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NEGATIVE SCREENING AND SUSTAINABLE PORTFOLIO DIVERSIFICATION

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Received ; accepted.....; published.....

Abstract. A critical issue for socially responsible investors is the selection of the potential companies to invest in. For retail investors, the easiest and more intuitive option is to apply a negative screening approach to avoid investing in companies with bad reputation. In this line, companies involved in scandals regarding irresponsible activities which have become notorious in the mass media will be excluded from the potential companies. Implementing this process in a consistent and objectivity way is not an easy task, especially with worldwide portfolios. Nevertheless, there already exist complex databases which offer sensitive information to investors. This paper describes one of these databases. Furthermore, the problems of implementing such a negative screening methodology are presented, which are mainly related with the proper diversification of the resulting investment portfolios.

Keywords: negative screening; bad reputation; negative media stories; ESG; controversies; sustainability; social corporate responsibility

Reference to this paper should be made as follows: Arribas, I.; Espinós-Vañó, M. D.; García, F.; Tamosiuniene, R. 2019. Negative screening and sustainable portfolio diversification, *Entrepreneurship and Sustainability Issues* 6(4): 1566-1586. [https://doi.org/10.9770/jesi.2019.6.4\(2\)](https://doi.org/10.9770/jesi.2019.6.4(2))

JEL Classifications: G15, Q56

1. Introduction

Socially responsible investment has experienced a significant growth in the last decades. As a consequence, several companies and organizations devoted to assess and rank firms' sustainability have emerged, together with new investment products such as sustainable stock indices (Kutay and Tektüfekçi, 2016). As a fact, there is not just one definition of what should be understood as sustainable behavior or socially responsible behavior, and many organizations and institutions have proposed their own definition and assessment methodology (Global Sustainable Investment Alliance, 2016).

Together with this trend, multiple academic research papers have been published dealing with sustainability issues and the ethical behaviour of companies. This problem has been approached from different perspectives and disciplines, including economy, finance, management, operational research, sociology etc. (Renneboog, et al. 2008; Berry and Yeung, 2013; Diouf et al., 2016; Dobrovolskiene et al. 2017; Jankalova and Jankal, 2017; Bikas and Saponaitė, 2018, Lin, 2018; Smaliukienė and Monni, 2019).

Among the most researched topics, great attention has been devoted to the aggregation of the different criteria that are employed to measure companies' behavior including the environmental, social and governance dimensions, where different multicriteria approaches have been used (Escrig-Olmedo et al., 2017; Lamata et al., 2018). The development of rankings which consider the socially responsible performance of companies has become a hot topic in recent years, as well (Ou, 2016; García-Martínez et al., 2017; Wei et al., 2017; Cervelló-Royo, 2017). Furthermore, the relationship between financial performance and social performance has been extensively studied (Charlo et al., 2015; Achim et al., 2016; Rodríguez Fernández, 2016; Tebini et al., 2016; Charlo et al., 2017; Macikova, 2018; Simiunescu, 2018; Zhao, 2018).

Regarding investment portfolio management, research has focused on topics such as the selection of sustainable companies to be included in the portfolio using multicriteria approaches (Ballesteros et al., 2012; Gonzalez et al., 2014; Mendez Rodríguez et al., 2015; García-Melón, 2016; Calvo, 2016) and the performance obtained by socially responsible investment funds (Renneboog et al., 2011; Slapikaite y Rima, 2013; Bertrand, 2014; Lean et al., 2015; Gómez-Bezares, 2016; Reddy et al., 2017).

Defining socially responsible or ethical behavior of companies remains a controversial matter (Silvestre et al., 2016). That is, to list which actions must or must not perform firms in order to be declared as socially responsible companies. This is a key concern, as this definition will significantly impact any subsequent analysis (Benson et al., 2006; Lesser et al., 2016; Nainggolan et al., 2016; Trinks y Scholtens, 2017). This issue has raised conceptual problems, as well, and some studies sometimes use concepts such as socially responsible, ethical or sustainable as synonyms, while other studies do not consider them equivalent.

Different definitions used to refer to sustainable behaviour and different methodologies to quantify sustainable performance of companies by a plethora of firms engaged in the identification and selection of socially responsible and sustainable companies can easily lead to misunderstandings. Among those, one of the most striking cases appears when the retail investor realizes that a company which is carrying out irresponsible activities in her/his view, is still included in a ranking for socially responsible firms and is a component of a sustainable stock index. In fact, this is not an uncommon situation. As a result, companies undertaking clearly unethical, irresponsible and unsustainable activities are usually included in the portfolio of socially responsible, sustainable or ethical investment funds. Some studies show that many companies which are defined as ethical or socially responsible or sustainable would not be classified as such, if simple negative screening criteria are applied (Schwartz 2003, Hellsten, 2006; Espinós-Vaño, 2016). This situation would easily explain the surprisingly high correlation between sustainable stock indices and their conventional benchmarks (Espinós-Vaño et al., 2018), as the components of the sustainable indices and those of the benchmarks are almost the same, which is also remarkable.

The above described situation makes many researchers wonder what is wrong in the company selection process undertaken by specialized corporations and organizations that assess firms' sustainability. How is it possible that companies involved in scandals for their irresponsible or even illegal activities make it through the selection process and become part of stock sustainability indices or get good positions in sustainability rankings. (Chatterji et al., 2009; Windpolh, 2011; Baccaro y Mele, 2011).

One option to avoid this outcome is to introduce a negative screening step in the selection process. This screening would automatically prevent companies with an irresponsible activities' record to be included in a sustainability ranking or sustainable stock index. If this option is chosen, the next problem is to clearly define and identify irresponsible activities by corporations. That is, what activities automatically make a firm receive the label of "irresponsible" or "unsustainable" company. Furthermore, a database should be created to collect all the required information about the companies, including negative news in the media. If the aim is to elaborate a sustainable stock index, the database should embrace all public companies.

At present, some databases are available which contain such information. Prestigious information companies as Thomson Reuters already undertake this kind of data collection and classify and assess all negative news, which are the so-called controversies, about the main global public companies worldwide (Thomson Reuters, 2018).

The aim of this research paper is to analyse the Eikon database by Thomson Reuters in order to answer different questions regarding the sustainable behavior of the most influential companies in the world, those which are components of most conventional and sustainable stock indices. In this line, it is interesting to know in what kind of controversies or negative activities the biggest companies in the globe are involved, how the number of controversies has evolved in recent years, how the different industry sectors are affected etc. It is necessary to answer all these questions in order to know the impact a negative screening strategy would have on the diversification capacity of sustainable investing portfolios.

