TECHNICAL UNIVERSITY OF CRETE

SCHOOL OF PRODUCTION ENGINEERING AND MANAGEMENT

Aligning Responsible Investing with the EU Sustainable Finance Action Plan: Regulatory Initiatives, Practices, and Implications

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1. Introduction

The notion of sustainability emphasizes the efficient use of valuable resources in a way that addresses the needs of current generations, without undermining the ability of future generations to meet their own needs by depleting these scarce resources.

Modern discourse about sustainability identifies three pillars of sustainability, an environmental pillar, a social pillar and an economic pillar. While there are references to sustainability and the responsible use of finite resources in the context of diminishing forest resources as early as the 17th and the 18th century. There are also questions about the feasibility of infinite growth in the works of classical political economy at the dawn of the industrial revolution.

The modern version of sustainability emerged in the latter half of the 20th century. It gained prominence in the 1970s and came to the forefront of the debate about economic growth and development, along with the social dimensions and impacts of economic activity. The same period saw the emergence of environmental movements in the West that called for better protection of the environment and limits to economic growth.

After the environmental movements lost traction, a new paradigm of economic growth came to the forefront of policy discussion in the ‘80s, that was based on the notion of economic growth that acknowledged environmental and social concern. The modern notion of sustainability was thus born and started to take hold in academia and policy debates. Today, sustainability is an important issue in every modern society, especially the advanced, democratic ones (Purvis et al., 2019).

Finance plays a critical role in promoting sustainability. From investors to policymakers there is an increased interest in promoting sustainable development and awareness about its important environmental and social implications. The environmental impact of economic activity and industrial activities is also gaining increasing attention and if often at the center of policy debates (Ahlström & Sjåfjell, 2022).

The European Green Deal was introduced by the European Commission on December 11, 2019. It constitutes a comprehensive growth strategy that seeks to promote prosperity and fairness in

the European union, by transforming the European economy promoting an alternative paradigm that promotes efficiency in the use of resources, while also maintaining competitiveness, and eliminating all emissions of greenhouse gases by 2050 (Schütze et al., 2020).

Sustainable development is a fundamental concept for the European Union. It appears in the Treaty of the European union and in the Treaty on the Functioning of the European union multiple times. The Treaty on the European Union dictates that the Union must contribute to sustainable development at a global scale. It calls for the promotion of not only sustainable economic development, but also for social and environmental development as well.

There are also frequent references to the concept of green in various legislative, as well as non-binding, acts of the European union. The European Commission estimates that in order for the European union to achieve the climate goals it adopted by 2030, would require an additional 350 billion euros in investments on an annual basis by the end of the present decade (Schütze et al., 2020).

Towards that goal the European Commission introduced the EU Taxonomy, along with other regulatory initiatives, seeking to promote sustainable finance in order to meet the European Union's environmental objectives and to finance the transition of the economy of the European Union to a sustainable future. The EU Taxonomy lies at the core of the EU's sustainable finance efforts and policies.

The present Thesis investigates the issue of aligning responsible investing with the European Union's Sustainable Finance Action plan. It provides an overview of relevant regulatory initiatives and their expected impact on responsible investing practices and the financing of the European Union's economy towards sustainability.

The structure of this Diploma Thesis proceeds as follows. The second chapter provides a review of the EU Taxonomy, the relevant regulatory frameworks and initiatives, while also outlining implementation challenges and criticisms of the provisions of the Taxonomy. Furthermore, it presents the provisions of the Taxonomy and its expected impact for three major sectors of economic activity. The third chapter presents the European Union's regulatory initiatives with respect to promoting responsible investing, such as the European Commission's Action Plan,

additional regulatory initiatives and the European Green Bonds regulation. The fourth chapter outlines responsible investing practices. A concise overview of the historic origins and the evolution of responsible investing is provided, as well as the reasons that lead investors to adopt responsible investing practices. ESG rating agencies and sustainability indices are also presented, while the problem of divergent assessments of a company's sustainability is also analyzed. The chapter also analyzes the potential impact of responsible investing on sustainability and climate change. It concludes with a presentation of the United Nation's Principles for Responsible Investment framework, along with responsible investing in practice. The fifth chapter presents the implications and recommendations about the EU Commission's regulatory initiatives, by the European Banking Authority and assessments and suggestions about the sustainable finance strategy and the EU Taxonomy. The sixth chapter presents the findings of the present research and concludes.

2. Literature review

Climate change concerns have pushed environmental sustainability to the forefront of policy discussions, aiming to mitigate the adverse impacts of greenhouse emissions and economic activity. Taxonomies are frameworks that specify which economic activities and investments, under which conditions, can be considered sustainable (Dusík & Bond, 2022).

In 2015 the European Union became a signatory to the Paris Climate Agreement, pledging to support its Member States to become resilient to the negative impact of climate change and to contribute towards the goal of keeping global warming due to climate change below 2 degrees Celsius.

Current trends of corporate investment, however, are not sufficiently supportive of the European Union's climate targets that it seeks to achieve by the end of the current decade. Financial market participants must be incentivized to direct considerable amounts of private funds towards achieving these goals. The lack of established criteria for the assessment of the degree of the environmental sustainability of an investment or a company hinders efforts to direct more capital towards economic activities that promote environment sustainability (Lucarelli et al., 2023).

The Paris Climate Agreement and the European Union seek to create the conditions for making finance consistent with the goals of climate change mitigation and environmental sustainability. Considerable public and private funds are required in order to reduce, if not eliminate, emissions and support environmentally sustainable economic activity (European Court of Auditors, 2021).

In 2016 the high-level expert group on a mandate by the European Union developed proposals for an EU strategy about sustainable finance and the report was released at the end of January, 2018. Based on these proposals, the EU Commission devised the Action Plan on sustainable finance, outlining the necessary actions that would align finance with the EU's climate action targets (Lucarelli et al., 2023).

The emphasis of the Action plan was on providing a common and consistent understanding of sustainability in the context of promoting environmentally sustainable economic activities, by establishing sustainability as one of the fundamental criteria for the allocation of capital

(Lucarelli et al., 2023). The Action Plan aimed to promote the financing of environmentally sustainable investments and mitigate financial risks emanating from the effects of climate change (European Court of Auditors, 2021).

2.1 The EU Taxonomy

Sustainable investments are investments that incorporate environmental, social and governance factors in the decision-making process. They are increasingly important in the modern financial landscape. Investors, policymakers and the public, place increasing emphasis on the sustainability of a firm's business practices (Edmans & Kacperczyk, 2022).

Building on the objectives outlined in the Action Plan, the EU Taxonomy was introduced to create a standardized framework for sustainable investments. The technical expert group was commissioned by the EU Commission to provide a classification, the EU Taxonomy, to assess the degree of sustainability of economic activities. The EU Taxonomy provides a set of economic activities along with relevant criteria about their environmental performance.

As long as they met the environmental criteria these activities would mitigate and promote adaptation to the effects of climate change, help control and prevent pollution, promote the sustainable utilization of water resources, protect valuable ecosystems, restore biodiversity and support the transition to a circular economy. At the present time, the focus of the European Commission is on mitigating the effects of climate change and promoting adaptation to its impacts (Lucarelli et al., 2023).

The Taxonomy Regulation, introduced by Regulation (EU) 2020/852, came into force on 12 July, 2020, establishing technical criteria and determining the responsibilities of the European Union and its Member States, those of large companies that operate in the EU and of financial companies and investors. Large corporations operating in the European Union have a legal obligation to disclose the extent to which the various dimensions of their performance correspond to the criteria established by the EU taxonomy (Lucarelli et al., 2023).

The Taxonomy serves the need to direct sustainable finance towards firms that meet certain environmental criteria. It incentivizes firms to pursue investments that improve their

sustainability profile to secure the financing they need at preferential terms (Lucarelli et al., 2023).

An economic activity is eligible under the EU Taxonomy if it promotes at least one established environmental objective, adheres to the minimum social safeguards, and does not significantly harm other environmental goals, while satisfying the technical criteria established for each of the environmental goals (Dusík & Bond, 2022).

Only activities that can help transform sectors that are the biggest polluters with respect to carbon dioxide emissions, such as agriculture, IT, water, waste management, transport, energy and manufacturing, are currently included in the Taxonomy (Schütze & Stede, 2024). Other activities may be added in the future, as the Taxonomy and the EU's efforts towards promoting environmental sustainability evolve (Lucarelli et al., 2023).

An activity contributes significantly to climate change mitigation if it results in reduced emissions or the removal of greenhouse gases. The targets set are based on the EU's Green Deal and its goals for the reduction of emissions over the span of approximately the next three decades, by the years 2030 and 2050 (Och, 2020).

Emphasis is placed on greenhouse emissions, with the Taxonomy seeking to address economic activities that result in high greenhouse emissions, thus their reduction can have a considerable impact on the efforts to mitigate climate change. The Taxonomy does not include economic activities that cannot contribute to the goal of reducing greenhouse emissions or there are more environmentally sustainable alternatives, such as burning fossil fuels for energy production (Schütze & Stede, 2024).

Applying straightforward and quantitative criteria is not feasible for every environmental objective, however, and for certain objectives a more qualitative approach must be adopted. To contribute to the adaptation to the potential hazards of climate change, an economic activity must contribute towards a reduction in climate change-related risks, while not enhancing other risks for society and the environment. An activity can be classified as climate-resilient if it significantly reduces its own negative consequences to the environment or other climate change risks, to the extent that is feasible to do so (Och, 2020).

While the EU Taxonomy places emphasis on environmental objectives and adaptation to the impacts of climate change, the minimum safeguards take into account the social impact of economic activities and dictate that, in addition to their environmental dimension, they must respect labor and human rights (Dusík & Bond, 2022)..

At the same time, compliance with the EU Taxonomy also implies that an activity must not be detrimental to any of the other environmental objectives. The "do no significant harm clause" dictates that even if an activity has a positive impact for a number of environmental objectives, it is still not eligible if it has a significantly negative impact on at least one other environmental objective (Dusík & Bond, 2022).

The technical criteria, established by Delegated Acts, clarify how the environmental objectives set by the Taxonomy will be met. Any measures must take into account the relevant scientific evidence, be compatible with EU regulations and a market economy, and the environmental impact of an economic activity must be evaluated throughout its life cycle (Och, 2020).

An economic activity can have a significant contribution to an environmental objective in various ways. It can contribute significantly to an environmental objective directly, or, if that is not possible, it should be the best available alternative for a specific economic sector.

These second-best economic activities are classified as transitional activities and are meant to provide incentives to economic sectors with high greenhouse emissions to concentrate their efforts on reducing them. This can provide incentives to critical sectors of the economy, with a large environmental impact and high greenhouse emissions, to utilize more environmentally friendly technologies and practices (Och, 2020).

An activity can be compliant with the Taxonomy even if it serves to enable other activities to contribute substantially to any of the environmental objectives, while the activity itself is not able to do so. Examples include research, manufacturing equipment and building infrastructure for renewable energy projects and other projects that can improve environmental sustainability (Och, 2020).

If the activities of every company in a sector had a significant contribution towards the environmental goals outlined in the Taxonomy, then the greenhouse emissions of said sector

would eventually be reduced to a bare minimum, or even become zero. That is not the case for transition activities, as they would reduce greenhouse emissions to the extent possible but still fail to eliminate them. Enabling economic activities have only an indirect effect on greenhouse gases emissions and the efforts towards environmental sustainability. Enabling activities also have to meet a minimum environmental performance threshold to be considered environmentally sustainable and thus be eligible (Schütze & Stede, 2024).

