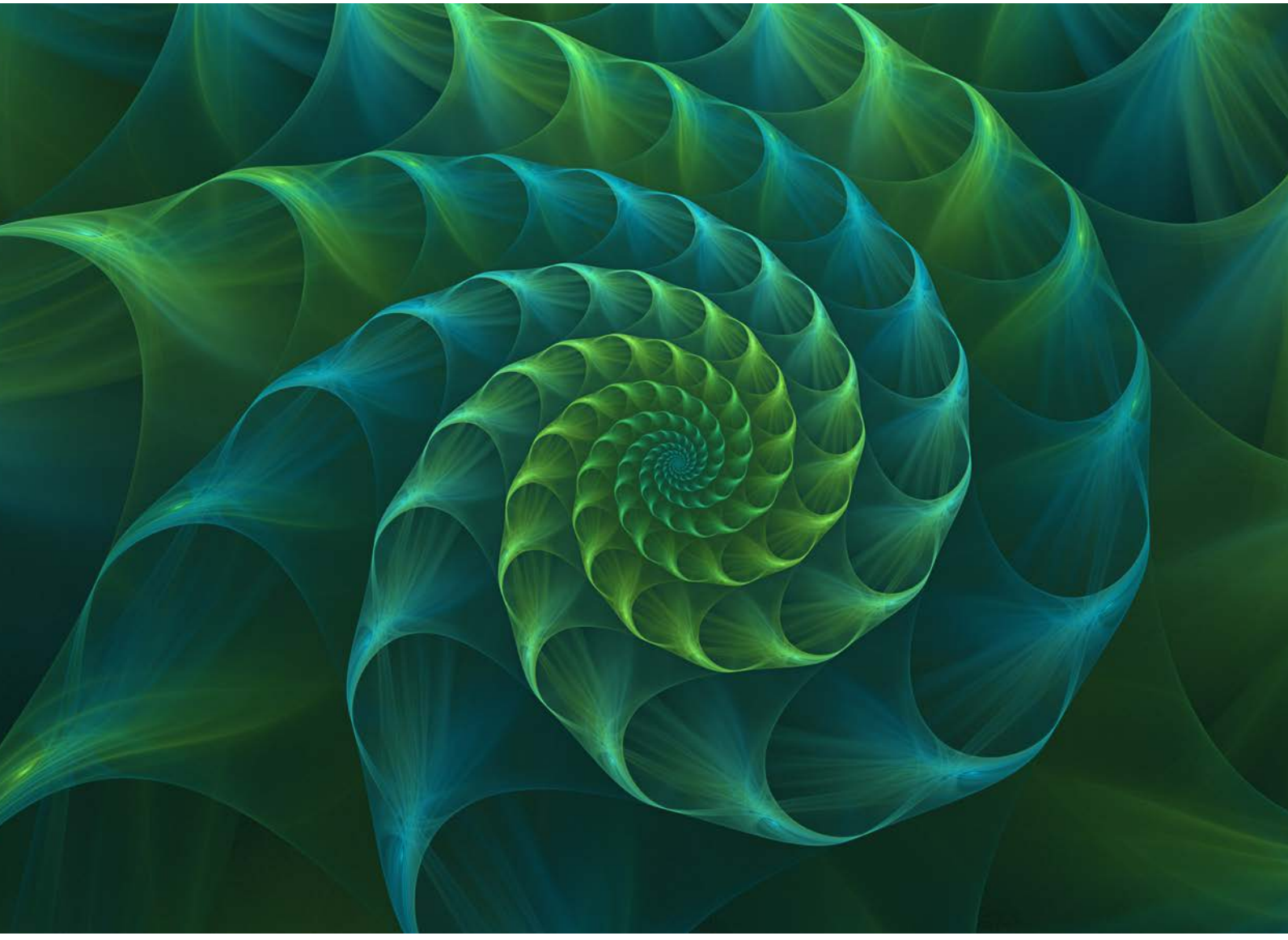
ESG Investing and Climate Transition

Market Practices, Issues and Policy Considerations



OECD

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Foreword

The growth of sustainable finance, including the increasing array of financial products, has attracted the attention of investors, policy makers, and various stakeholders in civil society as to its potential to deliver financial returns, align with societal values, and contribute to sustainability and climate-related objectives. In particular, ESG investing has become a leading form of sustainable finance, and has shifted from early stages of development toward mainstream finance in a number of OECD jurisdictions, and generally refers to the process of considering environmental, social and governance (ESG) factors when making investment decisions. ESG ratings, which are applied to companies representing around 80% of market capitalisation in 2020, have evolved in recent years to incorporate long-term financial risks and opportunities in investment decision making processes. At the same time, the environmental 'E' pillar score of ESG rating is being increasingly used as a tool to align investments with a low-carbon transition, and a range of financial market products and measurement approaches have developed to help investors align portfolios with specific climate-objectives and strategies in line with the Paris Agreement.

Despite noteworthy progress, considerable challenges remain that hinder the potential for these approaches to support long-term value and climate-related international objectives, notably with respect to ESG investing. Challenges include, the promulgation of different approaches, data inconsistencies, lack of comparability of ESG criteria and rating methodologies, as well as inadequate clarity over how ESG integration affects asset allocation. Ultimately, these challenges could constrain the pace and scale of the capital allocation needed to achieve tangible progress to support long-term value and a transition to low-carbon economies. Therefore policies should be considered to foster global interoperability and comparability of ESG approaches, as well as to strengthen the tools and methodologies that underpin disclosure, valuations, and scenario analysis in financial markets associated with a low-carbon transition.

