08, 09, 10 e 11 de novembro de 2022
ISSN 2177-3866

PHARMACEUTICAL SPIN-OFF: ABBOTT'S CASE

WILSON EDUARDO IKEDA
UNIVERSIDADE PRESBITERIANA MACKENZIE (MACKENZIE)

PHARMACEUTICAL SPIN-OFF: ABBOTT'S CASE

1 Introduction

According to Bansal *et al.* (2018), in the first semester of 2018, 212 deals were accomplished in the Pharmaceutical sector worth more than $200 billion. There are three core motivations for these mergers and acquisitions (M&A): (i) as a source of innovation – share of revenues coming from innovations sourced outside of large pharmaceuticals has grown from about 25% in 2001 to about 50% in 2016; (ii) capture synergies by scaling up and (iii) realign portfolios.

In 2019, occurred two huge mergers in the pharmaceutical business: Bristol-Myers Squibb completed a $74bn acquisition of oncology-focused Celgene by Bristol-Myers Squibb, and AbbVie bought Allergan for $63bn to prevent an expected decline in revenue due to losing the patent for Humira, the world's best-selling drug (Nawrat, 2020).

At the end of 2021, US healthcare Johnson & Johnson (J&J) announced plans to spin off its consumer health division to focus on its drug and medical device businesses (Jimenez, 2022). In February 2020, Merck announced it would create a new company for women's health with legacy brands and biosimilar businesses which represent about $6.5bn of their revenues in 2020. This spin-off will allow Merck to focus on its key growth pillars of oncology, vaccines, hospital, and animal health and they believe this movement will allow more agility to respond to market changes by simplifying its operating models. GSK and Pfizer announced at the end of 2018, a joint venture combining their consumer health businesses as a separate spin-off company with combined sales of £9.8bn with GSK's Sensodyne, Voltaren, and Panadol with Pfizer's Advil, Centrum and Caltrate products that will transform this new company as the largest over-the-counter medicines company. Sanofi announced in February 2020 that it would spin off the commercial and development activities of six out eleven of active pharmaceutical ingredients (API) focusing in simplify its operations. This spin-off is expected to be the world's second-largest API with €1bn in sales by 2022.

These movements could indicate a new pharma business trend although they are not a new phenomenon. According to intellectual property-focused law firm Mewburn Ellis partner Sarah Kostiuk-Smith "Spin-offs have been used by big pharma to provide a vehicle for interesting projects that are no longer core to the company's business, with numerous notable successes over the past 20 years" (Nawrat, 2020).

Over of past two decades, Abbott Laboratories, 1888 founded pharmaceutical company made several acquisitions and two significant divestitures: in 2003, Abbott announced its plans to create one of the largest manufacturers of hospital products in the United States by spinning off much of Abbott's core global hospital products business, after named Hospira, with estimated annual revenues of $2.5bn while total annual Abbott´s sales were $17.7bn (Abbott, 2003) and more recently, in 2011, announced that it plans to separate into two publicly traded companies, one in diversified medical products retained the Abbott name with estimated annual revenue of $22bn and the other in research-based pharmaceuticals after named AbbVie, with about $18bn in annual revenue (Abbott, 2011).

There is few scholars' literature dedicated to studying spin-offs in the pharmaceutical industry and, to our knowledge, there have been no studies about Abbott's spin-offs. While the first spin-off could be considered a traditional restructuring to focus on core business, the latest Abbott spin-off is the largest separation transaction ever in the healthcare sector. (Sierra, 2012)

In our exploratory longitudinal research, through secondary data, we intended to analyze these two spin-offs' decisions with special attention to the AbbVie spin-off and answer the following questions:

(i) What were the circumstances for Abbott's decisions?
(ii) What were the determinants for spin-off decisions?

(iii) What were the consequences for Abbott (parent company) and the spin-offs (Hospira and AbbVie)?

This article is organized by this introduction section, followed by a theoretical background section to include spin-off concepts, main drivers for spin-off's decision making and its consequences, the methodology used, results and discussions, and finally the fifth section concludes this paper.

2 Theoretical Background

A spin-off is an event that occurs when a company distributes its own common shares to a controlled subsidiary, creating a separate public company (Miles & Rosenfeld, 1983). Therefore, shareholders receive a pro-rata distribution of separate equity which corresponds to a subset of the original firm's net assets (Schipper & Smith, 1983) and the main motivation is not an immediate cash generation (Desai & Jain, 1999). According to Hite & Owers (1983), a spin-off is not a costless transaction as it requires registration of the new share certificates, distribution of the new shares, and duplication of the ongoing flow of servicing costs associated with dividend payments, ownership transfers and the benefits of independent operations must exceed these costs.

Basically, there are four main reasons for companies to choose spin-off: (i) to increase focus on the core business; (ii) to facilitate the company's evaluation for analysts and investors; (iii) to remove unwanted business; and (iv) to improve the alignment of spin-off firm manager's incentive compensations with stock market performance. Bennett & Feldman (2017) collected text descriptions of expected gains from the company's registration statement with the U.S. Securities and Exchange Commission (SEC). Improvement managerial focus was stated by 92% of the companies; 82% mentioned the need to clarify capital market perceptions and 73% pointed out the need to improve the alignment of divisional managers' interests with those of shareholders. Moreover, CEOs of most firms involved in spin-offs claim that as investors can perceive value clearer after the spin-off, the firm's market value improves. (Krishnaswami & Subramaniam, 1999) and Ahn & Walker (2007) suggest that firms with more effective corporate governance, have a greater probability of engaging in a spin-off, and their study show evidence that the firms which refocused their business through a spin-off, increased their market-to-book ratios and excess values in comparison with matched firm peers. In addition, Ozbek & Boyd (2020) found that CEO duality (one person keeping both positions: CEO and chairman which significantly reduces conflicts and disagreements during the decision-making processes) and board size (typically between seven and eight members) affect positively the change in market valuation of the spun-off subsidiary.

In a meta-analysis of 26 empirical studies that have investigated the wealth effects of spin-offs, Veld & Veld-Merkoulova (2009) obtained the mean abnormal return of 3.02% during the event window, with higher returns for larger spin-offs. As a confirmation of the idea that dispositions involving assets outside the core business of a firm are viewed by the market as value-increasing, spin-offs that lead to an improvement of industrial focus are associated with larger abnormal returns. Moreover, larger spin-offs are associated with higher abnormal returns is possibly also related to the industrial focus result. The divestiture of a large non-related spin-off is likely to be received more favorably than the divestiture of a small non-related subsidiary.

Furthermore, Chemmanur & Yan (2004) built a model comprising performance and value improvements following corporate spin-offs and showed that spin-offs will be associated with positive announcement effects and increases in long-term operating performance.

Comparing value creation in a sample of 85 US-based firms engaged in spin-offs from 1975 to 1991 in a five-year window starting two years prior to, and ending two years[1] following the spin-off year, Daley *et al*.(1997) show that spin-offs by removing unrelated businesses and allowing managers to focus attention on the core operations resulting in an average return

