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THE EFFECT OF THE USE OF DIFFERENT ACCOUNTING STANDARDS BY PHARMACEUTICAL COMPANIES ON THEIR REPORTED FINANCIAL STATEMENTS

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Abstract

The lack of uniform global accounting standards has reduced the comparability of financial statements prepared by firms using different sets of accounting standards making it difficult for investors to effectively compare the performance of companies. This non-comparability leads in turn to, non-optimal investment decisions and inefficient allocation of capital.

Specifically, it shows that firms in this industry using International Financial Reporting Standards (IFRS) report a higher profit than they would have reported under U.S. Generally Accepted Accounting Principles (U.S. GAAP).

This research examines the effect of different sets of accounting standards in the pharmaceutical industry. It is based on the analysis of the reported financial results of five pharmaceutical comapnies[1], that identifies the material differences in accounting standards between IFRS and U.S. GAAP. It identifies a number of accounting differences relating to impairment losses, development costs, and litigation provisions. The study examines the effect of each of these reporting differences on the company's level and volatility of reported earnings. The effects are expressed in terms of changes in financial ratios based on the financial statements and data presented in form "20-F[1]."

This study reaches the conclusion that, relative to the use of U.S. GAAP, the use of IFRS in the pharmaceutical industry in the years 2004, 2005, and 2006 resulted in higher reported net income by an average of 32.29% due primarily to impairment losses/gains and capitalization of development costs, a higher earnings per share by an average of 44.13% due to an increase in

[1] The five companies analyzed are GlaxoSmiithKline, Sanofi Aventis, Novartis, Bayer, and Astra Zeneca.

reported net income, a higher return on assets by an average of 42.86% due primarily to the increase in reported net income while maintaining a similar level of total assets under both sets of accounting standards, and less volatility in the reported earnings.

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Introduction

On August 27, 2008, the Securities and Exchange Commission (SEC) announced a comprehensive plan for a change from U.S. GAAP to IFRS (Appendix I). Due to increasing globalization in the pharmaceutical industry, it is common practice for companies to look internationally for financing and new customers. This globalization of the pharmaceutical industry has increased the need for common understanding of reported financial information.

Companies using different reporting standards to produce financial data, causes confusion and information risk for investors. The existence of two sets of financial reporting standards creates differences in the way performance is measured and presented in a company's financial statements. This research examines the principal differences in the application of U.S. GAAP and IFRS that materially affect a pharmaceutical company's reporting of development costs, litigation provisions, and asset impairment. I will explore the affect that each of the differences is likely to have on an investor's perception of a company's financial position, profitability, and risk. There are other differences in the two sets of accounting standards that are not discussed in this research because either the effect of these standards is too difficult to assess (e.g., the effect of different standards regarding consolidation), or the standards are unlikely to materially affect a pharmaceutical company's financial statements (e.g., revenue recognition standards).

Overview of Accounting Standards

In order to understand the impact that the transition from U.S. GAAP to IFRS will have on pharmaceutical company financial statements, it is critical to understand the components of each set of accounting standards and the current plans for convergence.

International Financial Reporting Standards

IFRS were initially drafted by the International Accounting Standards Committee (IASC); however, in 2001 the International Accounting Standards Board (IASB) was created to continue the work of the IASC in establishing IFRS. Approximately 120 nations across the world have permitted or required the use of IFRS and about 90 of the 120 nations have fully conformed to IFRS. Nations such as India, Mexico, United States, and Japan have established plans for the adoption of IFRS in coming years.

U.S. Generally Accepted Accounting Principles

While various groups were involved in the establishment of these standards over the years, U.S. GAAP were initially established by the Committee on Accounting Procedures for the American Institute of Certified Public Accountants (AICPA) in 1936 and are the required standards in the United States today. In 1959, the Committee on Accounting Procedure was replaced by the Accounting Principles Board of the AICPA, and in 1973, the responsibility of establishing principles was transferred to the Financial Accounting Standards Board (FASB) by order of the Securities and Exchange Commission (SEC) through Accounting Series Release No. 150. This release expressed the SEC's intent to look to the private sector for establishing and improving accounting standards through the FASB.

Convergence Efforts

The United States is currently engaged in major efforts and discussions regarding the convergence and transition from U.S. GAAP to IFRS in order to adopt the international accounting standards to enable global comparison of financial information. Despite the continued talks and the initiation of the convergence effort, FASB is responsible for creating and maintaining accounting standards in the United States. The SEC has established a plan for the convergence of US GAAP and IFRS; however, the plan does not mandate full convergence until

2015. In February 2010, SEC Chairwoman, Mary Schapiro, neither denied nor confirmed that the SEC will follow the prospective 2015 general plan previously issued. She stated "we remain on a steady path to be in the position to make such a determination in 2011" (Schapiro).

Currently, the SEC allows foreign registrants to file financial statements under IFRS without reconciliation to U.S. GAAP; however, domestic companies are required to file under U.S. GAAP. While convergence under the SEC's plan may not occur until 2015, the unification of the two accounting standards is inevitable. An overview of the SEC's plan is presented in appendix I. The adoption of IFRS will change the way in which pharmaceutical companies report financial information in the U.S. pharmaceutical industry.

