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HOW FINANCIALS MARKETS REACTED TO COVID-19 PANDEMIC

La reazione dei mercati finanziari alla pandemia da COVID 19

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Indice

ABSTRACT

Questa tesi ha l'obiettivo di analizzare quali sono stati gli impatti all'interno dei mercati finanziari della crisi economica e finanziaria innescata dalla pandemica Covid-19. In particolare modo, vengono analizzate le società quotate di nove paesi: Italia, Francia, Germania, Regno Unito, Spagna, Paesi Bassi, Belgio, Stati Uniti d'America e Cina. Analizzando ogni settore industriale si vuole capire quali sono stati i settori più colpiti e i settori che, al contrario, hanno in un certo senso beneficiato della crisi. Ogni settore viene analizzato per ogni sua specificità, per cercare di capire al meglio da che cosa è giustificata la reazione di ogni società e dell'intero campione.

INTRODUCTION

The aim of this thesis is to analyse and understand how listed companies (and financials markets as a whole) had been affected by the tragic pandemic that occurred in the world in 2020. This crisis was the first that was cause by health emergency, therefore, each companies and each sector was affected in a different manner. We will examine nine countries among the most affected by Covid-19 pandemic: United States of America, United Kingdom, Germany, France, Italy, Spain, Belgium, Netherlands and China. The first chapter contains a generic view of Covid-19 pandemic from both health side and economic side. In the second chapter, we show how we decide to evaluate the companies, in order to understand the relation with Covid-19 crisis. Moreover, we illustrate what companies we decided to take into consideration, among countries and sector (basing our analysis on Global Industrials Classification Standard (GICS) industry classification). The third chapter is the core section of the thesis. In this chapter, we illustrate the results obtained by the analyse of each, in order to evaluate how they were affected by Covid-19 pandemic. To examining the financial dynamics inside each sector we went into sectors with the higher level of specificity in relation to sub-classification. The fourth chapter contains a further study in our sample's companies in relation to risk-side of companies. Calculating the beta of each companies, we evaluate the correlation between the stock and the market.

CHAPTER 1

ECONOMY AND FINANCE: COVID-19 EFFECTS

1.1 COVID-19 PANDEMIC

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is the strain of coronavirus family that causes the Coronavirus Disease (Covid-19) pandemic in 2020. The first case was reported in the city of Wuhan, capital city of Hubei (China), in December 2019. Environmental samples taken in a food market in Wuhan were positive for the virus, so it supposed that the market could be the origin of the virus, or at least it played a role as an amplifying setting for the initial spread. Covid-19 distress started in the city only at the beginning of 2020, when the national authorities in China reported to World Health Organization (WHO) 44 case-patients of the virus. The cases increase exponentially day by day reaching a peak of 15’152 new cases on February 13, 2020. The Chinese government took quarantine-restriction in order to contain the virus diffusion. It asked to sixty millions of people in the province of Hubei to stay at home unless the emergency took place. People could leave home only in emergency cases, to buy food and essential items and migrant workers must respect the 14-day quarantine period coming back to the country. The restrictions allowed the contagion curve to go down but did not avoided the virus diffusion in the rest of the world. Exactly when the contagion curve began its descending trend in China, with total cases reaching 75’571, the coronavirus attain in Europe with the first 47 cases reported in nine different European countries at the end of February (although afterwards was discovered the virus presence outside China even before). Firstly in Italy, then Spain, followed by Germany, France and United Kingdom, the virus spread all around in Europe because of its high reproduction number (reproduction rate, or r0, is the average number of people infected by one person in a susceptible population). On June, 2020, WHO estimated r0 between 2 and 4, near the one of Spanish influenza of 1918-1919 that caused the deaths of about 50 million of people (that was one third of global population). This lead the WHO to declare on March 11, 2020, the Covid-19 outbreak a global pandemic. Like China, also European government took its measures to contain the virus spread through lockdown measures. The first country to announce a lockdown, in line with daily new cases, was Italy on March 9, 2020, followed by Spain, France, Germany, Belgium, United Kingdom and Netherlands (the latter with less restrictive measures). Like China, European countries reached a peak (38’303 new cases in the continent at the end of March) followed by the decline. However, the virus’s spread has not been the same in China and Europe. In China, Covid-19 produce its effects only from January to early March; from mid-March until the end of 2020 the cases had been containing. In Europe the virus diseases from end of February to end of May was only the first wave. In September, a second wave came in all Europe, after a flat period during summer, stronger than spring period. In fact, the peak reached in autumn was five time bigger than the other (199’928 new cases), registered on November 8, 2020. Differently from Chinese authorities, the European governments chosen to live together Covid-19, leading probably the second wave of Covid-19 in autumn. The situation is one more time different in United States of America. We can speak about the first and the second wave of Covid-19 but starting from the half of March, the contagion curve in USA never stop, due to another different management pandemic. The government took lockdown measures in order to contain the diffusion but maybe the reopening phase started too early, when the daily new cases was still high. Like Europe, the second wave in autumn arrive stronger than the first. At December 31, 2020, the world’s coronavirus cases amount to 81'477'457 and total deaths are 1’825’074, with a case-fatality ratio of about 2.2%. Approximately one in five people infected are from USA, which is the country with most Covid-19 cases, followed by India and Brazil. Czech Republic has the higher total cases to

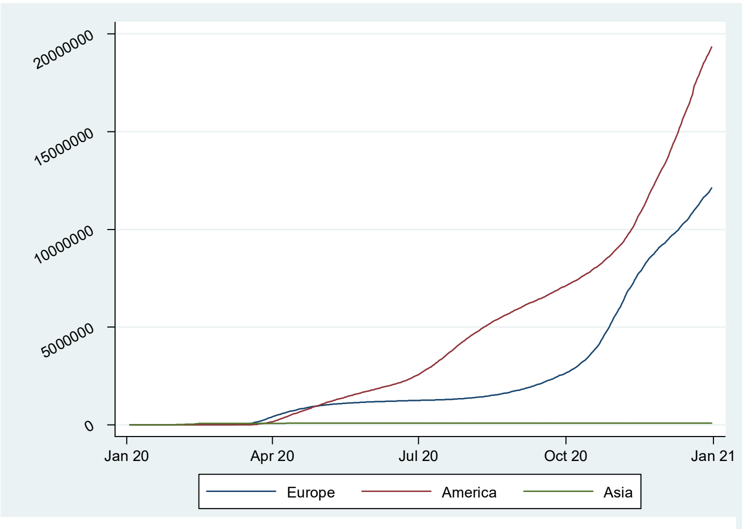

Figure I.1 – *Contagion Curve Covid-19 Cases (Source: WHO Database)* population ratio (6.72%) due to a small population of 10'694'000 people, followed by the giant USA. With 123'845 deaths over 1'401'529 total cases Mexico is the country with the higher case fatality rate (8.84%), with a population of 128'933'000 people, while Belgium has the higher total deaths to population ratio (0.17%) but with small population as Czech Republic, followed by Italy (0.12%, a most bigger country).

Like each virus, vaccine and treatment strategy will be very important in order to contrast Covid-19. At the beginning of 2021, SARS-CoV-2 does not have a specific treatment apart from supportive care, supplemental oxygen and mechanical ventilator. The main drug used, approved by both Food and Drug Administration (FDA) and European Medicine Agency (EMA), is Veklury, an antiviral medicine used in adults and adolescents with pneumonia requiring supplemental oxygen. EMA also approved the usage of Dexamethasone as another treatment, but tens of drugs are currently tested. On November 2020, they were announced three vaccine for Covid-19. The companies Pfizer (USA) and BioNTech (Germany) announce on November 9, 2020 the achievement from phase 3 study of its vaccine to implement to Covid-19 patients, declaring an effectiveness of more than 90%. One week later, the American Moderna followed the firsts company declaring a vaccine with an effectiveness of more than 94%. The third (and last, at the beginning of 2021) vaccine to be announced was from AstraZeneca, effective at 70% for Covid-19 patients. According to WHO, there are 60 vaccine in clinical development and 172 vaccine in pre-clinical development, confirming the numerous efforts from companies all over the world to discover an effective vaccine to contrast Covid-19. The importance of vaccine may be supported by the example of measles virus, which had a reproductive rate between 12 and 18 and not a specific treatment; the arrival of vaccine in 60s permits to reduce of about 70-80% the number of reported measles in fifteen years (although the fatality rate was lower).

1.2 COVID-19 IMPACT ON ECONOMY

As mentioned before, the Governments took measures that limited the movement of people in order to contain the spread of coronavirus. This set of measures contain also the closure of shops and business that run the so-called non-essential activities. Bars, restaurants, hotels, industrial companies, businesses involved with tourism are some example of enterprises that had to interrupt their activities because of lockdown measures. When production and consumption are suspended in this manner, with people cannot go work, the economy slowdown is the natural consequences. The economy downturn has took place in the majority of the world, some country more, some country less, but the main characteristic is both the slowdown in small-medium term and especially the uncertainty for the long term outlook. Sure enough, a lot of economic indicator had decrease its actual values and futures expectation, starting from GDP. According to International Monetary Fund forecasts, all advanced economies in the world have a negative outlook for GDP trend in 2020, expect for China. Chinese GDP will growth of about 1.9% in 2020, continuing non-stop growth rate for more than 40 years. The worst country in the world is Libya, with a expected contraction in real annual GDP of -66.7%, due to Covid-19 pandemic but especially to oil issues and internal conflicts. Regarding sample's companies, they all stop them growth after 5 years of positive rate: the worst are Spain with -12.8% annual rate and Italy -10.6%, mainly due to their economic and debt situations. Then France -9.8%, United Kingdom -9.8%, Belgium -8.3%, Germany -6%, Netherlands -5.4% and United States of America -4.3%. Nevertheless, the outlook for the period 2021-2025 claim an important recover in 2021 (+3.9% in Advanced Economies) followed by adjustment years, even if there is a high uncertainty. The economy contraction result also in unemployment rates, the number of unemployed persons as a percentage of the total labour force. USA's labour market is the most damaged in the world (after small countries as Belarus, Mauritius, Fiji, Belize, and Dominican Republic): the unemployment rate has reach

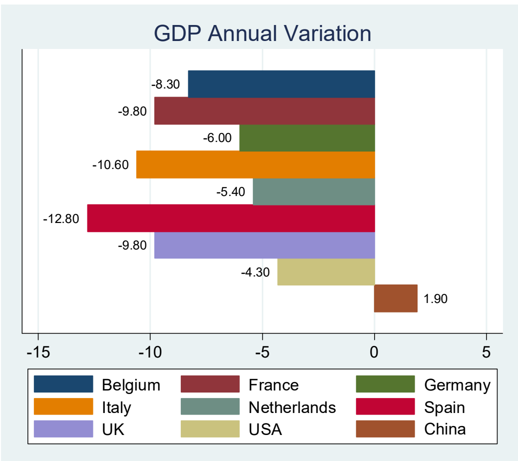

Figure II.1 – *GDP Annual Variation (Source: IMF Data)*

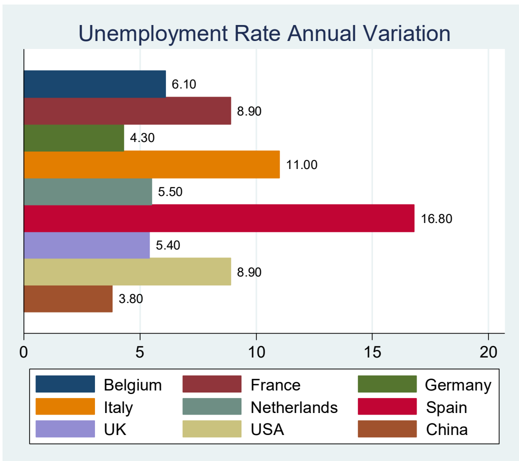

Figure III.1 – *Unemployment Rate Annual Variation (Source: IMF Data)*

8.9% in 2020, an increase of +140.54% from previous year, near of the 9.6% of 2010 after the financial crisis of 2007-2008. Netherlands follows USA in terms of jump from 2019 to 2020 (+61.76%) but unemployment was never a problem for the country, thanks to past low levels. UK and Germany unemployment rates line up respectively to 5.4% and 4.3% in 2020. In Spain, unemployed persons arrive to 16.8% in 2020, after the country halved its unemployment rate from 2013's peak (26.1%). Belgium and Italy suffer an increase of 12.96% and 11.11% in the last year, while China and France are the less damaged with an increase of only respectively 5.56% and 4.71%. Overall, all the countries of the sample should recover them increases in unemployment rate in about 3 years, according to IMF estimates. As regards national balance sheets, all countries have in common a higher debt and expenditure and lower savings in 2020. Gross debt (consists of all liabilities that require payment or payments of interest in percent of GDP) of sample's companies increase on average 22.14% from 2019, a "black year" as 2009 (when the average was 17.83%). Overall, with debt levels already at historic highs, this could lead to cascading defaults and financial crises across many economies. Moreover, all economic government response are based on massive public spending and gross debt will grow further. Italy and Spain are confirming them enormous Gross debt, realizing the personal record with an amount of respectively 161.8% and 123% of GDP. It is important to note that, according to IMF forecasts, four countries of the sample (China, France, United Kingdom and United States, that are four of the seven nation worldwide by GDP) will continue the negative trend on debt, reaching them peak of Gross debt in percent of GDP in following years. The situation is alarming, considering that the debt was already at historical levels, so the probability of cascading defaults and financial crises is increasing. One of the main consequence of the stop of production and consumption due the Covid-19 pandemic is the shrinkage of international trade. More or less, import and export had decline in all countries of the sample. Spain is one of the most damaged: Spanish volume of export of goods and services decrease of 25.49% and volume of import decrease of 22.33%, while its current account has dropped for about 75.55%. Then we have the others countries which most operates with foreign countries: Italy (volume of export -17.82% while volume of import -19.03%), United Kingdom (export -16.61% and import -19.98%), France (export -16.77% and import -11.37%) and United States (export -12.62% and import -12.31%). The latter is known for enormous deficit on current account balance (in 2006 took the minimum of -816 billion dollars) whereas the others remain in line with past years. As regards monetary and inflation situation, according to Consumer Price Index (CPI) all countries reported a higher deflation in 2020, with Belgium, Italy and Spain near to their minimum value of last ten years. The higher variation is registered by Netherlands with -1.5% from 2019, while China continue its inflation trend started five years ago.

1.3 COVID-19 IMPACT ON FINANCIAL MARKETS

Financial markets react more rapidly to unexpected shock than real economy but their trend is disconnected and shifted. Indeed, stock instruments had registered their minimum in March, while economy indicators in May. As regards stock indices, the chart below illustrate the trend during 2020 of the main stock indices of our countries, highlighting the big losses reached in March. The seven European stock indices of the sample lost on average 35.6% (from -33.16% of AEX INDEX

Figure IV.1 – *National Stock Indices 2020 Trend (Source: Elaboration on Eikon Data)*

to -37.19% of CAC 40), S&P 500 (USA) lost 30.75% while SSE 180 index (China) lost only 14.7% (thanks to the better government of Covid-19). The stock indices of the seven European countries included in the sample (BEL 20, CAC 40, DAX 30, FTSE MIB, AEX INDEX, IBEX 35 and FTSE 100) registered in March 12, 2020 the worst stock market close of the last 20 years. Also S&P 500 (-11.98% on March 16, 2020) registered the biggest loss of the last 23 years (since Black Monday in 1987) even worse than the Lehman Brothers crash. The Chinese main stock index

(SSE 180) was the least affected with a loss of only 14.7% in the first weeks of the year, smaller loss than the Chinese stock market bubble of 2007. However, only four stock indices recovered coming back to pre-crisis levels. The best performance is of the Chinese Index with +20.36% (as illustrated by the chart above is on top) then it follows the S&P 500, recovering an amazing 67.88% from the minimum reached in March 23, 2020, it is able to close the year with an annual performance of 16.26%. DAX 30 and AEX Index are the other two stock indices with positive performance in 2020 (respectively +3.55% and +3.31%). Going into negative field FTSE MIB, CAC 40 and BEL 20 registered not so bad performance closing the 2020 respectively at -5.42%, -7.14% and -8.46%. The worst are United Kingdom (FTSE 100) and Spain (IBEX 35): Brexit issues influenced the former while the latter pay the economy problems. FTSE 100 close the year at -14.34%, IBEX 35 registered a performance in 2020 of -15.45%. Considering the 2020 performance among sector, we use the Global Industrial Classification Standard (GICS) here and in the whole thesis. The chart below illustrate the trend on 2020 of the eleven MSCI world sectorial indexes. Each sectorial indices took a minimum in March, followed by a recover depending on sectors. The worst decline is by MSCI World Energy Index with -59.11%, followed by MSCI World Financials Index-42.46%, the two sector which was more affected by Covid-19 pandemic and consequences. The Energy sector has been in difficulty for the entire year, closing 2020 with a bad -34.40%. Quite the opposite, MSCI World Consumer Discretionary Index had the

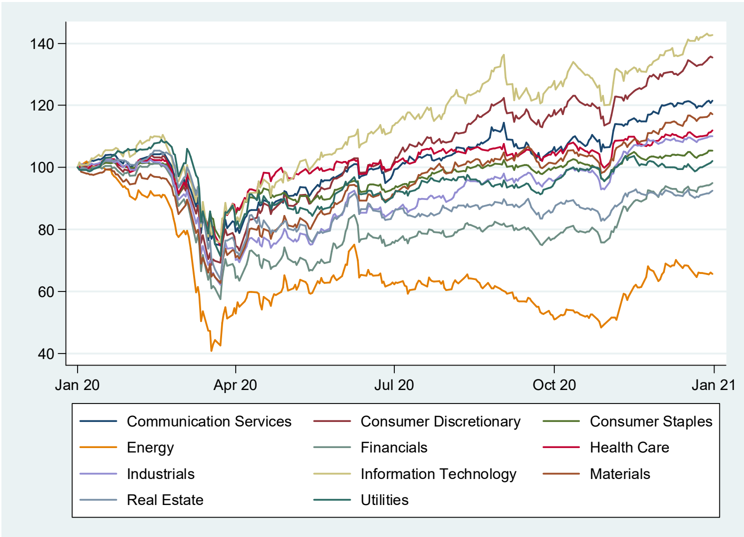

Figure V.1 – *MSCI World Sectorial Indices 2020 Trend (Source: Elaboration on Eikon Data)*

same performance but in positive (+35.44%), recovering a 97.44% from the minimum reached in March 18, 2020. MSCI World Information Technology Index did even better, closing the year with a performance of 42.65%, the best among sectors. The others sector and relative stock indexes recovered more or less to pre-crisis levels (from +2.1% of MSCI World Utilities Index to 21.51% of MSCI World Communication Services Index) except for two: Financials and Real Estate. MSCI World Financials Index lost -5.02% in 2020 while MSCI World Real Estate Index even worse -7.49%. The performance of sectorial indices perfectly reflect the effective trend of companies amidst sectors, as we will analyse later. The pandemic arrival make financial markets more volatile, as underline by the charts above. Measuring the volatility through standard deviation, we obtain the chart on the left, which illustrate the volatility for our nine stock indices during 2020. As expected,

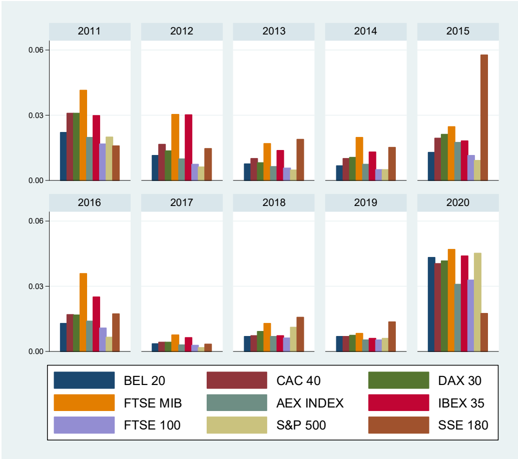

Figure VI.1 – 2020 *Volatility of National Stock Indices (Source: Elaboration on Eikon Data)*

Figure VII.1 –*Volatility of National Stock Indices of last ten years (Source: Elaboration on Eikon Data)*

in March the volatility levels were higher than in the others month. In addition, 2020 was the highest year by volatility of the last ten years, as underlined by the chart on the right, except for SSE 180 Index that had a higher volatility during 2015 (due to stock market turbulence during that year). History tends to suggest that the market will be so volatile even in 2021 (like 2009 after the large volatility of 2008) especially because the pandemic matters still go on. As regards government bond, the chart below illustrate the yield for the ten-year bonds of the nine sample's countries from 2010 to today. The year 2020 confirm the descending trend of government bond yield over the last 8-10 years. Italy and United States of America had the worst decline in 2020 losing nearly 100 basis point. The first took 2.17 in April 2020, then it declines to 0.51 at the end of the year. The latter remain in the same range during 2020 (near 1) after the big decline between 2019 and 2020. Four of nine countries of the sample had negative yield. Germany and Netherlands enter

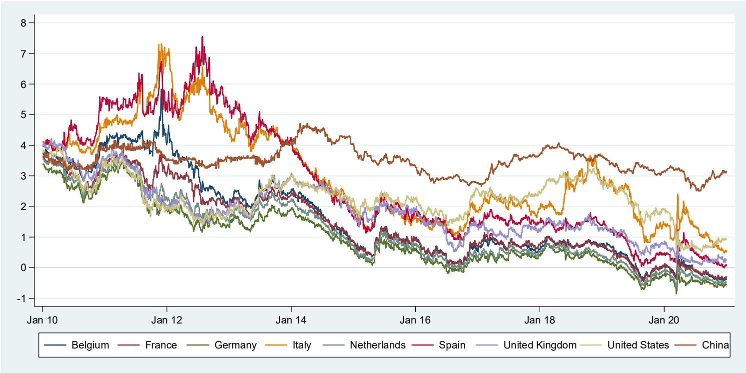

Figure VIII.1 – Government Bond Yields of last ten years *(Source: Elaboration on Eikon Data)*

in negative field in March 2019 and never came back above zero, while Belgium and France cross the zero-line in March 2020 but in summer they came back under zero closing the year respectively at -0.38 and -0.33. Spain went under zero for the first time in history on December 18, 2020 but it last only that day and now the yield remain near zero. Ten years United Kingdom government bond yield is now at historical minimum, swinging for the whole 2020 above zero. Finally, Chinese bond yield in the last ten years remain nearly the same, even if it took a minimum in July 2020 (2.5). Overall, 2021 can be similar to 2020 for government bond yields of our nine countries, continuing to be unattractive assets. Maybe investors will switch to developed market government yields, that now are low and prices expensive, or to corporate bonds, that have better yields but companies default risk is very high today.

CHAPTER 2

VALUATION MODEL AND DATA

2.1 VALUATION MODEL

On March 2020, the stock market suffered deep losses exactly when WHO declared the Coronavirus Disease a pandemic, due to cases increase (on March 11, 2020 the global cases was 121'189, nine months after they amount to 81'477'457). People must stay at home and many companies had to close, while others could continue their activity through smart working. Anyway, the lockdown period in spring was followed by recover in summer in both financial market and real economy. The autumn take with it the second wave of Coronavirus cases and the real economy stop again (although this time companies maybe were more prepared) while financial markets react differently amidst countries around the world. The aim of this thesis is to understand how listed companies had (and are) reacting to Covid-19 pandemic. At the beginning of the year, analysts believed the continuum of bull market started 10 years ago, especially in USA. The 2019 was an amazing year for stock market, in certain cases the best of last ten years. S&P grew by 28.88%, SSE 180 by 30.39% while the average growth of our seven European countries amounted to 21.42%. The arrival of Covid-19 make stock prices high volatile and increase uncertainty. However, listed companies did not react similarly. Some companies learnt to face the crisis and how to manage it, others were unbelievable damaged and they had not pick up again, even more there are companies that benefited from pandemic and went incredible up. Anyway, all companies registered a certain performance in 2020. We want to calculate for each company the so-called *Covid-19 effect* through the difference between the stock price performance in 2020 and the initial outlook at the beginning of the year. In order to estimate company outlook, we calculated a synthetic indicator computing the most important financial metrics, to consider all the main areas of a company (stock valuation, profitability, solvency etc.). The metrics are Earning per Share, Price to Sales, Price to Earnings, Price to Book Value, EBIT Margin, Return on Equity, Return on Debt and Book to Market ratio. We calculated the Actual value of our indicator (considering the average of the two past years, 2018 and 2019) and its Estimate value (based on company prediction as of January 2020, before Covid-19 pandemic). The percentage difference between the Actual value and the Estimate value is the outlook for the company. Let us make an example with one the most famous company: Netflix Inc. The US company 2020 outlook amounted to +42.76%, based on our synthetic indicator, but the company did even better. Netflix started the year at $325.9 and it finish it at $540.73, registering an upside of 65.91% in 2020. So, the Covid-19 effect for Netflix amounts to 23.15%, it means that thanks to Covid-19 the company has been able to outperform the initial outlook by 23.15%. Surely, Netflix is one of the most beneficiary of stay-at-home restrictions but the situation change company by company. Therefore, the companies are divide in two groups:

- Companies that benefited from Covid-19 pandemic (positive Covid-19 effect).
- Companies damaged from Covid-19 pandemic (negative Covid-19 effect).

To evaluate the situations all over the world we decided to consider the advanced economies (even in relation with stock market) and the most hard-hit countries. First of all China, the country were all began and were unexpectedly the pandemic last fewer. Then, inside Europe, we contemplate the most important countries: United Kingdom, Germany, France, Italy, Spain, Belgium and Netherlands. Lastly, about new continent we include United States of America, the biggest country in the world by GDP and the country with most Coronavirus cases. Countries hard-hit such as India, Brazil and Russia were not take into consideration due to the non-mature economy and non-advance financial markets. Others such as Canada and Japan, that are mature in both economy and financial market, were not considered because of not so hard-hit by Covid-19. Hence, we took listed companies on the main stock exchanges of country above obtaining 5’313 companies.

2.2 DATABASE

To divide companies in Industrial Sector we decided to use the Global Industrial Standard Classification (GICS) one of the most used in finance, that consider 11 Sectors and other sub-classifications (24 Industry Group, 69 Industries and 158 Sub-Industries). Moreover, another level of classification is represented by market capitalisation, in the following category: Micro cap (market capitalisation less than

GICS Sector		Country		Market Cap	
Communication Services	232	Belgium	64	Micro cap	1’001
Consumer Discretionary	632	France	267	Small cap	1’811
Consumer Staples	264	Germany	296	Mid cap	1’593
Energy	205	Italy	153	Large cap	870
Financials	724	Netherlands	65	Mega cap	34
Health Care	794	Spain	84		
Industrials	893	UK	615		
Information Technology	682	Europe	1544		
Materials	428	China	1’206		
Real Estate	322	USA	2’559		
Utilities	133				
Total: 5'309					

Table I.2 – Sample composition *(Source: Elaboration on Eikon Data)*

$300mln), Small cap (market capitalisation between $300mln and $2bn), Mid cap (market capitalisation between $2bn and $10bn), Large cap (market capitalisation between $10bn and $200bn) and Mega cap (market capitalisation over $200bn).