The Taxonomy is applied in tandem with other regulatory initiatives, including the non-financial reporting directive that is applicable to all large corporations with a workforce that exceeds 500 employees and the Sustainable Finance Disclosure regulation that applies to the financial sector. This set of regulations can help enhance transparency about the environmental sustainability of the economic activities and investments of companies, with an emphasis on greenhouse gases emissions (Schütze & Stede, 2024).

These disclosure obligations have important implications for investors, as they also have to disclose the extent that the activities of the companies they invest in conform with the requirements of the Taxonomy. It is up to the European Commission to determine how companies and authorities must conform with the regulations established by the Taxonomy Regulation (Lucarelli et al., 2023).

The Taxonomy can be used to assess the environmental sustainability and impact of individual investments, such as new plants and equipment as well as that of an entire company, its production facilities and equipment. It can help investors assess whether they should invest in a company taking into account environmental concerns, the environmental sustainability of its operations and its eligibility for sustainable finance (Schütze & Stede, 2024).

The EU Taxonomy can help promote environmental sustainability and reduced greenhouse emissions, by enabling companies with a better environmental profile access to capital, in the form of equity or bonds, at a lower cost, thanks to preferential access to public funds.

Moreover, eligibility for public financing, in the form of subsidies or other types of public investments, could be limited to environmentally sustainable investments that contribute to lower greenhouse gasses and climate change mitigation.

Hence, the Taxonomy can serve as a valuable policy instrument that can help advance the ambitious goals for environmental sustainability and climate change mitigation set by the European Union, by promoting sustainable finance (Schütze & Stede, 2024).

At the same time, the Taxonomy can have an impact on the cost of private capital for firms with a high share of Taxonomy-eligible activities, as a more efficient use of resources will not only lead to better firm performance, but also allow them to obtain equity from capital markets at a discount and raise more debt in preferential terms (Sharfman & Fernando, 2008).

Credibility is a necessary condition for preferential financing terms when issuing green bonds. In this respect, the Taxonomy can enhance the credibility of claims about the environmental sustainability of their activities by companies.

The enhanced credibility provided by the EU Taxonomy can also help companies appear more credible about their commitment to reducing the environmental footprint of their activities towards their stakeholders and consumers. A more detailed assessment of their greenhouse gases emissions, to assess their compliance with the Taxonomy, can help firms take the necessary actions to reduce them (Schütze & Stede, 2024).

The Taxonomy can be used to evaluate new investments, such as the construction of new production facilities and buildings, as well as for the evaluation of entire firms. Around 80% of all greenhouse gas emissions in the European Union are covered by the Taxonomy, mainly from industry, the energy sector, agriculture, transportation and the construction sector.

However, certain activities such as the production of refined petroleum, aviation and wholesale and retail sales are not, at least yet, included in the Taxonomy, therefore there is not an explicit threshold for these activities, while at the same time they are not considered unsustainable either (Schütze et al., 2020).

As Schütze et al. (2020) argues if the thresholds are set too low, there are will not be adequate incentives to replace technologies that produce increased levels of emissions or rely on fossil fuels, keeping them in production for decades to come. Too strict thresholds, however, could also bring about unfavorable outcomes, leading to a limited number of investments that are Taxonomy-compliant. They would also increase the financing costs for emission-intensive

sectors, thus limiting their ability to finance their transition towards sustainable activities and facilities.

Pacces & Tsai (2021) investigate whether the introduction of the EU Taxonomy contributed to an increase in the number and of firms aligning with the criteria outlined in the Taxonomy in order to benefit from preferential access to financing. The results indicate that merely the inclusion of a firm's sector of economic activity in the list of sectors deemed eligible by the Taxonomy is not enough to bring about a considerable increase in investments by the sector's firms compared to the level of investments by firms in other non-eligible sectors.

However, as the Taxonomy identifies eligible activities with different levels of detail not all the firms in a sector have to deal with the same degree of uncertainty. According to their results, when the sector of firms is defined at a level of NACE 4 digits there is less uncertainty for a firm, thus its inclusion contributes to more investments. Thus, the degree of uncertainty associated with a firm's sector and its eligibility is a crucial determinant of the level of investment and whether firms will pursue additional investments.

Furthermore, investigating the impact of firm size, they find that medium sized and large firms pursued more investments than small firms, indicating that firm size does have an impact on a firm's reaction to uncertainty. They attribute their findings to the pressure that increased regulatory initiatives exert on firms and the impact of peer effects due to the behavior of the other firms in the same sector.

As Pacces & Tsai (2021) argue a taxonomy that tries to classify economic activities according to their sustainability will be inevitably imperfect. However, the EU Taxonomy reduces the uncertainty that investors face due to greenwashing and allows institutional investors to select the companies they want to invest in according to their sustainability and affect the behavior of the companies in their portfolio.

The EU taxonomy and other related regulatory initiatives can also mitigate agency issues between institutional investors and the firms they invest in. Certain companies and investors would like to invest in green financial instruments, even if these investments yield lower returns. While institutional investors may want to support these companies, greenwashing is an important

issue that may hinder such efforts. Some firms may attempt to mislead investors into believing that they are environmentally sustainable, even when in fact they are not, in order to attract additional investments and reduce their cost of capital. The EU taxonomy can help mitigate this agency problem.

The requirement to disclose an economic activity's alignment with the Taxonomy will result in a reduction in greenwashing. The degree of a portfolio's Taxonomy alignment serves as a signal of environmental sustainability, allowing investors to easily recognize companies that are environmentally sustainable. The signal's credibility is enhanced by the fact that it is based on measures of sustainability defined in the context of regulatory initiatives (Pacces & Tsai, 2021).

The degree of Taxonomy alignment of a company's economic activities allows investors to perform comparisons between companies and, additionally, the verification of the information that mutual funds and the issuers of green bonds provide. However, as the Taxonomy is, at least to an extent, the product of a political compromise in the European Union, the degree of alignment of a company's activities with the Taxonomy as a metric of sustainability may be at least somewhat flawed and misleading. The EU, for example, refrained from setting transition limits for sectors such as natural gas and nuclear energy production.

At the same time, companies are allowed some discretion in the calculation of their activities' taxonomy alignment, a fact that can, to an extent, reduce the credibility and accuracy of this metric. In any case, as the measures defined by the Taxonomy are based on carbon dioxide emissions, it can effectively reduce greenwashing compared to the present situation, particularly for companies that are not sustainable despite their claims. Moreover, the measures of the Taxonomy are more credible compared to other ESG indicators and sustainability claims by companies (Pacces & Tsai, 2021).

In 2018 the amount for Taxonomy-eligible activities in the utility sector by the proceeds from bonds issuance amounted to 40 billion euros, 17 billion euros for construction, 10 billion euros for the transportation sector and 1 billion euros for other sectors with increased energy demands. Barely any amounts were raised for agricultural activities that are Taxonomy-eligible. The amounts raised for construction saw a steady increase and for sectors with increased energy demands slightly declined, compared to the previous period.

Green bonds finance around half of all eligible activities of the utility sector, while the proportion of activities financed through green bonds is less than 20% for the transportation sector. Thus, increasing the use of green bonds can provide valuable financing opportunities for the transition to a new sustainable paradigm of economic activities in various sectors (Alessi et al., 2019).

The respective amounts for Taxonomy-eligible activities that were financed by stocks in the same year amounted to 55 billion euros for utilities, 45 billion euros for construction, less than 5 billion euros for transportation and less than 10 billion euros for sectors with high energy demands. Once again, agriculture barely saw any financing of eligible activities by funds raised through stocks (Alessi et al., 2019).

2.2 Regulatory Frameworks and Initiatives

Other than the EU Taxonomy, additional taxonomies were also developed internationally. The European Union also supports the development of the International Platform on Sustainable Finance, that aims to promote the adoption of best practices, a common understanding and objectives and the consolidation of similar efforts to mitigate climate change and prepare for its adverse impacts (Schütze & Stede, 2024).

However, while aligning different taxonomies and efforts on mitigating climate change internationally would be beneficial, there are considerable challenges, as countries hold different beliefs about how far these efforts should go, as well as about the procedures and technologies that should be utilized (Schütze & Stede, 2024).

In June 2020 the Chinese Branch of the United Nations Development Program in collaboration with the Chinese think tank, China International Centre For Economic & Technical Exchanges, under the auspices of China's Ministry of Commerce developed the UNPD Sustainable Development Goals Finance Taxonomy (Nedopil Wang et al., 2022).

The SDG Taxonomy's guiding principles include promoting knowledge sharing and coordinating the actions of all relevant stakeholders, ensuring that the financed projects are

economically viable, ensuring the inclusion of underserved populations, while also minimizing any unintended consequences, and applying all relevant data to the selection of investments to finance and the assessment of their impact.

Activities that are included in the SDG Taxonomy must be compatible with national development objectives and strategies, adopt best practices to promote social development and be beneficial for underserved populations and sectors. Activities from sectors with a negative social impact, such as gambling, tobacco and guns and investments that do not respect and protect human rights are not eligible.

Furthermore, there must not exist more efficient alternatives with respect to the achievement of social and environmental objectives set by the SDG. The SDG Taxonomy also adopts the "do no significant harm principle" in accordance with the EU Taxonomy (Nedopil Wang et al., 2022).

Additional frameworks for sustainable finance include the Sustainable Bond Guidelines, introduced in 2018, the Global Reporting Initiative, also in 2018, and the Principles for Responsible investment, introduced in 2020. In 2015 China also published China's Green Bond and Green Industry Catalogue (Nedopil Wang et al., 2022).

2.3 Implementation Challenges and Criticisms

A report by the European Court of Auditors (2021) identifies a lack of consistency with respect to the European Union's actions in promoting the public and private financing of sustainable investments and the transition towards environmental sustainability. The European Commission's main focus is on promoting transparency, while it failed to adopt any measures aiming to internalize the costs of economic activities that are not consistent with a transition towards environmental sustainability.

It calls on the Commission to be more consistent when it comes to its evaluation of the sustainability of the investments financed by the Commission's budget and concentrate its efforts towards creating more opportunities for sustainable investment plans. While an emphasis on improved transparency about the eligibility criteria for sustainable investments and the reporting

requirements of the private sector and financial market participants can help promote environmental sustainability, delays and additional requirements for the implementation of planned actions were observed.

Most importantly, the EU taxonomy's design was delayed compared to the time schedule that was set. The report further emphasizes the need for measures that would help internalize the externalities imposed by unsustainable economic activities and their environmental and social impact.

The European Court of Auditors (2021) underscores the importance of the role of the European Investment Bank in the financing of sustainable investments and the effective enforcement of the EU Taxonomy. Furthermore, it mentions that according to its research, the allocation of the funds by the European Fund for Strategic Investments was negatively skewed against countries in Central and Eastern Europe, that received less support, while these countries are in dire need of sustainable financing.

Finally, the report finds that there are inconsistencies in the application of the "do no significant harm" principle on economic activities funded by the European Union's budget. Furthermore, the only EU-funded investment program that provides a comprehensive assessment of an investment's social and environmental impact consistent with the standards applied by the European Investment Bank is InvestEU, while there are no similar requirements for other programs.

This contributes to inconsistencies in the environmental and social standards applied by different initiatives of the European Union. The EU also fails to apply similar criteria with respect to environmental sustainability to the ones outlined in the EU Taxonomy to its own budget.

Despite its comprehensive framework, implementing and enforcing the EU Taxonomy presents significant challenges, particularly regarding the availability and reliability of sustainability data. The Sustainable Finance Disclosure Regulation mandates detailed disclosures, yet investors often struggle to access reliable data on the underlying activities of financial instruments.

