THE IMPACT OF THE ESG FACTORS ON PHARMACEUTICAL & CARE COMPANIES' PROFITABILITY AND MARKET VALUE

by

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LIST OF ABBREVIATIONS

ESG Environmental, Social, and Corporate Governance

UN United Nations

SASB Sustainability Accounting Standards Board

GSIA Global Sustainable Investment Alliance

CAGR compound annual growth rate

ROA Return on Assets

NPM Net Profit Margin

ESGC Environmental, Social, and Corporate Governance Combined Score

MSCI Morgan Stanley Capital International

EFPIA European Federation of Pharmaceutical Industries and Associations

ROC Return on Capital

P/E Price to Earnings

ROE Return on Equity

CSR Corporate Social Responsibility

CHAPTER 1. INTRODUCTION

In the modern world, under pressure from society, environmental, social and corporate governance (ESG) issues become increasingly significant for businesses - 73% of investors expect businesses to behave more ethically (Vontobel Study, 2019). Influenced by the trend, more and more companies today integrate sustainability in their corporate strategies. According to the UN, sustainable development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Our Common Future (Brundtland Report), 1987). In other words, sustainability of business refers to company performance without negative impact on environment and society.

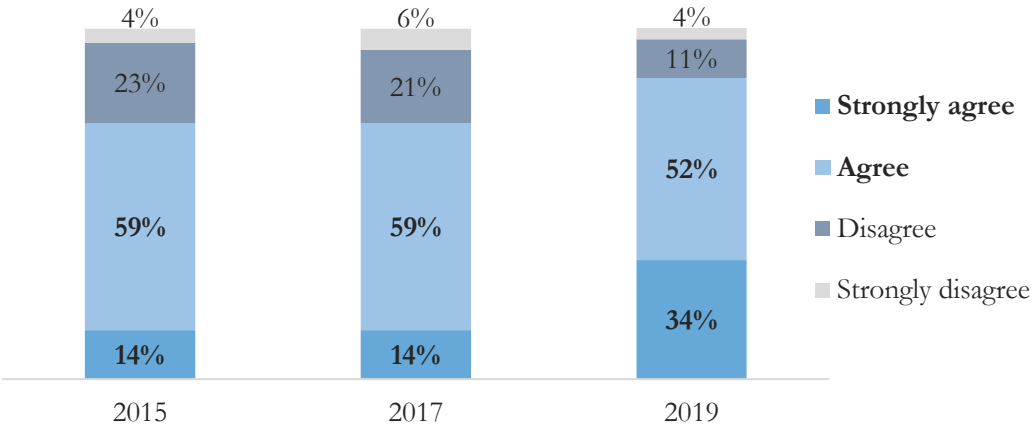
Constantly evolving corporate sector environment drives expansion of considering factors affecting financial stability of the company. That's why sustainability trends continue to be reflected in companies' financials. Sustainability Accounting Standards Board determines standards regulating disclosure of "financially material sustainability information" by companies. SASB defines financially material issues as those, that "are reasonably likely to impact the financial condition or operating performance of a company". The Financial Stability Board set up the Task Force on Climate-Related Financial Disclosures to develop efficient "climate-related financial disclosures" enabling investors to better understand "financial system's exposures to climate-related risks". Still, researchers continue debating whether sustainability initiatives, besides confronting global challenges, can drive financial performance, as well as business overall.

Even more sustainability concept integrates in companies' equity financing process, which implies selling shares to investors. According to GSIA, sustainable investing is a process of ESG factors integration while portfolio selection and management. As per CFA Institute, investors incorporate these factors into analysis to "identify material risks and

growth opportunities". Rapidly growing interest from investors side pushes up development of sustainable investing. According to Morgan Stanley Institute for Sustainable Investing, interest of individual investors in sustainable investing increased by 4 percentage points in 2017 and by 14 percentage points in 2019 comparing to 2015. According to this research, in 2015 year 71% of interviewed investors expressed interest in sustainable investing, 19% of which were "very interested". In 2019 share of those who were "very interested" rocketed to 49% (Appendix A).

Moreover, investors tend to believe that "ESG practices can potentially lead to higher profitability and may be better long-term investments" (Figure 2) (Morgan Stanley Institute for Sustainable Investing).

Figure 1. Investors' beliefs in potential increase of profitability due to ESG practices



Source: Morgan Stanley Institute for Sustainable Investing (2019)

The number of portfolio managers and analysts considering ESG factors during the process of making investment decisions is gradually growing (Bos, 2014). For the period 2016-2018 sustainable investing assets grew by 11% in Europe, and 38% in USA (Global Sustainable Investment Review, 2020). However, this market showed growth slowdown during last few years: the increase of growth rate was observed in USA only, while in Europe it was -13% (Appendix B).

At the same time, methodology of the ESG factors integration into investment process is still in the making.

Due to the specifics of their activities, companies in pharmaceutical and personal & home care sectors constantly face multifaceted ESG issues and as the focus on intensity and significance of sustainability factors will increase in these sectors, this will affect companies. Hence studying the effect of such factors on firms' performance is relevant and important.

Facing extension of ESG trends and further integration of them into financial analysis and investment processes, with this research the author set the following goals:

- to find whether relationship between ESG factors and profitability, market value exist;
- to determine the most influential on company's performance ESG factor.

The way the study contributes to the literature is extension of ESG factors to a broader category, ESGC factors. While many studies were investigating influence only of ESG pillars, this research is supplemented with examination of Controversies pillar among those making impact on company's profitability and market value.

The impact of ESG scores on profitability and market value of the company was estimated using time-firm fixed effect regression model. The model was controlling also for size, age, growth rate, efficiency, leverage and dividend ratio of companies, as well as for country of foundation. The sample for research consisted of companies from Pharma & Care sector, located in Europe.

In general, empirical evidence supports the existence of interdependence between ESG performance and financials of companies. To be more precise this study results are mixed, meaning the findings include both positive and negative relationship, as well as no

relationship between ESG performance and profitability, market value indicators of companies.

The paper is organized as follows: chapter 2 provides industry overview and ESG in this industry trends, as well as literature review; chapter 3 describes methodology, data collection process and state research hypotheses; chapter 4 presents data overview; chapter 5 describes the results of the analysis and chapter 6 completes with conclusions and recommendations.

CHAPTER 2. INDUSTRY OVERVIEW AND RELATED STUDIES

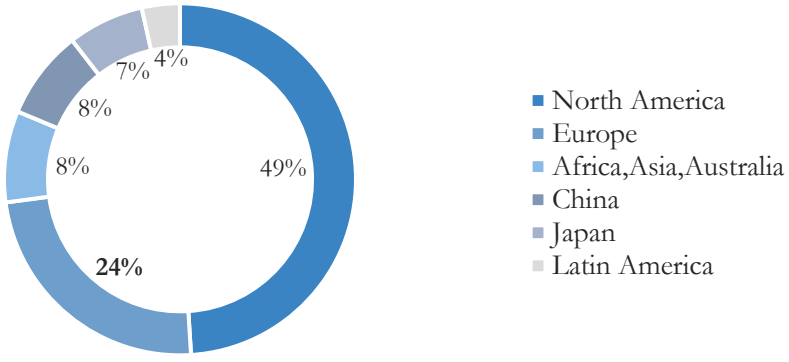
2.1. Industry overview

The global **pharmaceuticals market** was estimated at $1228.45 billion in 2020. It is expected to grow to $1250.24 billion in 2021 with CAGR of 1.8%. In a long run this market is expected to reach $1700.97 billion in 2025 (CAGR of 8%) (Pharmaceuticals Global Market Report 2021).