excess of 3.4% and an average ROA (return on assets) of 3.1% in cross-industry spin-off and -0.2% own-industry spin-off. Mostly driven by focus-increasing spin-offs, Chai *et al.*(2018) suggest some evidence that Australian spin-offs are associated with a positive long-run excess stock performance for up to 24 months after the spin-off in their study with 87 Australian-based spin-offs from 1999 to 2013. They also found a positive 3-day announcement effect of 2.93%.
Results showing positive abnormal returns to shareholders of 7% days prior to the announcement through completion of the spin-off of 116 US-based firms engaging in 123 spin-offs during the period 1963-1981 were presented within Hite & Owers's (1983) study. No evidence was found to indicate the gains to stockholders represent wealth transfers from senior security holders. Over the entire event period, the authors find positive gains for firms engaging in spin-offs to facilitate mergers or to separate diverse operating units though negative returns to firms responding to legal and/or regulatory difficulties.
With a sample of 156 spin-offs from 15 different European countries that were announced between January 1987 and September 2000, Veld & Veld-Merkoulova (2004) showed a cumulative average abnormal return (CAAR) over the 3-day event window of 2.62%. This number increased to 2.66% for the subsequently completed spin-offs. The cumulative average abnormal return was 3.57% for industrial-focusing spin-offs and only 0.76% for non-focus increasing companies.
Desai & Jain (1999) examined US-based spin-offs between 1975 and 1991 and found the three-day announcement period abnormal returns were significantly larger for the focus-increasing spin-offs than for the non-focus-increasing spin-offs (4.55% vs. 2.17%). While the abnormal return for the focus-increasing firms persisted in the third year following the spin-offs and corresponded to 33.36% (statistically significant) for the non-focusing-increasing firms was -14.34% (although non-statistically significant). The results are similar when the parents and the subsidiaries are examined separately.
Although most of the existing studies point out that spin-offs create wealth, at least, for stockholders, Allen *et al*. (1995) and Burch & Nanda (2003) argue that part of this wealth creation might be a compensation of value due to the pre-spin-off situation. Allen *et al.*(1995) with a sample of 94 US-based spin-offs that could be identified as having originated with an acquisition in a period from 1962 to 1991 found that excess stock returns that have been documented around the spin-off announcement represent, at least in, part of the re-creation of value destroyed at the time of an earlier acquisition. Burch & Nanda (2003) analyzed changes in excess values resulting from spin-offs with a sample of 106 US-based spin-off events by 95 parent firms in the 1979-1996 period and concluded that diversification discounts at least partially reflect a value loss due to the diversified nature of the firm itself.
The stock price could be also affected by larger institutions' movements. Using a sample of 74 US-based publicly traded spin-offs over the period from 1980 to 1990, Brown & Brooke (1993) demonstrated that, on average, the initial decline in the spin-off's stock price is related to the degree to which institutions divest their shares in the firm creating the largest movements in value.
Moreover, asymmetry information affects the market value of the spin-off as well as the parent firm. As Habib *et al*. (1997) state in their model as spin-off will increase the number of trade securities, the price system will be more informative, hence reducing information asymmetry that will lead to an increase in the total value of the parent firm and its spun-off subsidiaries.
Furthermore, Krishnaswami & Subramaniam (1999) found that spin-off enhances value because it mitigates the information asymmetry in the market about the profitability and operating efficiency of the different divisions of the firm.
Schipper & Smith (1983) suggest in their study that gains to shareholders may arise from: (i) possible relaxation of regulatory and tax constraints as contracts between shareholders and regulators are altered and/or (ii) improved managerial efficiency by reducing the size and

diversity of the asset base under given management may improve managers' productivity and increase their efforts to direct resources effectively.

Chemmanur *et al*.(2014) consulted data from Longitudinal Research Database (LDR) with about 50,000 US-based manufacturing plants with more than 250 employees for a period from 1974 to 2000 and identified 196 spin-off firms. From these, the authors found that the total factor productivity (TFP) of plants belonging to spin-off firms (parent or spun-off subsidiary) increased, on average, following the spin-off. This increase in TFP translates to an average increase in profits for the plants of approximately 7.2% annually. This increase in overall productivity began immediately, starting with the first year following the spin-off, and was long-lived. This performance improvement can be attributed to a decrease in workers' wages, employment at the plant, and a decrease in the cost of materials purchased but not from improved product market performance by these plants. Total wages in spin-off plants go down by about 1.3% following spin-offs, which translates to a decrease of approximately $7.15 million annually for an average firm involved in a spin-off.

In summary, the key drivers for spin-offs are: (i) reduce diversification focusing on the parent's core business; (ii) corporate governance represented by the CEO; (iii) reduce asymmetry information clarifying market perception; (iv) growth opportunities, and (v) learning through experience. The value creation of spin-off to parent and subsidiary could pass through: (i) improvement of core business focus, (ii) diminishing asymmetry information; (iii) getting tax and regulation advantages, (iv) improvement of managerial efficiency, and (v) increasing productivity.

3 Methodology

This study is exploratory case research with a qualitative and quantitative approach based on secondary sources. The data for this paper have been obtained from both public and private sources. They include published company data and reports, U.S. Security Exchange Commission (SEC)[2], the business press, analysts' reports, Yahoo Finance, and Economatica (a Brazilian financial data provider).

Antecedents of spin-offs were collected from the above-mentioned sources and performance post-spin-offs were calculated based on or extracted from Yahoo Finance's and Economatica's data. Performance figures assessed are included: cumulative abnormal returns (CAR) after spin-off announcement, long-run excess return after spin-off completion, and market value. Except for CAR, all other indicators were presented for both, parent, and subsidiary firms.

3.1 Measurement of cumulative abnormal return (CAR)

Sharpe (1964) developed his seminal article, the Capital Asset Pricing Model (CAPM) and this model is the dominant methodology for abnormal performance measurement (e.g. Bergh & Lim, (2008); Cusatis *et al*. (1993); Hite & Owers (1983); Krishnaswami & Subramaniam (1999); Schipper & Smith (1983); Seward & Walsh (1996); Veld & Veld-Merkoulova (2009)) as known as cumulative abnormal return (CAR). Using the standard event study methodology, whereby CAR was computed for the days surrounding the restructuring announcement (Bergh & Lim, 2008).

Considering that stock returns are distributed multi-variate normal (Dodd & Ruback, 1977), the CAPM model could be applied as following[3]:

$$\bar{R}_{jt} = \alpha_j + \beta_j \bar{R}_{mt} + \varepsilon_{jt} \quad (1)$$

where $\bar{R}_{jt}$ is the rate of return of stock j over period t, $\bar{R}_{mt}$ is the rate of return on a value market portfolio over period t, α_j is the difference among expected return of $\bar{R}_j$ and $\beta_j \bar{R}_m$ and β_j is the systematic risk of security j expressed by covariance $(\bar{R}_{jt}, \bar{R}_{mt})$ divided by variance of

$\bar{R}_{mt}$. Both coefficients, α_j and β_j, are the ordinary least squares estimates of the market model regression.
Following Hite & Owers (1983), the estimation period is from 200 days to 50 days before the spin-off announcement day (day 0).
The excess return of security j at day t (ε_{jt}) is obtained through the above equation and the cumulative abnormal return (CAR) from event day T_{1j} to event day T_{2j} is defined as:

$$\text{CARj} = \sum_{t=T_{1j}}^{T_{2j}} \varepsilon_{jt} \quad (2)$$

To check whether the average abnormal return for each stock is statistically different from zero, we are going to compute the following statistic test:

$$t_{CAR} = \frac{\sum \text{CAR/N}}{SD_{CAR}} \quad (3)$$

where CAR is the cumulative abnormal return and SD is the abnormal return standard deviation.
We considered as market portfolio two indexes: the Standard & Poor's 500 index (S&P500)[4] and NYSE Arca Pharmaceutical Index (DRG)[5] and Abbott's stock prices are evaluated in two periods: (i) from November 5, 2002 (200 day before announcement of spin-off subsidiary named Hospira) to May 3, 2004 (on that date, Hospira's common stock began trading on the New York Stock Exchange under the symbol "HSP.", 174 days after announcement) (*SEC.Gov*, 2016); (ii) from January 4, 2011 (200 days before the announcement of spin-off subsidiary named AbbVie) to January 2, 2013 (on that date, AbbVie's common stock began trading under the ticker symbol "ABBV" on the New York Stock Exchange, 301 days after spin-off announcement) (*SEC.Gov*, 2016.)
The following intervals are assessed: (i) 50 days before the announcement day to spin-off completion; (ii) 50 days before the announcement day to the announcement day (day 0)[6]; (iii) 6 days before the announcement to the announcement day; (iv) 6 days before the announcement to 6 days after (v) the day before the announcement to day 0; (vi) the day before to the day after the announcement; and (vii) the day after announcement to completion spin-off's day.