In order to evaluate the company positioning during 2020 we built the scatter plot below, y-axis represent the 2020 initial outlook while x-axis represent the Covid-19 effect. In this way we can divide the plot in four quadrant and each one represent a specific situation. The first quadrant is on top right, it contains the company whose outlook was positive and which have a positive Covid-19 effect, it means that they

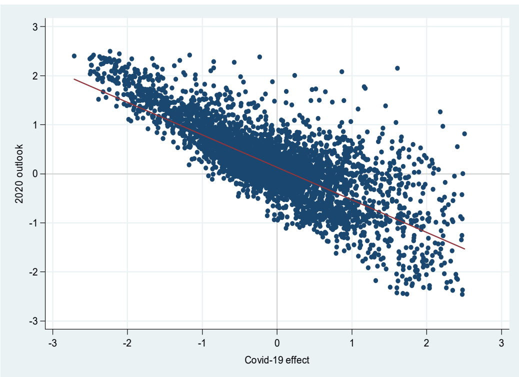

Figure I.2 – Companies Positioning on scatterplot *(Source: Elaboration on Eikon Data)*

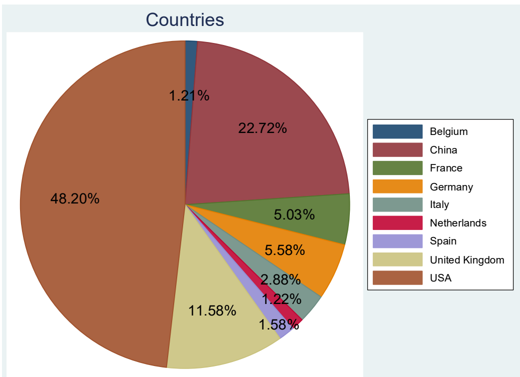

Figure II.2 – Sample composition over countries *(Source: Elaboration on Eikon Data)* outperform the initial estimate. Moving counter clockwise we have the second quadrant that include companies with positive outlook and which have been damaged by Covid-19 (it is the most populated quadrant with 47.49% of sample companies). The third and fourth quadrant (respectively bottom left and bottom right) include companies that initially were estimated to decline but then they have been damaged by Covid-19 (third quadrant) or for which Covid-19 was a sort of benefit (fourth quadrant). In our sample, the 63.85% (3'390 companies) of companies had a positive 2020 outlook; it means that the remaining 36.15% (1'919 companies) was estimated to decline. Among these two cluster, the 52.57% of the 3'390 companies initially estimated to go up went effectively up (the other 47.73% registered a negative performance in 2020), the percentage decrease to 43.51% considering the initial-negative-outlook companies (it means that 1'084 companies effectively go down, confirming the initial prediction). Considering all companies, the Covid-19 effect distribution assume a Gaussian distribution, with a mean of -0.0707 (or -7.07%).

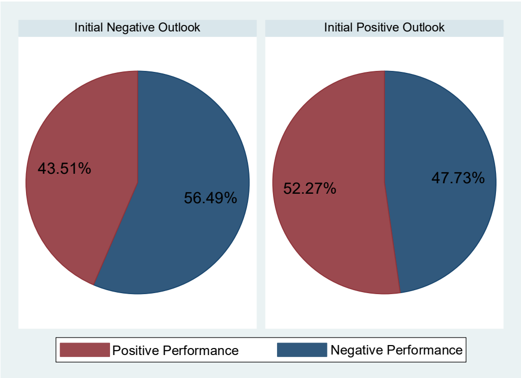

Figure III.2 – Companies Outlooks and Performances *(Source: Elaboration on Eikon Data)*

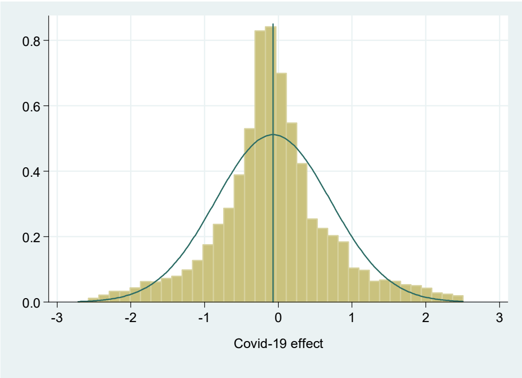

Figure IV.2 – Covid-19 Effect Histogram *(Source: Elaboration on Eikon Data)*

CHAPTER 3

RESULTS

In this chapter, we illustrate the results in different levels. First of all, we analyse the results among countries and in relation to market capitalisation (the main size criteria). Then we will analyse the results sector by sector, going inside the sectors through sub-classifications.

The panoramic table below illustrate the average data by country. All countries had positive outlook for 2020. The country less affected by Covid-19 is Germany, the only one with positive Covid-19 Effect (0.3%) which initial outlook and 2020 performance are almost equal. Germany data are result of excellent pandemic management; health care system well-provided and economy organization permitted to be one of the less hard-hit country, with a total cases to total population ratio of 2.07% (the lowest of sample countries excluding China). Speaking of China, the Asiatic country had an incredible outlook of 35.04% due to the

Country	**2020 Outlook**	**2020 Performance**	**Covid-19 Effect**
Belgium	16.84%	-6.19%	-23.03%
France	7.00%	0.33%	-6.67%
Germany	9.15%	9.45%	0.30%
Italy	22.25%	-6.45%	-28.71%
Netherlands	22.83%	6.33%	-16.50%
Spain	23.35%	-9.16%	-32.51%
United Kingdom	13.64%	-1.12%	-14.76%
USA	11.87%	9.02%	-2.85%
China	35.04%	26.91%	-8.13%
Total	**17.62%**	**10.55%**	**-7.07%**

Table I.3 – Results among Sample’s Countries *(Source: Elaboration on Eikon Data)* continuous non-stop growth of the last years. This lead China to register a negative Covid-19 effect of -8.13%, even if the 2020 performance amount to an amazing 26.91%, thanks to the little epidemic last. The others countries that closed 2020 in positive are USA, France and Netherlands (respectively at +9.02%, +0.33% and +6.33%) and they all have been damaged by Covid-19 pandemic, with the indicator amounts respectively to -2.85%, -6.67% and -16.5%. Then, Italy and Spain are the worst countries in term of Covid-19 effect. The two countries registered similar

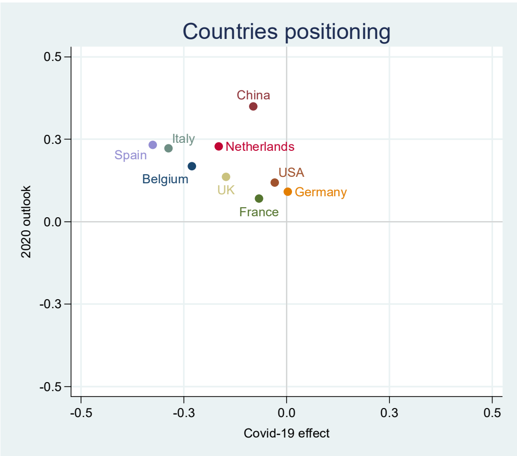

Figure I.3 – Countries positioning on scatterplot *(Source: Elaboration on Eikon Data)*

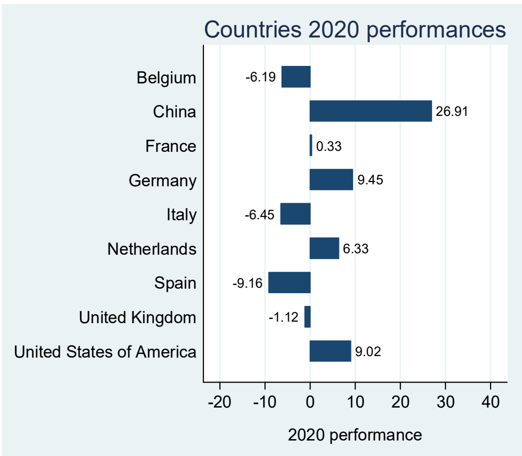

Figure II.3 – Countries 2020 performances *(Source: Elaboration on Eikon Data)*

downside (-6.45% for Italy and -9.16% for Spain) together with high expectation (respectively +22.25% and 23.35%) them Covid-19 effect amount to -28.71% for Italy and -32.51% for Spain. These results are confirming the bad situation in term of health care system and public spending of the two countries, consider that they have a deaths to population rate of 0.12% and 0.11%. However, the highest country in the world in term of deaths to population ratio is Belgium 0.17%. The hard-hit rate is proved by our results, with Covid-19 effect amounts to -23.03%. Lastly, United Kingdom registered a slightly -1.12% performance in 2020. Consider the expectation at +13.64% the UK Covid-19 effect amounts to -14.76%. As regards Market Cap Classification, as expected the Mega Cap companies had outperformed the expectation. The top 34 companies were on average estimated at +11.35% in 2020, they were able to register an even more rate of +22.81%, concluding with a

Market Cap Class	2020 Outlook	2020 Performance	Covid-19 effect
Micro cap	-6.93%	-6.16%	0.77%
Small cap	22.07%	5.81%	-16.26%
Mid cap	24.77%	19.34%	-5.43%
Large cap	23.74%	23.06%	-0.68%
Mega cap	11.35%	22.82%	11.47%
Total	**17.62%**	**10.55%**	**-7.07%**

Table II.3 – Results among companies classifications *(Source: Elaboration on Eikon Data)*

Covid-19 effect of 11.47%. The other cluster with (tiny) positive Covid-19 effect is Micro Cap companies, that was the only one with negative outlook (-6.93%): the better 2020 performance (-6.15%) permits to register a positive Covid-19 effect of 0.77%. Small cap, Mid cap and Large cap were all estimated to growth at good

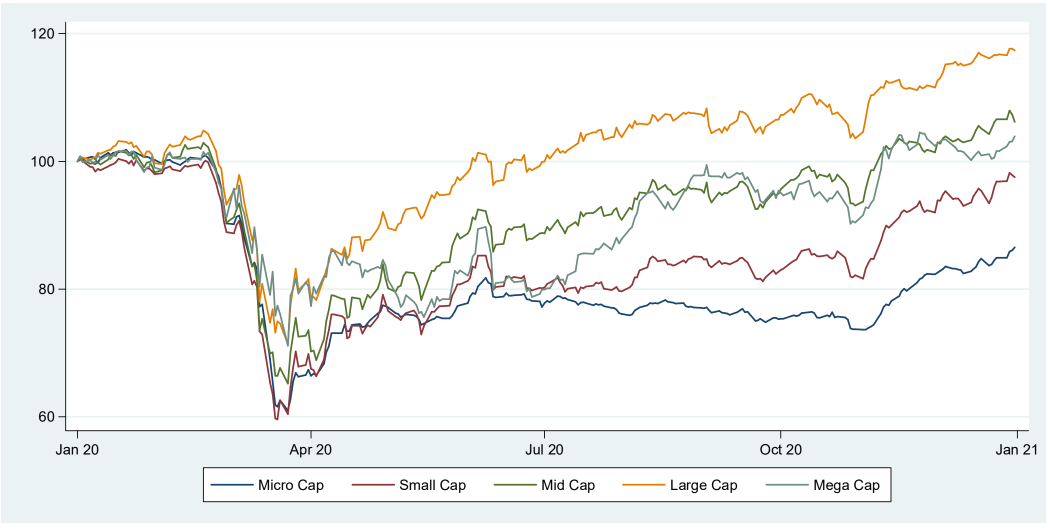

Figure III.3 – Companies classifications 2020 trend *(Source: Elaboration on Eikon Data)* level, respectively +22.07%, +24.77% and +23.74%. Mid cap and Large cap were able to close 2020 with high upside, respectively +19.34% and +23.06%, that permit to have Covid-19 effect respectively of -5.43% and -0.68%. Small cap companies are the worst in term of Covid-19 effect (-16.26%) as a result of high expectation and not-so-good performance. Concerning sectors, the table below the average statistics by sector. All sectors had positive outlook for the year (Energy the lowest with 0.77% and Real Estate with 5.28%). The year 2020 tell us that four

GICS Sector	**2020 Outlook**	**2020 Performance**	**Covid-19 effect**
Communication Services	17.32%	-2.25%	-19.57%
Consumer Discretionary	15.49%	14.12%	-1.37%
Consumer Staples	26.03%	22.23%	-3.80%
Energy	0.77%	-26.97%	-27.74%
Financials	18.79%	-8.39%	-27.18%
Health Care	10.80%	25.73%	14.93%
Industrials	21.19%	11.96%	-9.23%
Information Technology	24.73%	25.36%	0.64%
Materials	23.59%	21.14%	-2.45%
Real Estate	5.28%	-13.93%	-19.20%
Utilities	22.08%	2.70%	-19.38%
Total	**17.62%**	**10.55%**	**-7.07%**

Table III.3 – Results among GICS Sectors *(Source: Elaboration on Eikon Data)*

sectors closed the twelve months on negative field: Communication Services (-2.25%), Financials (-8.39%), Real Estate (-13.93%) and Energy (-26.97%). But only two sectors have positive Covid-19 effect: Information Technology (+0.64%) and Health Care (+14.93%). As expected, Covid-19 pandemic has benefited Health Care sector, thanks to vaccine and drugs necessary in this situation, Information Technology sector, thanks to remote working and IT services improvement. The graphs below illustrate the sample composition by GICS Sectors. Industrials sector is the one with most companies (893 companies) but considering market capitalisation the largest is Information Technology (more than $11tn) thank to the

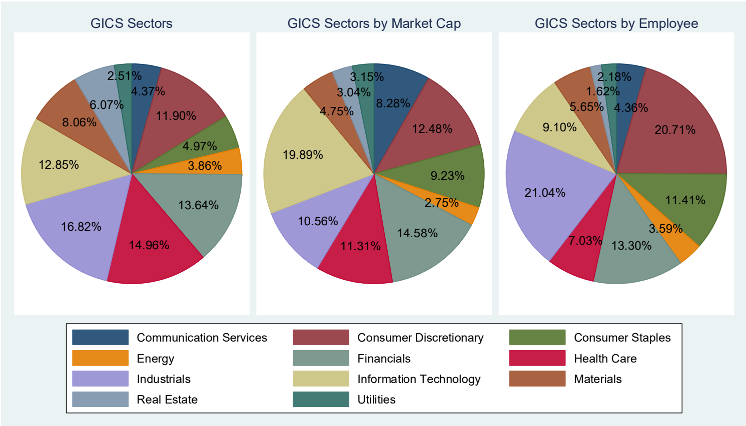

Figure IV.3 – GICS Sectors compositions *(Source: Elaboration on Eikon Data)*

presence of Mega cap companies such as Apple Inc and Microsoft Corp, while in term of Employee Industrials and Consumer Discretionary are the biggest. In order to illustrate companies' and sectors trend during 2020 we built stock indices through our sample companies. In the chart below are illustrated the trends of our sectorial indices composed by relating companies. As expected, Information Technology and Health Care are on top while Energy and Real Estate are on bottom.

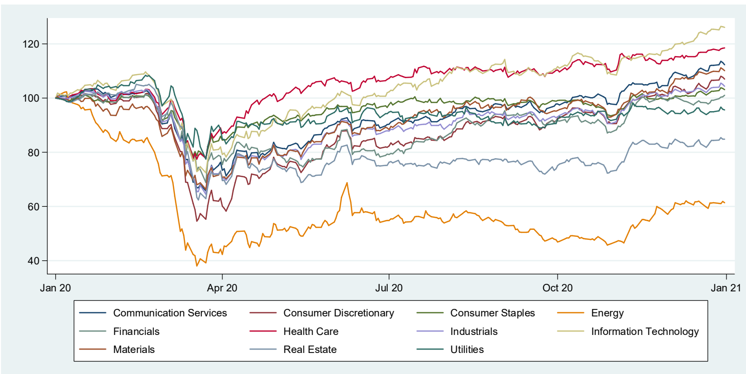

Figure V.3 – GICS Sectors indices 2020 trend *(Source: Elaboration on Eikon Data)*

3.1 ENERGY SECTOR

According to Global Industrials Classification Standard (GICS) definition, the *Energy* sector comprises companies engaged in exploration & production, refining & marketing, and storage & transportation of oil & gas and coal & consumable fuels. It also includes companies that offer oil & gas equipment and services. In the

Industry	2020 Outlook	2020 Performance	Covid-19 Effect
Energy Equipment & Services	-7.77%	-33.86%	-26.09%
Oil, Gas & Consumable Fuels	4.64%	-23.84%	-28.48%
Energy	**0.77%**	**-26.97%**	**-27.74%**

Table IV.3 – GICS Sector Energy Results *(Source: Elaboration on Eikon Data)*

sample there are 205 Energy's companies, which have suffered on average a reduction of 26.97% of their stock value in 2020. At the beginning of the year the Energy sector was still in trouble and analysts predicted a tiny increase on average of 0.77%, even if the sample is equally divided between companies which had positive outlook and companies with negative outlook. However, the arrival of Covid-19 pandemic drag the sector to negative performance of -56.41% from the beginning of the year to the minimum reached in mid-March. Based on the outlook predicted on January, 2020, and the stock performance in whole year, we obtain a negative Covid-19 effect for 138 companies of the sector (67.32% of the total) and a positive Covid-19 effect for the remain 67 companies, collocated respectively on the inferior and superior quadrants. In particular, nearly half of Energy sector companies (48.29%) is collocated in the second quadrant (top left) where are placed

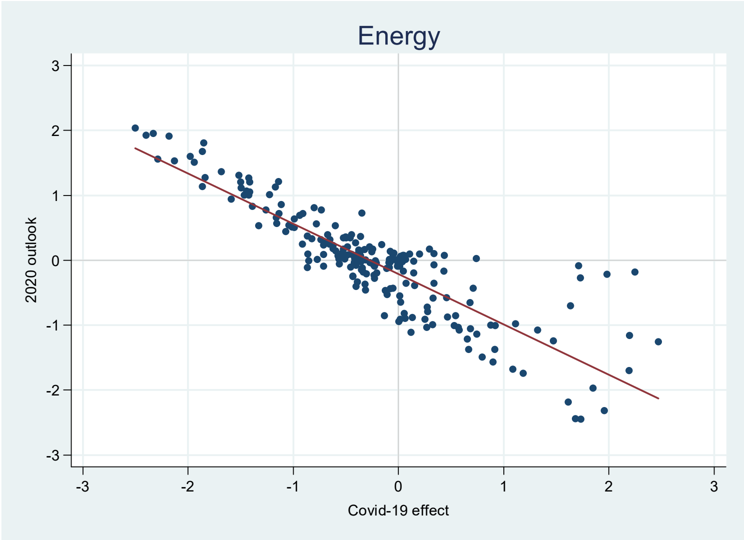

Figure VI.3 – Energy Companies scatterplot *(Source: Elaboration on Eikon Data)*

the companies which had positive outlook for 2020 and they were damaged from Covid-19 pandemic, while only 11 companies of the sector where predicted to grow in 2020 and they really grow. Of these 11 companies, 6 are Chinese mid-cap or large-cap companies that had suffered less than other Covid-19 pandemic thanks to disease management in China, like others Chinese companies.

Going into the Energy sector (passing through the same name Industry Group Energy), the GICS classification offers two branch of Industry: *Energy Equipment & Services* and *Oil, Gas & Consumable Fuels*. The first contains drilling contractors, manufacturers of equipment and providers of supplies. In the latter are included all the other type of companies working in Oil & Gas field (such as production, exploration, storage, transportation of Oil & Gas). In our sample, there are 64 companies belonging to the latter Industry and 141 to the former, but it is important to specify that Oil, Gas & Consumable Fuels represent 90.82% of Energy sector by market cap. Sure enough, in this Industry there are the most important Energy companies of the world that have deeply decreased in 2020: PetroChina Ltd close the year at -30.25%, Exxon Mobil Corp -41.39%, and Royal Dutch Shell PLC -45.73%. Companies that would not have loss in this way in absence of Covid-19 pandemic. However, the Industry Oil, Gas & Consumable Fuels had a positive outlook for 2020 (+4.64%) differently from Energy Equipment & Services (-- 7.76%). The difference between the two remain in 2020 performance because the latter registered on average -33.86% (even worse than the expectation) while the former end the year with -23.83%, collocating both in negative Covid-19 effect (Energy Equipment & Services -26.09% and Oil, Gas & Consumable Fuels - 28.48%). Moreover, only 9.36% of the Energy Equipment & Services Industry have recover from pre-crisis levels, confirming the bad 2020 performance, while in Oil, Gas & Consumable Fuels Industry the percentage is higher (21.99%).

Let us go now inside the two Industry. Starting with Energy Equipment & Services Industry, GICS classification divide it in two Sub-Industry: *Oil & Gas Drilling* and *Oil & Gas Equipment & Services*. According to GICS, in the former there are drilling contractors or owners of drilling rigs that contract their services for drilling wells, while in the latter there are the manufactures of equipment, including drilling

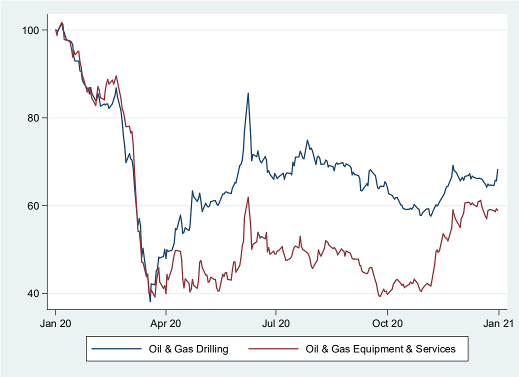

Figure VII.3 – Energy Industries indices 2020 trend *(Source: Elaboration on Eikon Data)*

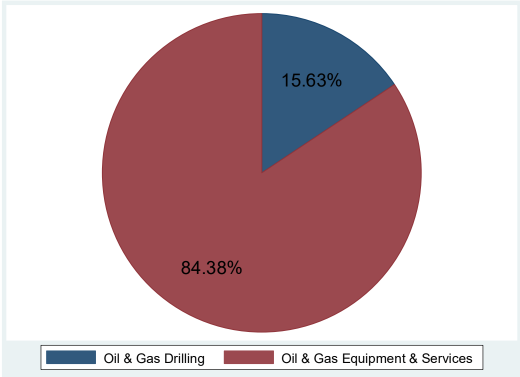

Figure VIII.3 – GICS Energy Sector composition *(Source: Elaboration on Eikon Data)*

rigs and equipment, and providers of supplies and services to companies involved in the drilling, evaluation and completion of oil and gas wells. As illustrated in the chart above, no one had come back to pre-crisis levels but the Oil & Gas Drilling Sub-Industry close the year at -31.78% while Oil & Gas Equipment & Services at -41.06%. The pie graph aside is the composition inside the Energy & Equipment Services Industry (10 and 54 companies). As regards Oil & Gas Drilling Sub-Industry, only one company has a positive Covid-19 effect: the German company Daldrup & Soehne AG, Micro Cap listed on Xetra Stock Exchange from 2007 and controlled by the Dalrup Family. At the beginning of the year the company revenue's was expected to growth for about 13.03% but now the percentage bump to 81.66% thanks to numerous order received in this year that guarantee higher sales. Another company worthy of note in the Sub-Industry is Capital Ltd, a UK based company that have fully recover from pre-crisis levels. The others companies had bad performed in 2020 registering a negative Covid-19 effect of -43.93%. The

54 companies of Oil & Gas Equipment & Services Sub-Industry had an average outlook of -10.36% for 2020 but they close the year badly with a -32.29% (with Covid-19 effect amounting to -21.93%). Only 5 companies of the 54 has yet recover from pre-crisis level, confirming us the difficulties of the Industry. Cangzhou Mingzhu Plastic Co Ltd is one of the five, a Chinese mid-cap company that operates in domestic market. At the beginning of the year, it had an outlook of +73%, the pandemic damaged the company (Covid-19 effect amounts to -34.74%) but it was able to close the year in positive with a +38.3% 2020 performance.

Passing through the other Energy Industry, Oil, Gas & Consumable Fuels, the GICS classification provide 5 Sub-Industry: *Integrated Oil & Gas* (11 companies), *Coal & Consumable Fuels* (24 companies), *Oil & Gas Exploration & Production* (73 companies), *Oil & Gas Refining & Marketing* (18 companies) and *Oil & Gas Storage & Transportation* (15 companies). The first includes integrated oil companies engaged in the exploration & production of oil & gas, secondly we have the sub-industry that encompasses companies primarily involved in the production and mining of coal, while the other explain by the name themselves. Like the majority of Energy Sector, neither these Sub-Industries had registered losses in their stock values. The scatterplot below illustrate that all the five Sub-Industries have less or more on average a negative Covid-19 effect and only one of those was predicted in decline, Oil & Gas Exploration & Production that had the worst performance in 2020 (-39.68%). Integrated Oil & Gas Sub-Industry includes three

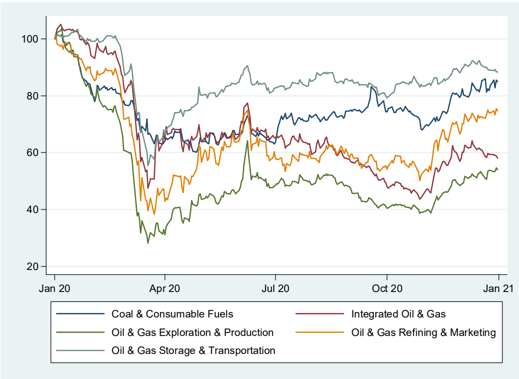

Figure IX.3 – Oil, Gas & Consumable Fuels Sub-Industries indices 2020 trend *(Source: Elaboration on Eikon Data)*

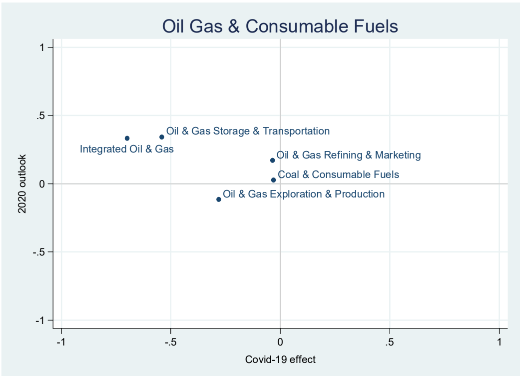

Figure X.3 – Oil, Gas & Consumable Fuels Sub-Industries scatterplot *(Source: Elaboration on Eikon Data)*

mega-cap companies that attain for the 39.57% of whole Energy Sector by market capitalisation: PetroChina Co Ltd, China Petroleum & Chemical Corp and Exxon Mobil Corp. Their big size do not save them from Covid-19 crisis: at the beginning of 2020 revenues was expected to grow for 4.04% in the next year; now, after Covid-19 difficulties, the revenues decline of about -25.48%. These declines, as the entire Energy Sector, are mainly due to the bad performance of Crude Oil futures. In fact, the futures arrive in negative field in April 2020 for the first time in history, closing the year at -20.58%, in line with recent years. Even if is the fourth for Covid-19 effect, Oil & Gas Storage & Transportation is the only Sub-Industry of the 5 that have a positive variation of revenue on average from 2019-2020 (+8.81%), this is mainly due to the fact that these companies never really stop during the year.

3.2 MATERIALS SECTOR

Based on GICS Sectors definition, the *Materials* Sector includes companies that manufacture chemicals, construction materials, glass, paper, forest products and related packaging products, and metals, minerals and mining companies, including producers of steel. The Sector (and relative same-name Industry Group) contains 428 companies in our sample, divided into five Industries: *Chemicals* (209 companies), *Construction Materials* (36 companies), *Containers & Packaging* (34 companies), *Metals & Mining* (133 companies) and *Paper & Forest Products* (16 companies). The results in terms of 2020 outlook, 2020 closure and Covid-19 effect for the Industries and the whole Sector are illustrated below. Materials Sector is the fourth in our sample in terms of 2020 upside (21.14%), considering the higher initial outlook on average of 23.59% the resulting Covid-19 effect is on negative field (-2.45%). The results are different among Industries. More or less they all grown in 2020 (on top Chemicals with +25.75%, on bottom Constructions Materials with +8.31% and Paper & Forest Products +2.71%). Nevertheless, the only Industry that overturn on average the initial expectation is Metals & Mining: the performance on average of 21.78% of its companies overturn the initial outlook of 9.9%, signing

Industry	**2020 Outlook**	**2020 Performance**	**Covid-19 Effect**
Chemicals	30.95%	25.75%	-5.20%
Construction Materials	19.90%	8.31%	-11.59%
Containers & Packaging	35.20%	12.53%	-22.67%
Metals & Mining	9.90%	21.78%	11.88%
Paper & Forest Products	24.90%	2.71%	-22.19%
Materials	**23.59%**	**21.14%**	**-2.45%**

Table V.3 – GICS Sector Materials results *(Source: Elaboration on Eikon Data)*

Covid-19 effect of 11.88%. In the chart below they are illustrated the trend of Industries stock index built through our companies. Overall, the Materials Sector is largely represented by Chinese companies (48.6% of the total).

