Department of Business and Management Chair of M&A and Investment Banking

Corporate restructuring trends in the pharmaceutical industry: Novartis-Alcon spin-off case

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Academic Year 2019 / 2020

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1 Introduction

After the $55.3 billion[1] Abbott-AbbVie spin-off in 2012, one of the biggest spin-offs of all the times, the spin-off pace in the pharmaceutical industry slowed down. In 2019, Novartis spun-off Alcon in a $31.4 billion[2] deal value: the biggest stock deal in Switzerland history. After Novartis, according to recent news, more pharmaceutical companies have considered spinning-off their subsidiaries, in order to focus their operations on the core business. In particular, Merck has announced plans to spin-off its women's health, biosimilar drugs and legacy products into a new publicly traded company, expecting the transaction to be completed in 2021[3], Sanofi is planning to spin off its drug ingredient subsidiary within 2022[4] and GlaxoSmithKline plans to spin-off the joint-venture with Pfizer within two years[5].

Why is the spin-off becoming so common in the pharmaceutical industry?

Is this spin-off trend in the industry going to last?

These are the two questions that the dissertation will try to address. To this end, the objective is to retrieve the most important aspects characterizing the pharmaceutical market and the big pharmaceutical corporations that make the spin-off an appealing deal to reshape company's portfolios, now and in the foreseeable future.

In *Chapter 1* the concept of firm value and the key inputs influencing the firm value, are introduced. The chapter will provide the reader with the theoretical foundations and valuations methods that are necessary to understand why firms decide to spin-off and the Novartis-Alcon business case valuations. The chapter ends outlining the three possible strategies that a company can employ to grow and set the stage for *Chapter 2*, in which the spin-off features are analyzed in depth. A thorough presentation of the transaction is provided, starting with the widely accepted definition of spin-off, and the trends that characterized the deal in the history of financial markets. Then, benefits and advantages are outlined, supported by scholars and practitioners' opinions and researches. The last part of the chapter is dedicated to the main

[1] Thomson Reuters Deal data

[2] The value is the Enterprise Value of Alcon based on Alcon market cap at the end of the first trading day

[3] CNBC, "BIOTECH AND PHARMA: Merck to spin off women's health and biosimilar drugs, focus on Keytruda", March 2020, https://www.cnbc.com/2020/02/05/merck-says-it-plans-to-spin-off-its-slow-growth-products-into-a-new-company.html

[4] Financial Times, "Sanofi to spin off drug ingredient business by 2022", https://www.ft.com/content/4650899c-5719-11ea-a528-dd0f971febbc

[5] FiercePharma, "GlaxoSmithKline's spinoff plan is here—and it may not be limited to consumer health", https://www.fiercepharma.com/pharma/gsk-kicks-off-2-year-program-to-spin-off-consumer-health-and-possibly-prescription

feature that distinguish the spin-off from all the other restructuring transactions: the possibility to qualify as tax-free.

After the theoretical introduction, *Chapter 3* analyzes the pharmaceutical industry market and deal-making trends in the industry. The market analysis focuses on the features that currently characterize the pharmaceutical industry and identifies the potential drivers of future growth that could give pharmaceutical corporations bright opportunities of expansion. However, weaknesses and future threats of the industry are also presented to provide a global overview of the industry. The objective of the chapter is to unearth the current and future trends and characteristics of the industry that are driving the current deal-making and spin-off trends. The industry analysis is complementary to Novartis-Alcon spin-off case, presented in *Chapter 4.* The chapter starts presenting the two companies involved, before explaining the spin-off transaction in detail, focusing on the market response, the benefits and disadvantages and how the transaction has affected the Environmental Social and Governance performance of the companies involved. Novartis-Alcon spin-off analysis highlights the particular financial features of pharmaceutical companies that make the company opt for a spin-off instead of a simple disposal.

A summary of the pharmaceutical industry and corporations' features that could support the opinion that the increasing trend in spin-offs will keep shaping the pharmaceutical industry in the future is the main discussion point of the *Conclusions.* The chapter outlines also several assumptions related to the market cycle, investor sentiment and corporate tax law that will be fundamental for the pharma spin-off deal number to continue its upward trend.

2 Chapter 1

2.1 Maximize the Firm Value

2.1.1 Setting the right objective

"An objective specifies what a decision maker is trying to accomplish and by so doing provides measures that can be used to choose between alternatives" (Damodaran, Applied Corporate Finance, Fourth Edition). This quote from Damodaran introduces the critical importance of choosing an objective within a corporate environment. If an objective is not chosen, there is no systematic way to make the decisions that the firm will be confronted with at some point in time. In particular, in most of the publicly traded firms the ownership differs from the management team, and thus, it is important that the two parties' interests are aligned.

How do the management team know that the objective chosen is the right one?

According to Damodaran, the right objective should have the following characteristics:

- It should be clear and unambiguous, otherwise the decisions made would vary from manager to manager and from time to time
- It should be measurable, to evaluate the degree or success of the decision
- It should not create costs for other entities or groups. The decision should not harm the society, because the people that own and operate the business are part of the society itself.

In practice, what should this right objective be?

Most of the Corporate finance practitioners and academics agree that the right objective when making business decisions should be to maximize the firm value.

The most relevant definition of firm value has been given by Modigliani and Miller in 1958 in their famous Proposition I statement which says: *In a perfect capital market, the total value of a firm's securities is equal to the market value of the total cash flows generated by its assets and is not affected by its choice of capital structure*[6] (Modigliani, 1958)

Leaving aside the assumption of perfect capital markets, which everyone could argue that does not reflect a real-world hypothesis, this proposition sheds a light on how to measure the firm value: the total value of a firm's securities, and thus the value of the entire business' assets[7], is

[6] F. Modigliani and M. Miller, "The Cost of Capital, Corporation Finance and the Theory of Investment," *American Economic Review* 48(3) (1958): 261–297.

[7] Firms securities are debt and equity. Considering the fundamental accounting principle, total sources of funding (securities) are equal to total assets.

equal to the present value of the cash flows produced by the firm's assets. It follows that, for the fundamental accounting equation:

$$Assets = Liabilities + Stockholder\ Equity \quad 1.1.1$$

the market value of the Equity is:

$$Equity\ Value = Firm\ Value - Net\ Financial\ Position \quad 1.1.2$$

where the $Net\ Financial\ Position$ is the market value of debt minus the firm availability of cash and equivalents[8].

This method of discounting future cash flows is known as financial method and is just one of the many methods that are employed in Corporate Finance to measure the firm value. In the following paragraph the financial method will be illustrated in order to make the business valuation process more explicit and easier to understand.

2.1.2 Financial Method

This method stems directly from the Modigliani and Miller proposition. The value of the firm is the present value of the cash flows that the firm's assets will produce in the future:

$$Firm\ Value = \sum_{i=1}^{n} \frac{CF_i}{(1+k)^i} \quad 1.1.3$$

where CF are the cash flows that the firm's asset will produce in the future and k is the cost of capital.

2.1.2.1 Cash Flows

Every Financial Statement of a company has three fundamental prospectuses:

- Income Statement: also known as Profit & Losses statement, shows the economic performance of the firm. The bottom line is the Net Income and is the result of revenues/gains minus expenses/losses
- Balance Sheet: divided into liabilities and assets, describes the company capital structure and assets at a specific point in time
- Cash Flow Statement: reconciles changes in the Income Statement and in the Balance Sheet. The bottom line shows the cash produced/consumed in the period and how the cash reserves of the company have changed during the Financial Year.

[8] The $Net\ Financial\ Position$ outlines the net indebtedness of the firm, considering that with the cash on hand the firm could repay part of the debt.

Even though the Net Income of a company is the most common measure of a company performance, when valuing a business, the focus is on cash flows, because cash is the only real resource already available for a firm to repay its financial claimers[9]. As long as revenues and expenses do not generate inflows or outflows of cash, they are credits and debts. Credits and debts are just a promise of payment and, because a promise can be honored or not, there is uncertainty whether the revenue/expense will transform into inflows or outflows of cash[10]: real resources already available to be used by the company. Moreover, the net income takes into consideration non-monetized items, such as the amortization and depreciation of assets, that are expenses that will not generate outflows of cash, and several accounting adjustments[11]. Therefore, the input to measure company performance when valuing a business is the free cash flow from operations ($FCFO$):

$$FCFO = NOPAT \pm non\ cash\ items \pm CFO \pm CFI \qquad 1.1.4$$

where $NOPAT$ is the net operating profit after taxes, CFO is the cash flow produced/consumed by the operating activities[12] and CFI is the cash flow produced/consumed by the investing activities[13]. Non-cash items are removed to ensure that all the non-monetized items that are considered in the $NOPAT$ do not affect the cash flow computation. The $Firm\ Value$ formula can be rewritten as:

$$Firm\ Value = \sum_{i=1}^{n} \frac{FCFO_i}{(1+k)^i} \qquad 1.1.5$$

2.1.2.2 Cost of Capital

Every investment has two main features:

- the expected return
- the risk profile

The expected return is based on the probability distribution of the cash flows that the investor expects, in the future, from the investment. The probability distribution of cash flows considers all the possible scenarios that could affect the investment profitability in the future. The cash

[9] Financial claimers are all the investors in a company: debtholders and shareholders, regardless of the type of security they own

[10] When valuing a company, it is more important to measure the likelihood that revenues will transform into cash, because it is assumed that the company will repay its debts, otherwise it would be insolvent.

[11] Non-monetized expenses are depreciation & amortization expenses (D&A) and provisions while examples of accounting adjustments are unbilled revenues or accrued expenses

[12] Changes in net working capital

[13] Capital expenditure (CAPEX)

flow that, given the probability distribution, is the most likely to be obtained, is the expected cash flow.

$$Expected\ CF = \sum_{i=1}^{n} p_i\ CF_i \qquad 1.1.6$$

where *i* are the set of different scenarios that could materialize, p_i is the probability that the i_{th} scenario materializes and CF_i is the cash flow associated with the i_{th} scenario.

For example, *Figure 1* shows the expected cash flow - expected value - of an investment where the probability distribution is normal.

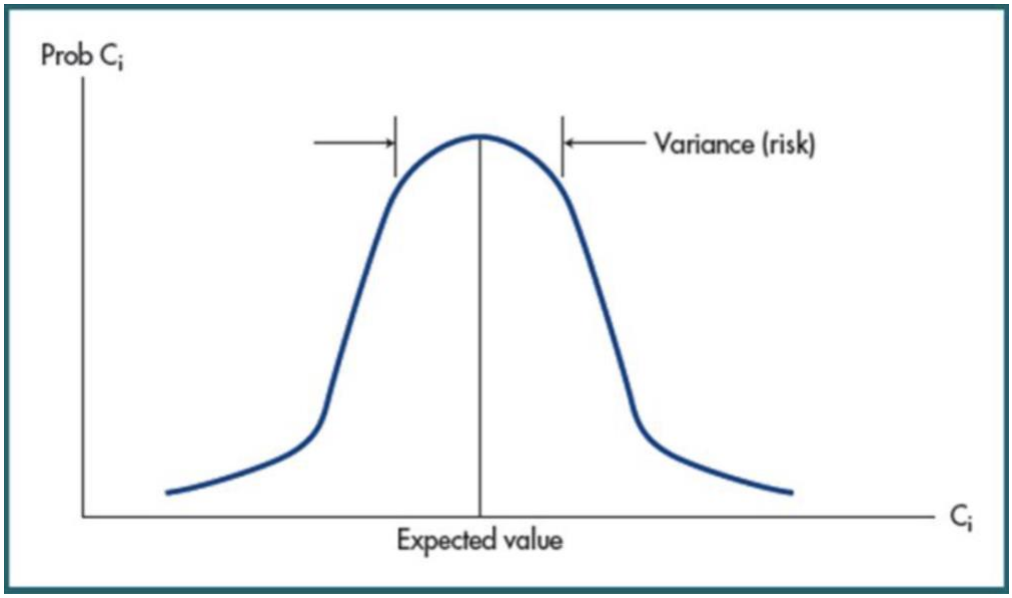

Figure 1: Cash flows probability distribution.
Source: "Corporate Finance", J. Berk and P. De Marzo, fourth edition

The expected return is obtained dividing the expected cash flow at the end of the reference period by the capital invested at the beginning of the period. If we consider the reference period as one year, then:

$$Expected\ Return = \frac{Expected\ CF_{t+1}}{Invested\ capital_t}\% \qquad 1.1.7$$

While the concept of the expected return is well defined in Corporate Finance, the risk profile of the investment is a more debated topic. The most common and agreed definition of risk is the volatility of future returns: the standard deviation of the probability distribution of the returns. The volatility of the returns gives the investor an idea of the possible range of future returns that could be obtained from the investment. An increasing standard deviation means

greater upside potential returns - the investment could return more than expected - as well as greater downside potential – the investment could return less than expected.

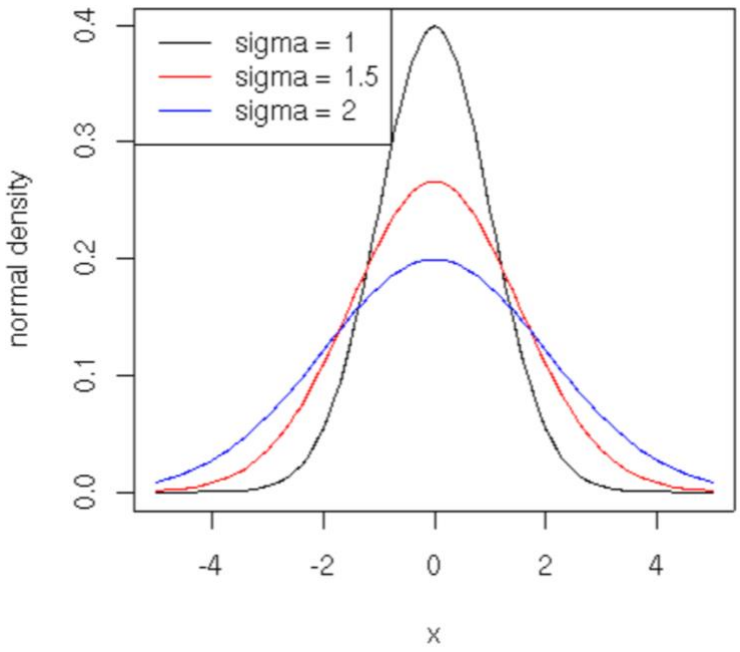

Figure 2: Normal distributions with different standard deviations.
Source: "Introduction to the normal distribution", SPC EXCEL Website

Figure 2 shows three normal probability distributions of returns with different standard deviations. The blue distribution shows a riskier investment than the black distribution because the standard deviation is greater and the probability of getting returns that deviate from the expected one is higher.

Figure 3 helps summarize the relationship between risk, expressed as volatility, and expected return.

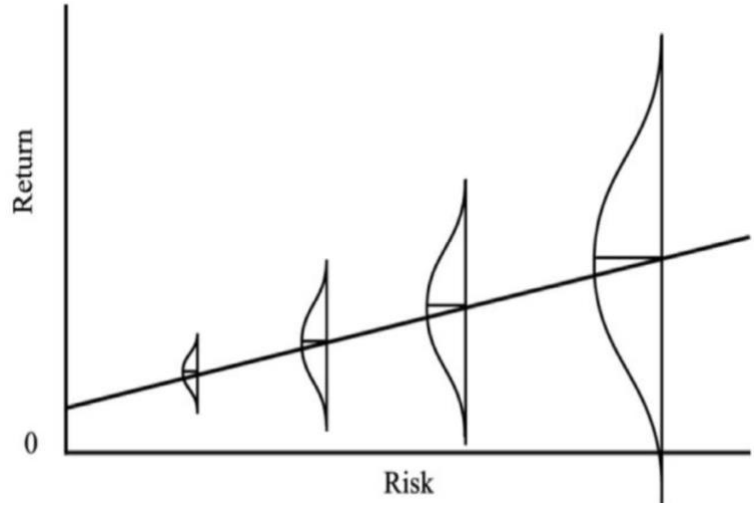

Figure 3: Risk and Return relationship.
Source: "The most important thing", Howard Marks

In *Figure 3*, the more an investment is risky, the greater is the standard deviation of the probability distribution of its returns, the upside and the downside potential. However, the more the investment is risky, the greater is the expected return,

Therefore, from *Figure 3*, it is evident that expected returns and risk profile of an investment are two strictly related features, at least in an efficient market. The best representation of this correlation is expressed by the Capital Market Line (CML).

According to the CML, the more an investment is risky, the more the return must increase, otherwise there would be no incentive for an investor to pursue risky investments. The range of riskiness of an investment varies between a "risk free" investment: money market instruments such as short-term bonds issued by governments with very high credit ratings and low default rate, to very high-risk investments: venture capital, as *Figure 2* shows.

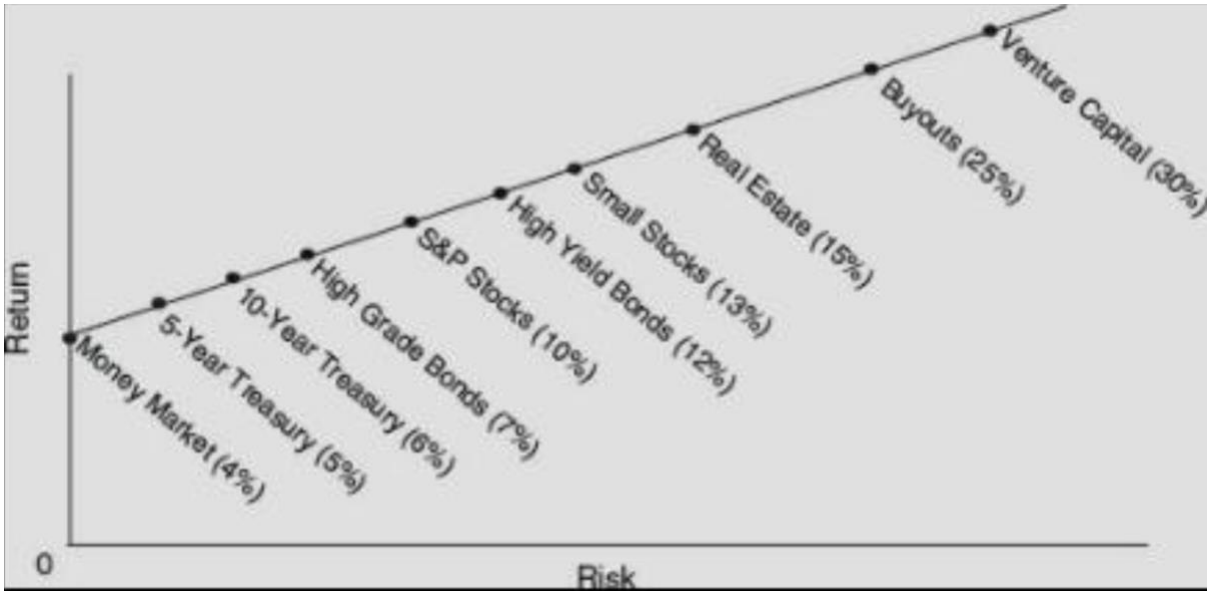

Figure 4: Capital Market Line.
Source: "The most important thing", Howard Marks

The CML slope is upward, because the curve assigns an increasing expected return to increasingly risky investments. The most important concept underlying the CML is that risk should be appropriately remunerated. Given the level of risk of the investment, there is a specific required return that an investor should expect to gain from the investment: the risk premium. The risk premium is the investor fair remuneration for having born a specific amount of risk inherent to the investment. All those investments that are not expected to pay off at least the required return should not be pursued, because the expected return is not commensurate to the investment risk.

The investor must then find a method to price risk, to measure the viability and profitability of an investment. The most common method employed in Corporate Finance for this purpose is the Capital Asset Pricing Model (CAPM)[14], introduced in 1964 by Sharpe, Lyntner, Trainor and Mossin[15].

The main concept underlying the CAPM is that every investment risk can be divided into:

- investment-specific risk: or diversifiable risk, is the risk born by investing in a particular type of asset[16]
- market risk: or undiversifiable risk, is the risk born by all the investors, regardless of the asset they have invested in[17]

Splitting the risk in these two components is particularly important because, as Markowitz showed in 1952[18], the investment-specific risk can be eliminated building a well-diversified portfolio of assets, while market risk is not eliminable, neither diversifying[19].

If it is assumed that the market is efficient, and that every investor is rational, markets agents can build and own a well-diversified portfolio, and thus every investor can eliminate the investment-specific risk. As a consequence, investment-specific risk should not be remunerated because can be eliminated; the only risk that should be remunerated is the market risk, the undeniable risk. Therefore:

- the risk premium for diversifiable risk is zero, so investors are not compensated for holding firm specific risk
- the risk premium of a security is determined by its systematic risk and does not depend on its diversifiable risk

It follows that, all the assets correlated with the economy are subject to systematic risk and so, investing in those assets requires a risk premium.

Since risk is defined as the variability of future returns, systematic risk can be defined as the volatility of the future returns of an investment that is due to the market risk. To determine how sensitive investment returns are to systematic risk, the investor should investigate how much

[14] The other methods to compute the cost of capital are: multifactor models: Fama & French model and Arbitrage Pricing Theory (APT) models, arithmetic average historical returns, dividend discount model,

[15] "Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk", William F. Sharpe, The Journal of Finance, Vol. 19, No. 3 (Sep., 1964), pp. 425-442

[16] Bad news about a company can represent an individual risk only for the investors in that company

[17] Economic downturns affect the entire market and all different types of assets in a different manner and degree

[18] "Portfolio Selection", Harry Markowitz, *Journal of Finance,* Vol.7 (March, 1952) pp. 77-91

[19] When an investor combines many stocks in a large portfolio, the stock-specific risk will average out and be diversified, while the market risk will not.

the returns tend to change for each 1% change in the return of an investment-portfolio that fluctuates solely due to systematic risk. To quantify this sensitivity, the investor needs two tools: the investment-portfolio affected only by systematic risk and the sensitivity of the specific investment returns to systematic risk. The first value is the efficient portfolio, the market portfolio, which is the portfolio made up of all the investments that are tradable in the markets, so that the diversification is maximum and diversifiable risk is completely eliminated. Practitioners usually choose the stock index S&P 500 as market/efficient portfolio, because it is large enough to be fully diversified. If the market portfolio is assumed to be efficient, all the changes in the value of the market portfolio represent systematic shocks to the economy. The second value is called the beta (β) of the investment: *"the beta of an investment is the expected % change in its return given a 1% change in the return of the market portfolio"*[20] (Berk, Corporate Finance, Fourth Edition). Beta measures the sensitivity of an investment to market risk factors, because the market portfolio returns can vary just because of systematic shock. In mathematical terms the beta is computed as:

$$\text{beta} = \frac{\text{Cov}(R_i, R_m)}{Var(R_m)} \qquad 1.1.8$$

where $\text{Cov}(R_i, R_m)$ is the covariance between the investment returns R_i and the market portfolio returns R_m, while $Var(R_m)$ is the variance of the market portfolio returns.
Different values of beta characterize whether an investment is counter or procyclical and to what extent:

- beta = 0: the investment return is not correlated with the market portfolio returns, and thus the investment is not affected by systematic or market-wide shocks
- beta < 1: the investment return is positively correlated with the market portfolio returns. The volatility of the investment return is less than the volatility of the market portfolio returns; the investment is affected by systematic or market-wide shocks less than the market portfolio is[21].

[20] "Corporate Finance", Jonathan Berk and Peter De Marzo, fourth edition

[21] An example could be the stock of a company in the industry of consumer staples, which are goods that people need to live. People will always buy these goods and the cash flows of these companies are stable, regardless of the economic scenario. Therefore, the stock of these companies will lose less than the market average loss during economic downturns but also will gain less than the average market gain when the economy is good.

- beta = 1: The market portfolio has beta 1, and all the investment returns that are perfectly correlated with the market portfolio returns have beta 1. The variability of the returns of both the investment and the market portfolio is the same
- beta > 1: the investment return is positively correlated with the market portfolio returns. the investment return is more volatile than the market portfolio returns are; the investment is affected by systematic or market-wide shocks more than the market portfolio is[22].
- beta < 0: the investment is countercyclical. The investment return is negatively related to the market portfolio returns. An example is gold, which is a reserve value commodity that performs very well during economic downturns, recording gains while the average market performance is a loss.

The mathematical formulation that allows to price investment risk and define the required return related to an investment is:

$$Required\ return = Rfr + \beta_i(R_m - Rfr) \qquad 1.1.9$$

where:

- Rfr is the risk-free rate: in real world there are no risk-free assets, but in practice this value is usually represented by the yield of a government issued debt security[23]. Depending on the time horizon of the valuation, a security with a different maturity is chosen. Moreover, the debt security chosen is usually issued by the government in which the investment to be valued is located[24]
- β_i is the beta of the specific investment, computed as in *Equation 1.1.8*
- $R_m - Rfr$ is the market risk premium: the difference between the risk-free rate (Rfr) and the average return, in a specific time frame, of the market portfolio (R_m). Usually, the market portfolio is the index of the stock market in which the investment is located[25]. The market risk premium shows the return that an investor should expect to gain for bearing only market risk.

[22] An example could be the stock of a company in the industry of leisure and hospitality. When the economy is florid, consumer spending is enhanced, companies in this sector collect cash flows above the market average and as a consequence the stock gain above the average returns. However, during a downturn, consumer spending crunches and the cash flows of the sector are less than the market average and the stock loses more than the average market loss.

[23] For example, 10-year Treasury Note.

[24] For example, a five-year investment in Italy would be valued using the yield of the five-years Italian Treasury Note (BTP).

[25] For example, an investment in Italy would have the FTSE MIB as market portfolio.

The risk premium for the specific investment is obtained subtracting the risk-free rate (Rfr) from the required return.

The rationale behind the CAPM method is that the investors should expect an investment return that is commensurate to the degree of market risk born. An investment with beta less than 1 is subjected to less market risk than the market portfolio, then the expected return of the investment should be less than the expected return of the market portfolio. On the contrary, an investment with a beta greater than 1 should return more than the market portfolio because the risk born by the investor is greater than the market risk.

The link between beta, a measure of risk, and the expected return of the investment is represented in the Security Market Line (SML).

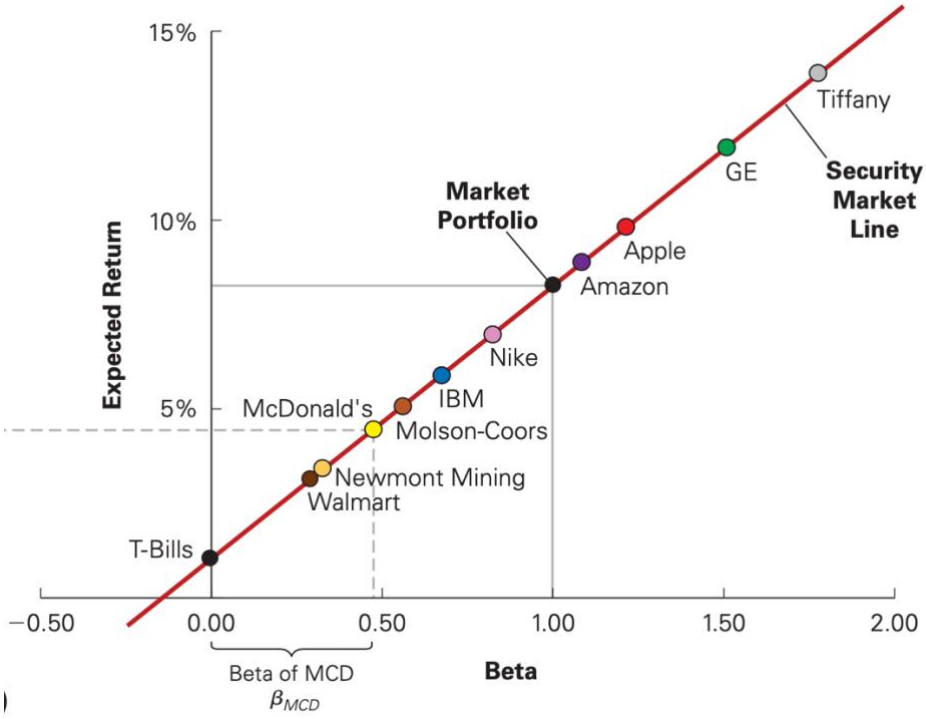

Figure 5: Security market Line
Source: "Corporate Finance", Jonathan Berk and Peter De Marzo, fourth edition

Figure 5 shows the application of the CAPM in the US stock market. The market portfolio corresponds to beta 1. The line is upward sloping because of the positive relationship risk-expected returns. Companies in very stable industries like consumer staples (Walmart) and oil and natural resources (Newmont Mining)[26] have betas less than 1, hence expected returns less than the average market expected returns. Companies in cyclical industries, like tech (Apple),

[26] The COVID-19 pandemic has shown that the oil industry can struggle more than the other industries in the case of a global lockdown. Indeed, during the pandemic the industry has underperformed with respect to almost every other industry, even though the beta of the industry is less than 1.

industrial and aerospace (GE) and luxury (Tiffany) have betas greater than 1 and an expected return greater than the average market expected returns.

The CAPM is widely employed among professionals and academics, in Corporate Finance, to compute the cost of capital, which could be asserted as the most important input in business valuation.

The cost of capital of an investment is *"the expected return available on alternative investments in the market with comparable risk and return"*[27] (Berk, Corporate Finance, Fourth Edition). The cost of capital is a hurdle rate that allows the investor to value the goodness of the investment. If the expected return is less than the cost of capital, the investment does not restore adequately the investor for the risk born and the investor should not invest in that asset because the market offers alternative investments with same risk but better expected returns.

Therefore, valuing an investment in a business, the investor will consider whether the expected returns are aligned with the cost of capital. To invest in business, investors can choose two types of securities, depending on their risk aversion: equity or debt.

Equity is the riskiest security when investing in a business. Purchasing shares of a company, the investor gets the ownership of part of the business. The return of an investment in equity is given by dividends, capital gains and share repurchase. Dividends are distributed if the firm has a profit for the period or retained earnings and under approval of the Board of Directors. Capital gains are the result of the appreciation of the stock price, while share repurchase reduce the number of shares outstanding, increasing the dividend yield of the stock, and thus the payout. Payouts for the equity holders are strictly linked to the business performance and are residual with respect to debt holders' repayments.

Debt is less risky than equity because the payout for debtholders is mandatory, regardless of the business performance. Debt securities get returns from periodical interests and capital repayments and debtholders are repaid before equity holders.

Since debt and equity have two different risk profiles, an equity investment must have a different cost of capital than debt, otherwise there would be arbitrage opportunities, which cannot exist in an efficient markets.

The equity cost of capital of a business is retrieved using the CAPM model, using *Equation 1.1.9*, where the returns of the specific investment (R_i) considered when computing beta are the returns earned from holding the shares of the specific business, and the risk premium ($R_m - Rfr$) is the equity risk premium.

[27] "Corporate Finance", Jonathan Berk and Peter De Marzo, fourth edition

The debt cost of capital is usually identified as the interest rate of the debt burden. Underlying this practical shortcut is the fact that the debt interest rate is usually set by the demand-supply interaction[28], hence it is a fair value set by the market. In a normal business condition[29], this rate is less than the equity cost of capital.

Figure 6 allows to understand that the total assets of a business must earn a return that is satisfactory and aligned with the cost of capital of both debt holders and equity holders.

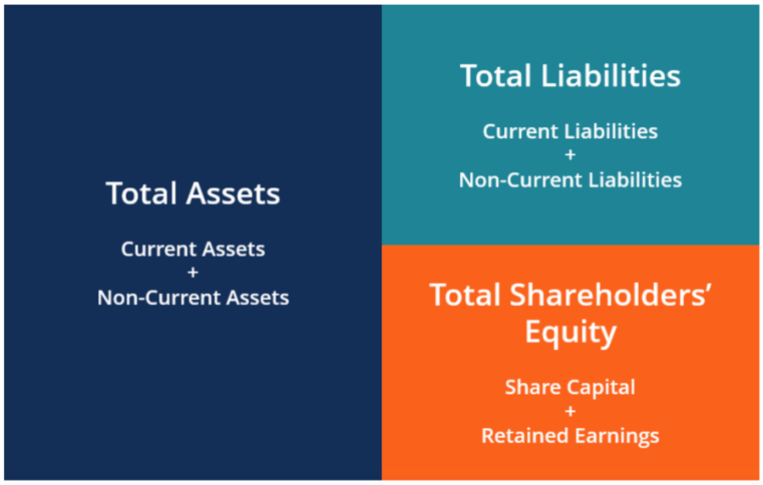

Figure 6: Corporate Balance Sheet.
Source: Corporate Finance Institute website

However, debt and equity have different costs of capital, and thus the issue is to understand which cost of capital to use, when valuing a business. The solution is the Weighted Average Cost of Capital, also known as WACC:

$$WACC = K_e \times \frac{E}{D+E} + K_d \times \frac{D}{D+E} \times (1-t) \qquad 1.1.10$$

where:

- K_e is the equity cost of capital computed using the CAPM model
- $\frac{E}{D+E}$ is the percentage of equity on total funds of the business, expressed in market values. The market value of the equity is usually assumed to be the market capitalization of a listed firm. This ratio is a representation of the firm capital structure
- K_d is the cost of debt equal to the debt interest rate

[28] This interaction is favorable to the borrower when the credit market is florid while is favorable to the lender when there is a credit crunch. For example, during the 2008 Financial crisis, even the best performing companies that wanted to issue debt had to bargain very high interest rates.
[29] There is the possibility of debt cost of capital being greater than the equity one. This happens when the company is overindebted and it is likely that debtholders will either take the ownership of the company after a bankruptcy process or be restored after the liquidation process of the company assets.

- $\frac{D}{D+E}$ is the percentage of debt on total funds of the business, expressed in market values. Debt market value is equal to the debt book value if the cost of debt is assumed to be equal to the debt interest rate.
- t is the tax rate. Taxes are particularly important because of the tax shield. The tax shield is the reduced amount of taxes paid by the corporation because of financial interests. This tax shield allows the equity holders to increase their returns on equity, reducing the taxes paid and the capital invested, because part of the assets is fund using leverage.

From a balance sheet, and visual, perspective this formula is shown by *Figure 7.*

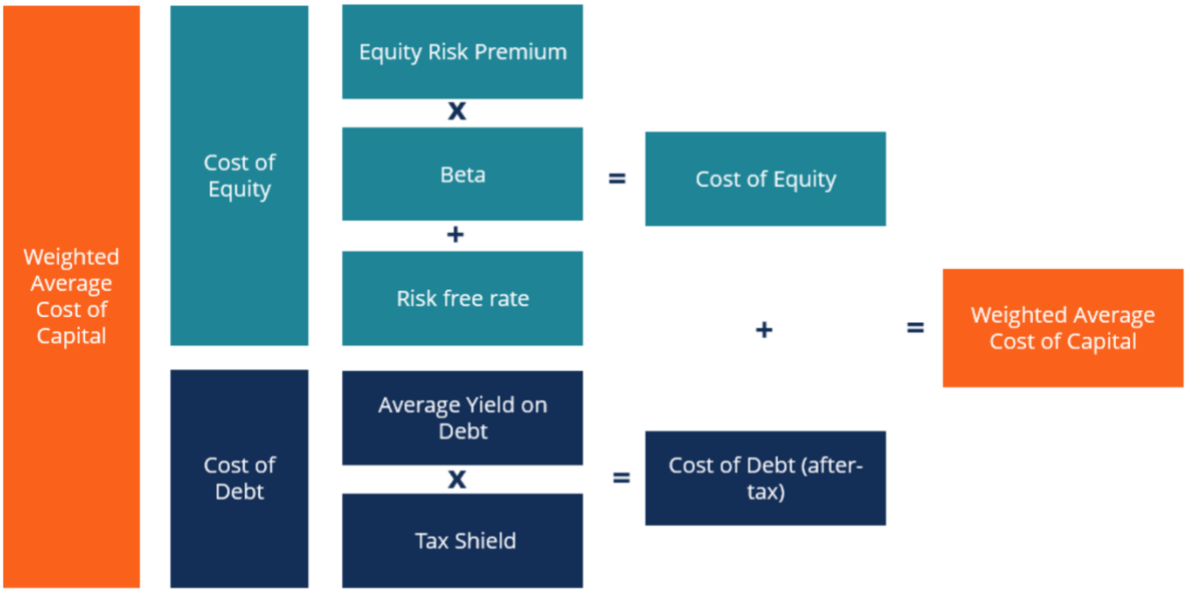

Figure 7: Balance Sheet and WACC.
Source: Corporate Finance Institute

In conclusion, the $WACC$ combines the costs of capital of all the different securities that subsidize the business and it is the cost of capital used when evaluating the entire business while the cost of equity, K_e, is the cost of capital used when evaluating only the value of the firm attributable to the shareholder's equity.

2.1.3 Terminal Value

Having defined the most important inputs involved when valuing a business, we can now rewrite the final formulation of equation 1.1.5 with the appropriate cost of capital:

$$Firm\ Value = \sum_{i=1}^{n} \frac{FCFO_i}{(1+WACC)^i} \qquad 1.1.11$$

To value a firm, the investor should estimate the expected future cash flows from operations ($FCFO_i$) produced by the firm's assets and the $WACC$ using *Equation 1.1.10*. In practice, the estimation of the $FCFO_i$ is usually limited to just a few years because the multiples scenarios that could directly or indirectly affect the financial and economic results of a business make the esteem particularly challenging. The period for which the expected $FCFO_i$ are estimated is the capitalization period or planning period, usually 3-5 years. After the capitalization period, the firm is assumed to return a perpetual stream of cash flows also known as Terminal Value (TV):

$$Terminal\ Value = TV_n = \frac{FCFO_n \times (1+g)}{WACC - g} \qquad 1.1.12$$

where:

- $FCFO_n$ is the normalized free cash flow from operations, expected after the capitalization period. The $FCFO_n$ should represent the cash flow of the business in a normal economic scenario, neither a boom nor a bust[30]
- g is the perpetual stable growth rate of the $FCFO_n$ after the capitalization period. This rate is particularly important because it has an impact on both the $FCFO_n$ and on the discount rate. The effect on the discount rate is more important than the effect on the $FCFO_n$. A small change in the growth rate can importantly affect the value of a business[31].
- TV_n is the terminal value at time n. Therefore, TV_n is not the present value of the terminal value.

2.1.4 Final Remarks on Firm Value

The definitive formulation for the firm value can be written as:

$$Firm\ Value = \sum_{i=1}^{n} \frac{FCFO_i}{(1+WACC)^i} + \frac{TV_n}{(1+WACC)^n} \qquad 1.1.13$$

where:

- $\frac{TV_n}{(1+WACC)^n}$ is the present value of the terminal vale (TV_n)[32].

[30] In practice, this cash flow is either equal to the cash flow of the last year of the capitalization period, or equal to the average of the expected cash flows of the capitalization period.
[31] In practice, this rate is usually assumed to be equal to the expected inflation rate and never higher than the Gross Domestic Product projections.
[32] The investor is interested in the value of the terminal value now, in order to get a correct understanding of the present value of the firm.

It is important to notice that the value of the terminal value usually accounts for the 80% - 90% of the value of the firm. Therefore, the inputs of the terminal value are of critical importance. A simplified version of *Equation 1.1.13* could be introduced:

$$Firm\ Value = \frac{FCFO_t \times (1+g)}{WACC - g} \qquad 1.1.14$$

According to this formulation, the investor could obtain a reliable firm value starting from the cash flow of the last Financial Year $FCFO_t$, or the average cash flows of the last three to five years, in order to have a normalized value, and estimating a plausible growth rate (g) for the future and the $WACC$.

It can be concluded that, the key drivers of firm value are the financial results of the last periods, the expected growth rate and on the $WACC$. It follows that the firm has to leverage these inputs in order to maximize its value and offer a return equal to the cost of debt to debt holders and, at least, a return equal to the cost of equity to equity holders.

2.1.5 Firm Value and the stock price

Damodaran's fundamental characteristics of the right objective outlined in paragraph 1.1 are: unambiguity, measurability and absence of social costs. According to these features, firm value does not seem the best candidate for being the right objective to maximize. In fact, the key inputs of *equation 1.1.14* are extremely subjective, especially the growth rate and the $WACC$, and so the firm value lacks unambiguity. For this reason, Corporate Financial theory is centered on stock price maximization as the sole objective when making decision. Three are the reasons for which the focus is on the stock price maximization:

- The stock price is the most observable of all measures that can be used to judge the performance of a publicly traded firm. The stock price is updated constantly because reflects all the new information related to the firm, and thus managers are able to receive instantaneous feedbacks from investors on every action taken.
- If it is assumed that market is efficient and investors are rational, the stock price will reflect the long-term value of the business which is the result of the long-term decisions made by the management.

- Stock price maximization as an objective allows the management to make categorical statement about the best way to pick projects and finance them and to test these statements with real-time feedbacks from the market.

However, taking the stock price maximization as objective has also many drawbacks:

- Shareholders vs bondholders: if the firm improves its performance and the stock price increases, the shareholders are the ones that benefit from it, not the bondholders. Sometimes, to maximize the stock price, the management pursues very risky investments. However, while the upside of these risky investments is benefit only for shareholders, the downside potential affects both the security holders.
- Information asymmetry: in the world of classical theory, information about companies is revealed promptly and truthfully to financial markets. In the real world, there are few impediments to this process; sometimes firms release intentionally misleading information, and thus it happens that stock prices deviate significantly from firm value. However, when the truth comes out, as it inevitably will at some point in time, the stock price will tumble.
- Stock price vs social costs: some decisions that benefit the stock price could be detrimental for the society. Even though the attention to Environmental Social and Governance (ESG) factors is extremely growing importance among money managers and executives, the ESG performance measurement is still too nebulous to be factored explicitly into analyses. Unless the regulators prescribe precise Key Performance ESG Indicators (KPI) that have to undergo a strict auditing process, as it is for Financial Statements, it is up to the social conscience of the management whether to make decisions that do not harm the society.

These are just three of the potential drawbacks linked to stock price maximization as objective. To avoid these drawbacks, according to Damodaran, Corporate Financial professionals have tried to identify a potential substitutive right objective: market share maximization, profit maximization or size/revenue maximization. All these alternatives have limitations and problems, too. The reason why the stock price maximization remains the right objective is that it is the only market-based approach: it allows the management to have a constant feedback on every action taken. Price increase is a positive feedback from the market that is appreciating the management decision. The price increases because the market thinks that the decision will produce, in the long-term, higher expected cash flows, reduce the risk of the company or increase the growth potential. Sometimes, the market can be wrong on valuations, in particular

when the management is trying to pursue short-term objectives[33], but it is self-correcting, and every wrong valuation will reverse back to a fair valuation thanks to broad market reactions. The fact that the market is self-correcting makes the market-based approach the preferred one in Corporate Finance, and the stock price maximization a good feedback for the management to understand whether the firm value is increasing. All in all, if the management increases the stock price it means that it is working toward the right direction for firm value maximization.