Constantly Europe takes the second place after US in the worlds pharmaceutical market (Figure 2). In 2019, USA pharmaceutical market generated $490 billion of revenue. Continuing its growth the market is expected to reach $605-$635 billion by 2024 with 3-6% CAGR (Pharmapproach). The second largest European pharmaceutical market was estimated at $219.9 billion and is expected to expand with CARG 4.5% from 2019 to 2027 (Pharmaceutical industry overview: Europe, 2020).

Pharmaceutical market is highly competitive on its nature. In 2020 world's largest 50 pharma companies' revenue was $851 billion (Visual Capitalist, 2021). Thus, top 50 companies' share composed 69% of the whole market.

Figure 2. Geographical breakdown of world pharmaceutical market, 2020 (%)

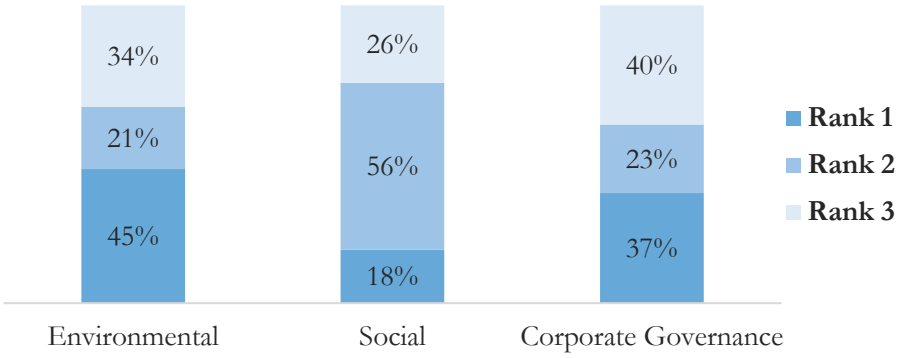


Source: EFPIA, 2021

Despite being a highly regulated area, pharmaceutical sector is continuing to struggle different ESG issues ranging from opioid crisis and lack of transparency on clinical data reporting to increasing pharma products prices and so on.

According to the Global Data poll, environmental is the most important ESG component that pharma needs to overcome (43% of respondents). The second place in terms of importance goes to social factor (31%) and the governance is viewed as the least important among ESG components (26%) (Global Data, 2021). The similar poll held by Pharmaceutical Technology, gives more detailed information of how people rank ESG factors for pharma industry (Figure 3).

Figure 3. ESG factors rank by importance (where rank 1 is the most important), 2021 (%)



Source: Pharmaceutical Technology, 2021

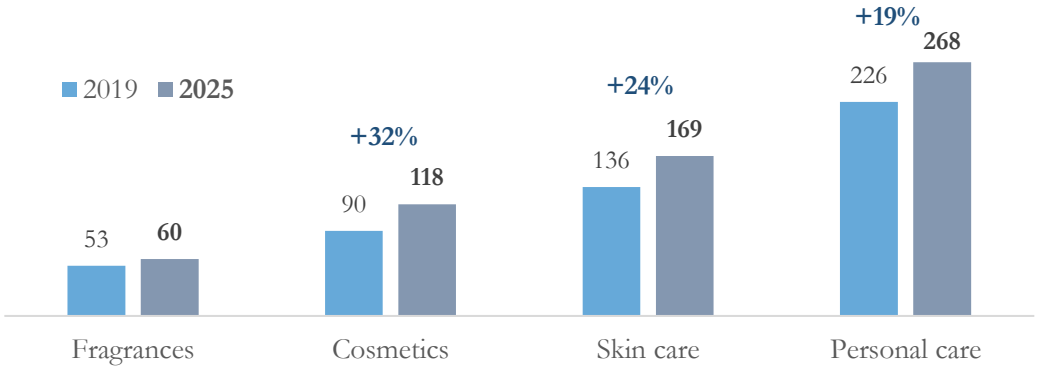
High requirements and expectations from society are reflected in historically low ESG ratings in pharma industry, but the latest trends influence the change of this situation. In accordance with RBC Capital Markets, from 2013 the industry demonstrates downwards trend in number of legal settlements and value of financial penalties (Appendix C).

The **global beauty and personal care** products market was estimated at $434.85 billion in 2020. In 2021 the industry is expected to attain $511 billion, demonstrating a CAGR of 4.35% during the 2021-2026 period (Beauty and personal care products market report, 2020; Beauty Industry Trends & Cosmetics Marketing Statistics, 2021).

This market is also characterized by high level of competition. Revenue of top 10 companies was $132 billion in 2020 (Statista, 2021), that made up 30% of whole market revenue.

Personal care is the biggest segment by revenue within the industry, while skin cosmetics is predicted to be the fastest growing (Figure 4).

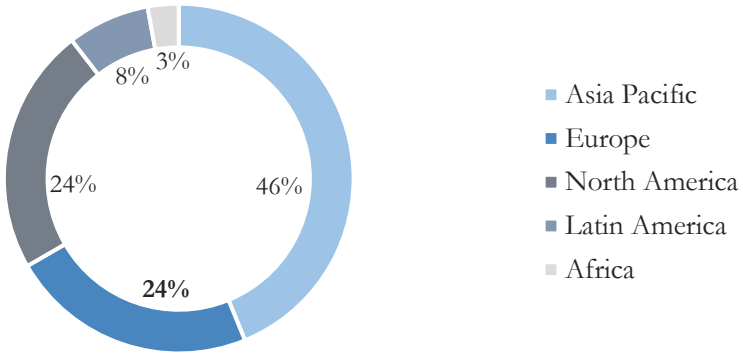
Figure 4. Beauty & care segment revenue and forecasted growth, 2019-2025 ($ bn)



Source: Common Thread Co., 2021

The biggest market share falls on Asia Pacific, moreover it is the fastest growing market. North America and Europe tied for second place (Figure 5).

Figure 5. Geographical breakdown of world beauty & care market, 2021 (%)



Source: Common Thread Co., 2021

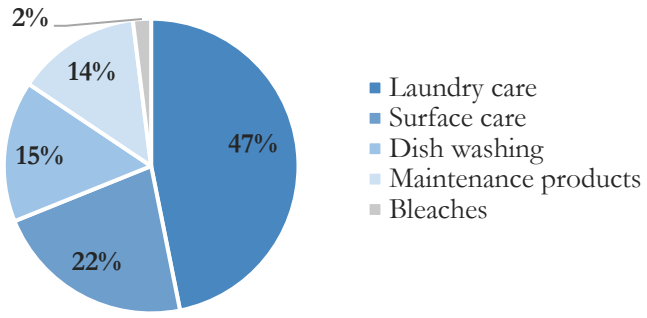
The largest beauty & care products markets within Europe are Germany (17.5%), France (14.3%), the UK (13.4%), Italy (13%), Spain (9%), Poland (5%) (Cosmetics Europe, 2019).