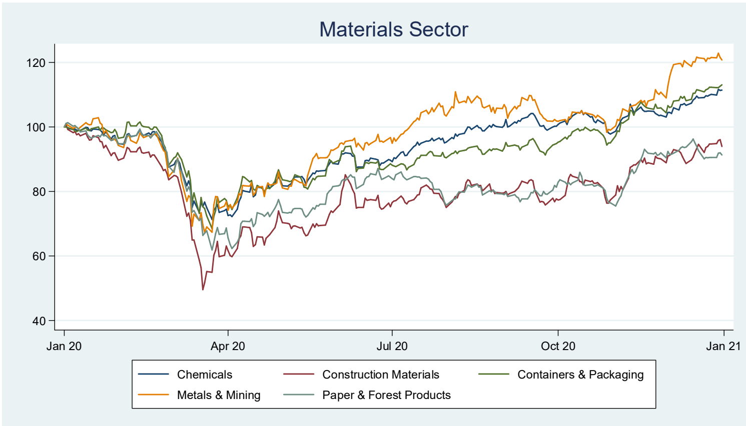

Figure XI.3 – Materials Industries indices 2020 trend *(Source: Elaboration on Eikon Data)*

The first Industry we analyse is Chemicals Industry that contains five Sub-Industries: *Commodity Chemicals* (with 70 companies in our sample), *Diversified Chemicals* (11 companies), *Fertilizers & Agricultural Chemicals* (32 companies), *Industrials Gases* (2 companies) and *Specialty Chemicals* (94 companies). To specify, Commodity Chemicals companies primarily produce industrial and basic chemicals (like synthetic fibres, films, plastics, petrochemicals etc.), Diversified Chemicals companies produce diversified range of chemical products not classified elsewhere, while Specialty Chemicals companies mainly produce high value-added chemicals used in manufacture. The bar graph below illustrate the results among Sub-Industries. If the blue bar (2020 outlook) is greater than the red (2020 Performance) it means that Covid-19 effect is negative, and vice versa. Commodity

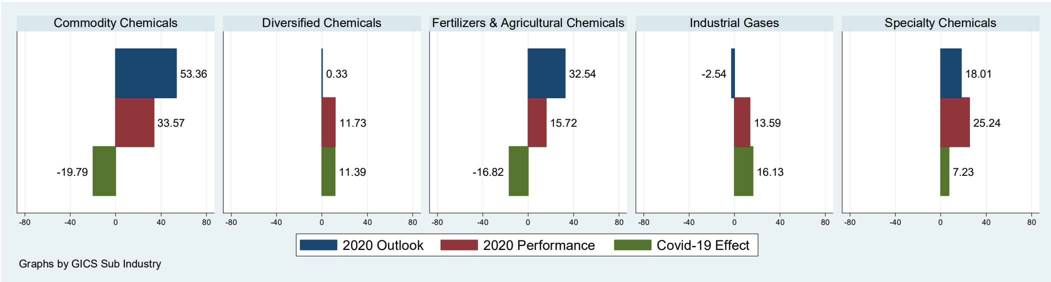

Figure XII.3 – Materials Industries results *(Source: Elaboration on Eikon Data)*

Chemicals and Fertilizers & Agricultural Chemicals collect negative Covid-19 effect, not due to bad performance (respectively on average 33.57% and 15.72%) but due to higher initial expectation. Chemicals Chinese companies (that own the higher market share among countries) had been able to rebound after minimum in March closing the year on average at +37.31%. An example is Wanhua Chemical Group Co. Ltd. (Specialty Chemicals Sub-Industry), China-based company mainly engaged in the manufacture and distribution of chemical products (it is the world largest producer of methylene diphenyl diisocyanate (MDI)). The company did not suffer any turmoil during 2020, with revenues had grown each quarter by 7.77% that permits the company to close the year with an upside of 59.89%. The other Materials Industry is Construction Materials (and relative same name Sub-Industry) composed by 36 companies that produce sand, clay, gypsum, lime, aggregates, cement, concrete an bricks. As the whole Materials Sector, Chinese companies made great performance even in Construction Materials Industry. During Covid-19 pandemic Chinese companies' prevention and control efforts became a model for the world. An example-model is Beijing Oriental Yuhong Waterproof Technology

Co Ltd, principally engaged in the research, development, manufacture and distribution of waterproof materials. Like the company name suggest, the company were able to take technology-train. The 2020 non-stop growth for the company last at ¥38.8, with an upside of 120.04% from the beginning of the year. As regards Containers & Packaging Industry, it is divided into two Sub-Industry: *Metal & Glass Containers* (15 companies in the sample that are manufacturer of metal, glass or plastic containers, including corks and caps) and *Paper Packaging* (19

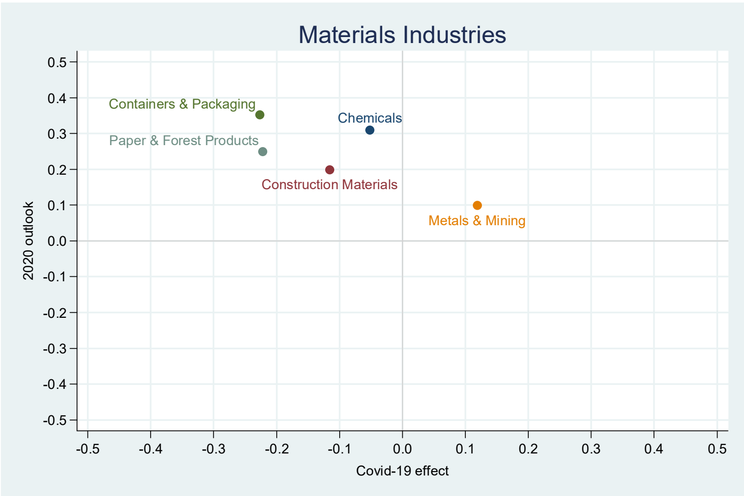

Figure XIII.3 – Materials Industries scatterplot *(Source: Elaboration on Eikon*

companies, manufacturers of paper and cardboard containers and packaging). Containers & Packaging Industry, as highlighted by the graph below, is the Industry with the higher initial outlook and the higher Covid-19 effect, meaning that the 2020 performance (even higher, +12.53%) was below the average expectation. Even here, more the company was bigger more higher was the trend during 2020. Sure enough, Micro Cap companies registered on average a downside for -15.21%

in the Industry, while Large Cap companies registered an upside on average of +43.68%. However, considering the two Sub-Industry, the results are perfectly in line with the ones of Containers & Packaging Industry. Concerning Metals & Mining Industry, it is divided into seven Sub-Industries. The Sub-Industries are: *Aluminium* (7 companies that produce aluminium and related products, bauxite and also recycler aluminium companies), *Diversified Metals & Mining* (36 companies engaged in diversified production/extraction of metals and minerals not classified elsewhere), *Copper* (10 companies), *Gold* (15 companies), *Precious Metals & Minerals* (3 companies mining precious metals and minerals not classified in the Gold Sub-Industry), *Silver* (1 company, obviously the smallest Sub-Industry in our sample) and *Steel* (61 companies, that are producer of iron and steel and related products, including metallurgical coal mining used for steel production). Metals & Mining companies often are involved in different mining operation, so the Sub-Industry classification represent the main business line for the company. As illustrated by the graph above, Metals & Mining Industry is the only one with positive Covid-19 effect, as a result of a performance above 11.87% from the initial outlook (on average 9.9%). Two Sub-Industry are too little to analyse (Precious Metals & Minerals and Silver, even Aluminium is smaller) but the others can be examined. However, just out of curiosity, the lonely Silver company in our sample Hochschild Mining PLC. The company is listed on London Stock exchange while its headquarter is in Peru (because of its operating area that is the America), it is engaged in mining, processing and sale of silver and also gold. The company had risen by 206% in the last five years while 2020 closed with an upside of +18.61% (although in the last three months of the year the stock decline by 31.22%), anyway, the company had good fundamentals (revenue annual growth rate amounts to 3.25% in the last three years). Concerning the other Sub-Industries, all the companies were able to continue its business even during Covid-19 pandemic. The best Sub-Industry in terms of performance are Diversified Metals & Mining (on average +34.67, registering positive Covid-19 effect by 14.75%) and Gold (on average 30.74%, overturning the initial declining outlook of -4.2%). Gold companies experienced as sharp rise in stock prices during spring (first lockdown measures) when gold price went up, but in the last two months of the year Gold companies stock prices suffered a correction as gold price decline with lockdowns being lifted. An example is the US Large Cap company Newmont Corporation, whose revenue comes from gold by 94%. Company stock price increase by 39.83% from the beginning of the year, not only thanks to gold price increase but also thanks to good fundamentals (revenue are expected to grow by 17.91% from previous year). The last Industry is Paper & Forest Products, the Industry with the lowest 2020 upside. The Industry includes two Sub-Industry: *Forest Products* (5 companies, manufacturers of timber and related food products) and *Paper Products* (11 companies, manufacturers of all grade of paper). The results differ among the Sub-Industry: both were expected to grow (Forest Products on average by +35.57% and

Paper Products by 20.04%) but 2020 gave them different performance (respectively +22.87% and -6.46%) and both negative Covid-19 effect (-12.7% and -26.5%). While the five companies of Forest Products Sub-Industry registered all positive performance in 2020, in Paper Products only two companies closed on positive field (both Chinese companies). The downside of Paper Products companies may be the declining demand for printing and writing papers (especially during stay-at-home restrictions with no paper consumption for workers and students).

3.3 INDUSTRIALS SECTOR

Based on GICS definition, the *Industrials* Sector includes manufacturers and distributors of capital goods such as aerospace, defense, building products, electrical equipment, machinery, and companies that offer construction & engineering services. It also includes providers of commercial & professional services including printing, environmental and facilities services, office services & supplies, security & alarm services, human resource & employment services, research & consulting services. It also includes companies that provide

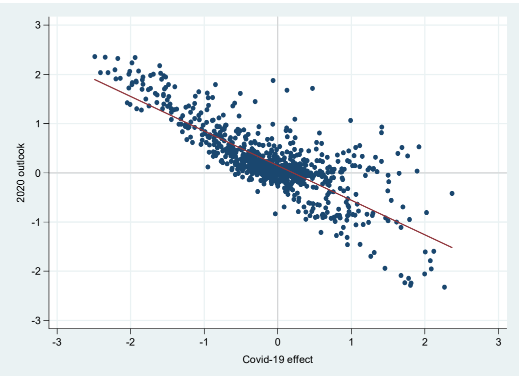

Figure XIV.3 – Industrials companies scatterplot *(Source: Elaboration on Eikon Data)*

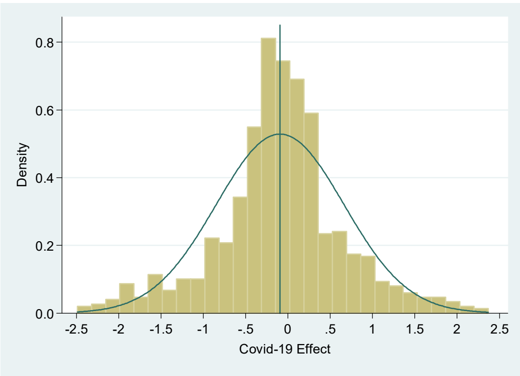

Figure XV.3 – Industrials Covid-19 histogram *(Source: Elaboration on Eikon Data)* transportation services. Our sample contains 893 Industrial companies, the most populated sector (most present among countries, expect for USA and Belgium), with a Covid-19 effect on average of -9.04% as highlighted in the histogram below.

Industry Group	**2020 Outlook**	**2020 Performance**	**Covid-19 Effect**
Capital Goods	21.79%	17.96%	-3.82%
Commercial & Professional Services	18.92%	-1.98%	-20.90%
Transportation	21.43%	3.08%	-18.35%
Industrials	**21.19%**	**11.96%**	**-9.23%**

Table VI.3 – GICS Industrials results *(Source: Elaboration on Eikon Data)*

At the beginning of 2020, the overall sector had an outlook for the year of +21.19%, all countries had positive outlooks, leaded by the 247 Chinese companies (on average +35.1%) that stand for the 63.09% of Industrials Sector market capitalisation. The Industrials Sector includes three Industry Group: *Capital Goods* (contains 590 companies, the most populated Industry Group of our sample), *Commercial & Professional Services* (168 companies) and *Transportation* (135 companies). Covid-19 pandemic damaged most the Transportation Industry Group that closed the 2020 with -13.48% and have 61.48% of its companies with a negative Covid-19 effect, while the largest number of companies that recovered in 2020 is Capital Goods (59.86%).

As regards Capital Goods Industry Group, it is divided into seven Industry. The Industry Group had great expectation by analysts (on average 21.79%) but also the great performance during 2020: on top Electrical Equipment Industry with +42.13% while the only one negative is Construction & Engineering with a tiny -

0.52%. The first Industry of Capital Goods Group is *Aerospace & Defense* Industry (with relative same-name Sub-Industry), that contains manufacturers of civil or military aerospace and defense equipment, parts or products (in the sample there are 69 companies). The revenue estimate Industry average growth rate for 2020 amounted to 24.4%, now after the Covid-19 pandemic the rate decreased to -1.89%, partially due to industry closures. Inside this Industry, there are two of the biggest aerospace manufacturers: the US Boeing Co and the French Airbus SA. Both companies had a bad year that closed respectively at -35.67% and -33.02%, with the first also affected by the airplanes issues. The second quarter was the worst in term of Revenue and Net Income but a partial recover took place, especially Airbus that probably close the fourth quarter in positive. *Building Products* Industry (48 companies), that contains manufacturers of building components and home improvement products and equipment, reacted to Covid-19 crisis closing the year +23.65%, with the 68.75% of its companies came back to pre-crisis levels. *Construction & Engineering* Industry (and relative Sub-Industry) includes companies engaged in primarily non-residential construction (our sample include 83 companies of this Industry). As already highlighted, it is the worst Industry of Capital Goods Industry Group in terms of 2020 performance (-0.52%), with the higher percentage of companies that have not recovered from pre-crisis levels (63.86%). The Industry is highly represented by Chinese companies, that standing for 83.88% of market capitalisation, mainly because of the presence of the mega-cap Chinese company China State Construction Engineering Corp Ltd, Beijing based company engaged in the engineering contracting businesses. The company underperform the Industry with a reduction of -16.89%, in line with 2020 outlook at -18.73%. However, the good fundamentals suggest an undervaluation for the company, confirmed by the analysts' coverage. *Industrial Conglomerates* Industry (and its same-name Sub-Industry, it has 14 companies) had similar position to Construction & Engineering Industry, as illustrated by the graph below. The Industry, that includes diversified industrial companies with business activities in three or more sectors (none of which contributes a majority of revenue), had a 2020 outlook on average of +20. 12% (for its 14 companies), the 2020 positive closure at 4.72% collocates the company in the second quadrant, on negative Covid-19 effect field (-15.4%). Another Industry (and relative Sub-Industry) is *Trading Companies & Distributors*, containing trading companies and distributors of industrial equipment and products. The 57 sample's companies of the Industry done well during 2020 with a performance of +13.34% but this Industry was the one with lower expectation for the year. However, the slightly difference between the two values collocates the company just in the second quadrant, on the border with the

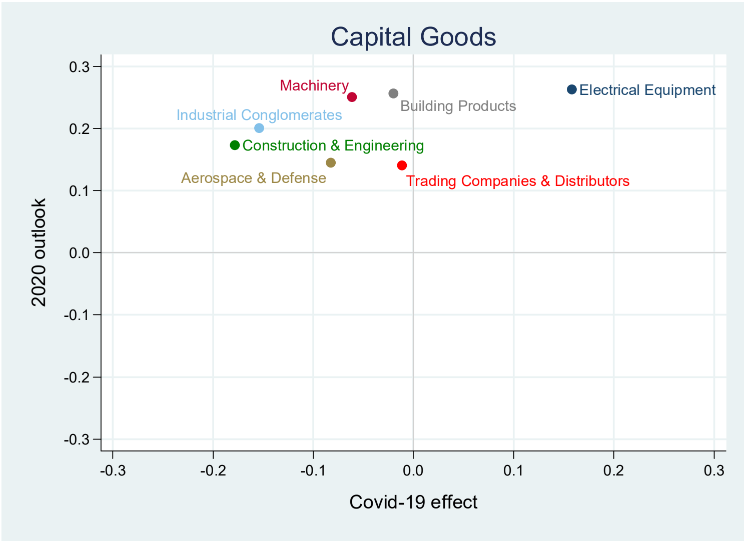

Figure XVI.3 – Capital Goods Industries scatterplot *(Source: Elaboration on Eikon Data)*

first quadrant. The best 2020 performance is to confer at Beijing United Information Technology Co Ltd, Chinese company mainly engaged in e-commerce, with the amazing +137.42%, being able to outperform the initial estimate at 80.88%, as the e-commerce business had done well in 2020. Then, another Industry of Capital Goods Industry Groups is *Machinery* that is composed by three Sub-Industry depending on the type of machinery manufacturer: *Construction Machinery & Heavy Trucks* (with 60 companies), *Agricultural & Farm Machinery* (7 companies) and *Industrials Machinery* (157 companies). The three Sub-Industries had similar 2020 trend. At the beginning of the year, all three Sub-Industry were expected to growth (on average of 21.83%), Industrial Machinery the most with 31.16%. Agricultural & Farm Machinery made the best peformance and this lead the Sub-Industry to a positive Covid-19 effect (+18.19%) differently from the other two that had it negative. The last Industry in Capital Goods Industry Group is *Electrical Equipment* (95 companies), the only one with positive Covid-19 effect in the Group (+15.80%). Like Machinery Industry, Electrical Equipment is highly represented by Chinese companies (87.18% by market capitalisation). This is because the sector more present in Chinese sample is Industrials (247 companies, or 20.31%, of the 1216 Chinese sample companies). Electrical Equipment Industry have two Sub-Industry: *Electrical Components & Equipment* (include companies that produce electric cables and wires, electrical components) and *Heavy Electrical Equipment* (contains manufacturers of power-generating equipment and other heavy electrical equipment). The former count 73 companies while the latter 22. The two Sub-Industries have similar Covid-19 effect that amount to 14.64% for Electrical Components & Equipment and 19.62% for Heavy Electrical Equipment. The first closed 2020 at 35.72%, better than the expectation of 21.07%, while Heavy Electrical Equipment close the 2020 with a better performance at 63.4%, as a result of an estimate average at 43.77%.

As already mentioned, the second Industry Group of Industrials is Commercial & Professional Services. The 168 companies in the Group are divided into two Industry: *Commercial Services & Supplies* (90 companies) and *Professional Services* (78 companies). The two Industry have same statistics in relation to Covid-19 pandemic: Commercial & Professional Services companies lost on average -

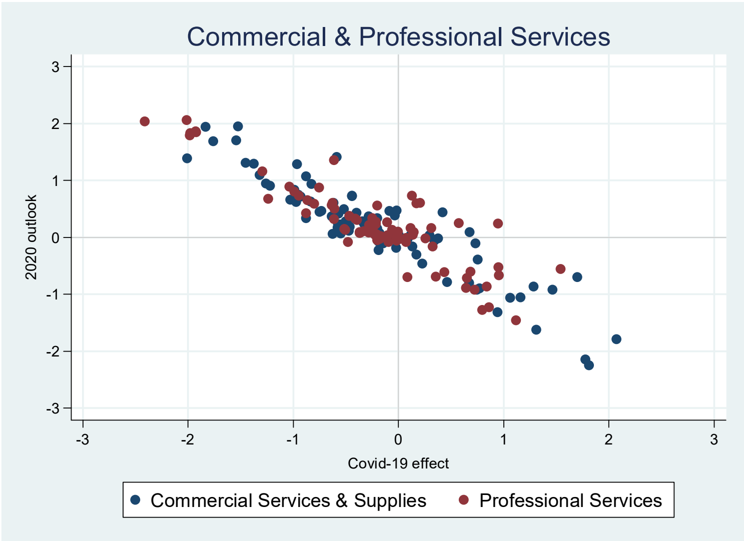

Figure XVII.3 – Commercial & Professional Services companies scatterplot *(Source: Elaboration on Eikon Data)*

2.56% while Professional Services lost -1.3%, together with 2020 outlook respectively for +16.95% and +21.18% result in Covid-19 effect of -19.52 % for the former and -22.49 for the latter. The scatter plot above illustrate the companies collocation for these two industry. The most populated quadrant is the second (top left) with 99 companies (58.93% of Industry Group total companies), these companies had positive estimate growth for 2020 but the Covid-19 damaged them underperforming the expectation. The percentages remain nearly the same going into the two Industry. Concerning Commercial Services & Supplies Industry, it include five Sub-Industry: *Commercial Printing* (with 7 companies in our sample), *Diversified Support Services* (26 companies), *Environmental & Facilities Services* (40 companies), *Office Services & Supplies* (12 companies) and *Security & Alarm Services* (5 companies). The other Industry in Commercial & Professional Services

Industry Group is Professional Services, that is divided into two Sub-Industry: *Human Resources & Employment Services* (30 companies) and *Research & Consulting Services* (48 companies). The performance of the Sub-Industries are different. Human Resources & Employment Services had lower expectation than Research & Consulting Services (+5.03% and 31.28%) but it had declined in 2020 (-4.58%) while the other had slightly increased (on average 0.73%). Inside Research & Consulting Services Sub-Industry it is noteworthy the performance of the Chinese Large Cap Centre Testing International Group Co Ltd. The company, principally engaged in the provision of technical testing services in trading goods, consumer goods, industrial goods and life science areas, had experienced a growth of 85.94% in stock price, thanks to increase in demand for its services (revenue will grow by 15.16% from previous year).

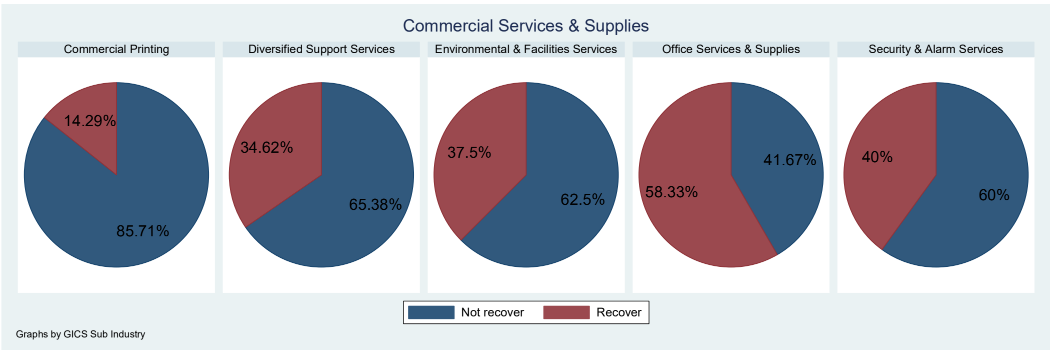

Figure XVIII.3 – Commercial Services & Supplies companies recover *(Source: Elaboration on Eikon Data)*

The third Industry Group of Industrials Sector is Transportation. The Industry Group include five Industry: *Air Freight & Logistics* (32 companies), *Airlines* (23 companies), *Marine* (9 companies), *Road & Rail* (8 companies belonging to

Railroad Sub-Industry while 29 companies belong to *Trucking* Sub-Industry) and *Transportation Infrastructure* (divided into three Sub-Industries: 15 companies from *Airport Services*, *Highways & Rail tracks* has 12 companiesand *Marine Ports* 7 companies. The results among Industries are very different. The worst 2020 performance is registered by Airlines (-19.96%) that were affected by travel stop and border closures. All big Airlines companies suffered deep losses in 2020. Air China Ltd, China Southern Airlines Co Ltd, Southwest Airlines Co and Delta Air Lines Inc are only some example of companies that registered downside during Covid-19 pandemic (respectively -21.08%, -16.99%, -14.24% and -30.74%). Not the same results for a similar Industry, Air Freight & Logistics. The companies belonging to this Industry improved its business during 2020 mainly thanks to increase on industrial transportation of goods. FedEx Corp, US Large Cap companies leader on transportation, e-commerce and business services, closed the year with an amazing upside of 69.49% (above the Industry average of 32.6%). Marine and Road & Rail Industries closed the year on average with positive performance: +12.78% the former, +8.29% the latter. However, these results are changing considering the two Sub-Industries of Road & Rail Industry. In fact, Railroad lost -1.47% while Trucking gain +10.99%. The former performance is a little bit represented by the Chinese Daqin Railway Co Ltd, that lost -20.83% in 2020 (mainly explained by revenue decrease of -7.58% from previous year). As regards the last Industry, Transportation Infrastructure, the average Industry performance of -17.37% remain the same among Sub-Industries. Marine Port & Services lost -25.55%, Airport Services -15.46% while Highway & Railtracks -14.98%. These performances, together with high initial outlook for these companies, result in average Covid-19 effect of -40.42% for the Industry.

3.4 UTILITIES SECTOR

The *Utilities* GICS Sector comprises utility companies such as electric, gas and water utilities. It also includes independent power producers & energy traders and companies that engage in generation and distribution of electricity using renewable sources. Our sample includes 133 Utilities companies that closed 2020 on average with slightly upside of 2.7%. Based on initial average outlook of +22.08% the resulting Covid-19 effect amounts to -19.38%. Utilities Sector contains five Industries: *Electric Utilities* (comprises 33 companies in our sample), *Gas Utilities*

Industry	**2020 Outlook**	**2020 Performance**	**Covid-19 Effect**
Electric Utilities	16.04%	-1.12%	-17.16%
Gas Utilities	16.87%	-12.22%	-29.09%
Independent Power and Renewable Electricity Producers	30.47%	19.68%	-10.79%
Multi-Utilities	14.86%	-10.81%	-25.67%
Water Utilities	30.19%	4.02%	-26.18%
Utilities	**22.08%**	**2.70%**	**-19.38%**

Table VII.3 – GICS Sector Utilities results *(Source: Elaboration on Eikon Data)*

(18 companies), *Multi-Utilities* (25 companies), *Water Utilities* (15 companies) and *Independent Power and Renewable Electricity Producers* (42 companies).

Based on GICS definitions, the first four Industry does not have further classification. While Independent Power and Renewable Electricity Producers includes two Sub-Industry: *Independent Power Producers & Energy Traders* (that contains 26 companies in our sample that operates as Independent Power Producers (IPPs), Gas & Power Marketing & Trading Specialists and/or Integrated Energy Merchants) and *Renewable Electricity* (16 companies involved in generation and distribution of electricity using renewable sources, including electricity producers that use biomass, geothermal energy, solar energy, hydropower, and wind power). As regards others Industry (and same name Sub-Industry), in Electric Utilities are comprises companies that produce or distribute electricity, includes both nuclear and non-nuclear facilities. Gas Utilities contains companies whose main charter is to distribute and transmit natural and manufactured gas. As regards Multi-Utilities, it includes utility companies with significantly diversified activities in addition to core Electric, Gas and/or Water Utility operations. Water Utilities Industry encompasses companies that purchase and redistribute water to the end-consumer (includes large-scale water treatment systems). Considering Utilities Sector as a whole, it is the one with higher percentage of Large Cap companies (33.83%) because of high barriers to entry. Exactly Large Cap companies are the only that on average closed 2020 in negative (-1.58%), with best performance for Small Cap (+11.66%) and Micro Cap (+9.61%). The chart below illustrate the trend of the five Industry stock indices. Independent Power and Renewable Electricity Producers made the best performance with an upside of 13.24%from the beginning of the year (68.97% rebound from March minimum). All others sectorial indices, even if during year they rebounded to positive performance, they close the year in negative (the worst Gas Utilities with -15.62%). All the five Industries have negative Covid-19 effect. Starting from positive initial outlook the negative performance as a whole give back negative Covid-19 effect (the worst Gas Utilities with -29.09%). Inside Gas Utilities Industry only two companies have registered an upside in 2020: Chesapeake Utilities Corp and Fulcrum Utility Services Ltd. The first is a part of the Public Utilities sector (which includes companies such as Total SE and Petroleo Brasileiro SA) that gain 14.56% in 2020, because of dividend payment are in non-stop growth since 2014. The second is a UK-based company being able to gain 51.06% in 2020, mainly thanks to the sale domestic asset portfolio that provide it of cash for the future. Water Utilities Industry made a performance of 4.02%, mainly guided by Large Cap companies that registered an upside of 14.59%. One of this is the US American Water Works Company Inc, water and wastewater utility company, that gain +26.86% during 2020. Demand of water and wastewater services, essential in nature, remain strong during the year, this permitted the company to gain stable revenue among quarters (+4.6% each quarter). As regards Independent Power and Renewable Electricity Producers, the Industry made the best performance with an average upside of 19.68%. However, it’s interesting to note the considering the average results of the Industry, the two Sub-Industries have different results. Independent Power Producers & Energy Traders was expected to growth by the amazing 40.2%, the slightly performance of 3.57% during 2020 result in Covid-19 effect of -39.23% (below Industry average). Quite the opposite Renewable Electricity that made a performance of 45.82%, given initial outlook of 10.42%, Covid-19 effect amounts to 35.42%. The upside is misrepresented by the +234.84% of Solaria Energia y Medio Ambiente SA, that tripled its production during 2020 and improve revenues (25.31% each quarter).