The research is structured as follows. First, the controversies database included in the ESG Scores module in the Thomson Reuters Eikon database is described. Then, controversies are analysed. Special attention is devoted to the impact a negative screening methodology would have on the diversification ability of sustainable portfolios, if those companies included in the controversies database would become illegible. Finally, the conclusions of the research are listed.

2. Controversies in the Thomson Reuters ESG Scores database

The Eikon database by Thomson Reuters has got a specific module to assess companies' behaviour in terms of environmental, social and governance performance. In this assessment, public available information from the companies is employed, that is, companies are the ones to provide this ESG information. Nevertheless, in order to avoid the possible positive bias towards good behaviour, the assessment is completed incorporating negative news and scandals related to the companies from various news agencies, mainly Reuters.

To this end, negative news, which are the so-called controversies, are collected. At present, more than 7,000 corporations are monitored, which are spread throughout the world: more than 2,900 are located in Northamerica, 250 in Latinamerica, more than 1,400 in Europe, more than 260 in Middle East and Africa, more tha 550 in Oceania and more than 1.160 in Asia. Assessed companies are the components of the mian stock indices in the globe and in the different regios, such as SMI, DAX, CAC 40, FTSE 100, FTSE 250, S&P 500, S&P ASX 300, S&P NZX 50, NASDAQ 100, DJ STOXX, MSCI World, MSCI Emerging markets and Russell 1000. Although it is not explicitly specified, it can be assumed that the more than 7,000 corporations under assessment are not always the same, but the particular companies for which information is collected vary regarding their inclusion or exclusion from the above-mentioned indices. Nevertheless, most of the companies will remain in the group throughout the years, as companies' rotation in these indices is not very high.

In short, it is possible to state that the analysis embrasses the major public companies in the world in terms of market capitalization.

The database is feeded with the negative new and scandals which affect those over 7.000 companies. Of course, the impact of a negative event can last for many years, as there are new developments related to the negative event, such as fines, law suits or legislation disputes.

There are more than 150 analysts in charge of analysing the information included in the database. Nevertheless, the question is whether there is a bias towards the English language. If this is the case, analysts would study those company news and reports in English more carefully and accurately than similar stories in other languages. As a result, companies operating in English-speaking countries would be subject to a tighter scrutiny than the rest of corporations.

The different socially irresponsible or illegal actions carried out bay companies are classified under 24 measures, which are grouped in 7 categories which embrasse all the ESG scope (environment, social, governance):

-Environment:

A. Environnement:

1. Environment

-Social:

B. Community:

2. Anti-competition

3. Business ethics

4. Intellectual property

5. Public health

6. Tax fraud

7. Bribery, corruption, fraud

C. Workforce:

8. Wages and working conditions

9. Diversity and opportunity

10. Employee health and safety

D. Human rights

11. Human rights

12. Child labor

13. Freedom of association

E. Product responsibility

14. Customer health and safety

15. Responsible R&D

16. Privacy

17. Responsible marketing

18. Product access

19. Consumer complaints

- Governance

F. Management

20. Management compensation

21. Executive compensation

G. Shareholders

22. Shareholder rights

23. Insider dealings

24. Accounting

By means of the previous 24 measures those irresponsible activities are specified, which are included in the controversies' database. Furthermore, it must be stressed that so far no weighting has been done regarding the different measures, categories, or ESG scopes.

When a negative screening methodology is applied, the decision maker has to consider whether all or only a subset of controversial activities are considered in the companies' selection process. That is, it could be defined that a company with a tax fraud record can still be defined as sustainable or ethic and therefore can be included in the investment portfolio. Moreover, the news could be explicitly analysed and weighted. For example, it may be defined that avoiding paying taxes taking advantage of legal gaps is not equivalent to avoiding taxation against the laws.

In any case, the Eikon database by Thomson Reuters offers a privileged image of the irresponsible actions undertaken by major public companies around the globe. For this reason, it is an excellent tool to analyse the problems that arise when the companies in the sustainable investment portfolio are selected implementing a negative screening approach, which prevents companies involved in scandals and negative news to be included in the portfolio.

3. Analysis of the irresponsible activities by global public companies

This research paper analyses controversies which occurred in the years 2011 to 2016.

Out of the 7,000 firms which are yearly assessed, in the studied period a total of 1,852 corporations have been involved in controversies. Those companies have led to 13,311 controversies. This means that almost 14% of the assessed corporations have performed some irresponsible activity, as defined above.

In any case, if we regard the data from a positive perspective, they are revealing that among the biggest public companies worldwide, more than 85% did not generate any controversy in the period 2011-2016. This is an important conclusion concerning the creation of a socially responsible portfolio applying a negative screening approach. In fact, if the percentage of companies involved in controversial activities is too high, it would be very difficult to obtain a properly diversified sustainable portfolio.

Figure 1 shows the development of total controversies during the analysed period. Surprisingly, in the period from 2011 to 2016, the number of controversies has increased, especially in the last year. This trend is the opposite to what might be expected, in a time when most global companies proudly announce their commitment with sustainability and socially responsible activities.

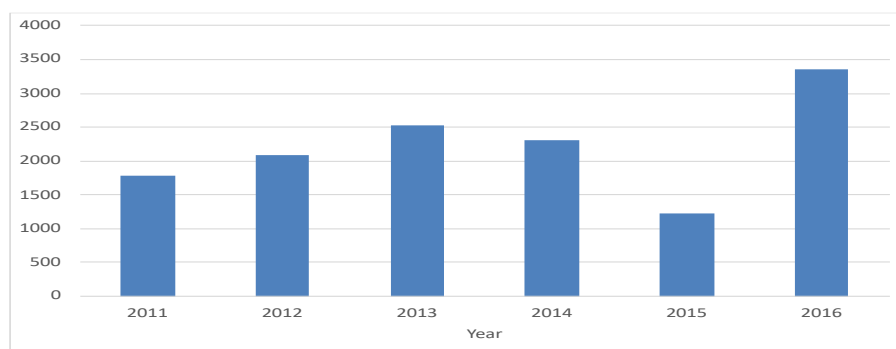


Fig. 1. Total Controversies 2011-2016

Source: The authors based on data by Eikon Thomson Reuters

It is possible that, in the sight of retail investors, not all kinds of controversies have the same relevance, and companies involved in some controversies' categories should specially be avoided, while other controversies are not perceived as too severe. For this reason, it is necessary to study the relative appearance of every category.

As Figure 2 shows, the category including the most controversies is "community". Those controversies are related with activities such as corruption, tax fraud or public health. Almost two thirds of all controversies are in this category. For this reason, a negative screening approach which excludes companies with controversies in the community category will see sharply decline the univers of eligible companies to include in the sustainable portfolio. On the opposite, it is easy to consider other categories, such as human rights, management, environment or shareholders. In principle, the use of these filters will scarcely affect the universe of eligible companies. Nevertheless, the use of these negative screening criteria may have on influence on the diversification ability of the portfolio, if the companies with controversial activities in one of these categories represent a high percentage of all companies within a region or an industry.