While U.S. GAAP is primarily used in the United States, increasing global operations for many companies has raised the issue of comparability of financial data between US and foreign entities. This has resulted in the need for an international set of standards, IFRS. Before discussing the differences in accounting standards, an overview of the pharmaceutical industry will help in clarifying my research.

Overview of the Pharmaceutical Industry

The pharmaceutical industry is a highly competitive industry in which companies face three main sources of competition: (1) competition from other large pharmaceutical companies such as Merck, Pfizer, and Johnson & Johnson, (2) competition from generic drug manufacturers that produce similar products but charge lower prices to consumers, and (3) competition from other forms of health care such as homeopathy, herbal medicine, acupuncture, and holistic medicine. While these sources of competition play an extensive role within the industry, companies must follow guidelines set out by governing agencies.

Companies in the pharmaceutical industry are constrained by various laws and regulations. For example, pharmaceutical companies selling medicinal products in the United States are regulated by the U.S. Food and Drug Administration (FDA), and the European Medicines Agency evaluates the selling of medicinal products in the European Union. Although not a focus of this research, regulations play an important part in the industry and an overview is presented in appendix II.

While companies follow regulations set out by governing agencies, they must follow any federal laws pertaining to them. For example, companies operating in the United States must follow the health care reform package that went into effect on March 23, 2010. While the effects of the package may not directly impact drug manufacturers this year, there are some long-term direct and indirect implications when the bill is fully implemented in 2020 as presented in appendix III.

Another component of the pharmaceutical industry is high research and development (R&D) costs. The average R&D cost needed to bring a new product to the market has significantly increased every decade. According to a study by the Tufts Center for the Study of Drug Development, the average R&D costs associated with a new product has doubled since the 1980s and is more than five times the cost since the 1970s; and the average cost in 2006 of developing a new product increased to approximately $1.2 billion dollars caused by the increase in required clinical study periods.

Now that I have discussed the two sets of accounting standards that will be the focus of this research and outlined the characteristics of the pharmaceutical industry, I will introduce the material differences between IFRS and U.S. GAAP that impact the financial statements of pharmaceutical companies.

Difference in Accounting Standards

A material difference between IFRS and U.S. GAAP is the framework used in developing the accounting standards. The standards under IFRS are more principle-based relying on professional judgment with limited interpretations by the International Financial Reporting Interpretations Committee (IFRIC), which can lead to different companies viewing the accounting treatment of a similar transaction in different ways.

While IFRS is principle-based, U.S. GAAP is a rule-based set of standards with specific interpretations for industries provided by FASB staff positions, FASB interpretations, SEC staff accounting bulletins, and emerging issues task force abstracts. The difference in the level of guidance provided becomes apparent when comparing the statements released by the two accounting boards. As Jeffrey Deane states, "Just the accounting literature initiated by the FASB is about nine inches thick compared to the entire volume of IFRS which measures approximately two inches thick."

While the accounting frameworks of IFRS and U.S. GAAP vary, differences exist in the accounting treatment of transactions and events between the two standards; specifically, the methods of accounting for asset impairment, development costs, and litigation provisions. These differences materially impact the financial statements of companies operating in the pharmaceutical industry.

Asset Impairment

Asset impairment is one standard where differences exist between IFRS and U.S. GAAP including the model used for determining impairment, the recovery of previously recorded impairment losses, and the level of account used in testing impairment.

Under U.S. GAAP, there is a two-step impairment test presented in SFAS 144. The first step states to recognize an impairment loss only if the carrying amount of a long-lived asset is not recoverable from undiscounted cash flows and exceeds fair value. If the carrying amount is lower than the undiscounted cash flows, then no impairment loss is recognized; however, if the carrying amount is higher than the undiscounted cash flows, then a second step is needed. The second step requires impairment loss to be recorded at the difference between the carrying amount and fair value of the asset which is defined as the price that would be received if the asset were sold in an orderly transaction between market participants. A company is required to determine if a principal market is available for an asset and, if so, must use the fair market value as determined from that market. According to FASB Accounting Standards Codification (ASC) 350, no impairment reversal is allowed under U.S. GAAP. This treatment of asset impairment differs from the standards provided by the IASB.

Under IFRS, there is a single impairment test presented in International Accounting Standard (IAS) 36. Under IAS 36, an asset is deemed impaired if the carrying amount of an asset is higher than the recoverable amount which is defined as the higher of (1) the asset's fair value less costs to sell or (2) the asset's value in use. The asset's value in use is the present value of the future cash flows expected to be derived from an asset or cash-generating unit. Impairment is normally tested on a cash-generating unit which is defined "as the smallest identifiable group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets". There exists no guidance in IFRS as to the market used in determining the fair value of an asset.

While no reversal of impairment is allowed under U.S. GAAP, IAS 36 allows for reversal if there is a change in the estimates used to determine the asset's recoverable amount since the

last impairment loss was recognized. However, the reversal is limited to the amount of the impairment loss previously recognized and is treated as a gain on the income statement in the period that the change in estimate occurs.

As a result of the differences for asset impairment tests, an investor can expect that a pharmaceutical company will recognize an impairment loss earlier under IFRS because, in most situations, the undiscounted cash flows will be higher for an asset relative to its recoverable amount due to the incorporation of the present value of money.