For the reasons explained above, the stock price will be the reference measure when trying to assess if a management decision has increased value for the shareholders[34]. However, in this dissertation, the intent is to assess how a business strategy affects not only shareholders' value, but also bondholders' value and society, referring to the ESG performance.

[33] Enron case is the perfect example. The accounting scandal that Enron's senior management put in place created a false valuation of the company until the scam was unearthed and the company filed for bankruptcy in 2001

[34] From this point onward, value will always refer to shareholder value and thus stock price maximization, unless otherwise stated.

2.2 Introduction to business strategies to increase value

According to Bruner and Perella (2004), there are two macro business strategies that can be employed by the management to enhance firm growth and increase firm value:

1. Diversify or expand the business: is the most common and intuitive strategy when thinking about growth or value increase. This growth can be organic, through internal investments or inorganic, through Mergers & Acquisitions (M&A) transactions for example
2. Restructure, redeploy assets or exit from business: is the "alternative" and less intuitive strategy for increasing value and enhancing growth. Markets usually perceive news of business divestitures with more skepticism, compared to news of M&A, because restructuring is usually associated with an entity that is in deep waters and has to break-up in order to raise funds and stay afloat. However, researches have showed that this business strategy can increase value as much as the diversify or expand strategy can.

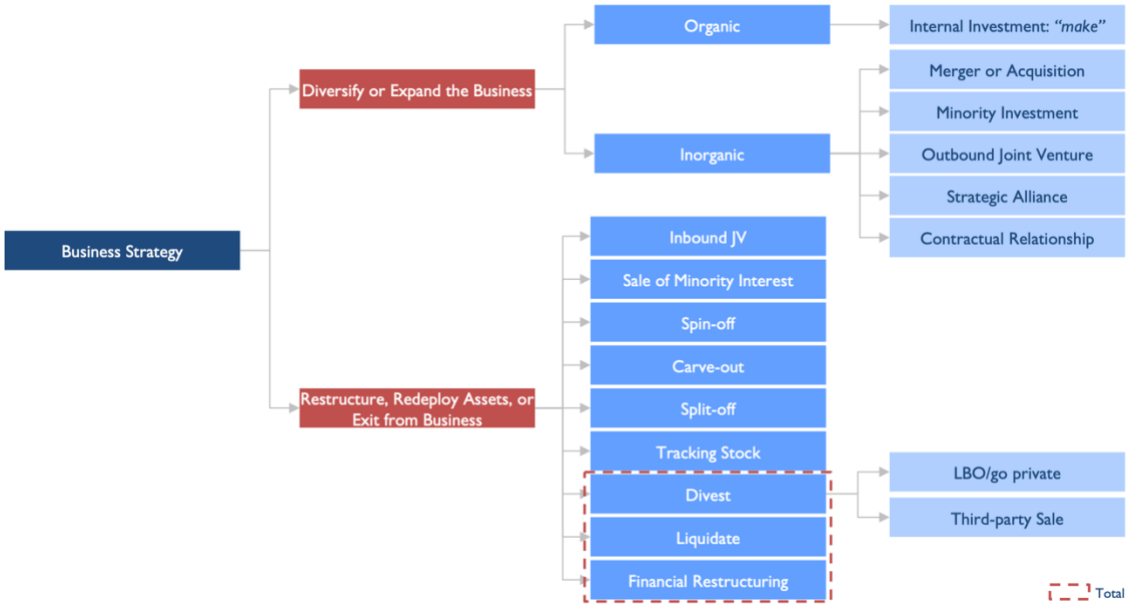

Figure 8: Business strategies to increase firm value.
Source: "Applied Mergers and Acquisition", Bruner and Perella, Wiley Finance Ch.6, 2004

Organic growth is the most traditional strategy of growth and value enhancement. It involves no transactions, but reinvestments of internal resources, such as retained earnings, in projects that have expected returns greater than the cost of capital. Differently, inorganic growth involves transactions between different business entities, such as M&A transactions. The focus will be on comparing inorganic growth through M&A against corporate break-ups or restructurings.

2.2.1 Inorganic growth and the Conglomerate Boom

Companies started taking into consideration inorganic growth and M&A to enhance firm value in 1893, with the first wave of M&A transactions.

The whole M&A transactions story is divided into 6 waves, but the most relevant for the purpose of this dissertation is the third wave, which is usually identified as the "Conglomerate Boom": the main rationale of the transactions, during this wave, was to build diversified conglomerates.

Conglomerate is a big corporation made up of many companies spanning multiple and often unrelated fields or industries. The third wave begun in 1955, enhanced by the economic recovery after the Second World War, low interest rates and a market that fluctuated between bullish and bearish, providing good buyout opportunities for acquiring companies. Moreover, a series of economic tailwinds came together to create an environment that supported a flourishing middle class. In fact, this period was regarded as "The Golden Age of Capitalism".

The other trigger for the conglomerate boom was the Celler-Dekefauver Act of 1950, which banned companies from growing through acquisition of their competitors or suppliers. The act was enacted to oppose the creation of monopolies and oligopolies, which were respectively the deal trend of the first and second M&A waves. Because of this law enforcement, companies began looking for growth, acquiring companies in unrelated fields. Furthermore, very volatile markets, as it was the case during 50' and 60' led executives to pursue cash flow stability to reduce risk - the beta - and enhance the firm value and the share price. Conglomerates could achieve this de-risking target following the idea of diversification, presented by Markowitz in this period (1952)[35].

The pros of conglomerates were:

- Cash flows low volatility: business units operating in different and low-correlated industries helps reduce volatility of the cash flows because bad performance from some business units will be overcome by good performance of the others, operating in different industries. The conglomerate could achieve stability of cash flow, increasing the total cash flow value and decreasing the risk, creating a double positive effect for investors, as *Figure 9* shows.

[35] Conglomerates could benefit from holding a portfolio of diversified businesses, operating in unrelated industries.

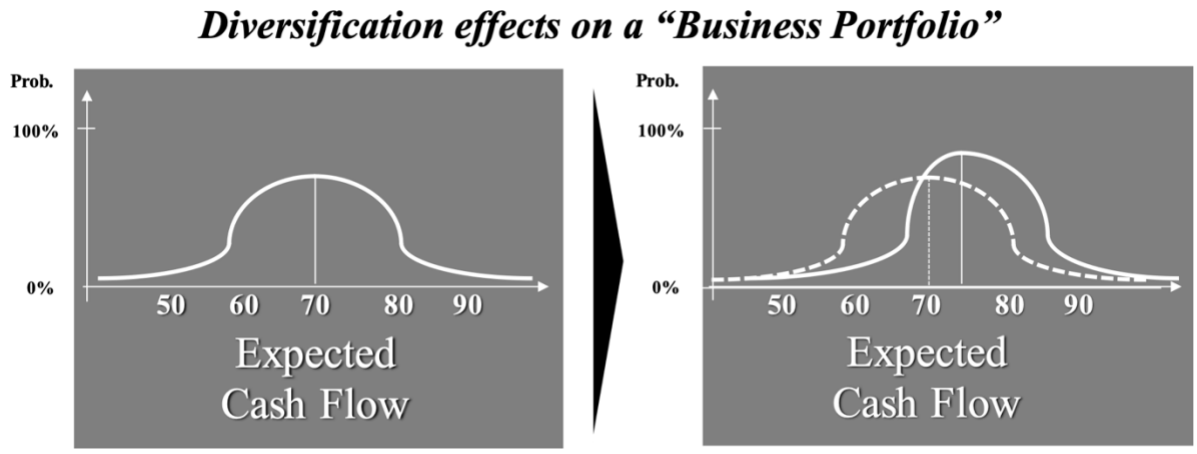

Figure 9: Cash flows after acquisitions of low-related business.
Source: "Special cases of business valuation", Marco Vulpiani, 2014

- Easier access to capital markets: low risk associated with cash flows improves the likelihood that capital markets will ease the conglomerate access to funds. During the Conglomerate Boom, these entities benefited from easier access to debt and equity. Furthermore, almost every conglomerate has an internal capital market division that allocates internal funds across the different divisions, delivering more flows toward those businesses that are struggling the most.
- Synergies: a conglomerate can leverage on cost efficiency to improve profitability, reducing fixed costs or sharing marketing expenses, utilizing overcapacity and eliminating all the resource duplications such as plants, warehouses, etc. Moreover, revenues can be improved sharing tangible resources and exploiting intangible resources such as brands or patents among several business units. These kinds of synergies reduce transactions costs and increase the opportunity for economies of scale.

Berkshire Hathaway, led by the American legendary value investor Warren Buffett, is an example of a conglomerate that has operated successfully for years.

2.2.2 The focus premium

Shocks to the corporate economic environment may give rise to severe organizational inefficiencies, and when interest rates began to raise again in 1970s, many of the conglomerates were forced to reduce their size through break-ups and divestitures, in particular those conglomerates that failed to increase the efficiency of the companies acquired. Moreover, the Federal Trade Commission became concerned with the power wielded by conglomerates and began investigating their accounting books, leading many firms to break up. This was

accompanied by the popularity of bust-up takeovers, after Ronald Regan came to power. Financiers bought large conglomerates and sold their constituent parts for profit, a trend that gave rise to the fourth M&A wave, characterized by leveraged buyouts (LBOs), hostile takeovers and junk bonds. Corporate Finance literature justified the decreasing interest for conglomerates with the development of the conglomerate discount concept, by Landg and Stulz (1994).

The research found that companies that are diversified across several businesses are sometimes valued below pure-play peer companies. A publication in the Journal of Applied Corporate Finance from Morgan Stanley (2011)[36] shows that, until 2011, a median of 5.5% conglomerate discount existed in most regions around the world. It is striking, however, how much the discount varies across regions, outlining different market conditions and investing preferences of capital markets agents around the world: in Western Europe and North America the median conglomerate discount is around 10%; in Asia, excluding Japan, the median is 9% while in Japan conglomerates trade at a premium of 2.6% and in Latin America the premium reaches 12%. In North America and Western Europe, the average historical discount is aligned with the 10% discount of 2011; only during economic downturns, which are periods of high volatility and funds-crunch in capital markets, the percentage decreases, as *Figure 10* shows. This because conglomerates offer less risky investments and usually have excess cash to internally subsidize the operations without accessing external capital markets that, during uncertain periods, require very high-risk premiums.

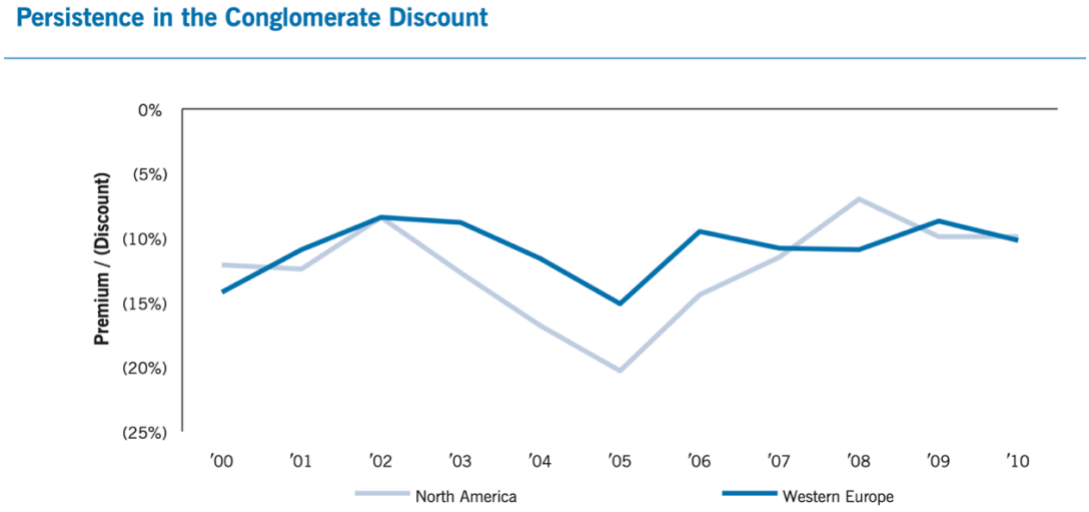

Figure 10: Source: Spin-offs: tackling the conglomerate discount, "Journal of Applied Corporate Finance", Vol. 23 N. 4, 2011, Morgan Stanley publication

[36] Spin-offs: tackling the conglomerate discount, "Journal of Applied Corporate Finance", Vol. 23 N. 4, 2011, Morgan Stanley publication

The conglomerate business model tends to dissipate when capital markets are open and robust. Indeed, *Figure 11* highlights a steady decline in conglomerates between 2000 and 2009 in North America and Western Europe.

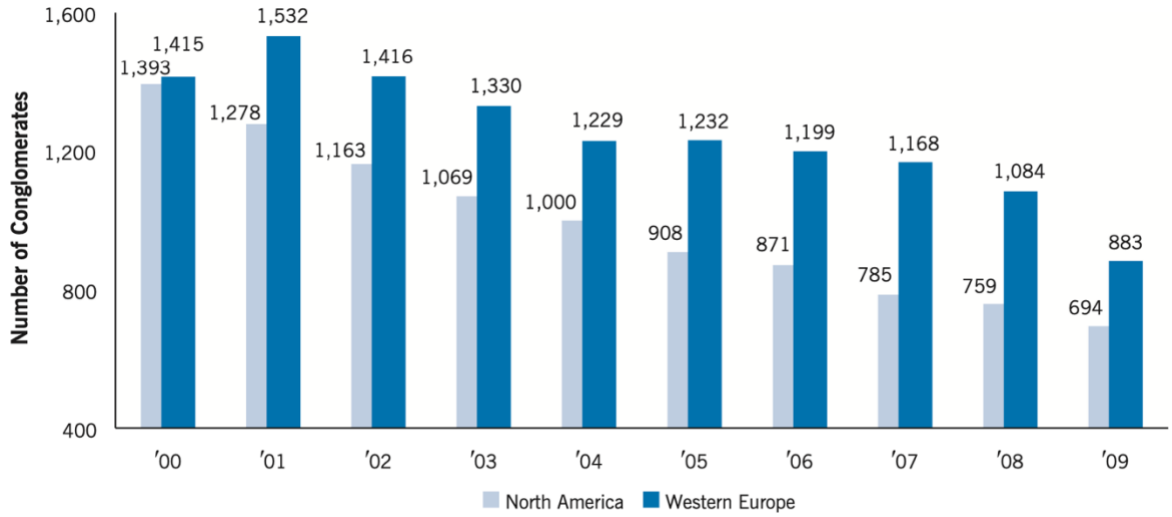

Figure 11. Source: Spin-offs: tackling the conglomerate discount, "Journal of Applied Corporate Finance", Vol. 23 N. 4, 2011, Morgan Stanley publication

It has to be noticed that the discount increases if the individual segments of the conglomerate operate in very different business lines or face divergent growth profiles, in particular in North America. *Figure 12* shows the relation between discount increases and degree of relatedness of the different business units of the conglomerate.

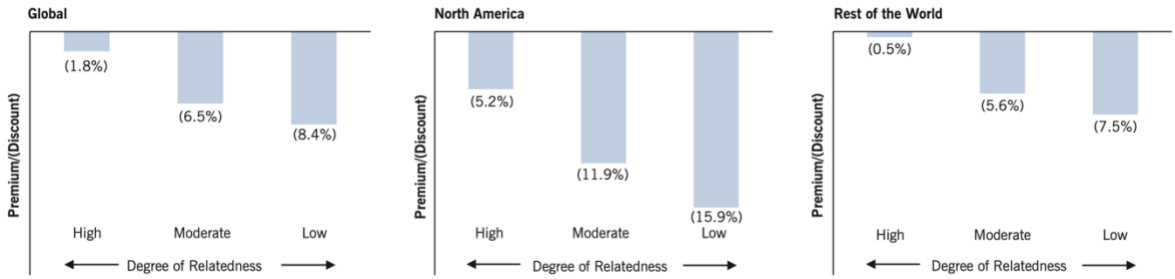

Figure 12: Source: Spin-offs: tackling the conglomerate discount, "Journal of Applied Corporate Finance", Vol. 23 N. 4, 2011, Morgan Stanley publication

The reason for this discount can be found in several drawbacks of the conglomerate business model, also known as diversification costs:

- Cross subsidization: sometimes top managers inefficiently allocate too much funds to divisions with poor investment opportunities, because it is difficult to manage business units with different growth perspectives
- Executive compensation: it is difficult to tailor divisional managers stock-based compensation directly to the underlying value of the operations under their control if the division is a private entity. This could be critical because stock-based compensation induces optimal investment decisions and helps retaining managerial talents in a competitive labor market
- Information asymmetries between investors and corporate insiders: *"outside investors observe the aggregated (conglomerate) cash flow only, while management also observes the divisional cash flows. Without detailed divisional information, the market rationally assigns an average performance to each division. This pooling results in undervaluation of the well-performing division and overvaluation of the poorly performing division."*[37] (Nanda, 1999). Moreover, conglomerates operating in a wide range of industries are more difficult for analysts to value, because analysts are usually specialized in specific industries.

In addition, during the last thirty years technology has exponentially improved, has become easier to access and the rate of industries disruption is extremely high. Every company top management needs to be focused on the core operations in order to proactively respond to every threat or opportunity that arises from technological and consumer behavior developments.

These reasons explain why investor preferences are evolving toward a focus premium, placing a premium on firms targeting narrower subsectors within a broader industry. The focus premium captures the valuation benefit attributed to firms, and *Figure 13* shows the extent to which investors have increasingly positively valued focus premium from 2005 to 2015.

[37] "Disentangling Value: Misvaluation and Divestitures", Nanda and Narayanan, 1999

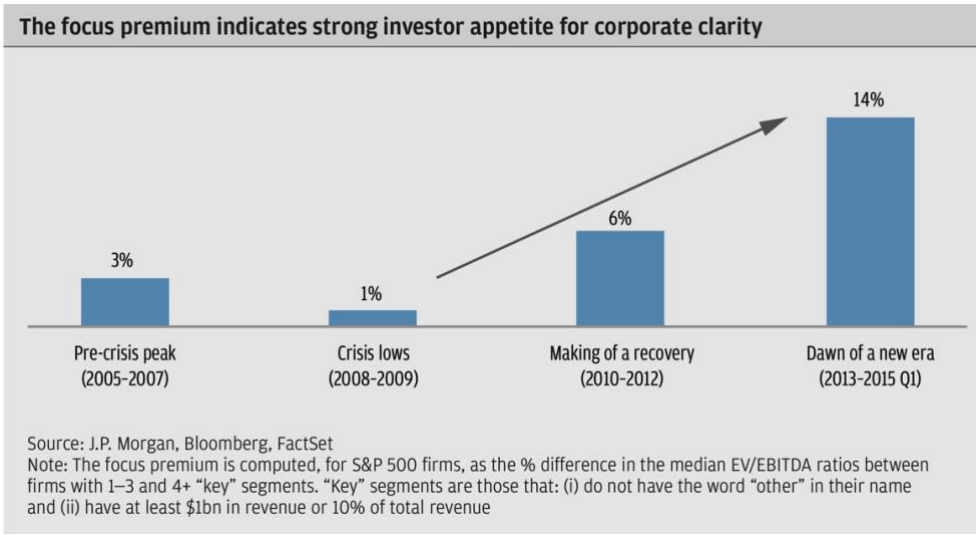

Figure 13:Trends in Focus Premium
Source: "Shrinking to grow, Evolving trends in corporate spin-offs", JP Morgan, 2015

The result of this shift toward focus premium is impacting the deal-world: the level of scope M&A, defined as transactions intended to enter faster-growing segments or to acquire new capabilities for future growth, is overtaking scale M&A and there is an increasing appreciation, among investors, for corporate restructurings and break-ups, that release the time, talent, energy and capital that is locked up in nonstrategic business.

According to the Corporate M&A Report 2020, from Bain & Company, until five years ago, the majority of the deals involved buying assets for scale, market power and getting to a lower cost position, even though investors were starting to value focus premium. However, the fact that the business world is now catalyzed by technological progress and the emergence of digital native competitors is making executives more concerned about approaching deals to invest in growth engines than to scale up and diversify the company. Scope deals percentage increased from 41% in 2015 to 60% in 2019, of all the deals worth more than $1 Billion in value. The industries that have an increasing need for scope deals and focus over size and cost efficiency, are healthcare, technology and consumer products (*Figure 14)*. Especially in these sectors, the definition of conglomerate is changing, and now identifies a company that exploits its strong market position and cash resources to pursue capability-driven deals made to strengthen the already existing competitive advantage in the core business and target digital opportunities. An example of this new definition of conglomerate is Google, which is dominating several subsectors of the broad tech industry, pursuing M&A scope deals.

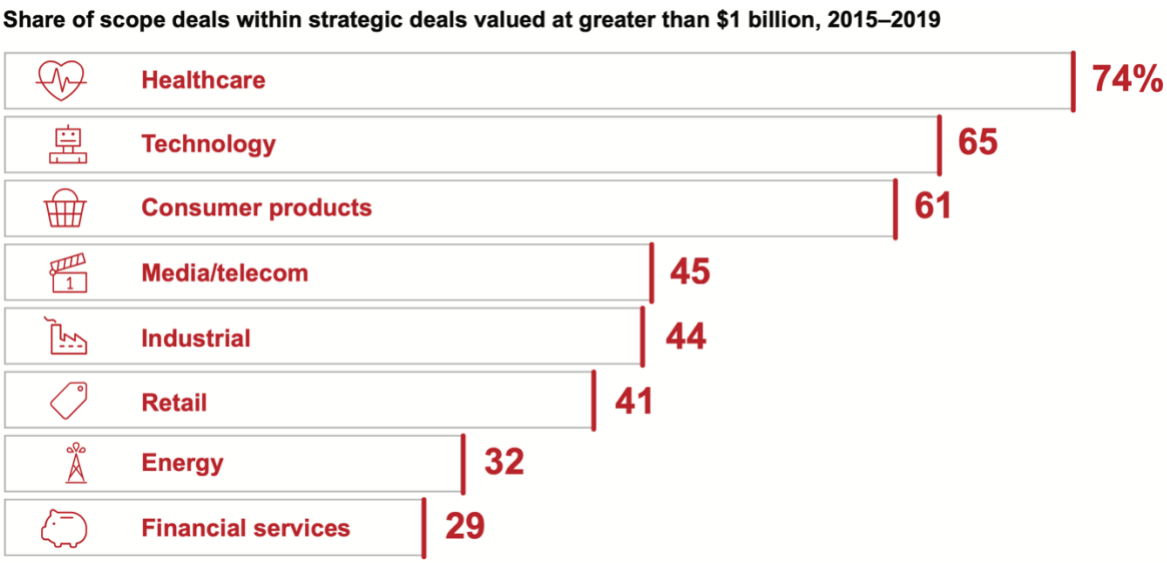

Figure 14: Source: Corporate M&A Report 2020, Bain & Company

2.2.3 The rise of corporate restructurings

Companies sometimes need to contract and downsize the operations when synergies from inorganic growth become negative, and thus the cost of keeping the company's assets together exceed the benefits from doing so. Even though the need for restructuring may arise because a division of the company or the entire company is performing poorly, break-ups have been growing importance as opportunities to "untap" value, increase growth perspectives or undo a previous M&A transaction that was unsuccessful.

Corporate restructurings can take several different forms:

- Divestitures: is a sale of a portion of the firm to an outside party. The selling is usually paid in cash, marketable securities such as money market instruments, or a combination of the two.
- Equity carve-out: is a variation of a divestiture that involves the sale of an equity interest in a subsidiary to outsiders. The sale may not necessarily leave the parent company in control of the subsidiary. The new equity gives the investors shares of ownership in the portion of the selling company that is being divested. In an equity carve-out, a new legal entity is created with a stockholder base that may be different from that of the parent selling company. The divested company has a different management team and is run as a separate firm.
- Standard spin-off: new shares are issued, but here they are distributed to stockholders on a pro rata basis. As a result of the proportional distribution of shares, the stockholder base in the new company is the same as that of the old company. Although the

stockholders are initially the same, the spun-off firm has its own management and is run as a separate company.

- Split-off: is an exchange offer in the sense that new shares in a subsidiary are issued and shareholders in the parent company are given the option to either hold on to their shares or exchange these shares for an equity interest in the new publicly held subsidiary. This type of transaction differs from a spinoff because parent company shareholders have to part with their parent company shares if they want the shares of the new company.
- Split-up/Starbursts: the entire firm is broken up into a series of spinoffs. The end result of this process is that the parent company no longer exists, leaving only the newly formed companies. The stockholders in the companies may be different because stockholders exchange their shares in the parent company for shares in one or more of the units that are spun off.

It is worth noting that sometimes companies can do a combination of more than one of these methods of separation, in order to tailor the restructuring to their specific needs.

From an historical perspective, divestitures are the first restructuring tool that entered the corporate finance landscape in the late 1960s, during the Conglomerate Boom. In this period, they accounted for a very small percentage of the total number of transactions, but under Regan government at the beginning of 1970s, changes in the tax law and other regulatory measures, along with the stock market decline, abruptly stopped the corporate expansions and divestitures jumped to 42% of total transactions. Companies began to reconsider some of the acquisitions that had proven to be poor combinations, and the need to sell-off divisions to raise funds and improve cash flows intensified in 1974-75 economic downturn. Moreover, the international competition pressured some of the 1960s conglomerates to become more efficient by selling off prior acquisitions that were not competitive in a world market. The divestitures trend peaked in 1975, when they accounted for 54% of total transactions. After 1980s, not only divestitures but also spin-offs and equity carve-outs started increasing in number, and during the fifth merger wave, from 1993 to 2000, corporate break-ups rose again as downsizing and refocusing became prominent business strategies. Another driver of corporate restructuring activity is the increasing trend of shareholder activism, an increasingly powerful force in the corporate landscape, and many activists agitate for value maximizing activity, including break-ups.

Corporate restructurings trends tend to follow M&A trends, because companies prefer to divest assets when the market is heating up and the economy is florid, to have better exit payouts, and

usually this time coincides with increasing M&A activity. Moreover, corporate break ups can be the exit strategy for unproductive M&A activity. For this reason, peaks in restructuring activity lags M&A peaks of one or two years, because usually M&A best performing years are followed by recessions, and during recessions all the inefficient decisions taken by the top management cause issues that are solved with restructurings. Even though *Figure 15* shows the trend of just divestitures, compared to M&A activity, it offers a good grasp of the historic trend of restructurings.

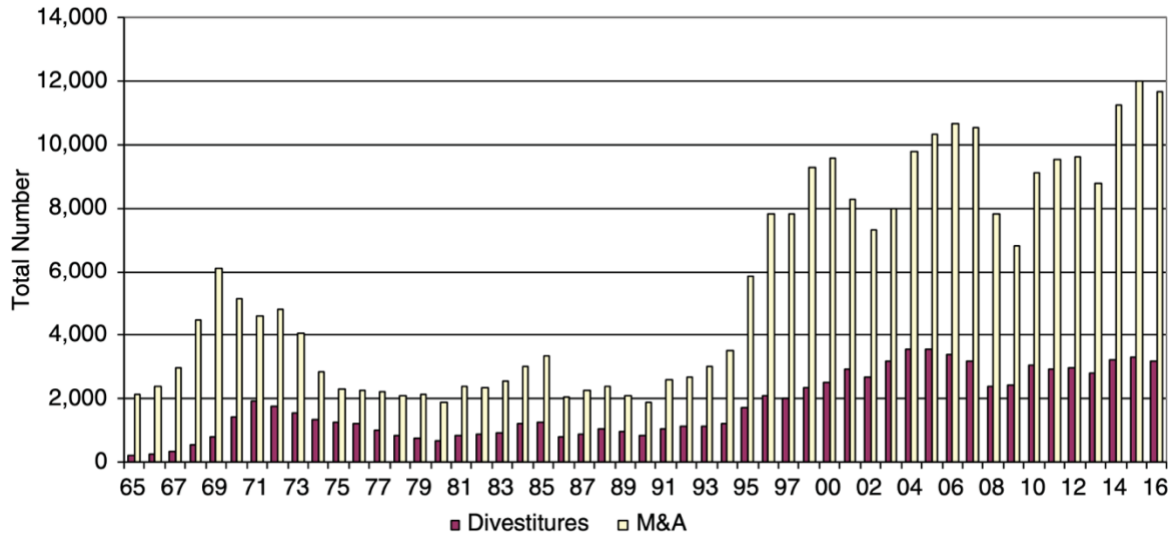

Figure 15: US mergers and acquisitions versus divestitures: 1965-2016.
Source: Mergerstat Review, 1994-1998, 2017

3 Chapter 2

3.1 Spin-off in detail

3.1.1 Definition and different structures

In a spin-off, a public company distributes its equity ownership in a subsidiary to its shareholders. The distribution is a pro-rata dividend and parent shareholders receive subsidiary stocks in proportion to their ownership in the parent firm. The spinoff involves a complete separation of the two firms. After the spinoff, the subsidiary becomes a publicly traded company with a unique ticker symbol and an independent Board of Directors.

There are several different structures that can be employed to spin a subsidiary off, depending on the financial and legal objectives that want to be accomplished. According to a report by JP Morgan (2015)[38], these separations strategies have become more sophisticated and innovative. The different spin-off structures are:

- **100% spin-off**: this is the typical spin-off and all of the shares of the spin-off company are distributed to the shareholders of the parent as a dividend. The shares of the spun-off entity are distributed to the parent company shareholders through dividends proportional to their stock ownership. Since the Board of Directors approves the spin-off, and it is assumed that there are no fundamental changes to shareholder rights before and after the spin-off, this mechanism does not require a shareholder vote under the law of most jurisdictions in the US, while in Europe shareholders' vote is required[39]. However, even in the US the vote is required if the spin-off happens through a charter amendment[40]
- **Partial spin-off**: the parent may distribute to its shareholders fewer than all of the shares of the subsidiary but not less than 80%, because the parent company must distribute "control[41]" of the spun-off entity, in order for the transactions to qualify as tax free[42]

[38] "Evolving Trends in Corporate Spin-offs", JP Morgan, 2015

[39] Corporate tax law and corporate governance topics are analyzed in paragraph 2.1.6: "Corporate Governance and Creditors Protection"

[40] An example of a spin-off involving a chartered amendment was the InterActiveCorp (IAC) spin-off of Expedia in 2005. The chartered amendment reclassified each share of IAC common stock as a share of IAC common stock and a fraction of mandatory exchangeable preferred stock that automatically exchanged into a share of Expedia common stock. Since the corporate charter was amended, shareholders were required to vote.

[41] Control is distributed if at least 80% of the voting power of all of the shares and at least 80% of any non-voting shares are distributed

[42] Tax regulation of spin off will be discussed later in the dissertation

- **IPO plus Spin off**: Part of the shares in the subsidiary are offered to the public market through an Initial Public Offering (IPO) before spinning the subsidiary off, distributing part the other shares to the parent's shareholders through dividends. An IPO allows the formation of a natural investor base for the subsidiary in advance of distributing the remainder of the parent's stake in the subsidiary to the parent's shareholders. This transaction could be helpful for the parent's shareholders because they can trade the subsidiary shares if they don't want to hold them, and they can rely on the market valuation of the company, escaping potential manager's moral hazard. However, in order for the transaction to be tax free, the parent cannot publicly offer more than 20% of the subsidiary shares, unless low-vote stocks are issued[43].
- **Umbrella Partnership-Corporation (Up-C)**: structuring the subsidiary as an Up-C is an alternative to the low-vote method employed when the parent wants to offer more than 20% of the subsidiary shares to external shareholders. The Up-C structure involves three different entities:
    i. The subsidiary that has to be spun off, which is contributed to an operating company
    ii. The operating company, that is a partnership for tax purposes
    iii. The Newly formed corporation that has a minority economic interest and a majority of the vote and control over the operating company

  The parent holds at least 50% of the economic interest in the operating company and non-economic high-vote stocks in the newly created corporation. In this way, the parent company can sell at most 50% of the economic interest in the subsidiary, and the remaining interest is spun-off
- **Sponsored spin-off**: the parent distributes the shares of the subsidiary in a tax-free spin-off concurrently with the acquisition by a sponsor of up to 49.9%[44] of either the parent or the spin-off company. The sponsor's investment allows the parent to raise

[43] Low-vote stock to the public may preserve the ability to spin off the subsidiary in a subsequent step if the parent wants more than 20% of the value of the stock of the subsidiary to be issued to the public. However, the tax treatment of the transaction, in the US, depends on the opinion of a counsel because the Internal Revenue Code (IRC), which is the US federal tax code, does not rule explicitly this kind of transaction.
[44]For the spin-off to be recognized as tax-free, both the spun-off company and the parent must not be acquired within 2 years from the transaction according to the US IRC. Therefore, the acquired percentage of shares from a third party cannot be more than 49.9%, otherwise the tax benefits are lost. In Switzerland, the shareholder base of the two companies can change even immediately after the transaction with no loss of tax-benefits.

proceeds in the spin-off without having first to go through the IPO process, and can help demonstrate the value of the target business to the market.

- **Spin-off combined with M&A Transactions**: a spin-off transaction can be combined with a concurrent M&A deal, which in the US must satisfy specific requirements to keep the tax-benefits of the spin-off. Morris Trusts and Reverse Morris Trusts allows the parent company to transfer a business to a third party in a manner that is tax-free, in the US, if some requirements are met. In a Morris Trust, all of the parent's assets other than those that will be combined with the third party are spun-off or split-off into a new public company and then the parent merges with the third party. In a Reverse Morris Trust, the spun-off assets are the ones that will be merged with the third party. To ensure that the transaction is tax-free, among other things, the spin-off entity shareholders must have the majority of the stocks of the entity resulting from the merger. The Reverse Morris Trust is preferred by managers because the entire transaction does not require the approval from shareholders, in the US. This because, at the time of the decision of the spin-off and subsequent merger, the only shareholder of the subsidiary is the parent company[45].

3.1.2 Spin-off in the history of financial markets

Historically, spin-off activity consistently entered US capital markets in 1985, before spreading to European markets in 1989 and in Asian ones later in 1995, during the bull run that brought to the dot-com bubble. Globally, activity soared in the second half of the 1990s and reached a peak in year 2000 with over 200 transactions and a total market value of $225 billion. In this period, many companies tried to take advantage of the higher valuation multiple investors were willing to pay for activities in the technological and industry sector by spinning-off subsidiaries and divisions in that space. While the interest in spinoffs plummeted with the burst of the internet bubble, the deal activity recovered through 2006 and 2007. The spinoff dollar deal volume fell again drastically with the onset of the financial crises but has recovered through 2010 and 2011, to peak again in 2015, recording the best year of the decade 2010-2019 with volume reaching $250.5bn and 100 deals. From 2016 to 2018, spin-off activity didn't show exceptional results, with an average volume of $130bn, and the highest number of transactions of 59, recorded in 2018. However, in 2019 the volume peaked again at $250bn, with only 41 spin-off transactions (*Figure 16*). Despite the low deal count, 2019 saw three of the top 10

[45] In Europe, such a decision would mandatorily require shareholders' approval

largest spin-off deals (Dow Inc: $52.4bn, Prosus NV: $34.5bn and Alcon Inc: $31.4bn), with the Dow Inc transaction coming in at the 2nd position by value in the decade, after the AbbVie deal in 2013 ($55.3bn), as *Figure 17* shows.

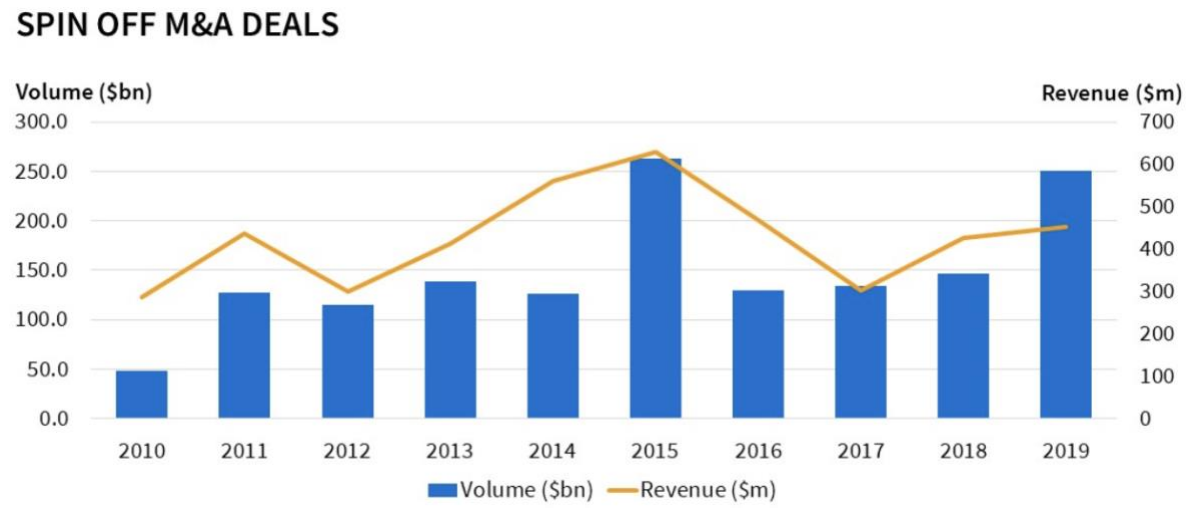

Figure 16: Figure 16: "M&A Highlights: full year 2019"
Source: Dealogic

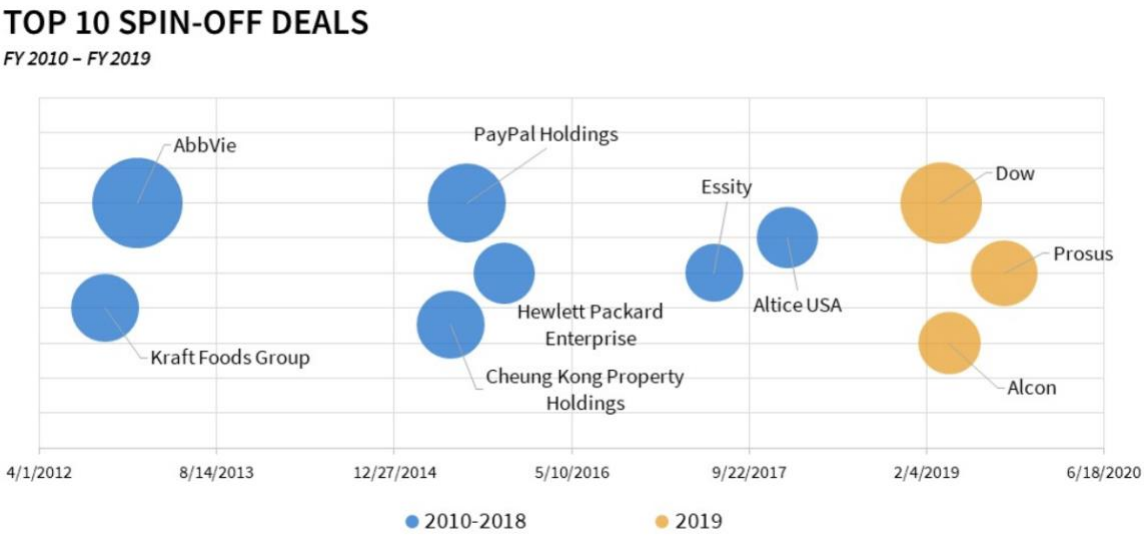

Figure 17: Figure 16: "M&A Highlights: full year 2019"
Source: Dealogic

Some economic factors have been driving the resurgence in separation activity after the financial crisis in 2008/09. Among the typical drivers of financial transactions, such as low interest rates and attractive capital markets, pressure from activist investors has been particularly important.

An activist investor is an individual or group that purchases large numbers of a public company's shares and/or tries to obtain seats on the company's board to effect a significant

change within the company. A company can become a target for activist investors if it is mismanaged, has excessive costs and could be run more profitably as a private company or has another problem that the activist investor believes it can fix to make the company more valuable. Among the other strategies employed by activist investors to enhance the share price of the target company, they have been pressing management to undergo corporate break-ups to divide high-growth divisions, with higher potential valuations, from low-growth ones, with lower valuations. Indeed, according to JP Morgan report on spin-off activity[46] from 2010 to 2012, the percentage of deals in which activists were catalysts was 14% while, from 2013 to 2015, the percentage was 36%.

The other important driver of corporate restructurings is a low growth environment. Figure 1 and 2 shows that the peaks in spin-off activity have characterized periods of economic slow-down: 2015 and 2018/19. Since 2018, some sectors, such as the pharmaceutical or the consumer product one, have been experiencing a very low growth environment. Industries characterized by high competitiveness, low opportunities for broadening the customer base and high degrees of consolidation have compelled companies to focus on their core competitive advantage. To this end, corporate break-ups have been exploited to make the production process more efficient, increase margins and valuations. Indeed, corporations have been facing increasing pressure to maintain performance and earnings results with punitive outcomes, from market participants, for companies that fail to achieve projections. Therefore, companies have been working to streamline business models to focus on core businesses that generate consistent results.

Fluid credit markets have been supporting corporate restructuring transaction. When spinning-off, both the parent and the subsidiary decrease the value of assets on which debt holders can rely on in case of bankruptcy. Moreover, increasing focus means increasing volatility of cash flows, and thus risk. For these reasons, after a restructuring, the credit rating of companies usually decreases and, unless the credit market is supportive, allowing easy refinancing deals, spin-offs could face fund-raising shortages.

Another important driver of spin-off activity is tax regulation on asset disposals and capital gains, because the main benefit of a spin-off transaction, with respect to divestitures and carve outs, is that it is tax-free, both in US and Europe[47]. For example, before 2018, in the U.S., tax-

[46] "Shrinking to grow. Evolving trends in corporate spin-offs", JP Morgan, 2015

[47] European countries have all different regulations on spin-offs tax benefits. For the sake of this thesis, Switzerland regulation is the representative European country regulation chosen to be compared with the US one.

free spin-offs represented an advantageous method of achieving corporate clarity due to the 35% federal corporate tax rate applicable to taxable dispositions. However, a variety of favorable changes in U.S. corporate tax law have increased the attractiveness of taxable sales for cash. Lower corporate tax rates have further been bolstered by immediate tax deductibility of acquired tangible assets and a more tax-friendly approach to foreign subsidiaries that now provide companies multiple options to achieve their corporate clarity objectives. For this reason, even though 2019 has been an almost record year for spin-off volume, the number of deals has been decreasing 30.5% with respect to 2018 and 59% with respect to 2015.