This lack of transparency complicates the accurate assessment of Taxonomy compliance, posing a barrier to the effective integration of sustainable finance across the market. At the same time,

only a limited number of companies, such as those obligated under the Non-financial Reporting Directive provide relevant data that investors can use (Och, 2020).

Lack of relevant data creates problems with investor compliance, especially for particularly complex financial products. A survey by PwC (2024) about compliance with the EU's Corporate Sustainability Reporting Directive finds that for almost six in ten senior executives consider data availability and quality as the biggest obstacle in their compliance efforts. At the same time, companies, particularly smaller ones, that lack the resources and expertise to compile and disclose environmental data about their activities may have limited access to financial markets. If investors have to resort to rating agencies to obtain the relevant data, these agencies will further consolidate their impact and control over financial markets (Och, 2020).

The collection and disclosure of the relevant environmental data is associated with additional costs. If these costs passed onto investors, this would have an adverse impact on the competitiveness of sustainable financial products, turning investors to other financial instruments. Simply disclosing that a particular financial product or company does not comply with the EU Taxonomy might be a better option.

If a considerable number of companies and investors follow a similar strategy, sustainable companies will be left with additional burdens and find themselves at a competitive disadvantage. This, in contrast to the goals of the Taxonomy, would undermine the mainstream adoption of sustainable finance (Och, 2020).

Only companies with a workforce that exceeds 500 workers are obligated under the non-financial reporting directive to disclose non-financial data. However, the biggest polluters are often small and medium-sized companies with fewer employees. The number of employees is not always a good indicator of greenhouse emissions and a company's environmental footprint. At the same time, the Taxonomy places additional administrative burdens on companies with a limited environmental impact that are low polluters (Schütze & Stede, 2024).

Another issue with the Taxonomy is that since it is used for the assessment of individual investments as well as entire companies, it might only end up promoting minor improvements

for new investments, while being counter-productive for innovation and the promotion of sustainability as one of the main pillars of economic activities (Schütze & Stede, 2024).

Furthermore, the Taxonomy addresses social issues only to a limited extent under the minimum safeguards. Thus, it fails to account properly for the social and governance aspects of ESG financial products available to investors in financial markets (Och, 2020).

Although the Taxonomy addresses most activities that are responsible for a large fraction of emissions in the European Union, a large number of activities are still not explicitly addressed. An additional category might be needed for activities that are not only incompatible but also detrimental to the efforts towards sustainability and climate-neutrality (Schütze & Stede, 2024).

The Taxonomy may not be able to prevent so-called greenwashing, as its scope is quite broad. A particularly challenging issue is the treatment of complex financial products. A number of sustainable financial products will often include activities from different companies. Assessing the eligibility of a financial instrument can be quite tedious and complicated if it packages together Taxonomy compliant and non-compliant economic activities. Non-compliant companies could use complex financial instruments to mask their lack of compliance, while still receiving additional investments by manipulating sustainable finance initiatives (Och, 2020).

Kooths (2022) criticizes the EU Taxonomy from a neoclassical perspective, arguing that the Taxonomy violates the principles of a market economy. While the Taxonomy does not currently prohibit non-compliant activities, he argues that it renders the economic environment more restrictive, as banks and other financial institutions are already more reluctant to provide financing for non-compliant activities. Furthermore, the reporting requirements introduce inefficiencies as the increased bureaucratic burden it imposes raises the cost of financing for every activity and all firms seeking to finance investment projects.

Simply the processing of additional legislative and regulatory documents requires considerable resources and man hours, as the EU Taxonomy Climate Delegated Act is a voluminous document that spans 349 pages and other relevant documents are even longer, for example the Technical Annex to the Taxonomy Report on Sustainable Finance, which is 593 pages long.

He claims the EU Taxonomy judges economic activities according to political goals, thus undermines the functioning of the free market that utilizes price signals to allocate resources and evaluate the potential returns of alternative investments. The price system that is an integral part of a market economy encapsulates all the available information about the availability of resources and the complex calculations that are required are reflected on market prices.

Furthermore, Kooths (2022) argues that the complexity of the market system cannot be replaced by bureaucratic processes, which is exactly what the Taxonomy is aiming to achieve in his opinion, hence undermining the fundamental principles of the market economy.

He believes that the Taxonomy is trying to achieve something that is fundamentally impossible, that is to bring about socially desirable outcomes relying on bureaucratic processes. At the same time, he argues that the Taxonomy can have undesirable implications for economic activity and social welfare.

He posits that even in the case of market failures due to the presence of externalities, where one could argue that profit maximization won't bring about socially optimal outcomes there are better alternative policy instruments available. These policies should seek to internalize the cost of these externalities within the workings of the market system and not try to replace it.

He mentions the EU's emissions trading system as the example to follow if one is seeking to pursue policies to mitigate climate change, by extending it to include all types and sources of emissions. This would better serve emission targets, since it would provide a price for each ton of carbon dioxide emissions and allow, subsequently, the market system to allocate resources, while also force those market participants that are responsible for carbon dioxide emissions to bear the costs.

Avoiding the additional costs for licenses for carbon dioxide emissions would provide the necessary incentives to reduce emissions, without the need for additional bureaucratic interventions. It would be costly and time-consuming for innovations to be verified as Taxonomy-aligned. At the same time, not every aspect of an investment can be precisely accounted for in advance.

He argues that no expert committee can devise a strategy that can more effectively reduce carbon dioxide emissions and promote sustainability than the market itself, with the appropriate internalization of externalities. Instead of trying to influence the financing costs and options using a set of criteria defined by the Taxonomy, he argues that the European union should instead utilize a market framework that makes provisions for environmental standards.

According to Kooths (2022) the taxonomy will not only introduce inefficiencies in the allocation of resources, but is also paving the way for actors seeing the promote their political agendas. Those with the ability to define or influence the definition of the criteria have access to a policy instrument that can promote certain business models, while also sidelining other business models.

Lobbyists will intensify their efforts to influence the Taxonomy in a way that promotes the interests they represent and undermines those of their competitors in the market. Inevitably, it will be easier for largest corporations to comply with regulatory provisions, and even influence the regulatory framework, compared to small and medium size enterprises, that may find themselves at a disadvantage. Thus, the Taxonomy provides rich opportunities for lobbyists, business consultants, and financial experts, by increasing the scope for lobbyism and the grip of bureaucracy on the economy.

Kooths (2022) also argues that the EU taxonomy could exacerbate the impact of Europe's demographic crisis and aging population. While the larger share of economically inactive people in the overall population would necessitate the production of more consumer goods and services, Europe's commitment to curb all emissions would have the opposite effect. This could lead to conflict about the just distribution of goods and might intensify political divisions and social tensions.

Another downside of the EU taxonomy according to Kooths (2022) is the fact that the compliance with its provisions will require highly skilled labor that could be put in better use in other activities, while also imposing a massive bureaucratic burden on companies without providing any benefits to economic activity. He concludes that the Taxonomy is fundamentally flawed and it should be entirely abandoned by the European Union.

2.4 Provisions of the EU Taxonomy for three major sectors of economic activity and its expected impact

Industry and construction account for 35% and 6% of turnover in the European Union, respectively. Industry employs more than 30 million people, which accounts for 21% of employment in the EU, while construction provides around 14 million jobs, around 1 in 10 jobs in the European Union (World Economic Forum, 2024). Hence, the potential impact of the Taxonomy on these economic sectors is rather critical for the European economy.

For the automotive industry, following the Clean Vehicles directive, the Taxonomy sets thresholds for passenger cars and light commercial vehicles. In order to be classified as sustainable they need to limit their emissions to no more than 50 grams of carbon dioxide per kilometer by 2025, as verified by the Worldwide Harmonised Light Vehicles Test Procedure. From 2035 onwards all new vehicles must produce zero emissions.

The new thresholds established by the EU Taxonomy are substantially lower than the current threshold of 95 grams of carbon dioxide per kilometer, incentivizing firms to turn to the production of sustainable vehicles. The new thresholds can only be achieved by electric, hydrogen and fuel cell vehicles, while combustion engines, or even hybrid cars, are incompatible with the Taxonomy (Schütze et al., 2020).

For the construction sector, the Taxonomy establishes two criteria for renovations that seek to increase the energy efficiency of existing buildings. A renovation must be a major renovation, according to the rules established by the EU Directive on the energy performance of buildings, or it must contribute to a reduction of a building's primary energy requirements by at least 30%, as verified by an energy audit and the accompanying energy certificate issued after the audit is conducted.

For newer buildings, it must be ensured that their annual primary energy demand will be at least 20% lower than the requirements established by the Energy Performance of Buildings Directive (EU/31/2010) that was revised in 2018. It calls for every new building in the European Union from 2021 onwards to comply with the Near Zero Energy Buildings standard. However, the

standard is defined by each government of EU member states at the national level and there is not a common requirement across the EU (Schütze et al., 2020).

The emphasis of the Taxonomy on industry is on the basic material industries, such as the manufacturers of steel, cement and chemical products, that are among the biggest polluters. The thresholds are defined according to the benchmarks specified for each sector according to the European Union's emissions trading systems, that are in turn set according to the facilities that achieve the lowest greenhouse gas emissions in each sector.

The use of these benchmarks for new facilities, however, may result in lock-in effects, as a new production facility's life cycle spans over many decades. This would hinder the efforts to meet the EU's target of becoming climate neutral by 2050.

Schütze et al. (2020) conclude that the Taxonomy sets thresholds that could lead to climate neutrality only for the automotive sector. For the construction sector to become climate neutral would require lower thresholds or the introduction of specific targets that the sector should reach, while for the basic materials sector they call for different thresholds between existing and new facilities, as they believe that a common threshold is incompatible with the goal of achieving climate neutrality (Schütze et al., 2020).

3. Regulatory Initiatives

Environmental sustainability lies at the core of the European Union's founding principles. The Consolidated Version of the Treaty on European Union mandates that environmental sustainability should be one of the main pillars of the EU's development efforts, while at the same time promoting other economic and social goals, such as full employment, price stability and inclusive economic growth, along with environmental protection as one of the Union's guiding principles (Martin, 2023).

The High-Level Expert Group on Sustainable Finance was established by the European Commission in October 2016 to provide recommendations on sustainable finance in the European Union, that would direct public, as well as private, capital to ventures that facilitate environmental sustainability, along with enhancing the resilience of the financial system with respect to risks stemming from carbon-intensive activities.

The Expert Group's final recommendations were submitted in January, 2018. It called for the development of a taxonomy that would provide a clear and definitive definition of environmentally sustainable activities, demarcating the role and the obligations of investors in the transition towards more sustainable financial markets, more stringent disclosure requirements that would allow for a more accurate assessment of an investment's environmental sustainability impact, a labelling scheme for green investment funds in the European Union, embedding sustainability in the mandate of the European Supervisors Authorities and the establishment of a set of rules and requirements for bonds designated as European Green Bonds (Martin, 2023).

3.1 The European Commission's Action Plan

The European Commission published the Action Plan, that outlines its strategy towards more sustainable financial markets in March 2018. The Action Plan seeks to promote a financial system aligned with the Union's environmental and sustainability goals. As part of the Capital Market's Union, it aims to promote the EU's compliance with the Paris Climate Agreement and the goals outlined in the EU's 2030 Agenda for Sustainable Development (Martin, 2023).

The European Commission's Action Plan also included 10 critical actions towards achieving the objectives of the EU's sustainability strategy. The first included the development of the EU Taxonomy, described above, that provides a scheme to classify sustainable economic activities in a concise and precise manner. The second action outlined in the Commission's action plan refers to the development of a voluntary EU standard for green bonds, along with relevant labels for green financial instruments available to investors in the retail market.