An example of the impact of the differences in accounting standards regarding asset impairment is presented in appendix IV, which shows the reconciliation of GlaxoSmithKline's intangible assets from IFRS to U.S. GAAP presented in their form "20-F" filing with the SEC in 2006. Only net losses were reported on the reconciliation, therefore no impairment gains can be determined. In 2004, the company showed the same impairment expense regardless of the set of accounting standards; however, in 2005 and 2006 GlaxoSmithKline (GSK) recorded differing amounts of impairment losses under IFRS and U.S. GAAP. In 2005, GSK reported an impairment expense of 99 million pounds under IFRS; however, if GSK were reporting using U.S. GAAP the impairment expense was 118 million pounds. In 2006, GSK reported an impairment expense of 80 million pounds under IFRS; while under U.S. GAAP, the company would have recorded an impairment expense of 41 million pounds. Overall, the difference in treatment for asset impairment resulted in a higher impairment expense under U.S. GAAP in 2005 of 19 million pounds but lower impairment expense in 2006 of 39 million pounds.

Development Costs

Another standard to consider when understanding the differences between IFRS and U.S. GAAP is development costs. Research and development (R&D) costs are commonly one of the

largest expenses shown on a pharmaceutical company's income statement. Based on the pharmaceutical companies analyzed in this research, on average, R&D costs were 14.58% of their revenue in 2006, and based on a Med Ad News survey, the percentage of revenues spent on R&D for the twenty largest pharmaceutical companies, on average, was 14.28%.

R&D costs are expensed as a single component on the income statement for companies using U.S. GAAP; however, IFRS requires the separation of research and development costs into two distinct groups of activities. Research is defined as the planned search for the discovery of new knowledge, and according to paragraph 8 of SFAS No. 2, development is defined as "the conceptual formulation, design, and testing of product alternatives, construction of prototypes, and operation of pilot plants. It does not include routine or periodic alterations to existing products, production lines, manufacturing processes, and other on-going operations even though these operations may represent improvements." While the distinction between research and development is not significant under U.S. GAAP, the distinction becomes important when pharmaceutical companies apply IFRS.

Under U.S. GAAP, SFAS No.2 requires pharmaceutical companies to expense both research and development costs for medicinal products as incurred because the outcome is unpredictable and therefore not capitalized as an asset on a company's balance sheet.

Under IFRS, a company must expense research costs as is done in U.S. GAAP; however, IFRS allows for the capitalization of development costs if six criteria are met. As set out in IAS 38, the criterion consists of the demonstration of:

1) The technical feasibility of completing the intangible asset so that it will be available for use or sale

2) The intention to complete the intangible asset and use or sell it
3) The ability to use or sell the intangible asset
4) How the intangible asset will generate future economic benefits or service potential. Among other things, the entity can demonstrate the existence of a market for the output of the intangible asset
5) The availability of adequate technical, financial and other resources to complete the development and to use or sell the intangible asset
6) The ability to measure reliably the expenditure attributable to the intangible asset during its development

If a company can demonstrate the six criteria set out in IAS 38, then the development costs are seen as giving a company probable future economic benefit and capitalization is reflected on the balance sheet. The time at which a company meets the criteria varies depending on circumstances such as required agency approval and resources available to the company to complete the asset. It is not until the later part of the process that a pharmaceutical company normally meets these criteria for capitalization because the commercial feasibility of the product does not occur until approval from regulatory agencies, such as the U.S. FDA.

When a pharmaceutical company has met all criteria established in IAS 38, a company may capitalize all directly attributable costs necessary to create, produce, and prepare the asset to be capable of operating in the manner intended by management. Some examples of directly attributable costs are given in IAS 38 and consist of:

- Costs of materials and services used or consumed in generating the intangible asset

- Costs of employee benefits arising from the generation of the intangible asset
- Fees to register a legal right
- Amortization of patents and licenses that are used to generate the intangible asset

The effect that this difference in accounting standards has on a company's financial statement performance is seen in the income statement and balance sheet. A company's balance sheet will contain any unamortized development costs incurred this year and any prior years. While an income statement under U.S. GAAP will in most circumstances contain all R&D costs for a pharmaceutical company; under IFRS, certain development costs can temporarily bypass the income statement and be capitalized onto the balance sheet. While the short-term impact of this accounting difference is material to the financial statements, the materiality of the long-term impact depends on the growth rate of the company's investment into development.

In the long term, a company with no growth rate in their development costs will show no material difference on their income statement. As the pharmaceutical company amortizes the capitalized development costs present on their balance sheet, eventually the development costs expensed each year will be the same under both sets of standards. However, if a company is experiencing growth in their investment in development costs, then the accounting treatment can have a material impact on the financial statements long-term. As the company capitalizes more development costs onto the balance sheet, more expenses bypass the income statement and allows for a company to show an increase in their reported net earnings. This conclusion will change if the circumstances of the growth in development costs of a company change. If a company experiences a period of no growth in development costs, then the development expense shown using both IFRS and U.S. GAAP will eventually equal. If a company experiences a

period of negative growth in development costs, then the development expense reported using IFRS may be greater than if reported using U.S.GAAP.

An example of the possible short and long-term effects of the development cost difference in accounting standards for a growing and stable pharmaceutical company is presented in the following table. For this example, short-term is defined as three years after initial capitalization in 2005, and long-term is defined as any period after year four.

