Melco Foundation
Management Accounting Research
Discussion Paper Series

The Melco Foundation

Melco Management Accounting Research Discussion Paper Series

No.MDP2018-006

Impacts of Voluntary IFRS Adoption on Japanese Pharmaceutical Companies: An Analysis by Financial Comparison

December 2018

Yuta Hoshino
Graduate School of Economics, Nagoya City University
1 Yamanohata, Mizuho-cho, Mizuho-ku, Nagoya 476-8501, Japan
e-mail: hoshino@econ.nagoya-u.ac.jp

The Melco Foundation

Nagoya, Japan

Impacts of Voluntary IFRS Adoption on Japanese Pharmaceutical Companies: An Analysis by Financial Comparison

Yuta Hoshino
Graduate School of Economics, Nagoya City University
1 Yamanohata, Mizuho-cho, Mizuho-ku, Nagoya 476-8501, Japan
e-mail: hoshino@econ.nagoya-u.ac.jp

Abstract

This study examines the impact of the voluntary adoption of International Financial Reporting Standards (IFRS) on pharmaceutical companies that are active in adopting IFRS. Japanese companies have decided to voluntarily adopt IFRS to prepare for advancing globalization, conduct global financial reporting, improve the comparability of financial information with other companies, easily explain information to foreign investors, increase financing options, and improve business management. The increase in pharmaceutical companies' voluntary IFRS adoption has been influenced by the expansion of overseas developments as well as mergers and acquisitions (M&A). This paper empirically analyzes a sample of main financial data to determine how IFRS adoption affects the performance of 13 Japanese pharmaceutical companies.

Keywords: IFRS, Voluntary Adoption, R&D, M&A, Indicator Analysis

JEL Classification: M41

1. Introduction

Companies worldwide are increasingly adopting International Accounting Standards (IAS) to respond to global economic activities. Specifically, International Financial Reporting Standards (IFRS) have currently been introduced in over 130 countries, which includes voluntary adoption. European Union (EU) member countries have already enforced the adoption of IFRS, while the United States' Securities and Exchange Commission has developed a road map for mandatory adoption. When Japan joins this movement, the IFRS will have been introduced in countries that account for 95% of the total market capitalization worldwide, and its influence will be substantial.

Although the relevant agencies in Japan are examining IFRS, the timing of its adoption has still not been disclosed, and this uncertainty is unlikely to be eliminated in the near future. However, industry awareness around IFRS adoption is steadily increasing, with nearly 200 companies having already adopted or deciding to adopt IFRS.[1] The contents of financial reports prepared under the IFRS guidelines are highly useful for management teams with an interest in future results rather than past performance, as these reports are material to evaluating company performance.[2]

Thus, the influence of IFRS adoption on Japanese companies' performance evaluation systems will significantly increase in the future. Companies even benefit, as it is easier to manage a unified method, rather than following different methods of recording assets and expenses for each country. Naturally, companies will adopt IFRS to unify accounting between their headquarters and overseas subsidiaries. Further, a management accounting system based on IFRS will also be useful in financial reporting to external stakeholders.[3]

In this article, I would like to focus on Japanese pharmaceutical companies that are actively adopting IFRS, and discuss the results of their voluntary adoption. The increase in the number of pharmaceutical companies that have applied IFRS has also been influenced by expanding overseas development and mergers and acquisitions (M&A). Circumstances also exist that are unique to the pharmaceutical industry, such as the International Council for Harmonisation (ICH[4]), which prepares drug regulatory

---

[1] Please refer to the article on "International Accounting Standard Adoption, Over 200 Companies" in the *Nihon Keizai Shimbun* dated July 16, 2018. This information includes the upcoming change schedule, and reports 204 companies as of the end of June 2018, or 20% more than one year ago. This is also 7.1% of companies listed on the Tokyo Stock Exchange (TSE) (see Parts 1, Parts 2, and Mothers' ("market of the high-growth and emerging stocks") total of 2,870 companies as of the end of June). As many large enterprises have adopted these standards, this corresponds to almost one-third of the total market capitalization.

[2] Please refer to Hoshino (2017, p.79).

[3] It is necessary to unify the accounting system so investors can gain the same perspective on accounting information that has been provided to management.

[4] Founded in 1990, the International Council for Harmonization of Technical Requirements for Pharmaceuticals for

guidelines from scientific and technological perspectives; this council will continue to be relevant, even if the industry actively adopts IFRS. In terms of aiming for international harmonization, in short, IFRS is also oriented toward ICH.

This paper discusses how the voluntary adoption of IFRS affects performance measurements in Japanese pharmaceutical companies. The remainder of this paper is organized as follows. Section 2 describes IFRS trends and their impact on companies. Section 3 discusses our verification task and hypothesis. Section 4 reports on research and development (R&D) investments and M&A incentives. Section 5 presents our analyses, and section 6 concludes.