The third action involves initiatives by the European Commission to promote sustainable finance using investment programs, such as InvestEU, to finance investments in green infrastructure and innovation and support small and medium-sized businesses. The fourth action refers to the obligations of financial advisers and insurance providers to take into account the impact of investments and economic activities on environmental sustainability when consulting with their clients. The fifth action of the Commission's Action Plan involves the development of sustainability benchmarks that will help investors incorporate in their investment decisions the environmental impact of their investments and their effect on climate change.

The sixth action involves the integration of sustainability factors in credit ratings, while the seventh action refers to the obligations of companies and investors to disclose information about the sustainability of their activities and investments, in the context of the Regulation of sustainability-related disclosures in the financial services sector. The eighth action refers to the inclusion of sustainability risks in the evaluation of the stability and resilience of the banking sector as well as individual banks and the treatment of green assets in banks' balance sheets.

The ninth action plan of the European Commission's action plan also involves disclosure requirements on the sustainability impact of economic activities and the revision of the Non-

Financial Reporting Directive. Finally, the tenth action involves the promotion of corporate responsibility with respect to sustainability and mitigating the effects on sustainability of an emphasis on short-term results in financial markets (*Renewed Sustainable Finance Strategy and Implementation of the Action Plan on Financing Sustainable Growth - European Commission*, n.d.).

Following the Covid-19 pandemic, the European Commission revised its sustainable finance strategy to ensure that during the recovery from the pandemic, the financial system will provide the necessary support to companies in their sustainability efforts as they stive to comply with the EU's regulatory requirements (*Renewed Sustainable Finance Strategy and Implementation of the Action Plan on Financing Sustainable Growth - European Commission*, n.d.).

For the implementation of the Action Plan, two directives have been issued for EU member states. On December, 29, 2019, Regulation (EU) 2019/2088 of the European Parliament and of the Council of November, 27, 2019, entered into force. It introduced mandatory disclosure requirements on how companies and investors account for ESG factors in their business decisions and practices, as well as about the potential environmental impact of their economic activities and the dissemination of information about financial instruments designated as sustainable (Martin, 2023).

Another directive, Regulation (EU) 2019/2089 came into effect on December, 9, 2019. The directive aimed to promote the effective functioning of the Union's internal market, while also ensuring that investors and consumers are protected from potential risks. It introduced two classes of benchmarks with respect to ESG goals, that differentiate between portfolios that are already consistent with the EU's sustainability objectives, and portfolios that will take steps towards environmental sustainability in the near future. EU Paris-Aligned benchmarks referred to portfolios whose carbon exposure is already consistent with the Paris Climate Agreement, while Climate Transition benchmarks pertained to the portfolios of investors that will take steps towards reducing the carbon exposure of their portfolios by 2022.

To improve the accuracy and extend the scope of information provided by financial and non-financial companies and investors with respect to their economic activities or investments, the Commission introduced the Delegated Act supplementing Article 8 of the EU Taxonomy in July

2021. With the Complementary Climate Delegated Act the European Commission further augmented the EU Taxonomy to include activities in the nuclear and gas sectors in February 2022 (Martin, 2023).

3.2 Additional regulatory initiatives

The European Union has also undertaken a number of additional regulatory initiatives to promote sustainable finance, transparency and accuracy with respect to reporting and disclosure standards by firms and investors.

Utilizing the foundation laid out by the Sustainable Finance Action in 2018, the European Commission in 2021 developed the Renewed Sustainable Finance Strategy in 2021. The Commission's Renewed strategy utilizes the EU Taxonomy, the Sustainable Finance Disclosure Regulation (SFDR) and other regulatory provisions to promote the Commission's objectives towards providing the necessary financial means for the European economy's transition to a new sustainability paradigm, expanding the scope of sustainable finance, helping the financial sector become more resilient and, at the same time, more oriented towards sustainability. It also seeks to propel the EU into the forefront of sustainability globally, serving as an international leader and trend-setter (Hurk & van der Klooster, 2024).

The Sustainable Finance Disclosure Regulation (SFDR) aims to determine the standards companies have to follow when disclosing sustainability information, to assist investors that want to invest their funds in companies that promote and serve sustainability objectives. At the same time, it provides investors with information about the sustainability risks involved in a project and their estimated impact on the environment and the potential profitability of the investment. The EU Taxonomy delineates the criteria for activities considered environmentally sustainable, whereas the SFDR obliges financial market participants to disclose the extent to which their financial products align with these criteria. In accordance with the SFDR, financial products must provide detailed information on their adherence to the EU Taxonomy. Investors benefit from greater transparency regarding the proportion of their investments in taxonomy-aligned activities.

The SFDR aims to direct more funds from the private sector into sustainable finance, thus supporting the financing of sustainable investments. The application of the Regulation started in March 2021 (*Sustainability-Related Disclosure in the Financial Services Sector - European Commission*, n.d.).

3.3 The European Green Bonds regulation

Environmentally sustainable financial products can be distinguished between financial instruments designed to finance projects with an ESG component, on one hand, and financial instruments designed to support issuing companies to improve their ESG record and their efforts to become more sustainable overall, on the other.

In the former category, for example, belong bonds that are issued to finance environmentally sustainable projects or a project with social implications. These are the so-called green bonds. The latter category includes financial products that are linked with the sustainability of companies in general. In many cases the interest on a loan will be lower if the company achieves a particular ESG score or implements certain practices to improve its environmental sustainability (Driessen, 2021).

The European Green Bonds regulation is another regulatory initiative of the European Union to promote sustainable finance. It outlines the requirements that issuers of bonds that claim that their bonds are environmentally sustainable and want to designate them as “European green bonds” must follow.

Environmentally sustainable bonds are used to finance investments in environmentally friendly technologies, sustainable infrastructure and improvements in energy efficiency and resource utilization. The European Green Bonds regulation seeks to provide a common standard in the green bonds market, that would increase transparency and trust and help market participants make the right decisions.

Companies are able to reassure investors that their projects are environmentally sustainable and Taxonomy-compliant, while investors know that they are investing in genuinely sustainable

projects, reducing their exposure to greenwashing and other sustainability risks. Thus, more private funds will be directed towards sustainable investments and green projects.

All the funds collected by issuing European green bonds will have to be invested in Taxonomy-aligned economic activities. The European Commission proposed a European green bonds regulation on July, 6th 2021 and the European Council adopted the regulation in October, 2023, while the regulation entered into force in November, 2023 (*European Green Bonds: Council Adopts New Regulation to Promote Sustainable Finance - Consilium*, n.d.).

Financial and non-financial companies as well as governments can be the issuers of green bonds. The Green bonds regulation aims to address the gap in existing initiatives and regulation concerning the definition of a sustainable economic activity. This shortcoming of previous regulations makes it difficult for investors to identify bonds that will help promote and serve the objectives for climate change mitigation established by the Paris Climate Agreement.

Different disclosure requirements and a lack of transparency regarding green bonds and of the external reviewers of these bonds pose major challenges for investors that seek to identify and evaluate green bonds. At the same time, issuers of environmentally sustainable bonds find it difficult to demonstrate that their activities are environmentally sustainable and thus are facing challenges financing their transition to a new environmentally sustainable paradigm of economic activity Bonds (*Regulation - EU - 2023/2631 - EN - EUR-Lex*, n.d.).

The European green bonds regulation aims to prevent different regulations, initiatives and policy members by each individual member state. This would not only impede the growth of the market for environmentally sustainable bonds, but would also undermine the European Union's internal market, leading to market fragmentation due to different rules, priorities and objectives.

This would pose significant challenges for investors as they would be unable to accurately and properly evaluate and compare different bonds, from companies located in different EU member states, would introduce inefficiencies in the allocation of capital and put certain issuers of green bonds at a disadvantage, as issuers would face different rules and regulations and market conditions. Furthermore, it would exacerbate the risks of greenwashing Bonds (*Regulation - EU - 2023/2631 - EN - EUR-Lex*, n.d.).

The absence of a common set of rules and criteria for the review of green bonds by external reviewers and a common definition of an environmentally sustainable economic activity, would make it particularly challenging for investors to compare environmentally sustainable bonds from different EU countries.

Since the green bonds market extends beyond national borders, with companies and investors issuing and investing in green bonds in different markets, while also employing the services of external reviewers from other countries than their country of origin, a common set of rules and practices established by the European Union would prevent market fragmentation. It would support the functioning of the European Union's common market and allow for the application of the EU Taxonomy for green bonds.

Thus, the European green bonds regulation aims to establish a common set of rules for companies and governments that would like to designate their environmentally sustainable bonds as "European Green Bonds". A common EU regulation for such bonds would establish a comprehensive and common set of rules for green bonds and ensure their proper application, as the emergence of various different national regulations and standards that would introduce uncertainty and regulatory fragmentation would be averted.

European Green Bonds will follow a common set of rules for the entire European Union, allowing investors to evaluate and compare green bonds and improving efficiency in the market for green bonds, as no discrepancies between different national approaches would not arise Bonds (*Regulation - EU - 2023/2631 - EN - EUR-Lex*, n.d.).

The EU Taxonomy establishes a definition of environmentally sustainable activates and the European Green Bonds regulation will utilize the Taxonomy to determine which bonds can be designated as "European green bonds", depending on the activities they are linked to and whether they are included in and comply with the Taxonomy. Disclosure requirements are also defined for activities that involve nuclear energy and fossil gas, as these activities are defined by Delegated Regulation 2021/2139 Bonds (*Regulation - EU - 2023/2631 - EN - EUR-Lex*, n.d.).

All the proceeds from the issuance of bonds designated as European Green Bonds must be directed towards environmentally sustainable activities as outlined in the Taxonomy, or

contributing to activates, that facilitate the transition of economic activities towards a new paradigm of sustainability according to the Taxonomy. All the proceeds from the issuance of a European Green Bond will have to be allocated before a bond's maturity.

Any costs related to the issuance of these bonds can be deducted by their issuers. These bonds can finance Taxonomy-compliant environmentally sustainable activities either directly, by financing investments in Taxonomy-compliant activities or the acquisition of financial assets that will finance these activities. For example, these bonds can finance the acquisition of fixed non-financial assets, that are either tangible or intangible, as long as they are Taxonomy-compliant.

Any proceeds from the issuance of European Green Bonds can be used to finance the purchase of financial assets, that will be used for Taxonomy-compliant economic activities. These financial assets can finance the purchase of other financial assets, as long as external reviewers are able to trace the final allocation of the proceeds from the issuance of European Green Bonds (*Regulation - EU - 2023/2631 - EN - EUR-Lex*, n.d.).

4. Responsible Investing Practices

4.1 A concise historical overview of responsible investing

The emergence of socially responsible investing can be traced back to the 17th century, when the Quakers in North America declined to participate in the slave and weapons trade. In the 20th century, the first mutual fund that screened potential investments relying on religious principles, the Pioneer Fund, was created in 1928 (Renneboog et al., 2008)

The '70s witnessed the emergence of the first modern mutual funds operating based on the principles of socially responsible investing, the Pax World Fund. The increasing public awareness about environmental issues and the emphasis placed on environmental principles contributed to socially responsible investing's considerable growth in the '80s.

Socially responsible investing constitutes an investment methodology that includes the assessment of the social, environmental and social governance impact of an investment and places emphasis on investing for the promotion of the common good, as well as in the active involvement of shareholders. While originally socially responsible investing was motivated by religious principles and beliefs, modern socially responsible investing places emphasis on the social principles of investors and their perspective on promoting social goals (Renneboog et al., 2008).