3.2 Measuring long-run performance

The first paper involving the long-run performance of companies involved in spin-offs is by Cusatis *et al*. (1993) to study the stock price performance of US firms (Veld & Veld-Merkoulova, 2009). They evaluated the stock-return performance of subsidiaries and parents for a period of 6, 12, 24, and 36 months following the effective spin-off's day presuming a buy-and-hold investment strategy.
Barber & Lyon (1997) advocated the use of buy-and-hold abnormal returns over cumulative abnormal returns as (i) CARs are biased predictors of BHARs; and (ii) even if the inference based on cumulative abnormal returns is correct, the documented magnitude does not correspond to the value of investing in the average or median sample firm relative to an appropriate benchmark over the horizon of interest. They propose to calculate the return on a buy-and-hold investment in the sample firm less the return on a buy-and-hold investment in an asset/portfolio with an appropriate expected return (BHAR) as:

$$BHAR_{jt} = \prod_{t=1}^{\tau}[1 + R_{jt}] - \prod_{t=1}^{\tau}[1 + R_{mt}] \quad (4)$$

where R_{jt} is the rate of return of stock j over period t, $\bar{R}_{mt}$ is the rate of return on a value market portfolio over period t and τ is the end of the evaluated period.

Since the expected value of BHAR is zero under the null hypothesis of no event effect, the null is tested in the literature by the conventional t-statistic

$$t_{BHAR} = \frac{\text{mean(BHAR)}\sqrt{\text{n}}}{s_{BHAR}} \quad (5)$$

Following Cusatis *et al.* (1993), we assume buy-and-hold perspective, BHAR calculation and chose several matching firms in the same industry (Merck and Pfizer), and DRG index as a proxy for pharmaceutical industry.

4 Results and Discussions

4.1 Abbott's History

Founded by a 30-year-old practicing physician in Chicago, Dr. Wallace Calvin Abbott in 1888, The Abbott Alkaloidal Company begins making granules of alkaloidal medicine—remedies containing the active ingredients of plants and herbs. Despite initial success, the next big thing in pharmaceuticals was not alkaloids derived from plants, but synthetic drugs. Drug companies abroad had started to generate large revenues from these chemical drugs. As a symbol of this transition, in 1915 the company changed its name to Abbott Laboratories and in the following year, Abbott produced its first synthetic medicine, Chlorazene, a breakthrough antiseptic to treat wounded soldiers in World War I (Maritato & Moser, 2013).

On December 14, 2000, Abbott purchased Knoll for $6.9 billion in cash, its largest acquisition ever taking them on to seize emerging opportunities (Maritato & Moser, 2013). Knoll had a desirable pipeline including a blockbuster-to-be in Humira. In addition, Abbott was interested in Knoll's global infrastructure, the sales force, particularly in Europe, Latin America, and Japan, and the R&D infrastructure and manufacturing facilities (Clinton, 2003).

In 2003, Abbott announced the spin-off of its Hospital Products Division and completed it in May 2004 (Maritato & Moser, 2013). The new company, Hospira[7], Inc., would own the worldwide core hospital products business historically conducted by Abbott including (i) medication delivery systems, such as electronic drug delivery systems and infusion therapy, and critical care devices; (ii) specialty injectable pharmaceuticals, including generic and proprietary products; and (iii) injectable pharmaceutical contract manufacturing. Hospira would include most of Abbott's Hospital Products segment and portions of Abbott's International segment (*SEC.Gov*, 2016).

Despite of hospital products division divesture, Abbott had continued to make acquisitions in the areas of medical devices and nutrition. On December 31, 2002, the U.S. FDA approved Humira for the treatment of moderate-to-severe rheumatoid arthritis. The approval was in near-record time, just nine months after Abbott's submission for the drug. Humira was the first fully human monoclonal antibody approved as a medicine. In 2003, Humira quickly became the most successful product launch in Abbott's history. Two years later, the FDA cleared Humira to fight psoriatic arthritis. Its symptoms are severe pain in the joints, tendons, or spine. It is also linked to psoriasis, in which the skin forms scaly, inflamed lesions called plaques. In 2007, the FDA and the European Commission first approved Humira as a treatment for Crohn's disease. This disease is a chronic inflammation of the gastrointestinal tract that can lead to cramping, weight loss, ulcers, and bleeding. In the following year, Humira was approved to treat juvenile idiopathic arthritis, from which pain and inflammation can be debilitating. Humira also treats ankylosing spondylitis, commonly called arthritis of the spine, as well as chronic plaque psoriasis, with its itchy and painful skin lesions, and ulcerative colitis, for a total of nine uses thus far (Maritato & Moser, 2013).

By the end of 2010, it had become clear that the strategic actions Abbott had undertaken over the previous decade had been extremely successful, dramatically reshaping and strengthening

the company. Abbott had expanded its global presence and aggressively rebuilt its pharmaceutical pipeline. Significant changes have occurred in the company's operating environment: (i) emerging markets' growing impact on global business; and (ii) rising regulatory standards had changed the landscape for new healthcare products (Maritato & Moser, 2013).

To expand company presence in the emerging markets, Abbott's made two major acquisitions: Solvay Pharmaceuticals, formerly part of the Belgium-based Solvay Group, which became Abbott's second-largest acquisition ever, after Knoll and Piramal Healthcare Solutions, a leading marketer of established pharmaceuticals, based in Mumbai, India. This move made Abbott India's largest pharmaceutical company (Maritato & Moser, 2013).

With these movements, Abbott had two different models in the pharmaceutical business: for one side, there were traditional research-based pharmaceuticals that were largely a business of developed markets and long and risk product approval and life cycles, R&D profiles, and regulatory environments different than Abbott's other businesses, and for other, with latest acquisitions, Abbott gained both a significantly expanded presence in emerging markets and a large portfolio of established products, also known as branded generics. Branded generics are products that are not on patent, but that have a brand identity and customer loyalty, and some premium pricing. Moreover, although Abbott was built on a diversity of businesses, it was not seeking diversity of business models. And particularly in relation to its stock valuation, this dichotomy could be counterproductive. Furthermore, the differences in these models created a lack of clear identity for each business. As consequence, Abbott was separated into two healthcare companies: a diversified medical products company under the Abbott name and a research-based pharmaceutical company, named AbbVie (Maritato & Moser, 2013).

4.2 Hospira's spin-off antecedents

On August 22, 2003, Abbott announced a plan to create a separate publicly traded company for its existing core hospital products business. All the shares of Hospira common stock would be distributed to Abbott shareholders on a pro-rata basis. On April 12, 2004, Abbott's board of directors declared a special dividend distribution of all the outstanding shares of common stock of Hospira, Inc. For every 10 Abbott common shares held at the close of business on April 22, 2004, Abbott shareholders received one common share of Hospira stock on April 30, 2004. On that date, Hospira began operating as an independent company, and on May 3, 2004, Hospira's common stock began trading on the New York Stock Exchange under the symbol "HSP" (SEC.Gov, 2016). Hospira, headed by Christopher Begley, former president of Abbott's US hospital products, at its founding ranked 660th in the Fortune 1000 listing of the world's largest firms with 14,000 employees, 14 manufacturing plants worldwide, $2.5 billion in sales, and a benefited from the size and wealth of contacts that the business had built up since Abbott's 1930s entry into hospital (Maritato & Moser, 2013).

From a broad perspective, Abbott's stock price presented a better performance in comparison with the S&P500 index (228.5% vs 135.8% considering 2004 as a reference) but the DRG index, which represents the pharmaceutical industry performed better (307.9%). While 1999 Abbott's performance was due to its issues, 2002 was known as the internet bubble burst. The stock market was enjoying a decade-long bull run where the Dow rose 15% per year from 1995 to 2000. However, several events started to unravel that led to market corrections: (i) besides the tragic human loss, the September 11 terrorist attack also had a financial impact closing the New York Stock Exchange for a period of time; (ii) the bursting of the dot.com bubble, led to many internet companies declared bankruptcy; and (iii) investor's confidence was damaged after accounting scandals from Arthur Andersen, Adelphia, Enron and WorldCom also had a substantial impact on the markets (Lahart, 2002).

Table 1 shows net sales evolution in the period of 2001 to 2003. Yet sales in the Hospital business represented about 21% of total Abbott's net sales, growing sales in the Hospital division continued to decrease and achieved 3.3% in 2003, and it had reduced its participation in the total net sales, year by year.