2. IFRS Trends and their Impact on Companies

Once Japan's Financial Services Agency (FSA) indicates a firm policy in relation to IFRS, its adoption will include companies listed in 2015 or 2016. Currently, the United States too mandates that domestic companies listed on its stock exchanges adopt US standards. Thus, among developed countries, only Japan and the United States have been cautious about adopting IFRS.

The widespread effects of IFRS adoption have led to changes not only in the preparation of annual reports, but also the reviews of financial measures as a basis for evaluation and the business process as a means of business management. The changes in financial measures after IFRS adoption have had a substantial effect on corporate performance.

Companies in Japan, which is close to adopting IFRS, must clarify the indicators that should support various management processes and construct a performance evaluation system to motivate management's organizational behavior. Moreover, if companies can present new "statements of financial performance" along with non-financial information, this will be useful for investors.[5]

What will change with adopting IFRS? First, the changes in the recording method will considerably impact corporate performance. Some researchers note that companies' financial performance may change due to the international convergence of accounting standards, which may greatly affect both dividend and investment behaviors.[6] Although

---

Human Use, or "ICH," was reorganized in October 2015 with the incorporation of Switzerland to respond to the globalization of drug development, regulation, and distribution. This ICH aims for a global harmonization of technical requirements to reduce animal experiments without compromising safety and effectiveness, and to effectively utilize limited resources. Further information on the ICH is available from the Pharmaceuticals and Medical Devices Agency's home page: https://www.pmda.go.jp/int-activities/int-harmony/ich/0014.html. For further details, see Kishi (2014).

[5] For the strategic meaning of Japanese companies' non-financial indicators, see Hoshino (2013, pp.129-131).

[6] Kagaya's (2012, pp. 42-43 and 46-52) thesis proves that it negatively influenced Japanese firms' investment behaviors when the IFRS adoption focused on changes in sustainable cash flow at the profit attribute, and especially in

IFRS adoption requires reform in the enterprise's business process, it is possible to create a global common evaluation index; consequently, this is advantageous, as it becomes easy to evaluate company performance in terms of such common indicators during M&As. Adoption of IFRS also contributes to sophisticated business management, such as strengthening the governance of group companies, including subsidiaries and other affiliated companies, and securing flexible group reorganizations. Therefore, companies adopting IFRS are likely to be targets for overseas investors.

The financial reporting under IFRS will be useful in predicting future cash inflows through the publication of financial statements that measure individual assets and liabilities; this information in such reports is more useful to investors than the one obtained under current Japanese standards, which provide financial reporting as a result of the past "profit and loss center." Naturally, the content of financial reports prepared under IFRS is highly useful for management, as a measure to evaluate performance. Therefore, IFRS adoption is important in disclosures to external stakeholders as well as internal management.[7]

The current trend of accounting internationalization worldwide has certainly evolved by converging the accounting standards of each country with the International Accounting Standards toward a direction that promotes and encourages IFRS adoption. In the section of "purpose of the constitution" in the IFRS foundation, it was newly specified in March 2010, that IFRS was also adopted through convergence (see Hoshino (2017,78)).

These circumstances have led to an increase in the number of Japanese companies that have voluntarily adopted IFRS; this includes nearly 200 organizations that have adopted or decided to adopt IFRS. As previously mentioned, standardizing their accounting methods makes these companies easier to manage and compare with other firms in the same industry; thus, it is more convenient for companies to expand in overseas markets and participate in M&As.[8]

3. Verification Task and Derivation of Hypotheses

3.1 The Verification Tasks Accompanying IFRS Adoption

the future, with substantial changes in profit.

[7] See Hoshino (2017, p.79).

[8] A survey conducted by the Financial Services Agency (2015, p.27) revealed that Japanese companies decided to voluntarily adopt IFRS for the following reasons, in descending order of importance: (1) contribution to business management, (2) the improvement of comparability, (3) the ease of explanation for overseas investors, (4) the proper reflection of business results, and (5) facilitating the procurement of funds, among others.

The difference between current Japanese standards and the IFRS is that the former are based on rules, while the latter are based on principles. Therefore, the general view is that the IFRS is easier to unify internationally, as the Japanese standards' rules are incredibly complicated. Further, the IFRS is subject to accounting at the company's discretion; thus, its scope of processes will be broader, but it is important that it can effectively prevent accounting fraud. Both standards include profit items (ordinary income is included in the Japanese standards, but not in the IFRS) as well as a method to amortize the goodwill from M&As, a method to process R&D expenses (Japanese standards treat these entirely as expenses, while the IFRS allows for the creation of some assets), a depreciation method, pension assets (Japanese standards expense insufficient funds in a certain period, while the IFRS immediately reflects these on the balance sheet), and differences in accounting standards for net sales, among other items.

Adopting IFRS has several merits: (1) it occurs by stock investment and merchandising across both countries and regions; (2) as the appropriation rules regarding sales and profit differ, it is not possible to offer material for an international comparison; and (3) the enterprise's evaluation and reliability increases when it adopts common measures. However, IFRS adoption also has some disadvantages: (1) companies become exposed to severe evaluation by global investors; (2) individual judgments occur based on principle; and (3) time and costs depend on the conversion from the existing to the new standards[9].