Rapid growth of socially responsible investing took place in the US during the '80s, while at the same time it made its first steps as a new investment paradigm in Great Britain. It started to take hold in continental Europe a decade later, with increasing importance placed on socially responsible investing in the region in the '90s (Escrig-Olmedo et al., 2010).

4.2 Why investors adopt responsible investing practices

Institutional investors adopt responsible investing practices for three main reasons. The first reason is superior returns. Studies have shown that responsible investing can either produce superior returns or have no impact at all on the returns of a portfolio. Thus, it has been shown

that responsible investing can provide at least equal returns to a traditional investment strategy, leading various investors to implement a responsible investing strategy.

As investors realize the importance of environmental, social and governance factors in the performance and financial results of companies, particularly but not exclusively through reputational effects, they've also come to the realization that responsible investing can also enhance risk management. Risk is a major concern for investors. There are notable examples of firms that suffered substantial financial losses due to ESG factors, such as pollution and harmful waste management, workplace accidents and the impact of environmental factors, such as adverse weather due to climate change (Bernow et al., 2017).

The long-term effects of climate change also raise issues about its impacts on economic activity and the resilience of firms to these hazards, thus raising awareness about the importance of environmental factors among investors.

Increased social awareness and concern about environmental issues and sustainability has motivated institutional investors to adopt responsible investing strategies, to better align themselves with the social demands of various stakeholders. Younger people, particularly, find the environmental impact of investments and economic activity increasingly important, considering ESG in their investing decisions and influencing their opinions on companies and investors and their social impact.

Other investors seek to promote the common good, by investing in companies with a positive environmental impact, while also maximizing their returns. Responsible investing is a useful investment strategy in that respect.

In order for responsible investing to be effective, however, investors and companies need to integrate it into their existing approaches and not treat it as a separate approach that needs to be implemented in parallel to their other investing activities (Bernow et al., 2017).

4.3 ESG rating agencies and sustainability indices

Using sustainability principles as a guide for investments can provide value for companies as well as investors (Bebbington, 2001). Many consumers place great importance on the social impact of a company's activities.

At the same time have greater trust on the evaluations of third parties about the ESG impact and sustainability of a company's activities than reports published by the company itself, that could be considered more as a public relations exercise than an impartial and accurate assessment (Schuler & Cording, 2006).

Thus, the assessment of a company's social responsibility by sustainability indices and ESG ratings provided by credit agencies is very important for investors and consumers alike (Escrig-Olmedo et al., 2010).

The growth of socially responsible investing led to a greater need for more information about the ESG performance of companies, that would enable investors to accurately identify the socially responsible ones and help them to further improve their practices. This pressing need led to the development of sustainability indices and rating agencies that evaluate the ESG aspects of a company's performance.

As a result of the increased informational needs of investors for the ESG aspects of a company's performance, ESG rating agencies and sustainability indices were established. They experienced rapid growth because of the rapid growth of the securities markets and increased regulatory initiatives mandating the disclosure of ESG data by companies and investors (Escrig-Olmedo et al., 2010).

Credit rating agencies are tasked with the assessment of stocks and companies, making recommendations about whether they expect a company to meet its financial goals in the foreseeable future. The assessment of a credit rating agency is provided in the form of a rating that it discloses. In line with financial ratings, ESG credit rating agencies provide assessments about the ESG performance of a company.

A number of different institutions publish ESG ratings. These include index companies, such as FTSE Rusell and MSCI and ESG ratings providers that may offer complete assessments or focus on certain aspects of ESG assessments, for example emissions, traditional credit ratings agencies, such as S&P and Moody's. There are also companies that specialize in the collection and analysis of company data, such as FactSet, Refinitiv and MorningStar.

In order to provide an ESG rating, agencies utilize publicly available information and questionnaire data, interviews with executives and visits on the premises of companies. Larger rating agencies and providers have the financial means to provide assessments more frequently than the smaller ones (Dimson et al., 2020).

These agencies use different assessment approaches and methodologies. They collect data by sending out questionnaires to the companies they review, but also utilizing any publicly available information. The criteria used by ESG credit rating agencies are subsequently often included in sustainability indices (Escrig-Olmedo et al., 2010).

Like conventional stock market indices, sustainability indices, indicate the price movements of a sample of representative stocks, but only limited to the stocks of companies that demonstrate socially responsible behavior.

ESG rating agencies and sustainability indices develop different criteria to evaluate the social responsibility of a company's behavior and subsequently to select firms to include in the index. The methodology of each sustainability index differs and depends on the institution that is responsible for its development and publication. They also act as benchmarks for investors that want to build and manage a socially responsible portfolio of investments (Escrig-Olmedo et al., 2010).

The majority of screening methodologies relies on negative criteria in order to decide which investments to exclude from consideration and positive criteria to create a shortlist of companies that can be identified as the ones that exhibit the most appropriate behavior with respect to social responsibility.

Most ESG rating agencies take into account information that pertains to a company's data, its external environment and its stakeholders, its corporate governance record, any of its activities that may be considered controversial and its transactions with investors and suppliers.

Certain criteria are used by most sustainability indices and ESG rating agencies. Environmental management, for example, is a common criterion for all ESG rating agencies, as it is considered a fundamental issue for a company to demonstrate socially responsible behavior. Most ESG rating agencies and sustainability indices utilize international standards in the models they use to evaluate companies. The most prominent ones are the Eco-Management and Audit Scheme, the ISO14000, the Global Reporting Initiative and the Triple Bottom Line models (Escrig-Olmedo et al., 2010).

The creation of credit rating agencies in the middle of the 20th century, like Standard and Poor's and Moody's, helped capital markets grow. They were trusted by investors since they were able to provide them with important information when rating different financial instruments, from government bonds to companies (Escrig-Olmedo et al., 2010).

ESG rating agencies in Europe were established much later, with the first rating ESG agency in Europe being the Ethical Investment Research and Information Services, EIRIS, launched in 1983 in the capital of Britain, London. Subsequently, and particularly recently, the ratings industry experienced tremendous growth (Dimson et al., 2020).

Globalization creates additional risks for firms and investors. ESG risks are just as important, nowadays, as financial risks. Corporate social responsibility is rather important in tackling these risks. ESG rating agencies, however, provide little guidance about how they evaluate these risks in their assessments.

Thus, while sustainability indices and ratings by ESG rating agencies are critical for investors that are committed to socially responsible investments, rating agencies are rather opaque about the evaluation criteria they use to evaluate risk management. This renders the processing of information by investors as rather complicated and difficult and introduces a considerable degree of uncertainty. Sustainability indices can be a valuable tool for investors in that respect, but they limit their ability to apply their own social responsibility criteria (Escrig-Olmedo et al., 2010).

While the number of ESG rating agencies and sustainability indices expanded rapidly, a standard and universally accepted methodology to evaluate the ESG behavior of firms is still lacking, with criteria weighted differently across rating agencies and indices. Every rating agency and index uses both positive and negative criteria to evaluate the ESG performance of firms, but they use different rating system and the results and ratings they provide are structured and expressed differently.

Hence, companies and investors do not have access to critical information, that would enable companies to improve their ESG performance in order to be included in a sustainability index and investors to identify sustainable companies to invest in (Escrig-Olmedo et al., 2010).

This highlights the importance of more detailed and accurate information, such as the information and insights provided by the EU Taxonomy, underscoring its usefulness for authorities, firms and investors in providing common and transparent evaluation criteria.

In recent years the ESG ratings industry experienced an uptick in consolidations both within the national borders of individual countries, as well as internationally. The main motivation behind most of these consolidations was achieving economies of scale, with rating agencies seeking to improve their stability and expand their ability to offer to investors complex products and services in international markets. ESG ratings companies with these consolidations also sought to create synergies with target firms to increase their market power through increased collaboration, improved standardization and enhancing their reputation (Avetisyan & Hockerts, 2017).

Avetisyan & Hockerts (2017), however, argue that this wave of mergers and acquisitions in the ESG ratings industry in fact had negative implications and instead of transforming the industry into a paragon of change of financial markets, instead led to a greater emphasis on traditional financial goals in ESG assessments and ratings, instead of sustainability. As a result, ESG rating agencies seem unable to induce significant institutional changes in the financial industry and induce meaningful changes.

4.4 The problem of divergent assessments of the sustainability of a firm's practices

A major problem with sustainability indices and ESG rating agencies is the use of different weights for the same criteria. This leads to different rankings for companies, thus rendering comparisons for investors and other stakeholders difficult and potentially inaccurate (Escrig-Olmedo et al., 2010).

Reliable and accurate data is essential for investors during the screening and selection process for stocks and sectors to invest in. Investors and companies often rely for data on external reviewers. While bond ratings are not significantly different among different rating agencies, that is not the case for ESG ratings.

ESG ratings often exhibit considerable differences and while one agency provides a high score for a company, another might provide a rather low one. At the same time, each ESG rating agency doesn't apply the same weighting to each of the three pillars of ESG when providing ratings (Dimson et al., 2020).

The ESG aspect of an investor's portfolio is becoming increasingly important. For investors to be able to structure their portfolio's according to their ESG strategy and implement a comprehensive and concise strategy that utilizes positive and negative screening, accurate and precise information is necessary. ESG rating agencies, thus play a critical role in responsible investing.

An issue that needs to be addressed with ESG-related financial products is the lack of consistency in the terminology used and the standards that are applied (Driessen, 2021). Ahlström & Sjåfjell (2022) refer to ESG ratings that are characterized by high precision, yet low accuracy. They underscore that investors interested in sustainable investments and responsible investment practices and regulators must be made aware of these deficiencies in ESG ratings.

There could be considerable consequences for investors, and society in general, when investments are not correctly assessed and evaluated and a proper label applied, such as an

increase in sustainability issues and concerns and a lack of trust in financial markets (Crona et al., 2021).

It is an important issue that undermines the validity of ESG ratings and the usefulness of these ratings, thus undermining the prospects of responsible investing. A prominent example of divergent ESG ratings is the case of Tesla, one of the world's largest manufacturers of electric vehicles. Tesla was rated highly by MSCI, but ratings of the company by FTSE were quite low. At the same time, rated the company as average.

These divergent ratings were due to diverging assessments of different aspects of the company's ESG behavior. MSCI considered Tesla to have a perfect record and performance on carbon emissions, while FTSE examining the firm's factory emissions evaluated Tesla's ESG performance as rather lacking (Dimson et al., 2020). This example highlights a common occurrence, with quite frequent discrepancies in the ESG ratings of companies.

Other notable examples of companies with divergent ratings by different ratings providers include Facebook, that was rated quite highly by MSCI regarding its environmental performance and quite low by Sustainalytics. Prominent companies like Pfizer, JP Morgan Chase and Wells Fargo were considered as very poor performers in the governance aspect of ESG by MSCI, but were rated highly by Sustainalytics. Discrepancies appear even with the overall ratings of companies, with a high overall ESG rating for Wells Fargo by FTSE, but a low overall ESG rating by MSCI (Dimson et al., 2020).

According to Kotsantonis & Serafeim (2019) the considerable differences observed between ESG ratings are due to discrepancies in the collected data, the applied benchmark, data imputation methods and an abundance of information that is not easy to process, and the use of different methodologies and metrics. While all rating agencies seek to measure the same thing, the methods they use differ considerably. As a result, the different methodologies used and differences in the treatment and evaluation of data lead to considerable discrepancies with respect to ESG ratings.

The benchmark they compare a company's performance against differs between rating agencies. A rating agency may use a market index with companies from different sectors, while another may perform comparisons against other companies only in the same industry.