Table 1: Example of the expenditures of development costs

Assumption A: Company xxx has no growth in development costs and the annual cost of development is $100 per year. All development costs are incurred at the beginning of the year and no development costs were incurred prior to 2005. Development costs meet the criteria under IAS 38 and are amortized over 4 years using the straight-line method.								
Assumption B: Company yyy has a 10% growth in development costs and the annual cost of development during 2005 is $100. All development costs are incurred at the beginning of the year and no development costs were incurred prior to 2005. Development costs meet the criteria under IAS 38 and are amortized over 4 years using the straight-line method.								
Assumption A								
Balance Sheet (Capitlized Development Costs)		IFRS	U.S. GAAP		Income Statement (Development Costs Expense)		IFRS	U.S. GAAP
2005		$ 75.00	$ -		2005		$ 25.00	$ 100.00
2006		$ 125.00	$ -		2006		$ 50.00	$ 100.00
2007		$ 150.00	$ -		2007		$ 75.00	$ 100.00
2008		$ 150.00	$ -		2008		$ 100.00	$ 100.00
					Total Development Cost Expense		$ 250.00	$ 400.00
Assumption B								
Balance Sheet (Capitlized Development Costs)		IFRS	U.S. GAAP		Income Statement (Development Costs Expense)		IFRS	U.S. GAAP
2005		$ 75.00	$ -		2005		$ 25.00	$ 100.00
2006		$ 132.50	$ -		2006		$ 52.50	$ 110.00
2007		$ 170.75	$ -		2007		$ 82.75	$ 121.00
2008		$ 187.82	$ -		2008		$ 116.03	$ 133.10
					Total Development Cost Expense		$ 276.28	$ 464.10

As shown in the table above, under assumption A, a company with no growth in their development costs over the long term shows no difference in the expense reported on the income statement between IFRS and U.S. GAAP. Company xxx under both sets of standards will

expense $100 each year after the fourth year and show a constant balance for capitalized development costs.

Under assumption B, a pharmaceutical company that experiences growth in their development costs will show higher net income under IFRS because of the decrease in development costs expensed on the income statement. Therefore, differences in accounting standards for development costs can generate both long-term and short-term effects depending on the growth of the development costs within the pharmaceutical company.

By allocating the development cost over a number of periods, capitalization of these costs is likely to have a smoothing effect on the reported earnings if the series of annual investments is erratic. If the annual development costs are steady, no further smoothing of reported earnings is obtained by capitalization.

Table 2: Variability of Development Expense

Assumption: Company zzz incurred the following development costs per year. All development costs were incurred at the beginning of the year and no development costs were incurred prior to year one. Development costs meet the criteria under IAS 38 and are amortized over 4 years using the straight-line method.			
Year	Development Costs Incurred	U.S. GAAP Expense	IFRS Expense
1	100	100	25
2	200	200	75
3	300	300	150
4	400	400	250
Average		250	125
Standard Deviation		111.803	84.779

As shown in the example above, an analysis of the variability in the expense recorded under both sets of standards reveals that, under IFRS a company will experience less variability in the development expense recorded when compared to U.S. GAAP. If the company stops

growing in their development expenditures after year 4 and continues annual investments of $400, then the variability in development expense will be the same under both sets of standards from year 8 on. It is only in the periods where development expenditures fluctuate, as in a growing company, that the variability in development expense is affected.

Litigation Provision

In addition to impairment loss and development costs, litigation provision is another area where differences between IFRS and U.S. GAAP impact financial statement reporting primarily due to differences in timing and amount of the liability recorded. When a pharmaceutical company faces litigation, the lawsuits are for large sums of money such as in 2007 when Merck agreed to pay $4.85 billion to resolve claims against their product Vioxx. The provision recorded for these large claims have the potential to be material for any pharmaceutical company.

In U.S. GAAP, FASB ASC 450 states there are three possible probability categories in which a contingent loss is classified and they are: probable, reasonably possible, and remote. A company is not required to disclose the loss contingency if the probability of a loss is remote, and must disclose a loss that is reasonably possible to occur in the notes of the financial statement. Pharmaceutical companies must recognize a loss on their financial statements if determined to be probable in occurrence. According to PricewaterhouseCoopers, a loss is determined to be probable, in most situations, if the estimated certainty of loss is 75 percent. In addition, when measuring a provision that has a range of liability estimates, with no one estimate better than another, the lowest point in the range is required to be recorded.

Under IFRS, IAS 37 states that a company must recognize a provision if, and only if:

1) A present obligation has arisen as a result of a past event
2) Payment is probable
3) The amount can be estimated reliably

While IAS 37 states that the recognition of a provision is required when payment is probable, the definition of probable is different than that under U.S. GAAP. IAS 37 describes probable as meaning the loss is more likely than not to occur or the loss probability is greater than fifty percent. When measuring a provision that has a range of liability estimates, the use of the midpoint within the range is required.

The difference in accounting standards for contingent losses impacts both a company's income statement and balance sheet. A company using IFRS can recognize a contingent loss sooner than a company using U.S. GAAP because of the lesser degree of certainty needed to classify a loss as probable. Pharmaceutical companies, using IFRS, recognize more of a loss on the balance sheet and income statement, if a range exists. This treatment will decrease reported net income and affect ratios such as debt to equity primarily due to the increase in the loss liability recognized. An example of the impact that these accounting differences have on the timing and reporting of a contingency is presented in appendix V.

