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Shire + Baxalta
New global leadership in the rare disease sector?

On the 10th of July 2015, the summer day had begun with rain in the Irish capital, something that really irritated Flemming Ørnskov, CEO of Shire Plc, even though he had already gotten used to the characteristic climate of this city. But the day was too important to spend any time or energy with the weather conditions, it was the day to make an offer to acquire Baxalta, the big American biopharmaceutical company, and Ørnskov was confident the two firms could come to an agreement that would benefit them both. The CEO of Shire stated that:

> *"We believe the proposed combination of Shire and Baxalta would be strategically and financially attractive for both of our companies, accelerating our respective growth ambitions and creating the leading global biotech company in rare diseases. The combined entity would have the opportunity to create significant shareholder value in one of the most attractive and fastest growing segments in healthcare. Together, the companies would be projected to deliver $20 billion in product sales by 2020, with the financial and operational firepower to fuel further innovation and growth in rare diseases. It is our strong preference to immediately enter into a negotiated transaction to explore the full potential of the proposed combination and finalize the terms of an agreement."*[1]

The Irish firm had a big interest on Baxalta for its marketed and in-development products, because the firm was investing in areas like oncology (which the forecast indicated as the therapy area with the biggest market share in 2020) but above all, because their alliance would result in the "leading global biotech company in rare diseases". Moreover, the growth of the combined company was expected to be greater than the growth of the companies by themselves.

The aim of the management of Shire was to complete a takeover of the American company but, to achieve that, the Board of Directors of Baxalta would need to accept the terms of the offer. The proposal made in private on the 10th of July was for an all-stock transaction, giving to Baxalta's shareholders 0,1687 Shire ADSs (American Depositary Shares) for each Baxalta share, implying a value of $45,23 per share. This offer was publicly rejected by Baxalta on the 4th of August of the same year, with the argument that the offer "significantly undervalues" the company and its potential.

[1] DUBLIN, August 4, 2015 /PRNewswire

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Time has passed and 2016 arrived, but Shire's management is still looking for the best thing to do concerning the failed attempted acquisition. Should they look for another company in the rare disease sector and give up on Baxalta? Or should they place another offer with a higher bid or even with different payment methods? At this point in time, Flemming Ørnskov is losing hope and starting to think this deal might never be completed…

The Worldwide Pharmaceutical Industry

The Pharmaceutical industry involves the different stages of development, production and marketing of the pharmaceuticals to be used as medication. This industry overlaps with the biotechnology industry in some aspects, and they both are constantly changing due to the fast development of new technologies and growing knowledge of the microorganisms and diseases which their products are intending to treat. The first records of products within this industry are of medical preparations from minerals, plants and animals which were used by apothecaries to treat general symptoms. Over time it has evolved tremendously and it's now possible to chemically synthesize drugs that target specific strains of pathogenic organisms which need to go through complex testing processes that assure the safety of such products.

The pharma industry has two large and distinctive markets which differ in the requisites needed to acquire medicines: Prescription drugs and over-the-counter drugs. Prescription drugs can only be sold in pharmacies or authorized facilities and their purchase requires a prescription authenticated by a doctor. Instead, over-the-counter drugs (OTCs) are considered safe for self-diagnosis and self-medication and can therefore be purchased in a larger variety of places without the need of any prescription.

Moreover, the pharmaceutics in the market may be of two kinds: (1) innovative pharmaceuticals, which are exclusive of a certain laboratory and are patented, or (2) generic pharmaceuticals, that may be classified as commodity generics, if they are sold under the name of the active pharmaceutical ingredient with no association to a specified brand, or branded generics, if they are sold under a specific brand name. Generics appear after the patent period of the innovative drug expires, and these can be sold at a much lower price (around 80% less) because the costs associated with their development and production are also much lower. In 2014, in the U.S., the generics only accounted for 28% of total drug costs, even though they account for 88% (9 out of 10) of prescribed drugs. The sale of prescribed generics can save billions of dollars to the health care systems but, in contrast, it destroys a huge amount of value in the pharma industry, as the products have the same therapeutic effects but generate only a very small fraction of the revenues generated by the originals.

New Drug Development Process with FDA Approval[2]

The process that an investigator needs to go through to have a new pharmaceutical in the market is very slow, costly and risky. It consists of five major steps which need to be sequentially overcame. The process begins with the Discovery & Development of the product, and is then followed by the Preclinical Research. The Clinical Research is the third step and is the phase that initiates the compatibility and effectiveness studies with humans, so that the treatment can be reviewed by the FDA and, if approved, marketed. Finally, after the treatment is available in the market, the last step is the FDA Post-Market Safety Monitoring, during which the product can be taken out of the market for safety reasons.

Only after going through this incredibly thorough process – process in detail in Exhibit 1 - the drugs can be safely marketed, which reduces the number of new drugs marketed per year to only a few tens out of the thousands of candidates.

The average cost associated to the development of a successful drug from scratch (considering the failed tries) is 2,6 billions of dollars. This very important factor is leading the market to change in the sense that

[2] From "Learn About Drug and Device Approvals" – U.S. FDA

large companies are outsourcing parts of the drug development process to specialized research and manufacturers firms as a way to reduce the costs in R&D and mitigate some of the risk associated to the process.

Patents

Patents are granted as a way to protect intellectual property and have the duration of 20 years. These allow the investigators to develop, test and sell a new drug without the need to disclose their methods, preventing the possibility of drug replication by a competitor. Given that the process of developing and testing a new medicine usually takes between 10 and 15 years, the company is granted 5 to 10 years of exclusiveness in the market before the generics with the same active pharmaceutical ingredient as the product under the patent can be launched. This is an essential advantage in this business because every month without competition, allows the firm to recover a big portion of its investments with high sales of the exclusive drug. When the competition enters the market, the sales of such product decrease abruptly, losing up to 80%-90% share of the sales with that medicine. The expiration of the patents and consequent decrease in the company's profits, prevents them to invest aggressively in investigation and creation of new medicines due to the scarcity of capital, forcing them to raise money to finance R&D expenses in the financial markets, keeping these expenses to a minimal, which conditions the research.

In the past few years, the phenomenon known as "Patent Cliff", which refers to the expiration of a large number of patents and consequent drop in sales has been changing the industry entirely. In an attempt to protect themselves from the effects of the next patent cliff, the big pharma companies are transforming their way of investing in new products. They are shifting from a strategy of investing strongly in a small number of blockbuster drugs, to one that diversifies the portfolio with a larger number of specialized drugs in smaller volumes. One of the best ways to reach that is to focus the resources of the company in the fields where it already has expertise and acquire or merge with companies that are already specialists in the new areas of interest, retaining their know-how and expanding to markets with high growth potential. This way, the risk and the waste are reduced to a minimum and the company's growth is maximized.

The major players of the pharmaceutical industry in 2014 were the giants Johnson & Johnson, Novartis, Roche, Pfizer and Sanofi. According to the World Health Organization, the top ten pharma companies, account for more than a third of the total market, which indicates that the market is highly consolidated. This meant that, if a company didn't grow enough or didn't get as competitive as needed, it would probably be the target of a bigger and more competitive company that wanted to enter a certain area. Indeed, the existing biotech bubble has been resulting in the investment of huge amounts of money in speculative companies with no track record by the big pharma companies, allowing the biotech stocks to rise faster than any other sector in the US market, for the last four years.

The global pharmaceutical market is expected to grow % and reach the value of Y by 2020, with the prescription drug sales alone, expected to grow from approximately $750 billion in 2014 to a value close to $1 trillion by 2020 (CAGR: 4.8% between 2014 and 2020).

Therapeutic Areas

The entire industry is subdivided in smaller markets referred to as therapeutic areas, amongst which are oncology, immunosuppressants, vaccines, and many others. A study released[3] in June 2015 by EvaluatePharma®, indicates that the three therapy areas with the highest worldwide market share in 2014 were Oncology (10,1%), Anti-rheumatics (6,2%) and Anti-virals (5,5%), corresponding to sales of $79,2bn, $48,8bn and $43,1bn respectively. The forecast for 2020 does not show big changes regarding the importance within therapeutic areas, with Oncology strengthening its position and reaching 14,9% market

[3] "World Preview 2015, Outlook to 2020" - EvaluatePharma®

share, with a +4,7pp change, and with the fall of Anti-rheumatics (5,2%) and Anti-virals (4,8%), allowing the climb of the Anti-diabetics area to second place with a market share of 5,9%. Exhibits 2 to 4 show the top 10 therapy areas in 2014 and 2020, their worldwide market share and sales growth.