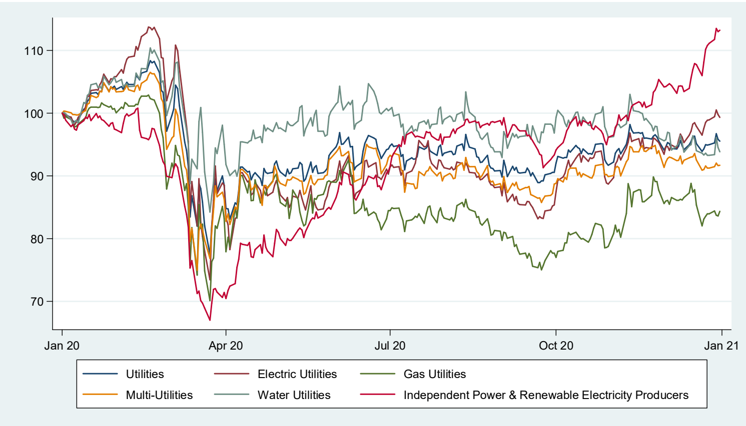

Figure XIX.3 – Utilities Industries indices 2020 trend *(Source: Elaboration on Eikon Data)*

3.5 CONSUMER DISCRETIONARY SECTOR

Based on GICS Sector definition, the *Consumer Discretionary* Sector encompasses those businesses that tend to be the most sensitive to economic cycles. Its manufacturing segment includes automotive, household durable goods, leisure equipment and textiles & apparel. The services segment includes hotels, restaurants and other leisure facilities, media production and services, and consumer retailing

Industry Group	2020 Outlook	2020 Performance	Covid-19 effect
Automobiles & Components	16.54%	19.86%	3.33%
Consumer Durables & Apparel	12.01%	13.16%	1.15%
Consumer Services	25.23%	0.40%	-24.82%
Retailing	11.25%	22.81%	11.57%
Consumer Discretionary	**15.49%**	**14.12%**	**-1.37%**

Table VIII.3 – GICS Sector Consumer Discretionary results *(Source: Elaboration on Eikon Data)*

and services. Our sample contains 632 Consumer Discretionary companies, which closed 2020 on average at +14.12%, an oddly result thinking of the sensitivity of this sector to economic cycles. However, there is some differentiation inside it. Starting from the first classification, Consumer Discretionary Sector encompasses four Industry Group, whose results are listed in the table below. Only Consumer Services Industry Group have on average a negative Covid-19 effect, due to the lower performance than the initial outlook. The results of Consumer Discretionary Sector are different amidst countries. USA is the only with positive Covid-19 effect (11.76%), together with Germany and China are the only that on average closed 2020 with positive performance (USA+26.66%, China +19.3% and Germany +7.77%). The worst countries in term of performance are Spain (-13.7%) and Italy (-9.96%).

The first Industry Group we analyse is *Automobiles & Components*, composed by two Industry: *Auto Components* (with 73 companies) and *Automobiles* (21). The Industry Group closed 2020 with an upside of +19.86%, better than the initial expectation on average of +16.53%, resulting in a positive Covid-19 effect of

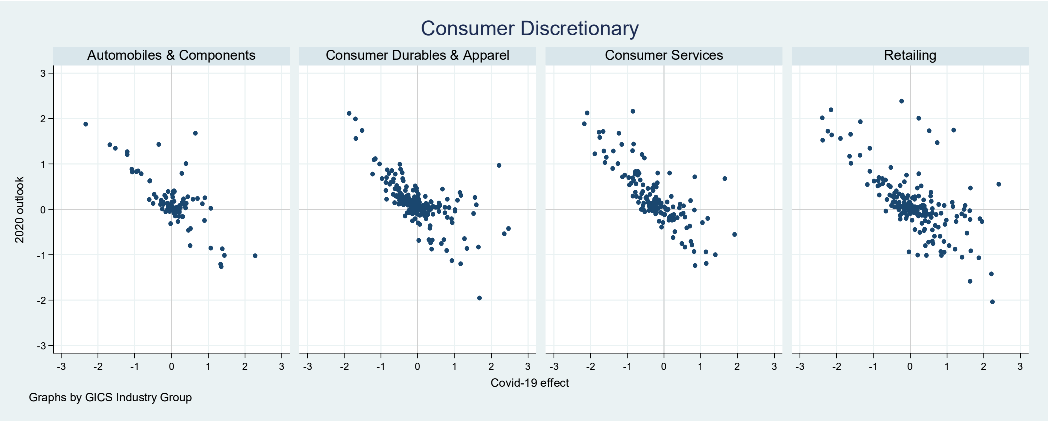

Figure XX.3 – Consumer Discretionary companies scatterplot by Industry Groups *(Source: Elaboration on Eikon Data)*

3.32%. Considering the two Industry, the results are not the same. Both Industries registered positive performance but Auto Components upside amount to +9.25% while Automobiles closed at +21.64%. In general terms, Automobiles was able to registered this performance thanks to industries reopen after lockdown restrictions, allowing the companies to went back to work, while Auto Components companies made this performance due to the fact that they generally work with motors sports, that suffered important disruption during 2020. Going inside Auto Components Industry, it is divided into two Sub-Industry: *Auto Parts & Equipment* (65 companies in our sample) and *Tires & Rubber* (8 companies). The performances are nearly the same for the two Sub-Industry (+18.6% for Auto Parts & Equipment and +14.5% for Tires & Rubber) while the Covid-19 effects are different due to high expectation for the latter. However, the sector was dragged by Chinese ad US companies, which registered respectively an upside of +30.15% and +30.53%, while European countries lost on average -3.85%. Quite the contrary is on

Automobiles Industry (that represent the 63.61% of Industry Group by market capitalisation), specifally the Automobile Manufactures Sub-Industry where French and Italian companies closed 2020 on average at +14.96% and +11.96%. These countries were leaded by them most important companies: Peugeout SA for France (+4.93%, while Renault SA made -13.25%, that higly suffered the second quarter, sales decline by 34.3% in the first half of 2020) and Fiat Chrysler Automobiles NV and Ferrari NV for Italy (respectively +12.10% and 26.19%). As regards *Motorcycle Manufacturers* Sub-Industry, the two companies of the sample, Piaggio & C SpA and Harley-Davidson Inc, closed respectively at -2.39% and 1.16%.

The second Industry Group of Consumer Discretionary Sector is *Consumer Durables & Apparel*, composed by 204 companies divided into the three Industry. The Industry are: *Household Durables* (include 103 in our sample), *Leisure Products* (24 companies) and *Textiles, Apparel & Luxury Goods* (77 companies). As illustrated by the chart below, Leisure Products index registered the best performance from the beginning of the year (71.25%), Textiles, Apparel & Luxury Goods index closed the year at +9.04% while Household Durables index is the only one in negative (-4.08%). Textiles, Apparel & Luxury Goods is the largest in term of market capitalisation (65.95% of tot Consumer Durables & Apparel market cap) even if they represent the 37.75% of companies. Speaking of it, the Industry is divided into three Sub-Industries: *Apparel, Accessories & Luxury Goods* (composed by 52 companies), *Footwear* (8 companies) and *Textiles* (17 companies,

Figure XXI.3 – Consumer Durables & Apparel indices 2020 trend *(Source: Elaboration on Eikon Data)*

manufacturer of rextile and relates products not classified elsewhere). As known, Luxury industry is not so sensitive to economic crisises because of the high and fixed demand along time. LVMH Moet Hennessy Louis Vuitton SE, Hermes International SCA and Moncler SpA are three example of companies that drag the Industry with high upside, respectively of +21.90%, 30.23% and 25.07% (all collecting positive Covid-19 effect, except for Moncler SpA whose Covid-19 effect amounts to -0.53%, due to higher initial expectation). However, Micro Cap and Small companiess suffered more than others the Covid-19 turmoil, due to stop closure. Regarding Foowear Sub-Industry, as Apparel, Accessories & Luxury Goods, Foowear Sub-Industry contains big companies that were not affected by Covid-19 pandemic thanks to the large size of the companies and the ability to endure to crisises. Nike Inc, Puma SE and Deckers Outdoor Corp are three companies in the Sub-Industry that had the amazing upside of +38.81%, 35.31% and 65.33%, also thanks to e-commerce businesses improvement. Textiles Sub-

Industry was the most affected inside Textiles, Apparel & Luxury Goods, losing on average -1.6%, due to industries closures among countries. Passing to Leisure Products Industry (and same name Sub-Industries) is one of the smaller in Consumer Discretionary Sector, represented for 70.83% by Small Cap and Micro Cap companies. This Industry improved them businesses during Covid-19 pandemic thanks to a higher demand (revenue had grown by +24.34% from first to second quarter and by +17.71% from second to third quarter) and dragged by US companies that closed 2020 on average with an upside of +35.09%. The third Industry in Consumer Durables & Apparel Industry Group is Houehold Durables that include five Sub-Industries: *Consumer Electronics* (comprises 14 companies in our sector), *Home Furnishings* (19 companies), *Homebuilding* (39 companies), *Household Appliances* (24 companies) and *Houseware & Specialties* (7 companies). The graphs below illustrate the positioning of the Sub-Industry in relation to 2020 outlook and Covid-19 effect and the 2020 performances. Household Appliances made the best average performance (+53.03%) and is the one with the higher Covid-19 effect. Homebuilding and Housewares & Specialites have the lowest performance during 2020 that lead them to negative Covid-19 effect. The 76.47% of Chinese Household Durables companies closed 2020 with positive performance, thanks to the fact that Covid-19 restrictions last only few weeks. Quite the opposite in UK, that suffered more the restricions and the overall

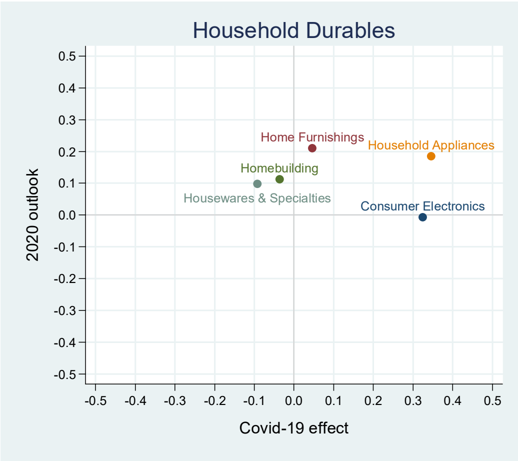

Figure XXII.3 – Household Durables Sub-Industries scatterplot *(Source: Elaboration on Eikon Data)*

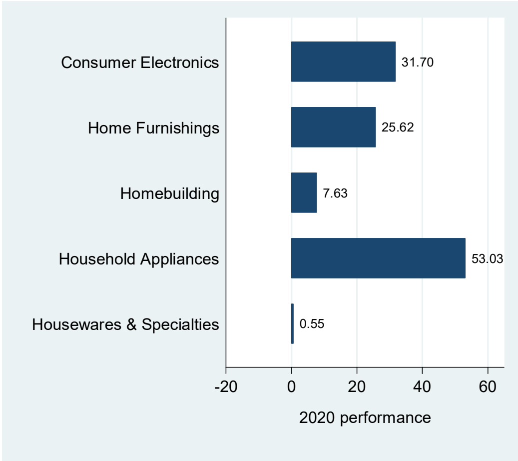

Figure XXIII.3 – Household Durables Sub-Industries 2020 performances *(Source: Elaboration on Eikon Data)*

pandemic. The 76.19% of British companies did not recover from pre-crisis levels, with the whole British companies that registered an average downised of -9.09%.

The third Industry Group is *Consumer Services*, that is the Industry Group with higher percentage of companies with a downside in 2020 (58.62%) of the Consumer Discretionary Sector. This percentage remain the same in the two Industries of the Consumer Services Group (a little big higher in Hotels, Restaurants & Leisure). Speaking of Indusries, the two are: the just mentioned *Hotels, Restaurants & Leisure* (with 119 companies in our sample) and *Diversified Consumer Services* (26 companies). Both Industries were estimated to growth at beginning of the year (respectively +23.52% and 33.02%), the 2020 was an underperformed year and the missed growth can be attributable to Covid-19 pandemic (especially for Hotel, Restaurants & Leisure Industry). As regards Hotels, Restaurants & Leisure Industry, it include four Sub-Industry: *Casinos & Gaming* (that are 25 companies in our sample), *Hotels, Resorts & Cruise Lines* (35 companies), *Leisure Facilities* (15 companies) and *Restaurants* (44 companies). They were all estimated to growth at the beginning of the year and they all collected a negative Covid-19 effect, but the performance were different among Sub-Industry but especially among companies. Starting from Casinos & Gaming, the 25 companies of the Sub-Industries made on average +30.67%, but the average is misrepresented by the performance of two company that overperformed the market: Penn National Gaming Inc and ZEAL Network SE (without them the average growth amounts to 17.28%, in line with the ones of others Sub-Industries). The two company represent the perfect example of not-affected company by Covid-19 pandemic, because they anywat grown in 2020. Penn National Gaming Inc is a USA-based Large Cap companies operating in the whole country, whose stock price started the year at $26.14, it reached a minimum in March at $4.52 and it closed the year at $86.37 (an incredible upside of 230.41% from the beginning of the year), even if the second quarter was dramatic in terms of revenues (-72.63% from previous quarter). This success achieved is thanks to the strong success of its Barstool Sportsbook App, which has become the most downloaded sports betting application in USA (in October the application received $48 million of total handle and generated $3.1 million in net gaming revenue). Concerning Hotels, Resorts & Cruise Lines Sub-Industry, obviously it is one of the most industries hard-hit by Covid-19 due to lockdown measures and border restrictions. The 35 companies of the Sub-Industry closed 2020 on average at -14.98% (the worst performance of this Sub-Industry) and is the Sub-Industry with the higher percentage of companies with downside (74.29%, the ones with upside are Chinese and US companies). Two Large Cap companies perfectly represent the Sub-Industry performance: the two largest travel leisure company in the world Carnival Corp and Royal Caribbean Cruises Ltd. The companies lost respectively -56.58% and -44.05% mainly due to travels stops during 2020. As regards Leisure Facilities Sub-Industry, the average 2020 closure amounts to -8.82%, considering the initial outlook of 17.21% the Covid-19 effect amounts to -26.03%. But the stock performance are conditioned by the best performance of one company (withouth it the 2020 downside would amount to -16.22%). The company is RCI Hospitality Holdings Inc, a US company that owns and operates gentlemen's clubs and sports bars/restaurants. Unbelievably, the company nearly doubled its stock price from the beginning of the year (94.67%), rebounding from April 2020 minimum when all locations were closed due to pandemic (reopenings help the company to lift up again). The last Sub-Industry of Hotel, Restaurants & Leisure Industry is Restaurants, where are contains 44 companies, thirty of wich are from USA (or 68.18%). Here, there are some big US companies that overperformed the market: Mcdonald's Corp (+7.25%), Starbucks Corp (+20.43%), Chipotle Mexican Grill Inc (60.29%) and Domino's Pizza Inc (+30.13%), that made good performance thanks to sales growth and business improvement, also in relation to take-away food. The other Industry in Consumer

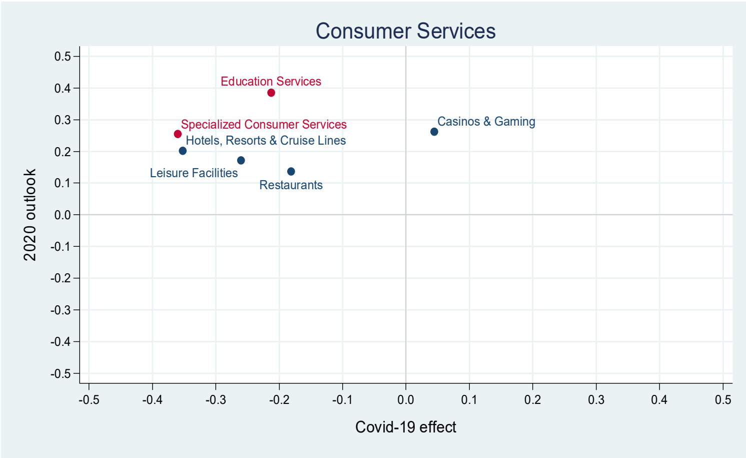

Figure XXIV.3 – Consumer Services Sub-Industries scatterplot *(Source: Elaboration on Eikon Data)*

Services Industry Group is Diversified Consumer Services, composed by two Sub-Industry: *Education Services* (15 companies in the sample) and *Specialized Consumer Services* (11 companies). The former registered better performance than the latter (respectively +17.3% and -10.52%), the higher initial expectation on average for the companies (+38.55% and +25.47%) drag the Sub-Industries on negative Covid-19 effect (-21.24% for Educational Services and -35.99% for Diversified Consumer Services). Obviously, educational services providers had seen its business improvement in 2020 thanks to remote teaching among schools and universities.

The last Industry Group of Consumer Discretionary Sector is *Retailing*, the one with best upside in 2020 among Industry Groups. Retailing encompasses four Industry: *Distributors* (contains 14 companies), *Internet & Direct Marketing Retailing* (47 companies), *Multiline Retail* (21 companies) and *Specialty Retail* (107 companies). It is the largest Industry Group in the Sector by market capitalisation (with a market share of 49.76%) mainly thanks to the presence of the Mega Cap Amazon.com Inc, that stand for 22.57% of total Sector market capitalisation. Moreover, Retailing is the Industry Group with the higher percentage of upside companies (91.83%, that closed 2020 in positive) and also with the higher percentage of companies with positive Covid-19 effect (90.26%), sure enough, as already mentioned early in the chapter, Retailing is the Industry Group that most benefited from Covid-19 pandemic. However, among Industries the performances were not the same, with Internet & Direct Marketing Retail that tops the list, closing the year at +39.61%. Multiline Retail and Specialy Retail registered a slighlty positive performance (respectively +2.28% and +3.30%) while Distributors index did not came back to pre-crisis levels (-3.69%). As regards Internet & Direct Marketing Retail, the success of this Industry (and same name Sub-Industry) is self-explained. Shop closures, lockdown restrictions and self-distancing lead people to increase them spending on internet. Some example are: the well-known

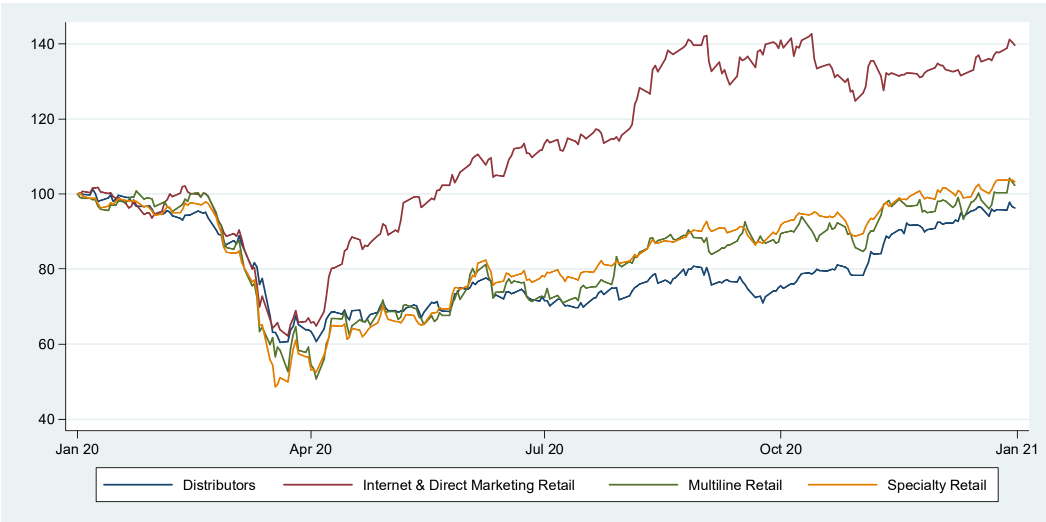

Figure XXV.3 – Retailing Industries indices 2020 trend *(Source: Elaboration on Eikon Data)*

Amazon.com Inc (with an amazing upside of +73.71%), Prosus NV (Netherland-based global consumer internet group working on payments & fintech, food delivery etc., +32.22%), eBay Inc (global commerce company +39.74%) and Zalando SE (German company involved in online shoes and fashion retailer, the incredible performance of 101.15%). All these companies will increase them revenues this year, overperforming the Industry average of +6.53%. As regards, Multiline Retail Industry, it is divided into two Sub-Industries: *Department Stores* (14 companies) and *General Merchandise Stores* (7 companies). The Industry on average closed 2020 with a slightly positive performance of 0.41%, but the performance differ amidst the two Sub-Industries: Department Stores lost on average -22.02% while General Merchandise Stores gain on average +45.29%. The percentage are different due to business category. Department Stores companies are primarily engaged in fashion retail, footwear, beauty and home products (such as Kohl's Corporation that lost -17.28%) while General Merchandise Stores offer a wider range of products (food assortments, housewares etc.) that were not hard-hit during 2020. The last Industry of Retailing Industry Group is Specialty Retail, divided into six Sub-Industries: *Apparel Retail* (26 companies), *Automotive Retail* (27 companies) *Computer & Electronics Retail* (8 companies), H*ome Improvement Retail* (9 companies), *Homefurnishing Retail* (7 companies) and *Specialty Stores* (30 companies). As expected by Covid-19 restrictions, Apparel Retail is the only one with a average downside (-13.34%) and negative Covid-19 effect (-27.08%).

The Industry comprises some big companies that overperformed in 2020, such as Home Depot Inc (in the Home Improvement Retail Sub-Industry with an upside of 21.33%) and Best Buy Co Inc (provider of technology products, services and solutions in Computer & Electronics Retail Sub-Industry had an upside of +14.46%).

3.6 CONSUMER STAPLES SECTOR

The *Consumer Staples* Sector comprises by definition companies whose businesses are less sensitive to economic cycles. It includes manufacturers and distributors of food, beverages and tobacco and producers of non-durable household goods and personal products. It also includes food & drug retailing companies as well as hypermarkets and consumer super centers. Our sample contains 264 companies of

Industry Group	**2020 Outlook**	**2020 Performance**	**Covid-19 Effect**
Food & Staples Retailing	34.34%	9.09%	-25.25%
Food, Beverage & Tobacco	21.12%	24.99%	3.87%
Household & Personal Products	38.98%	24.24%	-14.74%
Consumer Staples	**26.03%**	**22.23%**	**-3.80%**

Table IX.3 – GICS Sector Consumer Staples results *(Source: Elaboration on Eikon Data)*

Consumer Staples Sector, divided into its 3 Industry Group: *Food & Staples Retailing* (with 44 companies), *Food, Beverage & Tobacco* (180 companies) and *Household & Personal Products* (40 companies), that recovered more or less after Covid-19 pandemic, even if only Food, Beverage & Tobacco have a positive Covid-19 effect (+3.87%) due to higher expectation from others Industry Groups. The

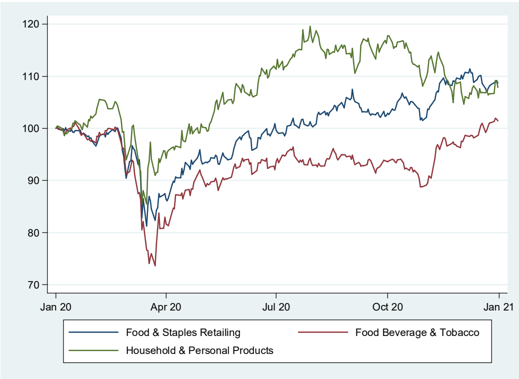

Figure XXVI.3 – Consumer Staples Industry Groups indices 2020 trend *(Source: Elaboration on Eikon Data)*

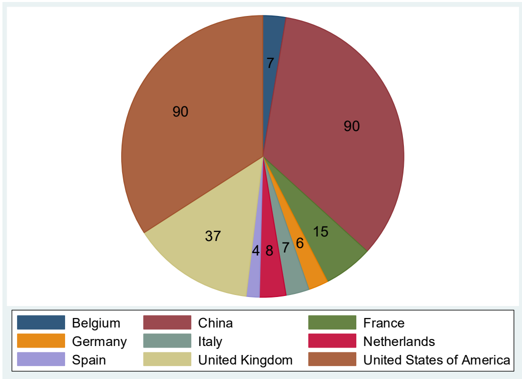

Figure XXVII.3 – Consumer Staples composition by country *(Source: Elaboration on Eikon Data)*

Sector is highly represented by US and Chinese companies (both stand for 68.18%) due to the high number of these companies in the sample. The 61.37% of Consumer Staples total companies have recover from pre-crisis levels, especially in China where 2020 performance amounts to +54.4%, outperforming the initial estimates. Considering the Industry Groups, the chart below illustrate us that the thing is common between the three is the high density of companies in the second quadrant (top left, on average the 44.56% of the total companies), where are situated the companies that had a positive outlook at the beginning of 2020 and they were damaged from Covid-19. An example is Procter & Gamble Co, the US companies operating in Household Products Sub-Industry, that closed 2020 with a positive +13.51% but the high expectation growth at the beginning of the year (+47.65%) result in a negative Covid-19 effect of -34.14%. Overall, the Consumer Staples Sector is one of the less damaged sector from Covid-19 pandemic (on average -2.56%) because it includes companies that had anyway worked during this year.

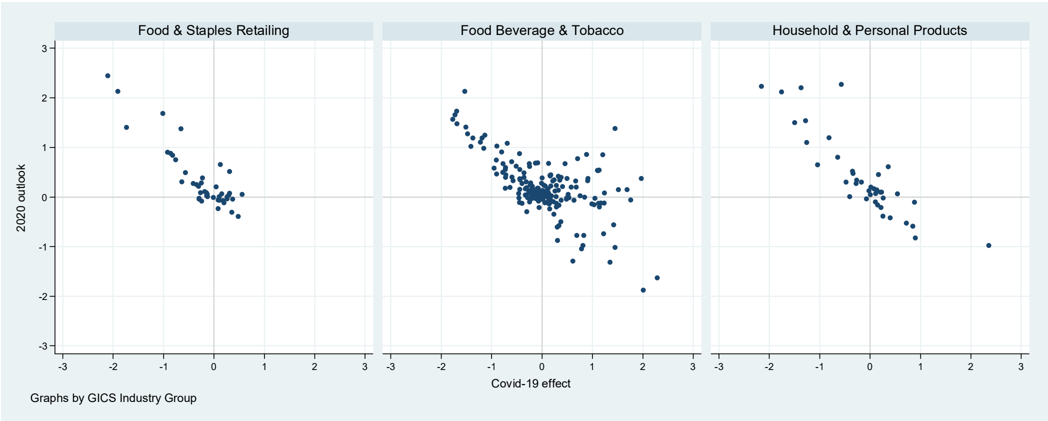

Figure XXVIII.3 – Consumer Staples companies scatterplot by Industry Groups *(Source: Elaboration on Eikon Data)*

Going more specific in Food & Staples Retailing Industry Group (passing through the Industry of the same name), the Global Industrial Standard Classification list four Sub-Industries. The first is *Drug Retail* (6 companies), where are includes owners and operators of primarily drug retail stores and pharmacies. The second and the third are similar: *Food Distribution* (10 companies) contains distributors of food products to other companies while *Food Retail* (18 companies) contains owners and operators of primarily food retail stores. In the end, the fourth Sub-Industry is named *Hypermarkets & Super Centers* (10 companies), the hypermarkets and super centers selling food and a wide-range of consumer staple products that are not included in other Sub-Industries. Not by chance, Drug Retail Sub-Industry wins the higher Covid-19 effect and the best 2020 performance of these four Sub-Industries. The very high sales of facemasks, hand sanitizers and various drug have permit these companies to improve the business, closing the year with an amazing +34.73%. Concerning the others three Sub-Industries, the trend in

2020 was not so bad (on average 6.04%) but due to high estimates for 2020 (on average +38.78%) the Covid-19 effect amounts to -28.5% for Hypermarkets & Super Centers, -31.37% for Food Retail and -38.35% for Food Distributors.