Now that I have discussed the material differences for asset impairment, development costs, and litigation provisions, I will analyze the effects of these differences on the reported financial performance of select pharmaceutical companies.

Effects of Accounting Standards on Reported Financial Performance

Each of the discussed differences in accounting standards has the ability to materially alter the financial information presented. The impact of accounting differences on the reported

financial performance of a pharmaceutical company can be seen through their effect on financial ratios. The results will indicate how the financial position, profitability, and risk of a pharmaceutical company are altered depending on whether the company's financial statements are prepared according to U.S. GAAP or IFRS.

Methodology and Analysis of Financial Performance

This analysis is conducted using the data presented on the form "20-F" so the only factor affecting the ratios is the difference in accounting standards. Prior to 2007, companies operating in the European Union that listed securities on a U.S. stock exchange were required to file a form "20-F" with the SEC providing a reconciliation of certain financial statement components from the issuer's local accounting standards to U.S. GAAP.

To evaluate the effect of differing accounting standards on a reported financial performance, I computed six financial statement ratios for five pharmaceutical companies that issued a form "20-F" during the period of 2004-2006. A test of the smoothing effect of the two sets of standards is conducted by dividing the standard deviation of reported earnings by the standard deviation of cash flow from operations (which is much less unaffected by accounting rules). The companies selected for this research are listed below.

Table 3: Companies used in research

	Company Name	Country of Headquarters
1)	Bayer Corporation	Germany
2)	Sanofi Aventis	France
3)	GlaxoSmithKline	United Kingdom
4)	Nycomed	Switzerland
5)	Novartis	Switzerland

Financial Ratio Indicators

For this research, financial ratios were chosen to provide an overview of the impact of accounting differences in three areas: financial position, profitability, and risk. The chosen financial ratios are described below.

Return on Assets (ROA) is calculated by dividing a company's net income by their total assets. ROA is an indicator of a company's efficiency in using assets to generating earnings, or net income and the asset intensity of a business.

Return on Equity (ROE) is calculated by dividing net income by average shareholders' equity. For this research, I assume that average shareholders' equity equals total shareholders' equity at the balance sheet date. This ratio represents a firm's efficiency at generating profits from a unit of shareholders' equity, or net assets. Unlike ROA, which remains stable throughout all capital structures, ROE can appear extremely low or high when comparing a company to another employing a different percentage of debt to equity.

Growth in Net Income is calculated as the annual percentage change in net income.

Profit Margin is calculated as the ratio of net income to sales. It captures the results of the company's pricing strategy and its ability to control their costs. Profit margin measures how much out of every dollar of sales a company keeps in earnings. A company with a high profit margin has a lower risk that a decline in sales will decrease the company's profit to the point of negative reported earnings.

Earnings Per Share (EPS) represents the reported earnings each outstanding share of a company theoretically earned. The calculation for EPS is a company's net income divided by average outstanding shares.

Sales Growth is calculated as the annual percentage change in revenue. Sales growth can only be calculated for the years 2005 and 2006 because no reconciliation between IFRS and U.S. GAAP is available for the 2003 fiscal year to compute the sales growth in 2004.

Earnings Smoothing is the reduction of variability in reported earnings by altering the accrual component of earnings, and is calculated by dividing the standard deviation of operating earnings by the standard deviation of cash flow from operations. A ratio that is lower than 1.0 indicates that accruals served to reduce the variability inherent in cash flows. While there is less accounting discretion measuring and reporting cash flow from operations, the two sets of accounting standards do affect cash flow to some extent, as shown in appendix VI.

Results of Research

The results are presented for the years 2004, 2005, and 2006, and then an overall percentage impact. The results of the analysis are expressed as a percentage change of IFRS over U.S. GAAP for each financial ratio. The results of the calculation for earnings smoothing is

expressed as single number representing the effect of accounting discretion for each IFRS and U.S. GAAP. The process used to conclude the following results is presented in appendix VII.

Table 4: Financial Ratio Indicators[2]

Financial Ratio Indicators	Ratio Differences			
	2004	2005	2006	Overall
Return on Equity	124.80%	62.23%	21.27%	69.43%
Return on Assets	44.91%	75.92%	7.74%	42.86%
Earnings Per share	51.38%	21.41%	59.61%	44.13%
Growth in Net Income	55.01%	22.18%	19.67%	32.29%
Profit Margin	51.38%	21.41%	22.18%	31.65%
Sales Growth	N/A	0%	0%	0%
	IFRS		U.S. GAAP	
Earnings Smoothing	0.911		0.985	

The results revealed that IFRS, on average, allows pharmaceutical companies to show an improvement for most financial statement ratios. The analysis showed a 32.29% increase in net income when pharmaceutical companies used IFRS rather than U.S. GAAP which led to other financial ratios such as EPS and ROE to experience increases, on average, as well.

The ratio of the standard deviation in operating income to the standard deviation in cash flow from operations, the measure of income smoothing, shows that the use of IFRS resulted, on average, in a lower volatility of operating income. This lower volatility reflects the smoothing effect of capitalizing development costs under IFRS.

[2] Only data obtainable for earnings smoothing calculation was for GlaxoSmithKline and Astra Zeneca because no cash flow from operation was provided using U.S. GAAP for other companies analyzed in this research.