Shire Plc

Shire Plc, headquartered in Dublin, Ireland, is a biopharmaceutical company founded in 1986 by Dennis Stephens, Geoff Hall, Harry Stratford and Peter Moriarty. The firm was founded in the UK, with its focus on some unmet medical needs and their possible solutions.

The first products Shire placed in the market were related to the prevention of osteoporosis, a disease that weakens the bones but, in the mid-90, the company started a series of strategic acquisitions that would allow them to enter new areas and develop their clinical pipeline. The first acquisitions, in 1997, were of Pharmavene and Richwood Pharmaceutical Company, later in the same year. In the years that followed, Shire kept on acquiring smaller companies at a slow pace but, from 2010 onwards, the pace of the acquisitions increased substantially and, since 2010 around $18 billion were spend with the completion of 11 deals to ensure the ownership of products already in the market, and compounds in clinical development, as the company tried to keep on growing in this competitive industry.

Meanwhile, in 2014, AbbVie Pharmaceuticals attempted to takeover Shire. On 20 June 2014, Shire rejected an attempt to acquire the company for $46,5 billion – equivalent to £46,11 per share - and on 8 July, the offer was increased to $51,5 billion. On 18 July, is was announced that AbbVie would acquire Shire for $54,8 billion, but the deal did not happen due to changes on the US "Tax Inversion" law, which made the board of directors of the acquiring company to lead the shareholders to vote against the deal. This made Shire's share price to fall abruptly (in October - Exhibit 5a)) and the cancellation of the deal subjected AbbVie to the payment of a break up fee in the amount of $1,6 billion, to Shire. The failure of this transaction allowed Shire to continue its growth through the acquisition of other firms.

Nowadays, the company has established a leading position in the rare disease market and is now the 30th largest pharma company in the world by sales, with $6,1 billion in sales – from which around 70% are of drugs protected by patents (Exhibit 6) - and $884,1 million in R&D expenses (financial statements and balance sheet can been seen in Exhibits 7 and 8). The market capitalization of Shire is $50,76 billion and its biggest areas of focus are Neurosciences, HAE.

The firm had established itself in the market over time and is a constituent of both the FTSE 100 and NASDAQ-100 Indexes.

Baxalta Incorporated

Baxalta Incorporated is an American biopharmaceutical company listed in the NYSE that develops, manufactures, and markets innovative biopharmaceuticals in the areas of hematology, immunology and oncology worldwide. It was created on the 1st of July 2015 as a result of a spinoff of the biosciences division of Baxter International, which would focus on lifesaving medical products. Baxter took this action with the intent of divesting the business segments that carried more risk, as a way of streamlining its operations into a leaner organization. Baxter's shareholders received one share of Baxalta for every Baxter's share owned, with Baxter keeping 19,5% of Baxalta and receiving $4 billion of special dividends after the spinoff. Baxter aims to use the funds earned in the separation to repay pension liabilities and debt obligations. The separation was expected to benefit both companies with enhance of financial flexibility and reduction of complexity, resulting in strong balance sheets and cash flows.

Before the spin off, Baxalta had already acquired SuppreMol, a German company focused on the early-stage development portfolio of biologic immunoregulatory therapeutics for autoimmune diseases, and

Oncaspar, a blockbuster leukemia drug Sigma-Tau Finanziaria S.p.A., as well as a couple of other companies.

In the FY 2015 the company earned $6,2billion in sales, of which 53% were originated in the US, and the remaining in the international markets. Regarding therapy areas, Hematology is the leader within Baxalta, accounting for 59% of the year's sales - $2,840million in hemophilia and $787million in inhibitor therapies. The details of the FY 2015 are in Exhibit 9.

Hematology

Baxalta is the market leader in hematology with a 30% market share and, within this therapy area, with ~50% market share, it dominates the growing hemophilia market offering the broadest range of hemophilia drugs. The hemophilia portfolio of the pharmaceutical includes Advate, Adynovate, Recombinate, and Rixubis as well as plasma-derived products such as factor VII, factor VIII, and factor IX. Still in this therapy area, Baxalta also produces inhibitor therapies, which was the third largest product category of the year. 59% of the firm's revenues were generated from hematology drugs and, even though the company maintains the leadership in this market, its biggest competitors Biogen, Pfizer, Bayer and Novo Nordisk (NVO) have been gaining some market share.

The hemophilia market is a competitive one due to the premium pricing that is charged for innovative drugs. This premium is charged because of the rareness of the disease being treated, and attracts new competitors to come up with new therapies for this condition. It is valued in $6-8 billion in terms of sales and Biogen, Roche and BioMarin are some of the companies know to be investing to be competitive in this market, with solutions that may threaten Baxalta's market share.

Immunology

This is the second largest sector of Baxalta following hematology and it is constituted by immunoglobulin therapies and biotherapies. It accounts for approximately 40% of the company's net sales and it is focused on immunoglobulin therapies. The marketed drugs on this therapy area are products such as Gammagard liquid, Subcuvia, and Hyqvia or biotherapies albumin and alpha-1 antitrypsin.

This segment reflected an annual growth of 9% in the company. The big firms competing in this area are Pfizer, Merck & Co., and Amgen.

Oncology

The smallest area of Baxalta, but a very promising one in oncology. The only oncology drug on the firm's portfolio is Oncaspar, which was only acquired in 2015. The drug is marketed in 31 countries and Baxalta forecasts its sales could reach approximately $1,9 billion by 2020. Furthermore, the company has announced its partnership with Merrimack in the development of the metastatic pancreatic cancer treatment ONIVYDE™, and its eventual success will enrich the firm's oncology portfolio.

The oncology market is expected to grow immensely in the next few year, which makes it a very attractive market to invest in.

The Deal

Shire was a big company and had already completed a number of mergers and acquisitions to get to where it was. But the truth was that none of those could compare to the acquisition they were aiming for this time. The takeover of Baxalta would be bigger than all the other deals they'd ever done together and probably one of the biggest takeovers of the year across all sectors.

According to the Chairman of Shire's Board Susan Kilsby:

> *"Our Board unanimously supports this combination with Baxalta. Following thorough analysis and discussion, our Board concluded that this proposed transaction will deliver significant value for shareholders. We urge Baxalta to engage with us to create a stronger combined company that will benefit all of our stakeholders."*[4]

The offer "to acquire all of the outstanding common shares of Baxalta in an all-stock transaction", made on July 10, 2015 had been declined on August 4, 2015, as the Illinois-based company's CEO considered the offer to undervalue the firm and said it was too soon for the company to be acquired. The offer stated Baxalta's shareholders were to receive 0,1687 Shire ADSs (American depositary shares) for each Baxalta share owned, which implied a payment of $45,23 per share of Baxalta and a premium of 36% over its price as of the 3rd of August. The proposed deal was for an all-stock transaction to maintain the tax-free nature of the spinoff. The values of the transaction also implied a total enterprise value of $33,9 billion and a 15x multiple of last twelve months EBITDA as of March 31, 2015, which were very attractive numbers in the Shire CEO's opinion. If this deal had been completed, Baxalta's shareholders would have become owners of approximately 37% of the Shire group, and a share buy-back program would have begun immediately after the acquisition to repurchase up to 13% of the post-transaction shares outstanding, within the next two years, as a way to increase the earnings accretion of the deal, maintaining financial flexibility and an investment-grade credit profile.

The failed deal had consequences on both companies' stock values, with Shire falling 5,3% to $253,60 and, contrary to that, Baxalta's jumping 11,9% to $37,11.

New global leader in rare diseases with compelling financials and strong outlook

In case Shire manages to persuade Baxalta into a deal, it is expected that the combined company reaches ~$20 billion in product sales by 2020, a billion dollar rare disease franchise business with substantial barriers to entry, and that both companies complement each other in terms of their expertise in rare diseases R&D, commercial and manufacturing, supported by global scale and infrastructure. This combination would generate thus, the new global leader in rare diseases.

The new leader would have a compelling financial profile and would create value for both companies, as it is projected double-digit top-line growth for the firm, there is a substantial amount of operating synergies to be exploited and accretion to Non GAAP earnings, breakeven in year one and sustainable returns including IRR in excess of 10% are expected.

Moreover, Shire planned more than 30 new product launches with ~$5 billion incremental sales potential by 2020 and a strong balance sheet and robust pro forma cash flow that will support future organic and inorganic growth, showing a bright future outlook for the firm. An increase with this value is very substantial considering Shire's and Baxalta's sales in FY 2015 were of $6,1 billion (increment of 80% for the companies individually and 40% for the combined company).