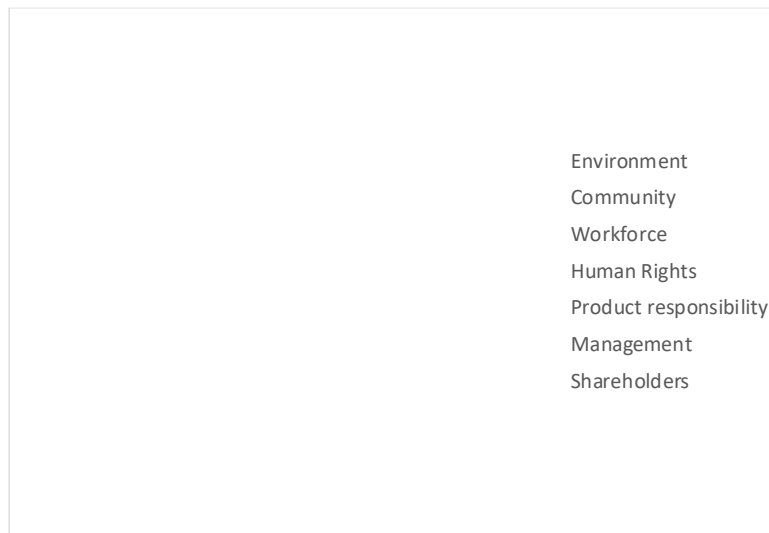


Fig. 2. Relative weight of each controversy category in the period 2011-2016

Source: The authors based on data by Eikon Thomson Reuters

Furthermore, it is important to analyse if the evolution presented in figure 1 is the same for all controversy categories or, on the contrary, the evolution has not been homogeneous. Down below, figure 3 shows this analysis for the 7 ESG categories.

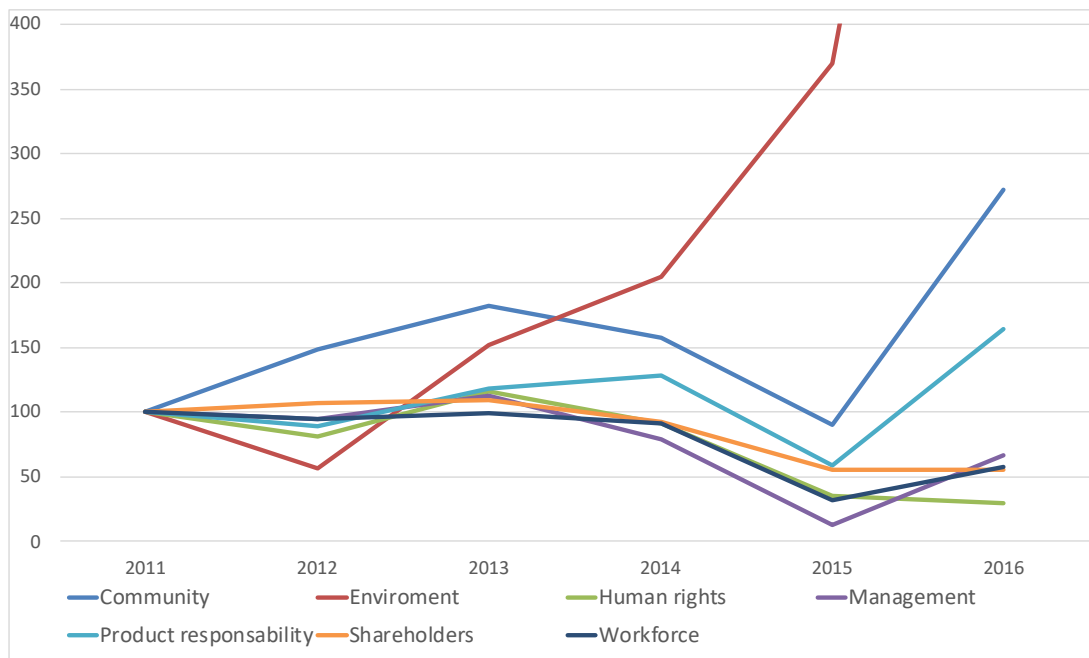


Fig. 3. Relative weight of each controversy category in the period 2011-2016

Source: The authors based on data by Eikon Thomson Reuters

It can be clearly observed how the evolution of the number of controversies has not been homogeneous along all categories. Actually, environment controversies have experienced a dramatic increase since 2012. In fact, environment controversies in year 2016 cannot be presented in the figure as controversies in this category multiply by 10 in this period.

The number of controversies in the other categories have a more homogeneous evolution. There is a decrease between 2011 and 2015 followed by a sharp increase in 2016. The category of “human rights” is the only exception and continued the downward trend in 2016. The small number of controversies in this category is remarkable, as well, being just 11 in the year 2016. Controversies in this category can heavily damage a company’s reputation and image, and it is logical that corporations try to avoid them, especially those in more developed economies.

The dramatic change in 2016 makes us wonder whether the rise in controversies is actually due to an increase of irresponsible activities by companies that year, or to a change in the methodology employed by Eikon to track companies’ behavior and assess it.

The considerations above reveal a new problem faced when implementing a negative screening approach in the construction of a sustainable investment portfolio. The new problem is the high fluctuations that could be experienced in the components of the portfolio. In fact, it is important to keep in mind that the number of companies that can be implied in scandals and controversies can significantly vary in a short period of time. Therefore, it is possible that the sustainable portfolio has to be suddenly and significantly restructured. Moreover, the eligible universe can be drastically be reduced, as well, damaging the diversification ability of the portfolio. In this context, it is important to define how long companies must be labelled as non-eligible once a controversy has been disclosed. Of course, this is a subjective decision, as it is to weight the diverse controversy categories differently.

Continuing with the issues linked to portfolios' diversification, it is paramount to study whether the different irresponsible activities are conducted equally by all industries, or whether some industries are more likely to perform this kind of activities. Figures 6 to 12 show the relative weight of the 5 industries with more controversies in each of the categories during the period 2011 to 2016. The 7 categories analysed are those already mentioned: Environment, community, workforce, human rights, product responsibility, management and shareholders. As a properly diversified investment portfolio must include companies in different industries, it is necessary to analyse whether there are industries with many companies which are often involved in controversies, so that it may be more difficult to find eligible firms in these industries.

Figure 4 shows that the 5 industries with the most controversies (automobiles and autoparts; electric utilities and IPPs, metals and mining, oil and gas, oil and gas related equipment and services) account, over the 2011-2016 period, for more than 70% of the environmental controversies. The automobiles and autoparts industry arises the year 2016, probably as the scandal regarding emissions from diesel engines was uncovered.