Alternatively, researchers must also consider IFRS adoption's effects on Japanese companies, including: (1) the governance of consolidated accounting; (2) improvement of the internal control system, resulting from the disclosure of strengthened information; (3) the substantiality of disclosing intangible assets; and (4) the strengthening of accounting literacy.

The features of IFRS include a conversion to three approaches: (1) a principle-based approach, (2) an assets-liabilities approach, and (3) fair-value accounting. Specifically, if IFRS is introduced, comprehensive income will be the primary performance measure, although previously, the achievements of Japanese companies were indicated by net profits. Therefore, it is necessary to reflect profit from the stock that reflects the market's quotation for the enterprise's property.

---

[9] Kato (2014, pp.1-2) points out that the benefits of IFRS are as follows: (1) improving comparability with overseas peers, (2) improving an understanding of financial content by overseas investors and business partners, (3) easier fundraising abroad, (4) easier consolidation, and (5) companies are added when they choose the JPX Nikkei INDEX 400, among other benefits. Meanwhile, Hiratsuka, Sou, and Fundrich (2009, p.44) note advantages that emphasize the policy aspect: (1) decreases the cost to prepare financial statements, (2) improves transparency in the company group's accounting as well as its speed and governance, and (3) improves the accuracy in cost management.

Additionally, and as previously mentioned, the pharmaceutical industry's council allows pharmaceutical regulators, the ICH, and representatives of the pharmaceutical industry to collaborate and discuss international guidelines for pharmaceutical products from a scientific perspective. Thus, cases not found in other industries also relate to the promotion of IFRS.

3.2 Hypotheses and Previous Research

Based on the above discussion, this paper aims to verify two hypotheses. The first hypothesis involves confirming the differences that exist between the indicators of consolidated financial statements prepared based on IFRS and those prepared using Japanese standards, which is posited as follows:

Null hypothesis (H_0): No difference exists in financial indicators between the IFRS and Japanese standards.

Alternative hypothesis (H_1): Differences exist in financial indicators between the IFRS and Japanese standards.

The second hypothesis discusses whether differences exist in financial indicators over time; specifically, before and after adopting IFRS, and before and after adopting Japanese standards. To verify this, Hypothesis 2 is posited, as follows:

Null hypothesis (H_0): No difference exists in financial indicators between the time before and after adopting IFRS and before and after adopting Japanese standards.

Alternative hypothesis (H_1): Differences exist in financial indicators between the time before and after adopting IFRS and before and after adopting Japanese standards.

In Section 5, I establish Hypotheses 1 and 2 as the alternative hypothesis (H_1), while classifying the hypotheses to be tested as the null hypothesis (H_0). I would like to verify whether each of these null hypotheses (H_0) is rejected relative to such financial indicators as sales, operating income, and research and development expenses. Subsequently, I introduce previous research that has examined voluntary IFRS adoption and its impact on financial accounting relative to these tasks.

Research examining mandatory or voluntary IFRS adoption's effects on financial information is scarce; I will begin with a review of overseas literature.

First, Horton, Serafeim, and Serafeim (2013) examine the impact of mandatory IFRS adoption on firms' information environment.[10] They discover that after this mandatory IFRS adoption, consensus forecast errors decrease for these firms relative to other firms' forecast errors. Additionally, the authors note that the larger the difference between the IFRS earnings and each country's GAAP earnings, the larger the improvement in forecast accuracy; this increases our confidence that IFRS adoption improves the information environment.

Meanwhile, Byard, Li, and Yu (2010) examine the effect of the European Union's mandatory adoption of IFRS on financial analysts' information environment. Specifically, they analyze the impact of the European Union's 2005 mandatory IFRS adoption on financial analysts' information environment as measured by forecast errors, forecast dispersion, and analyst following. The authors indicate that such information includes a control sample of firms that had already voluntarily adopted IFRS at least two years before the mandatory adoption date.

Li and Yang (2015) examine the effect of mandatory adoption of IFRS on voluntary disclosure and propose and validate three channels by which IFRS adoption changes firms' disclosure and incentives in response to increased capital market demand. These channels include improved earnings quality, increased shareholder demands, and increased analyst demand. Further, they contribute to literature examining the IFRS adoption's effect on business forecasts, which was previously unexplored.

Finally, Ozawa's (2015) Japanese research paper describes the status of voluntary IFRS adoption in Japan, and explains factors that have led public companies to adopt these international standards. He clarifies the reasons for Japanese public companies to voluntarily adopt IFRS by analyzing the primary differences between Japanese standards and the IFRS. His process demonstrates one main advantage gained from voluntarily adopting IFRS, in that Japanese companies can raise funds earlier in overseas financial markets. Another advantage of voluntary IFRS adoption is that it can unify not only external indexes for public announcements, but also internal indexes for business management. It is also one reason for an increase in the number of companies using the same indexes as foreign companies for comparison.[11]

4. R&D Investments and M&A Incentives

The Japanese standard, on the one hand, indicates that expenses are recorded at the

[10] Horton, Serafeim, and Serafeim (2013) published a 2010 Working Paper (11-029) in the Harvard Business School before submitting this paper.