Last but not least, a spin-off could feed the market with companies that are more appreciated by investors. Investors have been demonstrating continued preference for streamlined corporate structures in conjunction with adverse reactions toward companies with excess complexity, that are difficult to value.

Moreover, investors could be divided into two main different parties: value investors and growth investors. Value investors prefer companies with low growth potential but good current financial and economic conditions that can ensure steady cash flows, stable dividend distribution and overpricing. Growth investors, on the other hand, prefer companies with high growth potential; they love betting on the bright future of the companies, and thus they are ready to pay high prices for companies that sometimes don't earn profits yet. When a spin-off separates companies with different growth potentials, both value and growth investors are provided with companies that suit their risk-return tastes and investment strategy.

3.1.3 Benefits

Since spin-off deals entered the world of finance, scholars have tried to analyze the benefits and disadvantages of the transaction. The most relevant benefits of a spin-off transaction for both the subsidiary and the parent company are:

- **Increase in focus**: A spin-off will allow each business to focus on its own strategic and operational plans without diverting human and financial resources from the other business. Burch and Nanda (2003) found that the diversification discount is reduced when the spinoff increases corporate focus, but not otherwise.
- **Capital structure and financial policy**: A spin-off will enable each business to pursue the capital structure that is most appropriate for its business and strategy. Each business may have different capital requirements that may not be optimally addressed with a single capital structure. According to Dittmar (2004), spin-offs allows the subsidiary to

tailor the capital structure depending on its specific features as a stand-alone company. Small subsidiaries with high growth opportunities have lower leverage ratios, while large subsidiaries with high collateral value have higher leverage ratios than do their parents. Not only the capital structure but also the optimal dividend policy can be reviewed after the spin-off, depending on the growth profile and investment opportunities of the subsidiary. Companies conducting spin-offs often have established dividend histories and need to determine the appropriate dividend policy for the new company. The optimal dividend policy for the new company will be a function of its growth profile, investment and funding needs, and the value proposition to investors. Historically, there has been divergence in the dividend policies adopted by spun off companies: about 35% are dividend payers in the first year whereas 65% do not pay dividends, according to a Morgan Stanley research (2011). Spun-off entities are much more likely to pay dividends if the parent also pays dividends, but dividend paying spun-off companies when the parent is a non-payer are rare. For parent companies, an important consideration is whether their dividend policy should be changed if a business is spun off. On the one hand, investors tend to value consistency in dividend payouts, which suggests that maintaining the existing policy may be optimal. However, the growth profile and funding needs, as well as the assets and earnings stream, of the parent's remaining business may be materially different following a spin-off and these may require a change in the parent's dividend policy. *Figure 18* shows that in the period between 2001 and 2011, the median dividend payout ratio increased in parent companies, because less funds are needed to the business. This fact could be particularly beneficial for valuations of parent companies when stable dividend distributions are valued at a premium by investors, as it is the case in low growth environments.

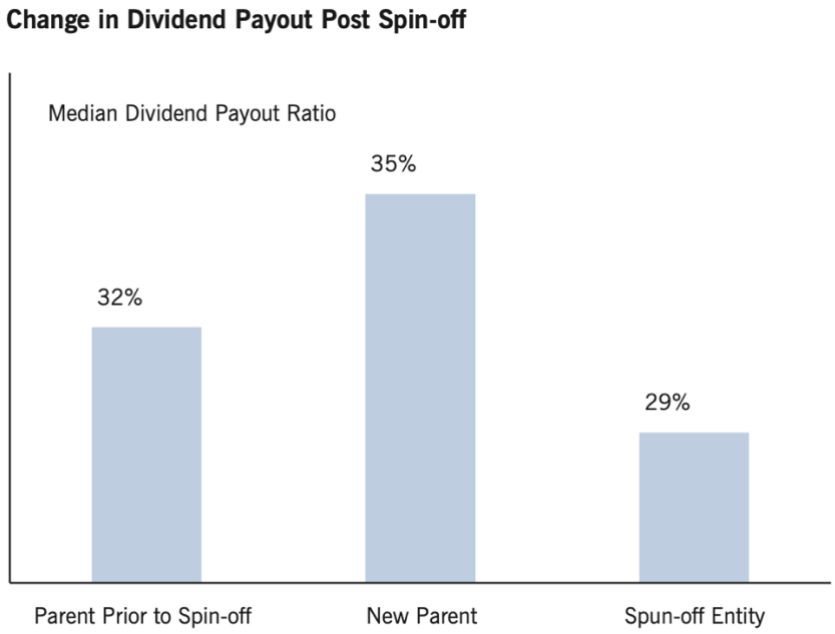

Figure 18: Figure 12: Source: Spin-offs: tackling the conglomerate discount, "Journal of Applied Corporate Finance", Vol. 23, N. 4, 2011, Morgan Stanley publication

- **Elimination of negative synergies**: spin-off transactions allows the management to reduce the errors of cross-subsidization, that are usually committed in a conglomerate. Gertner, Powers, and Scharstein (2002) show that the subsidiary's investment decisions become much more sensitive to the firm's investment opportunities after the spinoff. Overall, the evidence indicates that spin-offs create value by improving the investment decisions in diversified firms. Moreover, Allen, Lummer, McConnell, and Reed (1995) propose that spinoffs provide a way to unwind unsuccessful prior acquisitions. They found evidence that the greater the anticipated loss from the acquisition, the larger the expected gain from the spin-off, in terms of stock price.
- **Increase probability of a takeover**: after two years since the spin-off, both the parent and the subsidiary, if incorporated in the US, can be acquired by third parties, without losing the tax benefits of the transaction. The fact that is possible to acquire control of the spun-off division through a stock purchase, and that both the parent and the subsidiary are smaller entities than before the spin-off, increase the likelihood of a future takeover. Cusatis, Miles, and Woolridge (1993) examine 146 tax free spinoffs over the period 1965-1988 and show that both the parent and the spun off subsidiary are indeed more likely to become takeover targets, compared to a set of control firms matched on size and industry. They suggest that the two pure plays created by a spinoff are more attractive as targets than the combined company. Given the large premiums

typically paid in control transactions, the scholars attribute the positive abnormal stock returns at the time of the spinoff to the increased probability of being acquired. Moreover, the price paid to acquire control of the spun-off entity is even higher than it could have been while the company was not listed. This because, bidders purchase price of private companies shares discounts the lack of marketability of the shares, i.e. illiquidity, while stocks of a listed company are easier to liquidate, and thus the discount is not applied, and the share price is higher. The threat of a possible takeover has also another advantage: the management is forced either to work harder in running the firm or to relinquish control of one of the firms resulting from the spin-off.

- **Information asymmetry**: the aggregation of financial data across divisions may exacerbate informational asymmetries between outside investors and insiders for diversified firms. Investors have limited financial information about subsidiaries controlled by the parent company, because financial statements are consolidated. For this reason, for outside investors is extremely difficult to attribute a fair value to the entire group of companies; in particular if there are synergies within the group or subsidiaries with different growth and risk profiles. It is particularly important that information asymmetries with analysts are reduced because analysts play an important role in producing and disseminating information about the company, which inevitably affect the stock price. Gilson, Healy, Noe, and Palepu (2001) documented a 45% increase in analysts' coverage in the three years following a breakup and the new analysts tend to be specialists in the subsidiary's industry. Moreover, the accuracy of the earnings forecast improves by 30-50%. Hence, increases in corporate focus seem to improve the information provided by analysts, both in quality and quantity.
- **Clientele effects**: Previously combined into a single security, the spinoff creates an opportunity to hold the subsidiary stock separately. This expansion of investors' opportunity set increases liquidity and opportunities for investor diversification. Vijh (1994) finds abnormal stock returns of 3.0% on the spinoff ex-date[48], accompanied by an increased trading volume. He attributes the positive returns to higher demand for the parent and subsidiary stocks once they have been separated. Furthermore, by creating a separately publicly traded stock for part of the parent company's businesses, a spin-off could enhance the ability of both the parent and the spun-off business to effect acquisitions using its stock as consideration.

[48] The day the subsidiary starts trading separately

- **Equity-based compensation**: A spin-off will increase the effectiveness of the equity-based compensation programs of both businesses by tying the value of the equity compensation awarded to employees, officers and directors more directly to the performance of the business for which these individuals provide services. As long as the subsidiary is not publicly traded, it is more complex to tie management compensation to business performance.
- **Tax benefits**: both in the US and in Europe, spin-offs are forms of demerger that are exempted from tax burdens. This peculiarity makes the transaction extremely preferred with respect to divestitures and equity carve-outs, in particular when corporate tax rates are high. Given the importance of this advantage for strategic business purposes, *section 2.1.7* has been devoted to an in depth discussion of the topic.

3.1.4 Disadvantages

The disadvantages of a spin-off are mainly linked to the complexity of the transaction and the increase in risk of the two companies:

- **Risk of cash flows**: after a spin-off, the two companies increase their focus on the core business, reducing diversification. A potential drawback of less diversification is the increasing volatility of expected cash flows. Both the two companies will be extremely dependent on the whole industry performance. As a consequence, the beta of the companies will increase, decreasing the valuation and the stock price, because the risk for the investors is higher. Moreover, in the period after the spun-off entity ticker begins trading, the subsidiary share price experiences very high levels of volatility due to the uncertainty caused by the small company information that analysts and investors have. However, increasing risk of expected cash flows will impact debtholder more than shareholders, as the next bullet point describes
- **Bondholders**: A spinoff may increase shareholder value at the expense of the parent firm's creditors by reducing the total assets of the firm. In addition, if the spinoff increases the volatility of the cash flows of the two separate firms the expected payoff to debtholders will decrease, with a corresponding potential gain to shareholders. Maxwell and Rao (2003) found that the average abnormal bond return (adjusted for the treasury rate) in the month of the spinoff is -0.9% and decreasing in the relative size of the spun-off entity. Consistent with a bondholder loss, credit ratings are more likely to be downgraded than upgraded subsequent to the spinoff. They find, however, that the

combined value of the publicly traded debt and equity increases, suggesting a partial wealth transfer from bondholders to shareholders. *Figure 19* shows that fewer than 25% of all spun-off firms have a credit rating that is higher or the same as that of the parent. In the majority of cases the rating for the spin-off firm is lower than the parent. A lower rating for the spun-off entity may be appropriate if the nature of its assets warrants a higher degree of leverage than the parent's, as presented in *Figure 20*. However, in some cases, the lower rating is an outcome of the smaller size of the subsidiary relative to the parent, which limits the amount of debt the business may support. A spin-off can have important implications for the rating of the parent company as well. In some cases, spinning off a business may put downward pressure or jeopardize the parent's credit rating since the assets and earnings stream of the spun-off entity will no longer be available to the parent company.

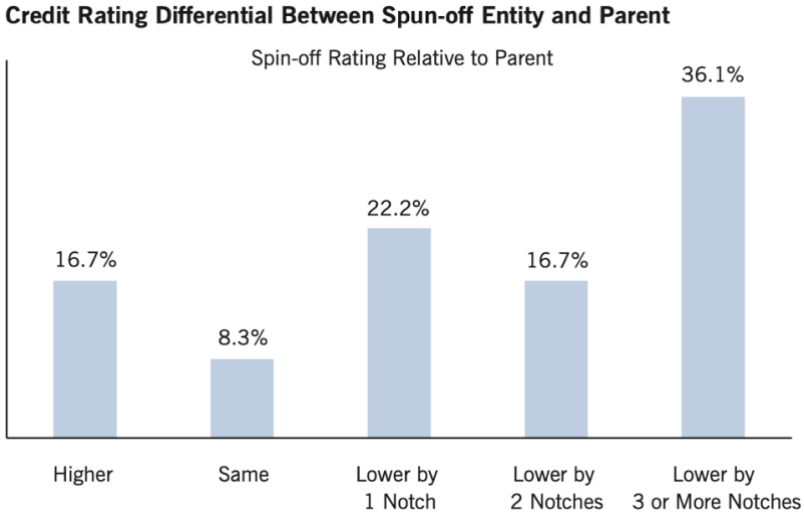

Figure 19: Source: Spin-offs: tackling the conglomerate discount, "Journal of Applied Corporate Finance", Vol. 23, N. 4, 2011, Morgan Stanley publication

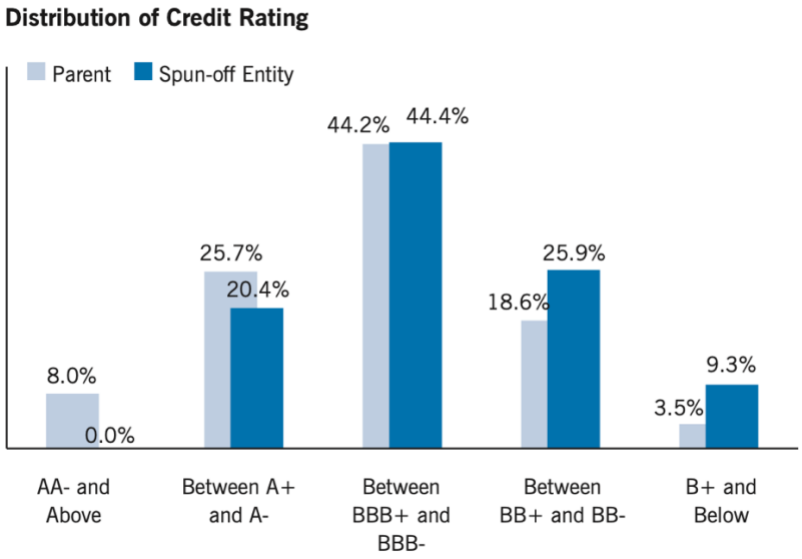

Figure 20: Source: Spin-offs: tackling the conglomerate discount, "Journal of Applied Corporate Finance", Vol. 23, N. 4, 2011, Morgan Stanley publication

- **Operational performance**: Dasilas, Leventis, Sismanidou and Koulikidou (2011), demonstrate that between January 2000 and December 2009 in the USA and Europe, the operating performance deteriorates in the post spin-off period for parent and subsidiary. US firms do not experience significant deviations in their Return on Assets (ROA)[49] relative to the comparable firms either pre-event or post-event, while European companies, have notably lower ROA than their matched firms in the second and third year after the spin-off. However, when considering the ratio EBITDA over total assets, which does not take into account depreciation and amortization costs, which could impact companies that are increasing the asset size to support growth, the study shows that European subsidiaries display a gradual increase in their operating performance. On the other hand, European parents and US parents and subsidiaries do not show positive pattern in the first three years after the spin-off, even when using this different ratio.
- **Time and effort**: The process of completing a spin-off is complex and requires consideration of a myriad of financial, capital markets, legal, tax and other factors. Indeed, divestiture usually takes around six months while a spin-off around twelve months. The management must put a great effort in it, with the potential drawback of losing focus on the operating and core business of the parent company, losing competitive advantage and market positioning. Moreover, spin-offs raise various issues

[49] Return on Assets (ROA) is equal to Net operating profit (NOPAT) divided by total assets employed

associated with taking a company public, such as drafting and filing the initial disclosure documents, applying for listing on a stock exchange, implementing internal controls and managing ongoing reporting obligations and public investor relations. Time and effort increase if the businesses are tightly integrated before the transaction or are expected to have significant business relationships following the transaction. It will take more time and effort to allocate assets and liabilities, identify personnel that will be transferred, separate employee benefits plans, obtain consents relating to contracts and other rights, and document ongoing arrangements for shared services and continuing supply, intellectual property sharing and other commercial or operating agreements.

- **Shareholder churn consideration**: Companies considering a spin-off should also be aware of the possibility of substantial turnover in the shareholder base of the spun-off entity relative to parent's shareholding structure. According to *Figure 21*, the 10 largest institutional shareholders of the parent company divest about half the shares of the spun-off entity they received in the distribution. Turnover in the shareholder base is a natural outcome of the different industry and growth profiles of the spun-off entity and the parent company, along with their often different financial and dividend policies.

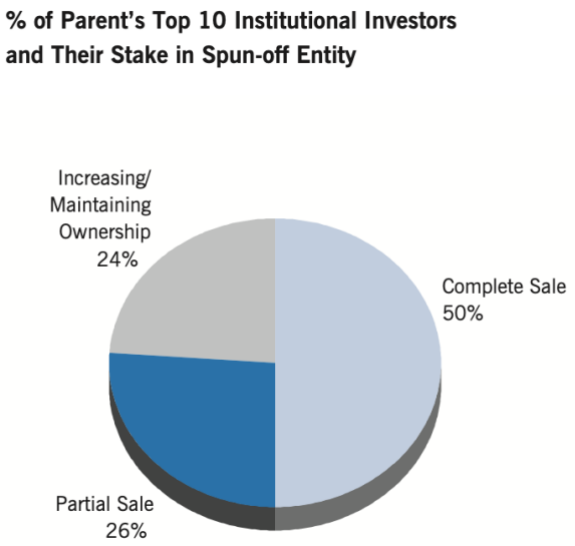

Figure 21: Source: Spin-offs: tackling the conglomerate discount, "Journal of Applied Corporate Finance", Vol. 23, N. 4, 2011, Morgan Stanley publication

3.1.5 Effect on shareholders' value

Many scholars have focused on understanding whether the spin-off increases the shareholders' value, and thus contributes to maximize firm value. To this end, this part reviews the major analysis that have tried to address this question, analyzing the stock price of both the parent and the subsidiary in the short term, around the announcement date and the effective date, and in the long term. In a spin-off transaction, the announcement date and the effective date are particularly important for the investors and traders in the markets: the announcement date, is

the date the parent company publicly discloses the spin-off, and the effective date, or ex-date, is the day the subsidiary's shares start trading with the subsidiary own new ticker.

Eckbo and Thorburn (2013) reviewed 24 selected studies estimating shareholder gains from spin-off announcement date. The 24 samples contain a total of 2,957 spinoffs announced between 1962 and 2007. Shareholder average cumulative abnormal returns are significantly positive and ranges from 1.7– 5.6% across the various studies. The lowest average CAR of 1.7% is for a sample of 156 European spinoffs announced in 1987–2000 and examined by Veld and Veld-Merkoulova (2004). Combining the 24 studies, the sample-size-weighted abnormal announcement return is 3.3%. In addition, they found that the total gains from a spin-off are frequently reflected in the parent company stock. However, this study takes into account only the returns gained during the announcement date, while it is important to consider also the days preceding the announcement date, the effective date and the subsequent months, in order to understand the long-term effectiveness of the business strategy in maximizing firm value. In the analysis produced by Credit Suisse (2012)[50], 17 years of spin-offs have been examined. According to the results, parent companies' performance dipped in the days preceding a spin-off announcement but returns exceeded the benchmark, S&P 500, on announcement date and then remained above the S&P 500's returns for the 30 days following the announcement. Even after the effective date the performance was positive, but the standard deviation of returns following the first 30 trading days after effective date was high: 11.7% for parents and 16.1% for spin-offs.

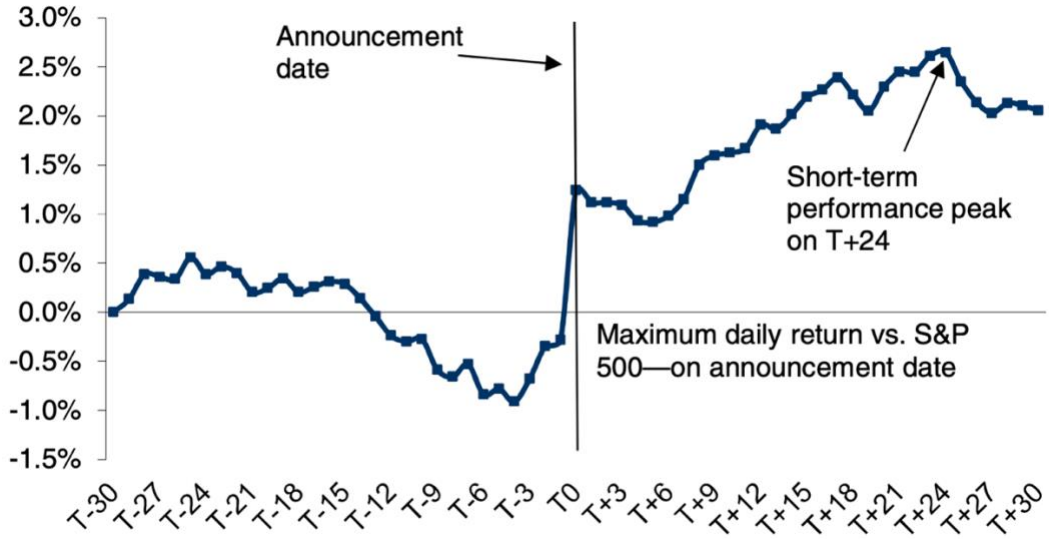

Figure 22:Parent company stock price at announcement date
Source: "Do spin-offs create or destroy value?", Quantitative Analysis, Credit Suisse, Sep. 2012

[50] "Do Spin-offs create or destroy value?", Credit Suisse, 2012

It is worth noting that in the period following the effective date, the two companies' shares trade in the opposite direction: parent's stock price rises and peaks after three day, then declines before increasing again, while the subsidiary's stock price suffers a very steep decline before turning up. These two patterns are shown in *Figure 23*, that describes the trend of the returns of the two entities for the first 60 days of trading, relative to the S&P 500 returns.

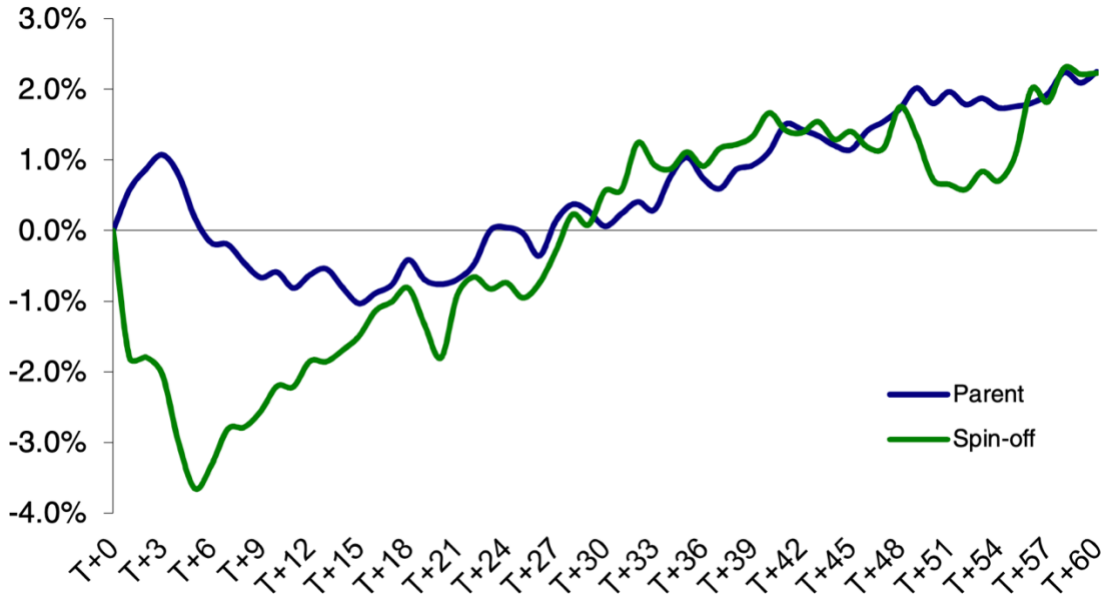

Figure 23: Parent and subsidiary returns over the S&P 500 30 days after effective date.
Source: "Do spin-offs create or destroy value?", Quantitative Analysis, Credit Suisse, Sep. 2012

The factors that determine the steep decrease in value of the spun-off entity could be:

- **Index Selling**: If the parent firm was a member of an index, such as the S&P 500, the spun-off entity likely is not. Index funds and institutional investors will sell the spun-off shares when they do not meet their fund mandates.
- **Ownership Criteria**: The new owners of the firm, that are the parent's shareholders, now own a firm that they never purchased. The spun-off firm may not meet their investment criteria. The parent may be a large-cap firm, while the spin-off a small or mid-cap firm. The investor may decide to sell the new spin-off shares. This factor and the "index selling" explain the subsidiary shareholder base turnover, presented in *section 2.1.4*
- **Limited History**: Available financial information may not be complete. Investors may wait to see how the spin-off fares on its own before investing.
- **Low Analyst Coverage**: Coverage from financial analysts is significantly less for the spin-off versus the parent firm.

Over a 12-month observation period, parent and spun-off firms outperformed the S&P 500 index by 9.6% and 13.4%, as *Figure 24* shows, according to the study.

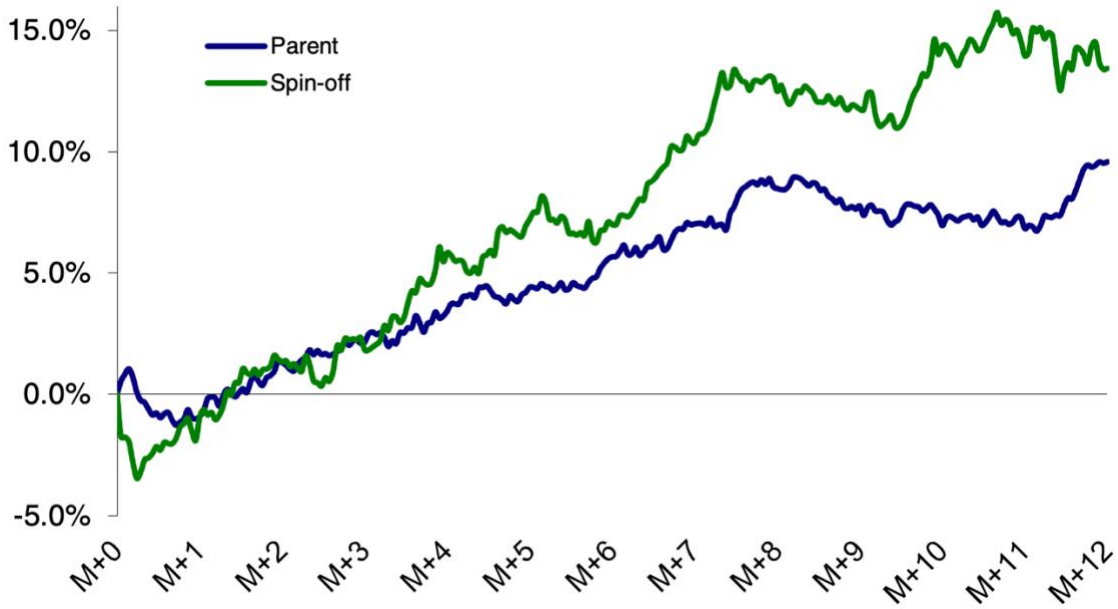

Figure 24: Parent and subsidiary returns over the S&P 500 in 12 months from the effective date
Source: "Do spin-offs create or destroy value?", Quantitative Analysis, Credit Suisse, Sep. 2012

From *Figure 24* seems evident that the returns of the spun-off entity definitely outperform the returns of the parent company. However, this is the case during periods in which investors perceive the markets as less risky, because the economy is thriving. Investments in spun-off entities are riskier than investments in the parent company, because of the smaller size and the cash flow volatility. Therefore, investors are willing to invest in spin-offs when perceived risk in the markets is low, and other equities investments gain lower returns because of high prices. In particular institutional investors, that have to realize a specific return every year regardless of market conditions, enter riskier investments when safer assets provide lower returns. On the other hand, during downturns, the risk perceived is extremely high and thus, all the riskier investments are avoided in order to favor safer opportunities. During uncertain periods, investors prefer parent companies that usually show higher credit ratings and more stable and solid businesses and cash flow production. This contrasting pattern is highlighted in *Figure 25.*

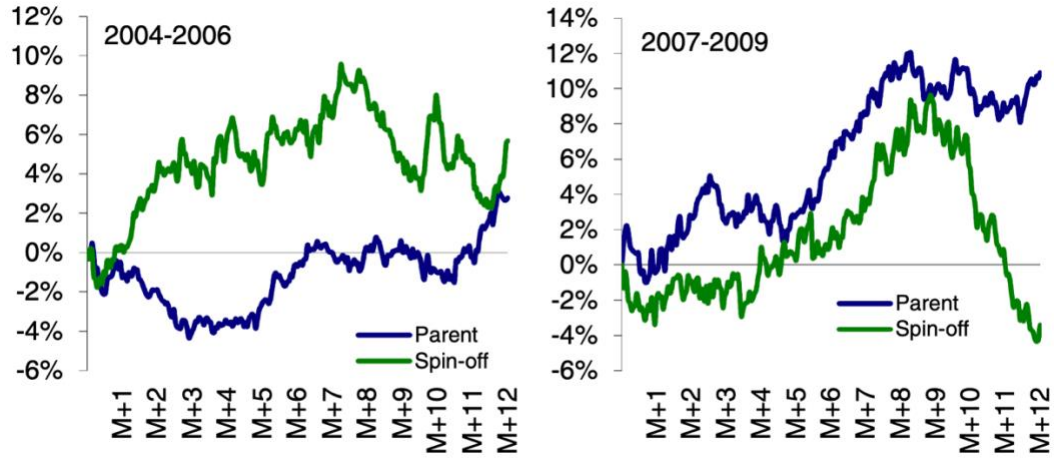

Figure 25: Parent and subsidiary returns over the S&P 500 in different time frames
Source: "Do spin-offs create or destroy value?", Quantitative Analysis, Credit Suisse, Sep. 2012

The fact that, on average, investors in the spun-off entity earn better returns than investors in the parent company has led to the common misperception that the value creation comes from the independence of high-growth subsidiaries. It would then be expected that the separation of a high-growth subsidiary would lead to a decline in the valuation multiple of the parent company after the spin-off, relative to the parent company before the spin-off, as *Figure 26*, left panel, shows. This intuition does not, however, play out in practice. A JP Morgan study (2015) found that valuation multiples of both the spun-off entity and the parent company after the spin-off increase relative to the pre-spin company, as *Figure 26*, right panel, shows. The uptick in valuation multiples post-separation has been estimated to be over 20%. After controlling for the fact that broader market multiples also increased during the research period, there is still evidence of an increase in multiples in the 10%–20% range.

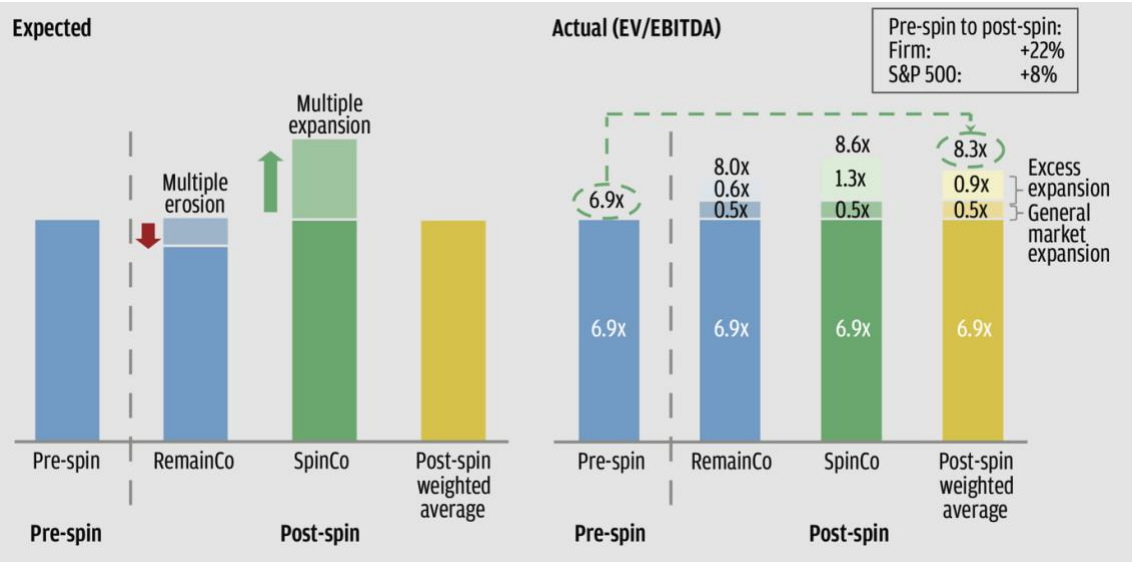

Figure 26: Multiple valuation expected and actual after spin-off transaction.
Source: "Shrinking to grow, Evolving trends in corporate spin-offs", JP Morgan, 2015

The fact that spin-off investments are preferred during periods of low risk perception, good macroeconomic conditions and low volatility could be confirmed by looking at the returns of the Invesco S&P Spin-Off ETF, fund based on the index S&P 500 in U.S, compared to the S&P 500 returns. The Index is composed of companies that have been spun off from larger corporations within the past four years. As *Figure 27* shows, the index underperformed the S&P 500 index during the financial crisis of 2008/09 and in the period beginning in 2019. In the other years it would be incorrect to say that the index steadily overperformed the S&P 500, because the graph highlights how the fund is more volatile than the index itself. Therefore, investors expect higher returns than the S&P 500, and thus the higher returns of the period between 2016 and 2019 should be considered as fair returns for the risk born. Perhaps, the index overperformed the market portfolio in the period between 2013 and 2016, period that was perceived particularly safe from an economic and financial perspective, with investors that were not discounting risks of a downturn to set prices of equities. This led investors to choose riskier investments to try to gain even better returns. Another interesting aspect to notice is that, during the 2008/09 market tumble and at the end of 2018 beginning 2019 turmoil, the index underperformance was smaller compared to the underperformance suffered during the 2020 health crisis. Moreover, after the 2019 steep decrease, the index hasn't been able to recover while the index did. This could be attributed to the fact that the corporate quality of spun-off entities is decreasing, which, in turn, could be the consequence of the growing influence of activist investors on companies' Boards of Directors. To increase the share price in the short term, some activist investors put pressure on the management to divest all those subsidiaries that decrease the value of the parent company. Since these subsidiaries are usually performing poorly before the spin-off, when they lose the support of the parent company, they have problems operating alone and they bear higher risk of financial or/and economic distress. In conclusion, the recent growing influence of activist investors pursuing short term strategies to increase the share price could increase the number of spin-offs of bad performing subsidiaries that struggle as soon as they lack the support from the parent company. This has been found as a possible explanation of the recent poor performance of the ETF, and of the US spin-offs in general, compared to the S&P 500.

Figure 27: Invesco Spin-off ETF vs S&P 500 returns
Source: Yahoo Finance

Corporate Governance and Creditors Protection

This section provides an overview of the leading governance principles in the US and in Switzerland, which regulation will be fundamental to understand the analysis of the Novartis-Alcon spin-off case. In Switzerland, the board of directors is a unitary board[51]. It is therefore similar to the one-tier system of Anglo-Saxon law and differs from the two-tier system embodied in German law. In Switzerland, the division of functions between the executive and supervisory board reduces the tasks of the latter to essentially a monitoring role. On the other hand, the US system is significantly more flexible and leaves the company considerable freedom to apportion powers between the board and the management. The Swiss Code of Obligation also leaves considerable organizational discretion to the board. Only the responsibility for key areas of the Board of Directors[52] cannot be delegated to the annual general assembly, or to the executive management.

The main difference between Switzerland Corporate Law and US Corporate Law for spin-offs is related to the shareholders rights. In terms of decision making for Swiss spin-offs, the general assembly shall resolve all issues regarding the transaction, and the general assembly has to approve the contract and plan. In Switzerland, shareholders' resolutions are required for almost all the transactions, and to approve a spin-off a qualified majority is needed. For corporations,

[51] This organization is required by the Swiss Code of Obligations
[52] These key areas are listed in section 716a of the Swiss Code of Obligations

the qualified majority is obtained with 2/3 of the voting power and ½ of the share capital. After shareholder's approval, the spin-off takes effect when the subsidiary is inscribed into the Commercial Register. Regarding the board composition of the spun-off entity, the new Swiss Merger Act (2004), does not comment on the board composition, so the normal rules apply, hence the general assembly elects the supervisory board members.

In US, shareholders' vote is not required in the majority of the jurisdictions because a spin-off is a dividend distribution, and thus the Board of Directors is entitled with the final approval of the transaction. Therefore, shareholders cannot formally oppose the spin-off in a general or extraordinary meeting. Moreover, the parent company appoints the Board of Directors of the spun-off entity, prior to the transaction. The subsidiary company board is then subject to the normal shareholder approval and confirmation after the transaction. The board members of the subsidiary company are appointed at discretion of the parent company, at least until the first general meeting, when shareholders can appoint new directors.

The fact that shareholders' vote for the transaction is not mandatory in the US, unless there are changings in the corporate charter, has been a very debated topic among scholars, because from this regulation could arise several agency problems. If the Board of Directors does not act in the interest of the shareholders, the corporate spin-off offers potentially unchecked discretion for managers over corporate governance. First of all, since the subsidiary stock is internally distributed to the parent company's shareholders, the spun-off entity various features including governance arrangements are not subject to market-pricing checks as in an Initial Public Offering. Secondly, current corporate law consistently treats a spin-off as a way to distribute dividends falling within managers' discretion. Indeed, parent company's managers can solely decide whether, when, and how to make dividends through the form of a spin-off without shareholder approval. Recent studies suggest that parent's managers tend to stretch their discretion to add new provisions affecting the allocation of power between shareholders and managers to a subsidiary's charter in a way to empower themselves over shareholders and to make them less accountable to shareholders. An example of these provisions are the antitakeover protections. The spin-off company could be more vulnerable to hostile takeovers than the previously combined company, because it has a smaller market capitalization, particularly in the period immediately following the spin-off, during which the stock price of the spin-off company may experience relatively high volatility. Therefore, in many spin-offs, the spun-off company has more antitakeover provisions in its charter and bylaws than the parent. These provisions could be preferable for the newly public from the onset for two reasons: in case of takeover within two years from the spin-off, all the tax-benefits related with

the transaction are lost, and the new company's board could always seek to eliminate the provisions later, whereas a decision to add antitakeover provisions made when the company is already public will likely face resistance from shareholders. However, these provisions would benefit managers over shareholders because shareholders benefit from a takeover, since the bidder usually pays a substantial premium for purchasing controlling shares. Managers are those who bear the worst consequences form a takeover: they would be replaced and would lose their jobs. For this reason, managers tend to work better if they face the risk of a potential takeover. Not requiring vote from shareholders, US corporate low on spin-off favors managers, while Switzerland corporate law tends to favor shareholders over management. However, the drawback of giving too much power to shareholders could be exploited by activist investors with speculative interests. Activist investors could gather the required quorum to force the management to pursue short term interests that harm the long-term value strategies of the company.

The last relevant difference between the two countries' regulations regards the protection of creditors. In Switzerland, all the demergers, and thus also the spin-off, requires prior to the shareholders' resolution, information of the creditors about the planned demerger and granting security to creditors requesting for it, unless the company proves that satisfaction of the claim is not jeopardized by the spin-off. Importantly, the companies bear secondary liability for claims that either have been transferred by spin-off or which remained with the transferring company[53]. Therefore, in case of a transfer of assets and liabilities, the transferring entity bears joint and several liability for the transferred claims for three years[54]. On the other hand, in US, when structuring a spin-off transaction, the Board of Directors of a solvent corporation owe their duties to the shareholders of the pre-spin company and may structure the transaction in a fashion that maximizes value for those shareholders. There is no duty of "fairness" as between the parent and the spin-off company. Accordingly, the parent board can make unilateral decisions as to the allocation of assets and liabilities between the parent and the spin-off company, subject to insolvency and tax considerations, before the spin-off is completed. US law does not guarantee protection to creditors as the Switzerland law does. This reason explains why most of the spin-offs transactions, especially in the US, result in a lower credit rating for both the parent and the spun-off entity.

[53] Article 47, Swiss Merger Act, 2004
[54] Article 75, Swiss Merger Act, 2004

In conclusion, corporate governance plays a critical role before and after the transaction to ensure that the spin-off creates long-term value for all the company investors. In particular, the corporate governance structure of the subsidiary has to be tailored to the specific business needs of the spun-off entity, its long-term targets and its shareholder base.

3.1.6 Tax benefits

The fact that the spin-off can be a tax-free transaction, if some requirements are met, in both US and Europe, makes the transaction an interesting alternative when restructuring a company. This section analyzes the spin-off tax implications in Switzerland and in the US.

In Switzerland, the key objective of the Merger Act (2004) was to facilitate mergers and restructuring transactions. This implies that these transactions can be conducted in a tax-neutral way. As most of these transactions did not trigger income and profit taxes already in the old law, there were few changes required in the tax laws. As stated by Von der Crone et. al (2004c) there are four key requirements to avoid income and profit-taxes[55]:

- The tax liability of the companies involved must continue after the restructuring in Switzerland: both the parent and the subsidiary must keep paying taxes in Switzerland. However, according to Swiss American Chamber of Commerce, cross-border reorganizations, with US companies, are income tax neutral if either the parent or the subsidiary taxable presence, at least in the form of a permanent establishment, is maintained in Switzerland.
- Assets and liabilities are transferred on the basis of existing book values
- Tax liabilities incurred by the parent company are assumed by the spun-off company
- The transfer must involve (part of) a business, and each of the transferring and the receiving companies must continue to operate at least one business unit[56].

As stated in Von der Crone et. al (2004c), and the Swiss-American Chamber of Commerce (2003), spin-offs and transfer of assets and liabilities are exempted from dividend withholding tax[57], stamp duties, share issuance taxes[58], and transfer duties on real estate. In Switzerland there is no capital gain tax for private individuals, but there may be tax implications for

[55] The key requirements are an extract from section 8 (3) and section 24 (3) of the 1990 Federal Law on the Harmonization of Cantonal and Municipal Direct Tax (StHG), a document that provides a framework within which the cantons must define their direct taxation laws on legal entities and individuals, as well as section 19 (1) and section 61 (1) 1990 of the Federal Law on Direct Taxation (DBG)

[56] This provision is called dual continuing businesses requirement

[57] Section 5 (1) of the Swiss Withholding Tax Act (VstG)

[58] Section 6 (1), 13 (2) and 14 (1) lit. b of the Federal Law on Stamp Duty (StG)

shareholders of the parent company, depending on whether there are compensation payments or other cash benefits such as an increase in nominal value[59].