The global **household cleaners** market was valued at $35.4 billion in 2020 and is projected to increase to $50.8 billion by 2026 with 5.9% CAGR (Household Cleaners Global Market Trajectory & Analytics, 2021).

The Europe household care market reached $ 29.5 million in value in 2020. It is expected to expand with CAGR of 2.7% and reach $34.9 million by 2026. The major regions are also Germany, the UK, France and Italy (Europe Household Care Market Report and Forecast 2021-2026, 2020).

Historically, laundry care has the largest share among household cleaning and hygiene products (Figure 6).

Figure 6. Europe household care market by segments, 2019 (%)



Source: Statista, 2021

Being involved in main environmental concern areas, home and personal care industry is also an object of "sustainability pressure". In this sector sustainability stands for small-footprint and not pollutive production, usage of safe-to-use components and recyclable packaging, decrease of depletion of natural resources and termination of cruelty to animals via testing.

Consumers show growing tendency for conscious consumption and choosing sustainable products. For instance, "recyclable" is the most demanded sustainable package for skin care products according to Euromonitor. The second most desired feature is recycled package and refillable bottles is the last in the list (Euromonitor International Beauty Survey, 2019).

Moreover, the issues related to customers' information, product safety and responsible marketing are "among the top 5 most controversial ESG topics" (Eiris, 2019).

From all the information presented above, nowadays ESG factors are not just ethical for businesses but those making substantial impact, that proves the need of further research of their influence.

2.2. Literature review

During recent years ESG factors not only brashly integrate in companies' business strategies but have become "central tenets in the capital allocation process" for both sides of this process: investors as providers of capital and companies as capital users (IVSC Perspectives Paper, 2021). That's why the number of studies investigating implication and influence of such activities also increases rapidly.

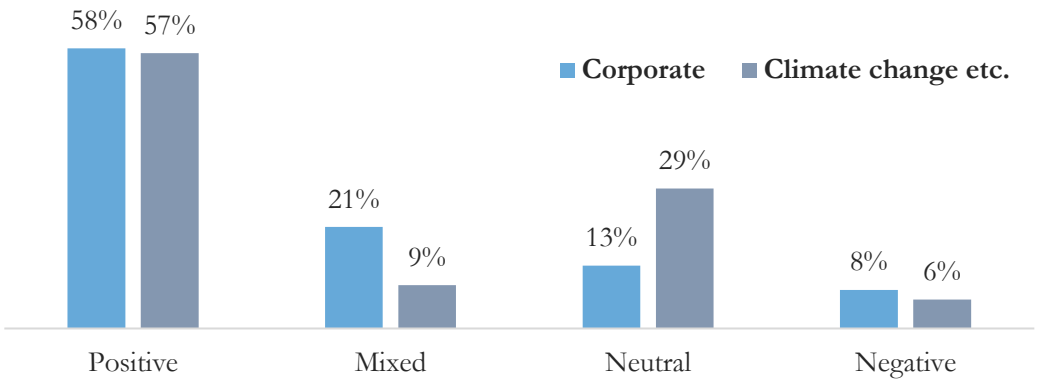
Topics related to ESG impact on company's economic and financial performance are examined by different researchers, but still a subject of debates. One part of research has found significant relationship between ESG factors and indicators of financial performance (Kim & Li, 2021; Lucia et al., 2020; Ahmad et al., 2021). According to MSCI (2018), "a change in a company's ESG profile has had an impact on valuation levels and stock prices that is not explained by the general market or other factors". Other studies have declared the absence of this relationship (Hedqvist & Larsson, 2020; Silanes et al., 2019).

Besides, those of studies that detected significant relationship also differed in terms of the sign of the relationship. For instance, Almeyda (2019) found positive relationship between ESG factors and ROA, ROC and negative with stock prices and P/E ratio for companies from G7 countries. Kim & Li (2021) also reveal a positive impact of ESG variables on credit rating with the social factor being the most influential among all variables. However, unexpectedly for authors negative relationship between environmental score and credit rating was found. Ionescu et al. (2019) also observed negative influence of social and environmental factors on market to book value of companies from travel and tourism industry.

Many of the examined studies find corporate governance to be the most influential factor for market value and financial performance among all ESG components (Ionescu et al., 2019; Velte, 2017; Kim & Li, 2021).

It is worth pointing, that there are more studies observing positive relationship between ESG and financial performance than negative or "no effect" (Figure 7).

Figure 7. Results of papers about ESG and financial performance relationship, 2021



Source: Stern Center for Sustainable Business & Rockefeller Asset Management

Research of NYU Stern Center for Sustainable Business and Rockefeller Asset Management examined more than 1 000 studies investigating relationship between ESG

and financial performance for 2015-2020 period. 58% of studies concentrated on operational indicators such as ROA, ROE or stock prices revealed positive relation, 13 % didn't found relationship, 21% showed mixed result (the same study observing positive, negative or mixed result) and 8% - negative impact. Figure 7 also present results of research of works about climate change or low carbon strategies tied to financial performance".

This study also highlighted some key takeaways:

- positive impact of ESG on financial performance more noticeably in a longer time period;
- ESG initiatives seems to "provide downside protection" and improve financial performance through better risk management and operational efficiency as well as higher innovation score;
- "managing for a low carbon future" drives financial performance.

The main contribution of the study held is analysis of ESG factors influence on financial performance of companies from a specific industry (Pharma & Care) and region (Europe). Another way the study contributes to the literature is extension of ESG factors to ESGC factors. While many studies were investigating influence only of ESG pillars, this research is supplemented with examination of Controversies pillar among those making the most significant impact on company's profitability and market value.

CHAPTER 3. METHODOLOGY

To achieve goals set at the beginning, regression analysis as a quantitative research method was chosen. This approach is commonly used by authors of variety of previous studies on similar topics. Variable selection was mainly motivated by the existing literature and their concordance with the aim of the study and stated hypotheses.

The author considers the following hypotheses:

***Hypothesis 1**: ESG scores have a positive effect on firm profitability.*

***Hypothesis 2**: ESG scores have a positive effect on company's market value.*

Similarly to Hassel et al (2005) approach, the author picks out two viewpoints on how ESG performance influence company's financial performance: cost-related and value creation-related. From the cost-related viewpoint, ESG initiatives generate only additional costs, negatively influencing profitability and market value. The value creation-related viewpoint is that by means of ESG performance a company create value through improved production technology, more valuable, expensive products, and elimination of risk of penalties related to ESG (e.g., environmental pollution penalty). In this way ESG positively impacts profitability, image and thus market value.