[11] Five questions have been raised by Prof. Nakamura, who was in charge of a discussion on Ozawa's (2015) paper.

time R&D occurs if it is unknown whether such R&D will succeed. On the other hand, the IFRS interprets R&D activities that likely to be commercialized as (intangible) assets,[12] and those that are regularly amortized appropriately represent the company's actual situation. If development expenses are recorded as assets, profits will temporarily increase. Naturally, tax is imposed on this profit, and thus, it is necessary to make adjustments to comply with tax laws in the case of single account settlements.

Particularly in industries such as pharmaceuticals, the R&D investment's success will influence future growth potential. Thus far, Japanese standards have fully recorded R&D expenses as expenses, but IFRS enables companies to record part of their R&D investment as an intangible asset. The IFRS also allows for capitalization if R&D has reasonable grounds to do so; R&D investments recorded in assets are amortized over a certain period of time after product sales, and are treated as expenses on the income statement. Many cases can be handled as expenses, such as with self-development under Japanese standards, which is difficult to evaluate as an asset. However, as R&D expenses can be recorded as assets after adopting IFRS compared with the Japanese standard of full cost, a profit-boosting effect occurs, which acts as an incentive to promote product R&D.

Regarding M&As, when the purchase price (or acquisition cost) paid by the acquiring company (acquirer) exceeds the net asset value of the acquired company (acquiree), the excess portion is treated as "goodwill." Here, goodwill involves treating those measures that cannot reasonably be calculated, such as brand value or human ability, as a premium (excess profitability). As such, goodwill is an "invisible" asset[13] that indicates the value of a corporate brand and its future profitability. Goodwill is amortized for up to 20 years in Japan, while in IFRS it is customary not to write this off because of differences in profit. Consequently, the goodwill arising from M&As can be recorded as an intangible asset on the balance sheet, and the superficial net profit increases through the absence of amortization expenses. This occurs because the "goodwill" intangible asset becomes a source of cash flow, and the profit increases unless it deteriorates. As a matter of course, the acquiring company should check the acquired company's value each time, decrease this value if profits do not exceed expectations, and conduct impairments.

The next section will extract key financial data from the consolidated financial

---

[12] According to the IFRS (IAS38.57), development expenditures can be recorded as intangible assets only if all six of the following requirements can be proven: (1) the technical feasibility of completing the intangible asset, (2) the intention to complete and use or sell the asset, (3) the ability to use or sell the asset, (4) the existence of a market for the intangible asset to generate economic benefits, (5) the availability of resources to complete its development, and (6) the ability to reliably measure the attributable expenditure.

[13] See Hoshino (1992, pp. 181-225). Corporate success involves how to effectively create a source of competitiveness. This is significantly influenced by the accumulation of purported "invisible" assets, such as ingenious technological knowledge, excellent research and development capabilities, or competent human resources.

statements of 13 Japanese pharmaceutical companies as corresponding samples, clarify their characteristics, and empirically analyze their relevance.

5. Analyses of Pharmaceutical Companies

5.1 Reasons and Background of IFRS adoption among Pharmaceutical Companies

One of the major reasons why trading companies and pharmaceutical manufacturers were early adopters of IFRS is that the industry involves active M&As. Specifically, the patents of many pharmaceutical companies expired around 2010, when the validity period (20-25 years) of patents acquired by large pharmaceutical companies in the latter half of the 1990s came to an end. Concerns exist that such patent expirations will significantly affect pharmaceutical manufacturers' revenues, a problem that occurred in 2010 regarding medicines with expired patents. Therefore, there are many examples of successful, large acquisitions that sought overseas markets for survival;[14] in 2016, it was reported that Japanese medical companies with medicine-related operations participated in 116 M&As, with the overall transaction value reaching a record high of 160 billion yen.[15]

As IFRS adoption is not currently mandatory in Japan, companies that choose IFRS note this as "voluntary" adoption. As of November 2015, eight of the 27 pharmaceutical companies in Japan have voluntarily adopted IFRS and published financial reports.[16] As these eight companies (including those intending to adopt) are all top-selling companies—with net sales of 58%, operating profits of 55%, net income of 51%, R&D expenses amounting to 64%[17]—their business results substantially influence all 27 companies.

Therefore, the ratio of companies in the pharmaceutical industry that have adopted IFRS or that plan to adopt it, is extremely high compared to other industries, with negligible differences in performance.