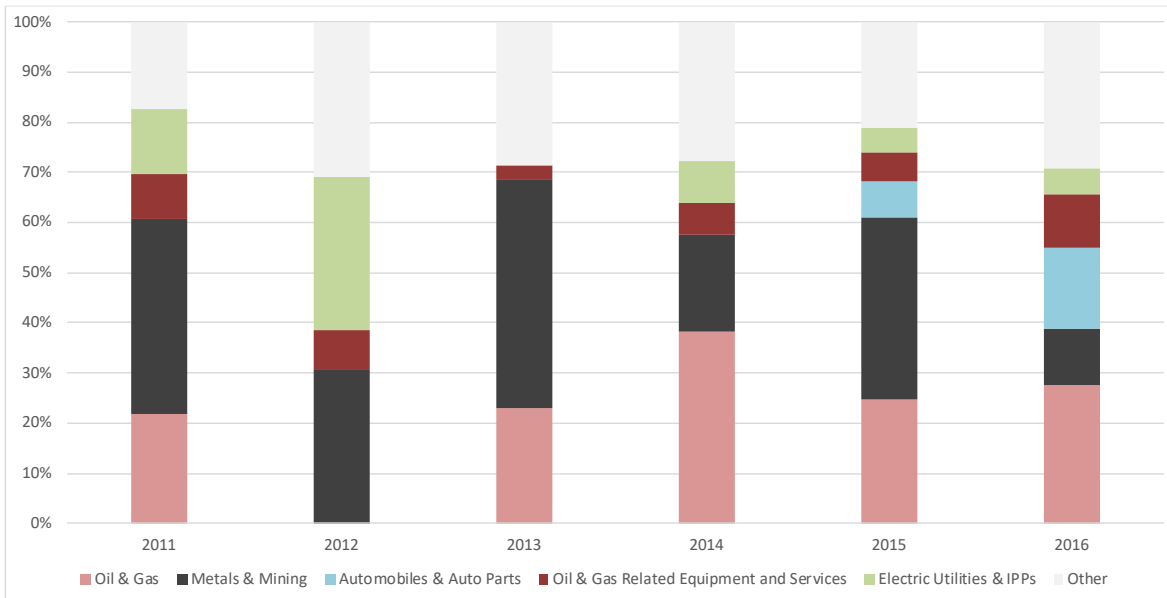


Fig. 4. Evolution of the controversies of the 5 most controversial industries over total controversies. Environment

Source: The authors based on data by Eikon Thomson Reuters

The 5 industry sectors which more controversies in the community category are automobiles and auto parts, banking services, oil and gas, pharmaceuticals y telecommunications services. Every year these industries have accumulated between 35% and 40% of all controversies in this category. The most irresponsible industry regarding community activities is banking, as figura 5 below shows.

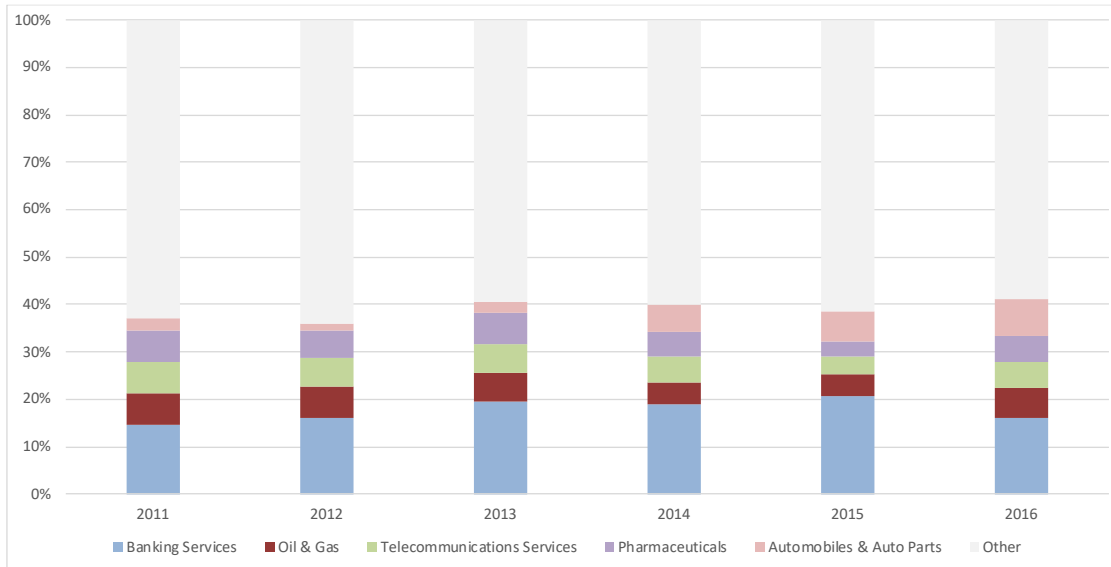


Fig. 5. Evolution of the controversies of the 5 most controversial industries over total controversies. Community

Source: The authors based on data by Eikon Thomson Reuters

Human rights category is the one with the less controversies in the period from 2011 to 2016. As can be observed in figure 6, all controversies are carried out by a few industries. Actually, in the year 2016 just 4 industries (automobiles and auto parts, food and tobacco, oil and gas, hotels and entertainment services) are responsible for more than 70% of the controversies.

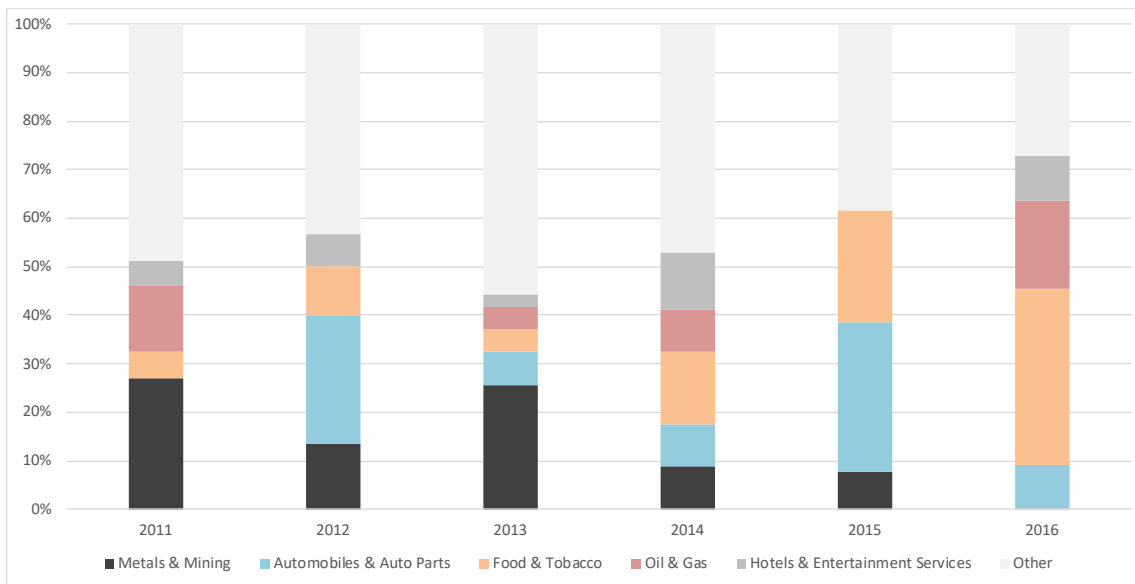


Fig. 6. Evolution of the controversies of the 5 most controversial industries over total controversies. Human rights