For measurement of business profitability Return on Asset and Net Profit Margin were chosen; while as indicators. Tobin's Q is a proxy for the market value of a company (Table 1).

Table 1. Variable description table

Variable type	Variable name	Symbol	Description
Dependent	Return on asset, %	ROA	Net Income/ Total Assets
	Net Profit Margin, %	NPM	Net Income/ Revenue
	Tobin's Q	TQ	Firm market value/ Total Asset Value
Independent	Environmental Pillar Score	Env	Company's impact on natural systems (air, land, water, complete ecosystems)
	Social Pillar Score	Soc	Company's capacity to generate trust and loyalty with its workforce, customers, and society (Refinitiv)
	Governance Pillar Score	Gov	Measures whether board members and executives act in the best interests of its long-term shareholders (Refinitiv)
	ESG controversies Score	Controv	Company's exposure to environmental, social and governance controversies and negative events reflected in global media (Refinitiv)
Control	Firm size	SIZE	Natural logarithm of total assets
	Firm age	AGE	Number of years from incorporation date
	Firm growth	GROWTH	Growth of revenue comparing to previous period
	Total asset turnover	EFF	Revenue/ Avg Total Assets
	Leverage	LEV	Debt/ Equity
	Dividend payout ratio	DIV	Dividends/ Net Income
	Return on asset	ROA	Net Income/ Total Assets
	Country	Country	Country of incorporation

Return on Asset is commonly used as measurement of profitability in literature. The ratio reflects the effectiveness of asset management policies. Net Profit Margin is another ratio considered as measurement of profitability, as it focuses on profit generated by business after accounting for all occurring expenses. While ROA and NPM are more accounting measurements, the Tobin's Q ratio additionally shows how the market value a company comparing to its' intrinsic value. Consequently, it is used as proxy for market value.

This study also defines two sets of control variables. The sets are different for models with business profitability indicators and with market value as dependent variable. The set of control variables used for models with business profitability indicators as variables is described below.

The size of company is considered as important factor to control for by many researchers (Buallay et al., 2017; Sushil Dev Subedi, 2018; Pasquini-Descomps, 2013; Yaghoub et al., 2021). Size can also reflect the market power of a company, that univocal have an impact both on profitability and market value. However, the relationship between the size and performance of company is ambiguous. On the one hand, bigger companies have more market power and can use economies of scale increasing their profitability. On the other hand, it is more difficult for them than for small companies to quickly adjust to frequent changes, that negatively influence profitability (Dugasova, 2019). Moreover, the growth rate of big companies is severely limited comparing to small one.

The next control variable is age. The similar effect as for big/small companies is expected to have place. This is justified by the fact that young companies usually grow faster than old one.

Company's growth rate is also widely used as a control variable in literature (Dugasova, 2019; Ham, 2018). Both revenue growth and level of efficiency (measured as total asset turnover) are considered to have a positive impact on financial performance.

Although the sample consists of companies located in one geographic region, country dummy variables are used in the study to control for country-specific effects connected with regulatory and disclosure otherness.

The second set of control variables, used in the model with market value as dependent variable, also contains size, age and country variables. The motivation for their inclusion is the same as described above.

Leverage measured as debt-to-equity ratio is commonly employed in similar studies (Ahlqvist, 2021; Sushil Dev Subedi, 2018). It is expected that leverage to negatively influences profitability indicators because of the interest payment burden linked with high level of debt accrued.

As dividends are a kind of reward for investments made, they are significantly valued by shareholders. Moreover, dividends act as a sign of financial wealth for investors. It affects investors' attitude to the company, hence its market value. Similarly, ROA signals investors about company's efficiency and performance level. Thus, making an impact on market value of a company, ROA and dividends ratio was included as control variables.

To make sample more homogenous in terms of macroeconomic factors, regulatory and ESG disclosure requirements, cultural patterns etc. companies chosen for analysis are located in Europe.

Panel data for 2010-2020 period was used for analysis. Several reasons were taken into consideration when choosing this type of data (Hsiao, 2005):

- "panel data usually contains more degrees of freedom and less multicollinearity than cross-sectional data";
- panel data contains more variability;
- it allows to control for impact of omitted variables due to combining information on both intertemporal dynamics and individual features of units;

- combining information on both intertemporal dynamics and individual features also helps to detect common and individual effects;
- above-mentioned features make estimates more accurate.

All selected companies may have unobserved characteristics, that can influence dependent variables. It is very unlikely to detect and control for all such individual characteristics. But omission of that variables may lead to endogeneity problem. To mitigate endogeneity problem the author chose a fixed effect model for regression analysis.

The fixed effect model is applied when omitted variables influence the dependent variable in the same way over time. This means that their effects are time-invariant or constant. This allows fixed effect model to control, or at least partially control, for time-invariant effects of constant variables over time (Williams, 2018).

Two models of the following forms were used:

(1) $Y_{it} = \beta_1 Env_{it} + \beta_2 Soc_{it} + \beta_3 Gov_{it} + \beta_4 Controv_{it} + \beta_5 SIZE + \beta_6 AGE + \beta_7 GROWTH + \beta_8 EFF + \beta_9 Country + u_i + v_t + \varepsilon_{it}$,

$i = 1, \dots, N,\ t = 1, \dots, T$, where Y_{it} – ROA or NPM.

(2) $Y_{it} = \beta_1 Env_{it} + \beta_2 Soc_{it} + \beta_3 Gov_{it} + \beta_4 Controv_{it} + \beta_5 SIZE + \beta_6 AGE + \beta_7 LEV + \beta_8 DIV + \beta_9 ROA + \beta_{10} Country + u_i + v_t + \varepsilon_{it}$,

$i = 1, \dots, N,\ t = 1, \dots, T$, where Y_{it} – Tobin's Q.

Based on the literature review results, I expect to observe positive influence of Environmental, Social, Governance and Controversies scores on financial performance and market value.

CHAPTER 4. DATA

For purposes of the study, selected sample consists of 66 companies from Pharma & Care industry located in Europe. The time period of the analysis covers 10 years from 2010 to 2020, resulting overall in 726 observations.

Companies' selection was based on Refinitiv classification. According to Refinitiv database, the chosen companies belong to Pharmaceuticals and Personal & Household Products & Services sector. Unfortunately, not all companies from this sector disclose their ESG performance, consequently, have ESG scores, that's why only companies with the ESG scores were included in the sample.

Data on ESG variables was collected from Refinitiv database, while S&P Capital IQ Platform database was used to collect all the financial performance data.