---

[14] Specifically, the expiration of a patent for a large-sized pharmaceutical company that sells 100 billion yen brings a "cliff of corporate performance," called a "patent cliff." For example, Takeda Pharmaceutical conducted two overseas M&As during the patent expiration rush. Among them, Millennium is a US venture acquired for approximately 900 billion yen in 2008, and is said to be helping management's struggle by creating multiple medicines as its main business force. See the article on "Crossroad Medical Industry" in *Weekly Toyo Economy* (2015, p.74-76).

[15] See the article on "The number of medical M&A transactions has reached a record high" in the *Nihon Keizai Shimbun* dated December 18, 2016.

[16] At that time, five companies—including Chugai Pharmaceutical, Takeda Pharmaceutical, Astellas Pharmaceutical, Ono Pharmaceutical, and Daiichi Sankyo—were companies that had already adopted IFRS; three companies—including Eisai, Santen Pharmaceutical, and Mitsubishi Tanabe Pharma—had planned to adopt IFRS, for a total of eight pharmaceutical companies with IFRS adoption. Please refer to the JPX home page. https://www.jpx.co.jp/listing/others/ifrs/index.html.

[17] See Murakami (2015, p.2).

Subsequently, the number of voluntarily adopting companies has increased; as of June 2018, 161 Japanese companies have adopted IFRS and 32 companies have decided to adopt it, forming a total of 193 companies. Among these, the 13 major pharmaceutical companies that have already applied IFRS are Chugai Pharmaceutical, Takeda Pharmaceutical, Astellas Pharmaceutical, Ono Pharmaceutical, and Daiichi Sankyo in the fiscal year (FY) 2013; Eisai and Santen Pharmaceutical in FY 2014; Mitsubishi Tanabe Pharma and Otsuka Holdings in FY 2016; and Kyowa Hakko Kirin, Japan Sumitomo Pharmaceutical, Nichi-Iko Pharmaceutical, and Sawai Pharmaceutical in FY 2017. The TSE Mothers that have decided to voluntarily apply IFRS will be added to this group, and four companies will be included: the Sosei Group, GNI Group, Kubota Pharmaceutical Holdings, and Solasia Pharma. Further, semi-major pharmaceutical companies, such as Terumo and Shionogi, are also considering adopting the IFRS in the near future.[18]

Therefore, the increase in pharmaceutical companies' IFRS adoption is motivated by overseas expansion, such as developing new markets and utilizing M&A to sell businesses' out-of-patent drugs. Additionally, many companies are developing global strategies, and it is possible to expand the likelihood of exploitation not only overseas, but also in overseas capital markets. This is another important reason why the same accounting standards for comparisons with overseas companies will become indispensable in expanding opportunities to raise capital overseas. In fact, this tendency is stronger when considering the high ratio of foreign shareholders among pharmaceutical companies.

5.2 Indicator Analysis of 13 Pharmaceutical Companies

As mentioned in the previous section, one reason for pharmaceutical companies to aggressively adopt IFRS includes their enthusiasm for pharmaceutical R&D, which again differs from other industries. As this industry's success is directly linked to corporate performance, as an extension, many aspects related to the processing of M&A-generated goodwill charges cannot be ignored, such as technical cooperation, income from license fees, and the processing of lump-sum contracts. Therefore, adopting IFRS affects financial indicators such as net sales (sales revenues), operating profits, intangible assets (specifically, the amortization of goodwill), tangible fixed assets (specifically, differences in depreciation methods), R&D expenses, and net income.

I would like to analyze a part of this influence by focusing on three indicators among the aforementioned 13 pharmaceutical companies: net sales, operating profit, and

---

[18] See International Pharmaceutical Information Editing (2016, p.19).

R&D expenses.

Seven companies have adopted IFRS from FY 2013 to FY 2014: Chugai Pharmaceutical, Takeda Pharmaceutical, Astellas Pharma, Ono Pharmaceutical, Daiichi Sankyo, Eisai, and Santen. Among these, the net sales (sales revenues) for that year collectively increased compared to the previous year, while only Ono and Eisai experienced a decline. Additionally, the sales growth rate has also roughly increased, with the exception of the same two companies, whose growth rate declined but with small downward ranges. Regarding operating profits, four companies have reported an increase in both their amounts and year-on-year rates, and three companies have reported a decrease. This result casts doubt on whether operating profits will increase by adopting IFRS. Regarding R&D expenses, Santen Pharmaceutical's sales to R&D expenditure ratio and R&D expenditures have both decreased compared to the previous fiscal year.

Meanwhile, six companies have applied IFRS from FY 2016 to FY 2017: Mitsubishi Tanabe Pharma, Otsuka Holdings, Kyowa Hakko Kirin, Dainippon Sumitomo Pharmaceutical, Nichi-Iko Pharmaceutical, and Sawai Pharmaceutical. Among these, four companies later applied voluntary adoption in FY 2017. These four companies' net sales (sales revenues) have generally increased compared to the previous year, and all companies' sales growth rates (year-on-year comparison) have increased. Regarding operating income, Kyowa Hakko Kirin has reported a decrease both in absolute terms and the growth rate, but other companies have experienced increases in both. This can be regarded as support for the view that operating profits will increase by adopting IFRS. Regarding R&D expenditures, Kyowa Hakko Kirin and Nichi-Iko Pharmaceutical have reported a decrease in the value and growth rate of R&D investments compared with the previous year, but all others have reported an increase.