Table 1 – Evolution of Net Sales per Division

Net Sales per Division	2001		2002		2003		CAGR
	Sales	Growth	Sales	Growth	Sales	Growth	2001-2003
Pharmaceutical	3.759	45,7%	4.268	13,5%	5.220	22,3%	17,8%
Diagnosis	2.929	0,2%	2.897	-1,1%	3.040	4,9%	1,9%
Hospital	2.778	10,8%	2.979	7,2%	3.078	3,3%	5,3%
Ross	2.088	2,6%	2.088	0,0%	2.136	2,3%	1,1%
International	4.418	33,6%	5.036	14,0%	5.685	12,9%	13,4%
Total	16.285	18,5%	17.685	8,6%	19.681	11,3%	9,9%

Source: *SEC.Gov* (2016)

The Abbott team, led by CEO Miles White and Richard A. Gonzalez, then the company's medical products chief, examined the market to see what innovations and organizations best fit Abbott's growth strategy would. And Hospital division with its mature core hospital products business seemed not to fit into this strategy. There was a pipeline issue that needed to increase investments and focus on core areas. Furthermore, there was a CEO perspective about longer development product cycles, more financial risk, and more unstable investor behavior (Clinton, 2003).

Therefore, the key drivers for the spin-off's decision were: (i) reduce diversification by focusing on the parent's core business: although it is not totally fit with a highly diversified company like Abbott, this driver would be considered especially looking at pipeline and R&D focus (Clinton, 2003). This would enable Abbott to sustain a technologically advanced, higher-growth medical and pharmaceutical products portfolio (Maritato & Moser, 2013); (ii) corporate governance represented by the CEO: no doubt that as simultaneously CEO and chairman of the firm provided a broader authority over the board of directors (Ozbek & Boyd, 2020). Moreover, Knoll's acquisition increased confidence in White's strategy (Maritato & Moser, 2013); (iii) reduced asymmetry information clarifying market perceptions: to publish more detailed information about the Hospital division as well as Hospira's figures, investors could have a better understanding of both, Abbott's and Hospira's potential (Abbott, 2003); (iv) growth opportunities: Hospira would focus on providing technology solutions for the hospital market through its leading positions in the manufacture and supply of a broad range of hospital products. Through enhanced strategic, financial, and operational flexibility, Hospira could seize new opportunities to expand its businesses globally. Both Abbott and Hospira were able to focus exclusively on maximizing opportunities in their respective markets (Abbott, 2003). Furthermore, Abbott was looking for what innovations and organizations would best fit Abbott's growth strategy (Clinton, 2003).; (v) learning through experience: although there was no direct experience in a spin-off, Abbott's experienced several integrations along acquisitions, especially the integration with the Knoll acquisition (Clinton, 2003).

4.3 Hospira's spin-off consequences

4.3.1 Net Sales

Table 2 shows Abbott's and Hospira's sales from the period 2001 to 2003 (*ex-ante* spin-off) and 2004 to 2006, three years after the spin-off. Sales of period 2001 to 2003 reflected products from former Abbott's Hospira division that went to Hospira. 2003 Abbott's net sales were not adjusted after the spin-off. If adjust was considered, 2002 net sales would be $15.279bn (9.8%

over 2001) and 2003 sales were adjusted to $17.280bn (growth rate of 13.1% in comparison with 2002 and 13.9% below 2004 net sales). (*Economatica*, 2022; *SEC.Gov*, 2016).

Table 2 – Abbott and Hospira Net Sales Evolution

Net Sales	2001		2002		2003		2004		2005		2006		CAGR	CAGR
($bn)	Sales	Growth	Sales	Growth	Sales	Growth	Sales	Growth	Sales	Growth	Sales	Growth	2001-2003	2004-2006
Hospira US	2,056	10,8%	2,205	7,2%	2,209	0,2%	2,220	0,5%	2,188	-1,5%	2,221	1,5%	3,7%	0,0%
Hospira Int'l	385	-2,1%	398	3,4%	415	4,3%	425	2,4%	439	3,3%	468	6,6%	3,9%	4,9%
Total Hospira	2,441	7,8%	2,603	6,6%	2,624	0,8%	2,645	0,8%	2,627	-0,7%	2,689	2,4%	3,7%	0,8%
Abbott	16,285	18,5%	17,685	8,6%	19,681	11,3%	19,680	0,0%	22,338	13,5%	22,476	0,6%	9,9%	6,9%

Source: *Economatica* (2022) and *SEC.Gov* (2016)

While considering sales in the U.S. the compound annual growth rate (CAGR) was 3,7% before spin-off and there was no growth in the period of three years after spin-off while sales outside the U.S. grew 3.9% before and 4.9% after spin-off suggesting some spin-off benefits. On other hand, Abbott's presented a CAGR of 9,5% between 2002 to 2004 and 6.9% after spin-off to 2006 showing a performance decrease.

4.3.2 Cumulative Abnormal Return

We computed 375 trading days data of Abbott's stock price and correspondent DRG and S&P500 index data using *Yahoo Finance* (2022) and *Economatica* (2022) databases. Data from 200 days to 51 days before the spin-off announcement was used as an estimation period. The cumulative excess returns for various intervals are presented in Table 3.

Table 3 – Abbott's CAR in intervals

Day(s) in interval	**S&P500**	**p-value**	**DRG**	**p-value**
CAR[-50,-1]	-17.7%	p<0.05	-9.1%	n.s
CAR[-6,-1]	-3.7%	p<0.05	-0.2%	n.s
CAR[-6,+6]	1.1%	n.s	4.7%	n.s
CAR[-1,0]	0.5%	n.s	2.3%	n.s
CAR[-1,+1]	2.0%	n.s	3.2%	n.s
CAR[0,+1]	3.3%	p<0.01	3.1%	p<0.05
CAR[+1,+6]	3.1%	n.s	2.7%	p<0.05
CAR[+1,+50]	3.7%	n.s	5.3%	n.s
CAR[+1,completion]	1.9%	n.s	2.0%	n.s
CAR[-50,completion]	-14.0%	n.s	-4.9%	n.s

Source: *Yahoo Finance* (2022) and *Economatica* (2022)
Note: n.s. stands for statistically not significant

In Table 3, there is a turning point after the spin-off announcement. Independent of the index used for comparing the cumulative abnormal return for Abbott's stocks price is negative from 50 days to announcement day (-9.1% to DRG – non-significant - and -17.7% to S&P500 p<0.05) and partially recovered after the announcement until completion day (-4.9% to DRG and -14% to S&P500, both non-significant). This recovery is shown through day1 after the announcement to spin-off completion day (+2.0% to DRG and +1.9% to S&P500, both non-significant). Moreover, Abbott's CAR results are aligned with Veld & Veld-Merkoulova's (2009) metanalysis results which present a CAR between [1.32%[8] to 5.56%] in an event window varying from 2 days (-1,0 and 0,1) to 12 days (-6,+6). Table 4 reports the comparison between metanalysis and Abbott's spin-off.

Table 4 – CARs comparison

Event window	# studies	Metanalysis CAR	Abbott's CAR
-1 to 0	12	[1.8 to 5.6%]	[0.5 to 2.3%]
0 to +1	3	[1.3 to 3.6%]	[3.1 to 3.3%]
-1 to +1	10	[2.1 to 5.4%]	[2.0 to 3.2%]
-6 to +6	1	[2.58%]	[1.1 to 4.7%]

Source: *Yahoo Finance* (2022) and *Economatica* (2022) and data extracted from metanalysis (Veld & Veld-Merkoulova, 2009)

Therefore, we can conclude, at least in the period comprising the spin-off announcement to spin-off completion, investors have well accepted Hospira's spin-off. It is interesting to note that, although it is not statistically significant, CAR one day before the spin-off announcement is positive, not only in our study but also in the metanalysis. This fact could suggest leaking information.

4.3.3 Long run performance

Assessment of long-term performance was built through 756 trading-days data of Abbott's and Hospira's stock prices as well as the comparator's (Merck – MRK, and Pfizer – PFE). In addition, correspondent DRG index data and S&P500 index data were collected. All data were collected from *Yahoo Finance* (2022) and *Economatica* (2022) databases.