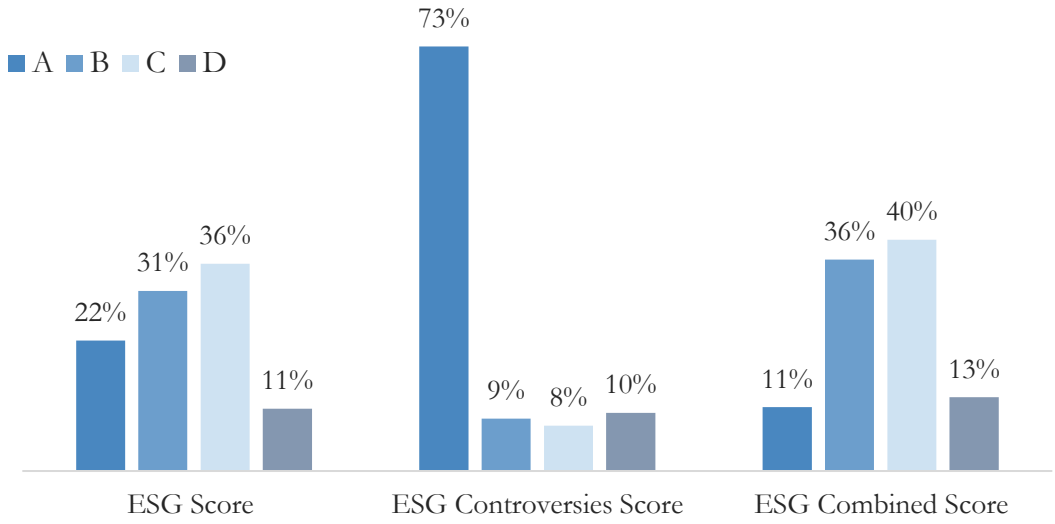
According to ESG scoring methodology, ESG score "measures the company's ESG performance based on verifiable reported data in the public domain" (Environmental, Social and Governance (ESG) scores from Refinitiv, 2021). Environmental pillar score is calculated based on resource use, emissions and innovation performance scores. Social pillar score includes workforce, human rights, community and product responsibility categories scores. Governance pillar is determined by management, shareholders and CSR strategy categories scores. ESGC (ESG Combined Score) "overlays the ESG score with ESG controversies to provide a comprehensive evaluation of the company's sustainability impact and conduct over time" (Environmental, Social and Governance (ESG) scores from Refinitiv, 2021).

4.1 Frequency distribution

ESG performance scores of the sample companies are presented in Figures 8 and 9. Figure 8 reports the share of companies with A, B, C and D score (with A being the best

and D being the worst) within ESG, ESGC and ESG Controversies Scores as well as Environmental, Social and Governance Scores as share of total.

Figure 8. ESG scores frequency



The majority of companies has "B" or "C" ESG and ESG Combined scores respectively, that confirms the inception of process of integration of ESG policies in business strategies. 22% of companies already have "A" ESG Score. The share of A-rated companies within ESG Score is higher than within ESGC, that is explained by influence of Controversies Score that are included in ESGC and have relatively lower scores in the sample. The share of companies having "C" score is the largest both for ESG and ESGC Scores. It indicates quite low level of ESG performance within the industry.

The most interesting observation is that 73% of companies have "A" Controversies Score, that indicates companies' concern about avoiding ESG controversies and about image, trying not to be the target of bad news regarding ESG.

The general state keeps similar in ESG and ESGC Scores, indicating that it could be treated as overall sector situation.

Figure 9. ESG pillars' scores frequency

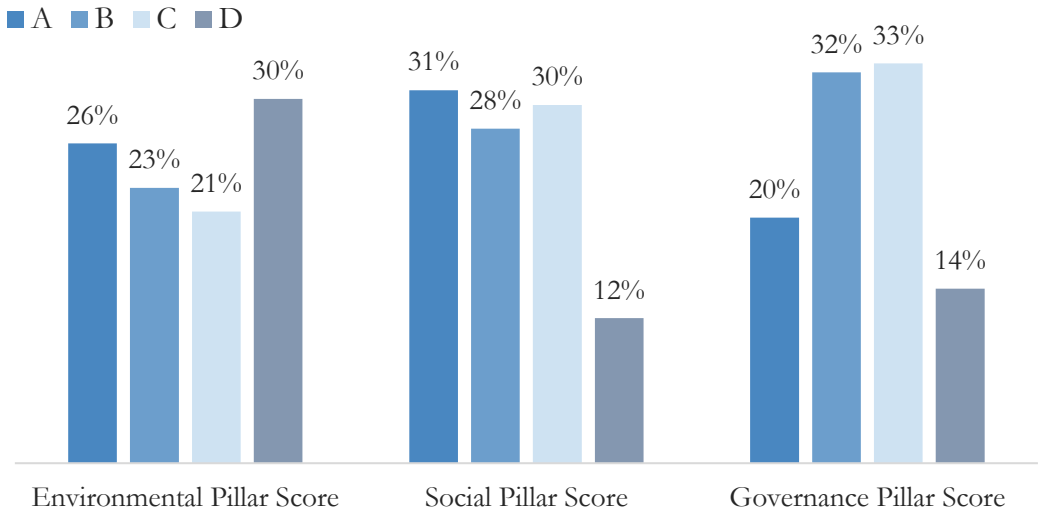


Figure 9 shows distribution of companies with the different rankings by pillar. The lowest scores companies receive for Environmental pillar (30% share of "D" scores). This fact is consistent with Global Data poll results mentioned above, which consider environmental as the most important ESG component that pharma industry needs to overcome. The best scores are observed for Social pillar– this component has the highest share of "A" scores and the lowest share of "D" scores. In turn, Governance pillar scores are on middle level (32% and 33% of "B" and "C" scores respectively).

Consistently with ESG and ESGC scores, there are high shares of "B" and "C" observed within ESG pillars scores, except Environmental one.

4.2 Preliminary data analysis

To be representative, the sample observed in research includes different types of companies – from highly to scarcely profitable, with high and low market value and with different levels of ESG performance. Data descriptive statistics table presented below in Table 2 confirms this statement.

Table 2. Variables descriptive statistics

Variable	Obs.	Mean	Median	St.dev.	Min.	Max.
ROA	663	3.50	5.940	19.29	-117.49	108.78
NPM	666	-32.03	9.55	207.59	-1836.6	409.51
TQ	708	1.84	1.33	1.94	0.00	19.15
Env	459	47.04	49.59	29.76	0.00	94.18
Soc	461	57.56	56.62	25.19	0.43	97.17
Gov	459	51.89	51.00	23.34	0.82	97.00
Controv	410	81.33	100.00	30.03	0.00	100.00
SIZE (assets)	708	26872.9	1535.3	97358.3	9.6	94858.0
AGE	720	75.02	65.50	68.71	0.00	352.00
GROWTH	688	16.04	6.05	58.52	-90.60	926.20
EFF	691	0.66	0.60	0.43	0.00	3.10
LEV	641	3.18	0.50	13.17	0.00	175.62
DIV	460	51.02	42.10	45.74	0.00	425.50

Standard deviation of ROA and especially Net Profit Margin is high, which shows a high dispersion in the values over time and across companies, meaning a presence of listed companies with different levels of profitability in the sample. However, the standard deviation of Tobin's Q ratio isn't very high, that indicates about majority of companies being close by market value indicator. Selected companies could be characterized as slightly overvalued by the market, as median of Tobin's Q ratio equals 1.33.