From August 2015 to January 2016

Since the rejection of the offer, Shire has been trying to negotiate with Baxalta to understand if an agreement between both companies would be possible, and if it was, which would be the value and form of payment to Baxalta's shareholders. Through the entire 5 months, Shire always made clear to everyone its view that the combination with Baxalta would benefit both companies, that the deal was still possible and that Shire would be "patient but disciplined" when handling the deal.

[4] DUBLIN, August 4, 2015 /PRNewswire

During the months between August and January, both Shire and Baxalta moved on with their operations and strategic agreements with different companies, whether it was with suppliers, as the extension of the agreement of Kamada supplying GLASSIA® to Baxalta until 2018 announced in October, or even the acquisition of new smaller companies as Shire did to Dyax Corp. for its hereditary angioedema (HAE) products, in a deal that amounted to a value up to $6,5 billion that occurred in the beginning of November and in which Shire paid $37,30 for each Dyax share upfront (implied premium of 37% over the closing price of 30 October 2015 – total of $5,9 billion) and with the possibility of paying an extra $4 per share if the HAE drug gets approved by the FDA before 2020 (total of $646 million).

The two global biopharmaceuticals exceeded the estimates for the 3Q reports. Sales and profits were boosted by new approvals for drugs with exclusivity in the market and/or higher prices: Shire benefited from the recent approval of Vyvanse, a drug for ADHD's treatment, and kept working on Lifitegrast, an ophthalmic solution for dry eye disease under regulatory approval, with expected sales of $700 million by 2020. Meanwhile, Baxalta announced the approval of OZIBUR in Canada and Adynovate in the U.S,, for the treatment of patients with acquired hemophilia A as of October and November respectively, and of Vovendi (for Von Willebrand disease) in December, the initiation of the pivotal clinical trial for M923 (biosimilar version of Humira), of the first in-human clinical trial of BAX 826 (for hemophilia), and the enrolment of the first patient in phase 2 study of ONIVYDE (for metastatic pancreatic adenocarcinoma). Baxalta also expanded their facilities, with the announcement of FDA approval of the Singapore facilities to enhance the reliability of the company as a supplier, and the opening of Global Innovation Center in Cambridge, Mass., dedicated to pioneering breakthroughs for patients with unmet needs.

In November, news came out that, according to Reuters, Shire was preparing a new offer including up to 40% of the payment in cash, to sweeten the deal for Baxalta, expecting it not to trigger any tax penalties in the bid. And in December, Barclays still stated that an offer from Shire up to $55 per share of Baxalta would make sense but, despite the absence of public offers, Baxalta was said to be looking for alternatives to Shire, wanting to make sure there were no best offers in the market.

Final Decision

2016 had arrived and 5 months had gone by since Baxalta had rejected Shire's offer, and they still hadn't been able to get to an agreement regarding the takeover. Should Ørnskov start looking for another company with characteristics similar to Baxalta? Should he raise the value of the offer? Should he turn it into a cash and stock offer? Time was running up and Ørnskov was determined to end the negotiations of this deal. Confident that he would accomplish what he desired, Flemming and his team met to decide what to do with relation to the Baxalta's deal.

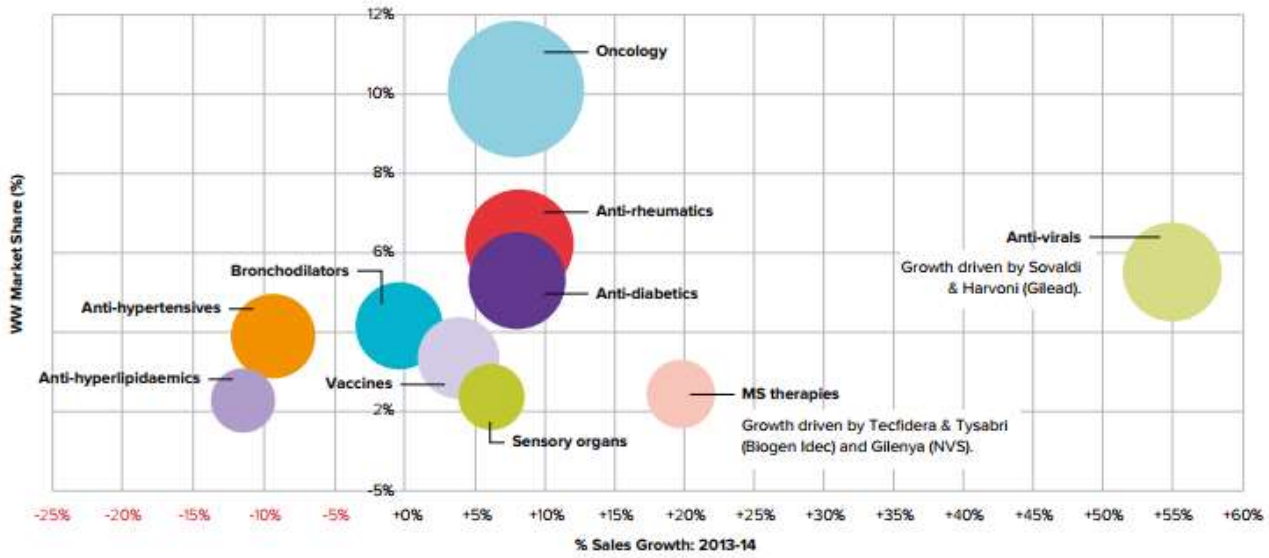
Exhibits

Exhibit 1 - New Drug Development Detailed Process with FDA Approval

- Step 1 – Discovery and Development
  - Identification and development of a promising compound
- Step 2 – Preclinical Research
  - Before testing the new drug on people, researchers need to conduct in vivo and in vitro tests to understand if the product has the potential to cause serious harm on the patients (toxicity)
- Step 3 – Clinical Research
  - In the clinical trials, the new product is tested on people and its interaction with the human body is studied. There are 4 phases of clinical trials, each one with a specific purpose:
    - Phase I: Testing on healthy volunteers for dose-ranging and safety, with a success rate around 70%;
    - Phase II: Testing on patients to assess efficacy and side effects, with a success rate around 33%;
    - Phase III: Testing on patients to assess efficacy, efficiency and monitoring of adverse reactions, with a success rate around 25-30%
    - Phase IV: Checking the efficacy and safety of the drug on a large number of volunteers who have the disease
- Step 4 – FDA Review
  - If there is evidence that the drug is safe and effective, an application to market it can be filed, seeking the approval of the FDA
- Step 5 – FDA Post-Market Safety Monitoring
  - Even though a new drug may seem safe in light of all the tests it has been subjected to, the months and even years after the product is on the market are very important to confirm if it is indeed safe. During this time, the FDA monitors the drug and may add cautions to dosage and usage information

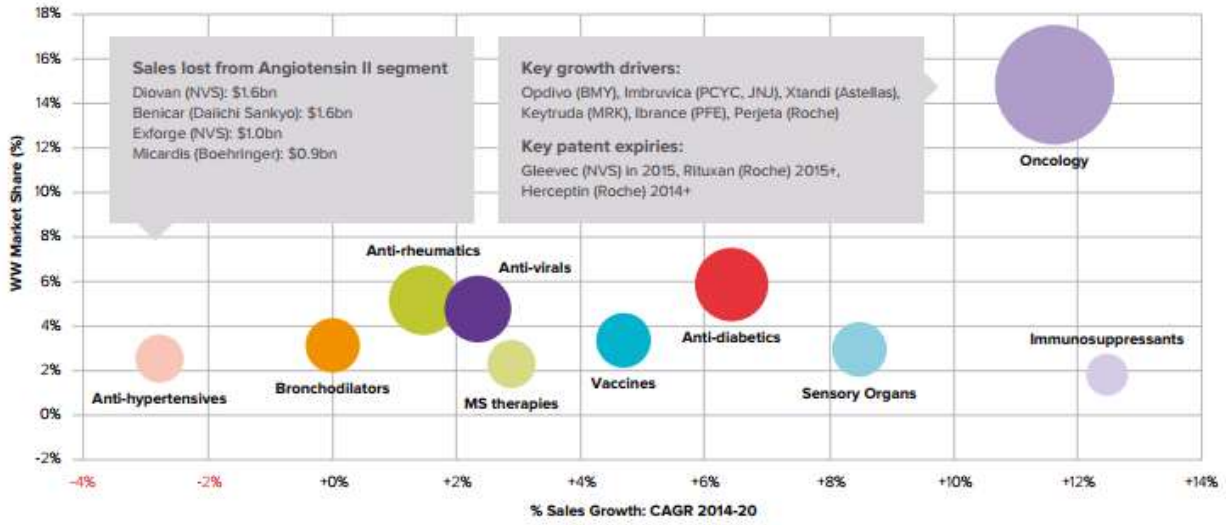
Source: "Learn About Drug and Device Approvals" – U.S. FDA