The analysis also indicates an apparent increase in the degree of convergence between the two standards over time. Specifically, the ROE and the rate of year-to-year change in income measured under the two sets of standards become closer over the years.

As anticipated, sales growth was not affected by the use of different accounting standards because the differences in revenue recognition do not materially affect the pharmaceutical industry. The sales numbers reported are the same for both IFRS and U.S. GAAP for each company over all three years.

It can be concluded from these results that pharmaceutical companies using IFRS rather than U.S. GAAP to prepare their financial statements will appear, on average, more profitable, in a better financial position, and have a lower likelihood of reporting losses. The differing accounting standards create a lack of comparability that can materially alter an investors understanding of a company's performance. Investors need to understand that a more profitable performance for a pharmaceutical company may be attributable to the financial reporting standards rather than an actual improvement in the performance of a company.

Conclusion

The conversion from U.S. GAAP to IFRS is inevitable but, until that time, there exists a lack of comparability between company's financial statements. The comparability in the pharmaceutical industry is affected by accounting differences in asset impairment, in development costs, and in litigation provisions. These differences impact the financial statement in a variety of ways which is shown by comparing financial statement ratios computed using the same financial data prepared using both IFRS and U.S. GAAP.

Using financial statement ratios, this study reaches the conclusion that, relative to the use of U.S. GAAP, the use of IFRS in the pharmaceutical industry during the years 2004, 2005, and 2006 resulted in higher net income by an average of 32.29% due primarily to impairment recognition differences and capitalization of development costs, a higher earnings per share by an average of 44.13%, a higher return on assets by an average of 42.86% due primarily to the increase in net income while maintaining a similar level of total assets, and less volatility in reported earnings.

These differences have the potential to materially alter the decision making process of an investor and are important to consider when making comparisons of companies using different sets of accounting standards. While this research focuses on the pharmaceutical industry, an investor can see that these differences in accounting standards can impact companies operating in other industries such as commercial banks, insurance, and crude oil production.

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Appendix I: SEC Roadmap for Converging to IFRS

In 2008, the SEC released a comprehensive plan putting forth milestones that, if met, would require the use of IFRS by U.S. issuers beginning in 2014. Under the plan, the SEC would decide in 2011 whether to proceed with the required use of IFRS for U.S. public firms. There are seven milestones that influence the SEC's 2011 decision on whether to move forward and they are:

- Improvements in accounting standards
- Improving the structure and funding of the International Accounting Standards Board
- Facilitating the use of interactive data under IFRS
- Updating the education and licensing of U.S. Accountants
- Evaluating the early adoption experiences of a limited group of companies
- Timing of future rulemaking
- Sequencing of companies required to use IFRS

Under the SEC proposed staged rollout, IFRS fillings would be required for large accelerated filers for fiscal years ending on or after December 15, 2014, and the remaining accelerated filers would begin IFRS filings for years ending on or after December 15, 2015. Non-accelerated filers, which include small reporting companies, would begin IFRS filings for years ending on or after December 15, 2016.

Appendix II: Regulations in the Pharmaceutical Industry

Medicinal products are regulated throughout their life-cycle and include regulations on promotion, pricing, and quality. These heavy regulations are set in place to protect the

effectiveness and safety of the products used by the end consumers. Regulations are created by the agency governing the country where the product is sold. The most common agencies can be seen in the Table 4 below.

Table 5: Common regulatory agencies

Regulatory authorities	Countries
European Medicines Agency	European Union
U.S. Food and Drug Administration	United States
Ministry of Health, Labour, and Welfare	Japan
Medicines and Healthcare products Regulatory Agency	United Kingdom

Each agency has the responsibility for setting the laws and regulations regarding the promotion, quality, and pricing for products sold within their borders. For example, the Ministry of Health, Labour, and Welfare has in place strict regulations concerning all aspects of pharmaceuticals. All prices of medicinal products are determined by comparing the product to the existing market and not solely by the company's discretion. The U.S. Food and Drug Administration (FDA) believes in allowing certain aspects such as price to be moderately regulated and allowing for companies to set their product's price in most circumstances. The U.S. FDA places price controls on government drug sales but places no direct price controls on non-government sales. On the other hand, the European Medicines Agency has placed moderate price controls on pharmaceuticals that are not as strict as those in Japan but are not allowed to move as prices are in the United States.

The financial cost of these regulations can be burdensome to a pharmaceutical company. According to a survey done by the European Federation of Pharmaceutical Industries and Associations, the costs a single inspection can run as high as $130,000 to $400,000 per day and

use as much as 1,000 to 2,500 work hours per inspection (Moran). Even through the help of the International Conference on Harmonization, only some of the redundant paperwork for selling products worldwide has been eliminated and heavy costs still burden pharmaceutical companies.

Appendix III: Health Care Reform Bill

The Health Care Reform Bill will take effect over a period of ten years. Some of the effects of the bill will be seen in 2010 while others will take effect between 2011 and 2020. President Obama said, "The legislation enshrines into law the core principle that everyone should have some health care security. (Condon)" The bill will expand coverage to 32 million Americans who are currently uninsured. Pharmaceutical companies in the United States may see an increase in sales figures in future years due to the ability of more individuals, who may currently be uninsured, to afford prescription drugs.