Min, max and standard deviation values of Environmental, Social, Governance and Controversies variables also denote high level of companies' diversity within the sample.

It is worth saying that Environmental score has the lowest mean and max values among all, while Controversies one has the highest. This confirms the statements,

mentioned during industry analysis, about that "environmental is the most important ESG component that pharma needs to overcome" and about "downwards trend in number of legal settlements". Moreover, it could be the evidence of that the collected sample reflects the industry state.

Despite, the fact both young and mature companies are presented in the sample, the median of the age of companies is 65 years. For comparison, "the average lifespan of a company on S&P 500 Index was just over 21 years in 2020" (Statista, 2021). There are also companies of different size presented in the data sample. Descriptive statistics provided in the table for SIZE variable is based on company's total assets value (in mln euro) rather than on log of assets. Thus, the mean at 27 bln of total assets could be treated as high, as average of top 34 largest pharmaceutical company rankings by Total Assets is at the level of 32 bln euro (Sovereign Wealth Fund Institute, 2021). Thereby, majority of companies in the sample could be characterized as mature, that is reflected on quite low growth rate with the median of 6%.

To determine patterns and possible multicollinearity between explanatory variables within dataset, correlation analysis was carried out (Table 3).

First of all, the analysis shows that correlation between companies' Environmental, Social, Governance, Controversies scores and profitability as well as market value exists. However, the correlation is not high, especially between ESGC scores and market value. All ESGC variables, except Governance are mostly positively correlated with ROA, NPM and Tobin's Q ratio. Governance score is negatively correlated with ROA and Tobin's Q ratio, while with Net Profit Margin positive correlation is observed. Apart from those mentioned above, the only negative correlation is observed between NPM and Controversies score.

The strongest correlation is observed between profitability and market value variables and Social score variable, as well as between Environmental and profitability variables. So, similar results can be expected in further regression analysis.

Table 3. Correlation Matrix

Var.	Controv	Env	Soc	Gov	ROA	NPM	TQ	SIZE	GROW	EFF	LEV	DIV	AGE
Controv	1	-0.41	-0.44	-0.39	0.01	-0.05	0.08	-0.01	0.14	0.12	0.05	0.03	-0.15
Env	-0.41	1	0.87	0.52	0.13	0.23	0.06	-0.05	-0.21	-0.19	-0.01	-0.01	0.27
Soc	-0.44	0.87	1	0.53	0.17	0.25	0.14	0.01	-0.18	-0.16	0.04	-0.04	0.26
Gov	-0.39	0.52	0.53	1	-0.06	0.04	-0.05	-0.16	-0.19	0.04	0.04	-0.05	0.07
ROA	0.01	0.13	0.17	-0.06	1	0.82	0.81	-0.01	0.03	0.43	-0.07	-0.05	-0.09
NPM	-0.05	0.23	0.25	0.04	0.82	1	0.58	0.08	0.10	0.01	-0.08	-0.07	-0.04
TQ	0.08	0.06	0.14	-0.05	0.81	0.58	1	-0.06	0.06	0.37	-0.10	-0.03	-0.21
SIZE	-0.01	-0.05	0.01	-0.16	-0.01	0.08	-0.06	1	-0.03	-0.16	0.03	-0.02	0.04
GROW	0.14	-0.21	-0.18	-0.19	0.03	0.10	0.06	-0.03	1	-0.05	-0.03	-0.02	-0.12
EFF	0.12	-0.19	-0.16	0.04	0.43	0.01	0.37	-0.16	-0.05	1	-0.01	-0.01	-0.07
LEV	0.05	-0.01	0.04	0.04	-0.07	-0.08	-0.10	0.03	-0.03	-0.01	1	-0.02	0.13
DIV	0.03	-0.01	-0.04	-0.05	-0.05	-0.07	-0.03	-0.02	-0.02	-0.01	-0.02	1	-0.02
AGE	-0.15	0.27	0.26	0.07	-0.09	-0.04	-0.21	0.04	-0.12	-0.07	0.13	-0.02	1

Correlation matrix shows a possible multicollinearity problem: high correlation between Environmental and Social variables. Lower correlation is also existing between Governance and Environmental, Social variables, as well as between NPM and Tobin's Q ratio.

Further Variance Inflator Factor (VIF) testing of regression models confirms this finding, as discussed in the next chapter.

CHAPTER 5. RESULTS

5.1. Fixed effect regression model results for profitability indicators

In order to identify whether ESG performance of a company influences its profitability, time-firm fixed effect regression analysis was used.

Two regression models with different profitability ratios as dependent variables were run. Independent variables of interest include Environmental, Social, Governance and Controversies scores. The set of control variables included company's size, age, country of incorporation, growth and efficiency level was also the same for both models. Table 4 presents results of regression of European Pharma & Care companies' ROA and Net Profit Margin on ESGC scores.

Table 4. Results for firm profitability ratios

Model	1		2	
Variable	ROA		Net Profit Margin	
	Coefficient	SE	Coefficient	SE
Env	-0.06073 **	0.00707	0.50439 *	0.04372
Soc	0.22064 ***	< 2.2e-16	0.71271	0.06113
Gov	-0.15818 *	0.01452	-1.22083 *	0.03160
Controv	0.06899 **	0.00280	0.34485	0.05766
SIZE	3.12769 *	0.02268	21.99262 *	0.01209
AGE	-0.01523	0.24853	-0.12429	0.16718
GROWTH	-0.01523	0.46060	-0.06904	0.53079
EFF	8.85719 ***	5.071e-09	52.69506 **	0.00322
Statistical Significance Level	* p<0.05	** p<0.01	*** p<0.001	
R^2	0.3515		0.2061	

To detect whether heteroscedasticity is present in regression models, Breusch-Pagan test was applied. As the p-value of the test was less than 0.05, heteroscedasticity presence was concluded. To control for heteroskedasticity, heteroscedasticity-consistent estimation of the covariance matrix of the coefficient estimates was done. Standard errors provided in Table 4 are heteroskedasticity adjusted.

The results show that all considered ESG scores have influence only on Return on Assets. There is a positive relationship between Social and Controversies scores and Return on Assets, that supports Hypothesis 1 stated earlier. Unexpectedly, Environmental and Governance scores and Return on Assets are negatively related, that contradicts to Hypothesis 1.

Ceteris paribus, controlling for firm-specific time-invariant characteristics and year-specific shocks, with 1 point increase in Social and Controversies scores, ROA on average increases by 0.22 and 0.07 percentage points respectively, while with 1 point increase in Environmental and Governance scores, it on average decreases by 0.06 and 0.16 percentage points respectively.

Positive relationship found was expected by the author and from the business point of view the higher the Social score is the better the working conditions in the company are, hence higher motivation and productivity of workers as well as share of talented workers, which in turn results in higher profitability. Positive effect of Controversies score is also expected as the low Controversies score frequently could be associated with legal settlements of litigations and hence lower profitability. Hence better Controversies score is associated with reduction of such costs and increase in profitability.