The second Industry Group of Consumer Staples Sector, Food, Beverage & Tobacco, encompasses three Industry: *Beverages* (with 120 companies), *Food Products* (54 companies) and *Tobacco* (6 companies). Beverages Industry in turn contains three type of Sub-Industry: *Brewers* (9 companies), *Distillers & Vintners* (32 companies) and *Soft Drinks* (13 companies, which are included also also mineral waters). Food Products include two further Sub-Industries: *Agricultural Products* (27 companies) and *Packaged Food & Meats* (93 companies, includes dairy products, fruit juices, meats, poultry, fish and pet foods). Lastly, Tobacco does not contain other classification. Starting from the latter, Tobacco Industry index registered the worst performance in 2020 of the three (-16.18%), followed by Food Products (-1.02%) and the only one in positive Beverages (+11.52%). The bar chart above highlight the company's average stock results in 2020 of the six Sub-Industries of Food, Beverage & Tobacco Industry Group: again, Tobacco is on negative field (-2.15%) while Brewers sign the best performance (+46.16%). Inside

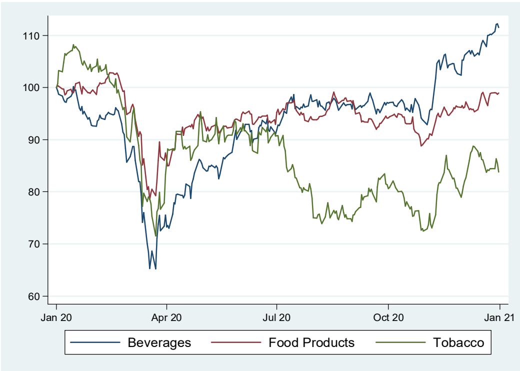

Figure XXIX.3 – Food, Beverage & Tobacco indices 2020 trend *(Source: Elaboration on Eikon Data)*

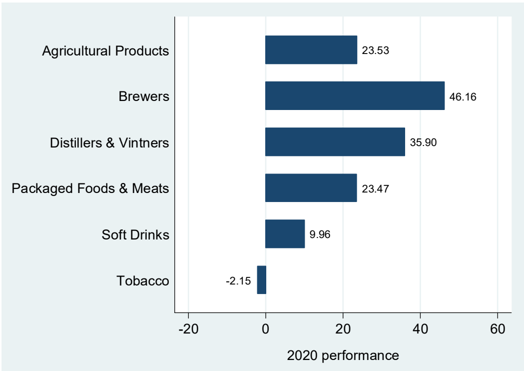

Figure XXX.3 – Food, Beverage & Tobacco Sub-Industries 2020 performances *(Source: Elaboration on Eikon Data)*

Beverages Industry, the 34.43% of the entire Consumer Staples Sector by market capitalisation, the three Sub-Industries have took advantage from Covid-19 pandemic, with the indicator amounts to 3.04% for Soft Drinks, 31.14% for Distillers & Vintners and the astonishing 47.44% for Brewers. Distillers & Vintners include one of the largest companies in the world, Kweichow Moutai Co Ltd, the producer of the famous Maotai baijiu. At the beginning of 2020, the company was predict to decrease for about -13.77% but the great performance in 2020 (+85.24%) result in positive Covid-19 effect. Clearly, stay-at-home restrictions taken by government allows these companies and the whole Consumer Staple Sector to improve the businesses. As regards the second Industry Food Product (inside the Food, Beverage & Tobacco Industry Group), the two Sub-Industry included, Agricultural Products and Packaged Foods & Meats, are highly represented by Chinese companies. The 60% of the companies have recovered from pre-crisis stock levels (the percentage is the same for the two Sub-Industries). Tobacco

Industry includes only six companies, four from USA and two from UK. They all had positive outlook, on average +92.24% (misrepresented by the +213% of Turning Point Brands Inc), combine with negative performance in 2020 result in negative effect from Covid-19 pandemic, expect for Turning Point Brands Inc that closed the year with +59.77%, thanks to its better fundamentals above the Industry average.

The last Industry Group is Household & Personal Products that is simply divided into two Industry (and relative Sub-Industry): *Household Products* (14 companies) and *Personal Products* (26 companies). The first include producers of non-durable household products, including detergents, soaps, diapers and other tissue and household paper products not classified in the Paper Products Sub-Industry (Materials Sector). The latter contain manufacturers of personal and beauty care products, including cosmetic and perfumes. Considering the scatterplot above, the 27.5% of total Industry Group companies is collocated in the fourth quadrant (bottom right). These 11 companies were predicted to decline at the beginning of 2020 and they benefited from Covid-19 crisis, resulting in a positive indicator on average of +69.21%. One of these companies is Unilever PLC, the London based company mainly operating in beauty & personal care (Personal Products Industry). The company was expected to decrease (-9.87%), as all companies it registered losses but it close the year at pre-crisis levels, with 2020 revenues growth rate amounting to 15.65% (increased from 10.18% estimate at the beginning of the year). In general, the results obtained by the two Industry is nearly the same due to the similar business involved (Household Products Covid-19 effect -19.14% and Personal Products Covid-19 effect -12.36%).

3.7 COMMUNICATION SERVICES SECTOR

According to GICS Sectors definition, the *Communication Services* Sector includes companies that facilitate communication and offer related content and information through various mediums. It includes telecom and media & entertainment companies including producers of interactive gaming products and companies engaged in content and information creation or distribution through proprietary platforms. Our sample includes 232 companies belonging to Communication Services Sector, which on average lost -2.24% during 2020. With an initial outlook at +17.32% for the Sector, the resulting Covid-19 effect is -19.56%. Amidst countries, Italian and French Communication Services registered the worst performance (respectively -12.19% and -7.67%), quite the opposite in Germany (+11.36%) and United Kingdom (+8.46%). Communication Services Sector includes two Industry Group: *Media & Entertainment* (includes 186 companies in

Industry Group	**2020 Outlook**	**2020 Performance**	**Covid-19 Effect**
Media & Entertainment	22.28%	-4.06%	-26.34%
Telecommunication Services	-2.75%	5.07%	7.83%
Communication Services	**17.32%**	**-2.25%**	**-19.57%**

Table X.3 – GICS Sector Communication Services results *(Source: Elaboration on Eikon Data)* our sample) and *Telecommunication Services* (46 companies). The table above illustrates the result of the two Industry Group, both of which overturn the initial expectation. Overall, Communication Services Sector have 64.22% of total companies that closed 2020 in decline, the percentage is nearly the same in Media & Entertainment Industry Group (67.2%) while it decrease considering Telecommunication Services (52.17%).

Regarding Media & Entertainment Industry Group, it is divided into three Industry: *Media* (with 101 companies), *Entertainment* (61 companies) and *Interactive Media & Services* (24 companies). The chart illustrate the trend of sectorial index built with relative Industry companies. Entertainment Industry made an amazing performance of +64.04%, Interactive Media & Services closed at +17.94% while Media is the only in negative with -1.13%. Sure enough, Media Industry is the one with larger percentage of companies that closed 2020 in negative (75.25%). Speaking of Media Industry, it includes four Sub-Industry: *Advertising* (with 35 companies), *Broadcasting* (27 companies), *Cable & Satellite* (12 companies) and

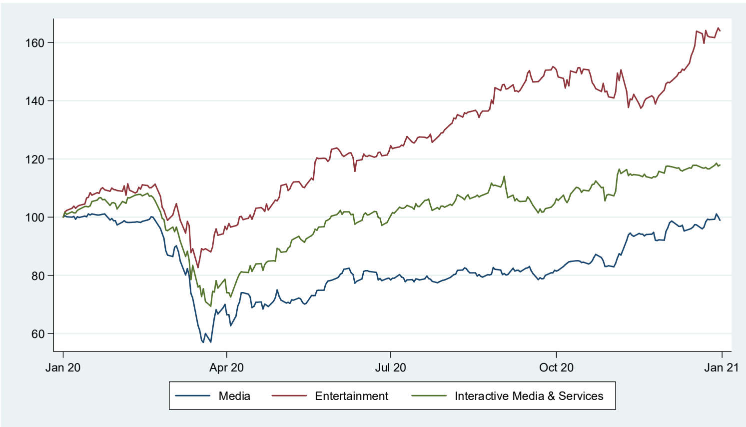

Figure XXXI.3 – Media & Entertainment indices 2020 trend *(Source: Elaboration on Eikon Data)*

Publishing (27 companies). The bar graph below illustrate the results among Sub-Industries. As illustrated, Advertising, Broadcasting and Publishing all have positive initial outlook and then they bad performed in 2020, resulting in negative Covid-19 effect. Instead, Cable & Satellite Sub-Industry had outlook near zero, so the positive performance of 4.96% can be attributable to Covid-19. Broadcasting and Publishing Sub-Industries deep losses was dragged by Micro and Small Cap companies, which decline on average respectively by -22.38% and -7.75% (Large Cap companies registered an upside of +4.9%). Among other companies, Cable &

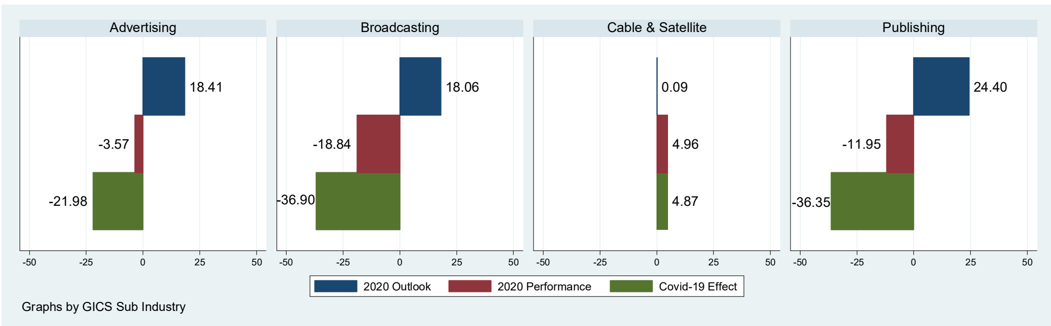

Figure XXXII.3 – Media Sub-Industries results *(Source: Elaboration on Eikon Data)*

Satellite Sub-Industry contains the Mega Cap Comcast Corp, media and technology company. Company stock price rose by 16.42% during 2020, mainly guided by the decision of prioritize streaming video over theatres (starting from a cartoon-film that permit to earn in three weeks the equivalent of five previous months in theatres). The second Industry of Media & Entertainment Industry Group is Entertainment, in turn composed by two Sub-Industries: *Movies & Entertainment* (41 companies) and *Interactive Home Entertainment* (20 companies). Even if the whole Entertainment Industry suffered Covid-19 restrictions (theatres closing, halls, and stadiums and other event centres staying under closure) the two Sub-Industry have very different results. Movies & Entertainment companies have on average lost -19.44% during the year, with 78.05% of companies that registered negative performance. Instead, Interactive Home Entertainment gain on average +25.73%, with 70% of companies with an upside. However, Movies & Entertainment contains the two important and famous Mega Cap companies: Walt Disney Co (+23.67% in 2020 and Netflix Inc (+65.92%). The latter is by a long margin the worldwide leader of streaming video (with revenue annual growth rate amounting to 31.70% for the last three years), the former is a worldwide entertainment company involved in different business areas (which recently launch its personal streaming platform, seizing the opportunity of stay-at-home restrictions). Inside Interactive Home Entertainment there as much companies that outperformed the expectation during 2020. The companies are Activision Blizzard Inc (58.26%), Electronic Arts Inc (33.96%), Take-Two Interactive Software Inc (70.03%) and Ubisoft Entertainment SA (26.39%). The thing in common among these companies is that they involved in video game industry, one of the business area that most benefited from lockdown measures. Lastly, Interactive Media & Services Industry (and same name Sub-Industry) contains 24 companies in our sample. Interactive Media & Services represent 10.34% of total Communication Services Sector, but considering market capitalisation the percentage pass to

44.49%. This difference is thanks to two of the largest companies in the world: Alphabet Inc and Facebook Inc (they represent the 3.49% of our entire sample by market capitalisation). The two companies registered performances in line with Industry average (respectively +28.73% and +30.91%). Even if the average performance is positive, there is some companies that closed 2020 in negative. An example is the US Tripadvisor Inc (-4.59& in 2020), which obviously suffered during pandemic because of stop travel.

The other Industry Group of Communication Services Sector is Telecommunication Services that is divided into two Industry: *Diversified Telecommunication Services* (33 companies) and *Wireless Telecommunication Services* (13 companies, with same name Sub-Industry). Diversified Telecommunication Services make another distinction in two different Sub-Industry: *Alternative Carries* (12 companies) and *Integrated Telecommunication Services* (21 companies). The Industry Group was expected to decline by a tiny -2.75%, considering the 2020 performance of +5.07% the resulting Covid-19 effect is +7.82%. The results remain nearly the same considering the two Industry. Diversified Telecommunication Services was either expected to decline by -3.46%, but the 2020 took a performance of +6.76% (Covid-19 effect of 10.22%), while Wireless Telecommunication Services same results but more little variation. However, in Diversified Telecommunication Services Industry the performance of the two Sub-Industry are different: Alternative Carries closed 2020 with an average upside of +32.34% while Integrated Telecommunication Services decline by -7.85%. This Industry Group contains the most important Telecommunication companies in the world, classified among sub-classification. The French company Iliad SA (classified in Alternative Carries Sub-Industry) were been able to improve its business also in 2020, after three years of continuous growth, with an upside of 43.61% (greater than the Sub-Industry average). Integrated Telecommunication Services includes two Mega Cap companies that declined in 2020, Verizon Communications Inc and AT&T Inc. The two holding company providers of telecommunication services had respectively decline by -2.73% and -26.37%. But the Sub-Industry contains also French and Italian company domestic leader namely Orange SA and Telecom Italia SpA, whose both stock returns reduced in 2020 by -26.59% and -32.33%.

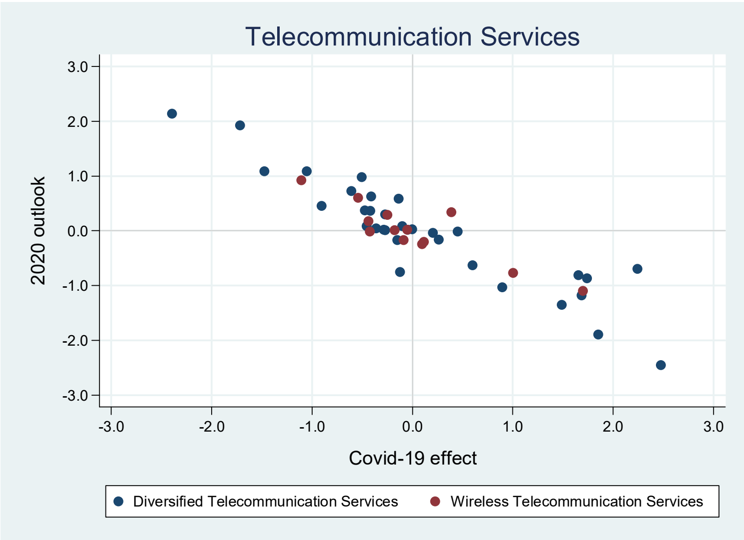

Figure XXXIII.3 – Telecommunication Services companies scatterplot *(Source: Elaboration on Eikon Data)*

3.8 INFORMATION TECHNOLOGY SECTOR

The *Information Technology* Sector comprises companies that offer software and information technology services, manufacturers and distributors of technology

Industry Group	2020 Outlook	2020 Performance	Covid-19 effect
Semiconductors & Semiconductor Equipment	23.60%	43.44%	19.84%
Software & Services	28.35%	24.48%	-3.87%
Technology Hardware & Equipment	20.79%	19.08%	-1.72%
Information Technology	**24.73%**	**25.36%**	**0.64%**

Table XI.3 – GICS Sector Information Technology results *(Source: Elaboration on Eikon Data)*

hardware & equipment such as communications equipment, cellular phones, computers & peripherals, electronic equipment and related instruments, and semiconductors. There are 682 Information Technology companies in our sample, that on average 25.36% during 2020, the highest increase after Health Care Sector. Sure enough, Information Technology Sector is the less affected by Covid-19 pandemic together with Health Care Sector. Moreover, the 64.08% of IT companies closed 2020 with upside, the highest percentage among sector. Information Technology Sector includes three Industry Group: *Software & Services* (316 companies), *Technology Hardware & Equipment* (260 companies) and *Semiconductors & Semiconductor Equipment* (260 companies). The table above illustrates the results among Industry Group. Both overall Sector and three Industry Groups had high growth rate at the beginning of the year, in line with good performance in 2019. The effective performance in 2020 has reflected the

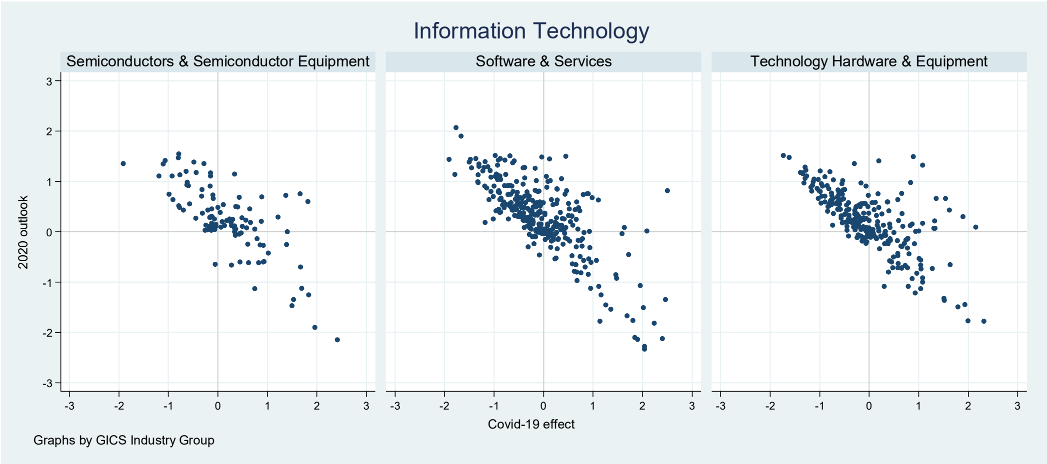

Figure XXXIV.3 – Information Technology companies scatterplot by Industry Groups *(Source: Elaboration on Eikon*

expectation more or less in the Industry Group, as a result Covid-19 effect is not so bad. Information Technology Sector is the second largest by market capitalisation in our sample (16.55%), while inside the sector the major market share is of Software & Services (50.96%). The graph above illustrate companies positioning in terms of Covid-19 effect and 2020 outlook. As illustrated, Semiconductors & Semiconductor Equipment companies are collocated especially in the first and fourth quadrant (Covid-19 effect positive), while the others two Industry Group has higher percentages in second and third quadrant.

The first Industry Group we analyse is Software & Services. The Group include two Industries: *IT Services* (with 133 companies) and *Software* (183 companies). The performances of these two Industry were good (respectively 11.97% and 33.56%), but IT Services have negative Covid-19 effect due to not-so-high performance and higher initial expectation (on average +29.83%). Software were able to perform better than the expectation (27.26%), as a result Covid-19 effect amount to 6.3%). Both Industries performance were dragged by big companies, Mega Cap companies registered +49.83% in IT Services Industry and 45.47% in Software. Speaking of IT Services Industry, the composition in Sub-Industry provide three sub-classification: *IT Consulting & Other Services* (72 companies), *Data Processing & Outsourced Services* (46 companies) and *Internet Services & Infrastructure* (15 companies). The outlook was positive for the three Sub-Industry, however 2020 gave not the same performance (the lowest Data Processing &

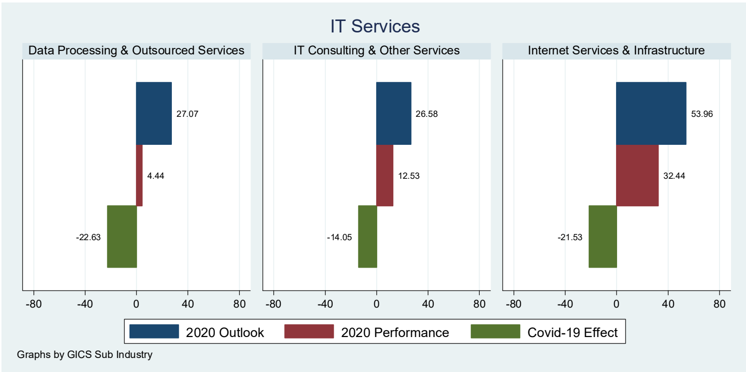

Figure XXXV.3 – IT Services Sub-Industries results *(Source: Elaboration on Eikon Data)*

Outsourced Services +4.44%). As a result Covid-19 effect become negative in the whole three Sub-Industry, perfectly in line with Industry results. As already mentioned, biggest companies dragged the Industry (and in turn the three Sub-Industries) to these performance, while Micro and Small companies went down. To note, Data Processing & Outsourced Services Sub-Industry includes three Mega Cap companies of IT Sector: Visa Inc, Mastercard Inc and PayPal Holdings Inc, all primarily involved in electronic and digital payment. Them business improve in

2020 thanks to the increase demand in digital payments and payments solutions. The 2020 closures amount to +15.36% for Visa Inc, +18.81% for Mastercard Inc and the amazing +115.34% for PayPal Holdings Inc (the latter will increase its EBIT by 85.79% from previous year). As regards Software Industry, it include two different Sub-Industry: *Application Software* (143 companies) and *Systems Software* (40 companies). The Sub-Industries results perfectly reflect those one of the Industry as a whole. Application Software initial expectation amounted to 30.03%, while Systems Software growth was estimated at 17.33%. Both Sub-Industry outperformed the initial predictions closing 2020 respectively with an upside of +37.23% and +20.44%, resulting in positive Covid-19 effects of 7.19% and 3.11%. Application Software is the Sub-Industry with the higher percentage of companies that closed 2020 with an upside (72.73%) in Software & Services Industry Group. Even here there is some big IT companies. Application Software includes the Mega Cap Adobe Inc (+50.73%, benefiting from an increase demand in company solutions through working-from-home trend during Covid-19 pandemic) and the German Large Cap SAP SE (-10.99%, the performance did not reflect the fundamentals because EBIT will increase by 28.38% from previous year thanks to improved business activity during the fourth quarter). While Systems Software contains the big Albuquerque-founded company Microsoft Corp, which has grown by 40.22% in 2020, based on tech intensity to improve business resilience.

The second Industry Group we analyse is Technology Hardware & Equipment, that this the Industry Group with lowest average performance. It is divided into three Industry: *Communications Equipment* (and relative same-name Sub-Industry, composed by 61 companies in our sample), *Technology Hardware, Storage & Peripherals* (and relative same-name Sub-Industry, with 26 companies) and *Electronic Equipment, Instruments & Components* (173 companies). The chart below illustrate the trend of the three Industry stock index. The best upside was achieved by Electronic Equipment, Instruments & Components (+25.71%), followed by Technology Hardware, Storage & Peripherals (+24.41%), a little bit far Communications Equipment (+13.28%). Starting from initial outlook, only Technology Hardware & Equipment have positive Covid-19 effect (+15.6%) while others have it on negative field, due to high expectation (although performances were goods). Communications Equipment Industry is highly represented by US and Chinese companies that stand for 85.24% (in terms of market capitalisation they represent the 98.98% of the Industry). These companies closed 2020 with an upside

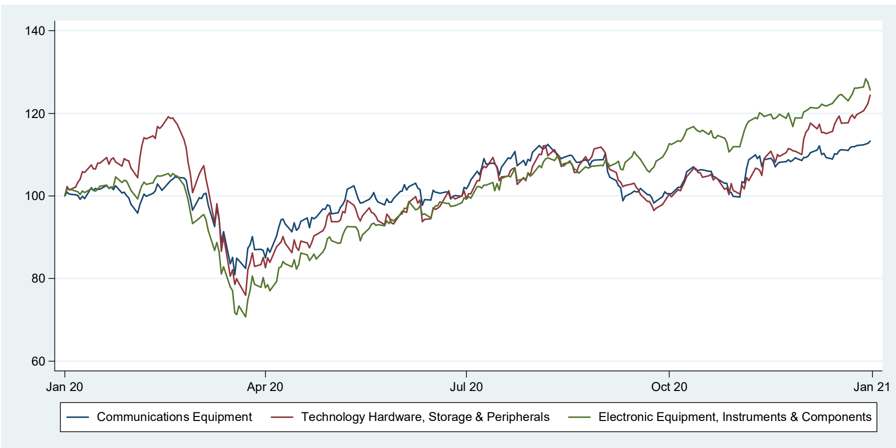

Figure XXXVI.3 – Technology Hardware & Equipment Industries 2020 trend *(Source: Elaboration on Eikon Data)* respectively for +19.36% and +11.21%. However, 47.54% of companies closed the year with negative performance. Among these companies there is also the US Cisco Systems Inc that lost -6.05%. The company went in trouble this summer after the decision to circle through cutting costs, as the company suffered higher enterprise spending during Covid-19 pandemic (revenue will decline by -5.16% on year basis). Like Communications Equipment Industry, even Technology Hardware, Storage & Peripherals Industry signed a good performance on average of +16.14%, but only the 50% closed the year in positive (especially Micro and Small Cap companies). In this Industry it is includes the big tech Apple Inc. The company is continuing a non-stop growth (revenues grown by 17.2% annual rate in the last ten years), closing 2020 with an upside of 78.45%. While Electronic Equipment, Instruments & Components contains four sub-Industries. The first is *Electronic Components* (57 companies), *Electronic Equipment & Instruments* (84 companies), *Electronic Manufacturing Services* (18 companies) and *Technology Distributors* (14 companies) comprises distributors of technology hardware and equipment. All four Sub-Industry closed 2020 on average with positive variation (in line with Industry average) but the different initial outlook result in different Covid-19 effect. The worst is Electronic Components, which 2020 outlook amounts to the amazing +48.17% (dragged by Chinese companies' outlook of +45.25%, they represent the 70.18% of total Sub-Industry companies) and so Covid-19 effect is -20.84%. Electronic Manufacturing Services and Technology Distributors Sub-Industries were the best in terms of both 2020 performance (respectively +24.37% and +17.98%) and Covid-19 effect (+16.59% and +13.94%).