The health care bill will affect the insurance companies as well. In 2018, insurance companies will pay a 40 percent excise tax on high-end insurance plans worth over $27,500 for families or $10,200 for individuals. In addition, the "donut hole", a gap in Medicare Part D coverage that causes individuals to pay for prescriptions completely out of pocket once their expenses reaches $2,700, will close by 2020. Starting in 2014 insurance companies can no longer deny coverage to anyone with preexisting conditions and must allow children to stay on their parent's insurance plan until they reach the age of 26.

There is an individual mandate within the bill. Everyone must purchase by 2014 health insurance or face a $695 annual fine; however there are exceptions for individuals or families with low income levels that may not be able to afford insurance plans. There is no additional

employer mandate to the bill; however, employers with more than 50 employees must provide health insurance to employees or face a fine.

Appendix IV: GlaxoSmithKline Intangible Reconciliation

Table 6: GlaxoSmithKline reconciliation

	2006 £m	2005 £m	2004 £m
Impairment charge under IFRS	80	99	26
Impairment charge under US GAAP	41	118	26

Appendix V: Contingent Liability Example

Table 7: Contingent liability example

12/31/2010	Original estimate for lawsuit was a range of $0-100 million and no amount better than any other amount within the range							
12/31/2011	No change							
12/31/2012	Best estimate determined to be $ 25 million							
	Provision balance as of December 31							
		2010	2011	2012				
	US GAAP	-	-	25M				
	IFRS	50M	50M	25M				
	Income statement impact							
		2010	2011	2012	Total			
	US GAAP	-	-	25M	25M			
	IFRS	50M	-	(25M)	25M			

Appendix VI: Statement of Cash Flows

IFRS and U.S. GAAP require the presentation of cash flows from operating, investing, and financing activities. Both sets of standards allow for the use of the indirect and direct method in calculating operating cash flow; however, there exists differences in the classification of certain items as shown in the table below.

Table 8: Differences in Cash Flow Statement for IFRS and U.S. GAAP

	U.S. GAAP Classification	IFRS Classification
Interest Received	Operating	Operating or Investing
Dividends Received	Operating	Operating or Investing
Interest Paid	Operating	Financing or Operating
Dividends Paid	Financing	Financing or Operating
Income Taxes	Operating	Operating unless associated with another activity

Appendix VII: Financial Ratio Data

	GlaxoSmithKline			Sanofi Aventis		
	2006	2005	2004	2006	2005	2004
Net Income						
US GAAP	8,260.25	6,038.16	5,026.88	3,176.38	1,775.81	(2,932.00)
IFRS	10,171.30	8,716.96	7,400.48	3,154.33	1,820.97	1,588.80
Equity						
US GAAP	64,108.05	62,050.42	62,637.28	36,238.58	37,421.77	33,305.60
IFRS	17,848.80	13,701.70	10,900.16	36,078.74	37,352.42	33,017.60
Total Assets						
US GAAP	101,052.55	103,564.58	102,747.44	61,051.97	69,549.19	66,276.80
IFRS	20,335.20	23,850.37	19,835.20	61,230.71	70,116.94	68,445.60
Current Liabilities						
US GAAP	27,570.55	31,360.06	31,349.92	8,064.57	12,368.55	12,076.00
IFRS	13,440.25	17,214.91	15,757.76	8,092.91	12,435.48	12,142.40
Sales						
US GAAP	42,966.25	39,204.60	36,774.24	22,340.94	22,025.00	11,896.80
IFRS	42,966.25	39,204.60	36,774.24	22,340.94	22,025.00	11,896.80

	Novartis			Bayer		
	2006	2005	2004	2006	2005	2004
Net Income						
US GAAP	5,264.00	5,190.00	4,793.00	519.78	1,065.95	525.00
IFRS	7,202.00	6,141.00	5,380.00	1,349.20	1,281.23	548.32
Equity						
US GAAP	41,670.00	38,300.00	38,101.00	9,828.07	9,784.72	10,489.63
IFRS	41,294.00	33,164.00	33,783.00	10,162.38	8,897.90	9,863.32
Total Assets						
US GAAP	68,849.00	65,101.00	59,281.00	43,585.13	30,631.38	30,950.31
IFRS	68,008.00	57,732.00	54,469.00	44,488.58	29,497.95	30,220.29
Current Liabilities						-
US GAAP	N/A	N/A	N/A	12,349.76	7,285.73	12,829.23
IFRS	16,234.00	15,328.00	11,078.00	22,540.00	14,764.24	15,774.24
Sales						
US GAAP	36,031.00	31,005.00	27,126.00	23,048.63	19,841.75	16,823.44
IFRS	36,031.00	31,005.00	27,126.00	23,048.63	19,841.75	16,823.44

	AstraZeneca		
	2006	2005	2004
Net Income			
US GAAP	4,392.00	3,884.00	2,951.00
IFRS	6,063.00	4,724.00	3,683.00
Equity			
US GAAP	32,467.00	31,894.00	35,477.00
IFRS	15,304.00	13,597.00	14,404.00
Total Assets			
US GAAP	47,690.00	43,757.00	48,600.00
IFRS	29,932.00	24,840.00	25,652.00
Current Liabilities			
US GAAP	N/A	N/A	N/A
IFRS	9,447.00	6,839.00	6,587.00
Sales			
US GAAP	26,475.00	23,950.00	21,426.00
IFRS	26,475.00	23,950.00	21,426.00