Inverse dependance between Environmental score and Return on Assets can be explained by the costs of investments related to environmental issues. Especially concerning with installment of new fixed assets (e.g. equipment) that takes time to pay off. Resulting expenses directly affect lower profitability.

Negative relation between Governance score and ROA is the most unexpected finding. The author associates it with the impact of implementation of CSR strategy, as CSR strategy is one of the factors included in evaluation of Governance score according to Refinitiv methodology. Implementation of a better CSR strategy may lead to decline of profitability due to additional costs. Moreover, there is an opinion existing among researchers stating that CSR strategy is rather individual initiative (as result of individual values) rather than corporate one. Consequently, this may cause an agency problem, as "individual managers do champion social responsibility as opposed to simply acting as agents of corporate policy" (Hemingway et al ,2004).

The second model results show that only Environmental and Governance scores have statistically significant impact on Net Profit Margin. The coefficient estimates are 0.5 and -1.22 respectively, meaning that companies with higher Environmental performance tend to have a higher Net Profit Margin, while with higher Governance score – lower NPM. Model results are partially in line with Hypothesis 1.

Companies with high Environmental score could be characterized as those have a slight negative impact on environment. Such companies do not become subject to penalties related to environmental pollution. Thereby they eliminate possible additional costs, which positively influences their Net Profit Margin.

Size variable is statistically significant in both models and has a positive impact on both ROA and Net Profit Margin. The results were expected as the size positively influence market power of a company. Moreover, bigger companies have an opportunity to use economies of scale increasing their profitability. Positive impact of efficiency on dependent variables in both models was also expected, as higher efficiency of assets in generating revenue leads to higher company's profitability.

It is worth noticing that both size and efficiency have higher impact on Net Profit Margin. While ceteris paribus, controlling for firm-specific time-invariant characteristics

and year-specific shocks, 1% increase in company's total assets leads to only 0.03 percentage points average increase in ROA, 1% total assets increase also leads to 0.22 percentage points average increase in Net Profit Margin. At the same time, ceteris paribus 1 percentage point increase in total asset turnover leads to 52.7 percentage points average increase in Net Profit Margin and only 8.9 percentage points average increase in ROA. Obtained results concerning direction of interdependence are overall consistent with existing literature (Sushil Dev Subedi, 2018; Dogan, 2013).

Age and growth rate turned out to have no impact on profitability of company. These results partially in line with the literature, as age is mainly found to have positive and statistically significant effect (Buallay et al., 2017), while other researchers find no impact of growth rate on ROA (Ham, 2018).

According to R squared, two models explain 35% of ROA and 21% of Net Profit Margin, respectively.

Taking into account quite high correlation between some variables, noted above, Variance inflation factor (VIF) test was applied.

Table 5. VIF test results (Model 1)

Model	Env	Soc	Gov	Controv	SIZE	AGE	GROWTH	EFF
1	3.719	3.918	1.623	1.324	1.906	1.229	1.119	1.095
2	3.721	3.924	1.624	1.316	1.911	1.230	1.115	1.094

Results, presented in Table 5 indicate that multicollinearity problems in models 1-3 are unlikely existed, because all variables have VIF values < 10.

5.2. Fixed effect regression model results for market value

Time-firm fixed effect regression model was estimated also to determine the impact of ESG performance on company market value. Tobin's Q ratio as a proxy for market value was used as a dependent variable in the model, while the set of independent variables stayed the same as in previous models. Additionally, the set of control variables changed and consisted of company's size, age, country of incorporation, ROA, leverage and dividend payout ratio.

Table 6. Results for market value (Tobin's Q)

Variable	Coefficient	SE
Env	-0.00047	0.8924932
Soc	0.00581	0.1043264
Gov	0.00559**	0.0095150
Controv	0.00139	0.3705630
SIZE	-0.19359***	0.0002320
AGE	-0.00256***	1.087e-05
ROA	0.15417***	< 2.2e-16
LEV	0.00339	0.6271219
DIV	0.00348***	3.655e-06
Statistical Significance Level	* p<0.05 ** p<0.01 *** p<0.001	
R^2	0.9469	

Variance inflation factor (VIF) test was also applied to Model 2 in order to identify whether multicollinearity problem exists there. Results of the VIF test are presented in Table 7.

Table 7. VIF test results (Model 2)

Model	Env	Soc	Gov	Controv	SIZE	AGE	ROA	LEV	DIV
3	4.387	4.651	1.764	1.378	2.021	1.170	1.148	1.077	1.223

According to the VIF test results, there seem to be no multicollinearity problem in model 2, as variables' VIF values are less than 10.

Heteroskedasticity problem was also detected in model 2 by Breusch-Pagan test. Heteroskedasticity consistent standard errors are presented in Table 6.

The model gave mixed results, part of which confirmed Hypothesis 2 and part of which rejected it.

The results show that only Governance among all the scores has statically significant effect on market value of companies. Model results indicate that ceteris paribus, controlling for firm-specific time-invariant characteristics and year-specific shocks and control variables, with 1 point increase in Governance score, Tobin's Q ratio on average increases by 0.006 points. This finding confirms that investors are more inclined to value companies with better management. In addition, high Governance score is likely to be a consequence of good CSR strategy. Influencing company's image, good CSR strategy also seems to be rewarded by investors. Thus, both factors would increase company's market value.

As it was expected by the author, size and age of the company are negatively related with its market value. Young companies are commonly associated to be small. As small companies are inclined to grow faster than mature one, they expect to generate higher return. This characteristic is rewarded by investors, increasing the market value of company. These results are consistent with previous results of other researchers (Yaghoub et al., 2021; Dugasova, 2019).

According to results of the model, ROA have positive impact on Tobin's Q ratio. As ROA is one of the indicators of company's profitability, the company with higher profitability would be more valued by the market. Positive relationship is also observed between dividend ratio and Tobin's Q ratio. Dividends are considered by investors as a return on investments made. That is why companies with higher dividend ratio have higher market value. Contrary to the expectations, the model shows no impact of leverage on Tobin's Q ratio. Obtained results, except for leverage, are in line with Irawan's results (Irawan, 2021).

According to R squared, 95% of variation in Tobin's Q ratio is collectively explained by independent variables. However, the biggest part of variation seem to be explained by the set of control variables rather then ESG factors.

In the next chapter, the conclusions and recommendations that stem from the discussed results are presented.

CHAPTER 6. CONCLUSIONS AND RECOMMENDATIONS

The aim of this study was to find whether relationship between ESG factors and profitability, market value of European Pharma & Care companies exists and to determine the most influential of ESG factors. This research is especially relevant in the light of increasing integration of ESG factors into all spheres of business and investment processes.

The impact of ESG scores on profitability and market value of the company was estimated using time-firm fixed effect regression model. The model was controlling also for size, age, growth rate, efficiency, leverage and dividend ratio of companies, as well as for country of foundation. The sample for research consisted of companies from Pharma & Care sector, located in Europe.

In general, empirical evidence supports the existence of interdependence between ESG performance and financials of companies. To be more precise this study results are mixed, meaning the findings include both positive and negative relationship, as well as no relationship between ESG performance and profitability, market value indicators of companies.