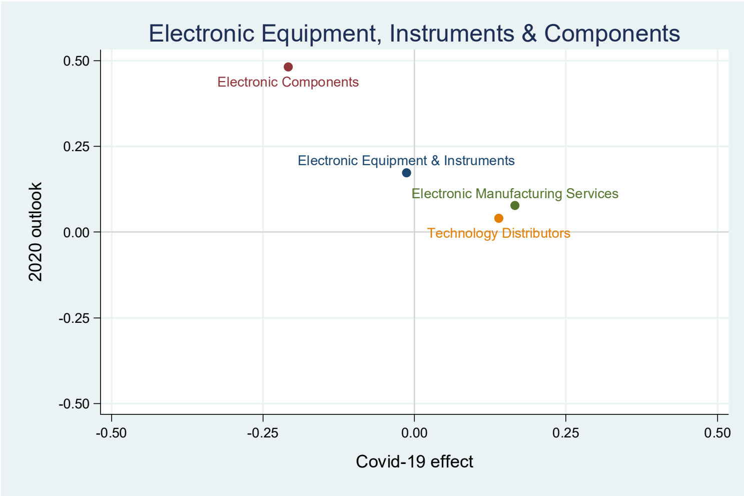

Figure XXXVII.3 – Electronic Equipment, Instruments & Components Sub-Industries scatterplot *(Source: Elaboration on Eikon Data)*

The last Industry Group is Semiconductors & Semiconductor Equipment. The same name Industry is divided into: *Semiconductor Equipment* (39 companies) and *Semiconductors* (67 companies). As highlighted by the histogram below, the Industry as a whole registered a positive Covid-19 effect for 19.84% (the percentage remain nearly the same in the two Sub-Industries, Semiconductor Equipment 26.62% while Semiconductors 15.89%). These results demonstrate how the Industry went headwind during 2020. Among countries, UK registered the worst performance (-26.71%) due to bad results of two companies: Kromek Group PLC and Nanoco Group PLC (both Semiconductors Sub-Industry), which lost respectively -55.74% and -24.40%. The two companies are both Micro Cap

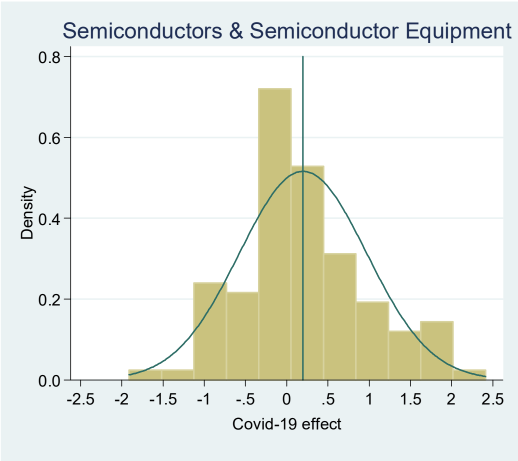

Figure XXXVIII.3 – Semiconductors & Semiconductor Equipment Covid-19 Effect histogram *(Source: Elaboration on Eikon Data)*

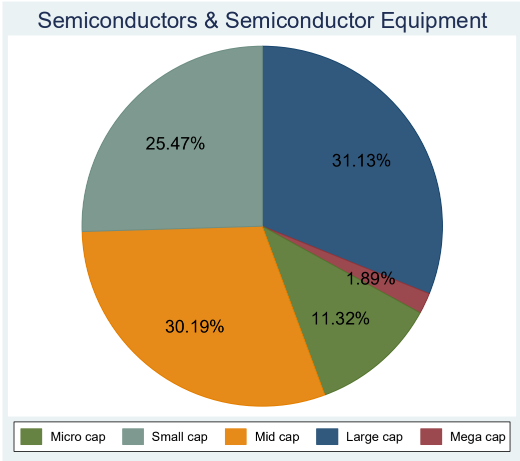

Figure XXXIX.3 – Semiconductors & Semiconductor Equipment composition by company classification *(Source: Elaboration on Eikon Data)*

companies that not yet becoming profitable (Net Income is once again negative), in addition they suffered Brexit issues. Instead, Chinese and German companies registered amazing performance (on average +68.62% and +37.44%). A brief note to the Dutch Mega Cap ASML Holding NV (Semiconductor Equipment) that closed 2020 with an upside of 48.37%. The company was not affected at all by Covid-19 pandemic thanks to higher demands by big techs for machines (necessary to make chips faster, cheaper and more efficient), revenue had grown each quarter by 24.06% (while annual revenue had grown by 18.26% from previous year).

3.9 HEALTH CARE SECTOR

According to GICS Sectors definition, the *Health Care* Sector includes health care providers & services, companies that manufacture and distribute health care equipment & supplies, and health care technology companies. It also includes

Industry Group	**2020 Outlook**	**2020 Performance**	**Covid-19 Effect**
Health Care Equipment	8.27%	23.41%	15.14%
Pharmaceuticals, Biotechnology & Life Sciences	12.15%	26.97%	14.82%
Health Care	**10.80%**	**25.73%**	**14.93%**

Table XII.3 – GICS Sector Health Care results *(Source: Elaboration on Eikon Data)*

companies involved in the research, development, production and marketing of pharmaceuticals and biotechnology products. There are 794 Health Care companies in our sample, that grown on average by +25.72% (the best performance among sectors). Sure enough, Health Care companies are the ones which have most benefited by Covid-19 pandemic, in relation to vaccine, face masks, hand sanitizers etc. Covid-19 effect amounts to 14.93% on average for Health Care Sector, as a result of an initial outlook of +10.79%. The Sector is highly represented by US companies that compose the 68.01% of the total (72.4% considering the market capitalisation). The Sector is divided into two Industry Group: *Health Care Equipment Services* (composed by 277 companies in our sample) and *Pharmaceuticals, Biotechnology & Life Sciences* (517 companies). As listed by the table below, the results of the two Industry Group are nearly the same (especially in terms of Covid-19 effect). Considering countries, China and United Kingdom registered the best average performance during 2020 (respectively +50.66% and +32.78%) while Italy and Spain the worst (respectively +3.76% and +1.85%). The Health Care Sector is the one with the highest percentage of companies with positive Covid-19 effect (55.54% of total Health Care companies).

As regards the first Industry Group, Health Care Equipment & Services, it include three Industry: *Health Care Equipment & Supplies* (160 companies in our sample) *Health Care Providers & Services* (87 companies) and *Health Care Technology* (30 companies). The three Industry have closed 2020 nearly with the same results in terms of upside (the latter a little bit better, respectively +22.03%, +19.23% and +42.86%). Nevertheless, the expectation were not the same. Health Care Equipment outlook was a decline by a slightly -0.2%, so the upside registered have to be

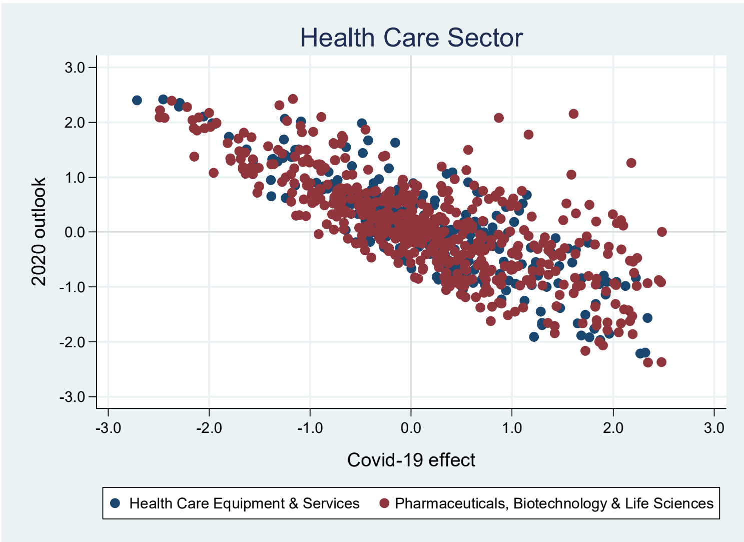

Figure XL.3 – Health Care companies scatterplot *(Source: Elaboration on Eikon Data)*

attributable entirely to Covid-19. Health Care Providers was expected to growth more than the effective performance, so on average the Covid-19 effect is negative (-6.92%). Lastly, the same sentence for Health Care Equipment can be made for Health Care Technology (it was expected to growth by a tiny +1.56%, so the performance can be attributable entirely to Covid-19). Going more specific into Health Care Equipment & Supplies Industry, it is composed by two Sub-Industry:

Health Care Equipment (122 companies in the sample), which contains manufacturers of medical instruments, drug delivery systems, cardiovascular & orthopaedic devices and diagnostic equipment, and *Health Care Supplies* (38 companies) that includes manufacturers of health care supplies and medical products not classified elsewhere (include eye care products, hospital supplies and safety needle & syringe devices). The results of the two Industries are the same in terms of Covid-19 effect but the arrival to the results are different. In other words,

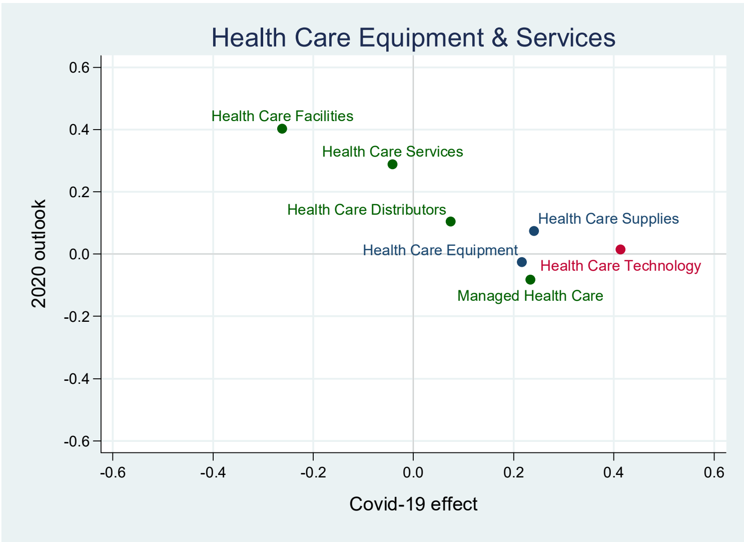

Figure XLI.3 – Health Care Sub-Industries scatterplot *(Source: Elaboration on Eikon Data)*

Health Care Equipment was expected to decline on average for -2.6% while Health Care Supplies had positive outlook for +7.49%. The latter registered a performance of +19.06%, the former did even better with an amazing +31.56%, resulting in similar Covid-19 effect (respectively 21.67% and 24.06%). Health Care Supplies Sub-Industry was dragged by companies that doubled those stock prices. An example is Q uidel Corp, US Mid Cap company engaged in the development, manufacturing and marketing of diagnostic testing solutions. The company outperform the market with an upside of 141.11% from the beginning of the year, thanks to test kits development (and then approved by US Food and Drug Administration). As regards Health Care Providers & Services Industry, the relative Sub-Industries are four: *Health Care Distributors* (with 16 companies), *Health Care Facilities* (28 companies), *Health Care Services* (36 companies, providers of health care services such as dialysis centers, lab testing services and pharmacy management services) and *Managed Health Care* (7 companies, owners and operators of Health Maintenance Organizations and other managed plans). As illustrated by the graph above, Health Care Facilities and Health Care Services are the only one in Health Care Equipment & Services Industry Group with Covid-19 effect (respectively of -26.22% and -4.18%). The results of Health Care Facilities are a little bit misrepresented by the performance of Micro Cap companies, that on average lost -42.03% in 2020. Instead, Managed Health Care Sub-Industry was initially expected to decline (on average -8.13%) but Covid-19 permit this Sub-Industry to overturn the outlook closing the year with a performance of +15.2% (resulting in a Covid-19 effect of +23.33). An example is UnitedHealth Group Inc, a Mega Cap US health and well-being company. The company benefited, like others health insurers, from lower health care spending in the first half of the year, which more than offset pandemic-related additional costs, this lead the company to closed 2020 with an upside of 21.12%. Health Care Distributors have exceed initial expectation by 7.41% (initial outlook amounted to 10.41%) thanks to business improvement during 2020 (in the Sub-Industry revenue grown on average by 9.07% each quarter). Lastly, *Health Care Technology* Industry (and same name Sub-Industry) contains 30 companies, that provide IT services primarily to health care providers (application, systems and/or data processing software, internet-based tools etc.). The Industry had been one of the most beneficiary from Covid-19 pandemic. In fact, the Industry was estimated to growth by a slightly 1.56%, the effective increase in 2020 amount to 42.86%, almost attributable to Covid-19 pandemic. The three Large Cap companies of the Industry dragged the whole performance: Veeva Systems Inc, Teladoc Health Inc and Cerner Corp overall generate an average upside of 79.46%.

The other Industry Group is Pharmaceuticals, Biotechnology & Life Sciences, and it is divided into three Industry (and relative same name Sub-Industry). The firs is *Pharmaceuticals*, that contains 167 companies in our sample, engaged in the

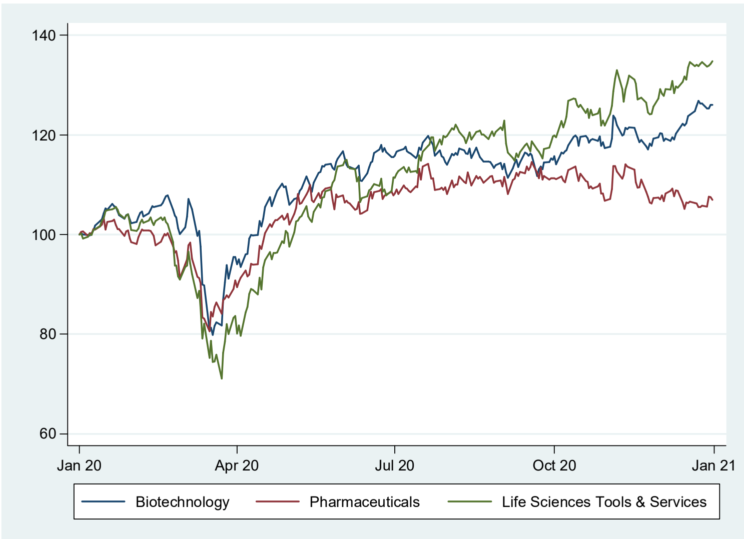

Figure XLII.3 – Pharmaceuticals, Biotechnology & Life Sciences Industries 2020 trend *(Source: Elaboration on Eikon Data)* research, development or production of pharmaceuticals (including veterinary drugs). The second is *Biotechnology* (310 companies) that encompasses companies primarily engaged in the research, development, manufacturing and/or marketing of products based on genetic analysis and genetic engineering. Lastly, *Life Sciences Tools & Services* (40 companies, 17 are Large Cap companies) includes companies enabling the drug discovery, development and production continuum by providing analytical tools, instruments, consumable & supplies, clinical trial services and contract research services. As illustrated by the chart above, the three Industry were able to rebound after them minimum in March, closing the year with high upside: Life Sciences Tools & Services +34.82%, Biotechnology +26.07% and Pharmaceuticals +6.91%. The performances lead the Industry to obtain a Covid-19 effect positive for the first two (respectively 42.18% and 20.97%) but negative for the latter (-3.15%). Biotechnology Industry represent the 39.04% of Health Care Sector in terms of population, while considering market capitalisation the percentage decline to 17.82% (due to the presence of Micro and Small Cap companies in the Industry, that represent the 77.42% of the total). However, Pharmaceuticals Industry stand for the 33.23% of total Health Care market capitalisation, thanks to the presence of three US Mega Cap companies: Johnson & Johnson, Merck & Co Inc and Pfizer Inc (together they represent the 38.58% of Pharmaceuticals Industry). Pfizer Inc maybe is the famous company in 2020 thanks to the discovery of Covid-19 vaccine (together with the German BioNTech SE), announced on November 9, 2020. However, the stock price did not see any strong return: it began the year at $38.25, then took a minimum on March at $28.35, one month after the vaccine announcement it took a maximum a $42.56 and finally closed the year at $36.81. Although the company discovered Covid-19 vaccine the stock price did not reflect it, with revenue remain at same levels during 2020. Biotechnology Industry, even if highly represented by Micro and Small Cap companies, includes some big companies, one above all is Abbvie Inc. The Illinois-based company closed 2020 with an upside of +20.80%, thanks to drug development (actually Rinvoq and a JAK inhibitor were submitted to Food and Drug Administration and European Medicines Agency but the approval process did not yet end). Life Sciences Tools & Services surely made the best performance, because of 97.5% of companies closed 2020 in positive. It means that only one company registered a downside. The company is the Brisith Clinigen Group PLC, which is in an odd situation in the last three years. In fact, the company stock price dropped by 33% in the last 36 months, when Earnings Per Share improve by 46% per year and revenues are actually up 17% over the three years. This is went so bad with revenues that are expected to grow by 12.53% from previous year. Anyway, here is no denying that markets are sometimes efficient, but prices do not always reflect underlying business performance. Market are not always efficient, prices do not always reflect underlying business performance, and probably that is the case.

3.10 FINANCIALS SECTOR

According to GICS definitions, *Financials* sector contains companies involved in banking, thrifts & mortgage finance, specialized finance, consumer finance, asset management & custody banks, investment banking and brokerage and insurance. It also includes Financial Exchange & Data and Mortgage REITs. Our sample contains 724 Financials companies (the third sector by size in the sample) divided into the three Industry Group: *Banks* (346 companies), *Diversified Financials* (285

Industry Group	**2020 Outlook**	**2020 Performance**	**Covid-19 Effect**
Banks	8.73%	-15.02%	-23.75%
Diversified Financials	25.76%	-0.33%	-26.10%
Insurance	34.88%	-8.40%	-43.27%
Financials	**18.79%**	**-8.39%**	**-27.18%**

Table XIII.3 – GICS Sector Financials results *(Source: Elaboration on Eikon Data)*

companies) and *Insurance* (93 companies). On average, the Sector was estimated to growth of +18.79%, the bad performance of -8.38% in 2020 result in a Covid-19 effect of -27.18% (the worst together with Energy Sector). The table above illustrates the results among Industry Group inside Financials Sector. Banks made the worst performance, closing the year on average at -15.02. The graphs below illustrate the companies positioning among Industry Groups. Insurance have the highest percentage of companies collocated in the second quadrant (74.19% or 69 companies) which includes companies that had positive prospects for 2020 but effectively the Covid-19 effect damaged (sure enough, only 18.84% of these 69 companies came back to pre-crisis levels).

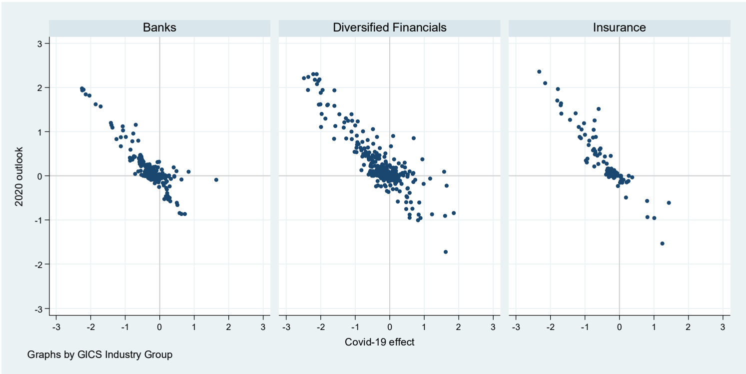

Figure XLIII.3 – Financials companies scatterplot by Industry Groups *(Source: Elaboration on Eikon Data)*

As regards Banks Industry Group, it is divided into two Industry: *Banks* (299 companies) and *Thrifts & Mortgage Finance* (47 companies). Then, *Diversified Banks* (60 companies) and *Regional Banks* (239 companies) Sub-Industries in turn compose Banks Industry. The three Sub-Industries nearly confirm the results of Banks Industry Group: good 2020 outlook, bad performance in 2020 and negative Covid-19 effect. Diversified Banks is the worst in term of 2020 downside and Covid-19 effect, also due to the higher expectation of the three. This Sub-Industry represent the 80.4% of the total Industry Group by market capitalisation, thanks to the presence of the most important Financials companies in the world such as JPMorgan Chase & Co, Industrial and Commercial Bank of China Ltd and Bank of America Corp, that stand for the 24.51% of the Industry Group total market capitalisation. Taking as example JPMorgan Chase, it perfectly represent the Banks Industry Group. The outlook amounted to +8.16%, however the year gave a negative performance (-8.15%). Sure enough, these businesses suffer the low interest rate scenario (in relation to core banking profitability reduction) and the highest credit risk of corporate and retail clients caused by Covid-19 pandemic. Concerning Regional Banks Sub-industry, the results are in line with those of Diversified Banks. This Sub-Industry is certainly highly represented by Small Cap and Micro Cap (67.78% of the total) which have worse results than Large Cap companies (Micro Cap closed the year on average at -41.45%). Overall, only the 11.3% of Regional Banks companies recovered to pre-crisis stock levels. The Thrifts & Mortgage Finance Sub-Industry have the lowest Covid-19 effect of Banks Industry Group (-12.5%) thanks to the not so bad 2020 performance of its 47 companies. The Sub-Industry is highly represented by US companies (41 are from USA, 4 from UK and 2 are Germans) due to the high diffusion of this business in the country (in Europe these services are usually offered by banks and insurances) and it's not include Large Cap or Mega Cap companies. Considering the whole Thrifts & Mortgage Finance, only the 25.53% of the companies recovered to pre-crisis levels, greater than the Industry Group average of 13.58%.

The second Industry Group is Diversified Financials that includes four Industry: *Diversified Financials Services* (36 companies), *Consumer Finance* (36

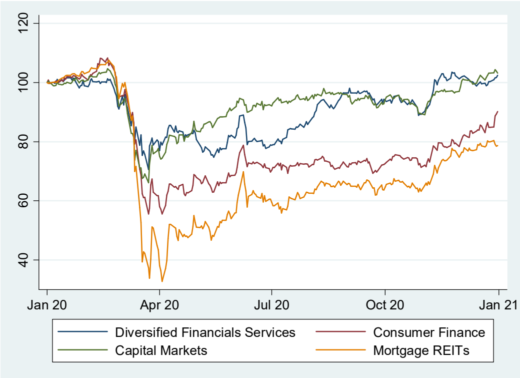

Figure XLIV.3 – Diversified Financials Industries indices 2020 trend *(Source: Elaboration on Eikon Data)*

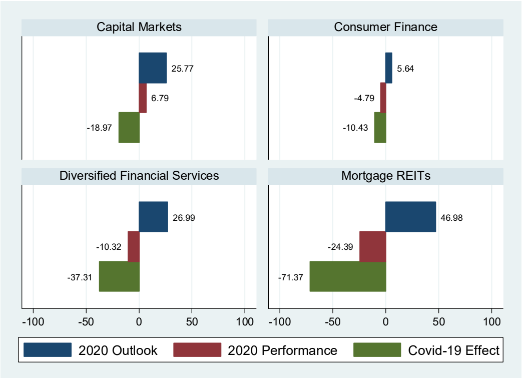

Figure XLV.3 – Diversified Financials Industries results *(Source: Elaboration on Eikon Data)* companies), *Capital Markets* (181 companies) and *Mortgage Real Estate Investment Trusts* (32 companies). As illustrated by the chart above, Diversified Financials Services and Capital Markets Industry indices are on top in terms of 2020 performance while Consumer Finance & Mortgage REITs indices has lost respectively -9.76% and -21.26%. Mortgage REITs went in crisis, like financial crisis of 2008, when asset prices go down in March and they not yet raise up again (only 3 companies of the total 32 came back to pre-crisis levels, with a performance on average of +41.34%). Consumer Finance Industry (and relative Sub-Industry) is composed by company from USA (22 companies or 61.11%), United Kingdom (12 companies or 33.33%) and Italy and Germany (one company each one). These 36 companies are equally divided between positive and negative Covid-19 effect companies. As regards British companies of Consumer Finance Industry, they took down the average 2020 performance consider the average downside of -32.18%. These companies suffered the bad second quarter of 2020 in which experienced a contraction of -24.32% in revenues. Concerning Diversified Financial Services Industry, it is composed by three Sub-Industries: *Other Diversified Financial Services* (10 companies), *Multi-Sector Holdings* (12 companies) and *Specialized Finance* (14 companies). The Industry is mainly composed by European companies that stand for the 66.67%. The three Sub-Industry maintain nearly the same results of Diversified Financial Services Industry in terms of 2020 performance and Covid-19 effect (swinging from -5.02% of Other Diversified Financial Services to -

16.13% Specialized Finance). Multi-Sector Holdings stand for the 91.23% of total Industry market capitalisation thanks to the presence of Mega Cap Berkshire Hathaway Inc but also the Italian Exor NV. It is the Sub-Industry with the higher percentage in Diversified Financials Industry Group of not-recover-companies (75%, behind Mortgage REITs with 90.63%); those which came back to pre-crisis levels registered a little positive performance, except for Plus500 Ltd (Specialized Finance Sub-Industry). The Company, like other online trading firms, tend to experience increases in demand during periods of financial market volatility, and this happened during Covid-19 turmoil. At the beginning of the year, company's revenue was expected to growth at 3.04% from previous year but now the percentage amounts to an amazing +156.07%, thanks to 2020 turbulences. As regards Capital Markets Industry, it is divided into four Sub-Industries: *Investment Banking & Brokerage* (42 companies), *Asset Management & Custody Banks* (116 companies), *Diversified Capital Markets* (4 companies all from Europe) and *Financial Exchanges & Data* (that comprises 19 companies). The results obtained tell us that Diversified Capital Markets and Asset Management & Custody Banks results are nearly the same: both had positive outlook (respectively +18.23% and +25.48%), the average performance was a bit different (-12.57% the former and -2.27% the latter) but the Covid-19 effects are near (respectively -30.81% and -27.76%). Investment Banking & Brokerage and Financial Exchanges & Data closed the year on average at the same level (respectively +24.16% and +27.83%), but the high expectations of the latter (as illustrated by the graph above) collocate it on negative Covid-19 effect field (-14.23%) in contrast with the other (+4.28%). Good trend fundamental during quarters in 2020 explain the good trend of Financial Exchanges & Data Sub-Industry (Revenue and Net Income did not see any contraction during quarter). Investment Banking & Brokerage Sub-Industry stand for the 38.17% of Capital Markets Industry by market capitalisation, mainly due to the presence of three US Large Cap like Morgan Stanley, Charles Schwab Corp and Goldman Sachs Group Inc. These three companies perfectly represent the Industry. The mean upside of these three companies in 2020 amounts to 20.18% (Morgan Stanley the best with +33.85%) and the all have positive Covid-19 effect (again Morgan Stanley the best with 31.8%). The Sub-Industry 2020 performance is in contrast with that one of Financials Sector. This is the proof that inside each sector the companies, and overall Industries and Sub-Industries, can had performed differently thanks to market and business divergence. Concerning Asset Management & Custody, among countries the best performance (the only one) is from Germany, whose companies have closed 2020 on average at +14.55%. The performance is explained by the better economy condition of the country in relation to Covid-19 disease, thanks to government ability to face the crisis. Anyway, US and British companies did not performed so bad, with a decline respectively of -2.37% and -3.83%, but the very high expectation for the companies from these countries (on average +35.18% for US and +22.46% for UK, as a consequence of

2019 results) take the Covid-19 effect down, respectively -37.56% and -26.3%. In addition, Large Cap Asset Management are the best companies in terms of 2020 performance (+9.04%) while the others closed on average on negative field (Mid Cap -3.28%, Small Cap -2.59% and Micro Cap -6.74%), confirming the ability of diversification by big companies thanks to a wider range of investments.