As it is in Switzerland, in the US one of the key elements of spin-offs is that they can be conducted tax-neutral on the level of the parent and the subsidiary company as well as on shareholder level. Most US companies planning spin-offs seek to clarify the tax situation with the Internal Revenue Service (IRS)[60] before the transaction. In specific situations, tax benefits may even be the primary motivation for spin-offs (Kudla and McInish, 1983). The Internal Revenue Code (IRC)[61] of 1954 and 1986 provides in section 355 and 368 (a) special rules for the distribution of stock and securities of a controlled corporation. If the requirements of these sections are met, the Code allows tax-free treatment on corporate as well as shareholder level. According to Suchan (2004) the basic idea behind these provisions is to prevent tax avoidance schemes. In the context of section 355 of the IRC, two principal concerns might be the driving forces: Spin-offs could be used:

- to convert ordinary dividend income at the shareholder level into capital gain
- to transfer appreciated property out of the corporation without triggering tax on the corporate level

There are four statutory requirements that must be satisfied, in order for the transaction to be tax-free:

- control: states that the distributing corporation must be in "control" of the subsidiary prior to the distribution. Control is generally obtained when an entity possesses 80 percent or more of voting power.
- device restriction focuses on the purpose of the transaction, and that it is not just a way to distribute earnings. It seeks to prohibit the distribution of earnings and profits to shareholders at more favorable capital gain rates. When confirming this requirement, determination of the "device" will look to the nature, kind, amount, and use of the assets immediately after the transaction.
- active trade or business requirement involves both the distributing entity and controlled subsidiary being engaged in the conduct of a trade or business immediately after the distribution.

[59] Section 7 (1) of the 1990 Federal Law on the Harmonization of Cantonal and Municipal Direct Tax (StHG), section 20 (1) c of the the Federal Law on Direct Taxation (DBG)

[60] The Internal Revenue Service (IRS) is a U.S. government agency responsible for the collection of taxes and enforcement of tax laws.

[61] The Internal Revenue Code (IRC) is the US federal tax code

- Distribution: requires that all of the stock, or at least enough to have "control," of the controlled subsidiary is what gets distributed.

Moreover, there are three non-statutory requirements that are not listed in Section 355, and they include:

- business purpose: requires that the transaction contains a valid corporate business purpose. This is to prevent shareholders from benefiting from the tax-free aspect of Section 355 if the transaction does not appear to be central to the business itself.
- The continuity of interest requirement: relates to the shareholders of both the distributing and the controlled entities, and requires that the shareholders retain their interest in both corporations after the transaction. Parent company shareholders must generally retain at least 50% of both parent company and subsidiary company shares for two years. Otherwise, contingent tax liability will be triggered. This condition is among the reasons for which the management and the Board of Directors tend to add antitakeover provisions in the charter of the spun-off entity
- the continuity of business enterprise: relates to the continuation of business operations that existed prior to the transaction

If these requirements are met, the parent company's capital gain on the subsidiary company share disposal is tax-exempt. The fact that there were many tax-free spin-offs in the USA over the last 30 years shows that these conditions can be met. If a spinoff does not qualify as tax-free, however, the distribution is taxed as a property dividend, which is an alternative to cash or stock dividends. The parent recognizes a gain equal to the difference between the fair market value of the subsidiary and the parent's tax basis in the subsidiary, similar to a capital gain. This imputed gain is taxed at the corporate tax rate. Moreover, shareholders pay a dividend tax on the fair market value of the subsidiary, which is the price of the distributed subsidiary stock. All in all, US and Switzerland are two countries in which the spin-off tax treatment is similar and extremely beneficial for shareholders and the two companies involved. When corporate taxes increase, spin-off transactions increase in number but, if the tax burden is low, other forms of restructuring are preferred because are less time and effort consuming and produce cash proceeds for the parent company, as it is the case in a divestiture or an equity carve-out.

4 Chapter 3

4.1 Pharmaceutical industry in detail

4.1.1 Health Care sector segmentation and size

The Pharmaceutical industry is one of the several industries of the Health Care sector. The health care sector is extremely important in the world economy: it accounted for 9.8% of the global GDP in 2017[62] and produced overall revenues for $1,853 billion in 2018[63]. In addition, after the pandemic the world is currently experiencing, the experts estimate that the health care global spending will increase at a more sustained rate than previously expected, in order to readily face any other possible outbreak like COVID-19.

From a global perspective, North America is the region that has the highest health care spending worldwide: US health care spending per capita, which is around $10,000, is 2.5 times higher than the average health care spending of the OECD countries[64]. The second region for spending is Europe, while Asia-Pacific (excluding Japan) is the region with the best future perspective.

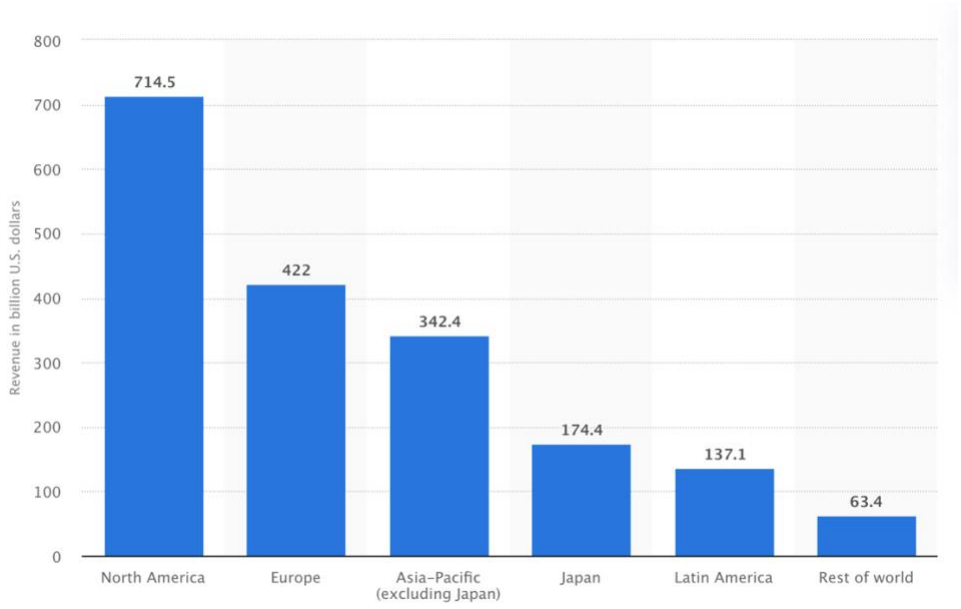

Figure 28: Projected global health care industry revenue in 2018, by region
Source: "Global Medical Device Market Outlook" 2018, Statista

[62] The World Bank Data
[63] "Global Medical Device Market Outlook 2018", Statista, 2018
[64] OECD data

The health care sector is segmented in 5 industries:

- **Pharmaceuticals:** comprises all the branded companies that manufacture branded drugs, and the direct competitors are the companies that sell generic drugs. The average Return on Invested Capital (ROIC)[65] for pharmaceuticals companies was 18.29% in 2019 and the after-tax operating margin (NOPAT) was around 24%[66]. This extremely good financial results are counterbalanced by the extremely expensive costs for developing a new drug: the average cost of taking a drug from discovery to the pharmacy shelf is between $800 million and $2 billions. Moreover, margins are highly sensitive to political and public pressure to lower the very high prices of prescription drugs, especially in the US. The process of discovering and launching a new drug on the market is long and extremely expensive[67] but then the new drug can be protected under a patent which expires both in US and in Europe after 20 years. During these 20 years, the company that has developed the drug is the only organization allowed to market it, and thus benefit from a monopoly. When the patent expires there are two options: the patent is prolonged for 5 years, or the drug can be marketed by other companies. At this point, pharma companies suffer the competition from generic drugs companies, which can cause drugs revenues to drop as much as 80% after six months. This industry will be analyzed in detail in the following sections.
- **Generic drug companies:** the business model of these companies is to start producing the drugs with expired patents at lower prices. Generic drugs have the same chemical composition as branded name drugs but cost significantly less, around 40-60% less. They can sell at lower prices because they do not bear all the Research & Development (R&D) costs that the pharmaceutical company bears before discovering and selling the drug. The ROIC is around 10% while the NOPAT is around 15-20%[68], substantially less than the pharma companies. However, generic drugs are experiencing a spike in demand, in particular if prescription drugs prices are too high.
- **Biotechnology:** these companies seek to discover new drug therapies using biologic – cellular and molecular – processes, rather than the chemical processes used by big pharma companies. These companies' main purpose is to develop groundbreaking drugs, using extremely innovative technologies, and thus the rate of failure of such

[65] ROIC is computed dividing the NOPAT, that is the operating margin after taxes, by the total assets minus cash.
[66] "Margins by sector", NYU Stern, January 2020
[67] The process will be described in detail in *section 3.1.3.1*
[68] "Margins by sector", NYU Stern, January 2020

drugs is extremely high. Usually these companies lack the adequate salesforce to enter the market, hence they used to rely on partnerships with big pharma companies to enhance the commercialization of the product. Currently, Venture Capital and Private Equity funds are investing huge amount of capital in this industry, allowing start-ups and smaller companies to market drugs without the help of big pharma players. This industry ROIC is at 8.7% and the NOPAT is around 20.17%[69]. The ROIC is lower than that of other industries because the probability of a new drug being effectively marketed is very low.

- **Medical device:** these companies make the hardware, such as pacemakers and artificial chips, for medical procedures. Companies operating in this industry benefit from very high entrance barriers because of economies of scale, high switching costs from one product to a competitor one and long-term clinical histories. Every company develops its own hardware, and for the physician the cost of switching from one product to another can be extremely time and effort consuming. Moreover, in this industry the improvements are evolutionary: industry players compete making each successive generation of any particular device just a little bit better than the previous one. As a consequence, the risk of a product approval being refused by the competent authority is reduced, and the odds that one company will leapfrog the rest by rolling out a truly revolutionary product are low. Anyway, the R&D costs are high and legal costs too. The ROIC for the industry, in 2019, is estimated at 15.87% and the NOPAT at 15.46%[70].
- **Health Insurance/Managed Care:** these companies are engaged in insuring customers from health care expenses. This industry is less attractive that the others because are subjected to intense regulatory pressure and widespread litigation. Moreover, these companies suffer increasing expenses if they underestimate the growth in health care costs. The business models of these companies are: underwriting medical insurances, the risk-based business, because insurance companies bear the risk of rising health care costs, or administrative services, the fee-based business, in which insurance companies are the intermediary between the employer and the employee. In the latter business model, the employer is the one that bears rising health care costs, because the insurer

[69] "Margins by sector", NYU Stern, January 2020
[70] "Margins by sector", NYU Stern, January 2020

has just to administer the health plan. The ROIC for 2019 is 10.48% and the NOPAT 9.23%[71].

4.1.2 The pharmaceutical industry

4.1.2.1 Market size and segmentation

The pharmaceutical industry accounts for the majority of the revenues of the health care sector, benefiting from the market predominance of the big international pharma companies.
In 2019, the pharma industry reached $1,250.4 billions in revenues, and in the period 2001-2019 experienced a compound annual growth rate (CAGR) of 6.68%[72].
So far, the top national pharmaceutical market is the United States, that in 2018 produced $484 billion in revenues, followed by China, that is growing importance in the worldwide pharma landscape, and Japan.

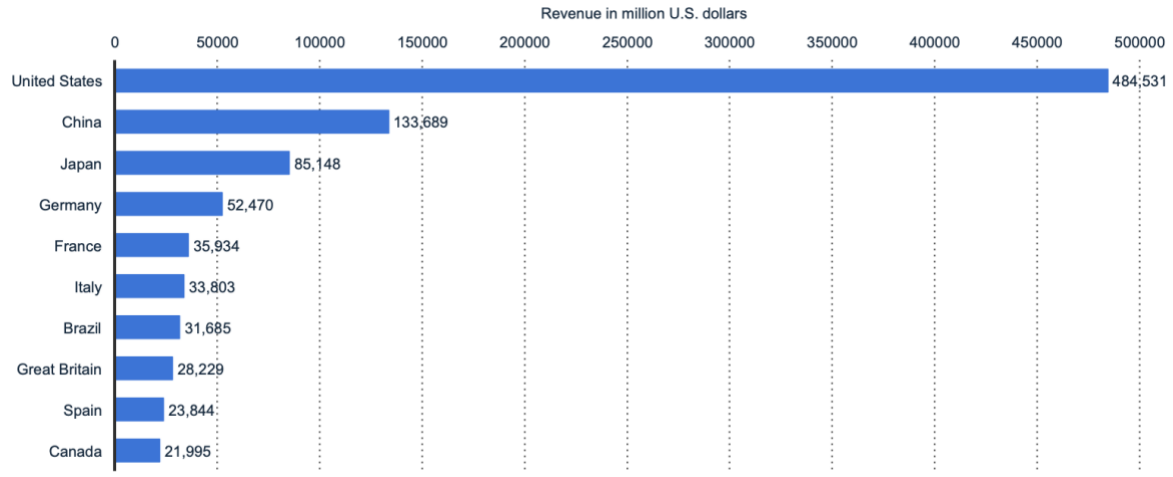

Figure 29: Pharmaceutical industry revenues by country
Source: "Pharmaceutical Market Worldwide, 2019", Statista, 2019

However, not only China but the entire Asia-Pacific region shows great potential for growth, while North American and European markets are expected to growth at a slower rate, and the lowest rates of the global regions are expected in Latin America and Africa, because emerging markets can barely afford for the high drugs prices.
The industry revenues are mainly generated by two sources of technology:

- Conventional: the drug is obtained from chemical compounds
- Biopharma/biotechnology: the drug is obtained using cellular and molecular processes such as the gene and cell therapy

[71] "Margins by sector", NYU Stern, January 2020
[72] "Pharmaceutical Market Worldwide, 2019", Statista, 2019

In *section 3.1.1*, when describing the different industries of the broader health care sectors we differentiated the pharmaceutical industry from the biotech one, but it is worth noting that many top players of the pharmaceutical industry have started shifting toward biopharmaceuticals developments from 2000. This because biopharma products can offer high efficacy and few side effects compared to the conventional drugs, and the opportunity to address previously untreatable conditions. Therefore, there is increasing demand and rising prices for biopharma drugs, leading to better profits and margins for the companies that own the patent.

The constant growth of biopharma products is shown by a strong 8% CAGR in the period 2010-2019, compared to a 0.3% CAGR for the conventional drugs[73]. The trend is expected to continue steadily, with a prospected 8.5% CAGR for biopharma in the forecasted period 2020-2024, while conventional drugs are expected to growth at a CAGR of 6.5% in the same period[74]. As *Figure 30* shows, while biopharma products in 2010 accounted only for the 17% of the total industry revenues, in 2019 the percentage has grown to 29% and is expected to reach 31.7% in 2024[75].

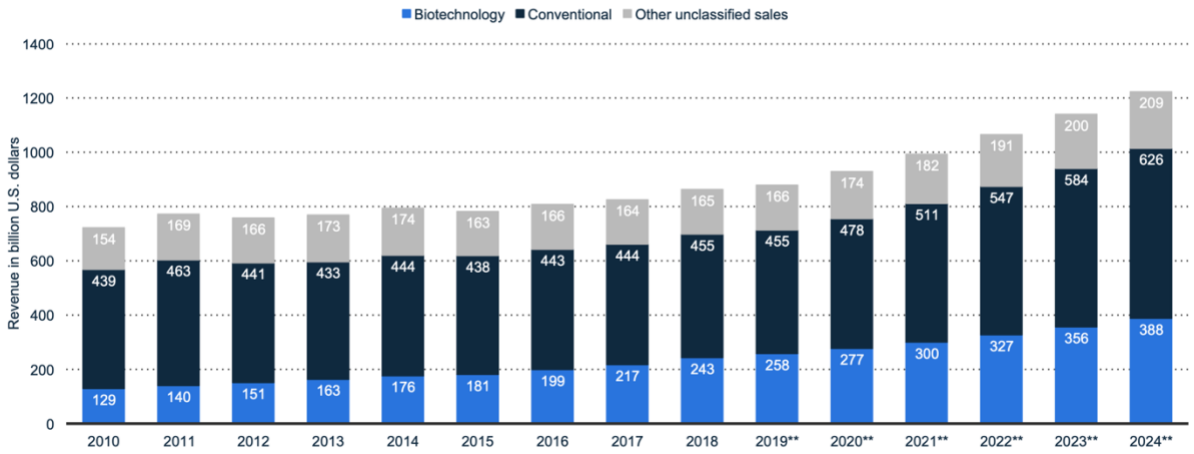

Figure 30: Pharmaceutical industry revenues by drug technology
Source: "Pharmaceutical Market Worldwide, 2019", Statista, 2019

As it will be exposed later in *section 3.1.2.4*, notwithstanding the many big players that make up the pharmaceutical industry, they don't face fierce competition but they benefit from oligopoly, because the industry is segmented in several different sub-sectors in which 2 or 3 companies are specialized, operate and dominate with their capabilities.

The top 4 sub-sectors for revenues in 2018 are:

[73] "Pharmaceutical Market Worldwide, 2019", Statista, 2019
[74] "Pharmaceutical Market Worldwide, 2019", Statista, 2019
[75] "Pharmaceutical Market Worldwide, 2019", Statista, 2019

- Oncologic: drugs to cure cancer. This sub-sector produced $99.5 billion in revenues in 2019, 8.2% of all the year revenues for the industry
- Antidiabetics: drugs to treat diabetes, like insulin. The revenues produced were $78.6 billion, 6.5% of the total year revenues for the industry
- Respiratory: drugs to cure respiratory diseases, like asthma. The revenues were $60.5 billion, 5% of the total year revenues for the industry
- Autoimmune diseases: drugs to cure diseases like HIV. The revenues were $53.5 billion, 4.4% of the total year revenues for the industry

All the pharmaceutical companies that develop a proprietary drug, benefit from a patent protection of the chemical or molecular compound for 20 years, both in the US and in Europe. Therefore, when developing a new drug, a company can monopolize the market that the specific drug treats, demanding very high prices, until the patent expires and a generic drug, which costs less, is usually commercialized. Then, the original drug drastically loses market share. However, to get the monopoly of the drug, the company has to invest between $800 million and $2 billions in R&D, and the drug development period lasts around 20 years. Moreover, the process of investing in R&D is never-ending in the pharma industry. Indeed, the so called R&D pipeline, that is the portfolio of all the drugs that are under development by the company, must always be full of new drugs to be launch in the market as soon as a patent expires, in order to reduce the losses from the patent expiration. As a consequence, pharma industry has the highest R&D spending, 15% in 2017[76], compared to all the other industries, that have an average R&D spending of 4.27%[77].

4.1.2.2 Market Segmentation

The segmentation that is usually employed in the pharmaceutical industry distinguishes 4 main types of drugs:

- **Prescription drugs**: drugs that are prescribed by a doctor, intended to be used by one person and bought only at a pharmacy. The prescription drugs are regulated by the Food and Drug Administration (FDA) in United States, the European Medicine Agency (EMA) in Europe and the National Medical Products Administration (NMPA) in China. Before the drug is approved by these organizations, it has to undergo a very long and careful review, so that patients are protected from potential harming or non-effective

[76] S&P Global Data

[77] The average of the industries is computed without taking into consideration the pharma industry. Source: S&P Global Data

drugs. In US and Europe, the chemical or molecular composition of the prescription drug is protected by a patent that expires after 20 years it is approved. Until the patent protection is active, the drug is attributed the name "branded drug". In 2019 prescription drugs accounted for 50% of the total revenues of the pharma industry, with $629 billions[78]

- **Generic drugs**: drugs that enter the market whenever a patent expires. These drugs are usually sold at a price 40-60% less than the branded drug, because generic-drugs companies do not have to cover the R&D costs with the selling price because they "copy" the chemical or molecular composition of the drug that is not protected by patent anymore, and thus they have only manufacturing costs to be covered. Generic drugs are reviewed by the regulatory pharmaceutical organizations to ensure that people have access to safe and affordable treatments. In 2019, generics revenues accounted for 6.3% of the total industry revenues, with $79 billions[79]
- **Over the Counter (OTC)**: drugs that do not require a doctor's prescription and can be bought in pharmacies or in general or grocery stores. These drugs treat minor diseases like fever, allergies or sore throats. This class of drugs have branded drugs as well as generic drugs and every new drug must be approved by the regulatory pharmaceutical organizations before entering the market, submitting an application that is less time and effort consuming, because side effects potential of OTC drugs is less than those of prescription drugs. In 2019, OTC drugs revenues accounted for the 9.1% of the total revenues of the industry, with $114 billions[80]
- **Orphan drugs**: drugs that treat rare diseases. In the US, these drugs are protected by the Orphan Drug Act (1983), which grants seven-years market exclusivity to the developing company, while in Europe, these drugs benefit from a 10-years market exclusivity, since they enter the markets. This because, the development is long, costly and the number of patients to which the treatment can be applied is constrained since very few patients are diagnosed rare diseases. US and European pharma law intend to encourage the development of medicines for rare diseases, by protecting them from competition from similar medicines. In the US, 217 orphan drugs are now no longer protected by patents, and yet only 116 of these unprotected medicines currently face generic or biosimilar competitors. Notably, just over half of the unprotected products

[78] "World Preview 2019, Outlook to 2024", EvaluatePharma, 2019
[79] "World Preview 2019, Outlook to 2024", EvaluatePharma, 2019
[80] "World Preview 2019, Outlook to 2024", EvaluatePharma, 2019

have faced competition, even decades after the lapsing of exclusivity. The factor that discourages generic-drugs competitors from entering this market are the very high cost of manufacturing and the small patient base. However, this market monopoly results in extremely high prices for these drugs, in particular those treating very few patients. In 2019, orphan drugs revenues accounted for 10.8%[81] of the total revenues of the industry, with $135 billions[82].

Figure 31 shows that prescription drugs have accounted and will account, according to the forecasts, for the majority of the drugs sold in the industry. OTC drugs sales projections, not shown in *Figure 31*, has a 4.4% CAGR the lowest of the four product types.

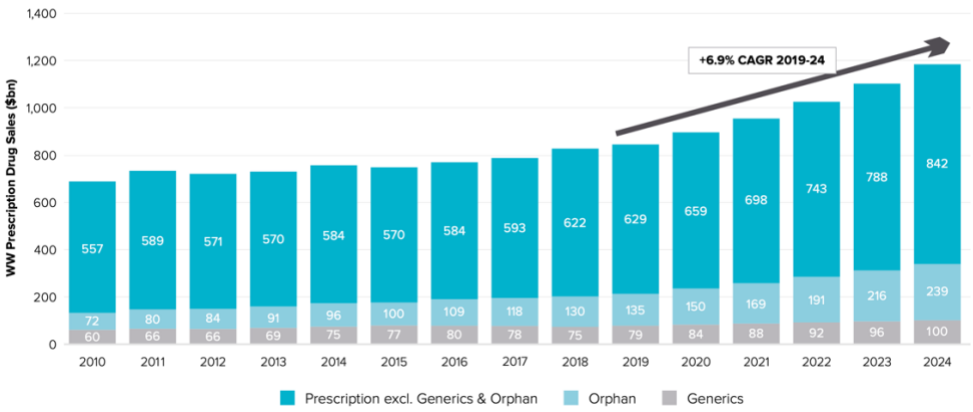

Figure 31: Prescription Drugs Sales
Source: "World Preview 2019, Outlook to 2024", EvaluatePharma, 2019

4.1.2.3 Market Drivers

The real drivers underlying the increase in sales of drugs are linked to five main aspects that will determine a stable increase in the pharmaceutical industry patient-base in the long-term:

- **Ageing population:** according to the United Nation projections[83], the world population is expected to grow at a 1% CAGR for the period 2020-2050: from 7.8 billion people in 2020, the world population is expected to top 9.7 billion people by 2050. The fastest growing regions of the world will be Africa and Asia, while Europe is the only region expected to reduce its population by 37 million. One of the drivers of population increase is the life expectancy at birth that, from 73 years in 2020, will reach 78 years in 2050. As a consequence, the percentage of 60+ years old people in the world will almost double in the period, growing from 11% of the total population in 2020 (962.3

[81] The revenues of these four segments presented in this section do not account for 100% of the total revenues of the industry because there are minor sectors that are not considered, such as the diagnostic segment or the health analytics one
[82] "World Preview 2019, Outlook to 2024", EvaluatePharma, 2019
[83] "World population ageing", United Nations Publication, 2017

million) to 21% in 2050 (2.03 billion). Europe and North America are the regions that will have the higher percentage of 60+ years old people. However, when considering the world population, Asia will have the 61.2% of 60+ years old people in the world in 2050, 30% of which will be in China, while Europe and US will account for only 17.8% of the 60+ years old overall population.

According to an OECD study[84] (2015), this increase in 60+ years old people will enhance the world drug spending. *Figure 32* represents how the per-capita spending on retail pharmaceuticals increase by age in Korea, representative for the Asian region, and Netherlands, representative for Europe. In both cases, drug spending exponentially grows by age.

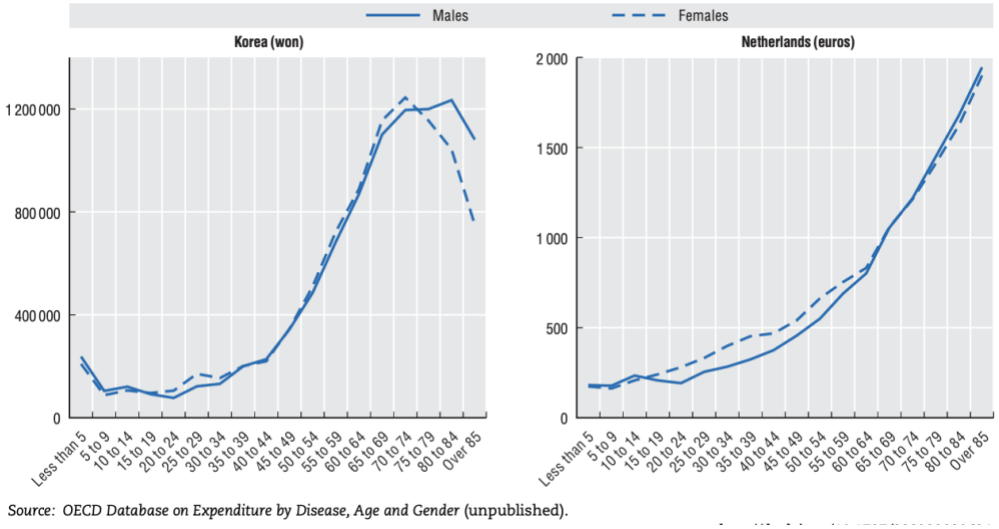

Figure 32:Per capita drugs expenditure by age.
Source: "OECD Database on Expenditure by disease, age and gender", OECD, 2015

The same pattern is detected in the US, with 85% of 60+ years old people buying at least one prescription drug per month. The result is that the demand for prescription and OTC drugs will exponentially increase in the foreseeable future, due to an increase in the 60+ years old population, the age range that spends the most in medicines. Drug spending is expected to reach $1.58 trillions by 2024, from $1.25 trillions in 2019, a CAGR of 4.7%[85].

- **Chronic diseases:** The prevalence of many chronic diseases, such as cancer, diabetes and mental illness has increased, leading to an increased demand for medical treatments. Improvements in diagnosis, leading to earlier recognition of conditions and earlier treatment with medicines, as well as the development of more medicines, both

[84] "Pharmaceuticals spending trends and future challenges", OECD, 2015
[85] "Pharmaceutical Market Worldwide, 2019", Statista, 2019

prescribed and OTC, to treat common conditions have also contributed to increase the consumption of drugs. An example of the increase in chronic diseases is the rise of diabetes. In 2019, approximately 463 million adults[86] were living with diabetes. By 2047 this count will rise to 700 million, an increase of 51%[87].

- **New and innovative drugs:** they expand treatment options and increase treatment costs. New drugs can be new chemical entities or new formulations of existing drugs. Both categories may increase treatment options, for instance, for previously unmet needs or for new population targets (e.g. children), increasing the quantity of drugs consumed. While the approval of new drugs in existing market segments can increase competition and lead to potential savings, usually new drugs offering therapeutic advantages for patients are priced higher than their competitors and contribute significantly to pharmaceutical spending growth. In recent years, the proliferation of specialty pharmaceuticals with high prices, in particular oral cancer drugs and immune modulators, has played an increasing role in pharmaceutical spending growth[88].
- **Urbanization:** according to the United Nations research[89], the percentage of people living in urbanized areas will grow from 56% in 2020 to 68% in 2050. Urbanization contributes to deteriorating people lifestyle habits, because life is more sedentary and stressful. In turn, poor lifestyle choices, such as smoking, overuse of alcohol, poor diet, lack of physical activity and inadequate relief of chronic stress are key contributors in the development and progression of preventable chronic diseases.
- **COVID-19, virus outbreaks and climate change:** even though viral diseases could seem totally unrelated with climate change, scientific research has shown that there is a correlation. In addition to each respective climate's naturally fluctuating temperatures, human activity has caused average temperatures to rise 1°C from pre-industrial levels, a trend that could reach up to 1.5°C before 2050[90]. As a result of climate change, sudden temperature changes and more frequent extreme weather events such as floods, hurricanes, and droughts, would be an ideal breeding ground conducive to virus modification and the emergence of infectious diseases. Furthermore, other factors that are related to climate change, like pollution and the deterioration of air

[86] Adults are considered people in the 20-79 years frame
[87] Diabetes data – World Health Organization
[88] In the United States, specialty drugs represented just 1% of total prescriptions but accounted for 25% of total prescription drug spending in 2012 (Express Scripts, 2015).
[89] "World population ageing 2017", United Nations, 2017
[90] Intergovernmental Panel on Climate Change

quality, make us more susceptible to infectious respiratory diseases. This was borne out by the 2002 SARS virus epidemic in China, during which patients from regions with higher levels of air pollution were twice as likely to die after being infected compared to those in regions with better air quality. *Figure 33* shows the increase in virus disease outbreaks after 2011, and the timeline do not include the 2016 Zika, and 2019/2020 COVID-19. The increase in likelihood of worldwide unknown virus outbreaks is enhancing the development and demand of vaccines, as the world is currently experiencing with COVID-19.

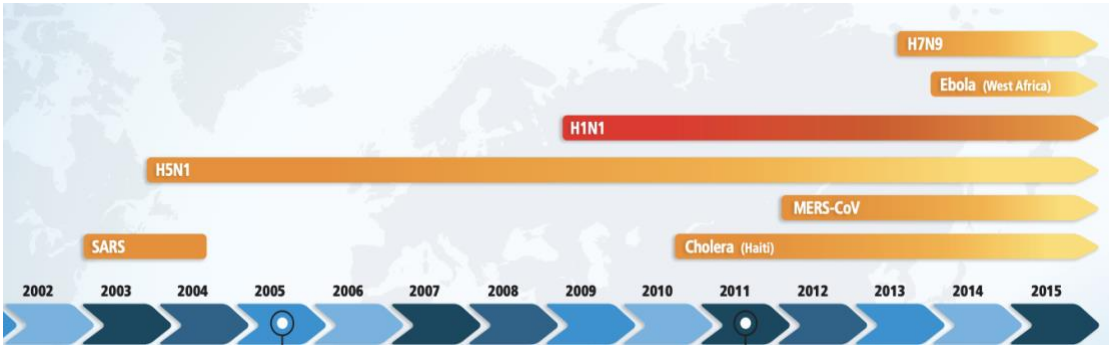

Figure 33: Timeline infectious diseases
Source: "Major infectious threats in the 21st Century", World Health Organization

Indeed, the global antivirus drugs market size has grown at a CAGR of 14.3% in the period 2014-2019 and is expected to keep growing at a slower, but sustained, CAGR of 5.27% toward 2024[91]. The market size went from $26.7 billion in 2014 to $52.16 billion in 2019 and is expected to reach $74.76 billion in 2027[92]. This trend has both positive and negative business impacts on the pharmaceutical industry. During COVID-19 health crisis, for example, the major pharmaceutical companies that were working on a potential vaccine development have seen their market capitalizations growing, as *Figure 34* shows, while many other companies operating in other sectors, like the financial or oil and natural resources ones have seen drastic declines.

[91] "Coronavirus, the pharma and medtech response", Statista, 2020
[92] "Coronavirus, the pharma and medtech response", Statista, 2020

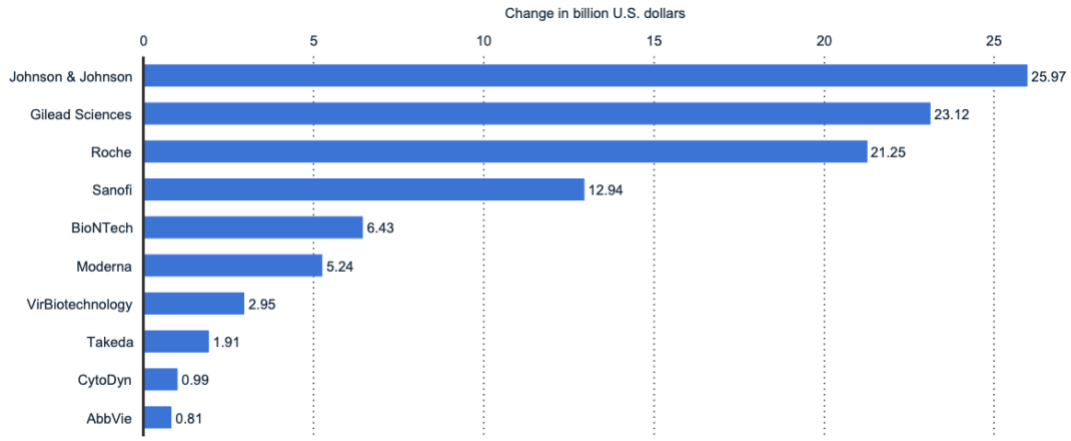

Figure 34:Pharma companies market capitalizaion increase during COVID-19.
Source: ""Coronavirus, the pharma and medtech response", Statista, 2020"

This rally in pharma companies stock prices is due to the forecasted increase in sales that could be generated from the developments of the vaccines against the COVID-19. However, this is only the positive side of the coin. The negative side is that, in order to deliver an effective vaccine as soon as possible, and conquer the largest market share, these companies are leaving aside all the other projects in pipeline. Therefore, the development of a COVID-19 vaccine is slowing down the development of many other medicines, and thus the treatment of many other important diseases. This could be a problem not only for the patients, but also for all those companies that will not deliver the vaccine on time, losing the adequate market share to recover the R&D costs of the vaccine. Moreover, delays in the R&D pipeline will cause critical losses when the patents of the existing drugs expire in the next years. This is the kind of disruption that potential virus diseases outbreaks could bring to the pharma industry, as it is the case of COVID-19.

As *Figure 35* shows, the future loss for pharma companies, due to the delay in launching new medicines, is expected to be costly, approaching $5.5 billion in 2021.

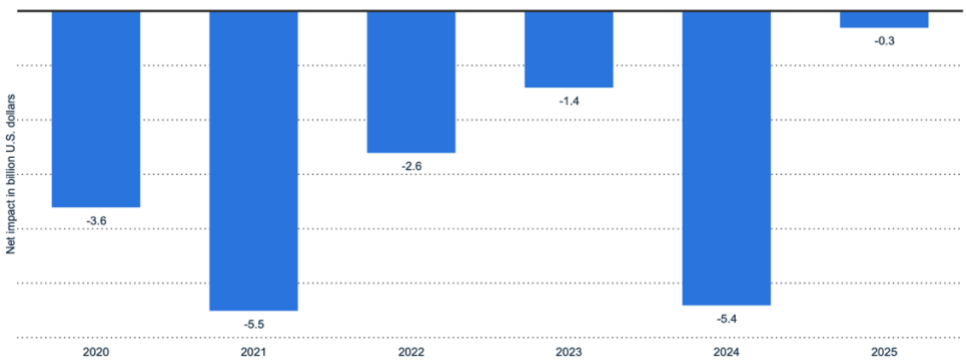

Figure 35: Expected losses for pharma industry cause by COVID-19
Source: ""Coronavirus, the pharma and medtech response", Statista, 2020

To avoid the disruption brought by unknow virus outbreaks and fully benefit from selling vaccines, pharma companies should constantly carry out research in order to be as much ready as possible to manage virus threats. This would reduce the effort to develop a cure, providing patients with an effective remedy in the shortest time possible, reducing the deaths on a worldwide level, without delaying the launch of projects in the R&D pipeline

- **Inelastic demand:** in 2019, prescription drugs accounted for the 74% of the product portfolios of pharma companies, and thus a variation in price of these drugs can have a wide marginal impact on total revenues of the company. However, prescription drugs are prescribed by a physician, and thus the patient must buy that specific drug, without considering different or cheaper alternatives, unless there is the generic version of it. Numerous studies have found that the price elasticity of demand[93] for prescription drugs is less than 1, ranging from -0.18 to -0.60[94], a situation referred to as "inelastic demand". Therefore, pharma companies can set the price regardless of market competitivity, because the patient and physician choice is not based on price but on cure effectiveness of the drug. Moreover, there is no much transparency around drugs pricing, hence patients find it difficult to compare different medicines and choose the cheapest one.

[93] Price elasticity of demand is the metric economists use to represent the relationship between price and demand and is expressed as the relative change in quantity demanded over relative changes in price.
[94] "The price elasticity of demand for prescription drugs: an exploration of demand in different settings", Marin Gemmill, London School of Economics

4.1.2.4 Main players

Many multinational listed companies operate in the pharmaceutical industry. The biggest in terms of market capitalization are presented in *Figure 36*

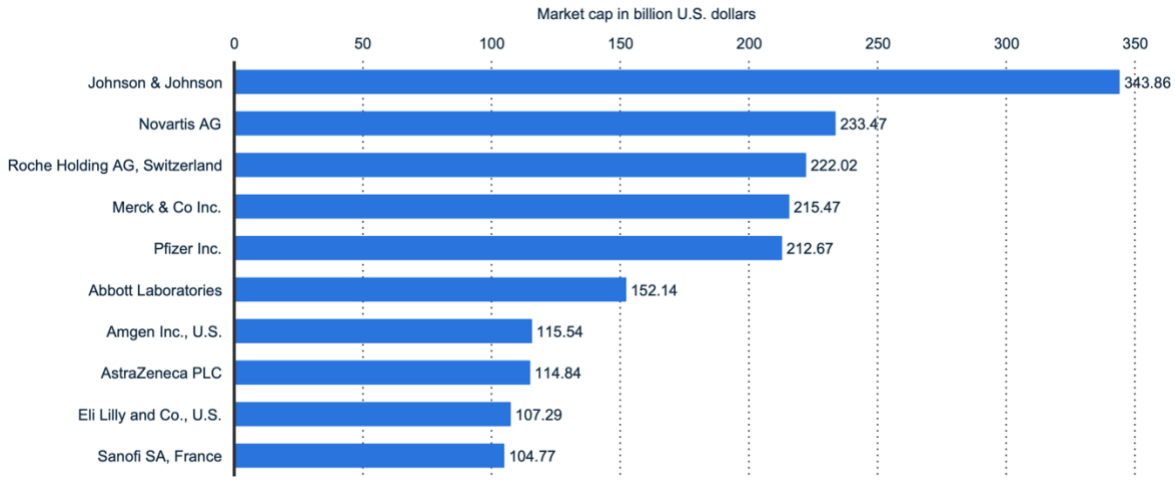

Figure 36: Top 10 pharma companies for market capitalization in 2019
Source: "Pharmaceutical Market Worldwide, 2019", Statista, 2019

All the top pharma companies for market capitalization are either from the United States or from Europe. Here, a brief presentation of the top four players for market capitalization of the pharma industry:

- **Johnson & Johnson** (JNJ) is based in US, New Jersey, and operates in two different segments of the health care sector: pharmaceutical, with prescription and OTC drugs, and medical devices. JNJ collected $82.06 billion dollars in revenues in 2019, 47.3% of which are from prescription drugs, has a current market share of 4.7% and strong R&D spending of $8.45 billions. In the period 2005-2019 has experienced a revenue CAGR of 3.9%, compared to the pharma industry revenues CAGR of 5.7%, in the same period[95]. In 2019, the company posted a 26.24% operating margin, above the 24% of the industry and a ROIC of 17.37%, slightly less than the 18.29% industry average[96].
- **Novartis AG** is based in Switzerland, Basel, and operates only in the pharmaceutical production. However, the company sells both patented drugs, with a special focus on oncology, and generics and active pharmaceuticals ingredients, through the Sandoz division. Being a holding, Novartis AG engages also has a Corporate division that manages the group and the central services. In 2019, the group collected $47.4 billion in revenues, 91.7% of which from prescription drugs, has a current market share of

[95] *"Pharmaceutical Market Worldwide, 2019", Statista, 2019*
[96] MarketWatch Data, DowJones

5.3% and $8.15 billions in R&D spending[97]. The revenues CAGR in the period 2005-2019 was 1.69%. 2019 operating margin was 19.2%, with a ROIC of 8.4%[98]. Both the ratios were much below the industry average.

- **Roche Holding AG** is based in Switzerland, Basel, and operates in two segments of the health care sector: pharmaceuticals and diagnostics. The Pharmaceutical segment refers to development of medicines in the field of oncology, immunology, ophthalmology, infectious diseases and neuroscience. The Diagnostic segment refers to diagnosis of diseases through an in vitro diagnostics process. In 2019, the company posted revenues for $63.92 billions, of which 69.7% are from prescription drugs, has a market share of 5.4% and $9.8 billions of R&D spending. The revenues CAGR in the period 2005-2019 was 2.9%[99]. The operating margin in 2019 was 28.5%, and a ROIC of 57%. The ratios are well above the industry average[100].
- **Merck and co. Inc** is based in the US, New Jersey, and operates through the pharmaceutical, animal health, and health care services sectors. The pharmaceutical segment includes human health pharmaceutical and vaccine products. The animal health segment discovers, develops, manufactures, and markets animal health products, such as pharmaceutical and vaccine products, for the prevention, treatment and control of disease in livestock and companion animal species. The healthcare services segment offers services and solutions that focus on engagement, health analytics, and clinical services to improve the value of care delivered to patients. In 2019, the company posted $46.59 billions in revenues, 80.1% of which are from prescription drugs, has a market share of 4.5% and $7.91 billions in R&D spending. In the period 2005-2019, revenues CAGR was of 6.2%, above the industry revenues CAGR of 5.7% in the same period[101]. 2019 operating margin was 28.62% and the ROIC was 20.52%. Both the ratios are well above the industry average[102].

The market share data of these top players shows that the pharmaceutical industry is not consolidated yet, on the contrary is extremely fragmented. Indeed, Pfizer is the company with

[97] *"Pharmaceutical Market Worldwide, 2019", Statista, 2019*
[98] MarketWatch Data, DowJones
[99] *"Pharmaceutical Market Worldwide, 2019", Statista, 2019*
[100] MarketWatch Data, DowJones
[101] *"Pharmaceutical Market Worldwide, 2019", Statista, 2019*
[102] MarketWatch data, DowJones

the greatest market share, 5.5%, which is relatively lower than those of companies in consolidated industries[103].