Source: The authors based on data by Eikon Thomson Reuters

Figure 7 shows that in the case of management controversies the situation is very similar, with just a few industries generating most controversies. In the year 2015, all controversies were due to 2 industries (banking services y pharmaceuticals).

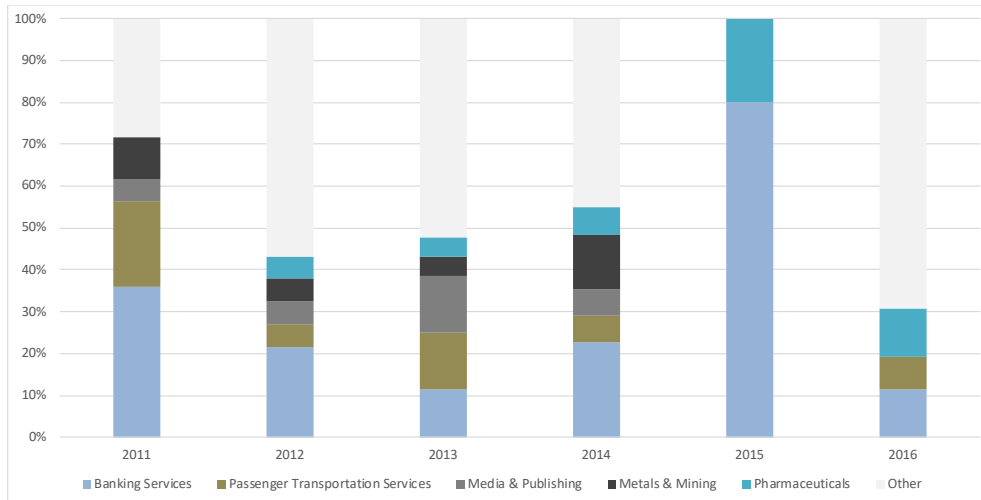


Fig. 7. Evolution of the controversies of the 5 most controversial industries over total controversies. Human rights

Source: The authors based on data by Eikon Thomson Reuters

Regarding the controversy category of product responsibility, figure 8 reveals again the high concentration degree among industries. Repeatedly, the 5 industries with more controversies in this category account for more than 50% of the irresponsible activities.

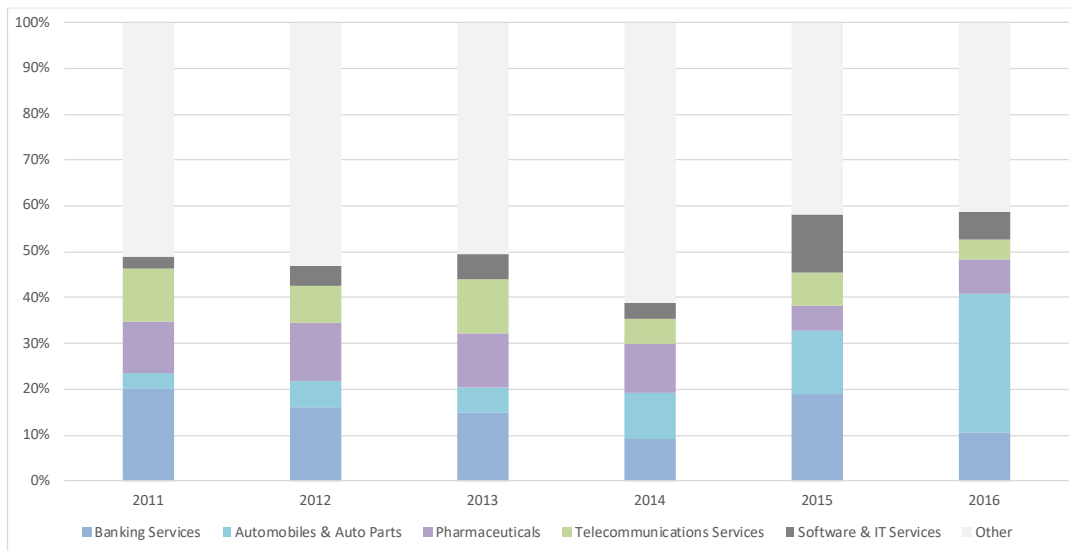


Fig. 8. Evolution of the controversies of the 5 most controversial industries over total controversies. Human rights

Source: The authors based on data by Eikon Thomson Reuters

In line with the previous figures, most controversies in the shareholder's category are caused by a few industries. Figure 9 shows that the 5 industries with more controversies in the shareholder's category account for more than 40% of all controversies in this category.

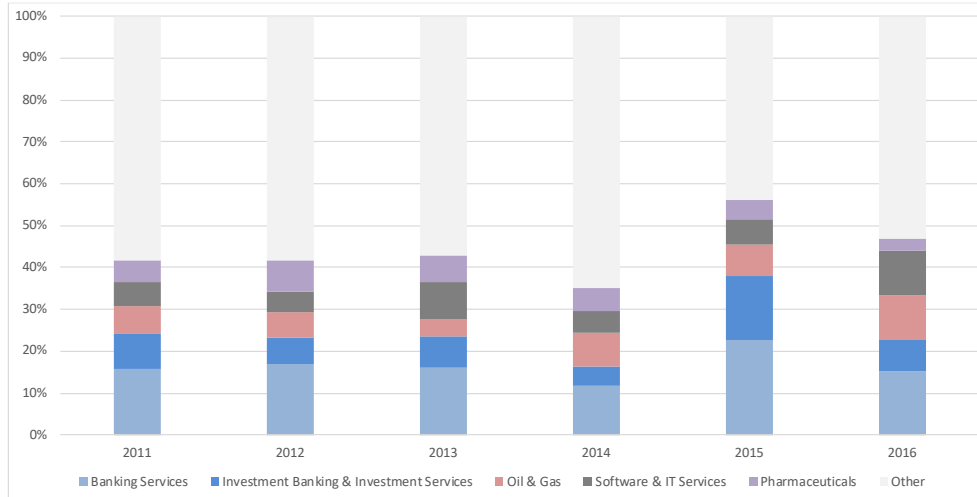


Fig. 9. Evolution of the controversies of the 5 most controversial industries over total controversies. Human rights

Source: The authors based on data by Eikon Thomson Reuters

Finally, figure 10 shows that controversies related with workforce are more common among industries. As a result, the concentration degree is not as high as in other categories. Nevertheless, in the year 2016 concentration by the 5 sectors with more controversies reached more than 50%.