Furthermore, there's a widespread problem of missing data. When a company does not disclose information about some aspect of its operations, certain rating agencies decide to rate companies with zero with respect to these activities. On the other hand, other rating agencies provide a score similar to the score of other companies in the same industry that do disclose relevant data.

At the same time, the abundance of publicly available information and differences in the metrics used leads to different ratings for the same company by rating agencies, as there are considerable disagreements about how to interpret the available data.

Furthermore, different weighing methodologies for the three distinct aspects of ESG are also used. Some rating agencies weigh all three dimensions of ESG equally. Others assign different weights to the environmental, social and governance aspects. These differences inevitably will lead to divergent ratings about a company's ESG performance.

Investors are becoming increasingly interested in sustainable investment funds. Demand for sustainable investment funds in Germany grew by 96% on an annual basis in 2019. However, the use of different definitions for sustainability and sustainability ratings undermines the efforts of private investors or public institutions to compare the sustainability of alternative investments. Thus, one of the major problems with socially responsible investing is the lack of a common definition and measurement method of sustainability and social responsibility (López et al., 2007).

Different standards and measurement approaches used render particularly difficult investment decisions with a sustainability perspective and the comparison of the sustainability performance of different companies (Krajnc & Glavič, 2005).

In this respect, the EU Taxonomy can prove rather useful for investors and companies and support efforts towards promoting sustainability and a new paradigm of sustainable economic activity. Seeking to reduce uncertainty and enhance transparency, the EU taxonomy provides a

set of criteria for sustainable investments that can be used to foster comparisons and facilitate a more transparent financial environment (Schuetze & Stede, 2020).

4.5 The potential impact of responsible investing on climate change and sustainability

The treatment of environmental and social issues is a fundamental part of corporate social responsibility. Major environmental challenges include carbon emissions and the overall environmental footprint of economic activity, energy efficiency and waste management. Critical social challenges related to ESG involve human resources management and industrial relations, safety in the workplace and the respect of human rights. Other issues pertain to commercial practices, the safety and quality of products, the privacy of customer data and the philanthropic activities of companies.

Climate change mitigation and dealing with its impacts lies at the core of ESG. It is considered as perhaps the greatest challenge of our time. Inevitably, it also concerns investors and firms, thus climate change risk factors are now embedded in asset management and investment decisions. Climate change poses a major threat for humanity and investors can use their influence to induce changes from companies that can help mitigate the risks from climate change (Dimson et al., 2020).

Investment funds that claim to take into account the environmental and social impact of their investments have become rather popular in recent decades. However, whether so-called responsible investment funds actively strive to improve the environmental and social impact of the companies they invest in, or just select companies with positive environmental and social characteristics remains an open question (Heath et al., 2023).

This issue has important implications as to whether responsible investing practices can have a lasting and significant impact on the behavior or companies and are able to facilitate changes in firm behavior and the environmental and social footprint of their operations.

While the potential impacts of responsible investing funds on the behavior of the companies they invest in remains unclear, there are 3 possible outcomes. Responsible investing funds may go

rogue, violate the principles of responsible investing they claim to abide by and engage in greenwashing. Hence, no differences will be observed in the companies they choose to invest in and the way they actively engage with then, compared to firms that do not claim to adhere to the responsible investing principles.

Another possibility is that these funds will select the companies they decide to invest in by taking into account social and environmental factors, but will not seek to actively manage them and influence their behavior with respect to social and environmental issues any further. Thus, in this case the only potential impact of these funds will have is to provide additional funds to sustainable and socially responsible firms, but will not have an impact on the behavior of the firms they invest in.

Finally, another option is that not only responsible investing funds will take into account social and environmental issues in their investment decisions, but will also actively seek to improve the behavior and the environmental and social practices of the companies they decide to invest in (Heath et al., 2023).

Two thirds of all socially responsible investing funds include improving the behavior of the firms they decide to invest in with respect to the environmental and social impact of their activities, by actively engaging with them, in their stated objectives (Heath et al., 2023). Thus, most of these funds consider actively engaging with the companies they decided to invest their funds in as a way to mitigate climate change risks and have a positive impact on the environmental sustainability of economic activities (Krueger et al., 2020).

However, for funds to be able to meaningfully influence the behavior of firms, they should be able to exert a significant influence on the cost of funds of these firms. Empirical evidence, however, indicates that the actual impact of these funds on the cost of funds for most firms is rather limited and thus unable to have any actual influence on the behavior and the environmental impact of the activities of these firms (Berk & van Binsbergen, 2021).

At the same time, actively engaging with the firms they invest in and seeking to exert an influence on their behavior comes with additional costs for these funds, compared to simply

selecting socially responsible firms to invest in and not having a say in their business conduct afterwards (Heath et al., 2023).

These additional costs can disincentivize any socially responsible investing funds from actively engaging with firms and simply opting for a selection approach (Davies & Van Wesep, 2018). Not only actively engaging with firms and trying to modify their behavior is costly for funds, many of them may not have the necessary know-how and the personnel to do so (Bebchuk & Tallarita, 2020).

Evaluating the actual behavior of socially responsible investing funds is often difficult, as different firm characteristics may have a different impact on investor behavior, thus it is not always obvious or easy to identify whether these funds have any actual impact on the practices of the companies they invest in, or they just select companies with certain characteristics. At the same time, both an active stake by a socially responsible investing fund and the firm's management and prior priorities may concurrently affect its behavior and practices (Heath et al., 2023).

Empirical research indicates that most investors simply adopt a selection strategy, investing in socially and environmentally responsible companies and do not seek to actively engage with them and modify their behavior. Their investment decisions are influenced by a company's social and environmental impact and influence, but they do not seek to modify their behavior and their investments do not lead to any further improvements with respect to a company's activities compared to its previous conduct (Heath et al., 2023).

4.6 The United Nations's Principles for Responsible Investment

The United Nations announced the Principles for Responsible Investment initiative in 2006, inviting major institutional investors from across the globe. The initiative aims to utilize the status and market influence of institutional investors to promote the principles of sustainable development. It is a not-for-profit organization funded by annual fees paid by the signatories of the initiative.

Experiencing significant growth over the following years, it is now the largest responsible investment initiative globally. Its signatories are approximately 4000 institutions, with the value of assets under management exceeding 120 trillion US dollars. Among its signatories are various funds, fund companies and financial advisers (Brandon et al., 2022).

Its signatories pledge to adhere to five main principles in their investing practices and conduct in financial markets. The signatories pledge that (Brandon et al., 2022):

- They will take into account ESG factors in their analysis when deciding which investments they will pursue.
- They will actively manage any assets that they acquire and embed ESG concerns in their management practices.
- They will ask the companies that they invest in to disclose their ESG policies and the impact of their activities.
- They will be environmental sustainability ambassadors and seek to expand the uptake and implementation of the responsible investment practices outlined in the Principles for Responsible Investment by capital market participants.
- They will disclose an honest and accurate assessment of the steps they're taking towards the application of the initiative's principles.

By becoming a signatory to the Responsible Investing Principles, a financial markets participant vows to adopt the six principles outlined above that form the backbone of the initiative. There also two binding requirements for all signatories. Paying a membership fee annually, that is used to fund the initiative's operations, along with disclosing their responsible investing activities and practices yearly, as outlined in the sixth principle mentioned above.

If a signatory does not comply with the requirements defined by the Responsible Investing Principles, it can be delisted by the organization. Responsible Investing Principles reports can serve as a signal of their adherence to ESG principles and expertise by investors and fund

managers when they fill requests for proposals, hence they are frequently listed on their websites on a voluntary basis (Brandon et al., 2022).

Research findings by Brandon et al. (2022) provide mixed evidence on the impact of the Responsible Investing Principles on the ESG scores of the portfolios of the initiative's signatories. While signatories exhibit higher total ESG scores and higher scores with respect to the Social governance dimensions, their Environmental scores do not differ significantly compared to the scores of non-signatories. On average, signatories exhibit 12% higher total ESG scores compared to non-signatories.

Signing the Responsible Investing Principles framework leads to an improvement of 9% of a standard definition in a signatory's total ESG scores compared to the previous period. Most of the improvement, however, is attributed to higher scores in the Social dimension of ESG.

There are also geographical differences in the ESG performance of signatories, with signatories in the US exhibiting worse ESG scores compared to signatories in other regions. At the same time, the ESG scores of signatories in the United States do not improve after becoming a signatory compared to the ESG scores of non-signatories also from the U.S. Furthermore, certain signatories from the U.S. have considerably worse ESG scores than non-signatories. Greenwashing emerges as an important issue particularly among US signatories of the initiative.

Signatories from other regions have higher total ESG scores compared to non-signatories and their total ESG scores also improve after becoming a signatory to the initiative. The total ESG scores of signatories outside the US are 17% of a standard deviation higher than the total ESG scores of non-signatories.

These findings indicate that while joining a responsible investing initiative may lead to improvements in total ESG scores of financial market participants, it may not be sufficient on its own to lead to significant and meaningful improvements in ESG scores, particularly with respect to the environmental dimension of ESG scores.

Greenwashing and refusing to undertake any meaningful changes is an important issue that may undermine similar efforts. At the same time, the environmental impact of the Responsible

Investing Principles initiative appears rather limited and most of the change in total ESG is associated with the Social and Governance dimensions of ESG.

4.7 Responsible investing in practice

Responsible investing experienced considerable growth in recent years and from a niche investing strategy, only for a limited number of investors with environmental and social concerns, turned into a popular investing strategy with many adherents, catching the attention of a considerable number of investors (Bernow et al., 2017).

Today, more than 25% of all assets globally are managed using responsible investing principles, that take into account ESG factors, as they are now considered relevant for a company's performance. The total amount of assets managed using responsible investing principles across the world in 2016 reached 22.99 trillion dollars, a 21.45% increase compared to the previous 4 years.

Some of the world's largest institutional investors, including major pension funds such as Japan's Government Pension Investment Fund, Norway's Government Pension Fund, as well as the Dutch pension fund ABP, adhere to responsible investing principles.

Along with responsible investing's increasing popularity, the techniques used also evolved and newer strategies aim to maximize investors returns adjusted for risk, just like traditional investing strategies.

A large number of institutional investors use investing strategies that include ESG factors. But other investors still remain skeptical, as they believe that responsible investing yields lower returns compared to a traditional investing strategy, despite a growing amount of evidence backed by research that this is not the case (Bernow et al., 2017).

The most popular responsible selection strategy globally is still negative screening, a technique that involves the exclusion of particular companies or economic sectors from an investor's portfolio, based on criteria that include ESG factors. The application of ESG factors in financial analysis has experience steady growth recently.

The adoption of responsible investing principles differs markedly across regions. More than half of the investments managed by professional asset managers in Europe, 52.6%, are sustainable investments, while the share of sustainable investments in Australia in New Zealand stands at 50.6%. In Canada sustainable investments account for 37.8% of all assets managed by professional asset managers. Sustainable investing is not quite as popular in the United States, where only 21.6% of all professionally managed investments are sustainable investments (Bernow et al., 2017).

Only a very small fraction of investments managed by professional asset managers in Japan are sustainable investments, indicating a very low penetration of sustainable investing in this Asian country. Sustainable investing practices are not particularly popular in the rest of Asia either, with only 0.8% of all professionally managed assets being classified as sustainable investments. In the period between 2014 to 2016, however, sustainable investing grew at a much faster rate in the rest of the world compared to Europe.