Exhibit 2 - Top 10 Therapy Sales in 2014, Market Share & Sales Growth (2013-2014) by EvaluatePharma®



Source: "World Preview 2015, Outlook to 2020" - EvaluatePharma®

Exhibit 3 - Top 10 Therapy Areas in 2020, Market Share & Sales Growth by EvaluatePharma®



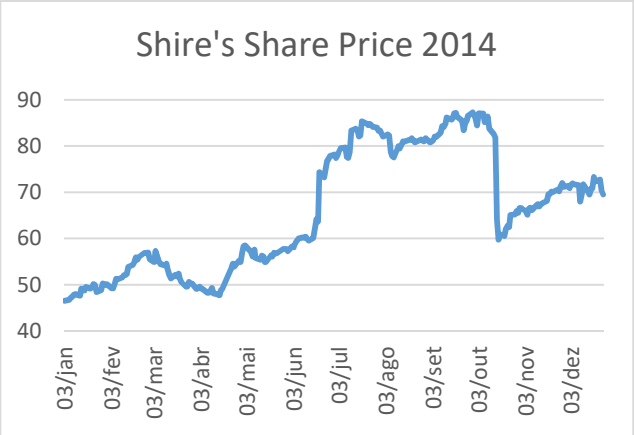
Source: "World Preview 2015, Outlook to 2020" - EvaluatePharma®

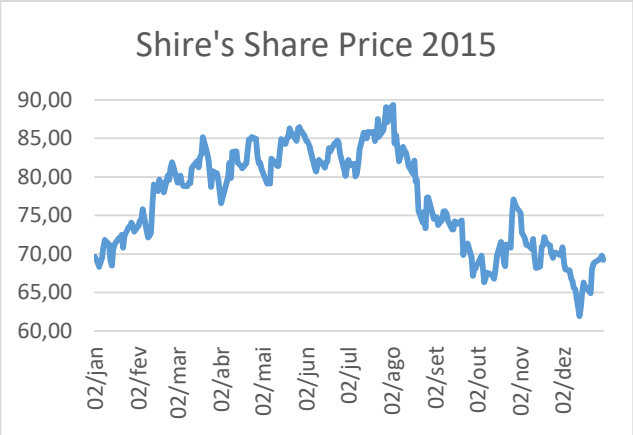
Exhibit 4 - Worldwide Prescription Drug & OTC Sales by EvaluatePharma® Therapy Area (2014 & 2020): Top 15 Categories & Total Market by EvaluatePharma®

Rank	Therapy Area	WW Sales ($bn) 2014	WW Sales ($bn) 2020	CAGR % Growth	2020 Change vs. Jun 14	WW Market Share 2014	WW Market Share 2020	WW Market Share Chg. (+/-)	Rank Chg. (+/-)
1.	Oncology	79.2	153.1	+11.6%	+0.0	10.1%	14.9%	+4.7pp	+0
2.	Anti-diabetics	41.6	60.5	+6.4%	-8.4	5.3%	5.9%	+0.5pp	+2
3.	Anti-rheumatics	48.8	53.2	+1.5%	-3.9	6.2%	5.2%	-1.1pp	-1
4.	Anti-virals	43.1	49.6	+2.3%	+4.0	5.5%	4.8%	-0.7pp	-1
5.	Vaccines	26.7	34.7	+4.4%	-6.6	3.4%	3.4%	-0.0pp	+2
6.	Bronchodilators	32.5	32.5	+0.0%	-3.4	4.2%	3.2%	-1.0pp	-1
7.	Sensory Organs	18.6	30.4	+8.5%	+2.2	2.4%	3.0%	+0.6pp	+2
8.	Anti-hypertensives	30.5	25.8	-2.8%	-0.3	3.9%	2.5%	-1.4pp	-2
9.	MS therapies	19.4	23.1	+2.9%	+1.3	2.5%	2.2%	-0.2pp	-1
10.	Immunosuppressants	9.2	18.6	+12.5%	+3.8	1.2%	1.8%	+0.6pp	+9
11.	Anti-coagulants	10.8	18.3	+9.2%	+0.5	1.4%	1.8%	+0.4pp	+6
12.	Dermatologicals	12.8	17.3	+5.2%	-1.9	1.6%	1.7%	+0.0pp	+0
13.	Anti-hyperlipidaemics	17.8	15.1	-2.6%	+2.1	2.3%	1.5%	-0.8pp	-3
14.	Anti-fibrinolytics	11.4	14.7	+4.3%	-1.8	1.5%	1.4%	-0.0pp	+1
15.	Anti-bacterials	13.4	14.5	+1.4%	-3.2	1.7%	1.4%	-0.3pp	-4
	Top 15	416	561	+5.1%		53.2%	54.6%	+1.3pp	
	Other	365	468	+4.2%		46.8%	45.4%	-1.3pp	
	Total WW Rx & OTC Sales	781	1,029	+4.7%		100.0%	100.0%		
	Total 'Rx & OTC Sales' includes:								
	WW Generic Sales	74.2	111.9	+7.1%		9.5%	10.9%	+1.4%	
	OTC Pharmaceuticals	37.7	42.1	+1.8%		4.8%	4.1%	-0.7%	

Source: "World Preview 2015, Outlook to 2020" - EvaluatePharma®

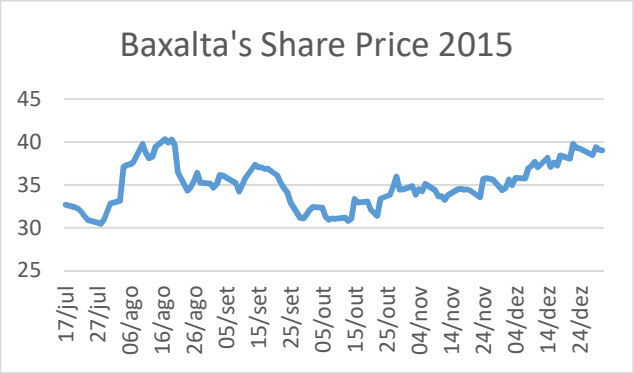
Exhibit 5a) – Shire's Share Price ($) in 2014 and 2015





Source: Bloomberg

Exhibit 5b) – Baxalta's Share Price ($) in 2015



Source: Bloomberg

Exhibit 6 – Shire's Revenues FY 2015 and Last Patent Expiry Date

Drug Name	Year to December 31, 2015 $'M	% of FY 2015 Sales	Latest Patent Expiry
Vyvanse	1722,2	28,2%	02/24/2023
Lialda	684,4	11,2%	06/08/2020
Cinryze	617,7	10,1%	Expired
Elaprase	552,6	9,1%	03/09/2019
Firazyr	445,0	7,3%	07/15/2019
Replagal	441,2	7,2%	Expired
Adderall xr	362,8	5,9%	04/21/2019
Vpriv	342,4	5,6%	Expired
Pentasa	305,8	5,0%	Expired
Fosrenol	177,6	2,9%	12/01/2030
Gattex	141,7	2,3%	11/01/2025
Other product sales	116,2	1,9%	
Xagrid	100,8	1,7%	Expired
Intuniv	65,1	1,1%	01/04/2023
Natpara	24,4	0,4%	01/12/2021
Total Product Sales	**6099,9**		
Royalties	300,5		
Other Revenues	16,3		
Total Revenues	**6416,7**		

* Most of the drugs which patents have expired were granted the status of orphan drugs and benefited from a period of market exclusivity