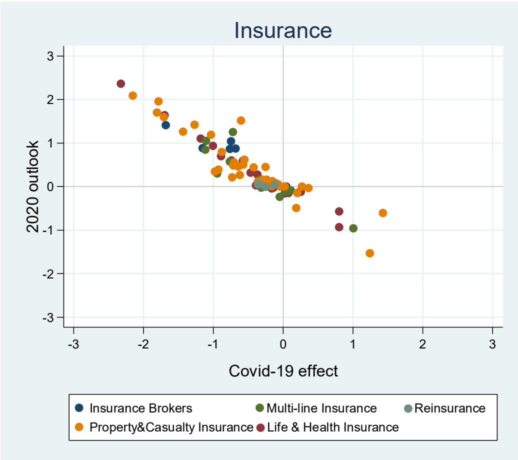

Figure XLVI.3 – Insurance companies scatterplot *(Source: Elaboration on Eikon Data)*

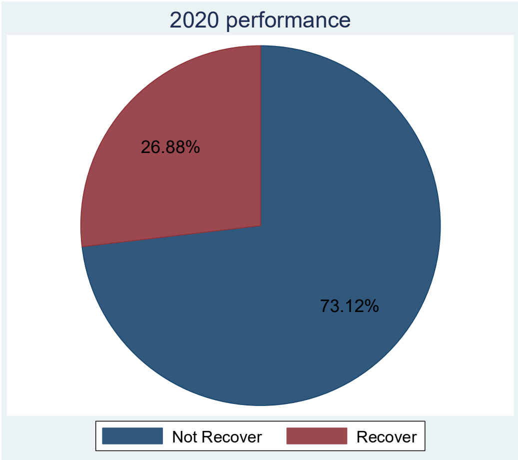

Figure XLVII.3 – Insurance companies recover *(Source: Elaboration on Eikon Data)*

The last Industry Group to analyse is Insurance (and the same-name Industry). This Industry encompasses five Sub-Industry: *Insurance Brokers* (6 companies in our sample), *Life & Health Insurance* (26 companies), *Multi-line Insurance* (20 companies), *Property & Casualty Insurance* (37 companies) and *Reinsurance* (the smaller with 4 companies). As highlighted by the graph above, the majority of the Insurance companies is collocated in the second quadrant (top left), precisely the 74.19% (or 69 companies), where are positioned the companies with positive initial outlook and negative Covid-19 effect (only 13 of them closed the year in positive).

The first quadrant (top right) is the less populated. Here there are two companies: Marsh & McLennan Companies Inc and Travelers Companies Inc (both Large Cap companies), which were able to close the year just on positive field (respectively +4.57% and 2.44%) and collect positive Covid-19 effect (4.32% the former and 2.27% the latter). In other words, these two companies were not been affected a lot by Covid-19 pandemic. The first, Marsh & McLennan Companies Inc, thanks to its diverse product suite, the wide geographic footprint and strong client retention (sure enough, company's revenues have been increasing consistently since 2010, except in 2015). The second, Travelers Companies Inc, was able to come back to end-2019 stock levels and now seems fairly priced, due to the fact that income generated by investing insurance premiums (the most important profitability source for the company) may slowdown in 2021. Overall, all the five Sub-Industries have negative Covid-19 effect and only one closed 2020 on average in positive (Insurance Brokers with +1.57%). Speaking of Insurance Brokers Sub-Industry, it is composed only by US and British companies (one from UK and five from USA, including Marsh & McLennan Companies Inc above-mentioned). They all had positive initial outlook but only four over six closed 2020 in positive. As regards Life & Health Insurance Sub-Industry, the 26 companies of the Sub-Industry represent the 44.55% of total Insurance Industry Group market capitalisation thanks to the presence of some big companies (especially the Mega Cap Ping An Insurance Group Ltd, one of the five Chinese biggest companies, but also China Life Insurance Co Ltd, Prudential PLC and MetLife Inc). Life & Health Insurance results are in line with those ones of Insurance Industry (stock decline on average of -9% and Covid-19 effect on average if -37.52%) even if there is some positive performance. One of this is the already mentioned China Life Insurance Co Ltd (with +9.75%), that were able to overtake the turmoil mainly because of its undervaluation (investors and analysts discovered good fundamentals in summer, survived at spring turbulences, and began to buy these stocks, making climb the stock prices). Concerning Property & Casualty Insurance, the average 2020 performance amounts to not so bad -5%. Nevertheless, considering the high initial outlook of 44.14% the average Covid-19 effect amounts to -49.14%. The Sub-Industry was hard-hit not only by Covid-19 pandemic but also by forest fires occurred during 2020. In fact, the 67.57% of Sub-Industry companies closed 2020 in negative. The last Sub-Industry of Insurance Industry is Multi-line Insurance. As illustrated by the chart below, Multi-line Insurance index made the worst performance in 2020, closing the year at -30.72%. In the Sub-Industry, there are the most important Insurance companies in Europe, which results are in line

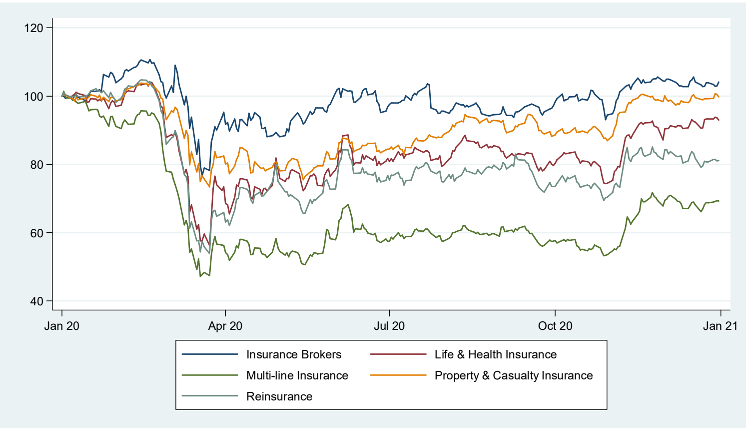

Figure XLVIII.3 – Insurance Sub-Industries 2020 trend *(Source: Elaboration on Eikon Data)* with those of Sub-Industry. We are speaking of the German Allianz SE, the French AXA SA and the Italian Assicurazioni Generali SpA, all Large Cap companies with negative performance in 2020 (respectively -8.38%, -23.39% and -22.56%). Probably the wide range of activities has condemned these companies, which underperform the market (like the whole Multi-line Insurance Sub-Industry).

3.11 REAL ESTATE SECTOR

Based on GICS definition (after 2016 changes), *Real Estate* Sector contains companies engaged in real estate development and operation. It also includes companies offering real estate related services and Equity Real Estate Investment Trusts (REITs). Our sample contains 322 Real Estate companies, mainly from USA (166 companies). The whole sector was estimated to growth at +5.27% in 2020 but

Industry	**2020 Outlook**	**2020 Performance**	**Covid-19 Effect**
Equity REITs	0.23%	-16.07%	-16.30%
Real Estate Management & Development	15.28%	-9.67%	-24.96%
Real Estate	**5.28%**	**-13.93%**	**-19.20%**

Table XIV.3 – GICS Sector Real Estate results *(Source: Elaboration on Eikon Data)*

Covid-19 pandemic drag the sector on average at -13.92%, resulting in a Covid-19 effect of -19.19%. The results remain nearly the same among countries (the less bad Germany with -7.66%, the worst UK with -18.17%). In addition, the results are a little bit different considering the two Industry. The first Industry is *Equity Real Estate Investment Trusts* (REITs), represented by 214 companies in our sample, and

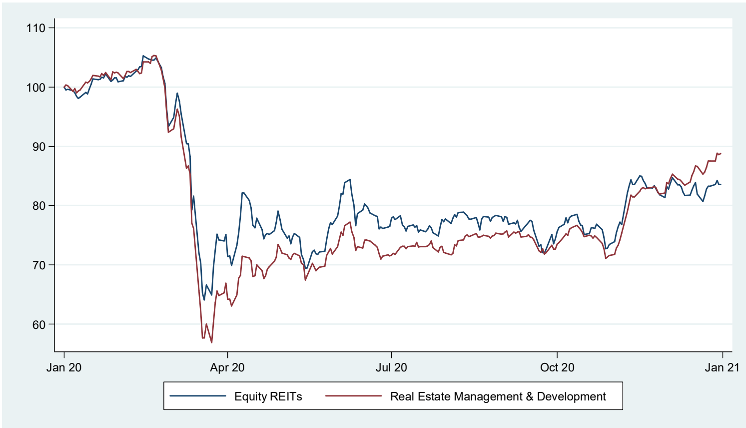

Figure XLIX.3 – Real Estate Industries 2020 trend *(Source: Elaboration on Eikon Data)*

composed by different types of REITs. The second is *Real Estate Management & Development* (108 companies in our samples) that contains companies engaged in management, leasing, development and services of real estate. Equity REITs had on average a tiny positive outlook at the beginning of the year (+0.23%), smaller than the expectation of Real Estate Management & Development Industry (+15.28%). However, both sectorial indices registered huge loss (-16.45% the former and -11.25% the latter) as illustrated by the chart above.

As concerns Equity REITs Industry, the 214 companies are divided into eight Sub-Industry in relation to core business activities (specifically acquisition, development, ownership, leasing, management and operation of relative properties). The Sub-Industries and the relative companies comprised are: *Diversified REITs* (23 companies), *Health Care REITs* (20 companies), *Hotel & Resort REITs* (16 companies), *Industrial REITs* (18 companies), *Office REITs* (37 companies), *Residential REITs* (24 companies), *Retail REITs* (44 companies) and

Specialized REITs (32 companies). As highlighted by the bar graphs below, each Sub-Industry had a specific outlook (certain positive and certain negative) while the 2020 performance and Covid-19 effect that is more different among Sub-Industries. Industrial REITs and Specialized REITs are the only that closed the year on average in positive (respectively +14.3% and +4.05%). It is interesting to note that when the expectation are high and the performance is low the Covid-19 effect is deeply low (is the case of Diversified REITs and Health Care REITs but the sentence maintain a general perspective). However, the best result in term of Covid-19 effect belong

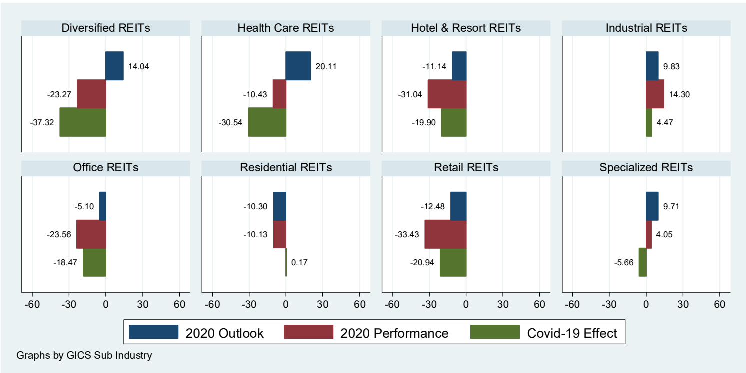

Figure L.3 – Equity REITs Sub- Industries results *(Source: Elaboration on Eikon Data)*

to Industrial REITs (+4.47%). Industrial REITs Sub-Industry is the less affected by Covid-19 turmoil or rather had somehow benefited from it. In particular the industries operating through e-commerce, that experienced an amazing growth during 2020. Sure enough, the 83.33% of companies in the Sub-Industry closed the 2020 in positive, with revenues average that will increase of +17.87% from previous year. Concerning Specialized REITs (that stand for 28.05% of the total Real Estate Sector by market capitalisation), they closed 2020 on average in positive (65.63% of companies in positive). Hotel & Resort REITs, Health Care REITs, Retail REITs and Office REITs are the most damaged by Covid-19 pandemic Real Estate Sub-Industries. Stay-at-home restrictions, border restrictions, health care emergency, store closures and work-from-home trend dragged these REITs to bad downside in 2020, as illustrated by the bar graphs above. Hotel & Resort REITs (-31.04% during 2020) had been damaged obviously by the pandemic, due to sudden stop of travels and voyages. From first to second quarter, this Sub-Industry experienced an average revenue reduction of -77.20% (in the whole year the decline will be about -58.46%). The 85% of Health Care REITs closed 2020 on negative field (average downside of -10.43&), confirming the bad year, for the clear reasons of pandemic. As regards Retail REITs (that lost 33.43% in 2020), they faced the crisis from the beginning when store were required to close, as physical distancing requirements. Moreover, bankruptcies among stores have disrupted a traditionally stable cash flow stream of these REITs. Office REITs close 2020 with a downside of -23.56% (94.59% companies closed in negative), mainly due to remote working for companies all over the world. The problem is future trend because a lot of companies will continue remote working in following months. However, Net Income will decrease from 2019 to 2020 on average about -22.87%. Then, Diversified REITs is the Sub-Industry with the worst Covid-19 effect (-37.32%) because of a bad performance of -23.27%. As already mentioned, these companies operates significantly in different property types, maybe the miscellaneous composition business activities lead the companies to bad performance. Residential REITs is one of the less affected Sub-Industry. 2020 outlook and 2020 performance are nearly the same (respectively -10.3% and -10.13%), as a result Covid-19 effect amounts to 0.17%. The explanation is simply: these companies were still in trouble at the beginning of 2020 and so they were supposed to decline, with the pandemic they effectively decline but not worst than the estimates, so the results are in line among themselves.

The other Industry of Real Estate Sector is Real Estate Management & Development, which includes 108 companies divided in four Sub-Industries: *Diversified Real Estate Activities* (19 companies), *Real Estate Operating Companies* (34 companies), *Real Estate Development* (39 companies), *Real Estate Services* (16 companies). As illustrated by the graphs below, all the four Sub-Industries passed a bad year. Real Estate Service made the less-bad performance closing the year at -4.52%. Exactly Real Estate Services is balanced by companies with good performance and company with bad performance. The differentiation can be the foreign activities. It means that companies that operates with foreign countries made worse than the ones who operate domestically. For example, the US Jones Lang LaSalle Inc, that operates all over the world, lost -14.65%, same as Savills PLC (British companies) that operates both domestic and foreign (37.68% of revenues came from UK in 2019 and 32.5% from Asia, the remaining between North America and Europe) lost -17.07%. Quite the opposite are the US Redfin

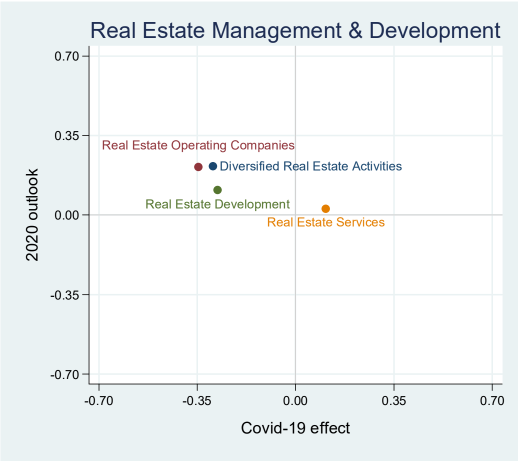

Figure LI.3 – Real Estate Management & Development Sub Industries scatterplot *(Source: Elaboration on Eikon Data)*

Figure LII.3 – Real Estate Management & Development Sub Industries 2020 trend *(Source: Elaboration on Eikon Data)*

Corp and the Chinese Shenzhen Worldunion Group Inc, both operates primarily domestically and increase in 2020 respectively for 217.58% and 32.62%. Maybe, the stay-at-home restrictions affected more the worldwide companies. As regards Real Estate Development, it have the 87.18% of companies that closed the year in negative. The Chinese companies suffered the worst loss amidst countries (-17.32%). Real Estate Operating Activities made worse mean performance with a -34.57% (73.53% companies closed 2020 in negative). These companies slumped as shop closures and stay-at-home restrictions, especially British companies that on average lost 19.43%. Lastly, the 19 companies of Diversified Real Estate Activities Sub-Industry had lost on average -7.81%. The trend was nearly the same as Diversified REITs in Equity REITs Industry. These types of companies are engaged in miscellaneous business activities, this probably drag them to negative performance.

CHAPTER 4

BETA ANALYSIS

In chapter 3, through company expectation and stock trend during 2020, we analyse the return-side of companies among sectors. In order to enhance the analysis we analyse also the risk-side of companies, through beta calculation. The beta of a stock is the measure of its risk in relation to the market. For example, a stock with beta of 1.5 have greater systematic risk than the market as a whole, so if the market rise 1% the stock will increase by 1.5%. During Covid-19 turmoil in 2020 we saw some stocks go up when market falling or decline when market went up (Technology, Health Care), these stocks displayed lower volatility during 2020. Quite the opposite there was another cluster of stocks (Energy, Financials) that followed the market and they displayed higher volatility. Therefore, to calculate these differences we decide to calculate two beta, considering the daily stock return of each company for the last year and the return for the relative market index (S&P 500 for US companies, FTSE for Italian companies and so on). The first beta was calculated at the beginning of the year, before the Covid-19 arrival in February-March, the second one at the beginning of 2021, after one year of Covid-19 turmoil. The difference between the two betas tell us if the company has increase its risk (higher beta, positive variation) or decrease it (lower beta, negative variation). For example, Amazon.com Inc had a beta of 1.32 at the beginning of 2020, a variation of -0.64 take it at 0.68, this means that before Covid-19 pandemic if S&P 500 rose 1%, Amazon would rise 1.32% on average, now when market rises 1%, Amazon increase by 0.68% (the stock became less volatile then the market). Putting together all the companies beta variation we obtain the tree map below: the area size is given by the market capitalisation while the area colour is given by the beta variation (if blue the variation is negative, if red the variation is positive). Health Care and Information Technology are the sectors which most benefited from Covid-19 (on average respectively -0.16 and -0.04) while Real Estate and Financials are the most hard-hit by pandemic turmoil (on average respectively 0.52 and 0.27). Now, we illustrate a brief analysis sector by sector considering the GICS Sub-Industry and them average beta variation, in order to catch the differences inside each sector.

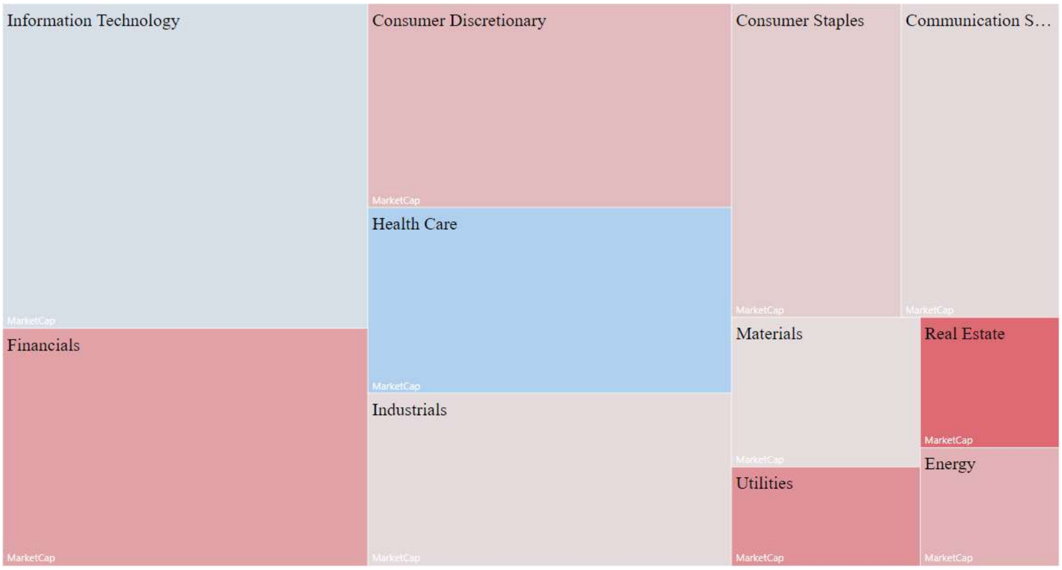

Figure I.4 – Sector categorized by Beta Variation and Market Cap *(Source: Elaboration on Eikon Data)*

4.1 ENERGY SECTOR

Energy Sector is one of the most hard-hit during Covid-19 pandemic. The average beta variation amounts to 0.2 and it remain nearly the same considering the seven Sub-Industries. However, some Sub-Industries are more red-coloured than others. Integrated Oil & Gas, Oil & Gas Exploration & Production and Oil & Gas Refining & Marketing have the beta variation greater than average sector (respectively 0.39, 0.31 and 0.23). The Large Cap Royal Dutch Shell PLC (whose stock price decline by -45.73% in 2020) experienced a beta increase for 0.86, exceeding the unit until 1.69 beta. Chevron Corp achieved the same result, passing from a beta of 0.81 to 1.35. As highlighted by the chart below, others Sub-Industries have seen smaller beta variation: Coal & Consumable Fuels (0.07), Oil & Gas Drilling (0.08) and Oil & Gas Storage & Transportation (0.08), whose companies was less affected by Covid-19 (maybe because big Energy companies suffered more than smaller).

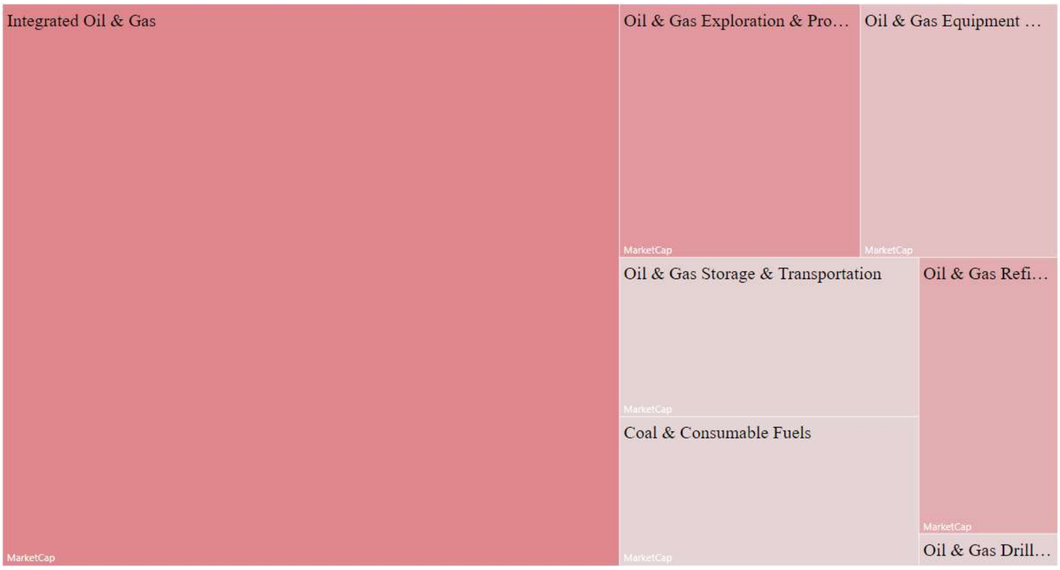

Figure II.4 – Energy Sub-Industries categorized by Beta Variation and Market Cap *(Source: Elaboration on Eikon Data)*

4.2 MATERIALS SECTOR

Materials Sector beta variation is near zero (0.03) but there are some important differences considering Sub-Industries, as illustrated by the chart below. Diversified Chemicals average beta variation amounts to -0.42 (nearly the same of some Health Care Sub-Industries). The companies of this Sub-Industry had high beta before 2020, the Covid-19 turmoil corrected them. For example, the US Mid Cap Huntsman Corp (that gained +8.59% in 2020) pass from 1.99 beta to 1.18. Quite the opposite Gold Sub-Industry companies (average beta variation of 0.77), whose beta were negative (when market went down gold stocks went up) and now they all exceed zero, even if there are under the unit. During 2020, Gold companies partially followed the market, especially they followed gold prices. Same as Precious Metals & Minerals, the beta variation amounts to 0.65. The others Sub-Industries have variation more or less around the zero.

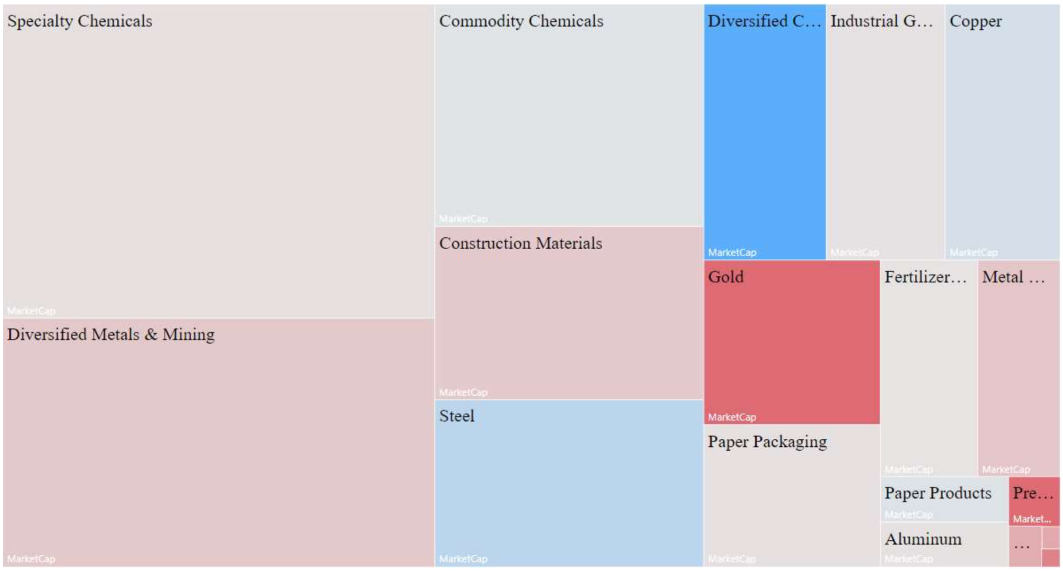

Figure III.4 – Materials Sub-Industries categorized by Beta Variation and Market Cap *(Source: Elaboration on Eikon Data)*

4.3 INDUSTRIALS SECTOR

Average beta variation amounts to 0.04 for Industrial Sector. Only seven Sub-Industries over 25 have negative beta variation. The best is Agricultural & Farm Machinery (-0.3) whose index closed 2020 with an upside of 38.1%. An example is the Italian CNH Industrial NV, that pass from a beta of 1.43 before the turmoil to 1.15. As expected, Airlines & Airport Services Sub-Industries registered the worst beta variation (respectively 0.33 and 0.39). These companies suffered travels stop and border closures. The beta for the Germany-based Deutsche Lufthansa AG, leader on passenger and cargo air transportation services, which experienced a downside of -30.62% in stock price, went beyond the unit to 1.36 (0.48 increase). Even Aerospace & Defense, the biggest Sub-Industry by market capitalisation, suffered a beta increase for 0.2 (like Deutsche Lufthansa, Boeing Co beta pass from 0.98 to 1.71).

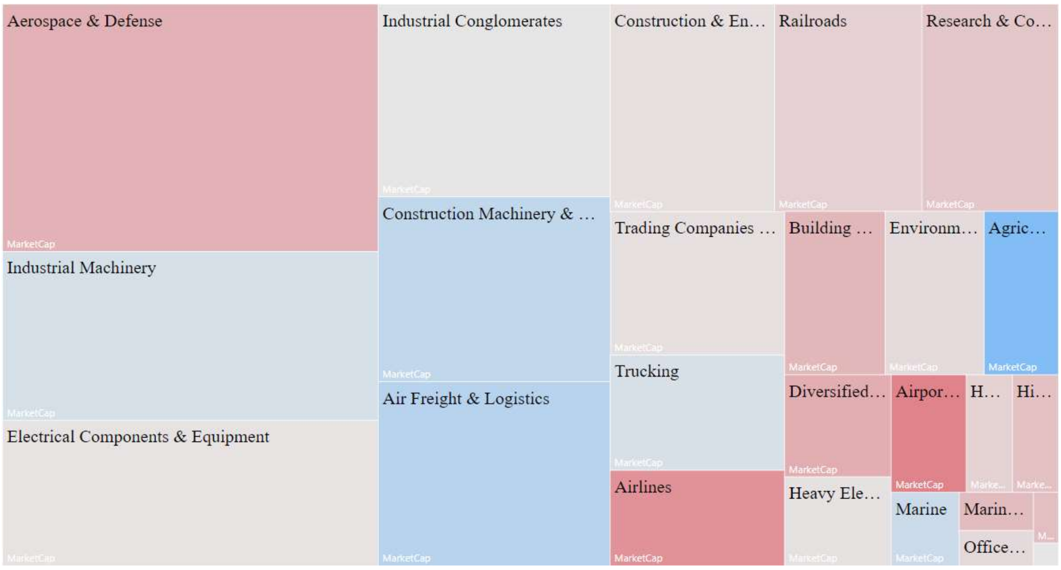

Figure IV.4 – Industrials Sub-Industries categorized by Beta Variation and Market Cap *(Source: Elaboration on Eikon Data)*

4.4 UTILITIES SECTOR

The Utilities Sector experienced a beta increase by 0.33, collocating it as one of the most hard-hit by Covid-19 pandemic. As highlighted by the chart below, all the three Sub-Industries have positive beta variation, although there are differences. Electric Utilities, Multi-Utilities and Gas Utilities have strong increase (respectively 0.53, 0.49 and 0.42), while Water Utilities, Independent Power Producers & Energy Traders and Renewable Electricity have little variation (respectively 0.22, 0.09 and 0.05). The general trend is an approach to the unit, because Utilities companies used to be defensive stocks (demand for them products is non-stop and constant). However, during Covid-19 pandemic the majority of Utilities companies were not be stock-shelter. The US Large Cap Nextera Energy (that stand for 17% of Electric Utilities by market capitalisation) pass from a beta of 0.15 to 0.92 (an increase of 0.77).