Notwithstanding that the industry is extremely fragmented, there is a significant product differentiation: there are many subsectors in which two or three groups of companies focus to develop the best treatment possible. Therefore, we can conclude that the industry is extremely fragmented, but the subsectors are consolidated, with few main players that create oligopolies to limit competition on prices[104].

4.1.2.5 SWOT Analysis

The SWOT analysis objective is to outline the Strengths, Weaknesses, Opportunities and Threats of an industry. It is a useful tool to describe the current features characterizing an industry – strengths and weaknesses – and its potential future developments – opportunities and threats.

The pharma industry main **strengths** are mainly linked to the high entrance barriers:

- **Size of the main players:** the economic moats of the industry are in the form of high start-up costs, patent protection, significant product differentiation and economies of scale. They make it extremely difficult for start-ups or small companies to grow in size conquering an increasing market share and compete against the big size players of the industry. Size is particularly important in pharma industry. Developing a new drug can take 15 to 20 years to get through the entire research, development and regulatory process, and cost between $800 million to $2.1 billions over that long-time frame. Few scientists and entrepreneurs have access to that kind of capital. Moreover, even if a new start-up surmounts the time and money hurdles, going head-to-head against the big pharma companies, when selling to physicians, requires a large salesforce and lots of advertising dollars. In contrast to software or restaurants, where start-up costs are low and new entrants spring up frequently, the big pharma players are established and have an edge in the industry. To the size advantage is linked another benefit: economies of scale. Some drugs are defined *Blockbuster* drugs because they have more than $1 billion

[103] the telecommunication industry in the US is considered a very consolidated industry and the two main players: AT&T and Verizon, had market share of respectively 39.9% and 29.2% in the last quarter of 2019.

[104] For example, the antidiabetics subsector has three main players that are Sanofi SA, Novo Nordisk A/S and Ely Lilly & Co, which make the antidiabetic market consolidated, with oligopoly strategies driving the price settlement, especially in the US where the Government does not negotiate lower prices.

in sales. Companies with blockbusters gain manufacturing efficiencies by spreading fixed costs over more products[105].

- **Salesforce:** The big players of the industry have strong sales and marketing capabilities, a strong brand name and customer reputation. Physicians rely on pharmaceutical salespeople to learn about new products, and a salesforce that has successfully penetrated the physician market in the company's core therapeutic franchise, already has physician's ears and often their trust. These aspects allow the big players to have a solid patient-base which is more willing to buy newly developed medicines. This expertise is fundamental to add to the portfolio blockbuster drugs and is so valuable that smaller biotech firms often partner with large drug firms and give up a sizeable percentage of their profits just to leverage the marketing resources of their drug-company partners.
- **Patent protection:** the path to develop a new drug is extremely lengthy, and costly, but whenever a new chemical or molecular composition is identified, the company applies for patent protection. Patent protection guarantees the developer 20 years of complete monopoly for that composition, from the date the company first completes the patent application. However, because a patent application is usually filed as soon as the drug is identified and not when enters the market, drugs rarely enjoy 20 years of monopoly profits, because a significant portion of the protected period is eaten up by trials and the approval process. Therefore, many drugs benefit only 8-10 years of patent protection, after they are launched in the marketplace. During this period, no other company can market the same chemical compound, although competitors are still free to develop different compounds that threat the same conditions. When a patent expires, the company experiences a steep decrease in sales from the once-protected drug because generic competitors enter the market[106]. Good management of these losses will provide investors with a steadier stream of cash flows and lower risk investments.
- **Inelastic demand:** as presented in *section 3.1.2.3*, inelastic demand is one of the main drivers of profitability of the pharma industry. Unlike clothing, computers or consulting

[105] A clarifying example of these efficiencies is Pfizer: in 1997, only two Pfizer drugs had annual sales greater than $1 billion, but by 2002, eight drugs surpassed the $1 billion mark, with four drugs breaking the $2 billions mark. Thanks in part to these blockbusters, the Pfizer's operating margins improved from 20% in 1997 to 38% in 2002.

[106] To give an idea of the potential revenue losses that could follow a patent expiration it is worth citing the Ely Lilly example. In 2001, its famous drug against depression: Prozac, lost its patent protection. The drug's quarterly revenues dropped from $575 million in the second quarter to $96 million two quarters later.

services, patients are frequently not the ones writing the check for the drugs they assume, and many times they are not the ones making the buy decision, as it is the case of prescription drugs. Whereas Wal-Mart shoppers can easily see which brand of pasta is the cheapest, pricing is often opaque to health care consumers and irrelevant to physicians helping make the purchase decision. Therefore, there is little incentive to look for the best price to keep cost lower. Moreover, in the biggest pharmaceutical market, the US, most drugs costs are paid by insurance plans, and thus there is even less price sensitivity for the end consumer.

The main **weaknesses** are mainly linked to patent expiration and social responsibility of pharma companies:

- **Generic drugs competition:** after a drug patent expires, the original developer market exclusivity ceases and the market becomes open to competition from generic medications. Generic drugs have the same medical composition as the brand name drugs but cost 40-60% less[107]. Generic drug makers can charge significantly less because they don't have to recoup the huge amount of R&D spending to develop the original drug. They only incur manufacturing costs, which usually are 20-25% of the sales price. The entrance of a generic competitor, in particular in the US where prescription drug prices are the highest in the world, can be devastating for the brand name counterpart. Drugs have been known to lose as much as 80% of their sales in the first six months after patent expiration.
- **Blockbuster drugs:** these drugs have been mentioned in the strengths of the industry. These are all the drugs that account for more than $1 billion in revenues in the company product portfolio. It could seem counterintuitive, but these drugs could become a disadvantage for the company, if the product portfolio is not managed adequately. If a drug's revenues become a large enough percentage of the total revenues of the company, the firm's fate can be linked too heavily to that drug. Because every drug will eventually lose its patent protection, the company could be exposed to a single-product risk.
- **Ethic and the pricing issue:** prescribed and orphan drugs are very expensive, in particular in the United States[108]. Therefore, the question that policymakers have been wondering for a long time is whether these very high prices are fair or are simply an

[107] "The five rules for successful stock investing", Pat Dorsey, 2005

[108] In the **threats** part of the discussion will be explained the reason for this big difference in drugs prices between US and European countries

exploitation of the monopolistic edge. Focusing on the US case, whenever policymakers consider approaches to reduce drug spending, the pharmaceutical industry complains that any reduction in drug manufacturer revenues will cause investment to wither, depriving manufacturers of the resources needed to research and develop future treatments. A research[109] compared the historical level of returns on invested capital in the pharmaceutical industry with those of other industries and then considered how much lower pharmaceutical industry revenues could be while maintaining returns at or above other industries. The result is that large pharmaceutical manufacturers could endure significant revenue reductions, including the reductions considered in the reform of the US legislation with the Lower Drugs Costs Now Act proposal, which targets to decrease health care spending in the US from $100 billion in 2020 to $481 billions in 2029. The study suggest that the pharma industry could face a 21% fall in profits and still be considered competitive than 75% of other industries, in term of ROIC. Moreover, there is another issue linked to price: pricing transparency. Given the very inelastic demand and the low-price competition in the industry, pharma companies rarely show transparent reports on how they price drugs, which drugs are increasing in price, which are not. This misbehavior does not allow the patient to choose the most convenient drug. For a long time, these two problems have been raising concerns about how pharma companies act ethically towards their patients. This is a major weakness of the industry that has not been considering enough the wellness of their patients in a holistic manner. So far, pharma companies have credit for having provided effective and innovative drugs to improve the health status of the patients. However, they have not put enough attention on reaching all patients, even low-income individuals that cannot afford the drug. In the future, wide patients reach should be a priority for pharma companies, in order to improve the overall health status of the world population.

In the most recent future, the industry presents valuable future **opportunities** linked to the digitization trends and the increasing prospected patient base and drug spending:

- **Market forecasts:** the pharma industry is expected to increase considerably in the foreseeable future, because of all the factors outlined in *section 3.1.2.4*, like ageing population and frequency increase in unknown viruses' outbreaks. The drug market is expected to reach $1.58 trillion by 2024 and, after the COVID-19 pandemic, the pharma

[109] "How much can pharma lose?", Westhealth policy center, 2020

industry could benefit from an even greater expected market increase. The world has now realized how tangible is the risk of a worldwide spread of a virus and how difficult it is to manage when institutions do not have adequate health care facilities and pharmaceutical companies do not have adequate supply chains to produce a worldwide vaccine. In conclusion it is plausible to expect an increase of health care spending by governments and a boost in new-diseases research project financing, in order to be more prepared to face future possible outbreaks of unknow viruses.

- **Digitization:** considerable growth is expected for the Artificial Intelligence (AI) market in biopharma. The market is predicted to increase from US$198.3 million to $3.88 billions between 2018 and 2025, at a CAGR of 52.9%[110]. AI in drug discovery alone accounted for the largest market size, increasing from $159.8 million to $2.9 billion in the forecast period[111]. As of December 2019, almost 180 startups were involved in applying AI to drug discovery. Almost 40 percent of these AI startups are specifically working on repurposing existing drugs or generating novel drug candidates using AI, machine learning, and automation. The most important benefit from this digitization process is for R&D expenditure. Now, the average cost of developing a drug is approximately $2.1 billion. In the future, a 10% improvement in the accuracy of predictions could lay the groundwork for saving the pharmaceutical sector billions of dollars and years of work. Drug discovery and preclinical stages could be sped up by a factor of 15 and enable more competitive R&D strategies. Another digital application that could reshape the pharmaceutical industry is cloud computing. This data-sharing trend could help leaders extend collaboration with other biopharma companies, smaller biotech companies, research laboratories, and academic institutions spread across the globe. To this end, big technology companies, like Amazon, are proposing cloud services solutions to make the pharmaceutical industry more data integrated[112]. The goal is to provide health care stakeholders with a scalable and secure service to create new collaborative business models and reimagine how they approach research, clinical trials, population health, and reimbursement. Last but not least, Internet of Things (IoT) is having a great impact in the manufacturing process of drugs. The demand for small-volume, personalized medicines is driving operations away from

[110] "2020 Global Life Sciences Outlook", Deloitte, 2020
[111] "2020 Global Life Sciences Outlook", Deloitte, 2020
[112] Amazon Web Services (AWS) launched Data Exchange, a service for unlocking many data sources that have traditionally been locked in silos across multiple organizations.

large-scale bulk production to multiproduct facilities that require meticulous tracking. There has always been pressure to get drugs to market faster, while maintaining compliance and data integrity. Smart factories for the future may offer digital automation solutions, industrial IoT connectivity, and flexible manufacturing processes. With a digitized core, including intelligent automation, a company may be able to streamline the number of days it takes to release a drug product from approximately 100 days to seven.

- **The emerging Asian Pacific market:** The past decade has seen Asia Pacific economies increase in significance to the global economy (*Figure 37)* and this growing affluence is translating into a greater demand for quality care and innovative medicines in the region. At the same time, the region is also shifting from volume-based to value-based health care, as a way of reducing spending while improving outcomes[113].

Figure 37: GDP by region.
Source: Economist Intelligence Unit Database

The Asia Pacific region is currently undergoing several waves of shifting demographics. These include an ageing population, accompanied by an increased prevalence of chronic diseases, rising affluence, and the growth of densely populated mega-cities. However, the region's diversity must not be ignored: Asia Pacific is essentially a collection of markets with very diverse sets of demographics and disease profiles – and such disparities are often indicators that a varied array of unmet patient needs exist within the region.

[113] "The road to value-based care: Your mileage may vary". Deloitte. 2015.

With their ageing populations, many of these Asia Pacific economies will also have to address issues related to declining workforce levels and increasing demands on public health expenditures. Chronic and non-communicable diseases (NCDs) are also on the rise: according to the World Health Organisation, NCDs account for 62% of total mortality in the Southeast Asia region[114] and 80% in the Western Pacific region each year[115]. Meanwhile, the shifting of the global economic centre of gravity towards Asia Pacific has generated an expanding middle class. By 2025, the Asia Pacific region will account for 60% of the global middle-class population, up from 46% in 2015[116]. China, in particular, is witnessing rapid growth in the number of High Net Worth Individuals (HNWIs): in 2017, it had 1.47 million of these individuals.

In terms of health care expenditures, estimates show that HNWIs in China spend about one-quarter of their family budgets, equivalent to about $1,969 - $3,234, on health care products every month, including exercise and regular medical check-ups[117].

However, so far, the Asian Pacific market has sustained a health care expenditure per capita that is lower than those of the US or European countries: while the figure for the US in 2018 is $10,628, it is only $4,170 in Japan, $793 for ASEAN economies, and $575 in China.

Asia Pacific economies, particularly emerging and frontier markets, have witnessed the development of a vibrant network of multilateral and bilateral economic relationships, as well as the harmonization and rapid development of the pharmaceutical industry. In particular, the harmonization of regulatory requirements for drugs and medical devices is expected to expedite the approval process for multinationals entering Asia Pacific markets.

This region is a potential, partially unexplored market, that could generate a double benefit for pharma companies: increase value, generating higher margins, and producing further economies of scale to lower drugs prices and increase value for patients, that, according to the trends, are striving for high quality medicines, in order to access better treatments against the spreading of chronical and non-communicable

[114] "The fatal link between tobacco and cardiovascular diseases in the WHO South-East Asia region", World Health Organisation, May 2018, http://www.searo.who.int/entity/noncommunicable_diseases/en

[115] "Noncommunicable diseases in the Western Pacific", World Health Organisation, 2018, http://www.who.int/westernpacific/health-topics/ noncommunicable-diseases

[116] "The unprecedented expansion of the global middle class: An update", The Brookings Institution, 2017

[117] "China's High Net Worth Individual Health Indicators Report 2017", Hurun, 2017

diseases. However, this is just the positive story, because the region is also the cradle of important threats for the industry and the current big pharma players.

The industry thrives of opportunities, but it would be misleading not considering the **threats** that could affect big pharma companies in the short and long term:

- **Venture Capital backed companies in biopharma:** In the future, smaller companies may ultimately take an increasing share of the market from big pharma by developing and commercializing products independently. With the recent influx of Private Equity and Venture Capital (VC) investments going into the biotech market, emerging companies have been able to pursue development into later stages. In the long run, this may make it more difficult for big pharma to buy innovation, acquiring smaller companies with bright high technological potential and R&D capabilities. Early stage companies in the biopharma industry have been raising capital from private funds at increasing levels, starting from 2017, as *Figure 38* shows. 2018 has been the record year with $17.86 billions raised by biopharma early stage companies from VC funds, while 2019 follows as the second-best year with $13.9 billions raised.

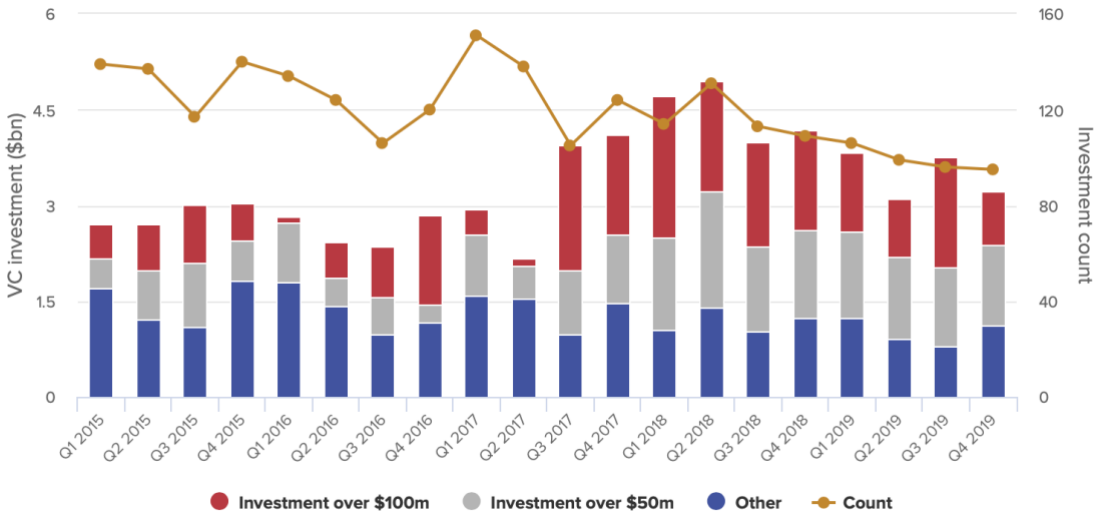

Figure 38: Venture Capital investments (value and count) in biopharma.
Source: "Evaluate Vantage Pharma, Biotech and Medtech 2019 in review", EvaluatePharma, 2020

In 2019 the average financing size, $36.7 millions, was lower than 2018's peak, $40.2 millions, but remained at record levels. It is worth noting that the frequency of mega rounds, those that amassed $100m or more, barely slowed, but the count of rounds raised fell to below 400 last year, for the first time since at least 2010. All of which points to an even more pronounced concentration of capital into the hands of a shrinking number start-ups. On one hand this financing trend in Venture Capital world will allow new companies to enter the market. On the other hand, it is also true that, in many cases,

the same big pharma companies are Limited Partners in Venture Capital funds. Therefore, some of the capital deployed in the biopharma VC industry is owned by the big corporations that wish to discover the best "start-ups" and exploit their innovational sprint and new developed drug compositions.

- **Political pressure to lower prices:** this is a very sensitive topic that involves the entire pharmaceutical industry. Prescription drugs performance are extremely linked to the price negotiations that every government put in place. The majority of the governments around the world have historically negotiated price caps to prescription drugs in order to limit the patient and state spending for prescription drugs. Most of European states, except for Sweden, Denmark and UK, adopt a method called External Reference Pricing (ERP) when negotiating prices for prescription drugs and the negotiations are managed by state-owned agencies[118]. The ERP intent is to create a benchmark built on the price of a pharmaceutical product across several countries, in order to have a reference benchmark price. According to one study[119], the countries that adopt the ERP method have ensured that prescription drug prices are moderately priced in the market, resulting in reduction in prices of about 15% over 10 years. These increasing cost containment measures are leading to tougher market conditions for drug manufactures. However, in the United States, which is the largest pharmaceutical market in the world, the state is far from a legislation that limits prescription drugs prices. As a consequence, pharma company still thrives from rising prices without law restriction. In the US, for the 2003 reform of the Medicare Modernization Act (MMA), negotiations for drugs prices are managed by prescription drug plans (PDPs), which are private insurers, not by the Secretary of the Department of Health and Human Services. These private insurers negotiate directly with the drug manufacturers to obtain drug discounts, the rebate. The rebate allows the health insurance companies to pay less for the drug, and thus reduce the premium that the patient pays to the insurance. However, this method shows no signs of positive impact on prices of prescription drugs: since the introduction of this new negotiation system in 2003, drug prices have been rising by almost 25%, while utilization only increased by 2%[120].

[118] An example of these agencies is the "Agenzia Italiana del Farmaco" (AIFA) in Italy

[119] "A painful pill to swallow: US vs International Prescription drug prices", Ways and Means committee staff, Sep. 2019

[120] "A painful pill to swallow: US vs International Prescription drug prices", Ways and Means committee staff, Sep. 2019

Private insurers do not have the bargain power that the US government would have, and thus, drugs prices in the US are higher than in the rest of the world. US patients pay on average four times more for drugs than other countries, and in some cases this ratio reaches 67 times for the same drug. The government is aware of this extremely inefficient pricing, but the pharmaceutical companies lobbing is extremely powerful. An introduction of pricing constraints in the US would generate disastrous effects on margins of pharma companies, that would lose the most profitable market in the world. The Trump Administration has proposed to change the MMA but with no success. The health care spending situation in the US is starting to be unsustainable, fueled by the increasing wealth gap that plagues the country and that is now fueling the riots started in Minneapolis, Minnesota. Soon or later the US health care legislation will be reformed, which means that pharma companies should set up strategies to face this incumbent risk. However, pricing pressure risk does not come only from the US, but also from the Asian Pacific region where the emergence of home-grown companies offering cost-effective solutions have intensified competition. Propelled by the rise of nationalism on global, regional, and local levels, these local companies mainly cater to cost-focused customer segments, although some are increasingly looking to expand into more premium customer segments

- **New competitors from Asia:** in the *opportunities* section we presented the Asian Pacific market as a great path toward value-increase for big multinational pharma companies. However, the great potential of the Asian pharma market is increasing internal investments: a combination of factors, including government ambitions, patients' pressure for better treatments and companies' appetite for expansion, have fuelled the growth in strength and presences of many home-grown pharmaceutical companies across Asia Pacific. With growing affluence driving an increased spending on health care and greater demand for quality care, Asia Pacific looks poised to become a key source of production within the global value chain as well as a R&D hub. One case in point is China, which is making a definitive move with its Made in China 2025 initiative: a plan with the ultimate objective of transforming the economy into a high technology powerhouse. As part of this plan, biopharmaceuticals and advanced medicinal products have been identified as one of the 10 sectors of focus for the government. With the government's backing, several domestic companies in this space have managed to achieve breakthroughs in terms of market access, as well as

technology improvements[121]. The strategy pursued by the Chinese government in the Made in China 2015 initiative is starting to reward the efforts: the most notable Chinese pharma companies with a market capitalization of more than $15 billion experienced an average revenues CAGR of 68.6%[122] in the period 2016-17, while the overall pharma industry average was 1.7%. China, however, is not alone. Thailand, for example, recently launched its Thailand 4.0 growth model, which identified 10 industries – including biopharmaceuticals, bio-economy, and medical hub – as priority areas to develop. Through a series of initiatives, the National Science Technology and Innovation Policy Office will be kick-starting and institutionalising major structural reforms to enable Thailand to better develop its competitive advantage in these segments[123]. Moreover, to solve the complexity of problems faced by the new companies entering the pharmaceutical industry, the private and public sector have opted for collaborations in the form of public-private partnership (PPP) structures that promote risk sharing and enable the exchange of critical expertise. In this context, PPPs – in particular, commercially-oriented PPPs that involve publicly funded research organisations and private pharmaceutical or biotechnology companies in early stage drug discovery – have emerged, in the Asian Pacific regions, as a viable model to alleviate some of the risks associated with these ventures. Singapore is a good example of the PPP partnership: the country established a Science Hub in the Buona Vista area to enable public and private researchers to work side-by-side, and to incubate and grow ideas when meeting along hallways[124].

Big pharmaceutical companies must be able to develop new and feasible strategies in order to prevent the competition from these new emerging companies, which benefit from outstanding financial resources, R&D and technological skills. In particular because, so far, those big players have avoided increasing competition from new companies acquiring them. In the case of Asian Pacific companies this strategy could be less viable because States and governments have controlling shareholding powers in those companies' equities and have the power to vote against possible acquisition deals. For instance, the China Securities Finance, company operating in the financial services

[121] "The Chinese Pharmaceutical Industry: Winners and Losers 2017", PharmExec.com, Feb 2018
[122] "The Chinese Pharmaceutical Industry: Winners and Losers 2017", PharmExec.com, Feb. 2018
[123] "National Science Technology and Innovation Policy Office (STI)", Ministry of Science and Technology Thailand, Feb. 2008
[124] "20 years of Science and Technology in Singapore", A*STAR. 2012

industry, mainly participated by the Chinese government, is a controlling shareholder in many of the top performing Chinese pharma companies[125].

4.1.2.6 Environmental Social and Governance (ESG) performance

In the previous sections, we provided insights about the financial performance of the pharmaceutical industry. In this section the focus will be on the Environmental Social and Governance performance of the industry. This analysis is growing importance in the investing world because it enables finance professional to assess a company impact and exposure to three key areas:

- **Environmental:** it comprises risks that are connected to climate change, such as extreme weather or supply disruptions and the impact that the company has on the environment: waste management and resource management are two key aspects under considerations
- **Social:** it measures the impact that the company has on the society and the risks of irreversible changes in the society habits, behaviors and organization. Other risks considered in this section are legislation risks such as interruptions of agreements between the company and governments or increasing tax burdens, and legal risks such as litigations with customers or employees.
- **Governance:** this last factor concerns the integrity and effectiveness of the governance structure of the company. A good governance is fundamental for a company in order to mitigate risks and inefficiencies and comply with legislations. A good corporate governance is the perfect bridge between management and investors and guarantees the commitment of both sides in pursuing the long-term objectives of the companies, reducing the risks involved in the business.

A good performance in managing risks and impacts related to these three areas allows the company to have better reputation, better financial margins and credit rating. In particular now, the competitive advantage given by brands is increasing and thus, leveraging the reputation of a brand is becoming a pillar in every company long-term strategy.

The pharmaceutical industry is mainly affected, and mainly affects, the social area. Environmental concerns are less than those of other industries, like Metals and Mining, while the governance area is as important as it is for all the other industries.

[125] "The Chinese Pharmaceutical Industry: Winners and Losers 2017", PharmExec.com, Feb. 2018

Environmental such as extreme weather or supply disruptions can affect some manufacturers, but to date this has rarely caused financial or credit deterioration for pharma companies. However, pharmaceutical products involve hazardous substances, like chemicals, and can produce byproducts that could harm the environment. Environmental remediation and failure to comply with regulations can be costly or cause plant shutdowns, which could affect product supply.

Social factors are prevalent in the analysis on pharma companies because most health care companies are providing a service to the community and products to treat human ailments. While many of these treatments, products, and drugs can benefit society, they can also be costly to the government or taxpayers, payers, and consumers. In developed countries, aging populations put cost pressure on health care systems. Improving health outcomes while raising the cost effectiveness of therapies are increasingly becoming twin goals for health care companies. In some markets, including the U.S., public debate focuses on the accessibility and affordability of medicines and quality care and relatedly the transparency of prices. Increasingly, payers are advocating that health care providers and manufactures be compensated for the value they bring, to better align incentives. According to an S&P Global analysis[126] on the consequences of these social risks, in the US, given health care's importance to the economy and society, the potential changes to reimbursement and access will likely be mostly incremental, rather than dramatic, over the next five years. The significant social benefits from the industry will lead to a balanced approach that supports continued investment in research and development (R&D) and attractive levels of returns and profitability. Social risks around drug pricing and affordability in Western Europe are less controversial due to high levels of regulatory involvement, and often the nationwide setting of drug formularies and price lists. Given this assessment of the social risk profile in the pharma industry, it is possible to conclude that pharmaceutical companies that are highly innovative, invest in R&D, meaningfully improve disease treatment, are thoughtful of public opinion in developing their pricing strategies, and have a reputation for clinical excellence and regulatory compliance have more sustainable business models. Moreover, pharmaceutical manufacturers must ensure the quality and safety of their products because safety issues could be life-threatening or debilitating. The risk of litigation related to safety matters could impair the company performance[127].

[126] ESG Industry Report Card: Health Care, S&P Global, May 21 2019

[127] For example, the proliferation of opioids has become a public health issue in the U.S. and could hurt the business model of some pharmaceutical manufacturers and distributors, like Johnson & Johnson.

Governance is company-specific and is often influenced by a company's culture and ownership structure. At the sector level, the health care industry is highly regulated because the government is an important payer for health care services and products. There are also regulations involving safeguarding patient information, safety testing, monitoring and manufacturing quality, and marketing compliance. Noncompliance with these regulations, improper billing for services and products, aggressive marketing tactics, pricing manipulation, and failure to protect patient privacy have surfaced within the sector and can negatively affect the long-term strategic targets.

Currently, the pharmaceutical industry is undergoing a period of profound change. Market trends indicate lower margins per product due to patent expirations, austerity measures among western countries and public policy requiring the industry to justify rising drug prices. Simultaneously, a stronger business focus on emerging markets raises new challenges for the industry. Furthermore, the pharmaceutical industry's continuous involvement in scandals over corruption, product safety, aggressive marketing, political lobbying and a general lack of transparency have resulted in a dramatic erosion of public trust in recent years. The industry is responding to these challenges, albeit in some respects too slowly, by taking a more customer-centric or value-based approach that aims for integrated health care solutions and targeting consumers at the middle and bottom of the income pyramid.

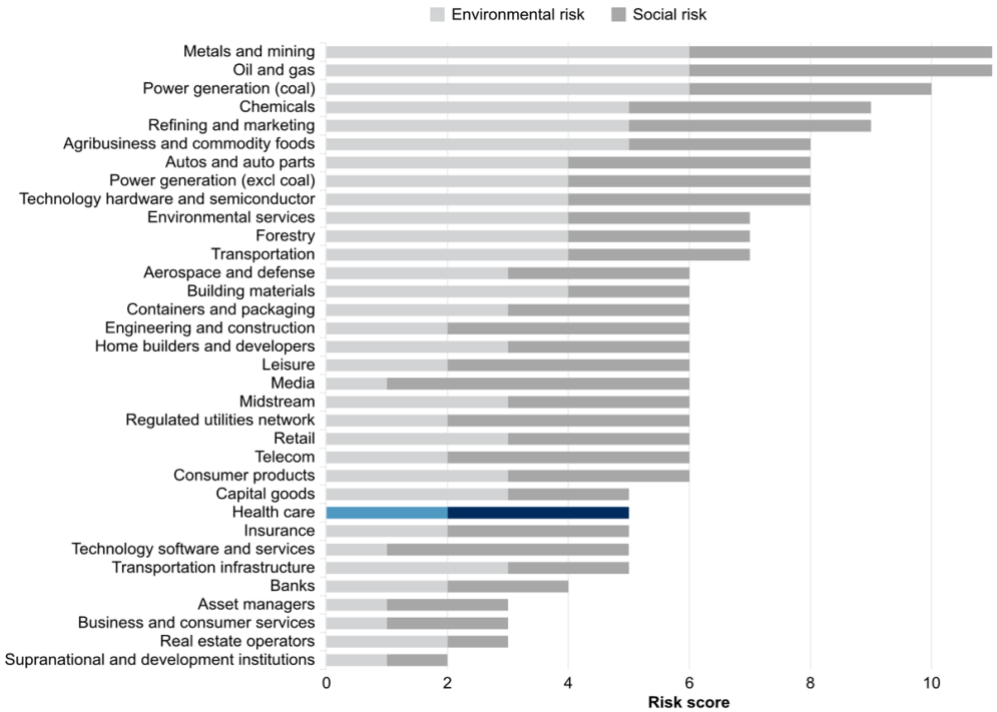

Figure 39: ESG Risk score by industry. Source: S&P Global Sustainalitics

4.1.3 Deals trend in Pharmaceutical industry

4.1.3.1 Rationale for deal trends: R&D, specialization and competition

To thoroughly understand the deal-making trends that are shaping the pharmaceutical industry landscape, it is worth focusing on three main aspects: R&D risk-return profile, specialization and competition.

R&D can be considered the main feature of the pharma industry, the fundamental field for the future development of the companies toward profitability growth and value creation. The R&D process is extremely long, costly and risky: the length of the development process is around 20 years, in 2019 the cost to bring an asset to the market was $1.9 billion and the percentage of the drugs that are approved by the regulatory agency and are then marketed accounts for 4.5%-12%[128] of the totality of the drugs in the pipeline.

In the following lines, the drug development process will be described. The timeline will take into consideration the average development period of a drug discovered in the US and approved by the Food and Drug Administration (FDA). The process is rather similar in Europe and in China.

The drug development process starts with the drug discovery and the preclinical testing, which is the animal testing phase. This step lasts between 8 and 10 years. The primary objective is to evaluate potential toxic effects of the newly developed drug. It takes two to three years, on average to discover a viable drug candidate and another year to find if it is fit for human testing. Of all the drugs discovered, 0.05% survive this phase and the company is required to present an Investigational New Drug (IND) application to the FDA, in order to move to phase I of the R&D process. Approximately 85% of all INDs applications move on to Phase I.

Entering the Phase I of the process, the drug is officially part of the R&D pipeline of the company. This phase lasts 1-2 years. This is the first of three stages of human clinical testing. In Phase I, a drug is tested in a small group of healthy volunteers, usually fewer than 100, with the goal of gathering initial data on safety and efficacy of the drug. A drug in Phase I has only a 20% chance of being approved by the FDA, but R&D expenditure at this stage is no more than a few million dollars, including the cost of development, clinical trials, and continuous communication with the FDA.

[128] The percentage varies according to the disease field of the drug. According to the report "Global report – global drug delivery and formulation report 2017" produced by Drug Development and Delivery, the highest acceptance rate is in the infectious field, 12%, while the lowest is in the pain management one, 4.5%.

After Phase I approval, the drug enters Phase II. In this phase, the drug is tested in a larger population, usually 300 to 500 patients. The phase lasts 2-3 years. The clinical trials population is made of patients affected by the targeted disease, to get a more comprehensive profile of how well the drug works. This phase often costs more than $5 millions, and around 29% of all drugs are approved by the FDA and move to Phase III.

Phase III is the final testing hurdle. The trials in this phase test a much larger group of afflicted patients over longer periods. This phase lasts 2-4 years and focuses more on long term patient safety. Because of the number of patients, usually more than 5000, administrative needs, time and resources involved, Phase III trials are very expensive. These trials consume the bulk of the total amount of R&D expenditure to develop an average drug. However, a drug in Phase III has the 60% of chance of eventual approval by the FDA. The FDA takes usually between 12-18 months to approve a new drug, and after the approval the drug is ready to enter the market. The company usually files for patent protection for the new drug chemical composition during the preclinical stage. Therefore, the 20 years of patent protection are less than 10, effectively.

The length of the process gives a brief idea of how much a pharma company has to invest before starting to collect returns from the investment. In order to deepen the analysis on R&D investment risk-return profile and understand the rationale behind the M&D deals of the industry, it is worth mentioning a study carried out by Deloitte. The study analyzes 10 years of R&D returns of the top 12 drug makers for R&D spending in 2009. The study measures the returns on the R&D investments using the Internal Rate of Return (IRR). This performance indicator is the rate at which future cash flows should be discounted so that they have a present value that is equal to the cost of the investment. In mathematical terms:

$$0 = CAPEX - \sum_{i=1}^{n} \frac{FCFO_i}{(1 + IRR)^i}$$

Where:

- $CAPEX$ is the capital expenditure to develop the drug
- $FCFO_i$ are the operating cash flows generated by the drug when and if enters the market

Therefore, the IRR is a hurdle rate that tells the investor the break-even point of the investments:

- $IRR - K_e > 0$: the investment is expected to return more than the required return. The investment could turn out to be a good opportunity and increase value for the investor

- IRR - K_e = 0: the investment is expected to return the required return. The price of the investment, $CAPEX$, is a fair price to pursue the opportunity, and it would neither increase nor decrease value for the investor
- IRR - K_e < 0: the investment is expected to return less than the required return. The investment could turn out to be a bad opportunity and decrease the value for the investor

Overall, the analysis shows that the 12 companies have seen significant declines in their expected returns over the ten years, suggesting the current high-risk, high-cost R&D model is unsustainable. The IRR declined from 10.1 per cent in 2010 to 1.8 per cent in 2019, down 0.1 percentage points from 2018 and 8.3 percentage points overall[129], as *Figure 40* shows.

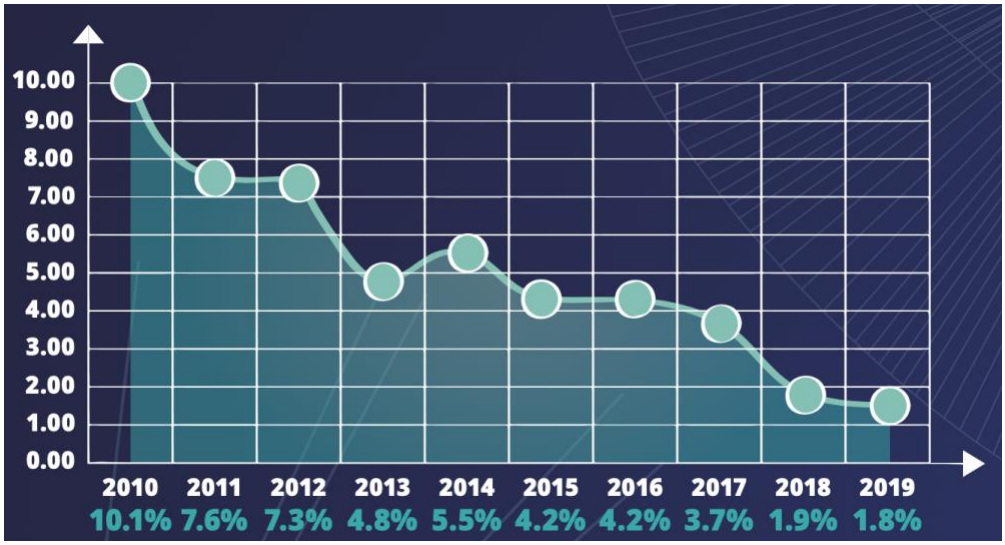

Figure 40: R&D IRR over time for the 12 pharma companeis with the highest spending in R&D.
Source: "Ten years on measuring the return from pharmaceutical innovation 2019", Deloitte, 2020

The study identified a weight adjusted cost of capital (WACC) of 7% in 2010 for the R&D investments, and the only year in which the IRR was above the cost of capital was in 2010, with an IRR of 10.1[130]. Therefore, big pharma companies involved in this study, in the years following 2013, pursued investments opportunities with IRRs lower than the cost of capital: the R&D investments in this period have returned less than the required rate, decreasing value for the company that invested in the projects.

The average cost to develop an asset, including the cost of failure, has increased in six out of nine years. In 2019, the cost to develop an asset decreased from $2,168 million in 2018 to $1,981 million in 2019, while the cost per asset in 2010 was $1,188 million[131]. Not only the

[129] "Ten years on measuring the return from pharmaceutical innovation 2019", Deloitte, 2020
[130] "Ten years on measuring the return from pharmaceutical innovation 2019", Deloitte, 2020
[131] "Ten years on measuring the return from pharmaceutical innovation 2019", Deloitte, 2020

development expenditure increased, but also the forecasted peak sales per asset declined. Peak sales are the maximum revenues that the drug under development is expected to earn in its top selling year when and if enters the market. The average peak revenues fell below $400 million for the first time, to $376 million in 2019, down from $407 million in 2018. Despite the fall in peak sales per asset, the average cost to develop an asset decreased because the company successfully replenished their late-stage pipelines, which is the most expensive phase in the R&D process, with assets from earlier stages of development, less expensive, or licensing deals, drug patents acquired form other and usually smaller companies that do not enough funds to finance all the steps before selling the drug.

The shift in drug development towards more scientifically complex modalities and therapy areas, like cell and gene therapies, has also affected clinical trial cycle times. Biopharma companies today are taking longer than ever to bring new drugs to market, with steady increases in average cycle time mainly due to the increasing share of the pipeline focused on oncology, which has longer average cycle times compared to other therapy areas. At the same time, biopharma companies have been finding it increasingly difficult to recruit patients that meet the selection criteria for their trials, increasing the trial time, in particular phase III trials, that requires many patients. The main drawback of increasing development time is that it reduces the time the company can benefit from the patent protection, reducing forecasted sales.

Given these decreasing trends in IRRs of R&D projects, from 2010, close to half of the companies late-stage pipelines were sourced through external innovation, in order to reduce the R&D spending, the risk of failure of the drug in the late-stage and to increase the number of drugs in the pipeline, ready to replace the drugs with expiring patents. This may be indicative of the challenges these companies face in achieving growth on top of an already sizable revenue base, prompting them to seek consolidation to bolster pipelines and improve productivity through synergies. Beside M&A, in-licensing and co-development are also growing importance in the market, suggesting more specialized companies are partnering to access capability as well as innovation.

The other aspect that is driving the M&A activity in the industry is that companies are modelling their portfolios toward specialization and focus. To this end, in every sub-sector, restructurings, divestitures and consolidation deals are increasing, with the aim of improving the quality of the core business products, lowering the production costs. This because pharma companies specialized and focused in a specific disease/sub-sector have recorded higher

Return on Capital (ROC)[132]. According to another study from Deloitte[133], ROC of pharmaceutical companies focused on specialty therapeutic areas were 17% in 2017, compared to 9% for companies with diversified portfolios. Moreover, specialty pharma companies' revenue grew 15% annually between 2011 and 2017, compared to diversified companies' 2%.

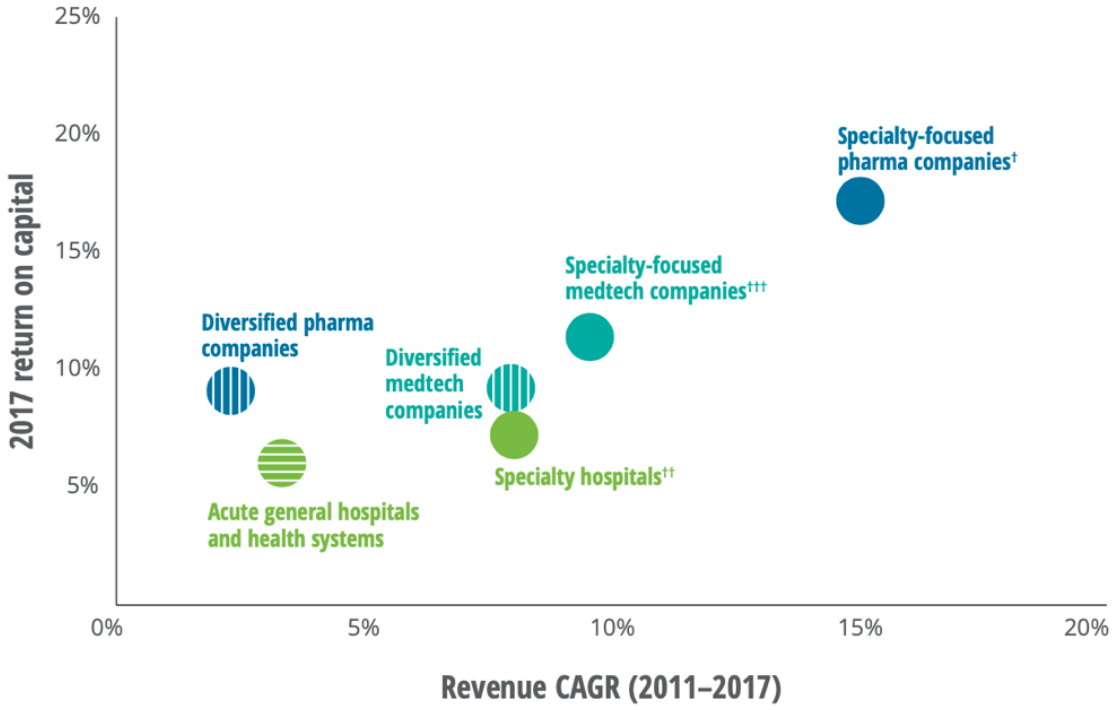

Figure 41: ROC and Revenue CAGR by specialization.
Source: "Return on capital performance in life sciences and health care", Deloitte, 2018

Therefore, several companies are strengthening their pipeline in their core business specialties. On the other hand, companies with a more diversified portfolio, or a generics focus, registered lower returns and slower revenue growth. Diversified companies generated returns of 9% in 2017, with average annual growth in revenues of 1% between 2011 and 2017.