Table 5 compares with the S&P500 index and Table 6 with the DRG index summarizes the long-term spin-off results for subperiods corresponding to buying at the closing price on the initial day of trading (tsp – May 3, 2004) and holding for periods of 6, 12, 24, and 36 months.

Table 5 – Long run performance compared with the S&P500 index

	Abbott		**Hospira**		**Merck**		**Pfizer**	
Period	**BHAR**	**p-value**	**BHAR**	**p-value**	**BHAR**	**p-value**	**BHAR**	**p-value**
[tsp+6mo]	-0.2%	p<0.01	16.0%	n.s.	-41.9%	p<0.1	-21.7%	p<0.01
[tsp+12mo]	12.7%	n.s.	16.9%	p<0.01	-32.7%	p<0.01	-28.3%	p<0.01
[tsp+24mo]	-17.2%	p<0.01	24.3%	p<0.01	-45.5%	p<0.01	-47.6%	p<0.01
[tsp+36mo]	1.7%	p<0.01	17.9%	p<0.01	-26.1%	p<0.01	-59.6%	p<0.01

Source: *Yahoo Finance* (2022) and *Economatica* (2022)

Table 6 – Long run performance compared with the DRG index

	Abbott		**Hospira**		**Merck**		**Pfizer**	
Period	**BHAR**	**p-value**	**BHAR**	**p-value**	**BHAR**	**p-value**	**BHAR**	**p-value**
[tsp+6mo]	11.3%	n.s.	27.5%	p<0.1	-30.4%	n.s.	-10.2%	p<0.01
[tsp+12mo]	17.8%	p<0.01	22.0%	p<0.01	-27.6%	p<0.01	-23.3%	p<0.01
[tsp+24mo]	1.1%	p<0.01	42.7%	p<0.01	-27.1%	p<0.01	-29.2%	p<0.01
[tsp+36mo]	25.6%	p<0.01	41.8%	p<0.01	-2.3%	p<0.01	-35.7%	p<0.01

Source: *Yahoo Finance* (2022) and *Economatica* (2022)

Overall, these returns suggest that Hospira's spin-off provided superior long-term returns to Abbott's and Hospira's investors. On February 5, 2015, pharmaceutical Pfizer announced it acquire Hospira for $17 bn. The acquisition was completed on September 3, 2015 (Pfizer, 2015). Pfizer had already had a generics business and the addition of Hospira would significantly increase its scale. During the period from May 3, 2004, to Feb 4, 2015 (the day before Pfizer's announcement to acquire Hospira), the Hospira market value increased about 2.7 times while Abbott's grew 2.2 times. In this period, the S&P500 index increased by 83.4% and the DRG index, by 61.1%. Therefore, both Hospira's and Abbott's investors would be satisfied.

4.4 AbbVie's spin-off antecedents

For decades, more than 60% of Abbott's revenues were from the United States but in the 2000s international sales were growing its participation. In 2008, for the first time ever, Abbott sales were greater outside the United States. Following the Knoll acquisition, Abbott integrated its formerly separate divisions for pharmaceutical research, manufacturing, U.S. marketing, and international marketing into a worldwide organization known as the Pharmaceutical Products Group (PPG). One of the key drivers of this shift was the growth of so-called emerging markets (e.g. Brazil, China, India, Mexico, Russia, South Korea, and Turkey) which grew their markets at a multiple of the slowing rate of developed economies. The pharmaceutical business in developing and emerging markets had a unique profile as well. This insight led to the formation of a new organization known as the Established Pharmaceuticals Division (EPD) (Maritato & Moser, 2013).

This period also saw the rising of regulatory standards that changed the landscape for new healthcare products. These changes in the environment essentially led each of Abbott's businesses to pursue distinctly different operating models. And it was clear to White and his team that the research-based pharmaceutical products business differed, in fundamental and important ways, from the rest of Abbott (Maritato & Moser, 2013).

To expand company presence in the emerging markets, Abbott's made two major acquisitions: Solvay Pharmaceuticals, formerly part of the Belgium-based Solvay Group, which became Abbott's second-largest acquisition ever, after Knoll and Piramal Healthcare Solutions, a leading marketer of established pharmaceuticals, based in Mumbai, India. This move made Abbott India's largest pharmaceutical company (Maritato & Moser, 2013).

With these movements, Abbott had two different models in the pharmaceutical business: for one side, there were traditional research-based pharmaceuticals that were largely a business of developed markets and long and risk product approval and life cycles, R&D profiles, and regulatory environments different than Abbott's other businesses, and for other, with latest acquisitions, Abbott gained both a significantly expanded presence in emerging markets and a large portfolio of established products, also known as branded generics. Branded generics are products that are not on patent, but that have a brand identity and customer loyalty, and some premium pricing. Moreover, although Abbott was built on a diversity of businesses, it was not seeking diversity of business models. And particularly in relation to its stock valuation, this dichotomy could be counterproductive. Furthermore, the differences in these models created a lack of clear identity for each business. As consequence, Abbott was separated into two healthcare companies: a diversified medical products company under the Abbott name and a research-based pharmaceutical company, named AbbVie (Maritato & Moser, 2013).

Abbott announced, on October 19, 2011, that it planned to separate into two publicly traded companies, one in diversified medical products and the other in research-based pharmaceuticals. The diversified medical products company had approximately $22 billion in annual revenue and a mix of products balanced across four major businesses (branded generic pharmaceutical, devices, diagnostic and nutritional), and would retain the Abbott name. The research-based pharmaceutical company had nearly $18 billion in annual revenue and would have a portfolio of market-leading brands, including Humira, Lupron, Synagis, Kaletra, Creon, and Synthroid (Abbott, 2011). On January 1, 2013, AbbVie[9] became an independent public company trading under the symbol "ABBV" on the New York Stock Exchange, because of the distribution by Abbott Laboratories of 100 percent of the outstanding common stock of AbbVie to Abbott's shareholders. Each Abbott shareholder of record as of the close of business on December 12, 2012 (the Record Date) received one share of AbbVie common stock for each Abbott common share held as of the Record Date (*SEC.Gov*, 2016). To lead this new business, Abbott turned to

one of the key architects of its transformation, Miles White's trusted former right hand, Rick Gonzalez (Maritato & Moser, 2013).
Despite presenting a better performance with the DRG index, Abbott's stock price had just slightly better than the S&P500 index. While in the 1990s Abbott's share more than doubled, in the period of 2003-2011 had just increased about 40% even with its revenues doubled ($19.7bn in 2003 to $38.8bn in 2011). This divergence could suggest some lack of confidence in Abbott's actual potential. In other words, it seems that the market had some uncertainty about Abbott's future, especially because of the dependency on just one product: the blockbuster Humira - the world's best-selling drug, according to Nawrat (2020) - which revenues in 2012 of USD 9.3 billion represented more than 23% of total revenues. And Humira's patent would expire in 2016 together with Kaletra and Aluvia's (SEC.Gov, 2016). Table 7 shows Abbott's, Pharmaceutical's, and Humira's sales evolution.

