statistical significance are presented in Table 2. Given that the sample consists of only twenty biotech companies, average values and median values are presented. Average values provide the mean value of a data set, while the median provides the value of the center observation. The median values are not skewed by outliers.

#### **5.1.1 Net Profit Margin**

The importance of reporting both the average and median values is exemplified by the net profit margin. As shown in the first row of Table 2, the average net profit margin over the 2006-2010 period was 16.72%, or that almost 17 cents out of every dollar of sales fell all the way to the bottom line of the income statement. Over the 2011-2015 period, the average value was 18.52%, which is 27.2 percent higher. Using the pair-wise t-statistic, we see that the difference is not statistically significant.

Median net profit margins present a much different result. The median net profit margin actually dropped from 18.19% to 17.49%., a decline of 3.85 percent. The difference in the ordering of largest returns would arise from the distributions of profit margins being negatively skewed before ACA passage and positively skewed after ACA passage. Using the Wilcoxon signed rank test (available at <http://www.socscistatistics.com/tests/signedranks/Default2.aspx>) we find that the difference in medians is not statistically significant. This is not a surprise, given the relative small (i.e., 3.85%) percentage decline across the time periods.

#### **5.1.2 Free Cash Flow Turnover**

As important as accounting income and the profit margin may appear, earnings reinvested in the firm are not enriching investors. In fact, even profitable firms may be seeking more investment in order to expand operations. Furthermore, bill and wage payments have to be made with cash, not earnings. Hence, it is important to examine free cash flow, which is operating cash flow adjusted for investments in current assets and fixed assets.

Cash flows as a percentage of sales figures, presented in Table 2's second panel, are persistently near 20 percent. Average numbers are approximately 21 percent before and after ACA passage. The mean cash flow to sales ratio's increase of 2.99 percent is not statistically significant. Median values are lower, suggesting a mild level of positive skewness, and drop by 1.278 percent from the period before to the period after ACA passage. The median's drop is not statistically significant. Hence, it does not seem as though investors in biotechnology companies are any better off on a cash flow basis as a consequence of the ACA legislation.

## **5.2 Asset Utilization**

Sales are the lifeblood of an organization. All active corporations are selling some product or service. In this study, firms are all generating products in the biotechnology industry. While the prior section considered the “bottom line,” these values may be negative as firms expand their product offerings or operations, resulting in high initial expenditures and higher depreciation levels. Despite negative earnings, such preparation for the future is typically highly prized by investors. In this study, we examine sales relative to total assets and sales relative net income.

### **5.2.1 Total Asset Turnover**

An interesting aspect of firms in the biotechnology industry is that their enormous investment in assets results in total asset turnover which is less than 1.0. As shown in Table 3, before passage of the Affordable Care Act (ACA), the total asset turnover was 0.62, or 62.0 percent of assets. This value declines post passage to 0.55, a 12.73% decline. Assuming assets stayed the same (in fact, without additional expenditures the asset base would have declined), we see that sales declined post ACA passage. The difference is significant at the 0.05 level.

Median total asset turnovers also declined. The difference from before to after is a drop of almost twenty percent. However, the total asset turnover values are similar, suggesting that there is no skewness in the distribution. The difference is again statistically significant at the 0.05 level. Hence, we can say with ninety-five percent confidence that the ACA has diminished the ability of biotech firms to generate sales.

### **5.2.2 Return on Assets**

Before ACA passage, the average and median annual return on total assets was approximately 10% and 11%, as displayed in the second panel of Table 3. These amounts decreased by 7.84 and 19.11 percent in the period post ACA passage period. However, the difference is not statistically significant. Some insight the lack of significance is provided by the median numbers, which have a much larger difference. Before ACA passage the average and median values are pretty much similar, suggesting a fairly normal distribution exists. The post passage median is much lower than the average value, suggesting the presence of positive skewness. In fact, looking at the individual numbers it is possible to locate one biotech firm, GILD, with a return on assets exceeding forty percent in two recent years.

## **5.3 Firm Financing**

### **5.3.1 Current Ratio**

Very significant changes have occurred in firms financing following the passage of the ACA. The current ratio declined by 12.50 percent, as shown in the top panel of Table 4. The drop is statistically significant at the 0.10 level. Given fairly constant current asset levels, this finding indicates that biotech firms have used significantly more current liabilities financing post-ACA passage. The median current Ratio also declined by 9.32% which is also significant at the 0.10

level. The implication of this finding may be that that firms are more confident concerning their future cash flows and therefore, are able to take on more current debts.

### 5.3.2 Debt/Equity Ratio

Evaluation of debt/equity ratios also reveals a significant increase in the amount of long term-debt financing. Growth of the debt/equity ratio is revealed by the numbers exhibited in the second panel of Table 4. For every dollars of equity financing, biotech companies increased the amount of long-term debt from \$0.42 to \$0.59. This 39 percent increase is significant at the 0.01 level, meaning we can be 99% confident in the assertion that the ACA has impacted the amount of long-term debt financing used by biotech companies. The median also rose by 28.66 percent, which is almost significant at the 0.05 level.