Therefore, big pharma companies have opportunities to tweak portfolio management for higher returns by leveraging geography, operating model, and ecosystem convergence.

The other factor impacting the M&A activity is that novel drug approvals, which are more likely to command higher market share and pricing, are increasingly coming from smaller or newer start-up companies. As we presented in *section 3.1.2.5*, these companies are increasingly less reliant on big pharma capabilities because Venture Capital and Private Equity funds are investing great amounts of capital in the industry to shepherd potential drug candidates through

[132] ROC is computed as the EBIT divided by total assets minus current liabilities. The difference with the ROIC is that ROIC has NOPAT as numerator and total assets minus cash as denominator.
[133] "Return on capital performance in life sciences and health care", Deloitte, 2018

the drug development process. This trend raises questions around the sustainability of big pharma's current innovation model, and whether smaller companies may ultimately take an increasing share of the market by developing and commercializing products independently.

This trend is unlikely to change, since new and small companies are sponsoring an increasing proportion of clinical trials. In 2010, big pharma companies sponsored 56 per cent of all trials, which decreased to 43 per cent by 2019.[134]

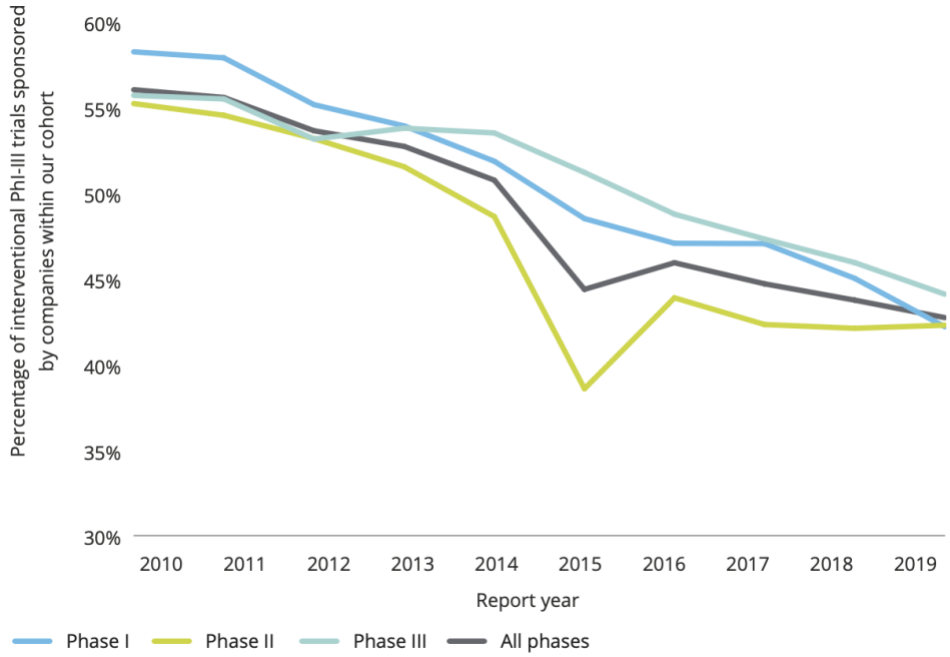

Figure 42: Percentage of Phase III trials sponsored by new and small companies.
Source: "Ten years on measuring the return from pharmaceutical innovation 2019", Deloitte, 2020

Also, there has been a sharp decrease, from 58 per cent in 2010 to 42 per cent in 2019 in the percentage of Phase I trials sponsored by big companies[135]. Running clinical trials has traditionally required a significant amount of capital and scale, and smaller companies have relied on bigger biopharma companies as partners to provide these resources and capabilities. Furthermore, developing drugs that treat chronic disease in large populations required large, multi-site and multi-year trials. Today, the shift in focus towards new modalities targeting smaller populations, together with an influx of capital into the biopharma market, have enabled smaller companies to be able to sponsor clinical trials independently.

The shift in focus towards new modalities in disease areas with high unmet need has also changed the nature of clinical development programs. Smaller companies focusing on disease areas, like rare and orphan diseases, are more agile and can pursue smaller patient populations

[134] "Ten years on measuring the return from pharmaceutical innovation 2019", Deloitte, 2020
[135] "Ten years on measuring the return from pharmaceutical innovation 2019", Deloitte, 2020

or accelerated pathways. According to IQVIA[136], emerging biopharma companies, active in the fastest growing areas of oncology and orphan drugs accounted for 72% of the 2018 late-stage pipeline activity, up from 61% a decade ago. Strong capital markets and smaller scale clinical trials have likely contributed to the reduced need for these companies to partner or be acquired to develop their therapies. Moreover, outsourcing companies such as Contract Research Organizations[137] (CROs) and professional service firms are starting to build services to provide support to new biotech and biopharma companies to progress the development and even commercialization of new drugs. This makes new biotech and biopharma companies less reliant on larger biopharma partners to commercialize therapies.

Big pharma companies' priority in deal making can be summarized in stable growth in revenues. To this end, late-stage R&D pipelines must be always filled up, so that revenues losses when patents expire are always replaced by innovative and patent-protected new drugs. Moreover, companies are looking for increasing cost efficiencies in the core business, innovative solutions like Artificial Intelligence (AI) and Machine Learning technologies to make the R&D less time and effort consuming and modern biopharmaceutical capabilities, in order to develop breakthrough treatments like gene therapy, partially leaving aside the more tradition small molecules treatments. To achieve this targets, big pharma players are reshaping their portfolios, with M&A deals, partnerships and divestitures.

4.1.3.2 2019 in Review

In 2017 and 2018 the pharmaceutical industry suffered decreasing operating results and stocks prices due to pricing pressure and concerns about possible changes in the US drug prices legislation, that would have been driven revenues and profit margins further down.

However, in 2019, the pharmaceutical regained momentum, managing to largely shake off fears about a tightening of drug pricing legislation in the US, after President Trump retreated the possible amendment to rebates and the Medicare Act, in the second quarter of 2019. At the end of the year, most big pharma stocks celebrated healthy, double-digit share increases, most of them enjoying a fourth-quarter comeback. Indices such as the Nasdaq biotech, S&P pharma and Dow Jones pharma and biotech, which were either flat or up in anaemic single digits at the end of the summer, roared back to end 2019 with double-digit gains.

[136] "The changing landscape of research and development: Innovation, drivers of change, and evolution of clinical trial productivity", IQVIA Institute, 23 April 2019.

[137] CROs are consulting companies in the pharma industry that offer a wide range of research tools to companies that want to outsource some research tasks during clinical trials

Overall, the top performers for the year were a trio of European based big cap stocks: Astrazeneca, with 31% price increase, driven by the oncology drugs, Roche, with 29%, and Novartis AG, with 27%[138].

On the other hand, Pfizer remained big pharma's worst-performing stock, driven down by concerns over its corporate strategy. Abbvie, like Ely Lilly, saw a major fourth-quarter recovery, finishing down 4% after standing off 18% at the end of the third quarter.

The IPO market followed the same path as the big pharma stock prices: until October it had looked as if the IPO window for young drug makers might be shutting as western stock markets contracted. Instead 14 listings, including four $100 million-plus listings, helped 2019 finish with a flourish as the markets bounced back to health[139].

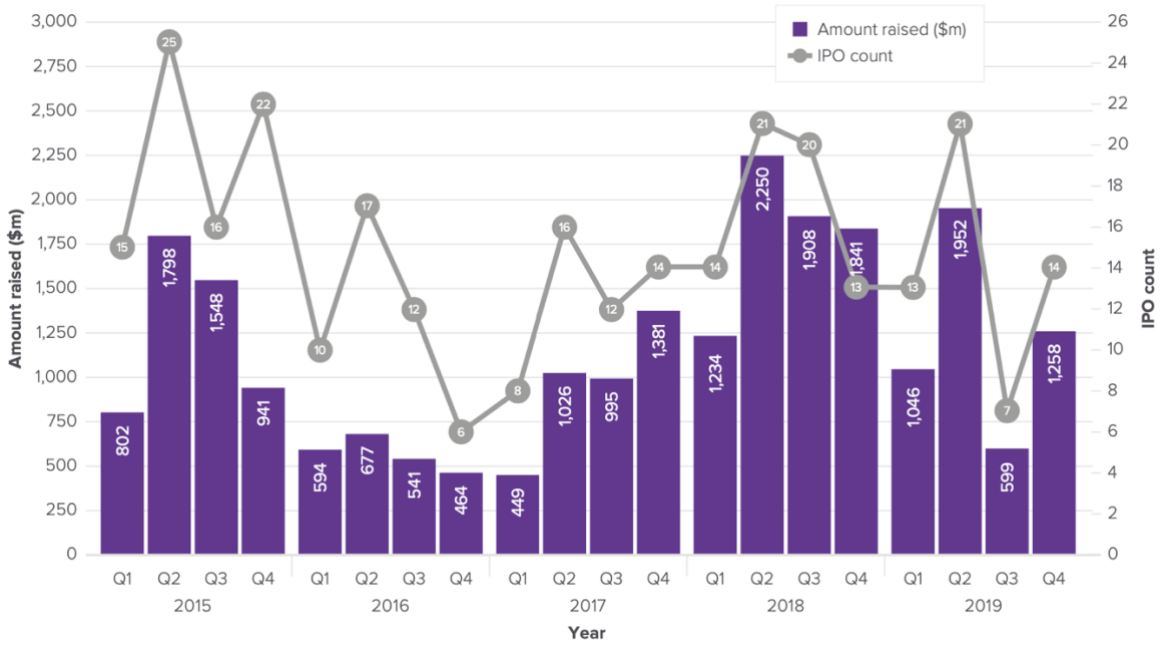

Figure 43: IPO value and count.
Source: "Evaluate Vantage Pharma, Biotech and Medtech 2019 in review", EvaluatePharma, 2020

It is extremely important to focus on one aspect that characterized both the IPO market and the Venture Capital investing, as shown in *section 3.1.2.5*: the average amount raised, at $88 millions, was the second highest over the decade but the number of IPOs was 14, an average for the industry. This suggests that the concentration of capital into the hands of fewer companies is not limited to the venture financing field.

[138] "Evaluate Vantage Pharma, Biotech and Medtech 2019 in review", EvaluatePharma, 2020
[139] "Evaluate Vantage Pharma, Biotech and Medtech 2019 in review", EvaluatePharma, 2020

Company takeouts at the end of last year, confirmed 2019 as a bumper period for biopharma deal-making. Global drug makers spent $265.8 billions on M&A deals, in the best year since 2013, as *Figure 44* shows.

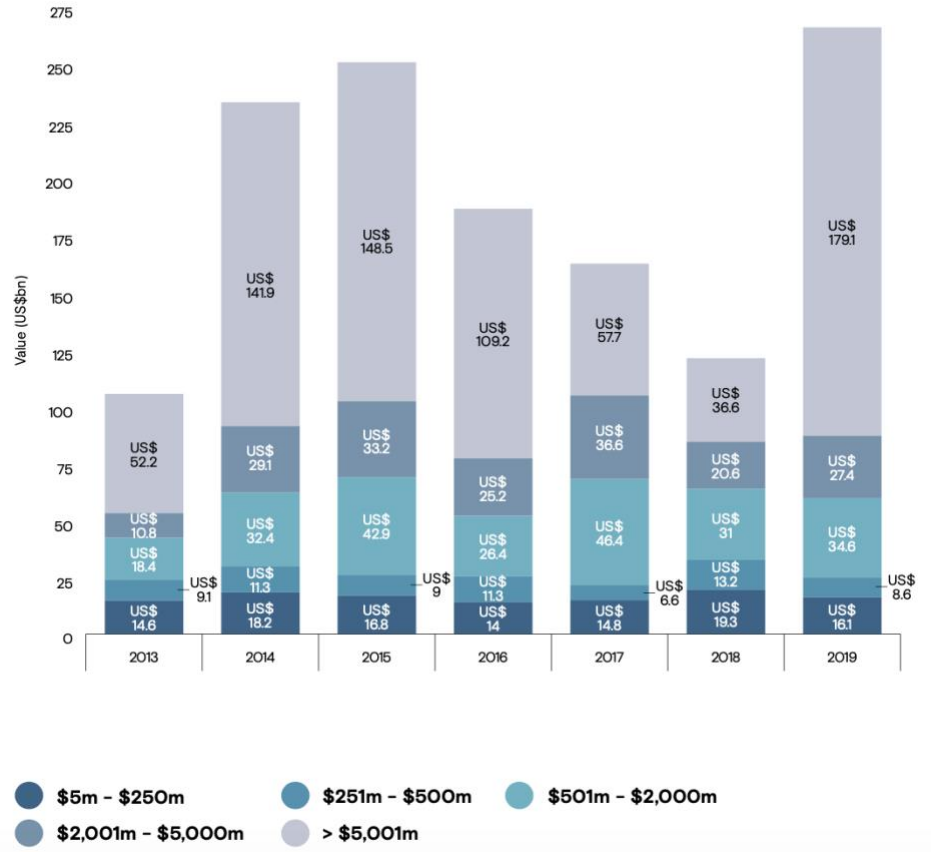

Figure 44: M&A deals value in pharma
Source: "Deals Drivers Americas 2019", Mergermarket, 2020

The vast majority of the cash deployed in 2019 was funneled in the two megamergers that confirm that pharma M&A deals rationale is revenue growth and specialization:
Bristol-Myers Squibb bough Celgene for $74bn and AbbVie acquired Allergan for $63bn. The first megamerger will result in an impressive combined oncology portfolio with nine drugs that have more than $1 billion in sales. Celgene's late-stage pipeline assets should help offset Bristol lost sales from its own blockbuster multiple myeloma drug, Revlimid, which loses patent protection in 2022. AbbVie's acquisition of Allergan delivers strong and stable cash flows from medical aesthetics as the company braces for the expiration of Humira, the top-selling drug in the world but one that will face competition from biosimilars as early as 2023.
Beside these big size deals, the industry experienced a rebound in mid-size deals in 2019, to

the highest level since 2015: deals valued between $1 and $15 billions accounted for the 26.5% of the total number of values[140]. In medium-size deals two approaches prevail as corporate acquirers have looked to improve their R&D pipelines with an eye toward developing their future growth prospects. First, companies buy smaller companies or individual assets within their own areas of expertise, to increase specialization and deliver better product in a cost-efficient manner. Pfizer thus acquired Array BioPharma, which specializes in small molecule drugs targeting cancer, for $11.4 billion. The deal strengthens Pfizer's category leadership in oncology. The second approach involves entirely new technological capabilities or platforms such as cell and gene therapy. For example, Roche bought Spark Therapeutics, which specializes in gene therapies, for $4.8 billion, to gain access to a gene therapy platform. And Pfizer purchased a 15% stake in Vivet Therapeutics, a French gene therapy company.

The high deal value was mainly driven by the two megamergers and very high prices for biotech and R&D focused companies, which benefitted from an average EBITDA multiple of 29.8X, versus a 23.4X in 2018. On the contrary, pharmaceutical companies have seen their multiples dropping from 28X in 2018 to 14.2X in 2019, because more generics drugs are entering the market due to patent expirations and global markets threaten a slowdown.

With $7.26 billions in value, the licensing deal market is another big area of deal making for biopharma but, echoing the decline being seen in straight company M&A deal count, the activity has been fading over the past couple of years, because capital is more concentrated in a few but highly valued transactions. For young drug makers cash is easy to come by and so they can keep their options open, with enough funds to sustain extremely expensive R&D processes; this is one likely reason for the downward trends seen in both M&A and licensing. The expectation is that this trend will not only impact the deal-making trends but the entire industry in the near future. All this availability of funds will decrease the entrance barriers of the industry, increasing competition for current top players.

[140] "Evaluate Vantage Pharma, Biotech and Medtech 2019 in review", EvaluatePharma, 2020

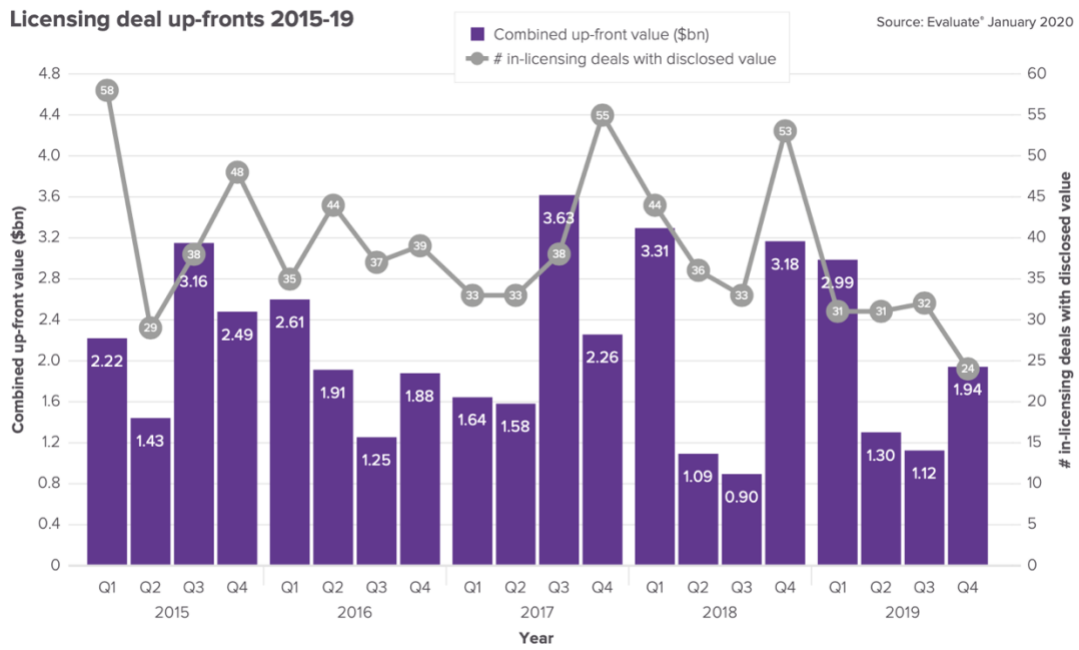

Figure 45: Licensing deals in pharma.
Source: "Evaluate Vantage Pharma, Biotech and Medtech 2019 in review", EvaluatePharma, 2020

The last factor that contributed to the pharma industry "hype" in the second quarter of 2019 was the Food and Drug Administration (FDA) with several surprisingly speedy approvals. Average approval times in the breakthrough designation category[141] improved markedly in 2019, with 6.3-month mean spent for approval, to give the regulator the fastest approval time since 2013. To make the action of the FDA even more remarkable was that in 2013 the record time was achieved reviewing only three projects, while in 2019 the average was derived from the review of 15 projects.

To accomplish the strategic target of reshaping their portfolios toward specialization and innovative technologies, big pharma companies are reconsidering their subsidiaries, with the aim of divesting non-core assets, raise cash or free up capital expenditure and funds to acquire companies that could contribute to the improvement of the core business. Therefore, many companies have been pursuing a divestiture or restructuring strategy before undergoing M&A activity. Indeed, larger companies divested noncore assets with subscale positions in order to focus on higher-return areas. Pfizer is a case in point, with a multiyear effort to rationalize its portfolio as it doubles down on patented drugs in areas such as oncology. Pfizer announced its discussions with Mylan to complete a potential spin-off of its Upjohn business. The last

[141] Breakthrough Therapy designation is a process designed to expedite the development and review of drugs that are intended to treat a serious condition and preliminary clinical evidence indicates that the drug may demonstrate substantial improvement over available therapy on a clinically significant endpoint(s).

restructuring announcement is the Merck's spin off of its women's health, biosimilar drugs and legacy products into a new publicly traded company.The move will allow the drugmaker to focus on key growth drivers like cancer drug Keytruda and vaccines.The company, which expects the transaction to be completed by the first half of 2021, forecasts operating efficiencies of over $1.5 billion by 2024 related to the spinoff[142]. Another example is Novartis that spun off Alcon in a $31.4 billion deal, , in order to accomplish the restructuring plan that aims at reshaping its product portfolio in order to expand its presence in the gene therapy market, one of the fastest growing and more promising sectors.

These deal trends are expected to continue in the foreseeable future. The run toward consolidation and specialization will continue, due to increasing competition from new high-tech biopharma companies and pricing pressure. In addition, big companies will look for start-ups with AI and Machine Learning know how, in order to make the R&D process quicker. To maintain the R&D late-stage pipeline always full, companies will also keep acquiring start-ups with outstanding research capabilities in innovative fields like gene therapy. However, the risk is that the competition among bidders will become fierce, driving valuations multiples to skyrocket levels, which could be unsustainable and would further depress the returns on investments in R&D.

In this context, divestitures and restructuring are growing importance. Before buying, big pharma companies are prioritizing the rationalization of their portfolios, in particular their non-core assets and low-growth businesses. To this end, the focus of the next chapter will be on the Novartis-Alcon spin-off, which will be analyzed to understand if the spin-off can be a good strategical transaction to reshape portfolios toward target acquisitions that focus on high-growth and core assets.

[142] Thomson Reuters News Analytics

5 Chapter 4

5.1 Novartis-Alcon spinoff

5.1.1 Novartis AG

5.1.1.1 History

Novartis was created in 1996 through a merger of Ciba-Geigy and Sandoz. Novartis and its predecessor companies trace roots back more than 250 years. From beginnings in the production of synthetic fabric dyes, the companies that eventually became Novartis branched out into producing chemicals and ultimately pharmaceuticals.

The history of Novartis traces the converging destinies of three companies: Geigy, a chemicals and dyes trading company founded in Basel, Switzerland in the middle of the 18th century; Ciba, which began producing dyes in 1859; and Sandoz, a chemical company founded in Basel in 1886.

5.1.1.2 Group Structure and Shareholding

Novartis AG, the Novartis group holding company, is organized under Swiss law and is based in Basel, Switzerland. It has more than 160 subsidiaries with total assets or net sales greater than $25 million in more than 25 countries. The most important holding is a 100% stake in Sandoz AG, which is the holding company of the generics and biosimilars business. The other strategically important holding is a minority of 33.3% voting rights in Roche, for two main reasons:

- Novartis has two agreements with two Roche subsidiaries: Genentech Inc. and Spark Therapeutics Inc., based in the US. Novartis has the exclusive right to develop and market the products of these two companies in Europe, paying royalties on the net sales. Furthermore, Novartis has several patent license, supply and distribution agreements with Roche
- Many analysists consider this position a future opportunity for the two Swiss pharma giants to merge, in a move toward market consolidation

According to the Shares Register, as of December 31, 2019, Novartis AG had approximately 161,000 registered shareholders, of which 96.43% are individual shareholders. The major shareholders are:

- Emasan AG[143] owns a holding of 3.5%
- Novartis Foundation for Employee Participation[144] owns holdings of 2.1%
- UBS Fund Management[145] owns holdings of 2.1%

87.68% of shareholders of the company are based in Switzerland.

The weighted average of the shares outstanding was 2.29 billion at the end of 2019, traded in the Swiss and New York stock exchange.

5.1.1.3 Business

The vision of the company is to be a trusted leader in changing the practice of medicine. The strategy is to build a leading, focused medicines company powered by advanced therapy platforms and data science, with products sold in approximately 155 countries around the world.

The Group comprises two global operating divisions:

- **Innovative Medicines:** the division is a world leader in offering patent-protected medicines to patients and physicians. The Innovative Medicines Division researches, develops, manufactures, distributes and sells patented pharmaceuticals, and is composed of two global business units: Novartis Oncology and Novartis Pharmaceuticals. The Novartis Oncology business unit is responsible for the commercialization of products in the areas of cancer and hematologic disorders. The Novartis Pharmaceuticals business unit is organized into the following global business franchises responsible for the commercialization of various products in their respective therapeutic areas: ophthalmology; neuroscience; immunology, hepatology and dermatology; respiratory; cardiovascular, renal and metabolism; and established medicines. The Innovative Medicines Division is the larger of the two divisions in terms of consolidated net sales. It reported consolidated net sales of $37.7 billion in 2019, representing 79% of Novartis group's net sales. Net sales are concentrated in the United States (37%), Europe (34%) and Asia (22%). Novartis Oncology produced net sales of $14.3 billions, 38.6% of the division net sales, while Novartis Pharmaceuticals produced $23.3 billions, and ophthalmology is the disease area with the best net sales results with $4.7 billions. Since 2018, 26 projects have been added to the R&D pipeline,

[143] Emasan AG is a financial services company based in Basel, fully owned by the Sandoz Family foundation, the foundations of Sandoz subsidiary founders

[144] The foundation is a Special Purpose Vehicle (SPV) founded by, but independent from, Novartis, based in Basel

[145] It is the fund management branch of the UBS bank, based in Basel

and 3 have been commercialized, showing strong future opportunities for the company. The division will keep playing a major role in generating sales for the company because the top six selling products in 2019 will still benefit from patent protection, and no generic competition, in the following years. The first drug in revenues will have its patent expired in 2026 while the other two patent-protected products, among the top selling list, will have their patent expired in three years. Only one product, of the top six, faces generic competition, while the other two have patents expired but no generic drug substitution. The main competitors of Novartis Innovative Medicines division are GlaxoSmithKline, AstraZeneca, Sanofi, Pfizer, Eli Lilly and Bristol-Myers Squibb

- **Sandoz**: the division is a global leader in generic pharmaceuticals and biosimilars, and sells products in over 100 countries. Sandoz develops, manufactures and markets finished dosage form medicines as well as intermediary products including active pharmaceutical ingredients. Sandoz is organized globally into three franchises: Retail Generics, Anti-Infectives and Biopharmaceuticals. In Retail Generics, Sandoz develops, manufactures and markets active ingredients and finished dosage forms of small molecule pharmaceuticals to third parties across a broad range of therapeutic areas, as well as finished dosage form anti-infectives sold to third parties. In Anti-Infectives, Sandoz manufactures and supplies active pharmaceutical ingredients and intermediates, mainly antibiotics, for internal use by Retail Generics and for sale to third-party customers. In Biopharmaceuticals, Sandoz develops, manufactures and markets protein or other biotechnology-based products, including biosimilars, and provides biotechnology manufacturing services to other companies. The Sandoz strategic ambition is to be the world's leading and most valued generics and biosimilars company. The divisional strategy has been refined to focus on three areas: developing a broad and consistent pipeline of off-patent launches across key geographies and major therapeutic areas; positioning Sandoz to have a strong pipeline with a concentration on being first to market, and "last out" by way of competitive costs and stable supply. Sandoz is a market leader in biosimilars, with a total of eight approved and marketed products and a pipeline of over 10 molecules, and has several commercialization agreements with biosimilars companies. In 2019, the Sandoz Division achieved consolidated net sales of USD 9.7 billion, representing 21% of Novartis group's total net sales. The two largest generics markets in the world, the US and Europe, are the principal markets for Sandoz. Europe has the 53% share of the division net sales with $5.1 billions, while US has the 26% of net sales with $2.4 billions. The main

competitors of Sandoz division are Teva, Actavis, Mylan, Dr Reddy and Sun Pharmaceuticals.

The two main divisions are supported by the following organizational units: the Novartis Institutes for BioMedical Research, Global Drug Development, Novartis Technical Operations and Novartis Business Services[146]. The Novartis Institutes for BioMedical Research (NIBR) is the innovation engine of Novartis, which conducts drug discovery research and early clinical development trials for the Innovative Medicines Division. The Global Drug Development (GDD) organization oversees drug development activities for the Innovative Medicines Division and collaborates with the Sandoz Division on development of its biosimilars portfolio. GDD works collaboratively with NIBR and with the Innovative Medicines and Sandoz Divisions to execute the overall pipeline strategy.

Novartis Technical Operations manages manufacturing operations, supply chain, and quality across the Innovative Medicines and Sandoz Divisions. The division is expected to enhance capacity planning and adherence to quality standards, and to lower costs through simplification, standardization and external spend optimization.

Novartis Business Services is the shared services organization, delivers integrated solutions to all Novartis divisions and units worldwide. The objective is to drive efficiency and effectiveness across Novartis group subsidiaries by simplifying and standardizing services across six domains: human resources, real estate and facility services, procurement, information technology, commercial and medical support activities, and financial reporting and accounting operations.

In 2019 Novartis created a new Global Health and Corporate Responsibility function to support the integration of the activities in the areas of ethics, pricing and access, global health and corporate responsibility into the core business strategy, and to help align the initiatives, funding and communications in these areas.

5.1.1.4 Financial and ESG performance

Financially, the group is doing great steps forward with respect to the previous years.

In 2019, Novartis group collected $47.4 billions in sales from continuing operations, a 9% growth compared to 2018, excluding Alcon spin-off. The group operating income from continuing operations amounted to $10.4 billions, of which $9.7 billions pertaining to the Innovative Medicines division, $1.1 billion to the Sandoz division and -$0.4 billion to the

[146] The financial results of these organizational units are included in the results of the divisions for which their work is performed.

corporate services of the group. The operating income grew 8% year-on-year. Moreover, the company produced a 21.25% of operating margin, which is slightly greater than 2018 one. The Innovative Medicines Division contributed to the operating margin with a 25.9%, while the Sandoz division with a 11.6%. This discrepancy is due to the difference in margin between the prescription drugs and the generics.

The Net Income for the year was $11.7billions, 7% lower than 2018, after accounting for the gain on distribution of Alcon Inc. shares, and Earnings Per Share[147] were $5.06, after dilution. However, the decrease in Net Income is not due to operating underperformance, because in 2019 the company improved all the operating indicators, compared to 2018. The difference lays in the fact that in 2018, Novartis group divested its 36.5% stake, for $13 billions in cash, the joint venture with GlaxoSmithKline: the GlaxoSmithKline Consumer Healthcare Holdings Ltd. In this occasion, Novartis realized $5.8 billions in pre-tax gains from this transaction, and thus the Income from Associated Companies in 2018 was "inflated" by the gains of this extraordinary transaction. All in all, the consolidated economic performance of the group can be considered aligned with the internal forecasts of the Chief Financial Officer (CFO), and the entire industry.

The cash flow from operating activities amounted to $13.6 billions, 4.5% less than in 2018, while the free cash flow, after accounting for the investing and financing activities, was -$2.1 billions. The item was negative because the cash flow produced by the operating activities could not cover the capital expenditures and the dividends and shares buy-backs. Total cash at the end of the period was $11.1 billions, which gives the company a quick ratio of 0.83: Novartis con cover up to 80% of all the current liabilities with the cash in-hand, hence the company has a very stable cash position.

The cash reserves and the 0.39 leverage give the company a strong balance sheet, which is extremely important to sustain the constant growth the company wants to accomplish while giving investors a good insurance against insolvency and liquidity issues. In addition, in 2019 the company invested the capital in more attractive projects, indeed, in 2019 the 8.17% ROIC was 2.2% greater than the previous year.

Given the financial statement analysis provided, it is our belief that Novartis has good odds of improving its profitability, achieving its long-term plans. Indeed, the company has an extremely filled pipeline, with 114 projects in phase I or II, 37 in phase III and 13 under

[147] Earnings per share (EPS) are the Net Income divided by the number of shares outstanding, that are the total issued shares minus the share repurchased

registration. In particular, in 2019 the company has filed for approval 5 medicines that are considered potential blockbusters. Therefore, not only the company is in a good current financial situation, but it is also well positioned to dominate the market in the future. The strong pipeline makes the revenues less dependent on few drugs which patent could be expiring in the following years. Considering that medicines under development in Phase III has a 60% chance of being approved, the company is likely to have around 20 potential new patents in the foreseeable future that will replace and cover losses from patent-expired drugs.

On June 9th, 2020, the share price of Novartis on close was $85.67 per share. The share price is slowly regaining momentum after hitting the top at $104.4 on June 2015 and experiencing a steep decline in the following years, touching $62 per share in November 2016. In *Figure 46* it is possible to see that, compared to the S&P 500 (red line), the share (blue line) has definitely lagged behind the index in the period 2016-2020. Moreover, the company has also lagged behind the SPDR S&P Pharmaceuticals ETF, which is is a multi-cap ETF that focuses on the U.S. pharmaceutical companies within the healthcare sector and tracks the S&P Pharmaceuticals Select Industry Index. The ETF's top three holdings include Horizon Therapeutics PLC, a biopharmaceutical company; Eli Lilly and Co., a pharmaceutical company; and Catalent Inc., a company that develops and produces drug delivery systems.

Figure 46: Novartis stock price
Source: Yahoo Finance

The company is currently trading at a 16.9X price on earnings (P/E) ratio compared to the past average of 23.6X, which means investors have mild positive future expectation compared to the past. This multiple is lower than that of a set of six selected comparable companies, three from the US, three from Europe. The comparable cluster has a median P/E of 27.61X, 10.7

lower than Novartis P/E, showing that investors think the company has lower growth opportunities than its comparables in the future. The same is true for the other multiples analyzed. The Enterprise Value (EV) [148] on Earnings Before Interests and Taxes and Depreciation (EBITDA)[149], EV/EBITDA, of Novartis is 12.61X, slightly lower than the multiple average in the past, which was 12.9X. Even in this case, Novartis is priced less than its comparables, that have a median EV/EBITDA of 17.0X. All in all, the company seems a little bit underpriced, considering also that the economic performance is improving year by year and the results are that Novartis Earnings per Share are $5.06 while the median for the comparables cluster is $2.31. Moreover, the company operating margin is aligned with that of the industry, around 22%. The 8.17% ROIC is the only indicator that is lower than the 13.3% of the comparables cohort. However, after this Financial Year results and the current strategy undergone, it seems like the company will be able to recoup the lag and play an important role in the future of pharmaceutical industry. Novartis is also the one with the smallest amount of leverage, and so it would be able to raise debt to finance its growth projects, reducing the equity involved in the investments, hence improving the low ROIC. Another aspect to take into consideration when valuing Novartis against comparables is that, Novartis not only is involved in development and manufacturing of prescription drugs, but also in generics ones, and the generic division has lower margins, ratios and multiples compared to the prescription drugs segment. In fact, Novartis Innovative Medicine division produced a ROIC of 13.88% in 2019, while the Sandoz one was 7.04%. Considering only the prescription drugs division, Novartis ROIC is perfectly aligned with the 13.3% of the comparables.

Novartis ESG performance has been valued by Standard Ethics as adequate, confirming on March 2020 the score of EE-[150], which is considered "investment grade"[151]. However, the sustainability rating company has negative outlook for Novartis, that means the company could be downgraded to E+, that is a "lower investments grade". Novartis appears to be sufficiently

[148] The enterprise value is equal to the value of the equity plus the net financial position. The value of the equity, for listed companies, is the market capitalization, while the net financial position is the debt, long term and short term, minus cash & equivalents

[149] The EBITDA is not an IFRS or GAAP measure, but it is frequently used by investors as a substitute for the operating cash flow. This metric considers only the operating performance of the company without accounting for the depreciation, which is an expense that does not cause a cash out, because it is an accounting tool to split the cost of a multiperiod asset toward its useful life. This measure is widely employed when valuing private companies, because financial data of cash flows for private companies could not be fully available

[150] Standard Ethics, Novartis Rating update, March 11th, 2020

[151] Comparing the Standard Ethics rating with Fitch rating, an EE- could be associated to a BBB.

aligned with the international sustainability guidelines[152] issued by the UN, OECD and EU and has a good corporate governance structure. However, according to the Standard Ethics methodology, there is ample room for improvement in the area of risk management and in particular in relation to anti-competitive practices. If the opportunity is not exploited, the company could be downgraded.

It is worth noting that Novartis was second in the medicines accessibility ranking index in 2018, which is an extremely important indicator in the industry, given the pricing pressures that the pharma companies face. Furthermore, since 2014, the company is part of the Dow Jones Sustainability Index, an index that comprises all the companies with the best ESG performances in the world.

We conclude that Novartis, given its R&D current potential and its strategy focused on selling value-added drugs, could hide great potential below mixed results in these recent years and could be well positioned to exploit all the opportunities that will arise in the pharma industry in the future. In addition, its growing commitment toward the ESG challenges will be an important competitive advantage in the foreseeable future, in which pharma companies will be engaged in ensuring reasonable and more transparent prices, less anti-competitive behaviors and better human and animal management during clinical trials, in order to increase their brand social reputation.

5.1.1.5 Long term portfolio strategy of the company

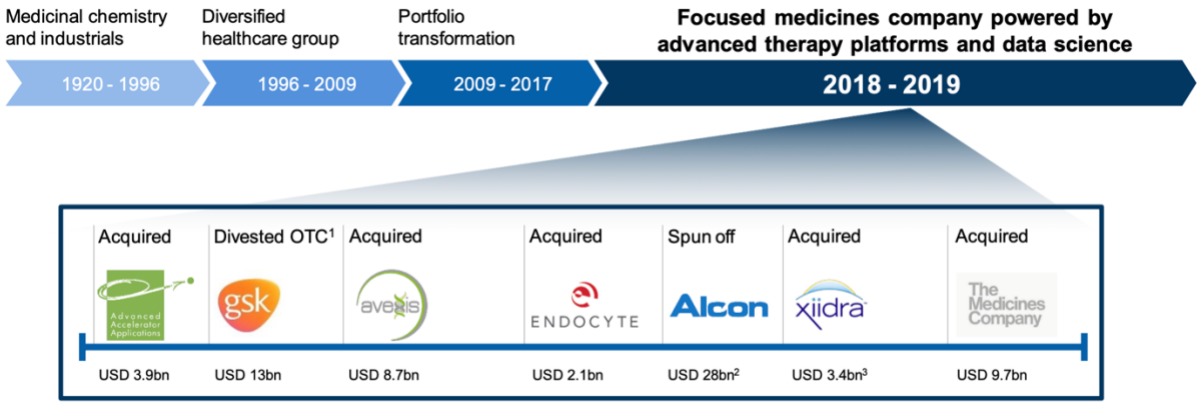

Figure 47: Novartis portfolio strategy
Source: "Novartis Investors presentation FY 2019", Novartis, 2020

[152] The most important sustainability guidelines, on a worldwide level, are the Sustainable Development Goals, set of 17 goals issued by the United Nations, that should be achieved within 2030. These goals cover an ample range of topics, from the society to the environment

Figure 47 shows the focus of Novartis, that aims at becoming a leading medicine company, focused on advanced therapy platforms like gene therapy and data science, in order to improve the efficiency of the R&D process. This strategy is extremely common in the pharma industry: the pricing pressure from patients and governments, the increasing competition from smaller companies backed by private capital investors and the threats outlined in *chapter 3* are requiring pharma companies to focus on operations that increasingly add value. The old pharma business model was suitable with the development of drugs based on small molecules: medicines were produced in large scale because the treatment was of the type "one-fits-all". Currently, a new paradigm based on specific treatments depending on the patient is emerging. Scalability is no longer a strategic value and has been replaced by drug-personalization and specificity. Therefore, the old business model is losing appeal and companies must shift to the new paradigm if they want to avoid margins shrinkage. In February 1st, 2018, Novartis Board of Directors appointed a new CEO: Vasant Narasimhan. Since then, the company started a portfolio revolution, in order to adapt to the new business model and enhance the development of the biopharma division. The Innovative Medicine division has been involved into several M&A, alliances and divestment moves, with the goal of restructuring and refocusing the portfolio on medicines, in particular on cell and gene therapy, which is the technology that is mainly shaping and disrupting the pharmaceutical industry toward a drug-personalized model, and toward the massive use of data science. Furthermore, in the last two years, the division entered into business development agreements with other pharmaceutical and biotechnology companies and with academic and other institutions to develop new products and access new markets. The focus is on strategic alliances and acquisition activities for key disease areas and indications that are expected to be growth drivers in the future.

In January 2020, Novartis completed the acquisition of US-based biopharmaceutical company The Medicines Company for $9.7 billions in cash on a fully diluted basis, to broaden the cardiovascular portfolio. The tender offer valued the company at $85 per share. In October 2019, Novartis announced a multiyear research and development collaboration with Microsoft. This alliance is expected to bolster the artificial intelligence capabilities to help accelerate the discovery, development and commercialization of medicines for patients worldwide, reducing the length and expenditure of the R&D process to increase the investment returns. Novartis is also very active in alliances with universities to develop new drugs in the most innovative fields. In September 2019, Novartis and the University of Pennsylvania entered into a new focused agreement to develop innovative cell therapies. Finally, the company is active in the licensing deals: in July 2019, Novartis announced the completion of the acquisition of Xiidra

from Takeda Pharmaceutical Company Limited for $3.4 billions in upfront fees, plus potential milestone payments of up to $1.9 billion. Xiidra is the first and only prescription treatment approved to treat both signs and symptoms of dry eye by inhibiting inflammation caused by the disease. To further strength its presence in the cell and gene therapy, Novartis is active as an investor in the private market. In April 2019 completed a $75 million investment in Poseida Therapeutics, a privately held biotechnology company focused on gene therapies, while in February 2019, the company completed the acquisition of CellforCure, a French company specialized in the development and manufacture of cell and gene therapies.

The generics division, Sandoz, went through one important acquisition agreement in 2020. On November 2019, the company entered into an agreement for the acquisition of the Japanese business of Aspen Global Incorporated, subsidiary of Aspen Pharmacare Holdings Limited. In January 2020, Sandoz has closed the deal paying up-front $336 million in cash, and upon fulfillment of certain considerations, Sandoz will add $112 million to the initial deal. The acquisition enables Sandoz to expand its presence in Japan's marketplace, the third largest for generics and off-patent medicines worldwide. It also strengthens Sandoz's presence in the hospital channel by complementing the broad Sandoz portfolio and pipeline of hospital generic and biosimilar products in Japan with a dedicated sales, marketing and medical organization.

On top of all this acquisition moves, the company went through several divestitures and restructuring transactions to monetize or spin off subsidiaries that do not fit the focus strategy of the company. This process begun on June 2018, with the divestment of the already cited 36.5% stake in the joint venture with GlaxoSmithKline Consumer Healthcare, for $13 billions, recording $5.8 billion in after tax gains. The full stake was bought out by GlaxoSmithKline. The joint venture produced OTC drugs, that have low margins and are considerably beyond the scope of the business model that Novartis wants to undergo, focusing on markets with high value-added products. The other important divestiture concerns the spin-off of Alcon subsidiary announced on June 29th, 2018, transaction approved by the shareholder Annual General Meeting of 2019 and completed on April 8th, 2019. As a result of the spin-off, Alcon subsidiary has been structurally separated by the parent company Novartis and currently acts as a standalone company. The total deal value was $31.4 billions, of which $3.5 billion of debt and $27.9 billions of equity, given the total market capitalization of Alcon Inc. on close of the first trading day. It is considered the biggest stock deal in Switzerland, so far.