As previously described, the time of IFRS adoption has been analyzed by dividing this period into two parts. According to this split, four companies—Chugai Pharmaceutical, Takeda Pharmaceutical, Dainippon Sumitomo Pharmaceutical, and Sawai Pharmaceutical—have reported an increase in terms of net sales, operating profits, and R&D. Santen Pharmaceutical and Nichi-Iko Pharmaceutical have reported an increase in their net sales and operating profits, except for R&D. While we cannot use a comparison of these financial indicators to clearly predict the general trends across these 13 pharmaceutical companies, it can be said that such tendencies exist in individual companies (see Table 1).

Many highly profitable enterprises, excluding Nichi-Iko Pharmaceutical, have a ratio of operating profit of sales that well exceeds 10%, and each company has strengthened its R&D through acquisitions and partnerships with outside parties when the patents on large medicines expired; this is also indicated in the results from Table 1. In

fact, many of these pharmaceutical companies increased their operating income margins in FY 2017. As demonstrated by Takeda Pharmaceuticals, such companies not only extend their stronger products overseas, but also have strategies to acquire overseas venture corporations (startup companies) and connect with major pharmaceutical companies overseas. Consequently, it is presumed that this result has been gradual.

Table 1. Key Indicator Comparison of 13 Pharmaceutical Companies (unit: million yen)

Indicators / Companies	Net Sales				Operating Profit				R&D Expenses			
	IFRS Base	Year-to-Year	Japanese Standards	Year-to-Year	IFRS Base	Year-to-Year	Japanese Standards	Year-to-Year	IFRS Base	Year-to-Year	Japanese Standards	Year-to-Year
Chugai	423,652	8.3	391,200	4.7	78,738	3.1	76,400	22.4	74,280	34.8	55,100	▲1.4
Takeda	1,691,685	8.6	1,557,267	3.2	139,274	13.7	122,505	▲53.8	341,560	6.3	321,323	14.0
Astellas	1,139,909	16.1	981,899	1.29	116,806	▲3.9	121,593	▲7.5	191,460	20.3	159,094	▲16.2
Ono	142.806	▲2.0	145,779	7.8	29,935	▲21.1	37,904	7.7	44,768	0.9	44,383	3.2
Daiichi Sankyo	1,118,241	12.4	994,659	▲0.3	111,552	13.0	98,743	1.8	191,212	3.7	184,393	0.7
Eisai	548,465	▲8.5	599,490	4.5	28,338	▲57.3	66,398	▲5.8	131,907	9.6	120,377	▲3.8
Santen	161,831	10.6	146,260	22.8	35,374	18.4	29,878	21.1	17,477	▲12.6	19,990	19.6
Mitsubishi Tanabe	423,977	▲0.4	431,701	4.0	94,083	15.0	36,929	41.4	64,783	0.3	64,613	▲7.2
Otsuka HD	1,195,547	▲16.2	1,445,227	▲8.1	101,145	▲32.1	151,837	▲10.1	168,818	▲16.7	201,010	26.2
Kyowa Hakko Kirin	353,380	1.6	343,019	▲5.8	29,116	▲8.0	31,638	▲27.7	49,155	▲7.1	53,792	4.4
Japan Sumitomo	466,838	14.3	411,638	2.1	88,173	67.1	52,759	42.9	86,928	6.8	81,373	▲1.5
Nichi-Iko	164,717	8.2	163,372	13.8	10,301	20.4	8,554	▲33.7	4,467	▲38.5	7,263	49.0
Sawai	168,068	26.9	132,428	7.2	22,209	7.6	20,633	▲11.0	14,533	42.4	10,207	27.3

Note 1: A year-to-year comparison of the net sales and operating profit reveals the growth rate, and the R&D expenses year-on-year indicates the change rate. See Note 3 for the official company names.

Note 2: The IFRS net sales represent sales revenue, although Otsuka HD notes net sales.

Note 3: The IFRS base is the result of each company applying IFRS, while the Japanese standards indicate the previous year's results. Specifically, Chugai Pharmaceutical, Takeda Pharmaceutical, Astellas Pharmaceutical, Ono Pharmaceutical, and Daiichi Sankyo in FY 2013; Eisai and Santen Pharmaceutical in FY 2014; and Mitsubishi Tanabe Pharma and Otsuka Holdings (HD) in FY 2016 are based on IFRS. Each company had used Japanese standards in the previous year. Further, Kyowa Hakko Kirin, Dainippon Sumitomo Pharmaceutical, Nichi-Iko Pharmaceutical, and Sawai Pharmaceutical are based on IFRS for FY 2017, and had used Japanese standards for FY 2016.