Table 7 – Abbott's, Pharmaceutical and Humira sales evolution

	2008		2009		2010		2011		2012		CAGR
	Sales	Grow	Sales	Grow	Sales	Grow	Sales	Grow	Sales	Grow	2008-2012
Abbott ($bn)	29,528	13,9%	30,765	4,2%	35,167	14,3%	38,851	10,5%	39,874	2,6%	7,8%
Pharmaceutical ($bn)	16,708	14,2%	16,486	-1,3%	19,894	20,7%	22,435	12,8%	23,133	3,1%	8,5%
Proprietary ($bn)			13,545	n.a.	15,331	13,2%	17,022	11,0%	18,012	5,8%	10,0%
Humira ($bn)	4,500	50,0%	5,500	22,2%	6,500	18,2%	7,900	21,5%	9,300	17,7%	19,9%

Source: *Economatica* (2022) and *SEC.Gov* (2016)

Therefore, some key drivers for Abbott's decision for spin-off could be: (i) reduce diversification by focusing on the parent's core business: as the research-based pharmaceutical products business differed from the rest of Abbott. Research-based pharmaceuticals are characterized as largely operating a business in developed markets and need to invest in a long and risky product development and approval, as well as continuous research to extend the life cycles. Therefore, seems understandable to spin off this profitable business (Maritato & Moser, 2013); (ii) corporate governance represented by CEO: Mr. White also led this spin-off which would bring confidence to this movement. Moreover, he designated one of the key architects of Abbott's transformation, his former right hand, Richard Gonzalez as AbbVie CEO (Maritato & Moser, 2013); (iii) reduce asymmetry information clarifying market perceptions: although Abbott was built on a diversity of businesses, it was not seeking diversity of business models. The dichotomy of working simultaneously with research-based and brand generics could be negatively evaluated by the investors and create a lack of clear identity for each business (Maritato & Moser, 2013).; (iv) growth opportunities: According to Mr. White, AbbVie would focus on select specialty products with breakthrough innovations that serve patient needs in some of the most critical medical areas, such as immunology, Multiple Sclerosis, chronic kidney disease, Hepatitis C, women's health and oncology and Abbott would be one of the largest and fastest growing investment opportunities in medical products with strong sales and ongoing earnings-per-share growth and a large, broad mix of products addressing many essential areas of healthcare (Abbott, 2011); and (v) learning through experience: Hospira's spin-off would increase Abbott's confidence on the largest separation transaction ever in the healthcare sector (Sierra, 2012). In addition, or perhaps the most important reason[10] was a huge challenge to fulfill the pipeline, especially to substitute Humira. A failure to totally accomplishes it could contaminate all of Abbott's business and lower Abbott's market value.

4.5 AbbVie's spin-off consequences
4.5.1 Net Sales

Table 8 shows Abbott's and AbbVie's sales from 2010 to 2012 (*ex-ante* spin-off) and 2013 to 2015. Sales of the *ex-ante* spin-off period reflected products from the former Abbott Pharmaceutical division that went to AbbVie. 2013 Sales presented the actual sales after spin-off but Abbott's growth is calculated based on 2012 Abbott's adjusted sales ($21,494bn). (*Economatica*, 2022; *SEC.Gov*, 2016).

Table 8 – Abbott and AbbVie Net Sales Evolution

Net Sales	2010		2011		2012		2013		2014		2015		CAGR	CAGR
($bn)	Sales	Growth	Sales	Growth	Sales	Growth	Sales	Growth	Sales	Growth	Sales	Growth	2010-2012	2013-2015
AbbVie US	8,971	n.a.	9,712	8,3%	10,435	7,4%	10,181	-2,4%	10,845	6,5%	13,561	25,0%	7,9%	15,4%
AbbVie Int'l	6,667	n.a.	7,732	16,0%	7,945	2,8%	8,609	8,4%	9,115	5,9%	9,298	2,0%	9,2%	3,9%
Total AbbVie	15,638	15,5%	17,444	11,5%	18,380	5,4%	18,790	2,2%	19,960	6,2%	22,859	14,5%	8,4%	10,3%
Abbott	35,167	14,3%	38,851	10,5%	39,874	2,6%	21,848	1,6%	20,247	-7,3%	20,405	0,8%	6,5%	-3,4%

Source: *Economatica* (2022) and *SEC.Gov* (2016)
Note: n.a. stands for not available

AbbVie's sales in the United States increased 15.4% in the period of three years after the spin-off almost double in comparison with the period *ex*-ante spin-off. An increase in Humira's sales (29% in 2015 and 25% in 2014) explained a great part of its success. However, international sales results were different (CAGR 2013-2015 was 3.9% vs. 9.2% of CAGR 2010-2012) due to the exchange currency rate. If considered at constant currency rates, 2015 results would grow 18% instead of the actual 2%. Consequently, the CAGR 2013-2015 would be 11.8%. Sales for Humira decrease 7% in 2015 due to the same situation (*SEC.Gov*, 2016). Meanwhile, Abbott's CAGR reflected the loss of its most profitable division signaling Abbott needed to realign its strategies.

4.5.2 Cumulative Abnormal Return

Using the same methodology in section 4.3.2 we computed 503 trading days data of Abbott's stock price and correspondent DRG and S&P500 index data. Table 9 shows the cumulative excess returns (CAR) for various intervals.

Table 9 – Abbott's CAR in intervals

Day(s) in interval	**S&P500**	**p-value**	**DRG**	**p-value**
CAR[-50,-1]	2.2%	n.s	2.2%	n.s
CAR[-6,-1]	-1.8%	n.s	-0.7%	n.s
CAR[-6,+6]	-1.2%	n.s	0.0%	n.s
CAR[-1,0]	1.9%	n.s	2.3%	n.s
CAR[-1,+1]	3.1%	n.s	3.3%	p<0.1
CAR[0,+1]	3.3%	p<0.01	3.2%	p<0.01
CAR[+1,+6]	-1.5%	n.s	-1.4%	n.s
CAR[+1,+50]	1.3%	n.s	-0.7%	n.s
CAR[+1,completion]	-0.1%	n.s	0.6%	n.s
CAR[-50,completion]	4.2%	n.s	4.9%	n.s

Source: *Yahoo Finance* (2022) and *Economatica* (2022)

Abbott's stock price presents a positive CAR during the period of 50 days, but a negative CAR in a period of 6 days, and positive again just one day before AbbVie's spin-off announcement. As it happened in Hospira's spin-off, once again, these results could suggest leaking information.

On the contrary, to Hospira's spin-off, apparently, Abbott's investors do not show the same confidence in AbbVie's spin-off as CAR [+1, completion] is negative in comparison with the S&P500 and practically null in comparison with the DRG index.

As shown in Table 10, in comparison with Veld & Veld-Merkoulova's (2009) metanalysis results, Abbott's CAR is similar, except in the event window of 12 days with negative

cumulated returns for the DRG index as well as the S&P500. This type of event window is not usual, although Denning (1988) argues that six days before the announcement or divestment date capture any market anticipation effect, as well as the six days after capturing any temporary and permanent return effects. Noticed that her study is related to divestment in general, not only spin-offs.

Table 10 – CARs comparison

Event window	# studies	Metanalysis CAR	Abbott's CAR
-1 to 0	12	[1.8 to 5.6%]	[1.9 to 2.3%]
0 to +1	3	[1.3 to 3.6%]	[3.2 to 3.3%]
-1 to +1	10	[2.1 to 5.4%]	[3.1 to 3.3%]
-6 to +6	1	[2.58%]	[-1.2 to 0.0%]

Source: *Yahoo Finance* (2022) and *Economatica* (2022) and data extracted from metanalysis (Veld & Veld-Merkoulova, 2009)

4.5.3 Long run performance

After collection from *Yahoo Finance* (2022) and *Economatica* (2022) databases of 756 trading-days data of Abbott's and AbbVie's stock prices as well as the comparator's (Merck - MRK and Pfizer – PFE) and correspondent S&P 500 and DRG indexes data, we made the assessment of long term performance for Abbott and AbbVie which are reported in Table 11 and Table 12 for subperiods corresponding to buying at the closing price on the initial day of trading (tsp – January 2, 2013) and holding for periods of 6, 12, 24, and 36 months.