In 2015 the ABP pension fund in the Netherlands, Europe's second largest pension fund, pledged to pursue two environmental goals. Reducing the emissions footprint of its stocks portfolio for the period between 2015 to 2020 by 25%, while also making considerable investments, with an estimated value of 5 billion euros, in renewable energy projects by the end of the period. Japan's Government Pension Investment Fund, that holds assets worth 1.1 trillion dollars, announced in 2017 that it would use three ESG indexes to invest in the Japanese stock market (Bernow et al., 2017).

Private sector companies are also taking steps to promote environmental sustainability and facilitate the transition to a new economic paradigm that includes environmental sustainability as one of its main objectives.

Unilever, one of the biggest multinational companies in the world, offering various consumer goods, issued a green bond for the first time in March 2014. Its total worth was 250 million British pounds, offering a 2% fixed rate and the final maturity date was December 2018. It became the first green bond denominated in British pounds and the first green bond ever by a consumer goods company. The bond’s bookrunner was DNV GL, a leading consulting company

specializing in environmental issues, that was behind the development of the Green Sustainability Bond framework (Martin, 2023).

Lloyd's Banking Group decided to extend green loans to companies, in order to support their efforts in reducing their carbon footprint. The loans had a duration of 15 to 20 years, supporting companies in their transition towards more sustainable business operations, by lowering their borrowing costs. Green loans can be used towards investment in infrastructure that would increase the energy efficiency of a company, along with increased use of renewable energy sources (Martin, 2023).

5. Implications and Recommendations

5.1 Recommendations and initiatives by the European Banking Authority

Among the European Banking Authority's objectives is to facilitate the transition of the banking sector in the European Union towards a more sustainable paradigm, with sustainability principles at the core of its operations and business practices. It seeks to mitigate climate change impacts and associated risks and promote the introduction and adoption of ESG principles in the European banking sector (*Sustainable EBA | European Banking Authority*, n.d.).

Articles 501c of the Capital Requirements Regulation (Regulation (EU) No 575/2013) and 34 of the Investment Firms Regulation (Regulation (EU) No 2019/2033) authorized the European Banking Authority to provide an assessment on whether the prudential framework on banks and investments firms should explicitly treat the risk of assets and activities associated with their impact on the environmental and social dimensions of the European Union's sustainability aims.

On October, 12, 2023, the European Banking Authority published a report on the treatment of environmental and social risks in the prudential framework for banks and investment firms. It proposed various amendments to facilitate the transition towards a more sustainable paradigm of business activities, while ensuring, at the same time, the resilience of the banking sector. It is imperative to promote the adoption of ESG factors without any adverse impact on the resilience and proper functioning of financial markets (*Sustainable EBA | European Banking Authority*, n.d.).

Social and environmental factors have important implications for the various risks banks face. These risks will become even more important and pronounced in the near future. Their impact affects every type of financial risks the banking sector faces, including market, operational as well as credit risks, enhancing financial risks for individual banks as well as systemic risks that may undermine the stability of the financial sector.

The European Banking Authority proposes various amendments to the risk categories included in the Pillar 1 framework and the use of macroprudential tools, but is against the introduction of supporting or penalizing factors, since it considers their implementation rather challenging (*The*

EBA Recommends Enhancements to the Pillar 1 Framework to Capture Environmental and Social Risks | European Banking Authority, n.d.).

At the same time, it includes a number of recommendations for actions that should be undertaken over the next few years in the context of the Capital Requirements Regulation and Directive. The European Banking Authority's recommendations include (*The EBA Recommends Enhancements to the Pillar 1 Framework to Capture Environmental and Social Risks | European Banking Authority*, n.d.):

- Introducing environmental factors in the performance of stress tests in the context of the Fundamental Review of the Trading Book.
- Promoting the introduction of environmental and social considerations in the assessment of the credit ratings provided by credit rating agencies and due diligence requirements and the valuation of collateral as it pertains to immovable property.
- Include requirements for banks to assess whether social and environmental factors could result in losses in their books associated with operational risk.
- Supervisory reports should gradually include metrics that involve the concentration of environmental risks.

Furthermore, the European Banking Authority suggests additional reforms to the Pillar 1 framework that would account for the significance of social and environmental factors and their associated risks in the modern financial system.

These additional recommendations refer to (*The EBA Recommends Enhancements to the Pillar 1 Framework to Capture Environmental and Social Risks | European Banking Authority*, n.d.):

- The introduction of scenarios that would improve the long-term perspective of the prudential regulation framework.
- The inclusion of transition-plans in the introduction of additional risk-based measures to the Pillar 1 framework.

- Possible revisions to the IRB supervisory formula and the standardized approach for the assessment of credit risk, in order to better incorporate potential environmental risks.

- Introducing concentration metrics in the Pillar 1 framework for environmental risk factors.

The European Banking Authority also vouches to keep promoting the introduction of social and environmental risks throughout the regulatory framework and the entire spectrum of its regulatory activities under its mandate (*The EBA Recommends Enhancements to the Pillar 1 Framework to Capture Environmental and Social Risks | European Banking Authority*, n.d.).

Stress tests are a widely used tool by regulatory authorities to assess the impact of severe adverse shocks to banks in the European Union. They assist authorities in fulfilling their supervisory role and devise strategies to mitigate associated risks for the stability of individual banks and the banking system in general.

Stress tests evaluate the ability of a bank to absorb losses and provide financing to businesses even during periods of market turmoil. They also help promote transparency and trust in the banking sector, as they allow market participants to assess the impact of various shocks to a bank's solvency.

In addition to regular stress tests by the European Central Bank, the European Banking Authority is also performing climate change stress tests, while also providing guidelines on how ESG risks should be evaluated. The EBA properly adjusts stress-testing frameworks to account for ESG risks and their impact on bank capital. It also prepares to develop frameworks that would particularly address and account for climate-related risks in the future, while also revising existing guidelines for stress tests in order to include climate change and ESG risks (European Banking Authority, 2022).

The EBA complements sustainability initiatives by the EU and is a participant in other international initiatives, such as the Network for Greening the Financial System, while also cooperating with regulatory authorities across the European Union.

Ensuring that ESG risks are included in the regulatory framework is a priority for the European Banking Authority. Its areas of activity stress testing, disclosure requirements and guidelines on the prudential treatment of risks, financial sector supervision and tackling greenwashing.

The EBA is focused on addressing greenwashing. It aims to provide a clear and concise definition of greenwashing, evaluate risks and proper supervisory tools and gather evidence about greenwashing practices. Understanding greenwashing and being able to better identify greenwashing practices will assist supervisory authorities to make better, more informed, decisions and promote the transparency and reliability of sustainability-related activities and reports.

By utilizing international experience, frameworks and debates, the EBA is developing guidelines to improve the identification and management of ESG risks to improve the assessment and management of such risks (European Banking Authority, 2022).

As part of its efforts to promote the European Union's transition towards sustainability, the EBA is focused on advancing the addition of ESG risks in the banking regulatory framework. It releases reports and recommendations on the treatment of ESG risks according to the prudential framework, their importance for the banking sector and how to improve their integration into existing frameworks and regulations and promote transparency by utilizing principal adverse impact indicators.

The European Banking Authority also seeks to address greenwashing and also provides recommendations on the treatment of sustainable bonds loans and mortgages. Furthermore, it developed a framework, titled Fit-for-55, that can be used for the analysis of various scenarios about the evolution and potential impact of climate risks. It can also help provide guidance on the resilience of the financial sector and support its transition towards sustainability even in times of market turbulence (European Banking Authority, 2023).

In March, 2022, the EBA published a report on sustainable securitization. The report recommends a number of practical steps that would enable securitization to support the transition to a new paradigm of sustainability in the financial sector and beyond.

It suggests that sustainability securitization regulations, aligning with the Green Bonds Standard, should also rely on how the proceeds from securitization are used and not on the underlying assets. That would help provide a unified treatment of financial instruments in the context of sustainability. The report also calls for the development of monitoring and reporting standards and procedures in the near future (*The EBA Publishes Its Roadmap on Sustainable Finance | European Banking Authority*, n.d.).

5.2 Assessments and suggestions about the EU's sustainable finance strategy and the Taxonomy

According to Ahlström & Sjåfjell (2022) the European Commission's initial Sustainable Finance Action plan, while acknowledging that the emphasis of financial market participants on short-term results is problematic, it failed to make any references to whether infinite economic growth is actually feasible and compatible with sustainability, while also not addressing the consequences of shareholder primacy in financial decisions. It remained within the traditional established limits of business analysis.

In subsequent steps, the proposals mainly revolved around the environment and particularly climate change. Recently, the Commission announced that it is also developing a social taxonomy. Ahlström & Sjåfjell (2022) argue that placing particular emphasis on climate change and only later introducing other sustainability aspects violates the recommendations of sustainability research, that proposes a unified approach that tackles all aspects of sustainability simultaneously.

Many recommendations by the High-level expert group that aimed to tackle important issues such as an emphasis on short-term results by financial market participants and aligning financial markets with social values were not adopted by the European commission. The Commission was focused on fostering the development of financial markets and ensuring the introduction of novel financial products (Ahlström & Monciardini, 2022).

The European Commission's renewed strategy for sustainable finance addresses some of the concerns raised by various stakeholders about the provisions of its initial action plan. It places more emphasis on the financing of small-and-medium sized enterprises, while the

interdependence of international financial markets is also acknowledged (Ahlström & Sjåfjell, 2022).

The European Commission is facing criticism about the actual impact of its Sustainable Finance Strategy and Taxonomy. It is argued that the Taxonomy does not offer an integrated approach towards sustainability, covering all of its aspects and dimensions, and fails to address important issues about the identification and measurement of sustainability (Cullen & Mähönen, 2019a).

It is further argued that focusing almost exclusively on climate change could create the false impression that climate change is the only important sustainability aspect that the corporate sector needs to address. Other sustainability issues and aspects are only addressed by other regulatory initiatives, indicating a fractured approach to sustainability by the European Union (Sjåfjell & Taylor, 2019).

There's also a lack of coordination about sustainability issues and an approach to sustainability that is based on research is not pursued. This fractured approach further exacerbates the lack of coherence of EU policies towards sustainability. It would be easier for financial markets participants to engage with a comprehensive regulatory approach towards sustainability, than having to be subject to a fractured and gradual approach that relies on the constant introduction of partial measures towards sustainability (Ahlström & Sjåfjell, 2022).

Migliorelli (2021) posits that taxonomies should be based upon a definition of sustainable finance that reflects views on the proper identification of all the relevant aspects of sustainability, in order to promote clarity and provide investors with concise information. The proper definition and identification of sustainable activities in a way that facilitates the recognition by investors of these activities that are considered sustainable is a necessary condition for the development of sustainable finance and related financial markets.

He identifies a number of risks when sustainable finance is defined through the establishment of taxonomies, namely greenwashing, misalignments in the allocation of capital and discrepancies between different jurisdictions in definitions and standards.

The EU Taxonomy has sparked considerable interest in the corporate world, due to the fact that many firms realized that if their activities are not considered sustainable, this could have

significant implications for their survival in the sustainable economy of the future (Ahlström & Sjåfjell, 2022).

Ahlström & Sjåfjell (2022) argue that not every business model is sustainable or can even be transformed into one. Thus, they propose that in order to provide clarity and be effective as soon as possible the focus of a taxonomy should be on which activities are not sustainable. This would allow firms to steer away from these activities, if their business model allows them to, thus becoming sustainable even if they currently aren't.

Furthermore, they argue that the sustainable finance initiative does not take into account the insights of sustainability research that recognize that the definition of sustainability is inherently complex, while also failing to encompass the complex inner workings of the global financial system which it claims that it aims to transform.

They believe that the sustainable finance initiative fails to address some of the critical problems that plug the present system, while they also express fears that the initiative will only bring about incremental changes to the status quo, instead of providing the necessary impetus for the transition towards sustainability of the financial system.