## 6. Conclusion

Despite the relatively large increase in the prices of many biotechnology stocks<sup>1</sup> since passage of the Patient Protection and Affordable Care Act, the legislation does not appear to have been an ideal prescription for biotechnology companies. While average profitability has been up slightly, the medians have declined. The change in these profitability ratios from before to after ACA passage is nonsignificant. Asset turnover have decreased, with the return on assets showing little change. However, more debt is being utilized. Less equity has been invested as these firms have expanded. Perhaps less business risk has allowed these firms to take more financial risk and thereby offer a higher rate of return to investors. Additional study of these firms, as well as other sectors expected to benefit directly from the Affordable Care Act, appears to be valuable future venues for research.

## Endnotes

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<sup>1</sup> From January 1, 2011 to December 31, 2015, the S&P Biotech ETF rose from 22.51 to 63.95, a 184 percent gain, while the S&P 500 ETF itself rose by only 63.5 percent, from 1257.64 to 2043.94.

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**Table 1. Biotech Firms in the Sample**

Firms	Symbol	Market Value	Products
Johnson & Johnson	JNJ	325,000,000,000	ReoPro, Invokana, Remicade, Topamax
Roche	RHHBY	211,100,000,000	Avastin, Xeloda, Vesanoind, Tarceva
Pfizer	PFE	204,300,000,000	Atorvastatin, Norvasc, Zyvox, Palbociclib
Novartis	NVS	188,100,000,000	Afinitor, Zaditen, Femara, Galvus
Merck & Co.	MRK	172,900,000,000	Gardasil, Zetia, Januvia, Vioxx
Amgen	AMGN	125,200,000,000	Corlanor, Neulasta, Aranesp, xgeva
Novo Nordisk	NVO	106,900,000,000	Novolin, Activella, Ryzodeg, Victoza
GlaxoSmithKline	GSK	105,300,000,000	Amoxicillin, Ceftazidime, Trimethoprim
Gilead Sciences	GILD	103,000,000,000	Letairis, Ranexa, Epclusa, Viread
Sanofi	SNY	98,600,000,000	Clopidogrel, Plerixafor, Oxaliplatin
Allergan	AGN	92,200,000,000	Avycaz, Armour, Byvalson, Celexa
Bristol-Myers Squibb	BMY	91,300,000,000	Coumadin, Glucophage, Orencia
Eli Lilly & Co	LLY	89,400,000,000	Forteo, Taltz, Axiron, Alimta
Bayer	BAYN	89,400,000,000	Kogenate, Xarelto, Betaseron, Trasylol
AstraZeneca	AZN	82,400,000,000	Carbocaine, Cubicin, Zoladex, Accolate
Celgene	CELG	80,800,000,000	Vidaza, Thalomid, Revlimid....
Biogen	BIIB	68,300,000,000	Alprolix, Avonex, Gazyva, Fampyra
Abbott Laboratories	ABT	61,900,000,000	Similac, Pediasure, Pedialyte, Elecare
Stryker Corporation	SYK	43,500,000,000	Osigraft
Teva Pharmaceutical Industries	TEVA	41,400,000,000	Copaxone, Azilect, proglycem, Amrix..

**Table 2. Analysis of Profitability Ratios Before and After ACA Passage**

Financial Ratio	Return Measure	Value Before	Value After	Percentage Change	t-statistic/ Z-statistic	P-value
<i>Net Margin=</i> Net	Average Return	16.72	18.52	10.77%	1.045	0.155
<i>Income/</i> Sales	Median Return	18.19	17.49	-3.85%	0.635	0.529
<i>Cash Flow</i> <i>Margin=</i> Free Cash	Average Return	21.28	21.71	2.99%	0.547	0.295
<i>Flow /</i> Sales	Median Return	19.87	19.62	-1.28%	0.411	0.682

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Statistical Significance Levels: \*\*\* = 0.10, \*\* = 0.05, \*\*\* = 0.01

**Table 3. Analysis of Firm Assets before and after ACA Passage**

Financial Ratio	Return Measure	Value Before	Value After	Percentage Change	t-statistic/ Z-statistic	P-value
<i>Total Asset Turnover = Sales/Total Assets</i>	Average Return	0.62	0.55	-12.73%	2.310	0.016**
	Median Return	0.64	0.52	-18.40%	-1.97	0.040**
<i>Return on Assets = Net Income/Total Assets</i>	Average Return	11.04	10.17	-7.84%	0.517	0.305
	Median Return	10.40	8.41	-19.11%	0.597	0.549

Statistical Significance Levels: \*\*\* = 0.10, \*\* = 0.05, \*\*\* = 0.01

**Table 4. Analysis of Firm Financing Before and After ACA Passage**

Financial Ratio	Return Measure	Value Before	Value After	Percentage Change	t-statistic/ Z-statistic	P-value
Current Ratio	Average Return	2.27	1.98	-12.50%	1.561	0.067***
	Median Return	1.84	1.66	-9.32	1.661	0.097***
Debt/Equity	Average Return	0.42	0.60	44.12%	2.075	0.026**
	Median Return	0.33	0.42	28.66%	1.941	0.052***

Statistical Significance Levels: \*\*\* = 0.10, \*\* = 0.05, \* = 0.01