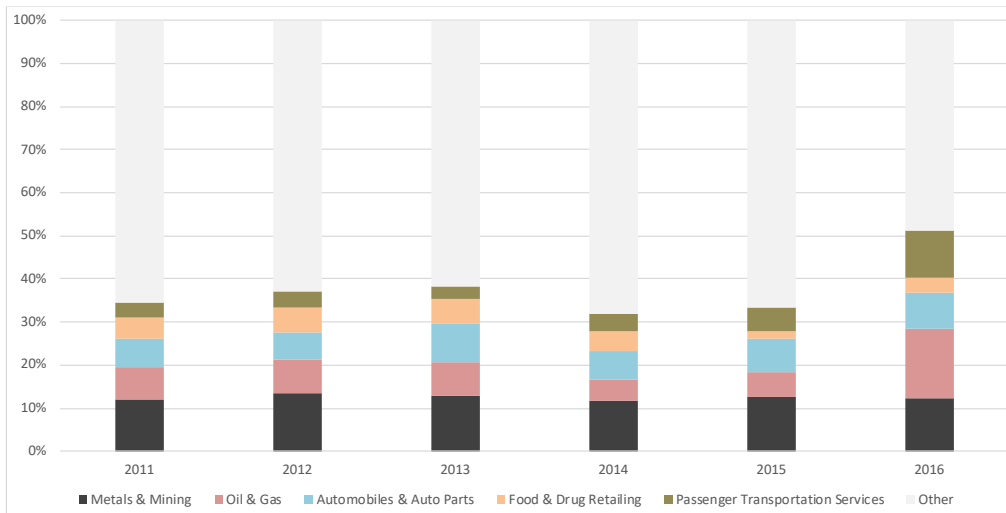


Fig. 9. Evolution of the controversies of the 5 most controversial industries over total controversies. Human rights

Source: The authors based on data by Eikon Thomson Reuters

From the analysis of figures 4 to 10 it can be observed that certain industries are repeatedly included in the top 5 of controversial sectors, regarding different ESG categories. Indeed, the industries automobiles & auto parts and oil & gas are five times in the top 5, out of a total of 7 categories. These industries are followed by banking services y metals & mining, which appear four times in the top 5. Then, pharmaceutical and telecommunications services appear three times in the top 5.

This simple analysis shows that applying a negative screening methodology which avoids investing in corporations inmerse in some controversial activities may impact the diversification ability of the investment

portfolio. This is the fact, even if just some ESG categories are considered. For example, for some industries it may be difficult to find enough companies eligible for investment, as could be the case of the automobiles & auto parts or the banking services industries. For these industries, it may be difficult to find enough companies that are not involved in controversies, so that the portfolio can properly be diversified.

We have already identified several problems that may appear when a negative screening methodology is applied using Eikon controversies as discriminant criterion. Together with these problems, two other issues should be considered: geographical diversification and industry diversification.

Geographical diversification is related to investing in companies located in different countries, continents or economic areas, so that the companies in the portfolio are not subject to the same economic cycle. As a result, economic crises in one country or specific area will only affect a subset of companies in the investment portfolio, not all of them. Proper geographical diversification is crucial for any portfolio.

Table 1. Total number of controversies per country in the period 2011-2016

Country	Number of controversies	Country	Number of controversies	Country	Number of controversies
United States of America	5531	Israel	88	Portugal	14
United Kindom	1392	Spain	80	United Arab Emirates	13
Japan	785	Hong Kong	74	Cayman Islands	12
Germany	718	Singapore	73	Jersey	10
India	476	Denmark	53	Macao	9
Australia	432	Norway	51	Poland	9
France	405	Belgium	42	Saudi Arabia	8
Republic of Korea	399	Austria	40	Indonesia	7
Canada	384	Malaysia	38	Colombia	5
Switzerland	334	Finland	36	Egypt	5
China	223	Turkey	34	Jordan	5
Brazil	199	Luxembourg	30	Nigeria	5
Netherlands	198	Thailand	23	Peru	2
South Africa	182	Chile	21	Puerto Rico	2
Ireland	177	Greece	19	Cyprus	1
Taiwan	137	Bermuda	18	Guernsey	1
Russian Federation	124	Czechia	16	Kuwait	1
Sweden	123	Philippines	16	Kazakhstan	1
Italy	107	New Zealand	15		
Mexico	89	Hungary	14		

Source: The authors based on data by Eikon Thomson Reuters

It is important to keep in mind that major public companies are not homogeneously distributed around the globe. Countries have different sizes and different importance in economic terms. Therefore, it is interesting and relevant to study how controversial activities are distributed among countries. That, what is the nationality of the companies that perform irresponsible activities is.

Table 1 shows that the companies with the highest number of controversies have their headquarters in the USA, Great Britain, Japan and Germany. Out of 1,852 corporations generating controversies in the period from 2011 to 2016, these four countries host more than 50% of the irresponsible companies, which account for 63% of the total number of controversies worldwide, as can be observed in table 2.

Table 2. Number of companies with controversies in the five countries with more controversies

Period 2011-2016	United States of America	Great Britain	Japan	Germany
Number of companies	611	140	139	44

Source: The authors based on data by Eikon Thomson Reuters

It is easy to understand this fact, as those countries represent very big economies and are the host countries of most major public companies in the world. Nevertheless, it is striking the relatively high number of controversies by British firms, maybe due to the language bias mentioned above.

In fact, it is possible that, due to the language, as Thomson Reuters is an American company, more attention is devoted to those firms which have some link to English-speaking countries. In this line, companies from English-speaking countries or operating in English-speaking countries will be more accurately monitored, as their irresponsible activities will be published by English-speaking media.

In any case, table 2 shows that the number of companies illegible for the sustainable portfolio may be very high for some specific countries, as Great Britain and Germany. In fact, the number of major public companies in those countries is not as high as in the USA. The problem is especially important if industry segmentation is performed in order to better diversify the portfolio. Once more, the diversification issue is highlighted, when creating a unsustainable investment portfolio applying negative screening criteria.