This transaction is important for two reasons:

- it allows Novartis to keep pursuing its portfolio strategy toward specialization and focus on prescription drugs. In fact, Alcon is a Medical Device ophthalmic company, with different growth rates, margins and business model
- it started a "spin-off trend" in the pharmaceutical industry, especially to separate those large subsidiaries that were previously acquired and have turned out as mistaken acquisitions. After Novartis spin-off, more companies are engaging in this kind of deal, such as Merck and Sanofi, as announced in early 2020.

In the following sections, the focus will be on Novartis Alcon spin off, in order to understand the rationale behind the deal, its strategic implications and under which circumstances is the spin-off preferable than a divestiture.

5.1.2 Alcon: the business

Alcon was originally founded in 1945 by pharmacists Robert Alexander and William Conner, who opened a small pharmacy under the "Alcon" name in Fort Worth, Texas. In 1947, Alcon Laboratories, Inc. was first incorporated and began manufacturing specialty pharmaceutical products to address ocular health needs. In the succeeding years, Alcon began operating internationally with the opening of an office in Canada and first formed its surgical division. The mission of the company is to provide innovative products that enhance quality of life by helping people see brilliantly.

Alcon is currently the largest eye care company in the world and focuses on research, development, manufacturing, distribution and sale of a full suite of eye care products within two key businesses: Surgical and Vision Care. Based on sales for the year ended December 31, 2019, the company is the number one by global market share in the ophthalmic surgical market and the number two by global market share in the vision care market, operating in over 70 countries and serving consumers and patients in over 140 countries.

The Surgical business is focused on ophthalmic products that supports the end-to-end needs of the ophthalmic surgeon. The Vision Care business comprises daily disposable, reusable and color-enhancing contact lenses and a comprehensive portfolio of ocular health products, including devices and over-the-counter products for dry eye, over-the-counter products for contact lens care and ocular allergies, as well as ocular vitamins and redness relievers. The Surgical and Vision Care businesses are complementary and benefit from synergies in R&D, manufacturing, distribution and consumer awareness and education. The outlook of the business of the company is positive because the global ophthalmic surgical and vision care

markets are large, dynamic and growing. As the world population grows and ages, the need for eye care is expanding and evolving, and the expectation is that the size of the eye care market in which Alcon operates was approximately $25 billion in 2019 and is projected to grow at approximately 4% to 5% per year to 2024. The surgical market in which the company operates was estimated to be $10 billion and is projected to grow at 4% per year toward 2024, while the vision care market was estimated to be $15 billion and is projected to grow at 5% per year until 2024. In 2019, Alcon recorded $7.1 billions in revenues.

5.1.3 Alcon-Novartis: the acquisition in 2010

Before 2008, Alcon was a subsidiary of the Swiss multinational group Nestlé, that owned 77% of Alcon's equity.

On April 7th, 2008 Novartis entered in a Purchase and Option Agreement with Nestlé, to acquire the 77% Alcon's stake owned by Nestlé. The deal was structured in two steps. The first happened in 2008, with Novartis buying slightly less than 25% of Alcon's stake, around 74 million shares, at the current market price per share of $143.18. The price paid in cash was $10.5 billions. In this first tranche, the company paid 19.27X Alcon's trailing EBITDA, that in 2007 was $2.0 billions, 27.7X the $5.25 2017 earnings per share, and 12.5X the book value of equity. The second step was dependent on Novartis exercising the call option on the remaining 52% of Nestle's owned equity in Alcon, in the period going from January 1st to July 31st, 2010. The option agreement granted Novartis to buy the stake for at most $181 or at least 20.5% more than the average of Alcon's price in the four days preceding the exercise announcement. Novartis exercised the call option on January 4th, 2010, for $181 buying 155 million shares, for a total value of $28 billions. Therefore, the total payment made to Nestlé amounted to around $38.5 billions, financed with cash and short-term borrowings. In this second tranche, the company paid 21.25X Alcon's trailing EBITDA, that in 2009 was $2.4 billions, 27.2X the earnings and 11.8X the book value. In the same date Novartis announced to Alcon's Board of Directors the proposal for a merger of Alcon with and into Novartis, acquiring the remaining 23% minority of Alcon's stake, so to own 100% of the equity of the eye-care company. Novartis proposed the Board to give the holders of the 23% stake 2.8 shares of Novartis for each Alcon's share. At that time, Novartis shares were valued $54.9, hence the company was valuing the remaining 23% stake at $153.72. This proposal was rejected by Alcon's Board, alleging that the shares were underpriced. After several talks between the Board and Novartis' senior management, Novartis agreed to pay $168.79, which was the weighted average purchase

price of Nestle's shares, for 69 million shares, and a total price of $11.6 billions. To resume the transaction, the average price paid by Novartis to acquire 100% of Alcon's equity amounted to $52.2 billions: $168.7 per share. In terms of multiples, for the overall transaction, and considering 2009 financial data, the company paid 20.4X Alcon's EBITDA, 25.3X the earnings and 11.5X the book value. Considering 262 MedTech transactions in the period 2008-2010, Novartis paid more than the sectors multiples for Alcon. Indeed, the average EV/EBITDA of the 262 transactions was 16.7X, while Novartis paid 3.7X more, and the average Enterprise Value on Total Sales was 3.6X, while Novartis paid 7.58X[153].

5.1.4 2011-2019: the evolution of the deal

After the acquisition, in the period 2011-2014, Alcon kept producing the good pre-acquisition results, with sales growing at a 2.8% CAGR, but the free cash flow produced by the eye-care company was not enough to justify the high price paid by Novartis. Indeed, during this period, the Financial Return on Investment (FROI)[154], had never been greater than 6.7%, which is definitely smaller than the minimum cost of capital of 7.5% implied by Novartis management during the acquisition. Therefore, in this period, Alcon acquisition was not returning neither the minimum required return, hence Novartis investment was not paying off. Things got even worse in 2015, when Alcon suffered a 9.3% decrease in sales due to some patent expiration and an empty pipeline, without new drugs that could readily enter the market to substitute the ones that were suffering generics competition. In 2015 Alcon returned a 4.4% FROI, 3% less than the minimum required return. The acquisition was clearly turning out as a mistake, because the synergies and the benefits that were deemed Alcon could have brought to Novartis had been completely overstated. Therefore, Novartis management started thinking about selling the subsidiary but, to reduce the financial damage of the M&A deal, decided to incorporate the Alcon ophthalmic division into Novartis Innovative Medicine business division, paying Alcon slightly more than $110 million. This shift impacted positively the Novartis Innovative Medicine division, because the company already had an ophthalmic portfolio of prescription drugs, that was very profitable thanks to the drug Lucentis, that in 2015 was the third Novartis drug for total sales. However, the drug would have lost the patent

[153] Medical Device and Diagnostic Industry, "Buyer's Market Prevails for Medtech Firms" https://www.mddionline.com/stub/buyers-market-prevails-medtech-firms, 2010

[154] Financial Return on Investment (FROI) is defined as free cash flow, that is free cash flow from operations plus capital expenditure, over the net invested capital

in 2015, causing a steep decrease in sales and revenues, hence Alcon's division could provide know how and patents to further boost the revenues for Novartis eye-care portfolio, without suffering tough losses from Lucentis patent expiration. Alcon's ophthalmic division had always accounted for the majority of Alcon revenues, around 38.86%, $4 billions on average in the period 2011-2014. Moreover, the ophthalmic division had the highest margin and profitability, compared to the surgical and vision ones. After the division shift, Alcon was definitely in crises. In 2016, sales decreased by 40%, FROI was 1.5%, 6% less than the implied cost of capital for the merger. Novartis was trying to save the subsidiary appointing a new CEO, that could restructure the company in order to get a better price in the case of a divestiture sale. After the executive change, in 2017, sales rebounded 16%, but the low marginality of the products sold kept plaguing the financial performance of the company. After the ophthalmic division was shifted to Innovative Medicine division, Alcon had never gained positive operating margin again, hence from 2016 Alcon contributed negatively to the operating performance of the parent Novartis. In 2018, Novartis group appointed a new CEO and on June 29th, 2018, the Board and senior management decided to spin Alcon off to refocus the portfolio on medicines only, without pursuing diversification strategies, and to boost the financial performance of the company, without suffering Alcon negative performance. We tried to compute the Internal Rate of Return of the acquisition, in order to value the Novartis-Alcon merger, and asses if it was a wrong deal. We accounted for:

- $3.1 billions in cash that Alcon returned to Novartis during the spin off[155] in 2019
- The free cash flows produced by Alcon in the period 2011-2018
- The value of Alcon ophthalmic division that was shifted to Novartis Innovative medicine division in 2015.

To value the division, we assumed that Novartis would earn a constant stream of cash flows of $0.95 billions, equal to 2015 cash flow produced by the division, for 15 years. The periods of the cash flows streams are computed taking into consideration that the average prescription drug patent life is 10-12 years and some drugs were already in the pipeline. The cost of capital has been estimated at 7.5%, as it is for the pharmaceutical industry and for the comparative transactions of patented drugs. The last input is the growth of these streams of cash flows, which is estimated as -3%. This value considers the decrease in the cash flow streams magnitude because of increasing competition and patent expiration during the 15 years. The value has been estimated as the average decrease in cash flows that Alcon ophthalmic division

[155] The spin off transaction will be thoroughly explained in the following paragraph

experienced in the past 4 years, before the division shift. The ophthalmic division has then been valued at $7 billions.

The final Internal Rate of Return of the Alcon acquisition is estimated to be -8%, while the minimum required return should have been 7.5%. This result verifies that the deal turned out as a bad investment, because the price paid was excessive compared to the benefits that synergies and diversification in the eye-care and MedTech business could have brought to Novartis.

5.1.5 The spin off

On June 29th, 2018, Novartis announced its intention to seek shareholder approval for the spin-off of the Alcon business into a separately traded stand-alone company.

The Novartis AG shareholders approved the spin-off at the 2019 Annual General Meeting held on February 28th, 2019. On April 8th, 2019 the spin-off was executed by way of a distribution of a dividend in kind of Alcon Inc. shares to Novartis AG shareholders, which amounted to $23.4 billions and, in the balance sheet, is recognized as a reduction to retained earnings. Through the Distribution, each Novartis shareholder received one Alcon Inc. share for every five Novartis shares held on April 8th, 2019. On April 9th, 2019, the shares of Alcon Inc. were listed on the SIX Swiss Exchange (SIX) and on the New York Stock Exchange (NYSE) under the symbol "ALC."

The dividend in kind distribution liability to effect the spin-off amounted to $26.4 billions on March 31st, 2019 and was in excess of the carrying value of Alcon $23.1 billion net assets at the same date.

On March 6th, 2019, Alcon entered into financing arrangements with a syndicate of banks under which it borrowed on April 2nd, 2019, a total amount of $3.5 billions in debt. Prior to the spin-off, through a series of intercompany transactions, Alcon legal entities paid approximately $3.1 billions in cash to Novartis and its affiliates.

At the distribution date, April 8th, 2019, the fair value of the distribution liability of Alcon business amounted to $23.4 billion, a decrease of $3.0 billions from March 31, 2019. However, the additional net debt and the cash transaction resulted in a decrease in Alcon's net assets to $20.0 billion at the date of the distribution of the dividend in kind to Novartis AG shareholders. The distribution liability on April 8th, 2019, remained in excess of the then-carrying value of the Alcon net assets by $3.4 billions, amount recorded by Novartis as a tax-free capital gain.

Furthermore, certain consolidated foundations own Novartis AG dividend-bearing shares that Novartis accounts for as treasury shares. Through the spin-off distribution, these foundations

received Alcon shares representing an approximate 4.7% equity interest in Alcon. Upon the loss of control of Alcon through the distribution, the 4.7% equity interest was recognized as financial investment at its fair value based on the opening traded share price of Alcon on April 9th, 2019. At initial recognition, the fair value of $1.3 billion was reported on Novartis' consolidated balance sheet as a financial asset. Therefore, the total non-taxable, non-cash gain recognized at the distribution date of the spin-off of the Alcon business amounted to $4.7 billions consisting of:

- $3.4 billions of difference between the distribution liability and Alcon's net assets derecognized
- $1.3 billion of Alcon shares obtained through shares owned by consolidated foundations

It is worth noting that the purpose of the intercompany cash transaction was to monetize part of the non-taxable capital gains, in particular those related to the difference between net assets and distribution liability.

The costs of the transaction, namely separation costs, legal items, advisory and corporate reorganization, recognized in the consolidated income statement of Novartis amounted to $114 million, while those recognized in Alcon's income statement amounted to $320 million, for a total cost of $434 million.

Total Alcon shares issued in the transaction amounted to 488.7 million with CFH 0.04 par value, for a total share capital of $19.5 million. The remaining $19 billions, were allocated as retained earnings or treasury shares. After the first day of trading Alcon market capitalization was $27.9 billion, with a closing price of $54.7 per share, and net debt of $3.5 billion, for a total enterprise value of $31.4. After the spin-off, the shareholding structure of the company, was led by three shareholders owning more than 3% of the capital:

- Emasan AG[156] owns 3.7% of the voting rights,
- BlackRock Inc.[157] owns 3.6% of the voting rights.
- The Capital Group Companies Inc. owns 3.1% of the voting rights

After the first trading day, Alcon EV/EBITDA was 22.4X, that was higher than the multiple paid by Novartis for the acquisition in 2010 and more than the industry average of 18.4X. However, the multiple that could be the most explicative of Alcon's situation is the price to book value (P/B): before the acquisition was 7.78X, while after the acquisition was 1.45X, a

[156] Emasan AG is a financial services company 100% owned by the Sandoz-Fondation de Famille,
[157] BlackRock Inc. is the largest investment company in the world,

6.3X decline. This multiple steep decline is a good indicator of the market opinion on the future Alcon potential. A P/B value close to 1 means that investing in the company equity is not expected to return more than the current equity balance sheet value in the future[158]. Therefore, the market opinion on Alcon is that the company has poor growth perspectives and that the return that the investor could get from liquidating the entire equity stake of the company is close to the total value of all the assets working together and organized in the most economical and strategic way by the management. In other words, Alcon management is not adding the so-called Goodwill: which is the ability of the capital to be organized efficiently in such a way to return more than the required cost of capital. In addition, a P/B ratio almost equal to 1 is typical of firms in financial difficulty, that could be liquidated and in case of liquidation, the value that the shareholders can expect to get is the selling price of their corresponding stake of the equity book value.

5.1.6 The tax benefits

The spin-off gave Novartis the opportunity to benefit from tax-free capital gains and dividend in-kind distribution, under the Swiss and US corporate law[159].

Under the Swiss Corporate Law, since the spin-off was executed at Alcon tax book value, the transaction qualified as tax neutral. Therefore, this "internal transaction" had no Swiss tax consequences for Novartis shareholders. The same is true under the US Corporate Law.

When issuing the shares, the shareholders encountered two scenarios:

- They received 1 Alcon share for each 5 Novartis shares
- They received cash for each fractional Alcon share. Novartis had not distributed any fractional shares of Alcon. This means that, in the case a shareholder owned 6 Novartis shares, she/he will receive back only 1 Alcon share plus the cash obtained from the sale of 1/5 of Alcon's share. UBS AG, as the Swiss settlement agent, aggregated all fractional shares that Novartis shareholders and ADR holders would otherwise have been entitled to receive. To raise the cash needed to pay back these fractional shares, UBS sold the aggregate shares in the open market and the proceeds of such sale, net of brokerage fees and other costs were then distributed to the shareholders

[158] The equity balance sheet value, per share, is computed as total assets minus liabilities divided by total shares outstanding

[159] Switzerland and US are the countries taken into consideration because most of Alcon and Novartis shareholders are tax residents in these two countries.

To explain why the spin-off is a tax-free transaction for shareholders, it is worth making a practical case that shows how the transaction works for tax purposes. The rationale behind the law is that the aggregate tax basis of the Novartis Shares and Alcon ordinary shares held by each holder immediately after the distribution is the same as the aggregate tax basis of the Novartis shares held immediately before the distribution. In fact, after the distribution, all Novartis shares previously owned, were allocated between the Novartis shares and the Alcon ordinary shares in proportion to their relative fair market values on the date of the distribution. There are several different ways to determine the fair market value of Novartis Shares and Alcon ordinary shares. The allocation described below is based on the closing trading price on the New York Stock Exchange of Novartis and Alcon ordinary shares on April 9th, 2019.
Assume a shareholder held 100 Novartis Shares, acquired before the distribution for $50 per share, for an aggregate tax basis of $5,000. In the distribution, such shareholder received 20 Alcon ordinary shares. The tax basis would be allocated as follows:

- The fair market value based on April 9th closing or average trading price would be computed for Novartis and Alcon shares. In our case we could assume a Novartis price of $70 per share and Alcon price of $40 per share[160]. The fair value of Novartis shares for this investor is $7000, while Alcon shares fair value is $800. Hence, the total fair value of Novartis and Alcon shares is $7800. Novartis shares proportion of total fair value is 89% while Alcon proportion is 11%.
- The current tax basis for the investor is $5000, which is the number of shares multiplied by the price at the time of the purchase of the shares. Therefore, the tax basis of Novartis shares, according to the proportions computed above is 89% of the $5000 of tax basis: $4450. On the other hand, Alcon shares allocated tax basis will be $550, 11% of the total tax basis of $5000.
- The allocated tax basis per Novartis shares will be $44.5[161], while the allocated tax basis per Alcon shares will be $25.6.
- The final tax book value of the shares held by the investor after the spin-off is the same as before the distribution. The sum of the total tax book value of Novartis shares with the total tax book value of Alcon's is equal to the total tax book value of Novartis shares before the transaction: $5000.

[160] The prices assumed in the example are purely explicative and non-representative of the real prices
[161] This price is given by $4450 divided by the total number of Novartis shares (100) owned by the investor

The main difference between the US and Swiss Corporate Tax Law regarding spin offs is for the treatment of cash distributions in lieu of fractional shares. In Switzerland, the investor that holds Novartis shares as a private asset, and not as a business asset, does not pay the capital gain over the cash distribution, while in the US the cash distribution is taxed as capital gain. This because, under US Law, the cash distribution is comparted to a buy-sell transaction, in which the shareholder bought the fractional shares and immediately sold them. Therefore, the tax rate on capital gains has to be applied on the transaction.

The tax benefit of the spin-off is strictly related to the corporate tax law of the country in which the transaction is pursued. In Novartis-Alcon case, 86.7% of all the shareholders engaged in the deal had the tax residence in Switzerland, and Switzerland tax rates are extremely favorable to transactions like the spin-off. This because, the tax rate on capital gains from shares is very low for both physical persons and corporations, it is between 0-11%, while the dividend withholding rate is 35%. If the tax rate on capital gains is lower than that on dividends, switching dividends to capital gains is always preferable for shareholders, in order to increase the returns, unless the spun-off entity share price tumbles more than 30-40%.

5.1.7 Advantages

The transaction potential benefits are:

- **Enhanced strategic and management focus**. The spin-off will allow Alcon and Novartis to more effectively pursue their distinct operating priorities and strategies and enable management of both companies to focus on unique opportunities for long-term growth and profitability. This is particularly important because both Novartis and Alcon have different growth rates. Alcon will not be able to grow at a CAGR greater than 4%, while Novartis, boosting investments in the prescription drugs division, could grow up to 6.8% annually. Furthermore, spinning Alcon off, Novartis can dedicate more funds to keep investing to focus on biopharma developments, which have extremely high growth rates that could top 8.5% CAGR in the period 2019-2024.
- **Creation of a nimbler medical device company with ability to quickly focus on innovating products to meet the needs of the market**. The spin-off will allow Alcon to become a more focused and nimbler medical device company. For example, focusing on the product research and development cycle and innovation goals of the medical device industry versus the pharmaceutical industry will allow Alcon to better target its investments in R&D toward the products and applied science advancements that are

expected to have the maximum impact on its business. In addition, a company solely specializing in medical devices can more quickly adapt to the market and customer demands;

- **Distinct investment identity**. The spin-off will allow investors to separately value Novartis and Alcon based on their distinct investment identities. In addition to product R&D cycles, the Alcon business differs from the Novartis business in several other respects, such as commercial call points, distribution models and manufacturing processes;
- **More efficient allocation of capital**. The spin-off will permit each company to concentrate its financial resources solely on its own operations without having to compete with each other for investment capital;
- **Direct access to capital markets**. The spin-off will create an independent equity structure that will afford Alcon direct access to the capital markets and allow Alcon to capitalize on its unique growth opportunities and potentially make future acquisitions using its shares;
- **Alignment of incentives with performance objectives**. The spin-off will facilitate incentive compensation arrangements for employees more directly tied to the performance of the relevant company's businesses, and may enhance employee hiring and retention by, among other things, improving the alignment of management and employee incentives with performance and growth objectives.

5.1.8 Disadvantages

However, there are potential negative factors, especially for Alcon in terms of:

- **Disruptions to the business as a result of the separation**. The actions required to separate the respective businesses of Novartis and Alcon could disrupt Alcon operations because it is smaller and requires more adjustments before adapting to be efficient and competitive as a stand-alone company;
- **Increased significance of certain costs and liabilities and impact of certain stranded costs.** Certain costs and liabilities that were otherwise less significant to Novartis as a whole will be more significant for Alcon as a standalone company. In addition, the separation will give rise to certain stranded costs at Novartis relating to associates and infrastructure that previously supported the Alcon division;

- **One-time costs of the separation and spin-off.** As a division of Novartis, Alcon historically relied on financial and certain legal, administrative and other resources of Novartis to operate its business. Following the separation, Alcon will no longer benefit from these synergies and will incur costs in connection with the transition to being a standalone public company that may include accounting, tax, treasury, legal, and other professional services costs, recruiting and relocation costs associated with hiring key senior management personnel new to Alcon, and costs to separate information systems;
- **Inability to realize anticipated benefits of the separation and spin-off**. Alcon may not achieve the anticipated benefits of the separation and spin-off for a variety of reasons, including, among others: the separation and spin-off will require significant amounts of management's time and effort, which may divert management's attention from operating and growing the Alcon business. Following the spin-off, Alcon may be more susceptible to market fluctuations and other adverse events than if it were still a part of Novartis. Alcon business will be less diversified than the Novartis business prior to the separation, increasing risk for the investors;
- **Covenants and obligations of Alcon**. Alcon is and will be subject to numerous covenants and obligations arising out of agreements entered into in connection with the separation. For example, under the Tax Matters Agreement, Alcon will agree to covenants and indemnification obligations designed to preserve the tax-neutral nature of the spin-off. These covenants and indemnification obligations may limit the ability of Alcon to pursue strategic transactions or engage in new businesses or other transactions that might be beneficial.

5.1.9 ESG aspects of the Spin off

Novartis-Alcon spin-off had important consequences in terms of ESG performance of both the companies, but more on Alcon side. Novartis already had to disclose ESG performance through the annual sustainability report, hence little changed for the parent. On the contrary, much changed for Alcon. Before the spin-off, as a subsidiary, Alcon did not have to officially disclose ESG performance, and investors could not know whether the company behaved in a socially responsible manner. After the transaction, as a listed stand-alone company in Switzerland, Alcon started disclosing the sustainability report and rating agencies started evaluating its commitment and performance. According to S&P ESG rating scale, the company was attributed a BBB mark, which means that Alcon is committed toward improving the ESG

performance, but adverse conditions or changing circumstances are more likely to weaken the company's capacity to meet its targets. One of these adverse circumstances happened in 2018, when Alcon voluntary withdrew from the market its stent CyPass, that was found dangerous for patients in the long term. This event could have a negative impact on Alcon ESG rating. As a stand-alone company, now Alcon has direct responsibility on every decision that it takes. Since brand reputation is becoming a relevant competitive advantage, Alcon will have to take steps to improve its ESG performance in order not to fall behind its competitors.

As the spin-off allows the investors to appreciate the different financial and business features of the two companies, the transaction allows the two companies to better show their ESG commitment, in particular when the performance is different. In Novartis-Alcon case, the two companies were rated differently from S&P ESG Global, after the spin-off: Novartis was AA-, while Alcon BBB. While they were a unique entity, Alcon worse performance was partially offset by Novartis better rating. This resulted in a lower rating for the entire group, which could have harmed the reputation of Novartis. Therefore, the spin-off helped make clarity over the specific features and social responsibility of the two companies, empowering Alcon to improve its ESG rating.

Moreover, the spin-off is helping the two companies streamline their operations, improve their capabilities in their core business and better allocate the capital in investments that could earn better returns. This will allow both the companies to be more efficient and produced better outputs, improving the value-added in the product and the quality for the patient while reducing the price. This will have a positive impact on the price policies of the two companies. In fact, having more efficient operations, the companies will be able to sell products at lower and more affordable prices, reducing the impelling problem of high prices for prescription drugs. Novartis, after the spin-off, has been the first pharma company that decided to present an innovative pricing-model: the price is based on the value measured by health outcomes relative to the care package.

5.1.10 Alcon financials after the spin off

In 2019, after the spin-off, Alcon kept suffering a net loss of $656 million, despite a 2.9% increase in sales year-over-year. The operating loss amounted to $187 million but the core operating income was $1265, 4% more than that of 2018. In the period 2017-2019, the company incurred in high non-operating costs that have caused the decline of its bottom line and non-core operating results. In particular, since 2017, the company has been impairing the

product CyPass, after a voluntary market withdrawal, and the related impairment is around $1.3 billion per year. Moreover, in 2019 the company incurred in the spin-off costs, to reorganize the business as a standalone company, that amounted to $328 million. Without considering the non-operating expenses, the core operating margin is good at 18.2%, but the operating margin of -2.5% is extremely low compared to that of the MedTech business comparables, which is around 21.44%. Moreover, the ROIC is not satisfying at all, Alcon ROIC was -2.93% in 2019, while the average for the industry is 11.21%, hence the company is pursuing investment projects that have underperformed and have not returned at least the minimum required rate.

The cash flow from operations has always been positive in the period 2017-2019, but has been decreasing at a 9.8% rate in the years 2017-2019, signaling that the business is still able to produce cash flows and returning a FROI around 5%, but unfortunately the return is still below the cost of capital for the business, which is around 7.5%.

Market opinion of Alcon seems mixed, leading probably to a negative outlook, given that the P/B ratio is very low at 1.45 and the enterprise value over sales (EV/Sales) is 2X lower than the industry average at 5.7X.

5.1.11 Market reaction to the spin off announcement

Before the spin-off announcement date, on June 29th, 2018, Novartis stock price was in free fall, pushed down not by quarter results, that were better than precedent quarters, but because the new CEO, Vasant Narasimhan, was appointed in February 1st. He declared his intentions to keep refocusing the business portfolio of the company, a process started with the previous CEO, Joseph Jimenez, in order to make Novartis a leading medicine company. As *Figure 48* shows, during the period 2014-2017, the company went through an important portfolio transformation, divesting the OTC, Vaccine, Animal Health and Alcon divisions, in order to improve the capabilities and efficiency in the Oncology, Generics and Pharmaceuticals divisions.

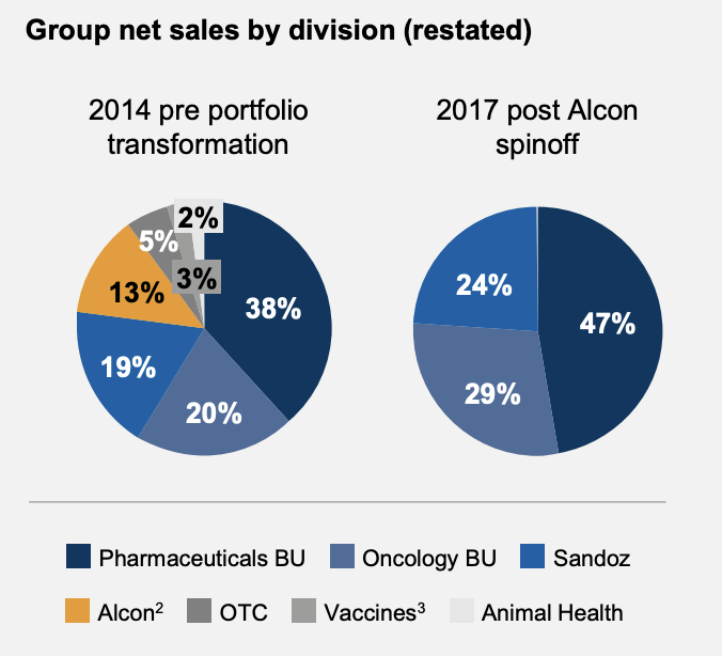

Figure 48: Total sales by division, 2014-2017
Source: "Investors presentation FY 2019", Novartis, 2020

The new CEO attributed an extremely important role to the digitalization of Novartis operations, in order to reduce R&D spending with the purpose of increasing the return on invested capital. However, this strategy was not seen positively by analysts and investors. The opinion of the market over this strategy was well explained by the UBS analyst of Novartis:

"If you're a pharma CEO and you say you are scaling back R&D because you don't think you are going to make a return, it is probably a sell signal." According to the analyst, the situation looked like a "Cold War scenario". Therefore, it was clear that the strategy was not appealing the market participants, even though the impelling needs for a change in the R&D strategy where necessary, given the R&D returns problems: it was ninth in the operating profit over R&D spending ratio, with a 0.63, while the best in class, Novo Nordisk had a 1.81 ratio in 2017. For these reasons, the stock price collapsed in the period between January 29th, 2018, the date of the annual financial statements release, when the new CEO was appointed and disclosed its strategical targets, and the announcement date of the spin-off. It dropped from $83.3 to $64.4 in 5 months, a 22% decrease.

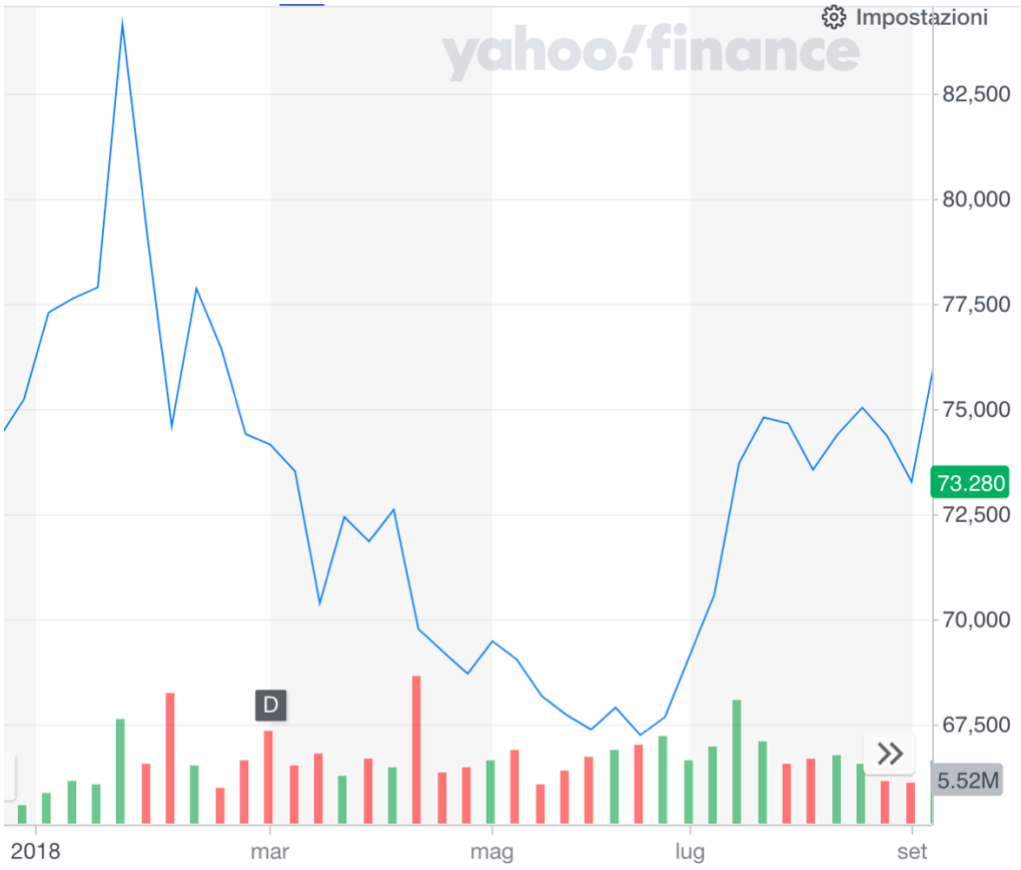

Figure 49: Novartis stock price at announcement date
Soruce: Yahoo finance

However, on June 29th, 2018 Novartis senior management announced Alcon spin-off and after one week, on June 5th, 2018, the CFO announced the beginning of a share repurchase program of $5 billions shares. The stocks bounced back, and the trend was sustained by the great second quarter results disclosed on July 18th: Novartis recorded a 5% increase in sales, and a 7% increase in core operating margin compared to 2017 second quarter. The stock price was living a bright moment because Novartis disclosed to the market the idea of pursuing strategies to benefit shareholders returns, maximizing the firm value with better-returns investment strategies, dividends buybacks and restructuring programs. Given the market reaction to the spin-off, it is possible to infer that the spin-off announcement may cause positive stock price movements for two main reasons:

- the spin-off is a tax-free manner to distribute earnings to shareholders, hence contributes to increase shareholders distributions and returns
- the spin-off is seen as a better signal from management than a divestiture, especially when the market is skeptical about the future of a company, as it was Novartis' case. Benefits for the parent company are not immediately available after a spin-off. While the divestiture gives the selling company cash, the spin-off main benefits for the parent

company are in the long term, hence the spin-off could be a good signal for investors that the management wants to pursue long term value maximization strategies. This is particularly true in Europe, where shareholders have to vote to approve the spin-off, reducing agency costs and moral hazard risks from the management. However, this is less true in the US where the management can decide for a spin-off without any approval from the general meeting, and the shareholders could be subjected to opportunistic decisions from the management.

From the announcement date to March 22nd, 2018, Novartis stock price appreciated almost 30%, coming back to $83.7 per share, the price of the stock before the great fall in the first half of 2018, as *Figure 50* shows.

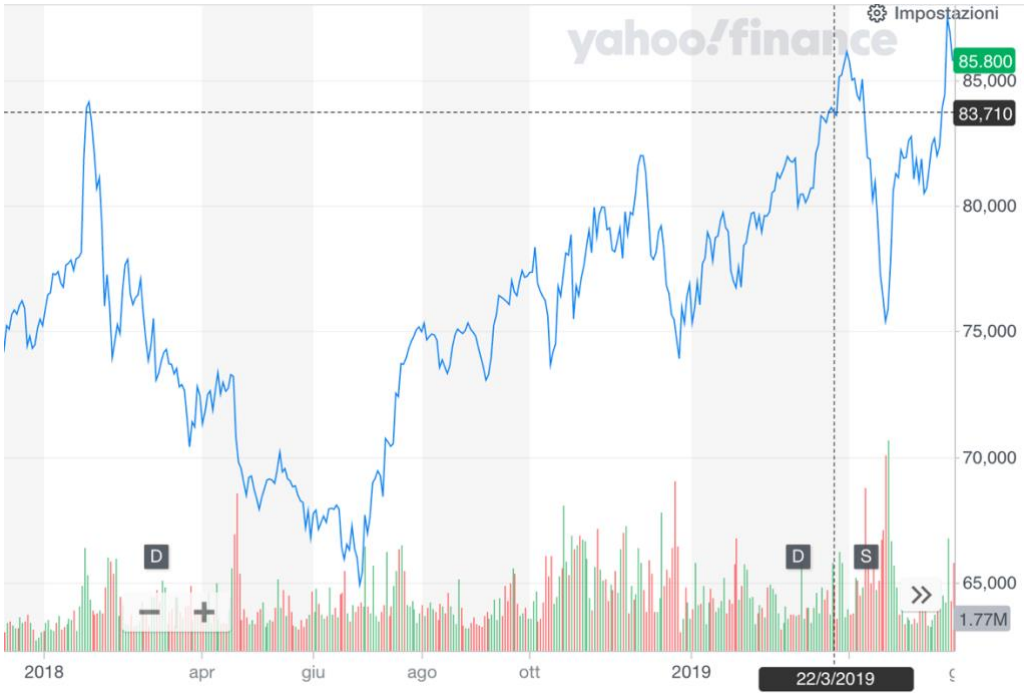

Figure 50: Novartis stock price reaction when the spin-off date is disclosed
Source: Yahoo finance

After Novartis officialized the spin-off with a public statement on its website, the stock kept appreciating, reaching $86.1 per share, before sliding to $85.0 per share, on the cum-dividend date, which is the last day of trading to buy Novartis shares with the right to receive Alcon Shares. As it is for dividends, the days preceding the declaration of a spin-off encourages investors to purchase the stock. Because investors knew that they would have received Alcon shares if they purchase the stock before the ex-dividend date, they were willing to pay a premium. The premium was also due to the fact that, in this spin-off the sum of the two stand-alone companies' values was greater than the value of Novartis as a group. In fact, using the

Discounted Cash Flow model, Novartis equity fair value per share was estimated at $74.97, while Alcon equity fair value per share was estimated at $28.83 per share. Therefore, the sum of the two prices, $ 103.70, was definitely more than the current price for Novartis group that, on March 22nd, 2019, when the spin-off was confirmed, was valued at $83.71. This caused Novartis stock price to increase in the days leading up to the ex-date.

On the ex-date, April 9th, 2018, day in which Alcon started trading with its own ticker on the Swiss and New York stock exchange, investors drove down Novartis stock price by the amount of the distributing liability to complete the spin-off to account for the fact that new investors are not eligible to receive Alcon shares and are therefore unwilling to pay the premium. Even the ex-date share price trend is similar to that of dividends distributions. This highlights the fact that the market reacts to the spin-off as if it was a dividend distribution. Indeed, Novartis share price dropped 11.2% from $85 per share to $75.4, which is $9.5 per share. Multiplying this loss by Novartis total shares outstanding in 2019, 2.319 billion, we get $22.03 billion, which is almost as much as the distribution liability that Novartis management distributed to shareholders for the spin-off: $23.4 billion.

As Figure 52 shows, not only Novartis share price dropped, but also Alcon price did.

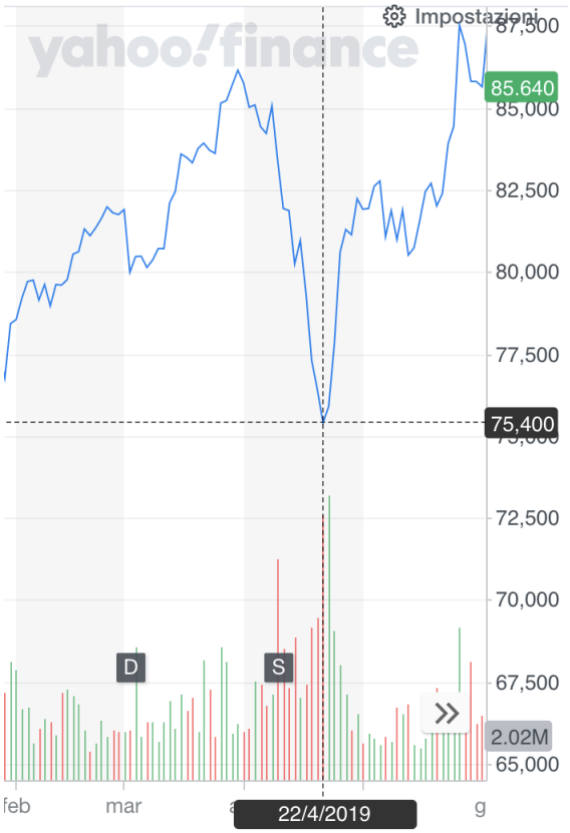

Figure 51: Novartis stock price after the spin-off Source: Yahoo finance

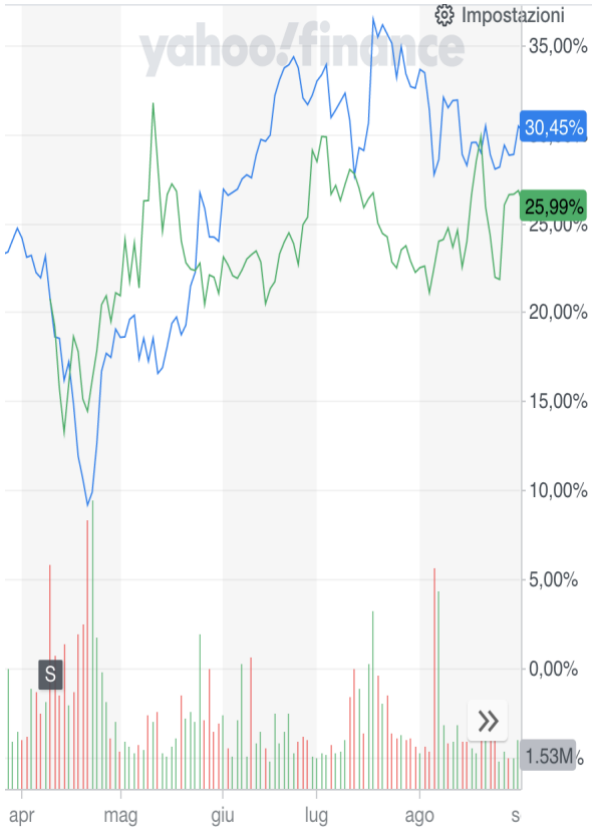

Figure 52: Novartis and Alcon stock price after the spin-off Source: Yahoo finance

Alcon started trading at $58.04 total outstanding shares of 488.7 million, for a market capitalization of $28.5 billions and enterprise value of $32 billion.

After the first 30 days from the transaction, Alcon share price was $60.9, up 4.9% from the spin-off date, while Novartis shares were trading at $80.9, down 3% from the spin-off date. However, it is difficult to retrieve, from a short-term analysis, the investors and market opinion of the transaction; a more long-term approach could better show what are the investors and market opinions of the two stand-alone companies involved in the spin-off. Therefore, we focused the analysis on the share prices recorded on the day the annual financial statements were released. Even though after one year the two companies were still affected by each other and by the transaction, because of the costs incurred and the agreements in act, the financial results after one year from the transaction could be good indicators to evaluate the ability of the two companies to be competitive on a stand-alone setting. This is true especially for the spin-off entity, that has to reorganize its business and operations to replace the tasks that were performed by the parent company. At the time Alcon financial statements were disclosed, February 2nd, 2020, the price was $57.9, almost as much as when the company was spun-off. This means that investors, in the first year of stand-alone life of Alcon, have not seen any improvements in operations and future expectations for the eye-care company. On the other hand, Novartis, disclosed its results on January 9th, 2020, and the share price was recording a $11.3 increase in price, since the spin-off date. It was traded at $94.7, up 13% from $83.4 on the spin-off ex-date. As a consequence, it could be straightforward to infer that the market opinion was that the transaction, after the first financial year, has benefitted the parent Novartis more than the subsidiary Alcon. However, this result is expected, because Alcon, given its pre-spin-off difficult situation, will take time before recording better financial results, if there will be any, that show the goodness of the strategy and the overall transaction.