Pharma & Care companies' profitability is mostly affected by Environmental and Governance pillars. While Governance pillar is found to decrease profitability (-0.16 pp in ROA and -1.22 pp in NPM for every additional point in the score, all else being constant), Environmental pillar could have both positive and negative impact on profitability. -0.06 pp in ROA and +0.5 pp in NPM change is associated with every additional point in Environmental score, all else being constant. According to the results of the study, Social and Controversies pillars also have an impact on profitability, however positive impact is observed only on ROA and no impact is found on NPM.

The results of the study indicate that overall, there is no strong relationship between ESG factors and market value of Pharma & Care company. Ceteris paribus, with 1 point

increase in Governance score, market value of company on average increases by 0.006 points. It was observed no impact of Environmental, Social and Controversies scores on market value of companies during this research.

Based on results of the study, some recommendations can be given for the European Pharma & Care companies. First of all, ESG policy should be integrated in business strategy, as it has an influence on profitability and market value of company. ROA is the most influenced by ESG factors indicator, that should be considered during integration process. Although the estimated impact is not large in magnitude, industry and overall market trends point out further increasing importance of ESG factors.

Second, companies should develop and implement strategies and policies to generate trust and loyalty with its workforce, customers, and society. For example, competitive remuneration, good working conditions and transparent corporate culture for employees; loyalty programs for customers and make a positive social impact externally through various programs. All this influence company's Social score, consequently, increases its' profitability. It is also important for Pharma & Care companies' profitability level to take care of reputation to prevent litigations.

Third, companies should responsibly and consciously approach the development of policies regarding resource use, emissions and innovation performance. However high Environmental score have a negative impact on ROA. So, implementation of mentioned policies should be gradually so as not to greatly reduce profitability. The same goes for implementation of CSR strategy, that could negatively affect profitability.

Fourth, results of the study indicate that investors are inclined to more appreciate companies with better management, that influence company market value. In this connection, it is important for Pharma & Care companies to be governed by highly qualified management acting in the best interests of its long-term shareholders.

Several directions for future research areas can be identified to better understand the influence of ESG factors on profitability and market value of companies from Pharma & Care industry. Firstly, it could be useful to decompose Environmental, Social and Governance pillars scores on the scores of categories that make up these scores. This will give an understanding of which categories make the most significant impact on company's financials. The results of such study would be helpful for the development of ESG strategy of the company. Moreover, future research with more balanced company data is recommended.

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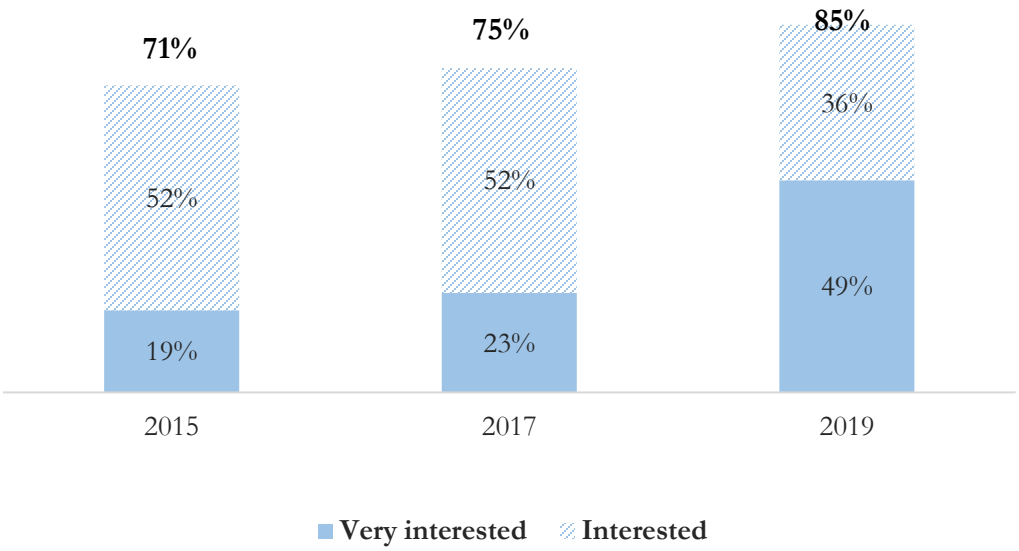
APPENDIX A

Figure A: Individual investors' interest in sustainable investing, 2015-2019 (%)



Source: Morgan Stanley Institute for Sustainable Investing (2019)

APPENDIX B

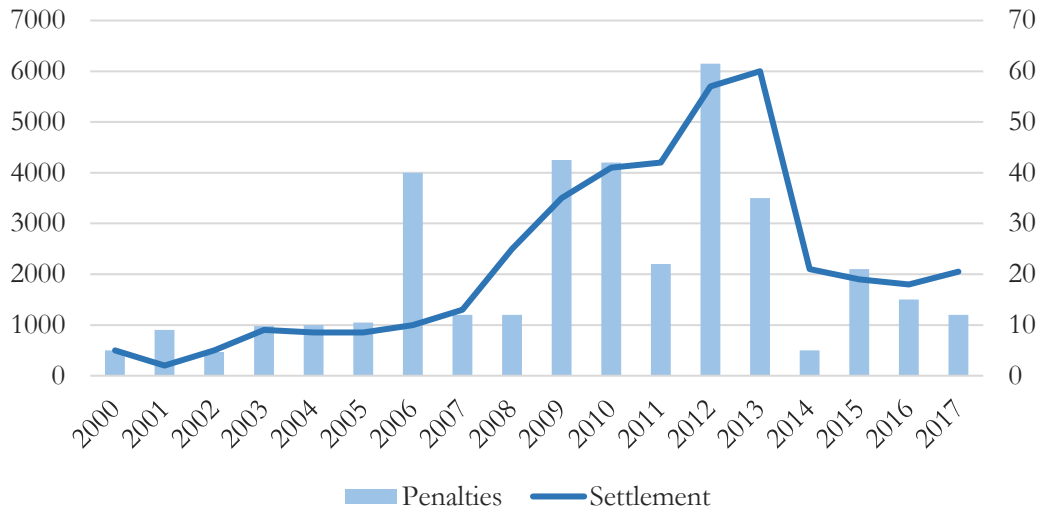
Table B: Growth of sustainable investing assets by region, 2016-2020 (billions)

Region	2016	2018	2020	Growth 2016-2018	Growth 2018-2020
Europe (EUR)	€11,045	€12,306	€10,730	11%	-13%
United States (USD)	$8,723	$11,995	$17,081	38%	42%
Canada (CAD)	$1,505	$2,132	$3,166	42%	48%
Australasia (AUD)	$707	$1,033	$1,295	46%	25%
Japan (JPY)	¥57,056	¥231,952	¥310,039	307%	34%

Source: Global Sustainable Investment Review 2020

APPENDIX C

Figure C: Pharmaceutical industry penalties ($ million) and settlements, 2000-2017



Source: RBC Capital Markets, 2021