This issue appears again when the number of controversies in each industry is analysed. Table 3 shows this information. At a glance, it can be observed that just a few industries are responsible for the most controversies. That is corporate social irresponsibility is concentrated in some few industries. In this sense, 33% of all controversies are generated by 4 industries: banking services, automobiles and auto parts, oil and gas, and pharmaceuticals.

Table 3. Number of controversies in each industry in the period 2011-2016

Industry	Number of controversies	Industry	Number of controversies
Banking Services	1891	Professional & Commercial Services	159
Automobiles & Auto Parts	903	Multiline Utilities	156
Oil & Gas	814	Healthcare Equipment & Supplies	151
Pharmaceuticals	781	Beverages	139
Telecommunications Services	680	Coal	101
Metals & Mining	658	Communications & Networking	85
Software & IT Services	541	Semiconductors & Semiconductor Equipment	85
Computers, Phones & Household Electronics	425	Construction Materials	77
Investment Banking & Investment Services	422	Electronic Equipment & Parts	72

Passenger Transportation Services	376	Textiles & Apparel	60
Food & Drug Retailing	374	Real Estate Operations	58
Food & Tobacco	352	Household Goods	52
Hotels & Entertainment Services	325	Diversified Industrial Goods Wholesalers	42
Insurance	299	Leisure Products	42
Freight & Logistics Services	293	Collective Investments	36
Media & Publishing	288	Homebuilding & Construction Supplies	36
Electric Utilities & IPPs	263	Residential & Commercial REITs	34
Machinery, Tools, Heavy Vehicles, Trains & Ships	258	Containers & Packaging	33
Personal & Household Products & Services	212	Office Equipment	30
Chemicals	209	Transport Infrastructure	24
Construction & Engineering	208	Natural Gas Utilities	22
Aerospace & Defense	206	Biotechnology & Medical Research	20
Industrial Conglomerates	206	Water & Related Utilities	20
Diversified Retail	200	Paper & Forest Products	17
Oil & Gas Related Equipment and Services	196	Investment Holding Companies	11
Specialty Retailers	182	Renewable Energy	8
Healthcare Providers & Services	172	Uranium	7

Source: The authors based on data by Eikon Thomson Reuters

Table 4 shows the number of irresponsible companies in those industries which present the highest number of controversies. It becomes obvious that diversifying a socially responsible investment portfolio is not an easy task. In fact, a high number of companies in some industries would be ineligible, so proper diversification in those industries is not actually possible.

Table 4. Number of irresponsible companies in the 15 most irresponsible industries in the period 2011-2016

Industry	Irresponsible companies
Banking Services	162
Metals & Mining	118
Oil & Gas	97
Telecommunications Services	84
Food & Tobacco	78
Machinery, Tools, Heavy Vehicles, Trains & Ships	78
Software & IT Services	64
Automobiles & Auto Parts	59
Pharmaceuticals	58
Electric Utilities & IPPs	56
Chemicals	55
Insurance	55

Hotels & Entertainment Services	53
Investment Banking & Investment Services	53
Professional & Commercial Services	53

Source: The authors based on data by Eikon Thomson Reuters

Furthermore, it is important to know which companies have performed the most irresponsible activities or are involved in the most severe scandals regarding sustainable performance. Knowing the names of the specific companies, it is easier to get an intuition of the diversification problem by the sustainable portfolio, as we get to know which companies are illegible.

Table 5 lists the 34 companies which have gathered the most controversies in the period under study. This 34 firms are responsible for 21% of all controversial activities. That is, those are companies that clearly should not be included in any investment portfolio claiming to be sustainable, ethical or socially responsible, at least as these concepts are understood by retail investors.

Table 5 shows that, if the companies with the most controversies are illegible (50 or more controversies in 6 years), the sustainable portfolio will not be able to invest in many of the major companies worldwide in terms of capitalization. That is, even if the negative screening policy is limited to prevent those 34 companies which are the most irresponsible worldwide to become components of the portfolio, severe diversification problems may arise. In fact, the portfolio had to avoid investing in many firms included in the main stock indices in the world.

Table 5. Number controversies by the most irresponsible companies in the period 2011-2016

Company	Industry	Number of controversies
Volkswagen AG	Automobiles & Auto Parts	157
Bank of America Corporation	Banking Services	156
JPMorgan Chase & Co	Banking Services	151
Alphabet Inc	Software & IT Services	134
Apple Inc	Computers, Phones & Household Electronics	127
Citigroup Inc	Banking Services	114
Unicredit Spa	Banking Services	109
Barclays Plc	Banking Services	108
Wells Fargo & Co	Banking Services	107
Samsung Electronics Co.,Ltd.	Computers, Phones & Household Electronics	98
Walmart Inc	Food & Drug Retailing	91
Hsbc Holdings Plc	Banking Services	86
Royal Dutch Shell Plc	Oil & Gas	81
Royal Bank of Scotland Group	Banking Services	77
Johnson & Johnson	Pharmaceuticals	75
General Motors Company	Automobiles & Auto Parts	71
Bp Plc	Professional & Commercial Services	69
At&T Inc	Telecommunications Services	67

Chevron Corporation	Oil & Gas	67
Ubs Group AG	Investment Banking & Investment Services	65
Credit Suisse Group AG	Banking Services	65
Morgan Stanley	Investment Banking & Investment Services	63
Goldman Sachs Group Inc	Investment Banking & Investment Services	62
Petroleo Brasileiro S.A.	Oil & Gas	61
Fiat Chrysler Automobiles N.V.	Automobiles & Auto Parts	60
Pfizer Inc	Pharmaceuticals	57
Heidelbergcement AG	Metals & Mining	56
Toyota Motor Corporation	Automobiles & Auto Parts	55
Ford Motor Co	Automobiles & Auto Parts	55
Tesco Plc	Food & Drug Retailing	53
McDonald's Corporation	Hotels & Entertainment Services	52
Glaxosmithkline Plc	Pharmaceuticals	51
Exxon Mobil Corp	Oil & Gas	50
Daimler AG	Automobiles & Auto Parts	50

Source: The authors based on data by Eikon Thomson Reuters

All companies in table 5 have performed irresponsible activities each of the 6 years under assessment, but Volkswagen AG, which has been subject to controversies 5 years.

Regarding the diversification issue studied throughout this paper, it is evident that diversification in the automobiles & auto parts industry would be very difficult, as it would be not allowed to invest in major companies such as VW, General Motors, Chevron, Fiat Chrysler, Ford, Daimler, Honda, BMW and Hyundai. And this is already a problem when only the 34 companies are excluded worldwide, those with more than 50 controversies, including all industries.