Source: Numerical figures from FY 2013 to FY 2017 in this table are calculated by supplementing the Nikkei Value Search and International Medicine Information Edition (2016; 2017; 2018) based on each company's securities reports.

Table 2. Correlation Coefficient with Adoption Criterion—*t*-Test of Corresponding Samples

	Adoption Criterion	N	Correlation Coefficient	*t*-value	*P*-value
Net Sales	IFRS base	13	0.9764	0.2798	0.3922
	Japanese standards	13			
	IFRS year-to-year	13	-0.4922	1.2622	0.1269
	Japanese standards year-to-year	13			
Operating Profit	IFRS base	13	0.8087	0.2956	0.3863
	Japanese standards	13			
	IFRS year-to-year	13	0.3206	0.2776	0.3975
	Japanese standards year-to-year	13			
R&D expenses	IFRS base	13	0.9875	1.0491	0.1574
	Japanese standards	13			
	IFRS year-to-year	13	-0.4922	0.4154	0.3529
	Japanese standards year-to-year	13			

Note 1: As a result of the *t*-test, the net sales for the IFRS base versus Japanese standards indicate: the degree of freedom = 12, *t*-value = 0.2798, and *P*-value = 0.3922; not significant. Regarding the operating profit for the IFRS base versus Japanese standards: degree of freedom = 12, *t*-value = 0.2956, and *P*-value = 0.3863; not significant. Regarding the R&D expenditures for the IFRS base versus Japanese standards: degree of freedom = 12, *t*-value = 1.0491, *P*-value = 0.1574; not significant.

Note 2: The *P*-value indicates the upper probability.

Based on the above discussion, *t*-tests were conducted using the samples to verify whether differences exist between the IFRS and Japanese standards relative to the financial indicators in each company's consolidated financial statements (see Table 2).

The results indicate that net sales, operating profit, and R&D expenses were not significant at the 5% level. Additionally, a *t*-test was conducted using the same sample to determine whether a difference exists between the IFRS year-to-year and Japanese standards year-to-year, but the difference of mean value of two groups with correspondence was not statistically significant, and thus, we have not rejected the null hypothesis. Alternatively, an observation of the coefficient test, net sales, operating profit, and R&D expenditure reveals extremely high correlations between the IFRS base and Japanese standards. However, this does not verify Hypothesis 1: "Differences exist in financial indicators between the IFRS and Japanese standards."

Various reasons may explain why no significant difference exists. First, there were only a few target companies, and this small sample may have influenced the robustness of verification as well as any errors. Further, even if IFRS was adopted, the impact is only noted for one year, and it can be posited that no change has occurred thus far to significantly impact business performance. Thus, it seems that no motivation exists for

companies to adopt IFRS to improve their performance. For example, it is observed that on the one hand, net sales will substantially decrease, as the IFRS require payment commissions to be deducted from sales. However, the data indicates that if the Japanese standards change to IFRS, actual net sales figures will not decrease as much. On the other hand, if the technical revenue associated with licensing newly developed pharmaceutical products is recorded, this will become a factor in increasing operating income. Clearly, the discussion thus far indicates that adopting IFRS is important for Japanese companies to advance their global strategies, and a strategic accounting takes the initiative for both M&A and investment opportunities.

Table 1 presents such numerical figures as net sales and operating profit, which do not substantially differ from before and after IFRS adoption. However, it seems that net sales have been influenced not through the total amount of transactions, but by indicating product sales amounts and the fees received as service consideration. The IFRS addresses the transient gains and losses arising from non-operating income and expenses, and treats extraordinary gains and losses as operating income and expenses. The operating profit is the gross profit minus operating expenses, and the IFRS significantly influences operating profit as determined by the magnitude of this transient change in revenues and expenses. Conversely, the decrease in R&D expenses due to IFRS adoption occurs because the IFRS permits a part of R&D expenses to be recorded as intangible assets. If the development is successful, the investment amount recorded in the asset will be amortized after product sales, and is expensed on the income statement. However, it should be noted that if such development fails, it will need to be impaired, which will impact operating expenses and significantly reduce operating profit.

6. Summary and Conclusion

This paper analyzes the reasons pharmaceutical companies adopt IFRS and compares key financial indicators to reveal the standards' impact on these companies. Switching from Japanese standards to IFRS will certainly alter these companies' settlement figures, as the amortization of goodwill and the methods to record development costs differ. However, regardless of whether apparent profits temporarily increase or decrease, it is noteworthy that the enterprise's actual situation does not substantially change.

On the one hand, Japanese companies have decided to voluntarily adopt IFRS for the following reasons: to provide financial reporting based on common international indicators, improve their financial information's comparability with other companies, prepare financial information such that it is easy for foreign investors to understand,

increase financing options, and allow for the easier evaluation of management, among other reasons.[19] On the other hand, IFRS items differ from Japanese standards, such as net sales, goodwill, the impairment of intangible assets, the depreciation of fixed assets, R&D, and comprehensive income as it impacts net income.