Return on Equity

	2006			2005			2004		
	US GAAP	IFRS	Percentage Impact	US GAAP	IFRS	Percentage Impact	US GAAP	IFRS	Percentage Impact
GSK	12.88%	56.99%	342.27%	9.73%	63.62%	553.78%	8.03%	67.89%	745.98%
Sanofi	8.77%	8.74%	-0.25%	4.75%	4.88%	2.73%	-8.80%	4.81%	-154.66%
Novartis	12.63%	4.81%	-61.91%	13.55%	17.44%	28.71%			
Bayer	5.29%	13.28%	151.03%	10.89%	14.40%	32.18%	5.00%	5.56%	11.07%
Astrazeneca	13.53%	39.62%	192.86%	12.18%	34.74%	185.30%	8.32%	25.57%	207.39%
Avg			124.80%			62.23%			21.27%
Overall Average	69.43%								

Net Income

	2006			2005			2004		
	US GAAP	IFRS	Percentage Impact	US GAAP	IFRS	Percentage Impact	US GAAP	IFRS	Percentage Impact
GSK	8,260.25	10,171.30	23.14%	6,038.16	8,716.96	44.36%	5,026.88	7,400.48	47.22%
Sanofi	3,176.38	3,154.33	-0.69%	1,775.81	1,820.97	2.54%	(2,932.00)	1,588.80	-154.19%
Novartis	1,775.81	7,202.00	305.56%	(2,932.00)	6,141.00	-309.45%	5,264.00	5,380.00	2.20%
Bayer	519.78	1,349.20	159.57%	1,065.95	1,281.23	20.20%	525.00	548.32	4.44%
Astrazeneca	4,392.00	6,063.00	38.05%	3,884.00	4,724.00	21.63%	2,951.00	3,683.00	24.81%
Avg			55.01%			22.18%			19.67%
Overall Average	32.29%								

Profit Margin

	2006			2005			2004		
	US GAAP	IFRS	Percentage Impact	US GAAP	IFRS	Percentage Impact	US GAAP	IFRS	Percentage Impact
GSK	19.2%	23.7%	23.14%	15.4%	22.2%	44.36%	13.7%	20.1%	47.22%
Sanofi	14.2%	14.1%	-0.69%	8.1%	8.3%	2.54%	-24.6%	13.4%	-154.19%
Novartis	14.6%	20.0%	36.82%	16.7%	19.8%	18.32%	17.7%	19.8%	12.25%
Bayer	2.3%	5.9%	159.57%	5.4%	6.5%	20.20%	3.1%	3.3%	4.44%
Astrazeneca	16.6%	22.9%	38.05%	16.2%	19.7%	21.63%	13.8%	17.2%	24.81%
Avg			51.38%			21.41%			22.18%
Overall Average	31.65%								

Earnings Per Share

	2006			2005			2004		
	US GAAP	IFRS	Percentage Impact	US GAAP	IFRS	Percentage Impact	US GAAP	IFRS	Percentage Impact
GSK	1.38	1.70	23.14%	1.01	1.46	44.36%	0.85	1.25	47.22%
Sanofi	2.36	2.34	-0.69%	1.33	1.36	2.54%	-3.22	1.75	154.19%
Novartis	2.24	3.07	36.82%	2.22	2.63	18.32%	2.05	2.30	12.25%
Bayer	0.70	1.81	159.57%	1.46	1.76	20.20%	0.72	0.75	4.44%
Astrazeneca	2.81	3.88	38.05%	2.40	2.92	21.63%	1.76	2.20	24.81%
Avg			51.38%			21.41%			59.61%
Overall Average	44.13%								

Return on Assets

	2006			2005			2004		
	US GAAP	IFRS	Percentage Impact	US GAAP	IFRS	Percentage Impact	US GAAP	IFRS	Percentage Impact
GSK	8.2%	50.0%	511.90%	5.8%	36.5%	526.87%	4.9%	37.3%	662.60%
Sanofi	5.2%	5.2%	-0.98%	2.6%	2.6%	1.71%	-4.4%	2.3%	-152.47%
Novartis	7.6%	10.6%	38.51%	8.0%	10.6%	33.43%	8.1%	9.9%	22.16%
Bayer	8.1%	9.9%	22.16%	1.2%	3.0%	154.30%	3.5%	4.3%	24.81%
Astrazeneca	9.2%	20.3%	119.95%	8.9%	19.0%	114.25%	6.1%	14.4%	136.45%
Avg			44.91%			75.92%			7.74%
Overall Average	42.86%								

Note: The gray shaded boxes were excluded from the calculation of the ratios due to their outlying nature. The determining factor for exclusion was a difference of 150% over the closest percentage for that given year. The exclusion will prevent a single year for a company having a strong influence on the overall average of the ratio.

Earnings Smoothing

GlaxoSmithKline						
U.S. GAAP						
std dev of operating income	1350.516	0.97		IFRS Average		0.911
std dev of cash flow from operations	1391.72			U.S. GAAP Average		0.985
IFRS						
std dev of operating income	1385.981	1.01				
std dev of cash flow from operations	1374.652					
Astra Zeneca						
U.S. GAAP						
std dev of operating income	596.754	1.00				
std dev of cash flow from operations	596.754					
IFRS						
std dev of operating income	974.166	0.81				
std dev of cash flow from operations	1196.446					

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