In brief, it is surprising to conclude that most of the major public companies in the world are included in the Eikon controversies database by Thomson Reuters. It is also striking that the biggest corporations in the world, those with the most market capitalization and benefits, are the ones responsible for the most controversies, that is, are the firms performing the most irresponsible and unsustainable activities. This is especially unexpected, as all those firms publicly and repeatedly state their commitment to corporate social responsibility, environment, consumer protection etc., and their mission to make the world a better place.

It is possible to argue that these huge multinational corporations, due to their enormous size and relevance, are closer monitored than smaller and local firms, which is probably correct. Nevertheless, this fact can not be an excuse, as the irresponsible, and many times illegal, activities that are the origin of the controversies cannot be denied.

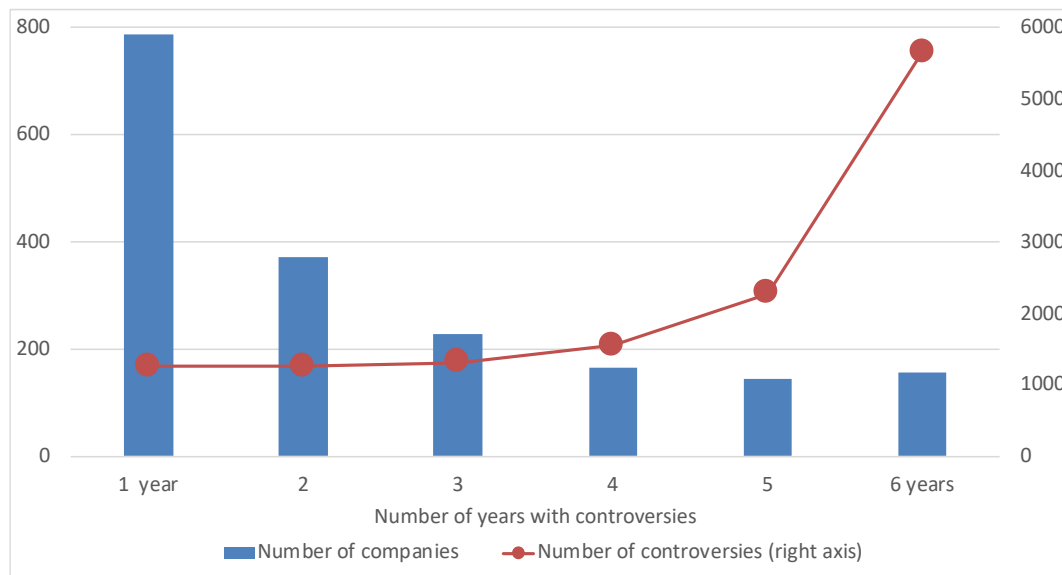


Fig. 9. Number of companies performing socially irresponsible activities different years in the period 2011-2016 and number of controversies by these companies

Source: The authors based on data by Eikon Thomson Reuters

Finally, it should be underlined that a relatively high number of companies are repeat offenders, as can be extracted from figure 11. In fact, more than 400 companies are linked to controversial activities in 4 or more years, out of the 6 years analyzed. Furthermore, these 400 companies are responsible for the most controversies. That is, companies performing socially irresponsible activities do not really feel the need to change and improve their behavior. It is important to stress the fact that, as explained above, all firms listed in table 5 belong to this group of 400 companies. Moreover, these corporations are usually included in the most prestigious sustainable stock indices and are defined as sustainable companies and socially responsible corporations by most analysts.

Conclusions

Socially responsible investment has dramatically increased in the last decade and nowadays has become a significant investment style. In fact, the trend to only invest in those companies with good sustainable and social performance has attracted many investors, who care for global problems such as depletion of the ozone layer, climate change and numerous scandals regarding major companies' behaviour involved with corruption, fraud, child labor, slavery, irregular management compensations etc.

As a consequence of this new awareness to protect environment and society, retail investors wonder whether it is ethical to invest money and become co-owners of companies with poor sustainable performance and carrying out irresponsible and even illegal activities. To cover this new request by retail investors and attract potential clients, the financial industry has rapidly created new investment products like sustainable stock indices or ethical investment funds. These products are supposed to undertake a thorough selection of the companies included in the portfolios in terms of both return and corporate social responsibility, so that socially irresponsible firms are excluded. Nevertheless, the best-in-class approach which is typically employed in the selection process does not guarantee that firms with a reprehensible behaviour are excluded from the portfolio. The reason is that this approach does not erase those firms from the eligible universe of companies, but selects the less-irresponsible firms to be included in the portfolio employing sophisticated, multivariate and opaque methodologies. As a

result, poorly performing companies in terms of corporate social responsibility can become parts of the investment portfolio, while the diversification ability of the portfolio is preserved.

This research paper analyses the implications of applying the negative screening approach to identify those companies which should be automatically excluded from socially responsible, sustainable or ethical investment portfolios. This screening methodology does in fact avoid the inclusion of firms which have been involved in damaging activities against the environment or the society in the eligible universe of companies. In order to study whether the negative screening option is actually feasible, the companies' controversies included in the ESG Scores in the Eikon database by Thomson Reuters are analysed. This database collects negative news published worldwide about the 7,000 major public companies in the world, which are the so-called controversies.

The analysis clearly shows how difficult it is to implement the negative screening selection methodology to build a sustainable investment portfolio. In fact, this portfolio could not properly be diversified, not in geographical terms, nor regarding industry sectors. Furthermore, most major public companies in the world, in all industries, would be excluded from the portfolio, as they have been involved in diverse controversies during the period analysed, from 2011 to 2016. This is, obviously, an important drawback for a global investment portfolio.

These results reveal that it is actually not feasible to apply negative screening to select the companies in a sustainable, socially responsible or ethical portfolio. This is probably an important reason why most sustainable investment products currently apply the best-in-class methodology, which makes it possible to quite openly invest in companies involved in scandals due to their irresponsible behaviour. Nevertheless, the use of the best-in-class screening approach is probably misleading retail investors, who may believe that a so-called sustainable, ethical or socially responsible investment fund would never invest in companies performing activities which are clearly against the environment, the customers or the employees. This strategy by investment companies to mislead potential customers should come as no surprise. In fact, the financial industry is the industry collecting the most controversies in the category of community, which includes responsible marketing and customer complaints controversies. If it is not feasible to generate efficient investment portfolios for technical reasons, the ethical solution is not to change the simple negative screening methodology for a new one, more complex and less transparent. Especially, when the new approach makes it possible for clearly irresponsible companies to become a component of the ethical portfolio and be identified as sustainable and socially responsible forms. The ethical solution would be to recognize that, given the fact that most of the major public companies in the world are not behaving in a sustainable and socially responsible way, it is not feasible to generate efficient sustainable portfolios that are properly diversified just including responsible companies.

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