By adopting IFRS, the rules to evaluate corporate performance may change significantly. For example, product sales can shift from shipping standards to arrival standards, and depreciation can be applied to certain options, but assets' future economic benefits must be predicted, which involves many constraints. Meanwhile, using common standards worldwide offers advantages that make it easier to grasp and compare companies' financial situations, and it will be easier for businesses to establish overseas financing, M&As, and strategic planning.

This analysis has revealed that a strategic accounting needs to take the initiative for Japanese companies to adopt IFRS. Thus, it is necessary to carefully examine IFRS to understand what influence is exerted on the accounting practice by its introduction, not only with respect to strategic goals and performance measurement measures,[20] but also for other management accounting techniques, such as capital investment and budgeting, or R&D investments and international taxation. Consequently, further studies on IFRS should be conducted in the future.

Acknowledgements

I appreciate the helpful comments of the session participants at the 12th New Zealand Management Accounting Conference. This work was supported by Grant-in-Aid for Scientific Research (C) of JSPS KAKENHI Grant Number 16K04016.

References

Byard, D., Li, Y., & Yu, Y. (2010). "The effect of mandatory IFRS adoption on financial analysts' information environment." *Journal of Accounting Research,* 49(1), 69-96.

Financial Services Agency (2017). IFRS application report. [In Japanese]. Available at https://www.fsa.go.jp/singi/singi_kigyou/siryou/kaikei/20150415/01.pdf.

Hiratsuka, T., Sou, Y., & Fundrich, E. (2009). "Impact on Japanese companies by introducing IFRS (International Accounting Standard)." [In Japanese]. *Intellectual*

[19] Takeda Pharmaceutical Co., Ltd. listed its reasons for voluntarily IFRS adoption as "Improvement of comparability of financial information with other companies in Europe and the United States, expansion of options for raising funds, and unification of accounting treatment within the group." For further information, refer to the news release published by Takeda Pharmaceutical (2013) at: https://www.takeda.co.jp/news/2013/20130509_5760.html.

[20] See Hoshino (2017, 89).

Asset Creation, (September), 32-47.

Horton, J., Serafeim, G., & Serafeim, I. (2013). "Does mandatory IFRS adoption improve the information environment?" *Contemporary Accounting Research*, 30(1), 388-423.

Hoshino, Y. (1992). *Corporate Strategy and Accounting Information System—Theoretical and Empirical Research on Environmental Adaptation and Innovation* [In Japanese]. Tokyo: Taga Publishing.

Hoshino, Y. (2013). "Strategy goals, financial and nonfinancial measures, performance evaluation in Japanese manufacturing industries." *The Journal of Management Accounting, Japan Supplement*, 2(March), 121-138.

Hoshino, Y. (2017). "Effect of IFRS adoption on corporate strategy and performance measurement: Analysis of Japanese manufacturing companies." *Universal Journal of Accounting and Finance*, 5(4), 78-90.

International Accounting Standards Board (2004), *2004 International Financial Reporting Standards (IFRS)*. London: International Accounting Standards Committee Foundation (IASCF) Publications Department.

International Pharmaceutical Information Editing (2016). *Actual state of pharmaceutical companies and their midterm perspective*. [In Japanese]. International Commercial Publication, (August), 1-369.

Kagaya, T. (2012). "Has the convergence to the IFRS affected investment behavior? International evidence." [In Japanese]. *Hitotsubashi Business Review*, 60(1), 38-56.

Kishi, K. (2014). "Outline and trend of Japan-US-EU pharmaceutical regulatory harmonization international conference (ICH)—Who belongs to ICH." [In Japanese]. *Pharmacia*, 50(8), 767-771.

Kato, A. (2014). "Trends in IFRS and response to voluntary application by Japanese companies." [In Japanese]. *Abitus* (July). http://www.abitus.co.jp.

Li, X., & Yang, H. I. (2015). "Mandatory financial reporting and voluntary disclosure: The effect of mandatory IFRS adoption on management forecasts." *The Accounting Review*, 91(3), 933-953.

Murakami, N. (2015). "Voluntary IFRS (International Financial Reporting Standards) adoption by pharmaceutical companies." [in Japanese]. *JPMA Newsletter*, 165,1-3.

"The number of medical M&A transactions has reached a record high" (2016). *Nihon Keizai Shimbun* [Japanese financial newspaper], (December 18).

"International accounting standard adoption, over 200 companies" (2018). *Nihon Keizai Shimbun* [Japanese financial newspaper], (July 16).

Ozawa, Y. (2015). "The impact of voluntary IFRS adoption on Japanese public companies." *The Research Institute of St. Andrew's University*, 40(3), 63-80.

"Crossroad Medical Industry" (2015). *Shukan Toyo Keizai* [Weekly Toyo economy], (July 18).