Source: Shire Annual Report 2015

Exhibit 7 – Shire's Consolidated Balance sheet 2015

	Dec 31, 2015 $'M	Dec 31, 2014 $'M
Assets		
Current assets:		
Cash and cash equivalents	**135,5**	**2982,4**
Restricted cash	**86**	**54,6**
Accounts receivable, net	**1201,2**	**1035,1**
Inventories	**635,4**	**544,8**
Deferred tax asset	**-**	**344,7**
Prepaid expenses and other current assets	**197,4**	**221,5**
Total current assets	**2255,5**	**5183,1**
Non-current assets:		
Investments	**50,8**	**43,7**
Property, plant and equipment, net ("PP&E")	**828,1**	**837,5**
Goodwill	**4147,8**	**2474,9**
Other intangible assets, net	**9173,3**	**4934,4**
Deferred tax asset	**121**	**112,1**
Other non-current assets	**33,3**	**46,4**
Total assets	**16609,8**	**13632,1**
Liabilities and equity		
Current liabilities:		
Accounts payable and accrued expenses	**2050,6**	**1909,4**
Short-term borrowings	**1511,5**	**850**
Other current liabilities	**144**	**262,5**
Total current liabilities	**3706,1**	**3021,9**
Non-current liabilities:		
Long-term borrowings	**69,9**	**-**
Deferred tax liability	**2205,9**	**1210,6**
Other non-current liabilities	**798,8**	**736,7**
Total liabilities	**6780,7**	**4969,2**
Commitments and contingencies		
Equity:		
Common stock of 5p par value; 1,000 million shares authorized; and 601.1 million shares issued and outstanding (2014: 1,000 million shares authorized; and 599.1 million shares issued and outstanding)	**58,9**	**58,7**
Additional paid-in capital	**4486,3**	**4338**
Treasury stock: 9.7 million shares (2014: 10.6 million shares)	**-320,6**	**-345,9**
Accumulated other comprehensive loss	**-183,8**	**-31,5**
Retained earnings	**5788,3**	**4643,6**
Total equity	**9829,1**	**8662,9**
Total liabilities and equity	**16609,8**	**13632,1**

The accompanying notes are an integral part of these consolidated financial statements.

Source: Shire Annual Report 2015

Exhibit 8 – Shire's Income statement 2015

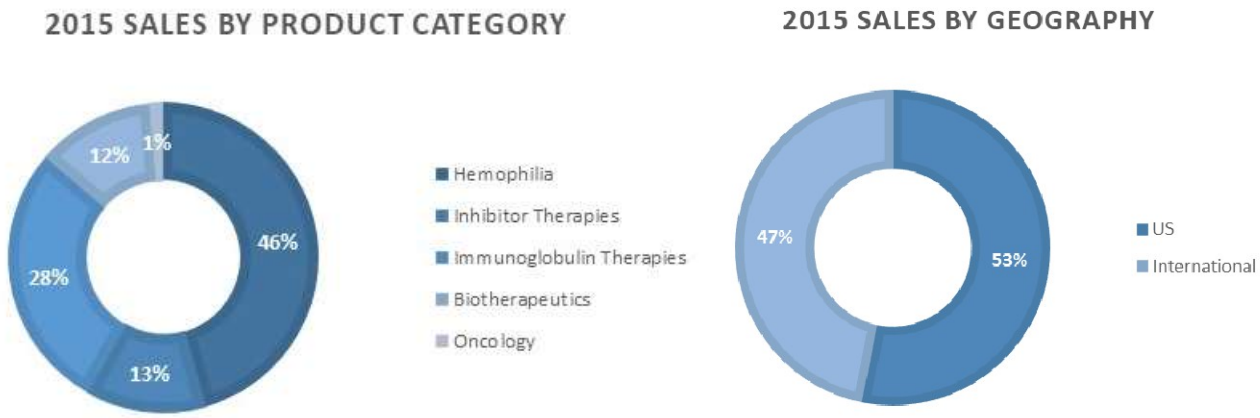
Year to December 31,	2015 $'M	2014 $'M
Revenues:		
Product sales	**6099,9**	**5830,4**
Royalties	**300,5**	**160,8**
Other revenues	**16,3**	**30,9**
Total revenues	**6416,7**	**6022,1**
Costs and expenses:		
Cost of product sales	**969**	**979,3**
Research and development	**1564**	**1067,5**
Selling, general and administrative	**2341,2**	**2025,8**
Goodwill impairment charge	-	-
Gain on sale of product rights	**-14,7**	**-88,2**
Reorganization costs	**97,9**	**180,9**
Integration and acquisition costs	**39,8**	**158,8**
Total operating expenses	**4997,2**	**4324,1**
Operating income from continuing operations	**1419,5**	**1698**
Interest income	**4,2**	**24,7**
Interest expense	**-41,6**	**-30,8**
Other income/(expense), net	**3,7**	**8,9**
Receipt of break fee	-	**1635,4**
Income from continuing operations before income taxes and equity in (losses)/earnings of equity method investees	**1385,8**	**3336,2**
Income taxes	**-46,1**	**-56,1**
Equity in (losses)/earnings of equity method investees, net of taxes	**-2,2**	**2,7**
Income from continuing operations, net of taxes	**1337,5**	**3282,8**
(Loss)/gain from discontinued operations, net of taxes	**-34,1**	**122,7**
Net income	**1303,4**	**3405,5**
Earnings per ordinary share — basic		
Earnings from continuing operations	**226,5¢**	**559,6¢**
(Loss)/gain from discontinued operations	**-5,8¢**	**20,9¢**
Earnings per ordinary share — basic	**220,7¢**	**580,5¢**
Earnings per ordinary share — diluted		
Earnings from continuing operations	**225,5¢**	**555,2¢**
(Loss)/gain from discontinued operations	**-5,8¢**	**20,8¢**
Earnings per ordinary share — diluted	**219,7¢**	**576,0¢**
Weighted average number of shares (millions):		
Basic	**590,4**	**586,7**
Diluted	**593,1**	**591,3**

Research and development ("R&D") includes IPR&D intangible asset impairment charges of $643.7 million for the year to December 31, 2015 (2014: $190.3 million). Selling, general and administrative ("SG&A") costs property rights acquired of $498.7 million for the year to December 31, 2015 (2014: $243.8 million) include amortization of intangible assets relating to intellectual

The accompanying notes are an integral part of these consolidated financial statements.

Source: Shire Annual Report 2015

Exhibit 9 – Baxalta's FY 2015 Sales by Product and Geography



Source: Baxalta Annual Report 2015

Exhibit 10 – Baxalta's Enterprise Value

In Millions of USD except Per Share	FY 2014	FY 2015
12 Months Ending	**12/31/2014**	**12/31/2015**
Market Capitalization	**—**	**26 512,6**
- Cash & Equivalents	0,0	1 001,0
+ Preferred Equity	0,0	0,0
+ Minority Interest	0,0	0,0
+ Total Debt	551,0	5 268,0
Enterprise Value	**—**	**30 779,6**
Total Capital	**6 298,0**	**9 192,0**
Total Debt/Total Capital	8,75	57,31
Total Debt/EV	—	0,17
EV/Sales	**—**	**5,01**
EV/EBITDA	**—**	**21,97**
EV/EBIT	**—**	**26,91**
EV/Cash Flow to Firm	**—**	**36,71**
Diluted Market Cap	**—**	**26 657,5**
Diluted Enterprise Value	**—**	**30 924,5**
Periodic EV to Shares Outstanding	**—**	**45,31**
Reference Items		
Trailing 12 Month Values for Ratios		
Sales	5 952,0	6 148,0
EBITDA	1 842,0	1 401,0
EBIT	1 636,0	1 144,0
Cash Flow To Firm	1 373,0	838,5
Free Cash Flow To Firm	403,0	-377,5

Source: Bloomberg

Exhibit 11 – Top M&A Deals of 2015 in Terms of Total Value

Acquirer	Target	Total Value ($'B)	% in cash	Value/share $	Premium	EV/EBITDA
Pfizer	Allergan	160,00	0%	363,63	16%	21,4x
Teva Pharmaceutical Ind.	Allergan - Global Generics	40,50	83%	-	-	16,5x
Abbvie	Pharmacyclics	20,80	58%	261,25	39%	15,3x
Pfizer	Hospira	16,80	100%	90	42%	23.2x
Danaher	Pall	13,80	100%	127,20	28%	16,2
Valeant Pharmaceuticals Int.	Salix Pharmaceuticals	15,80	90%	173,00	44%	34x
Alexion Pharmeceuticals	Synageva	8,40	50%	230,00	140%	NM
Par Pharmaceutical	Pharma Endo Int.	8,05	81%	-	-	11x
Celgene	Receptos	7,20	100%	232,00	12%	NM
Shire	Dyax	5,90	100%	37,30	35%	NM
Shire	NPS Pharmaceuticals	5,20	100%	46,00	51%	NM

Source: Bloomberg and Companies Websites

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DATE: JANUARY, 3, 2018

Shire + Baxalta

New global leadership in the rare disease sector?