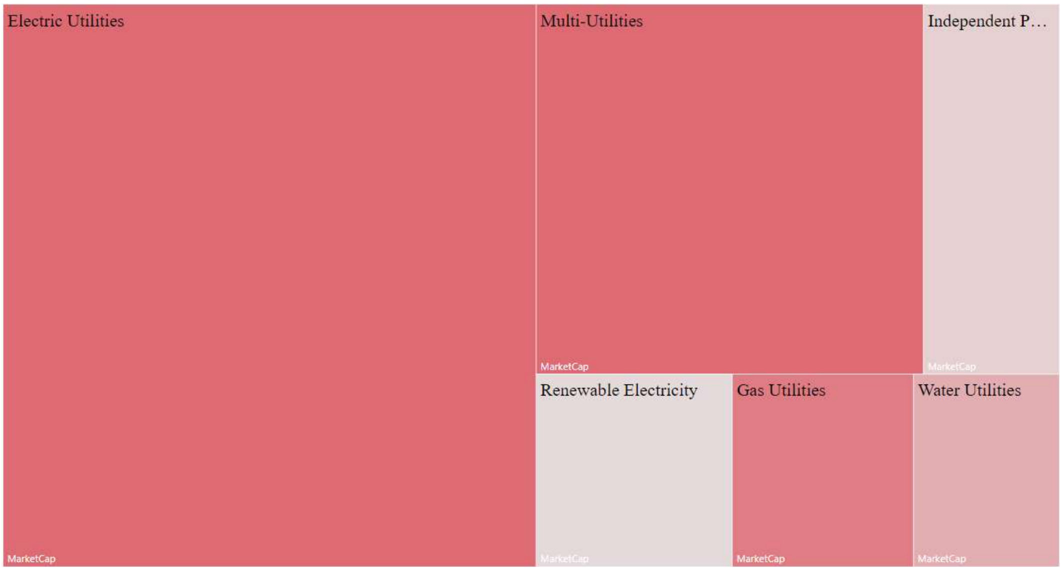

Figure V.4 – Utilities Sub-Industries categorized by Beta Variation and Market Cap *(Source: Elaboration on Eikon Data)*

4.5 CONSUMER DISCRETIONARY SECTOR

The average beta variation of Consumer Discretionary Sector amounts to 0.17. However, the average evidence of the Sector does not describe the Sub-Industries results, as highlighted by the chart below. Within Consumer Discretionary there are red Sub-Industries (Leisure Facilities and Restaurants, respectively with an average beta increase of 0.65 and 0.62) that became more riskier in terms of beta than other Sub-Industries of this Sector (Household Appliances and Internet & Direct Marketing Retail, respectively with an average beta decrease of -0.17 and -0.08). We already mentioned Amazon.com Inc; another company whose beta decrease is Hermes Intl (Apparel, Accessories & Luxury Goods Sub-Industry), its beta pass from 0.96 to 0.68, a variation of -0.28. Quite the opposite the famous US company Darden Restaurants (Restaurants Sub-Industry), whose beta now exceed the unit (from pre Covid-19 beta of 0.63 to post-Covid-19 beta of 1.58759).

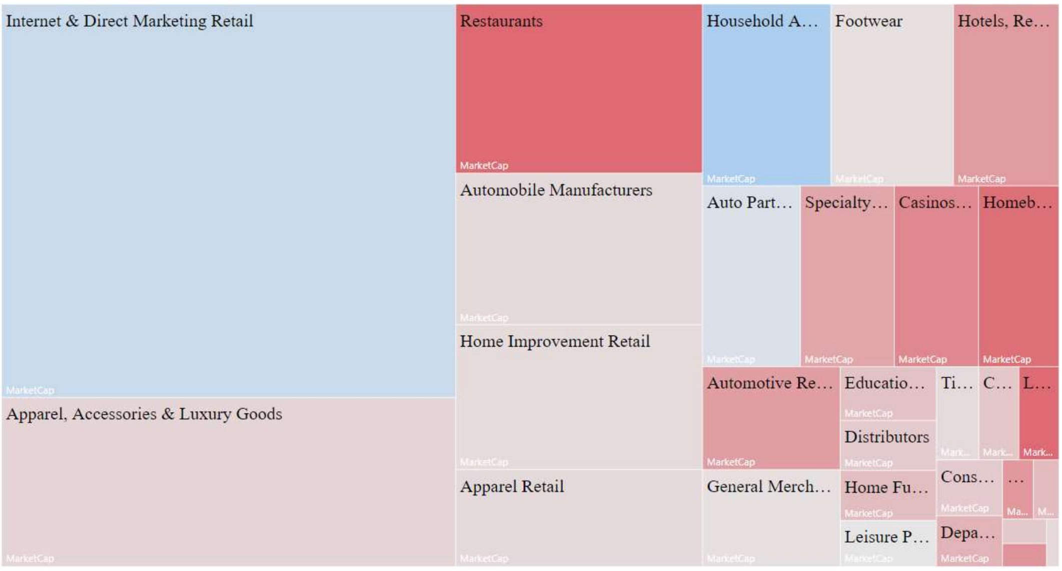

Figure VI.4 – Consumer Discretionary Sub-Industries categorized by Beta Variation and Market Cap *(Source: Elaboration on Eikon Data)*

4.6 CONSUMER STAPLES SECTOR

Consumer Staples Sector suffer an average beta increase of 0.1, but the chart below demonstrate how the variation are different considering Sub-Industries. The most red-coloured Sub-Industry are Agricultural Products and Food Distributors, respectively average beta increase of 0.34 and 0.31. However, if we go into the two Sub-Industry we see that some companies experienced beta decline (3 over 27 in the former, the higher percentage in the Sector, and 3 over 10 in the latter), meaning that business activities and core products and services have affected the results and performance during Covid-19 pandemic. In the chart, we see also a blue Sub-Industry, Drug Retail, which have obviously benefited from pandemic (beta decrease of -0.34) because of higher drug demands and long quarantine period during the year. Distillers & Vintners, the biggest by market capitalisation, saw no variation, so it is white-coloured (precisely the variation amounts to -0.00002).

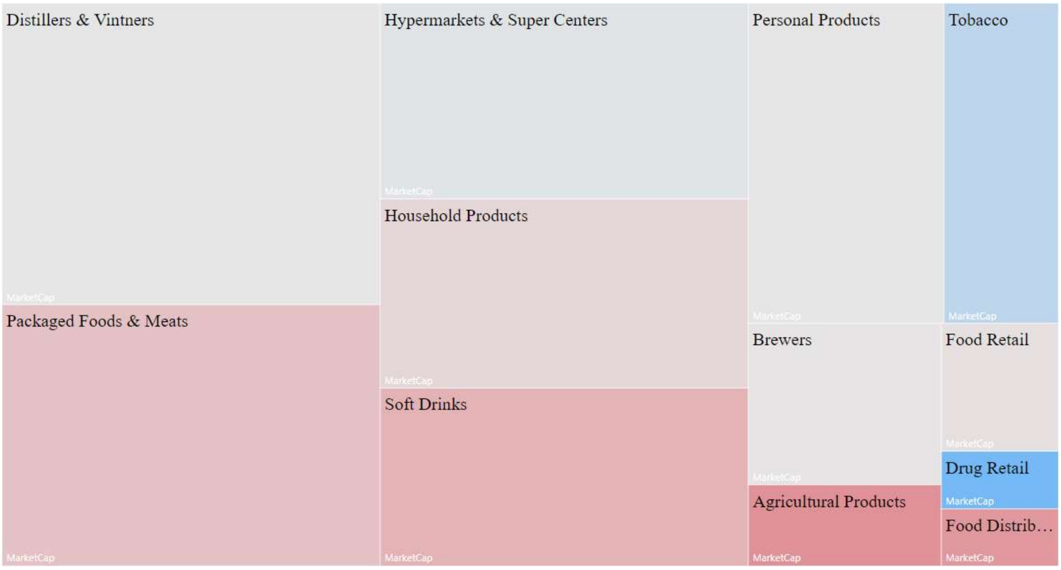

Figure VII.4 – Consumer Staples Sub-Industries categorized by Beta Variation and Market Cap *(Source: Elaboration on Eikon Data)*

4.7 COMMUNICATION SERVICES SECTOR

The beta increase for Communication Services Sector is near zero (0.04) with some differences among Sub-Industries. Advertising, Broadcasting and Publishing had seen the highest variation (respectively 0.24, 0.13 and 0.11) in line with stock performances. The beta of Large Cap Omnicon Group Inc (Advertising), that lost -21.96% in stock price during 2020, approached the unit, passing from 0.78 to 1.01, it means that the stock almost-perfectly followed the market. Quite the opposite the blue-coloured and largest in terms of market capitalisation Sub-Industries Interactive Media & Services and Integrated Telecommunication Services, whose beta decreased on average by -0.23 and -0.14. Alphabet Inc and Facebook Inc (Interactive Media & Services, two of the biggest company in the world) have experienced a beta decrease under the unit, passing respectively from 1.28 and 1.27 to 0.95 and 0.99.

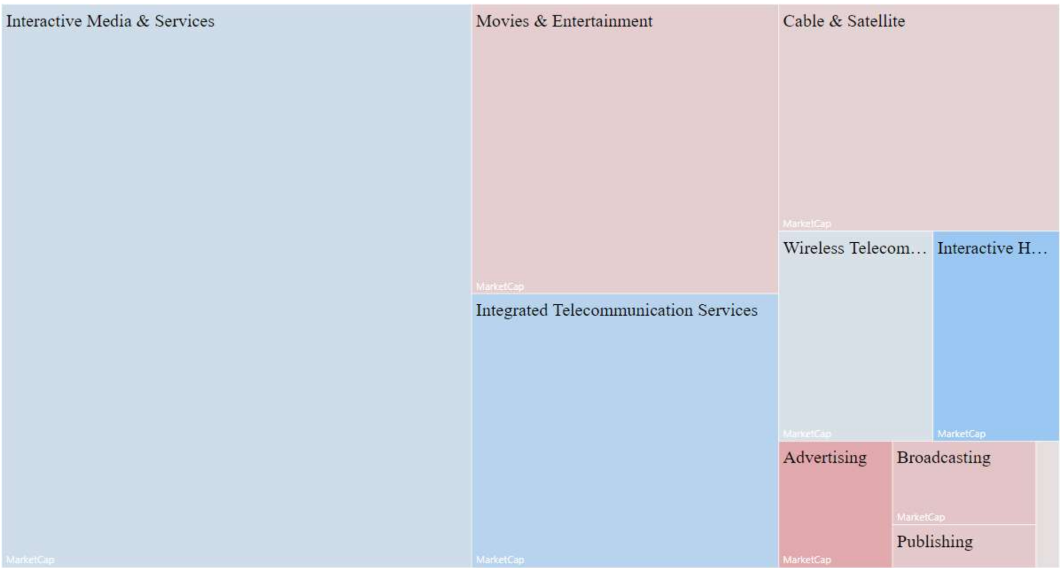

Figure VIII.4 – Communication Services Sub-Industries categorized by Beta Variation and Market Cap *(Source: Elaboration on Eikon Data)*

4.8 INFORMATION TECHNOLOGY SECTOR

The beta variation of Information Technology Sector (-0.04) is the only negative together with Health Care Sector. However, the chart below illustrate us that there is some Sub-Industries with positive variation. They are Technology Hardware, Storage & Peripherals (0.16) and Data Processing & Outsourced Services (0.13), even Technology Distributors (the smallest square on bottom right) have positive variation but very tiny (0.002). Regarding the former, the variation is misrepresented by Micro Cap companies, whose beta increased on average by 0.76. In fact, the Sub-Industry includes also the Mega Cap Apple Inc, whose beta approached the unit to 1.12 (-0.44 decrease). The most blue-coloured Sub-Industry are Internet Services & Infrastructure (0.21) and Systems Software (0.19). Beta of Micro Cap Intellinetics Inc (Systems Software) even went under zero to -0.09 (variation of -0. 76), meaning that the stock followed opposite trend from market.

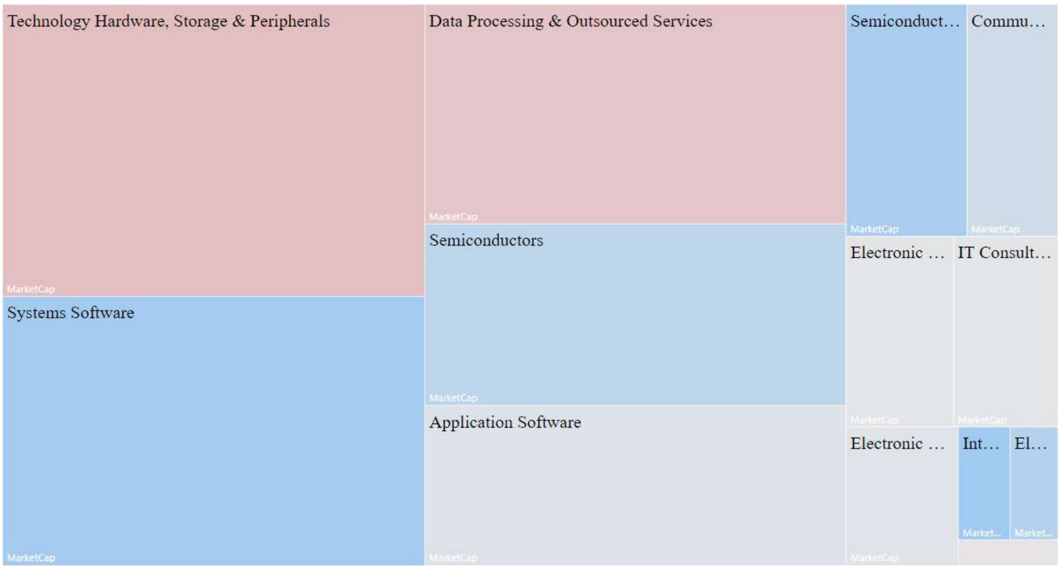

Figure IX.4 – Information Technology Sub-Industries categorized by Beta Variation and Market Cap *(Source: Elaboration on Eikon Data)*

4.9 HEALTH CARE SECTOR

Health Care Sector is the less affected by Covid-19 pandemic, or rather it benefited from it. The average beta decrease amounts to -0.16 (when the market went down the Health Care Sector went up). Three Sub-Industries are collocated above the average Sector: Biotechnology (-0.27), Health Care Supplies (-0.3) and Life Sciences Tools & Services (-0.21). However, there are also Sub-Industries whose beta on average increase. The three are Health Care Distribution (slight decrease of 0.006, in other words the Covid-19 pandemic did not changed something for this Sub-Industry), Health Care Facilities (+0.13) and Managed Health Care (+0.08). For instance, the first vaccine distributors Pfizer Inc (Pharmaceuticals Sub-Industry, the largest in the Sector) passed from a beta of 0.75 to 0.68 (tiny decline of -0.07). Not better than Sangamo Therapeutics Inc (Biotechnology) whose beta passed from 2.1 to 0.92 (investors took shelter here).

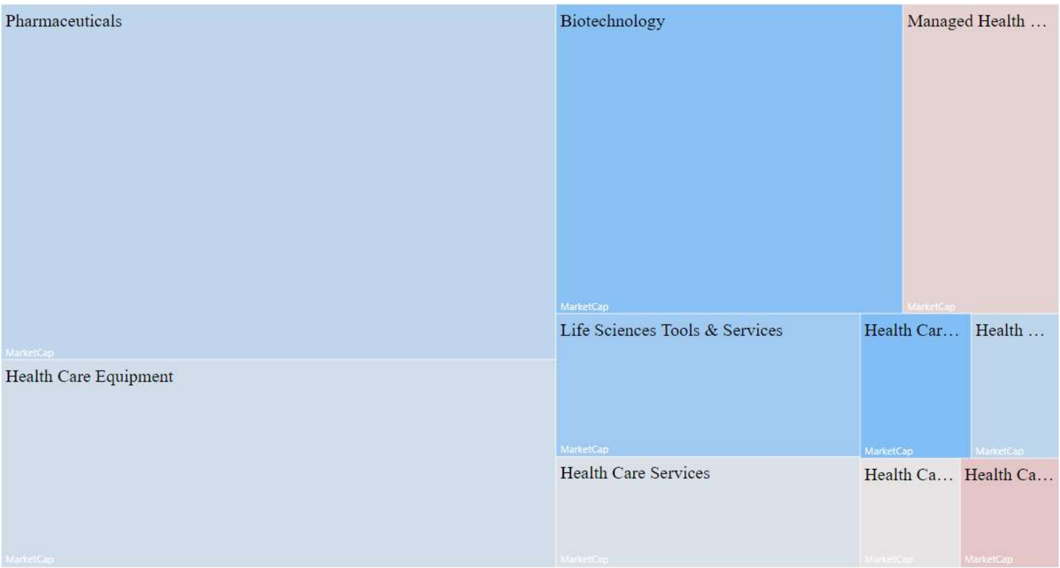

Figure X.4 – Health Care Sub-Industries categorized by Beta Variation and Market Cap *(Source: Elaboration on Eikon Data)*

4.10 FINANCIALS SECTOR

Overall, companies belonging to Financials Sector registered on average a beta increase for 0.27. The graph below illustrate how the trend remain among Sub-Industries. Only two had declined them average beta during Covid-19 turmoil: Insurance Brokers and Investment Banking & Brokerage (both -0.06), it means that companies' providers of financial services had less suffered the crisis. An example is Charles Schwab Corp (Investment Banking & Brokerage) whose beta decrease by -0.22. All the others Sub-Industries are more or less red-coloured (it means they experienced a beta increase), the worst are Mortgage REITs (+0.84) and Reinsurance (+0-59). As regards companies, the Mega Cap JPMorgan Chase (Diversified Banks) pass from 1.06 to 1.28 (+0.22) but there is also beta decrease, especially in China (beta of Industrial and Commercial Bank of China Ltd decrease even more at 0.54 (before Covid-19 it was at 0.59).

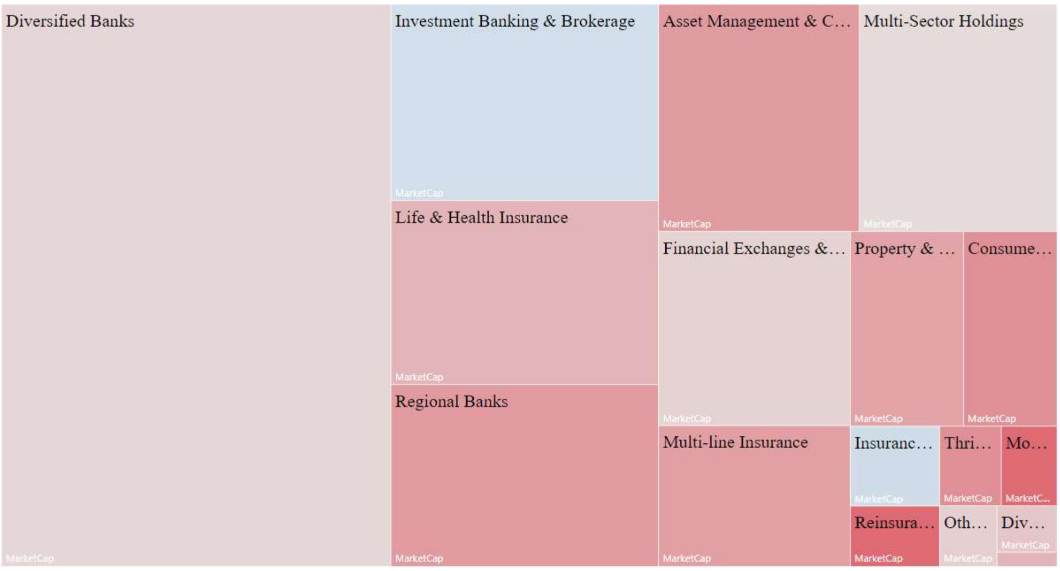

Figure XI.4 – Financials Sub-Industries categorized by Beta Variation and Market Cap *(Source: Elaboration on Eikon Data)*

4.11 REAL ESTATE SECTOR

Real Estate Sector was the most influenced by Covid-19 pandemic in terms of beta variation, with an average increase of 0.52. Before 2020 turmoil, the average beta of Real Estate companies was 0.5, after the turmoil average beta increased to 1.02, meaning that on average Real Estate companies followed the market. All Real Estate Sub-Industries (like Utilities Sector) experienced positive variation. Among Sub-Industries, the variations swing from 0.1 of Real Estate Development to 0.9 of Health Care REITs. For example, the Health Care REITs Welltower Inc (USA-based company that lost -20.76% in stock price during 2020) pass from a beta of 0.17 to a exceeding-unit beta of 1.39 (the amazing increase of 1.22). Hotel & Resort REITs suffered a beta increase of 0.82 (the worst after Health Care REITs). Surely, the beta increase has followed the bad stock performance: Health Care REITs lost on average -10.43% while Hotel & Resort REITs -31.03%.

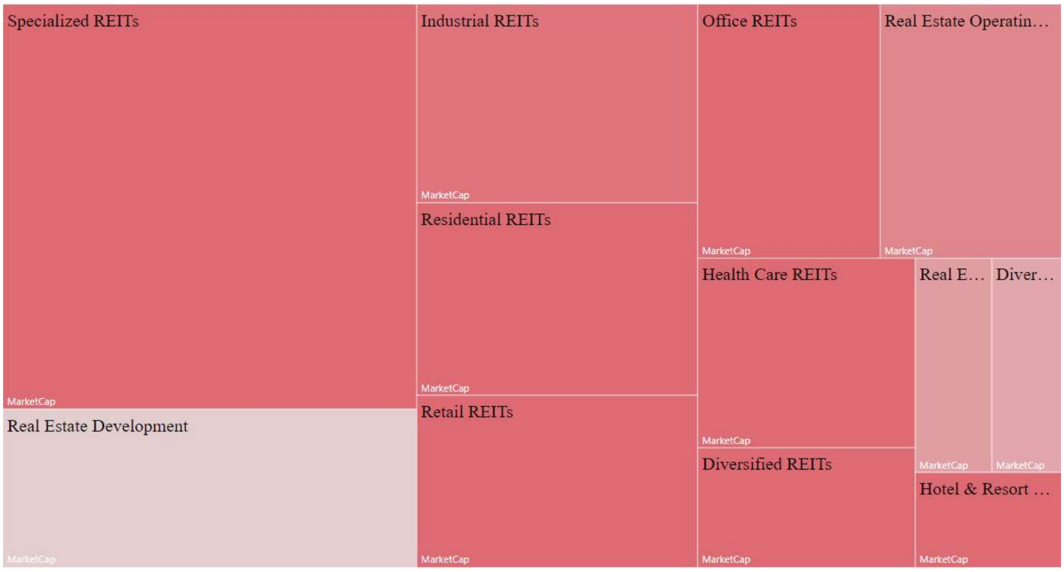

Figure XII.4 – Financials Sub-Industries categorized by Beta Variation and Market Cap *(Source: Elaboration on Eikon Data)*

4.12 BETA COMPARISON WITH 2008 FINANCIAL CRISIS

In order to have a wider view of Covid-19 crisis, we decide to compare it to the Financial Crisis of twelve years ago, making a sort of those stress test implemented by supervisory authorities. Calculating beta during both crisis permit us to conclude about size and impact on listed companies in both turmoil. The main issue we met was the data availability for our sample's companies. However, as illustrated by the table below, even if the companies are half, the percentage composition of the sample remain nearly equal (only Health Care and Industrials Sectors disclose little differences). Therefore, beta calculation was the same. We took our sample's

Sector	Covid-19 Crisis		2008 Financial Crisis	
Communication Services	230	4.37%	110	4.20%
Consumer Discretionary	625	11.87%	327	12.50%
Consumer Staples	263	4.99%	152	5.81%
Energy	204	3.87%	97	3.71%
Financials	720	13.67%	371	14.18%
Health Care	783	14.87%	252	9.63%
Industrials	888	16.86%	497	18.99%
Information Technology	676	12.83%	326	12.46%
Materials	429	8.15%	217	8.29%
Real Estate	318	6.04%	168	6.42%
Utilities	131	2.49%	100	3.82%
Total	**5267**		**2617**	

Table I.4 – Sample composition *(Source: Elaboration on Eikon Data)*

companies listed in 2007 and for which there were data availability, obtaining 2617 companies. Then we calculate the two beta for these companies, through linear regression of daily return for both stock and relative market index. The first beta was calculated at 2007, before the first sign of crisis on summer 2007, the second one at 2009, after the market turbulence. Lastly we calculate the difference between the two betas for each company: one more time, positive difference means higher stock risk, negative difference means lower stock risks. Computing and comparing the results obtained for the 2617 companies in both crisis, we got the results illustrated in the table below. The results are interesting. First of all, the turmoil activated by Covid-19 were stronger than 2008 Financial Crisis (average beta variation of the market of 0.14 versus -0.03). Moreover, the average beta variation during 2008 financial suggest that the market became less risky in terms of beta. Regarding Sectors, during 2008 financial crisis the sector that became more risky in terms of beta was Financials (0.33), followed by Real Estate (0.21), like what happened with Covid-19 turmoil (with intrusion of Utilities Sector). This means that these two sector are more sensitive to economic cycles than others are, during markets turmoil they register deep losses. Quite the opposite Information Technology and especially Health Care Sector. The latter was in both crisis the sector which registering the "best" variation (higher decrease) in terms of beta. This means that when market crash investors put themselves in safe buying Health Care companies. In 2008 Financial Crisis probably investors re-balanced the portfolios with less sensitive sectors (Health Care, Information Technology, Utilities, Energy as a result of our analysis, but also Consumer Staples, Materials and Industrials). The rebalance may happened also in 2020 but only two sectors represented investors' shelter (Health Care and Information Technology), this means that these

Table II.4 – Beta variation results *(Source: Elaboration on Eikon Data)* two sectors probably grown more than the initial expectation (that is what really happened). If investors wanted to rebalancing portfolios after 2020 turmoil toward less sensitive companies, they had to buy Health Care and Information Technology companies, and they bought them at higher prices (in fact, according to MSCI World index, the Information Technology index rebound to pre-crisis levels on May 15, 2020 while Health Care index rebound on May 28, 2020).

Sector	**Beta variation**	
	2008 Financial Crisis	**Covid-19 Crisis**
Communication Services	0.07	0.05
Consumer Discretionary	0.13	0.17
Consumer Staples	-0.04	0.10
Energy	-0.14	0.21
Financials	0.33	0.27
Health Care	-0.25	-0.17
Industrials	-0.09	0.04
Information Technology	-0.18	-0.04
Materials	-0.09	0.03
Real Estate	0.21	0.52
Utilities	-0.23	0.34
Mean	**-0.03**	**0.14**

CONCLUSION

In this thesis we tried to examine and explain how industrial sectors had react differently at Covid-19 crisis. With no doubt, Health Care and Information Technology Sectors were the less affected, thanks to their positive correlation and importance to the pandemic. Health Care Sector had grown when market went down, meaning that there is a positive correlation between this sector and the pandemic curve. Certainly, investors grabbed to Health Care Sector that had been the stronger during 2020. Quite the opposite all the others sectors. In particular Energy, Financials and Real Estate Sectors experienced sharply decline. The companies belonging to these sectors registered deep losses both in stock value and in financial statements lines. Furthermore, these companies probably will not stop to have problem in 2021 conversely to the others less affected companies (such as Communication Services and Industrials) that probably will see a rebound. In addition, we had have the confirm the Mega Cap companies does not stop to growth, proving them extremely strength.

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