As last step, we will analyze the stock price after one year from the transaction. When evaluating the share price at April 9th, 2020, it is important to take into consideration that the world is currently living one of the worst health and economic crisis, and that in the week starting on March 19th and ending on March 23rd, 2020 the market experienced a sell-off that pushed the S&P 500 down 33.9%, in just one week. On April 9th, 2020, after one year from the spin-off, Novartis was trading at $84.85, $1 more than in 2019, up 1.2%, while Alcon price was $50.8, 14% down from the spin-off price.

It is extremely interesting to see that the investors valued differently the two companies after the big sell-off, given the ongoing economic crisis triggered by the pandemic. Novartis, as parent company, is perceived by the investors as more solid and more capable to weather this

difficult economic situation, while Alcon is now perceived as riskier, because of the precarious financial results that have plagued the company performance in the last 4 years. During market crises, investors are less willing to invest in risky assets, as it could be a new spun-off entity, hence the stock price of the subsidiary could suffer from adverse market conditions.

5.1.12 Shareholders vs bondholders

In this section the analysis will be focused on comparing the returns for shareholders and bondholders after Novartis-Alcon spin-off. The main objective is to understand whether the transaction benefited one group more than the other, and why.

First of all, the spin-off analyzed was mostly favorable to shareholders: in 2019 Novartis distributed to shareholders around $35.5 billions, of which:

- $6.6 billions of dividends: which is 8.4% of $78.7 billion, Novartis total equity at the beginning of 2019
- $5.5 billion of shares repurchased, 6.9% of total equity
- $23.4 billion of dividend in kind to effect the Alcon spin-off, 29.7% of total equity.

Therefore, in 2019, Novartis returned to the shareholders 45% of its total equity at the beginning of the year. In addition, it should be considered not only the distributions to shareholder, but also the capital gains of Novartis' shares during the year. To calculate those capital gains, we will create a portfolio with 100 Novartis' shares, bought at the beginning of 2019. The events would be as follow:

- On January 2nd, 2019, which is the first trading day of the year, the investor would have paid $75.32 per Novartis share, hence $7,532 for 100 shares
- On April 9th, 2019, Novartis-Alcon spin-off is concluded, and 100 Novartis shares have the right to receive 20 Alcon shares, because the ratio is 5:1, thus the investor ends up with a portfolio of 120 shares, of which 83% are Novartis shares and 17% are Alcon ones. Given that Novartis distributed $23 billions to execute the spin-off, and that Novartis shares outstanding at the beginning of 2019 were 2.3 billion, then each Novartis shareholders received Alcon shares with a value of $50 per share[162].
- On December 31st, 2019, the last trading day of the year, the investor decides to exit the position and sell the 120 shares. Novartis shares would be sold at $94.69, while

[162] The value of Alcon shares received by all the Novartis shareholders is $50 because the distribution liability of $23 billions is divided by 2.3 billion shares, which gives $10 per share distributed for each Novartis share. Then the distribution per share, $10, is multiplied by 5, because 1 Alcon share corresponds to 5 Novartis shares.

Alcon ones at $54.8. The capital gains before taxes of Novartis shares would be 25.7%, while Alcon shares distributed appreciated by 9.6%. The weighted average return before taxes for the portfolio would be 22.3%, for a weighted average beta for the portfolio of 0.68. To understand whether the returns were congruent with the risk profile of the investment, a benchmark portfolio is built, using the S&P 500 that is usually employed by practitioners to estimate the returns for a potential market efficient portfolio. The S&P 500, the market portfolio, in 2019 returned 28.7%. At this point, the investor should compare the two risks profiles of the portfolios. Novartis-Alcon portfolio has a beta of 0.68 while the S&P 500 has a beta of 1. Therefore, the minimum required return for an investment in Novartis-Alcon portfolio, given the returns of the S&P 500, should have been 19.5%. However, Novartis-Alcon portfolio returned 22.3%, which is 3.2% more than the minimum required return.

The spin-off has benefitted Novartis shareholders, allowing them to gain more than the required return, given the risk profile, in 2019. The stocks of Novartis-Alcon portfolio returned 22.3% of capital gains before taxes and 3.9% of dividend yield[163], plus a potential 1.2% increase in the dividend yield of 2020 due to share repurchases[164], if Novartis keeps stable the dividend payout. To this, it should be included the possibility of getting dividends from Alcon, even though in the first year as a stand-alone company it has not distributed any dividends.

However, many scholars argue that the increase in payout to shareholders, due to a spin-off, decreases the returns and grants for debtholders, because the company owns less assets, hence less grants in case of default and it is more risky because it decreases the diversification of its businesses and cash flows.

Novartis-Alcon spin-off confirms this common wisdom among debtholders. In fact, on July 3rd, 2018, four days after the announcement of the spin-off, Moody's downgraded the company's rating on the back of the spin-off decision, as well its plans to spend $5bn raised from asset sales on a share buyback.

Moody's downgraded Novartis from Aa3 to A1[165], dropping it from high grade to upper medium grade, saying that Novartis would have been less diversified following the Alcon spin-off and would have increased its reliance on the riskier, innovative medicines portfolio. Moody's analyst explained this decision because: "while the share buyback program fits with

[163] The dividend yield is computed as the dividend distributed per share divided by the purchase price of the share

[164] All the computations are assuming that the investor bought Novartis shares on January 2nd, 2019.

[165] Moody's, "Novartis AG update following spin-off and share buyback announcement", 2018

Novartis' capital allocation policy, it prioritizes shareholder distribution over reimbursement of debt." Debtholders were skeptical about the spin-off because:

- Novartis was willing to bet on more riskier investments. Focusing on medicines meant the company was more dependent on R&D returns on investment and innovative drugs development. This is considered as a risky business because, as we said in *chapter 3*, only 10% of the total R&D pipeline drugs will be marketed. Then revenues and cash flows are strictly related to patent protection and expiration
- The assets on which debtholders rely in case of default decrease after a spin-off. In fact, Novartis total assets decreased of $20.0 billions, that are the assets derecognized following the spin-off
- The direct consequence of the decrease in assets is the increase in leverage. Before the spin-off, the leverage of Novartis was 0.3, while after the transaction it reached 0.4.

The negative impact that a spin-off has on debtholders is reflected on the prices of the bonds issued by Novartis. At the time of the spin-off Novartis had 6 bonds issued with different maturities, the longest one was 2044. For the sake of the analysis we will focus on the price of just one of the bonds, the one issued on September 20th, 2012 and maturing on September 20th, 2022. The bond pays a semiannual 2.4% coupon and the issue price was $99.43, and thus the bond was issued at a premium for the bondholder. As it was for the stock price, the bond price collapsed after the new CEO was appointed on February 1st, 2018. From $99.35, the bond price declined 2.3% to $96.98 on June 28th, 2018, the day before the announcement of Alcon spin-off. On the announcement day, the price kept sliding, to $96.92. After this point onward, the bond started trading at a price range between $96 and $97, bottoming at $95 on November 12th, 2018. This volatile trend shows the uncertainty for bondholders regarding the spin-off and Novartis future. However, after bottoming in November, the price gained momentum. The same volatile trend seen in after the announcement date, affected the bond price around the spin-off date, but after less than 2 months the price turned up, crossing the $100 threshold and reaching the top at $104.25 in June 2020.

Figure 51: Novartis 12/22 bond price
Source: Business Insider database

Therefore, studying Novartis bond price, we can conclude that bonds have not been so affected by the spin-off, except for the months around the announcement, where uncertainty can increase the risk aversity of investors, pushing prices down. However, it is likely that, if the company is solid with low leverage, bondholders will not suffer losses on the long term because of the transaction. This is particularly true in Europe, where debt holders can oppose the spin-off if they believe that undermines the grants that the company promised when the bond was issued.

Regarding Alcon, as it is usually the case, after the spin-off the subsidiary was rated lower than the parent at Baa2[166] by Moody's, with a stable outlook. In September 2019, the company issued $2 billion of secured notes with different maturities with a rate between 2.75% and 3.8%. The rate was the same as when the company lent $3.5 billion when was still part of Novartis group. Therefore, debtholders had not showed signs of credit contraction, notwithstanding the bad financial results. This could be because Alcon has a 0.19 leverage, which is extremely low, hence debtholders haven't seen solvency or liquidity issues yet.

In conclusion, Novartis-Alcon spin-off has returned extremely satisfying results to shareholders and not so many threats to bondholders. This because both Novartis and Alcon have very good credit ratings, abundant cash reserves, strong balance sheets, low leverage and good assets that can back debt issuance. Therefore, the transaction under examination has not showed the transfer of value from debtholders to shareholders that is deemed to be typical of restructuring transactions in general and of the spin-off in particular.

[166] Moody's, "Alcon update after spin-off completion", 2019

6 Conclusions

6.1 Is the spin off trend going to last in the pharma industry?

According to the pharmaceutical market analysis and Novartis-Alcon spin-off case, it is possible to infer that, in the foreseeable future, pharmaceutical companies will keep opting for a spin-off when transforming their portfolio, if certain structural features of the industry and of the pharma companies do not change.

The trends and features typical of the pharmaceutical industry that could lead companies to increase the number of spin-offs are:

- **Pricing pressure from patients and governments, competition from smaller companies backed by private investors and better technologies are driving the industry toward focus on the core business.** Pharma business model is changing toward specialization: the old model based on the scalability of the small molecules is being replaced by the new business model based on drugs that are tailored on the specific patient needs, such as the innovative cell and gene therapy. The spin-off is a transaction that can support pharma companies in this portfolio transformation process
- **the very high pace of M&A transactions, involving companies and licenses**. This trend has always characterized the pharma industry. This very high number of deals leads to a higher probability of wrong deals, because the synergies are overvalued, or the price paid is too high, as it was in the Novartis-Alcon case. In such a dynamic financial environment, the spin-off can be a valuable exit in case of wrong M&A deal.
- **Heterogeneity of growth rates.** The health care sector is made of industries with extremely different growth rates. Since the growth rate is a key input when valuing companies, growth rate clarity can contribute to eliminating the conglomerate discount that could significantly lower the firm value of a diversified company. The spin-off allows the two separated companies to be valued with two different growth rates so that analysts and investors can better appreciate the companies' own peculiarities and future opportunities.
- **Investment decisions in R&D are crucial decisions in pharma**. Wrong capital allocation strategies could drive the company toward very grim periods of wide losses and decreased margins. Holding a very diversified portfolio of companies could make investment decisions extremely challenging. In particular when a subsidiary is struggling, it is difficult that the holding company would let it default, without

providing enough capital to keep financing R&D projects and current operations. However, this capital allocation would deny the parent to invest in better alternative opportunities. The spin-off can help the management streamline the operations and do better capital budgeting decisions

- **ESG issues.** Pharma companies do not have a good reputation in terms of ethic and social responsibility. In the recent years, companies have been taking steps to increase their brand social reputation. ESG analysts find it easier to value the ESG performance of two different stand-alone companies. Before the spin-off, the subsidiary could benefit from the good social actions of the other companies of the group. After the spin-off both the parent and the subsidiary are subjected to ESG ratings and have to publicly disclose their own sustainability reports, thus they are responsible for their own social actions. The spin-off would increase the transparency over ESG performance of both the companies, especially the spun-off subsidiary. The two entities would then increase their effort to act responsibly: an aspect that is growing importance to increase market share and raise capital, because patients and investors are giving more importance to the social reputation of the companies.

Not only the industry, but also pharmaceutical corporations have some common financial features that increase the probability that the spin-off will be widely employed in the future in corporate restructurings:

- **Cash reserves**. Pharma companies have good cash reserves, with an average quick ratio between 0.8 and 1, for the industry. Pharma companies do not need to divest assets to raise cash, because most of the time they have it in excess. Therefore, the spin-off could be a viable alternative to divestitures, when the parent company is not in immediate need of cash and other liquid funds
- **0.74 median beta**. Pharma companies have a beta lower than 1, hence the volatility – the risk - of their business is lower than that of the market. After the spin-off, the two new entities are riskier than the previous diversified single entity, but pharma companies have more stable cash flows compared to companies in other industries, and revenues have a low correlation with market cyclicity. The spin-off is more suitable for pharma companies because investors perceive the business as less risky, hence they are more prone to invest in transactions that increase the risk for the companies involved.
- **0.85 median leverage**. Pharma companies have a median low leverage. Therefore, bondholders will perceive their capital less at risk if a pharma company undergoes a spin-off then if the transaction is performed by a highly levered company. In addition,

the spun-off entity has usually low leverage too, hence investors are available to provide funds, even though the company is performing poorly, as it is Alcon case

- **Retained earnings**. Pharma companies have outstanding returns on investments and profitability margins, compared to other industries, hence companies accumulate large reserves of retained earnings. The spin-off qualifies as an exceptional way to distribute retained earnings to shareholders, without being taxed as dividends are.

These specific features of industry and companies make the pharmaceutical field particularly prone to execute spin-offs, thus the opinion is that the spin-off trend will keep shaping pharma corporations in the future. However, the positive trend depends on several specific circumstance:

- **Market cycle**. The spin-off increases the risk of the two companies involved. If the market outlook is positive, prices are high and common investments have lower expected returns than in normal or grim times. Therefore, in this market condition, investors will welcome extraordinary and riskier transactions like the spin-off, because the expected returns are higher, given the higher risk. Hence, the market will provide enough funds, both equity and debt, to finance the stand-alone companies. The spun-off entity in particular needs good economic environment and credit availability to stabilize as a stand-alone entity. The spin-off could be undermined if the economic outlook is grim, because investors are usually more risk averse and less funds are available for risky transactions such as the spin-off. Timing for the spin-off transaction is a critical aspect: if the economy is good the spin-off is more likely to be successful, if the market is perceiving the threat of a recession, a simple divestiture could be better, also because the parent could raise cash that is necessary during economic downturns
- **Investors sentiment**. announcing the spin-off, Novartis was able to revert the downward trend of its stock price, because the spin-off benefits shareholders first. Hence, when the stock market opinion for the parent company is negative and the price is lowering, the spin-off should be considered to divest assets. The announcement usually has a positive effect on the share price and could be a good deterrent to revert a sell-off trend. Therefore, if the share price is falling, the parent could be more encouraged to spin the subsidiary off, otherwise the disposal could be preferred because more cash is raised
- **Corporate tax rate**. a company would benefit more from a spin-off when corporate tax rates on capital gains are high. Even though the simple disposal of an asset is less effort and time consuming for the management than a spin-off, the company would opt

for the latter so not to incur in high taxes on gains on disposals. On the together hand, if the rates are low, a simple sale is preferable because it is less resources, time and effort consuming

- **Cash requirements**. They are a critical point to consider. If pharma companies will maintain this quick cash conversion cycle and broad cash reserves, they will not need to raise cash through disposals to pursue strategic acquisitions or other operation purposes. If this will not be the case and the parent needs cash to finance future M&A deals to replace the divested company or to avoid financial insolvecy, then a divestiture could be preferred, even if gains are taxed.

In the foreseeable future, top pharmaceutical companies will be faced with more challenges that will require them to adapt their portfolios, focusing on the core business. To this end, a solid restructuring and M&A strategy will be necessary, in order to be at the foremost of innovation, deliver better drugs at more affordable prices and grant that the R&D pipeline is always filled. In this context, the number of spin-offs in the industry has the potential to increase, given the needs and the particular financial features that distinguish pharmaceutical companies from those operating in other industries. However, this upward trend will be more likely if the economy will be in expansion, investors will be less risk averse, corporate tax laws will be high and pharma companies will maintain their current cash reserve levels. If these assumptions are not violated, the belief is that, in the next decade, spin-offs will reshape companies' portfolios in the pharmaceutical industry.

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8 Summary

According to Corporate Finance scholars and practitioners, the first objective for every management team should be to maximize the firm value. To this end, every management team should pursue strategies that enhance the growth of the company or reduce its risk. Two are the main business strategies to increase the growth rate and the future cash flows expected:

- **Diversify or expand the business through organic or inorganic growth**. Organic growth is achieved reinvesting internal resources, the retained earnings produced by the operations, in projects that have expected returns greater than the cost of capital. Inorganic growth is the opposite, because the source of growth is found externally, acquiring or merging businesses, in order to create operational and financial synergies. In the best-case scenario operational costs are reduced, fixed assets are shared, and revenues increased;
- **Restructure, redeploy assets or exit from business**. Corporate restructurings are usually associated to companies that are facing difficulties and choose to divest or streamline the business to avoid insolvency or default. However, this is not only the case, as we will present in this dissertation. Even companies with strong balance sheets can choose to restructure their portfolios because they prefer to specialize and focus on the core business instead of diversifying in different unrelated businesses.

Corporate restructuring as a firm value maximization strategy entered the business landscape after the "Conglomerate Boom", trend that characterized the third M&A wave started in 1955. During this wave, the main rationale of the transactions was to build diversified conglomerates. A conglomerate is a big holding corporation with subsidiaries spanning multiple and often unrelated fields or industries. Given the very volatile markets of the 50' and 60', executives diversified their companies so that cash flows were more stable, and risk was reduced, following the concept of diversification presented by Markowitz in 1952. Moreover, conglomerates could benefit from easier access to capital markets, because perceived as less risky investments, synergies and economies of scale.

However, under Regan government at the beginning of 1970s, changes in the tax law and other regulatory measures, along with the stock market decline, abruptly stopped the corporate expansions, and break-ups jumped to 42% of total transactions. Companies began to reconsider some of the acquisitions that had proven to be poor combinations, and the need to sell-off divisions to raise funds intensified in 1974-75 economic downturn. Moreover, the international competition pressured some of the 1960s conglomerates to become more efficient by selling

off prior acquisitions that were not competitive in a world market. Interest for conglomerates faded away among investors, and Corporate Finance literature justified the trend with the development of the conglomerate discount concept: companies that are diversified across several businesses are sometimes valued below pure-play peer companies. A publication in the Journal of Applied Corporate Finance from Morgan Stanley (2011) shows that, until 2011, a median of 5.5% conglomerate discount existed in most regions around the world.

The reason for this discount can be found in several drawbacks of the conglomerate business model, also known as diversification costs:

- Inefficient capital allocation to businesses with different growth perspectives;
- Executive compensation not linked to stock-based compensations;
- Information asymmetries between investors, analysts and corporate insiders;
- Non-agile companies. Very high disruption rate requires management to be focused on the core operations in order to respond proactively to every threat or opportunity that arises from technological and consumer behavior developments.

Therefore, investor preferences have been evolving toward a focus premium: firms targeting narrower subsectors within a broader industry were preferred by market participants. To accommodate the market opinion and business needs, companies started considering break-ups as opportunities to "untap" value and increase growth or undo a previous M&A transaction that was unsuccessful. Corporate restructurings can take several different forms: divestiture, equity carve-out, split-off, split-up and spin-off.

In a spin-off, the holding company separates one of its subsidiaries issuing new shares, distributed to its stockholders on a pro rata basis through a dividend in-kind distribution. As a result of the proportional distribution of shares, the stockholder base in the new company is the same as that of the old company. Although the stockholders are initially the same, after the transaction, the parent and the subsidiary have their own management and Board of Directors and are run as two separate entities. To qualify as a spin-off, it is fundamental that the parent distributes the control of the subsidiary: at least 80% of the voting power of all of the shares and at least 80% of any non-voting shares. The most common form of spin-off is the 100% spin-off, but also Morris Trust, Reverse Morris Trust, namely spin-offs followed by M&A transactions, are increasingly employed, depending on the needs of the parent company. Historically, spin-off activity consistently entered US capital markets in 1985, before spreading to European markets in 1989 and in Asian ones later in 1995, during the bull run that brought

to the dot-com bubble. Two economic factors may have been driving the resurgence in separation activity, especially after the financial crisis in 2008/09:

- **low interest rates** characterize periods of low growth. During these times, corporations face increasing pressure to maintain performance and earnings results and corporate spin-offs are exploited to make the production process more efficient, in order to increase margins and valuations;
- **pressure from activist investors** to undergo corporate break-ups to divide high-growth divisions, with higher potential valuations, from low-growth ones, with lower valuations.

The benefits of the spin-off resolve the issues created by the diversification costs in a conglomerate. These advantages are:

- **Increase in focus**: each company can focus on its own strategic and operational plans without diverting human and financial resources from a different business;
- **Tailored capital structure and financial policy**: each company pursues the capital structure that is most appropriate for its business and strategy. In addition, the optimal dividend policy can be reviewed after the spin-off, depending on the growth profile and investment opportunities of the parent and subsidiary;
- **Elimination of negative synergies**: the management may reduce the errors of cross-subsidization, that are usually committed in a conglomerate, and make better investment and capital allocation decisions. Moreover, spinoffs provide a way to unwind unsuccessful prior acquisitions;
- **Reduced information asymmetry** informational asymmetries between outside investors, analysts and insiders typical of diversified firms are reduced. The valuation of two different entities is easier than valuing one big diversified holding;
- **Clientele effects**: Previously combined into a single security, the spinoff creates an opportunity to hold the subsidiary stock separately. This expansion of investors' opportunity set increases liquidity and opportunities for investor diversification;
- **Equity-based compensation**: A spin-off will increase the effectiveness of the equity-based compensation programs of both businesses by tying the value of the equity compensation to the stock price;
- **Tax benefits**: both in the US and in Europe, spin-offs are forms of demerger that are exempted from tax burdens, if some specific requirements are respected. In the US one of the main requirements is that the spin-off must have a precise business rationale

while in Switzerland[167] the main requirement is that one of the two companies involved must keep paying taxes in the country. Tax-neutrality is recognized to both the company and the shareholders. The capital gains for the parent company are tax-free, while for shareholders the spin-off generates a reduction in the allocated tax basis of the parent company shares, owned by the investor. Hence, the book value of the parent company shares before the transaction is equal to the book value of both the parent and subsidiary shares after the spin-off. Tax-neutrality makes the transaction extremely preferred with respect to divestitures and equity carve-outs, in particular when corporate tax rates are high.

The disadvantages of a spin-off are mainly linked to the complexity of the transaction and the increase in risk of the two companies:

- **Risk of cash flows**: after a spin-off, the two companies increase their focus on the core business, reducing diversification. The drawback of less diversification is the increasing volatility of expected cash flows and the risk for the investors is higher. Moreover, in the period after the spun-off entity ticker begins trading, the subsidiary share price experiences very high levels of volatility due to the uncertainty caused by the small amount of information about the new company, that analysts and investors have;
- **Bondholders**: A spinoff may increase shareholder value at the expense of the parent firm's creditors by reducing the total assets of the firm on which the bondholders can rely in case of default. Moreover, a spin-off can have important implications for the rating of both the companies. In some cases, spinning off a business may jeopardize the parent's credit rating since the assets and earnings stream of the spun-off entity will no longer be available to the parent company;
- **Time and effort**: The process of completing a spin-off is complex and requires consideration of a myriad of financial, capital markets, legal, tax and other factors. Indeed, divestiture usually takes around six months while a spin-off around twelve months. The management must put a great effort in it, with the potential drawback of losing focus on the operating and core business of the parent company, losing competitive advantage and market positioning;

[167] In this dissertation, Switzerland is the reference European country because Novartis-Alcon spin-off was regulated under the Swiss Corporate Low.

- **Management opportunism**: in the US the spin-off transaction does not require the vote from the shareholders, but only the Board of Directors approval, because it is like a dividend distribution. Therefore, management can exploit the spin-off for opportunistic reasons, namely, to transfer to the parent's shareholders the risk of the investment in the subsidiary. Opportunistic behavior is less pronounced in Europe, where shareholders vote is required to approve every demerger.

Currently, an industry that is increasing the interest in spin-offs is the pharmaceutical industry. Even though after the $55.3 billion Abbott-AbbVie spin-off in 2012 the spin-off pace in the industry slowed down, Novartis-Alcon $31.4 billion spin-off, in 2019, relieved the interest for the transaction. According to recent news, after Novartis also Merck, Sanofi and GlaxoSmithKline have planned to spin-off subsidiaries.

Five main reasons could explain the increasing spin-off trend in the industry. **Focus on the core business** is the first. An increasing number of pharmaceutical companies are streamlining their operations to specialize and focus on the core business, in order to create cost efficiencies, to produce more effective products at lower prices, and to be more agile to quickly adapt to industry disruptions. This is a compelling strategic target for all big pharmaceutical corporations, in order to maintain the outstanding margins and profitability achieved in the recent years: 18.29% ROIC[168] and 24% NOPAT[169] margin in 2019, that could be jeopardized by three threats that are challenging the industry:

- **Pricing pressure from patients and governments.** Pharma companies have always been pledged for setting unjustified high prices, especially for prescription drugs, that account for 50% of total revenues of the industry. Drug prices are extremely high because the industry benefits from medicines inelastic demand, 20 years patent protection of new products and high entrance barriers that further protect from competition. While European countries governments negotiate drugs prices using international price benchmarks, in the US, that is the largest drug market with $484.3 billion in revenues, negotiations are among private entities and drug prices are on average four times higher than in Europe. Drug prices are becoming unsustainable for governments and patients and a change in US drug legislation is expected, with the result that pharma margins and profitability could be drastically decreased;

[168] Return On Invested Capital
[169] Net Operating Profit After Taxes

- **Competition from smaller companies backed by private investors.** Since 2017, private capital investors have been pouring money into the pharma Venture Capital market at an increasing rate, with $13,9 billion raised in 2019. Without this capital injections, small pharma companies could not to develop a drug from the R&D[170] to the marketing phase, because the process is extremely long and expensive. Therefore, in the next years, a growing number of small companies will enter the market, increasing competition. Among the others, Asian new companies are quickly increasing their market share and their importance in the industry: Chinese pharma companies with a market capitalization of more than $15 billion experienced an average revenues CAGR[171] of 68.6% in the period 2016-17, while the overall pharma industry average CAGR was 1.7%, in the same period. Big pharma companies are used to acquiring smaller companies to avoid competition, but this strategy could not work with Asian small companies, because most of them are partly state-owned or are Public Private Partnerships, and it is likely that these shareholders will oppose every takeover bid;
- **Better technologies**. Pharma business model is changing: the old model based on the scalability of the small molecules is being replaced by the new business model based on biopharma treatments, that are tailored on the specific patient needs, such as the innovative cell and gene therapy. Scalability is no more a competitive advantage, while specialization and innovation are becoming the two "economic moats" of the industry.

The second reason is linked to the very **high industry volume of M&A transactions**, involving companies and licenses. In 2019, drug makers spent $342 billion on M&A deals, the second highest spending after the $517 billion of the energy & power industry, and $7.35 billions in up-front fees for licenses deals. Big pharma companies recurred to M&A to innovate their drugs pipeline, acquire digital capabilities and innovative treatments techniques. Bristol-Myers Squibb acquisition of Celgene for $74 billion and AbbVie acquisition of Allergan for $63 billion were the two megamergers of the year. Moreover, the deal valuations are increasing, given the larger base of bidders that enter the M&A arena every year, in particular for biotech/biopharma targets. In 2019, the EV/EBITDA[172] multiple was 29.8X versus a 23.4X in 2018. The high number of deals made by every company, and the high price paid, increases the probability of wrong acquisitions, because the synergies could be overvalued. In such a

[170] Research & Development
[171] Compounded Annual Growth Rate
[172] Enterprise Value (EV) over Earnings Before Interests, Taxes and Depreciation or Amortization (EBITDA)

dynamic financial environment, the spin-off can be a valuable exit in case of wrong M&A deals.

The third reason concerns the **heterogeneity of growth rates.** The health care sector comprises industries with extremely different growth rates: the MedTech industry could grow at 4% CAGR toward 2024, the convention prescription drugs at 6.7% while biopharma at 8.5%. Since the growth rate is a key input when valuing companies, growth rate clarity can contribute to eliminating the conglomerate discount that could significantly lower the firm value of a diversified company. In fact, analysts usually make conservative assumptions and between two different growth rates they could opt for the lower one. The spin-off allows the two separated companies to be valued with two different growth rates so that analysts and investors can better appreciate the companies' own peculiarities and future opportunities.

The fourth aspect is related to the **investment decisions in R&D**, that are crucial decisions in pharma. Wrong capital allocation strategies could drive the company toward wide losses and decreased margins. When a drug patent expires, generic medicines that cost 40-60% less enter the market, and sales of the old "branded drugs" could decrease up to 80%. Pharma companies must have their R&D drugs pipeline always filled so that, whenever a drug patent expires, the drug is replaced with a new one and losses are counterbalanced by the revenues of the new patented medicine. However, the R&D process is extremely long, up to 20 years, expensive, around $1.9 billion for the entire development process in 2019, and risky, the probability that a drug is marketed is between 4% and 12%. Moreover, in the last ten years, the IRR[173] of R&D investments have decreased from 10% to 1.8%, while the average cost of capital is around 7.5%. Holding a very diversified portfolio of companies, operating in different business, could make investment decisions and capital allocations extremely challenging, and the management is more prone to cross-subsidization errors, especially if a subsidiary is in financial difficulty. The spin-off can help the management streamline the operations and do better capital budgeting decisions toward the investments with the best expected returns, given the risk.

The last aspect concerns the **ESG[174] issues.** The pharmaceutical industry's continuous involvement in scandals over corruption, product safety, aggressive marketing, political lobbying and a general lack of transparency have resulted in a dramatic erosion of public trust in recent years. To regain this trust, companies are committing more resources to improve social reputation and the spin-off could increase the transparency over ESG performance of

[173] Internal Rate of Return
[174] Environmental Social and Governance

both the companies involved in the deal, especially the spun-off subsidiary. Before the spin-off, the subsidiary could benefit from the good social actions of the other companies of the group. After the spin-off both the parent and the subsidiary are subjected to ESG ratings and have to publicly disclose their own sustainability reports, thus they are singularly responsible for their own social actions.

Beside these industry features, pharmaceutical corporations have some common financial characteristics that, in the future, could increase the probability that the spin-off will be widely employed for corporate restructurings. To unearth these financial characteristics, the Novartis-Alcon spin-off is analyzed.

Novartis is a Switzerland medicine company, created in 1996 through a merger of three entities. It has subsidiaries in more than 25 countries and the most important holding is the 100% ownership of Sandoz AG, a generic drug and biosimilars company. 87.7% of the shareholders are based in Switzerland, and the Sandoz Family Foundation has the largest stake of voting rights in the company: 3.5%. The shares outstanding at the end of 2019 were 2.310 billion and trade on the Swiss and New York Stock Exchange. The main businesses of the company are the Innovative Medicine Division, that focuses on the development and marketing of prescription drugs, and the Sandoz division, the generic drug and biosimilar segment. In 2019, the company collected $47.4 billion in sales, 9% more than 2018 and the operating margin was aligned with the industry average, at 21.3%: the Innovative Medicine division contributed with a 25.9%, while the Sandoz division with 11.6%, since generic drug margins are lower. The Net Income for the year was $11.7 billion, 7% lower than 2018, because Net Income in 2018 was inflated by $5.8 billion after-tax gains on disposals for a sale of a 36.5% stake in a joint venture with GlaxoSmithKline. The company has a strong balance sheet with 0.39 leverage, good liquidity reserves, for a quick ratio of 0.83, and an increasing efficiency of the capital invested, that in 2019 returned 8.17%, compared to the 6.5% in 2018. Since 2016, the returns of Novartis' stock have lagged those of the S&P 500 index and the SPDR S&P Pharmaceuticals ETF[175], because the earnings and sales expectation were not satisfying. To improve the company's performance, stock price and firm value, the management have started a process to transform Novartis portfolio from diversified to medicine only. Between 2016 and 2019, the company exited the businesses of Vaccines, Over The Counter drugs, Animal Health and MedTech, to focus and specialize on drugs, prescription and generic, and invest on innovative treatments

[175] The SPDR S&P Pharmaceuticals ETF[175] is a fund that comprises all the pharmaceutical companies that are part of the S&P 500

like gene and cell therapies. Among the other divestitures, Novartis spun-off Alcon, the MedTech division specialized on eye-care products, on April 9th, 2019. The relationship Novartis-Alcon started in 2010, when Novartis acquired the 77% of the company from Nestlé, and the remaining 23% from minority holders, in a $52.2 billion, for a weighted average price per share of $168.79. The company was valued at 20.4X the EBITDA and 7.58X the Sales, while the average for the MedTech industry, in the same period, was 16.7X the EBITDA and 3.6X the Sales.

From 2011 to 2019, the cash flows produced by Alcon were not enough to justify the high price paid by Novartis. The Financial Returns on Investment were always lower than the 7.5% cost of capital assumed by the management when valuing the deal, and the IRR of the transaction resulted in a -8%. The deal turned out as a mistake, and the management decided for the Alcon spin-off, announcing the deal on June 29th, 2018. Before the announcement date, Novartis stock price was in free fall, while immediately after, the stock rebounded, also because the company announced a $5 billion in share repurchases. The equity market reaction was good, and the stock appreciated 15% in the first 30 days post-announcement date, while the bond market response was negative. On July 3rd, 2018, Moody's downgraded Novartis from Aa3 to A1, because the company would have been less diversified and focusing only on medicines would have increased the business risk. As a consequence, Novartis' bond price with maturity on September 20th, 2022 declined 2.3% on the announcement date before entering a very volatile period, culminated with the bottom at $95 on November 12th, 2018.

The shareholder approved the deal on the Annual General Meeting in 2019. 5 Novartis shares gave the right to 1 Alcon share, and instead of fractional shares, cash was distributed. Alcon shares outstanding were 488.7 million and Novartis distributed to its shareholder $23.4 billion in a dividend in kind distribution, equal to the value of Alcon's net assets. Before the separation, Alcon raised debt for $3.5 billions, and through an intercompany transaction transferred to Novartis $3.1 billion in cash. Therefore, in the end, Alcon net assets value was $20 billion, while Novartis distribution liability was $23.4, hence a $3.4 billion of tax-free capital gains were recorded by Novartis. The $20 billion was Alcon's total equity, divided between $19.5 millions of share capital and the remaining $19 billion as retained earnings. On March 22nd, 2019, the company officialized the date of the spin-off: April 9th, 2019. From March 22nd the stock price gained momentum, justified from the fact that the sum of the values of the two separated entities, that using the DCF[176] was valued at $103.7, was greater than Novartis' share

[176] Discounted Cash Flow Model

price as an holding company before the spin-off: $83.7. This upward trend in Novartis' share price stretched until April 8th, 2019: the cum-date, that is the day before the execution of the spin-off and corresponds to the last trading day investors can buy Novartis shares with the right to receive Alcon's shares. The day after the cum-date, the so-called execution date: April 9th, Alcon started trading with its own ticker and closed the day at $54.7 for a total market capitalization of $27.9 billion. In the same day, Novartis stock bottomed at $75.4 from $85 on the cum-date, which was a $9.6 decline. This drop was because investors react to spin-offs as they do for dividend announcements. Company share price increases until the cum-date, and then the price drops as much as the value of the dividend distribution on the execution date. In fact, Novartis price dropped $9.6, that multiplied by the 2.310 billion shares outstanding gives roughly the value of Novartis distribution liability for the spin-off: $23.4 billion. After this fall, both the shares rallied toward maximums of $99.84 for Novartis and $65.37 for Alcon, at the beginning of 2020, before the pandemic induced sell-off in March 2020.

Regarding debtholders, after the slide suffered on the months following the announcement date in 2018, Novartis bond price increased until reaching $104.25 in June 2020. Alcon was rated Baa2, that is still investment grade, and despite the poor financial performance, was still able to raise debt at almost the same cost as before the spin-off: 2.5-3%.

All in all, shareholders reacted positively to the spin-off, because the deal is a way to distribute retained earnings in a tax-free dividend in-kind distribution. In 2019, Novartis distributed $35.5 billion of retained earnings to shareholder with dividends, share repurchase and the spin-off. The annual returns in 2019, for a shareholder that on January 2nd, first trading day of the year, invested in Novartis, amounted to 22.3% in before-taxes capital gains. Considering as a benchmark the returns of the S&P 500, in the same period, Novartis-Alcon shares' portfolio earned 3.2% more than the expected returns for a market portfolio with same risk. On the other hand, debtholders suffered more the transaction, because the risk of the two companies increased and, after the deal, there was uncertainty on the potential impact of the transaction on the future performance of the two entities, resulting in increased bond price volatility. However, if the transaction benefits the long-term performance of the companies involved, then even bondholders will get returns from the spin-off, as showed by the constant appreciation of Novartis bond price, after bottoming up in November 2018.

Novartis-Alcon spin-off had important consequences in terms of ESG performance on both the companies. After the transaction, as a listed stand-alone company in Switzerland, Alcon started disclosing the sustainability report and rating agencies started evaluating its ESG performance.

After the transaction, Novartis was confirmed an AA- rating while Alcon was attributed a BBB. While they were a unique entity, Alcon worse performance was partially offset by Novartis better rating. Therefore, the spin-off helped make clarity over the social commitment of the two companies, empowering Alcon to improve its ESG rating.

After analyzing the deal, four are the critical financial features of pharma companies that make the spin-off appealing for corporate restructurings:

- **Cash reserves**. Pharma companies have good cash reserves, with an average quick ratio between 0.8 and 1, for the industry. Pharma companies do not need to divest assets to raise cash, because most of the time they have it in excess. In fact, 0.8-1 quick ratio means that the companies have enough cash for operations needs and to potentially cover almost all the current liabilities. Therefore, the spin-off could be a viable alternative to divestitures, when the parent company is not in immediate need for cash and other liquid funds. Moreover, Novartis-Alcon case showed that even a spin-off can provide the parent company with cash, by increasing the leverage of the subsidiary before the transaction, so that to monetize the capital gain;
- **0.74 median beta**. Pharma companies cash flows and returns are less volatile than those of the market portfolio, that has beta of 1. Low risk is usually associated with pharmaceutical companies, hence investors are more prone to pour money in risky transactions, such as the spin-off. Indeed, Novartis and Alcon after the spin-off maintained a beta lower than 1, notwithstanding the fact that the companies were less diversified. Pharma companies steady cash flows and low volatility make investors more supportive in case of a spin-off, because even after the deal the beta of the companies is lower than the beta of companies operating in cyclical sectors;
- **0.85 median leverage**. Pharma companies median balance sheet is solid, with low leverage. Therefore, bondholders will perceive their capital less at risk if a pharma company undergoes a spin-off then if the transaction is performed by a highly levered company. In addition, the spun-off entity has usually low leverage too, hence investors are available to provide funds, even though the company is performing poorly, as in Alcon case. Despite the fact that, since 2015, Alcon has been recording losses, the company issued, 6 months after the transaction, a $2 billions senior note at 3% rate, that was easily underwritten by bondholders, mainly because Alcon has a very low leverage, close to 0.2;
- **Retained earnings**. Pharma companies have outstanding returns on investments and profitability margins, compared to other industries. Therefore, companies accumulate

large reserves of retained earnings. The spin-off qualifies as an exceptional way to distribute retained earnings to shareholders, without being taxed as dividends are.

The specific features of the industry and the financial structure of the companies make the pharmaceutical field particularly prone to execute spin-offs. However, the prosecution of the positive spin-off trend depends on several specific circumstance:

- **Market cycle**. The spin-off increases the risk of the two companies involved. If the market outlook is positive, prices are high and common investments have lower expected returns than in normal or grim times. In this market condition, investors will welcome extraordinary and riskier transactions like the spin-off, because the expected returns are higher, given the higher risk. Hence, the market will provide enough funds, both equity and debt, to finance the stand-alone companies. The spun-off entity in particular needs good economic environment and credit availability to stabilize. The spin-off could be undermined if the economic outlook is grim, because investors are more risk averse and less funds are available for risky transactions. Timing for the spin-off transaction is a critical aspect: if the economy is good the spin-off is more likely to be successful, if the market is perceiving the threat of a recession, a simple divestiture could be better, also because the parent could raise cash that is necessary during economic downturns;
- **Investors sentiment**. announcing the spin-off, Novartis was able to revert the downward trend of its stock price, because the spin-off benefits shareholders first. Hence, when the stock market opinion for the parent company is negative and the price is lowering, the spin-off should be considered to divest assets. The announcement usually has a positive effect on the share price and could be a good deterrent to revert a sell-off trend;
- **Corporate tax rate**. a company would benefit more from a spin-off when corporate tax rates on capital gains are high. Even though the simple disposal of an asset is less effort and time consuming for the management than a spin-off, the company would opt for the latter so not to incur in high taxes on gains on disposals. On the other hand, if the rates are low, a simple sale is preferable because it is less resources, time and effort consuming;
- **Cash requirements**. This is a critical point to consider. If pharma companies will maintain this quick cash conversion cycle and broad cash reserves, they will not need to raise cash through disposals to finance strategic acquisitions or operational purposes. If this will not be the case and the parent needs cash to finance M&A deals to replace

the divested company or to avoid financial insolvency, then a divestiture could be preferred, even if gains are taxed.

All in all, the pharmaceutical industry is a very promising market, rich of opportunities: within 2050, life expectancy could increase from 73 to 78, the percentage of 60+ years old people, the most frequent pharma customers, could double, reaching the 21% of the expected 9.7 billion world population. Hence, drug spending is projected to reach $1.58 trillions by 2024, from $1.25 trillions in 2019, a CAGR of 4.7%, with the Asian market that will grow faster than the other world regions. To thoroughly exploit these opportunities and avoid the threats, pharma companies are rethinking their business models, replacing diversification with specialization and focus on the core business. To this end, a solid restructuring and M&A strategy will be necessary, in order to be at the foremost of innovation, deliver better drugs at more affordable prices and grant that the R&D pipeline is always filled. In this context, the number of spin-offs in the industry has the potential to increase, given the needs and the particular financial features that distinguish pharmaceutical companies from those operating in other industries. However, this upward trend will be more likely if the economy will be in expansion, investors will be less risk averse, corporate tax laws will be high and pharma companies will maintain their current cash reserve levels. If these assumptions are not violated, the belief is that, in the next decade, spin-offs will further contribute to reshape companies' portfolios in the pharmaceutical industry.