-Teaching Note

Summary of the case

Shire Plc is a Dublin-headquartered biopharmaceutical company founded in 1986 by four Irish man, with the purpose of finding the solution for unmet medical needs. The company has grown a lot through strategic acquisitions focusing mainly on its biggest therapy areas in terms of sales - Neuroscience and LDSs – and registering sales of $6,1 billion in the FY of 2015. Baxalta is an American-based biopharmaceutical company that resulted from the spinoff of the biosciences division of Baxter International on the 1st of July 2015. The company markets innovative biopharmaceuticals in the therapy areas of hematology, immunology and Oncology. In the FY of 2015, the company's sales amounted for a total of $6,2 billion.

On the July 10th 2015, Shire made a $30B offer to acquire Baxalta in an all-stock transaction, in which shareholders would receive 0,1687 ADS's (American Depositary Shares) for each Baxalta's share owned, implying a payment of $45,23/share and a premium of 36% over the price of Baxalta's shares as of 3 August, 2015, the day prior to the public announcement of the offer. With the combination with the global company, Shire intended to become the new global leader of the rare diseases. It was predicted that the combined company would have double-digit top-line growth, substantial operating synergies ($500 million within the first three years after the deal is closed), ~$20 billion on product sales and more than 30 new products launched by 2020. Although Shire's management considered this to be a very attractive offer, the CEO of Baxalta, Ludwig N. Hantson, saw it as an undervaluation of the firm he managed, rejecting it.

In the beginning of 2016, the two companies still hadn't reached an agreement, despite the attempted negotiations by Shire, who were convict the deal would be extremely positive for both firms. The Irish company was considering increasing the offer and paying some of it in cash to sweeten the deal for Baxalta.

After 6 months of negotiations, in 11 January, 2016, Baxalta and Shire agreed on the terms of the acquisition, with Shire paying Baxalta's shareholders a combination of $18 in cash and 0,1482 Shire ADS's for every Baxalta's share, implying the payment of $47,50/share, a premium of 37,5% over the price of Baxalta's shares in August 3, 2015 and consequently valuing the biopharma company in $32 billion.

Teaching Objectives

The case of Shire + Baxalta refers to the attempt of a takeover and its negotiations, involving two large companies within the pharmaceutical industry between August 2015 and January 2016, in which the comprehension of the particularities of the industry itself and the way it operates are crucial to the understanding of the case.

Through the case resolution, the concepts of organic and inorganic growth and its importance and impact in different situations and markets should be clarified. Students should be able to indicate the assets with the highest value in a company such as the one being acquired and the main drivers to go or not go through with this takeover from both sides of the negotiations table.

The key issue of the case is the valuation of Baxalta. Students are oriented in a way to discover which of the possible different valuation approaches better fits the circumstances. The comprehension of real options and its complexity should be encouraged as well as the big limitations of the DCF approach in businesses that are so R&D intensive as the ones in the pharmaceutical industry. As a solution, students should use the multiples valuation method and use deals similar to the one being studied to understand the value that should be offered. The concept of synergy should also be deepened and accounted for whilst valuing the firm.

The case is designed for the students to analyse the deal either from the buyer's and the seller's perspective, but the biggest decision forces them to think strategically and take the place of the buyer's Management Team.

Possible Poll Questions

1. Which are the biggest strengths and risks Shire and Baxalta face considering the industry and sector where they are positioned and the conjuncture of the past few years?
2. What is the role that inorganic (and organic) growth plays in the development of the pharmaceutical industry? Does the "Patent Cliff" influence the importance of inorganic growth?
3. Is a company with a track of successfull acquisitions better qualified to do a new one than a company with no experience? What about the case of Shire and Baxalta? Did the previous deals prepare Shire for this acquisition?
4. Does Baxalta have the right strategic fit for Shire?
5. Why is the valuation of pharmaceutical companies so uncertain? Which are the most significant factors that contribute to that? Why does a pure DCF approach underestimate the true potential of the firm? How can the true value be calculated?
6. What is the sealing price Shire should offer to Baxalta's shareholders according to the Multiples method? And which is the implied premium payed? Is it appropriate?
7. What should Flemming and his team decide regarding the purchase of Baxalta?

Class Plan

1. ***Which are the biggest strengths and risks Shire and Baxalta face considering the industry and sector where they are positioned and the conjuncture of the past few years?***

Both Shire and Baxalta are companies operating in the pharmaceutic industry and in the rare disease sector. This makes some of their strengths and risks to be similar but the fact that they are specialized in different therapy areas, gives them unique characteristics that should be analysed.

Both companies have strong characteristics that make them succeed. To begin with, it is important to highlight a couple of strengths which are intrinsic to the market itself. Both companies are positioned in a market which is not too exploited by their competitors and that gives them room to grow and discover completely new treatments in a way that would not be possible in a stable and saturated market with fierce competition. This market allows the companies to deal with less competition (although the number of competitors is growing quite fast) and price their new products higher and with higher margins than most markets would. Moreover, they can "easily" be pioneers in the treatment of certain diseases, gaining the trust and loyalty of the patients and establishing a strong position in the market with the launch of fewer drugs than it would usually be needed.

And if one analyses each of the companies in particular, they will find that they have characteristics that make them unique: Shire is focused on the therapy areas of neuroscience, LSDs, GI/Endocrine, HAE and is investing in ophthalmic. The new drug in the ophthalmic area developed by the company, Lifitegrast, is subject to regulatory approval, and its approval is expected to be very beneficial for the company, with sales reaching $700 million by 2020. Moreover, the firm keeps expanding and diversifying its portfolio with successful strategic acquisitions, consolidating its position in the market. Additionally, the report for the 3Q of 2015, show the company exceeded the expectations for this period. Shire is also developing new drugs and expects to market around 10 new products by 2020. On the other hand, the biggest strengths of Baxalta are its leading position in the hematology area, with ~50% market share in the hemophilia market, its emerging investment on oncology, with the acquisition of Oncaspar and the program to develop a treatment to pancreatic cancer, and the project for the launch of 20 new products by 2020 in the three therapy areas the firm focuses on.

Regarding the risks these firms face, the same thing is verified: some are intrinsic to the market and other are company-specific. Firstly, in the business of selling drugs, companies always have the problem of expiring patents. When the patent on a product expires, the generics competition kicks in and the revenues of the branded product decrease substantially, which is obviously harmful for the company. Secondly, as in the previously mentioned problem, the risk of the large investment in R&D, is a risk that hurts every pharma company. Firms can spend huge amounts of money trying to discover the treatment for a specific disease and, after all the hard work and investment, still be left with nothing either because the drug had too many problems to be worth further investment or because de FDA didn't approve it.

Summing up to the aforementioned risks it is important to highlight the fact that Shire was a target of an attempted acquisition by AbbVie, a deal which ended up not happening due to matters with the US tax laws, but still shows that the company can be in a situation of "buy big or be bought", increasing the pressure to make a purchase. Baxalta presents a different risk given that its revenues are very dependent of the hematology drugs, which account for almost 60% of its total. This presents a risk for the company as the competition in this market is increasing and that can be harmful for the American company's sales.

2. ***What is the role that inorganic (and organic) growth plays in the development of the pharmaceutical industry? Does the "Patent Cliff" influence the importance of inorganic growth?***

The first thing needed to answer this question is to clarify the concepts and differences of organic and inorganic growth. Organic growth refers to the internal growth of the company, obtained by increasing output and enhancing sales, whilst inorganic growth is the growth rate related with mergers and acquisitions.

Is it always important to grow organically independently of the business or industry? Every company should work to optimize their operations to be able to increase their output with minimal increase in costs, expand in geography and product lines and reach as many clients as possible, achieving higher profits with internal change. This kind of growth confers the company a steady and stable long time growth, although it may take some time to achieve the results wanted.

The particularities of the pharmaceutical industry give inorganic growth a higher importance than usual. This importance is even further enhanced in conjunctures as the one the industry is going through with the phenomenon known as *Patent Cliff.* The *Patent Cliff* refers to the mass expiration of patents that has been occurring in the past few years. It allow the generic products to be launched and has big consequences in the revenues of the big firms that lost product exclusivity. These companies feel the need to develop and market a large amount of new drugs in a short amount of time and with lower capital (result of the decrease in revenues), which is nearly impossible to accomplish without recurring to inorganic growth. Thus, companies need to conjugate their own R&D with the outsourcing of some of the first and most risky stages of development and with the acquisition of entire companies or segments of companies with their products, pipeline and new drugs development.