Table 11 – Long run performance compared with the S&P500 index

	Abbott		**Abbvie**		**Merck**		**Pfizer**	
Period	**BHAR**	**p-value**	**BHAR**	**p-value**	**BHAR**	**p-value**	**BHAR**	**p-value**
[tsp+6mo]	-1.1%	p<0.01	8.0%	p<0.01	1.6%	n.s.	-3.2%	n.s.
[tsp+12mo]	-6.0%	n.s.	22.7%	p<0.01	-5.6%	n.s.	-7.7%	n.s.
[tsp+24mo]	-0.6%	p<0.01	46.9%	p<0.01	-2.4%	p<0.01	-19.8%	p<0.01
[tsp+36mo]	-3.7%	n.s.	26.4%	p<0.01	-10.7%	n.s.	-14.3%	p<0.01

Source: *Yahoo Finance* (2022) and *Economatica* (2022)

Table 12 – Long run performance compared with the DRG index

	Abbott		**Abbvie**		**Merck**		**Pfizer**	
Period	**BHAR**	**p-value**	**BHAR**	**p-value**	**BHAR**	**p-value**	**BHAR**	**p-value**
[tsp+6mo]	-1.6%	n.s.	7.6%	p<0.01	1.2%	n.s.	-3.6%	n.s.
[tsp+12mo]	-4.1%	p<0.01	24.7%	p<0.01	-3.6%	n.s.	-5.8%	p<0.01
[tsp+24mo]	-2.1%	p<0.01	45.4%	p<0.01	-3.9%	n.s.	-21.3%	p<0.01
[tsp+36mo]	-8.2%	p<0.01	21.9%	p<0.01	-15.2%	p<0.01	-18.9%	p<0.01

Source: *Yahoo Finance* (2022) and *Economatica* (2022)

For AbbVie in all comparisons, there was a superior return for all periods but better for 24 months period. In Abbott's case, there was a negative performance. However, comparisons with Merck and Pfizer showed a superior performance after 6 months. This could suggest that Abbott's spin-off decision was a good one.

5 Final Considerations

When Hospira was created its market value was about $4.2bn. By the time Pfizer announced the acquisition of Hospira, its market value was increased by 3.5 times ($14.8bn) and Pfizer

bought Hospira for $17bn. With AbbVie was not different: its initial market value of $57.8bn became, nine and half years later, $266bn[11] (4.6 times greater). Meanwhile, at the beginning of this century, the parent company Abbott had a market value of $75bn. At the time of Hospira's spin-off on August 22, 2003, its value was decreased to $60.9bn. When the Hospira spin-off was consolidated on May 3, 2004, Abbott's market value was $66bn and increased to $83bn when announced on October 19, 2011, AbbVie's spin-off. On December 31, 2012, Abbott's market value was $103.5bn, and three days after dropout to $52.5bn due to the split of its shares with AbbVie. Currently, Abbott's market value is more than tripled to $191bn. Therefore, Hospira's and AbbVie's spin-offs could be considered as well succeeded.

Moreover, the cumulative abnormal return (CAR) in both spin-off announcements was, for three-day-window, +3.2% (non-significant) and +3.3%($p<0.1$) in comparison with DRG pharma index and +2.0 (non-significant) and +3.1% (non-significant) to S&P500 index, for Hospira's and AbbVie's spin-off respectively.

Furthermore, a long-run performance, using a buy-and-hold strategy, showed positive results: (i) in Hospira's spin-off, the buy-and-hold strategy resulted in +25.6% ($p<0.01$) for Abbott's investors, and +41.8% ($p<0.01$) for Hospira's investors, after 36 months in comparison with DRG index, and +1.7% ($p<0.01$) for Abbott and +17.9%($p<0.01$) for Hospira, when compared with S&P500 index; and (ii) in AbbVie's spin-off, AbbVie's investors in 36 months would get +26.4% ($p<0.01$) and +21.9% ($p<0.01$) in comparison with S&P500 and DRG index, respectively. During the same period, Abbott's investors would lose -3.7% (non-significant) or -8.2% ($p<0.01$) in comparison with S&P500 or DRG. But these losses would be worse if the same investors got Merck, -10.7% (non-significant) or Pfizer, -14.3% ($p<0.01$) of S&P500 or Merck, -15.2% ($p<0.01$) or Pfizer, -18.9% ($p<0.01$) in comparison with DRG index.

Along of theoretical background section, we summarized as key determinants for spin-off are: (i) reducing diversification focusing on the parent's core business; (ii) corporate governance represented by the CEO; (iii) reducing asymmetry information clarifying market perception; (iv) growth opportunities, and (v) learning through experience.

In the case of Hospira's spin-off reduced diversification to allow Abbott to focus on the recent Knoll integration and prepare the company to launch Humira seemed logical. Also, this split reduced asymmetry information, showing the market what are Abbott's priorities. Moreover, growth opportunities aligned with each firm were clearly developed for Abbott and Hospira. Finally, the leadership of CEO Miles White speed up the decision process. Perhaps the driver learning through experience is the only one missing for obvious reason.

Analyzing, AbbVie's spin-off it is less obvious. Although, Abbott's diversified nature, the company's heart was pharmaceuticals. Along with its history, Abbott was a pioneer in many areas like anesthetics, and HIV drugs and currently they were managing Humira, the world's best-selling drug. Moreover, although riskier, in time and investments, and perhaps, because of these risks, research-based pharmaceutical has the most profitable margin in the healthcare sector. Once again, we detected all key determinants for a spin-off. First, to reduce diversification by focusing on the parent's core business. Research-based pharmaceuticals work in a different way from other Abbott's businesses, and this was more evident with brand-generic manufacturers' acquisition and expansion in emergent markets. With the spin-off announcement, asymmetry information was reduced, and the announcement showed what was the path for Abbott and AbbVie. This split led to growth opportunities through acquisitions or agreements for both companies and Hospira's spin-off experience helped to manage the split. Finally, Mr. White's role was fundamental to the acceptance of this dramatic movement. In summary, Mr. White and his team have split a company valued at about $100bn, and nine and half years later these two giant companies are valued together at more than $457bn.

Usage of only secondary data for this case assessment is the main caveat for this study. Internal data and interviews with participants of spin-offs would create more insights. Spin-offs provide

a unique moment to analyze how a firm could restart. For example, examine how the capital structure is chosen after a spin-off. Is similar to the parent's choice? Therefore, avenues for studies could appear to analyze this important divesture way. In addition, further study is needed to determine whether the successes of Abbott's spin-offs are more common or if they were sporadic.

Notes

1. Results indicated that performance changes if any, occur in the first year after the spin-off (Daley *et al*., 1997)
2. 1993 is the earliest Form 10-K available from the Securities and Exchange Commission. At the beginning of each year, a company is responsible to submit the annual report referred to the year before
3. Equation was extracted from Dodd & Ruback (1977) who referred to see Fama (1976, pp 63-132) for a discussion of this model
4. The S&P500 Index is a market-capitalization-weighted index of the 500 largest U.S. publicly traded companies. The index is widely regarded as the best gauge of large-cap U.S. equities. There is over USD 11.2 trillion indexed or benchmarked to the index, with indexed assets comprising approximately USD 4.6 trillion of this total (approximately 80% of available market capitalization) (S&P500® - S&P Dow Jones Indices, 2022).
5. The NYSE Arca Pharmaceutical Index (DRG) is designed to represent a cross-section of widely held, highly capitalized companies involved in various phases of the development, production, and marketing of pharmaceuticals. The DRG Index was developed with a base value of 200.00 on July 31, 1991. The value of the Index is published every 15 seconds through the Consolidated Tape Association's Network B and/or the NYSE Euronext Global Index Feed under the ticker symbol "DRG" (NYSE, 2014).
6. Announcement for Hospira's spin-off was on August 22, 2003 (Abbott, 2003) and for AbbVie's spin-off was on October 19, 2011 (Abbott, 2011).
7. After a naming contest among its employees, the new firm was dubbed Hospira, from the words "hospital," "spirit," and "*spero*" (hope in Latin) (Maritato & Moser, 2013)
8. In fact, Veld & Veld-Merkoulova (2009) observed that there is only one exception in the study from the UK, in a three-day window, CAR was -0.19% but not statistically significant. Furthermore, the authors noticed that one year later with data from the same country, a study shows an abnormal return of 2.13%.
9. In branding this new company, White and his team chose a name that established its connection to Abbott (Abb), while suggesting the Latin root for "life" (Vie), underscoring the company's mission (Maritato & Moser, 2013).
10. This is pure speculation. There is no clear evidence of this mindset. Besides, there are many mechanisms to extend patents (e.g. new novelty indication approved). Moreover, there are different regulatory bodies (e.g. FDA (US), European Medicines Agency – EMA (EU), NHS (UK), and ANVISA (Brazil)) with different requirements.
11. Source of all Market value data is Economatica (2022). The latest date for AbbVie and Abbot's market value referred to was July 26, 2022.