Furthermore, they argue that the initiative lacks the will to question the foundations of the present financial system, instead limiting itself in trying to bring about change only across certain aspects of the present system and only to a limited degree. Additionally, its approach towards financial risk is rather limited.

For Cullen & Mähönen (2019b) the EU Taxonomy fails to address the entire extent of the financial risks posed by unsustainability, while also not integrating the insights of sustainability research, leading to rather limited approach about the issues it seeks to address.

According to Ahlström & Sjåfjell (2022), the sustainable finance initiative does not completely understand the inner workings of the financial system, relying on policies that fail to address the critical barriers towards sustainability in the present financial system. At the same time, it does not properly address the challenges associated with sustainability in the financial system, instead promoting a limited and simplistic approach towards sustainability and environmental protection.

They call for a new thinking towards sustainable finance that accounts for its complexity and the uncertainty that is an inherent characteristic of financial markets.

Polasky et al. (2020) suggest a new approach that would result in more effective responses, that also address uncertainty. They argue that decisions should have a direct and strong impact on outcomes, they should be based on sufficient evidence, decisions with controversial or uncertain impacts that cannot be properly measured and quantified should be avoided, and the focus should be on the big picture, instead of trying to tweak and manage every minor detail.

In the case of a taxonomy, they argue that this new approach would imply a shift towards the identification of unsustainable and detrimental activities, with an emphasis on the do no significant harm principle. As an example, they mention the impact of greenhouse gas emissions on climate change, with activities that result in high greenhouse gas emissions undoubtedly constituting harmful economic activities.

Since there is an urgent need to reduce environmental pollution, they argue that the Taxonomy should be particularly clear and definite about the activities that companies need to shift away from, while being flexible about the activities that they will have to shift towards, thus adopting an approach that places emphasis on what should be avoided, rather than what should be pursued.

They posit that for sustainable finance the focus should shift away from a taxonomy that defines which activities are deemed sustainable, towards a taxonomy the identifies and communicates which activities are unsustainable and cause significant harm to the environment. They also call for more initiatives and policies that address the uncertainty and increased complexity from globalization and unsustainable activities at an international level. Policy coherence should be a guiding principle of regulatory initiatives.

The Taxonomy alone may not be enough to foster the transition towards a sustainable economy in the European Union. Additional regulatory initiates may be necessary in order to develop a concise policy framework that would create the necessary incentives to spur innovation and promote sustainability. Policy coherence refers to the design of policies in a way that their proper

implementation will contribute towards the achievement of a stated goal, in this case of sustainable development.

Polasky et al. (2020) mention as an example the European Union's sustainable corporate governance initiative. They argue that ingraining sustainability into corporate law and governance can help bring to fruition the full potential of EU initiatives on sustainable finance and reporting requirements, helping create synergies between regulatory initiatives in the broader context of the European Union's efforts to promote a sustainable economy.

Embedding sustainability in public procurement framework is also critical. Public capital will be instrumental in the EU's efforts to promote sustainability. Private investments alone will not be sufficient to provide the required capital for investments in infrastructure and facilities that would help propel sustainability to the forefront of economic activity in the European Union.

The EU's Strategy for Financing the Transition to a Sustainable Economy also appears more consistent with the principle of policy coherence, as it aims to improve the interaction of the EU's financial markets policy with its international economic development and policies (Ahlström & Sjåfjell, 2022).

Furthermore, Ahlström & Sjåfjell (2022) argue that ESG metrics can be improved by introducing metrics of biodiversity that would serve to highlight the implications of economic activities for biodiversity and the use of natural resources.

Ahlström & Sjåfjell (2022) note that the EU taxonomy was applauded and welcomed by the private sector, particularly the financial industry, since it is believed that it will enhance clarity in the markets, reduce the risk of greenwashing and have an impact on the cost of financing.

However, they express doubts whether it will be able to shift the financial sector towards sustainability. As they expect uncertainty and complexity to further increase in the coming years, they call for increased intention to these issues both with respect to financial regulation in general and with regulation pertaining to the shift towards sustainability in particular.

They argue that properly accounting for uncertainty and complexity is not possible through the use of ESG metrics or in the context of a taxonomy. Thus, they suggest a shift in emphasis

towards the analysis of risk rather than a one-dimensional focus on ESG metrics, which may suffer from inaccuracy in trying to assess aspects of sustainability that may be difficult or impossible to identify accurately.

According to Ahlström & Sjåfjell (2022), emphasis should be placed on the big picture, not relying on inaccurate measures, and emphasizing the details. They believe that it is necessary to complement the Taxonomy with other relevant regulatory initiatives, in the spirit of the European Union's initiative about sustainability in corporate governance.

At the same time, they bring up another critical issue that is not raised often in mainstream policy discussions and underscore the importance how to properly measure sustainability. As they point out standard mathematical models are not able to account for considerable uncertainty with precision, thus it may not be feasible to apply quantitative methods and probability-based models to assess sustainability.

In the presence of considerable uncertainty, ESG metrics cannot account for various sustainability impacts. Thus, the measurement of sustainability and its impacts via the use of ESG metrics, as well as in the context of the EU taxonomy must be reassessed accordingly. They suggest measures that will capture non-measurable aspects of sustainability, such as human rights, as well as aspects that can be quantified, utilizing climate change metrics.

According to Alessi et al. (2019) in the best-case scenario, the EU Taxonomy would help the EU achieve its environmental targets, even though its estimated impact on reducing the investment gap by helping direct funds towards sustainable activities differs according to different potential scenarios and is not identical across sectors of economic activity.

However, they expect it will help direct funds towards important sectors to help finance their transition towards sustainability and in accordance with the European Union's environmental targets. In any case, their analysis indicates that the Taxonomy will have a positive impact on responsible finance and the availability of funds for the financing of sustainable economic activities across the European economy.

6. Conclusions

Environmental protection and respect of the valuable, scarce, natural resources is one of the fundamental principles of the European Union. Sustainability lies at the core of the Union's economic growth and social coherence policy. The EU seeks to a leader in the efforts for climate change mitigation and environmental protection internationally, acting as an example for other regions across the world and becoming a global leader in sustainability.

The EU Taxonomy is the main policy initiative for promoting sustainable finance of the EU's Sustainable Finance Action Plan. The Action Plan constitutes the main pillar of the European Union's strategy to promote sustainable finance in order to finance the transition of the European economy to a new paradigm of economic activity that is sustainable and environmentally-friendly.

The Taxonomy provides a classification of economic activities according to their environmental impact and sustainability, defining specific criteria of sustainability for economic activities in the major sectors of the European economy. In doing so, it incentivizes companies in the EU to transform their activities with an emphasis on sustainability and environmental protection, and facilitates the allocation of both private as well as public capital to sustainable economic activities and the sustainable transformation of major sectors of the European economy.

Taxonomy- eligible activities must contribute to the EU's environmental objectives, satisfy the technical criteria of the EU Taxonomy and comply with the Taxonomy's social safeguards. An important principle of the Taxonomy is the "do no significant harm" principle, that states that regardless of its other impacts, an activity should not cause significant harm to the environment. The Taxonomy and the EU's sustainable finance strategy prioritizes sectors that cause high emissions like the energy sector, transportation and agriculture. Green bonds and stocks are the

primary financing options for Taxonomy-compliant activities and the transformation of economic activities.

The Taxonomy will help mitigate the risk of greenwashing for investors, allowing them to properly recognize sustainable investments that are truly credible in their pledge to environmental protection. However, the fact that it allows companies discretion in their reporting and compromises in the political process in the EU during the debate about the Taxonomy could undermine its credibility and mitigate its actual impact.

The Taxonomy is not without limitations and challenges. It does not yet include economic important sectors such as aviation, while the thresholds applied are in certain cases inconsistent, a fact that can undermine its credibility. Political influence and compromises that led to the exclusion of critical sectors, such as the natural gas and nuclear energy sectors, may also undermine the Taxonomy's effectiveness and credibility.

Furthermore, the need to meet technical criteria increases the complexity of compliance that firms face, as well as the cost of compliance. Simplifying the compliance process could alleviate the bureaucratic burden companies have to deal with and reduce compliance costs.

It has also been argued (Kooths, 2022), from a neoclassical perspective, that the Taxonomy increases the potential for political lobbyism from powerful economic interests. Its attempt to regulate economic activity is also viewed as inconsistent and incompatible with the proper functioning of a market economy and the EU's internal market. The bureaucratic burden it imposes also diverts labor and resources from productive activities. In this regard, a market-based approach, similar to the emissions trading scheme in the EU is touted as more efficient and effective.

The EU Taxonomy has been criticized that it fails to acknowledge and account for aspects of sustainability that cannot be precisely quantified, such as the inherent uncertainty and complexity of financial markets. It is thus argued that its approach is rather simplistic and fails to effectively address the critical barriers that hinder sustainability in the financial system (Ahlström & Sjåfjell, 2022).

Others call for a new approach that focuses on the big picture, with an emphasis not on identifying sustainable activities, but rather unsustainable ones that cause significant harm to the environment, such as activities that result in considerable pollution and increased greenhouse gas emissions (Polasky et al., 2020).

At the same time, the European Union has been accused for a lack of consistency in its approach towards directing private and public funds to sustainable activities. At the same time, it has been criticized that its strategy on sustainability only focuses on increasing transparencies, instead of addressing the externalities that environmental pollution causes (European Court of Auditors, 2021)

Even though not without flaws and limitations, the Taxonomy improves the credibility of sustainability measures compared to ESG metrics provided by ESG rating agencies. These ratings are often inconsistent and significant divergence is observed. At the same time, they rely on a rather opaque framework, lacking transparent and consistently applied criteria. Thus, the Taxonomy can provide more reliable metrics to investors and enhance transparency and, consequently, investor confidence and accountability.

The European Union has implemented various additional regulatory initiatives like the Renewed Sustainable Finance Strategy, the Sustainable Finance Disclosure Regulation and the European Green Bonds Regulation, to promote sustainability objectives and align financial markets with sustainability objectives. These initiatives aim to position the EU as a leader in sustainable finance and climate change mitigation globally.

By creating a unified framework for sustainable finance at the EU level, the European Union seeks to prevent regulatory fragmentation among EU member-states, ensuring a level playing field and policy cohesion across the Union and facilitating investment in sustainable activities and projects.

By doing so, it seeks to promote sustainability and improve capital allocation in this regard. These regulatory initiatives promote market efficiency, as they facilitate the comparison of the sustainability bonds from issuers from different countries of the EU and prevent any disparities that may arise due to differences in the regulatory framework of member-states.

The EU's Sustainable Finace Action Plan, with the EU Taxonomy at its core, will create a favorable environment for sustainable finance, conducive to the financing of sustainable economic activities. It is expected to bring an increase in the financing of sustainable activities and a shift towards more environmentally friendly and sustainable activities across firms in the European Union.

While not without shortcomings and important challenges to its implementation, it is a crucial first step in the EU's efforts towards meeting its environmental objectives in the next decades and becoming a global leader in efforts to mitigate climate change and promote sustainability and sustainable finance.

Environmental protection, addressing the consequences of climate change, sustainability and the role of sustainable finance in promoting sustainability are expected to remain important issues in the future both in the European Union as well as internationally. While the EU's sustainable finance action plan paved the way for a new era of sustainable finance, improvements in existing legislation and the regulatory framework are necessary. Additional regulatory initiatives that would improve the efficiency of the regulatory framework are also required for the EU to be able to create a complete and concise regulatory framework that will help further advance sustainable finance in the Union.

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