The inorganic growth allows the company to grow faster in the short term with the acquisition or the merger, to reduce the risk of discovering and developing drugs from scratch, because the acquired companies have products that were already approved or are in different stages of approval, and even to mitigate the risk of entering a new market in which the firm has no knowledge whatsoever, if the acquired company has already established itself and gained experience on such market. Opposite to that, this type of growth also carries some risks such as the risk of the integration process not going as planned and the possibility of losing the know-how with the key employees abandoning the company, or even the risk the synergies that were actually realized after the acquisition may not correspond to the predicted synergies before the deal, resulting in lower values of cost savings or sales improvement than expected, and implying an overvaluation of the target company.

3. ***Is a company with a track of successful acquisitions better qualified to do a new one than a company with no experience? What about in the case of Shire and Baxalta? Did the previous deals prepare Shire for this acquisition?***

An acquisition is constituted by a number of steps and, for each one, different skills and knowledge are necessary. The steps of an acquisition will be roughly described to clarify the process: the acquisition begins with the development of an acquisition strategy followed by the process of searching and choosing the right company to combine with, and this is really a crucial step for the entire process because if you fail here, everything else is basically worthless. After that comes the valuation, the offer to the target company, negotiations and the due diligence process. If the deal is successful, after closing and setting the financing strategy, the final step, integration process of the acquired company, begins. Each of these steps plays a vital role in guaranteeing the success of an acquisition.

A study made by The Boston Consulting Group (BCG)[1] shows "acquisitions more often than not destroy value" and, when asked to corporate leaders why did the acquisitions failed to create the expected value, the reasons mainly fall into three categories: "poor deal preparation and execution

(including target selection and strategic fit); inadequate PMI; and bad market timing". The three key takeaways that BCG considered every company should take in consideration when acquiring are: "cast a wide net, but prepare to seize opportunity; effective PMI is imperative; and timing and communication matter". Let's consider these three important categories to understand if the experience with previous acquisitions can or not, be valuable.

The first takeaway to consider is "cast a wide net, but prepare to seize opportunity". This relates to the beginning steps of the process like the M&A strategy, the search of a target and the final choice. The recommendations for BCG for the problems within these steps of the process are that the acquirer should analyse the industry and its trends, they should have an M&A strategy before starting the search for a target, and that the search should be rigorous, without shortcuts, embedded in the process of the organization, for future screening processes, but still flexible enough so that the firm can take an opportunistic and fast step when one presents itself. With this type of issues, an experienced company in terms of M&A deals would have a clear advantage over a first-timer. All of these recommendations are perfected over time and get more clear and systematic with repetition.

Moving on to the second takeaway, effective PMI (post-merger integration) is imperative. One of the most common problems with an acquisition is the after closing integration. It needs to be fast (shareholders expect cost cutting synergies within 12 to 36 months after the deal is signed), to maintain day-to-day cash flows and to change the culture, habits and norms of one or both companies all at once, which is obviously a very difficult task for managers. According to BCG, deals done by "one-timers" (with only one acquisition in the last five years) only deliver an average relative total shareholder return (RTSR) of 2%, and only 43% of these deals generate positive shareholder returns. The numbers for more frequent buyers are higher and vary between 6-8% RTSR and 51-56% of positive shareholder returns' generation. The study shows that "one-timers" are most likely to underestimate the challenges of PMI and to overestimate the synergies, whilst more experienced buyers are more likely to understand and have high incentives to overcome the obstacles of this difficult step.

Lastly, timing and communication matter. The best time for an acquisition is when the economic growth and the volatility of the market are low. This is the time when the return is higher. In times when the growth is high, the deal often fail to have positive returns. This doesn't seem to depend much on the experience of the buyer rather than on its attention to the macro environment. A completely different subject is to talk about communication. This is entirely a responsibility of the management team and can make a major difference to the well-being of the company in an M&A deal. The thing is that capital market hate surprises thus, regular and transparent communication between managers and shareholders is very important. One very important thing is to manage the expectations of the investors about the synergies the combination of the companies can generate, because if the expectations are too high, they are impossible to meet. The best practices are to show a bit of a background to demonstrate the deal makes sense, explain the rationale takes in consideration the macro economic conditions and the company is a good strategic fit for them, and finally disclose conservative values of the synergies to be obtained by the combination.

Considering everything, it is safe to say that, generally speaking, an experienced company is much more like to make a successful M&A deal than a one timer. But what about cases like the one of Shire's acquisition of Baxalta in which the value of the offer is as big as the sum of all the other acquisitions of the company? What if the deal is as different as this one is from the previous ones?

In this case, although Shire still has some advantage from its previous deals, and it is of great value when selecting the target, negotiating, choosing the right time and even when it comes to the communication skills, its biggest "loss" is when it comes to the PMI, in that matter, the company is not prepared at all for this kind of acquisition from its previous ones. The thing is integrating a small company with a few hundreds of workers and a handful of ongoing projects and marketed drugs is completely different from integrating one with 16.000 employees and a large number of ongoing projects and drugs in the market. It is clear that, in a case like this, Shire

will have the need to learn from scratch what the best practices are and what is needed to successfully integrate Baxalta if the deal is closed.

4. Does Baxalta have the right strategic fit for Shire?

According to Barclays, if the offer is up to $55/shr of Baxalta, the deal makes sense for Shire, and according to the Bloomberg Gadfly columnist Brooke Sutherland[2], a deal between $46,50 and $48 per share, is attractive enough for Baxalta to accept and low enough to keep the possibility of earnings accretion for Shire in 2017. But what if we look beyond the pure mathematical side of the price matter and evaluate the combination between both companies? Does it still make sense or is it too risky for Shire? This is actually not a simple question at all, given that even the analysts and investors fail to agree on it. The truth is, whilst analysts like Jason Gerberry said it was "a good strategic fit and financially attractive", the actions of investors showed they are not so sure about that – after the announcement of Shire's offer (4 August 2015), Shire's shares fell 4% to £55.

When trying to answer this question, it is essential to look at the positive and the negative aspects that can come out of the combination. In the upside, it is easy to see some of the benefits this union would have: the creation of the global leading company on rare diseases, the reduction of taxes, the potential synergies that can be exploited, which would produce substantial cost savings and enhance the product lines and company growth in a way the firms wouldn't reach on their own (Baxalta alone, was planning the launch of 20 new products before 2020), and the creation of value for both company's shareholders. Shire's shareholders can see their company grow faster, diversify its portfolio and enhance its cash flows. In the other side, Baxalta's shareholders benefit from an immediate premium over the shares owned, and the possibility of faster growth and diversification.

The bet on two strong therapy areas in the rare disease sector is a strategic option in the path to become the leader in the market, and surely will bring benefits to the combined company but, the bet on oncology is also a very important part of this deal, as this therapy area is expected to increase its market share within the worldwide pharmaceutical market and to have an even higher increase in sales. This means that a bet in this area may be very profitable in the years ahead.

But it would not be clever to consider the benefits without taking a good look at some of the biggest risks of the deal. The first thing to consider is the price: if we consider the purchase is in accordance with the projected value of around $48 per share, it is implied that the company is bought at roughly 6x its revenues of 2015, a value in line with the big companies sales in the pharmaceutical and biotechnological markets over the last decade, but Baxalta's growth is slower than many of those target companies, which makes one wonder if this deal looks a bit expensive and if there is no other better alternative for Shire.

Another risk that is important to consider is that the growing competition in the hemophilia market can also create a problem, considering that around 45% of Baxalta's earnings rely on the treatment of the blood disorder. The growing market and consequent growth in the number of competitors is obviously dangerous to the dominance of the firm in this therapy area. It's thus important to diversify the portfolio in different practise areas, as Baxalta is doing with the bet on Oncology drugs. In reference to this problem, Baxalta is protecting themselves with the approval of new hemophilia medicine, and the diversification of the portfolio with oncology and immunology. Plus, the costumers are usually, not keen on changing when they are happy with the product, which is good for the American pharmaceutical.

The last evident big risk is related to the size of Baxalta. With the combination of the companies, Shire will roughly triple the number of employees and increase the number of facilities, projects and drugs in the market immensely. This is something that can go either way: if the integration process go smoothly, the companies' interests are aligned and the company adapts itself fast to this big boost, the benefits can be huge and it will definitely be proven to have been worth it. But, if things don't go that well, this may create a major problem to Shire. The firm may lose valuable

human assets (usually one of the most important ones in areas where R&D has such a central role), it can jeopardize the synergies that could came from the combination and can even lose focus on their operations due to the resources and management's focus on the integration, hurting its own cash flows.

To sum up, given the big amount of advantages this deal can bring to Shire, if the two biggest "red flags" are controlled - the price offered kept at a reasonable value, the protection of the leading position in the hemophilia drug market, the strong bet in growing markets as oncology and the elaboration and implementation of a very strong integration process, Baxalta is a good strategic fit for Shire, considering the short and long term goals Shire is aiming for.