References

Abbott. (2003). *Hospira's spin-off*. Press Release. https://www.sec.gov/Archives/edgar/data/1800/000104746903028572/a2117498zex-99_1.htm

Abbott. (2011). *AbbVie's spin-off*. Press Release.

https://www.sec.gov/Archives/edgar/data/1800/000110465911057748/a11-27657_2ex99d1.htm
Ahn, S., & Walker, M. D. (2007). Corporate governance and the spinoff decision. *Journal of Corporate Finance*, *13*(1), 76–93. https://doi.org/10.1016/j.jcorpfin.2006.03.001
Allen, J. W., Lummer, S. L., Mcconnell, J. J., & Reed, D. K. (1995). Can Takeover Losses Explain Spin-Off Gains ? *The Journal of Financial and Quantitative Analysis*, *30*(4), 465–485.
Bansal, R., De Backer, R., & Ranade, V. (2018). What's behind the pharmaceutical sector's M&A push. In *McKinsey & Company*. https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/whats-behind-the-pharmaceutical-sectors-m-and-a-push
Barber, B. M., & Lyon, J. D. (1997). Detecting long-run abnormal stock returns: The empirical power and specification of test statistics. *Journal of Financial Economics*, *43*(3), 341–372. https://doi.org/10.1016/S0304-405X(96)00890-2
Bennett, V. M., & Feldman, E. R. (2017). Make Room! Make Room! A Note on Sequential Spinoffs and Acquisitions. *Strategy Science*, *2*(2), 100–110. https://doi.org/10.1287/stsc.2017.0030
Bergh, D. D., & Lim, E. N.-K. (2008). Learning How to Restructure: Absorptive Capacity and Improvisational Views of Restructuring Actions and Performance. *Strategic Management Journal*, *29*(6), 593–616. https://doi.org/10.1002/smj.676
Brown, K. C., & Brooke, B. A. (1993). Institutional Demand and Security Price Pressure: The Case of Corporate Spinoffs. *Financial Analysts Journal*, *49*(5), 53–62. https://doi.org/10.2469/faj.v49.n5.53
Burch, T. R., & Nanda, V. (2003). Divisional diversity and the conglomerate discount: Evidence from spinoffs. *Journal of Financial Economics*, *70*(1), 69–98. https://doi.org/10.1016/S0304-405X(03)00142-9
Chai, D., Lin, Z., & Veld, C. (2018). Value-creation through spin-offs: Australian evidence. *Australian Journal of Management*, *43*(3), 353–372. https://doi.org/10.1177/0312896217729728
Chemmanur, T. J., Krishnan, K., & Nandy, D. K. (2014). The effects of corporate spin-offs on productivity. *Journal of Corporate Finance*, *27*, 72–98. https://doi.org/10.1016/j.jcorpfin.2014.04.005
Chemmanur, T. J., & Yan, A. (2004). A theory of corporate spin-offs. *Journal of Financial Economics*, *72*(2), 259–290. https://doi.org/10.1016/j.jfineco.2003.05.002
Clinton, P. (2003). From Good to Great , Act Two. *Pharmaceutical Executive*, 42–52. www.PharmExec.com
Cusatis, P. J., Miles, J. A., & Woolridge, J. R. (1993). Restructuring through spinoffs. The stock market evidence. *Journal of Financial Economics*, *33*(3), 293–311. https://doi.org/10.1016/0304-405X(93)90009-Z
Daley, L., Mehrotra, V., & Sivakumar, R. (1997). Corporate focus and value creation: Evidence from spinoffs. *Journal of Financial Economics*, *45*(2), 257–281. https://doi.org/10.1016/S0304-405X(97)00018-4
Denning, K. C. (1988). Spin-offs and Sales of Assets: An Examination of Security Returns and Divestment Motivations. *Accounting and Business Research*, *19*(73), 32–42. https://doi.org/10.1080/00014788.1988.9728833
Desai, H., & Jain, P. C. (1999). Firm performance and focus: Long-run stock market performance following spinoffs. *Journal of Financial Economics*, *54*(1), 75–101. https://doi.org/10.1016/S0304-405X(99)00032-X
Dodd, P., & Ruback, R. (1977). Tender offers and stockholder returns. An empirical analysis. *Journal of Financial Economics*, *5*(3), 351–373. https://doi.org/10.1016/0304-405X(77)90043-5

Economatica. (2022). Economatica. https://economatica.com/
Habib, M. A., Johnsen, D. B., & Naik, N. Y. (1997). Spinoffs and information. *Journal of Financial Intermediation*, *6*(2), 153–176. https://doi.org/10.1006/jfin.1997.0212
Hite, G. L., & Owers, J. E. (1983). Security price reactions around corporate spin-off announcements. *Journal of Financial Economics*, *12*(4), 409–436. https://doi.org/10.1016/0304-405X(83)90042-9
Jimenez, D. (2022) J&J spin-off: pharma continues to cut the cord on consumer healthcare. *Pharmaceutical Technology*. https://www.pharmaceutical-technology.com/analysis/j-j-spin-off-pharma-consumer-healthcare/ Retrieve on July, 8, 2022
Krishnaswami, S., & Subramaniam, V. (1999). Information asymmetry, valuation, and the corporate spin-off decision. *Journal of Financial Economics*, *53*(1), 73–112. https://doi.org/10.1016/S0304-405X(99)00017-3
Lahart, J. (2002). *The crash of 2002*. CNN Money. https://money.cnn.com/2002/07/19/news/crash2002/
Maritato, K., & Moser, R. (2013). *A Promise For Life: The story of Abbott*. Abbott Laboratories.
Miles, J. A., & Rosenfeld, J. D. (1983). The Effect of Voluntary Spin-off Announcements on Shareholder Wealth. *The Journal of Finance*, *38*(5), 1597–1606. https://www.jstor.org/stable/2327589?origin=crossref
Nawrat, A. (2020). *Beyond pharma M&As: will 2020 by the year of the spin-out?* Pharmaceutical Technology. https://www.pharmaceutical-technology.com/features/pharma-spin-out-2020/
NYSE. (2014). *The NYSE Arca Pharmaceutical Index (DRG)*. www.nyse.com
Ozbek, O. V., & Boyd, B. (2020). The influence of CEO duality and board size on the market value of spun-off subsidiaries: The contingency effect of firm size. *Journal of Strategy and Management*. https://doi.org/10.1108/JSMA-03-2019-0039
Pfizer. (2015). *Pfizer to Acquire Hospira*. Press Release. https://www.pfizer.com/news/press-release/press-release-detail/pfizer_to_acquire_hospira
S&P500® - S&P Dow Jones Indices. (n.d.). Retrieved July, 26, 2022, from https://www.spglobal.com/spdji/en/indices/equity/sp-500/#overview
Schipper, K., & Smith, A. (1983). Effects of recontracting on shareholder wealth. The case of voluntary spin-offs. *Journal of Financial Economics*, *12*(4), 437–467. https://doi.org/10.1016/0304-405X(83)90043-0
SEC.gov. (2016). US Governement. https://www.sec.gov/
Seward, J. K., & Walsh, J. P. (1996). the Governance and Control of Voluntary Corporate Spin-Offs. *Strategic Management Journal*, *17*(1), 25–39. https://doi.org/10.1002/(sici)1097-0266(199601)17:1<25::aid-smj797>3.3.co;2-7
Sharpe, W. F. (1964). Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk. *The Journal of Finance*, *XIX*(3), 425–442.
Sierra, M. (2012). *Abbott markets $14.5 billion for spinoff - Reuters*. https://www.reuters.com/article/us-abbott-package-idUSBRE85J1EP20120620
Veld, C., & Veld-Merkoulova, Y. V. (2004). Do spin-offs really create value? The European case. *Journal of Banking and Finance*, *28*(5), 1111–1135. https://doi.org/10.1016/S0378-4266(03)00045-1
Veld, C., & Veld-Merkoulova, Y. V. (2009). Value creation through spin-offs: A review of the empirical evidence. *International Journal of Management Reviews*, *11*(4), 407–420. https://doi.org/10.1111/j.1468-2370.2008.00243.x
Yahoo Finance - Stock Market Live, Quotes, Business & Finance News. (n.d.). Retrieved June 30, 2022, from https://finance.yahoo.com/