5. ***Why is the valuation of pharmaceutical companies so uncertain? Which are the most significant factors that contribute to that? Why does a pure DCF approach underestimate the true potential of the firm? How can the true value be calculated?***

The valuation of the company is the most important factor when accessing the fairness of any offer, but it can also be a very tricky process, especially in industries like the pharmaceutical, in which most of the value of the each firm is in the products that are yet to be developed. The expiration of patents and the uncertainty of the products to be marketed in the future, make the valuation of pharma companies very hard to determine. The trends in this industry are not only hard to estimate but even harder to meet, as the product development duration and success is extremely uncertain. Moreover, in case a competitor company reaches technological advances or breakthrough methodologies, to which the firm does not have access, it can be very hard to keep up with the cadence of the launching of new products, as the processes become obsolete and, consequently very time and cost consuming.

In companies as Baxalta, a lot of factors must be taken into consideration so that its valuation is as accurate as possible. One needs to consider the existent assets, such as the facilities and the marketed products (taking into account the patents that will expire), but also the drugs that are being developed and tested by the R&D teams (accounting for the ones that will succeed, the ones that will fail, and even the ones that will actually be marketed but not with the purpose that they were being created for). This means that, using the traditional DCF methodology, the value of the firm would be underestimated. The real value of the undeveloped drugs can be estimated using a methodology based on options similar to the financial options, but with an adjusted application of the Black and Scholes model to value real options. The large number of factors that need to be considered, make the valuation of a pharma company, a very complex process, especially when relying on these valuation methods.

An alternative valuation method is the use of multiples, comparing Baxalta with similar companies (comparable companies) in terms of size, industry, markets and geography. The choice of the comparable companies is extremely important given that this industry has values that cannot be compared with the rest of the market (for example a higher price-to-earnings ratio due to the R&D costs of a drug being paid a long time before the drug starts producing revenues) and because any big disparities between companies, even within the same industry, may result naturally in very different ratios, without them having any relation to the relative performance of the companies. This method uses equity or enterprise multiples as PE or EV/EBITDA from the selected comparable companies to compute a market multiple and, finally, multiply it with the measure of the target company to obtain its equity or market value respectively.

6. ***What is the sealing price Shire should offer to Baxalta's shareholders according to the Multiples method? And which is the implied premium payed? Is it appropriate?***

Although the valuation method, as described, would be a good one to value the target companies as Baxalta, it is still not accurate enough. This valuation does not consider the premium that should be payed to the acquired company's shareholders, it only accounts for the estimated

company's market value. To understand the true value one should offer to acquire a target company is to use multiples of other recent and similar acquisitions. Through these multiples, the buyer company can have a real sense of how much the market is paying in acquisitions as the one they intend to do, already considering the synergies and negotiation levers.

The deals used to reach a "market multiple" were the biggest deals of 2015, because in an industry as volatile as the pharmaceutical and the biotechnological, it is very important to have in mind that the multiples of acquisitions made a couple of years ago may be very different from the ones practiced today. Besides, in terms of size, given that the deal of Shire and Baxalta's revolves around $30 billion, one of the biggest deals of the year, it would not be appropriate to compare it with very small deals.

After the selection of the companies to use, it becomes necessary to choose the most appropriate multiple to use in this specific industry. EV/EBITDA is one of the most used multiples in the valuation of companies for takeovers, especially for capital intensive businesses like the pharmaceutical ones, amongst other reasons because it is less sensitive to the capital structure and can, thus, be used to compare companies with different debt levels. In theory, a valuation with a lower multiple than the market one is underestimated and one with one higher than the average is overestimated. High growth industries such as the one in study are expected to have a very high EV/EBITDA multiple. The table with the companies and their EV/EBITDA multiples is presented in exhibit x and an average was computed (excluding the outliers) to reach a market multiple of 18,3x. The value offered and rejected in the previous August was around $30 billion ($33,9 billion including debt), which implies a EV/EBITDA of 15x (considering the last twelve months EBITDA as of March 31, 2015). A 15x multiple is considerably below the market, indicating the value of the offer can be increased and still be a good deal for Shire. If the 17,3x multiple is applied to the EBITDA of Baxalta, the total value, including debt, is of $39 billion and the value payed is $35,2 billion. This is, in theory, the highest value Shire should offer to Baxalta and it would imply a premium of 45% over Baxalta's share price on August 3, 2015, indicating this price is may be a little too high, given that the average premium in 2015 pharmaceutical deals was 39%. If the average premium was applied, the EV would be of $34,6 billion and the EV/EBITDA of 15.3x but, as it has already been established, this is an industry where every specificity can have a big weight on the value of a company and for that reason, every deal needs to take into account as many of the specificities as possible.

For that, it is important to consider the predicted quantifiable benefits that will come of this purchase to know how much to pay for Baxalta. The combined company is expected to have ~$5 billion incremental sales until 2020 and to carry out more than $500 million in cost-cutting within the first 3 years after closing the deal.

On the 11th of January, 2016 both companies agreed on the deal terms, with Baxalta's shareholders receiving $47,50/share, a premium of 37,5% over the price of Baxalta's shares in August 3, 2015. The price payed per share implied a transaction of $32 billion, a value that corresponds to an EV/EBITDA of 16x, quite bellow the market average.

7. What should Flemming and his team decide regarding the purchase of Baxalta?

According to the analyses made throughout this case, it is concluded that companies in this industry and conjuncture have the need to grow, entering new markets and strengthening their positions in market they already operate through M&A deals. Considering this need and the strategy Flemming wants to employ of becoming the global leader in the rare disease sector, and being aware of the strength and weaknesses/risks of both companies Baxalta is indeed a go candidate for the next deal of the company.

Considering then Baxalta as the target to get, and concluding that Shire should not give up easily on the American company, it is very important to make sure Shire is prepared to handle the takeover in the best way possible. This means Shire should be aware of the difficulties and obstacles they are to have in the concretization of the predicted synergies, and have a plan to

positively integrate Baxalta after the merger to mitigate as much as possible the risk of destroying value with the acquisition instead of creating value with it.

The last important thing to be decided by Flemming and his team is the new offer to present. It was concluded that the offer should not be higher than $38 billion including debt, which corresponds to a value of $51,4 per share, with a premium of 55% over the value of August 3, 2015, and with an implied EV/EBITDA of 16,8x and the offer can be sweetened by the alteration in the way of payment, adding cash to the offer. The problem here is the tax burden that may arise from the cash payment, given the status of recently spun-off company that Baxalta has. Thus, Flemming should have legal and fiscal advice on the consequences of different amount of cash in the offer and act according to it, offering a percentage of cash per share that is very attractive to the shareholders and that doesn't create tax problems to the company.

The actual amount payed in cash was $18 per share, corresponding to around 38% of the total payment of $47,50/share. This value was found to not create a tax burned associated with the cash payment and still fulfil the goal of making the offer more attractive to Baxalta's shareholders.

Literature References

1 - Jens Kengelbach, G. K. (2015, October 12). From Acquiring Growth to Growing Value. bcg.perpectives.

2 - Sutherland, B. (2016, January 4). Is Baxalta Just Right For Shire? BloombergGadfly.

Exhibits – Teaching Note

Exhibit TN-1 – Top M&A Deals of 2015 in Terms of Total Value and Average Premium and Multiple

Acquirer	Target	Total Value ($'B)	% in cash	Value/share $	Premium	EV/EBITDA
Pfizer	Allergan	160,00	0%	363,63	16%	21,4x
Teva Pharmaceutical Ind.	Allergan - Global Generics	40,50	83%	-	-	16,5x
Abbvie	Pharmacyclics	20,80	58%	261,25	39%	15,3x
Pfizer	Hospira	16,80	100%	90	42%	23.2x
Danaher	Pall	13,80	100%	127,20	28%	16,2
Valeant Pharmaceuticals Int.	Salix Pharmaceuticals	15,80	90%	173,00	44%	34x
Alexion Pharmeceuticals	Synageva	8,40	50%	230,00	140%	NM
Endo International	Par Phamaceutical	8,05	81%	-	-	11x
Celgene	Receptos	7,20	100%	232,00	12%	NM
Shire	Dyax	5,90	100%	37,30	35%	NM
Shire	NPS Pharmaceuticals	5,20	100%	46,00	51%	NM
Average*					**39%**	**17,3x**

* The average was computed without the outliers
Source: Bloomberg and Companies Websites