This report, which serves as a contribution to the G20 Sustainable Finance Working Group in 2021, highlights the main findings from recent OECD research on ESG rating and investing. It offers policy considerations to strengthen ESG practices to foster global interoperability and comparability, as well as encourage greater alignment of environmental metrics with a low-carbon transition. This work represents part of a broader body of work to monitor developments in sustainable finance and ESG rating and investing.

The report and accompanying analysis has been prepared by Catriona Marshall, Robert Patalano and Riccardo Boffo from the OECD Directorate for Financial and Enterprise Affairs, and has benefited from valuable discussions with delegates of the OECD Committee on Financial Markets.

Executive Summary

Amid public sector initiatives to reach the objectives of the Paris Agreement and the Sustainable Development Goals (SDGs), there has been a sharp growth in investors' use of ESG approaches, including the incorporation of climate transition factors into investment decisions. In turn, ESG investing has become a leading form of sustainable finance for long-term value and alignment with societal values, and has evolved from its early stages of development to mainstream investing in a number of OECD jurisdictions.

The environmental 'E' pillar score of ESG rating is being increasingly used as a tool to align investments with a low-carbon transition, and could *in principle* help unlock valuable forward-looking information on firms' climate transition risks and opportunities. Also, a number of financial market products and practices have emerged to align capital flows with the low-carbon transition. These encompass instruments for issuers, third party ratings, principles and guidance, as well as index and portfolio products to help channel financing to transitioning entities, and better price the risks and opportunities of the transition.

Notwithstanding noteworthy progress, there remain considerable challenges that hinder the efficacy of these approaches, and notably ESG investing, to support long-term value and climate-related international objectives. These challenges include the promulgation of different approaches, data inconsistencies, lack of comparability of ESG criteria and rating methodologies, as well as inadequate clarity over how ESG integration affects asset allocation. This report will further address progress, challenges, and policy considerations, with respect to the following:

- **First, on strengthening the comparability of ESG rating and investing approaches, and improving the quality of data used for investment decisions.** ESG ratings often lack transparency in their calculation and differ substantially in the metrics on which they draw, as well as the methodologies used in their calculation, raising questions as to the extent to which their aggregation contributes to long-term value. Methodologies also tend to differ substantially across rating providers, and result in a lack of correlation between ESG ratings supplied by different providers. Therefore policies are needed to ensure global transparency, comparability and quality of core ESG metrics in reporting frameworks, ratings, and definitions of ESG investment approaches.
- **Second, on improving the alignment of the environmental pillar of ESG ratings with a low-carbon transition.** Inconsistencies in the construction of ESG ratings across providers, the multitude of different metrics measured in one E pillar score, and insufficient quality of forward looking metrics prevent them from supplying consistent and comparable information on transition risks and opportunities across firms and jurisdictions. Notably, rating providers appear to place less weight on negative environmental impacts while placing greater weight on the disclosure of climate-related corporate policies and targets, with limited assessment as to the quality or impact of such strategies. Such limitations could hinder the use of E pillar scores by investors with an aim to align portfolios with the low-carbon transition. Greater transparency and precision of the meaning of sub-category scores and metrics could contribute to better alignment of E pillar scores

with a specific purpose, such as to assess climate transition risks and opportunities, or broader environmental impacts. Such clarity would allow investors with specific sustainability goals to use ESG approaches as a more effective tool for portfolio rebalancing and risk management.

- **Third, to strengthen the integration of climate transition risks and opportunities into market frameworks and products in a manner that enhances market efficiencies to support an orderly low-carbon transition.** While markets are beginning to price transition risks and opportunities due to progress on climate-related financial disclosures, they remain constrained by a number of impediments, from uncertainties that undermine pricing of externalities to inadequate disclosures of forward looking metrics on net-zero pathways. In particular, the effective market pricing of the positive and negative valuation impacts of a transition is hampered by insufficient data, including financially material metrics and analytical tools to measure and manage transition risks, and lack of policy clarity regarding carbon pricing and support for renewables. Moreover, market products and measurement instruments will need to further evolve to allow investors to better align portfolios with specific climate-objectives and strategies, from divestment to active engagement and assessment of ways to strengthen the veracity of transition plans.

These competing dynamics and challenges associated with ESG rating and investing could compromise market integrity, erode investor confidence, and mask the extent of environmental and climate-related impacts of investment decisions. Ultimately, challenges could constrain the pace and scale of the capital allocation needed to achieve tangible progress to support long-term value and a transition to low-carbon economies. Therefore policies should be considered to foster transparency and comparability of ESG approaches, as well as to strengthen the tools and methodologies that underpin disclosure, valuations, and scenario analysis in financial markets associated with a low-carbon transition.

On ESG disclosure frameworks and approaches:

- Ensure global interoperability and comparability and quality of core ESG metrics in reporting frameworks, ratings, and investment practices to address global fragmentation. Frameworks should utilise standardised core metrics to form baseline reporting for the E, S and G pillars for use by market participants.
- Strengthen relevance of ESG metrics through alignment with long-term enterprise value, including environmental and social factors that become material over time. Currently, ESG rating and reporting approaches do not sufficiently clarify the materiality of either financial or non-financial factors. Therefore, a comparison should be provided for investors to assess the relative weighting of metrics and financial considerations across markets and industries.
- Promote transparent and comparable scoring and weighting methodologies for established ESG ratings and indices. This will ensure that market participants can understand how ratings are devised, and can support the potential tailoring of ratings by market participants with differing motivations with respect to long-term value or environmental, social and governance topics.

On the environmental pillar of ESG rating and investing:

- Facilitate greater transparency on the high-level purpose of the environmental pillar so that market participants understand the extent to which the methodology they choose aligns with transition risks and opportunities, and environmental impact.
- Improve transparency of methodological practices, including metric calculation and weighting of categories in the generation of environmental pillar scores and indices.
- Encourage greater transparency and precision of environmental pillar sub-categories, such as with respect to metrics that could be used to develop climate transition or environmental impact sub-scores, in order to improve the informational value of the Environmental pillar score.

On considerations to strengthen the tools, methodologies, and products to support an orderly transition:

- Further strengthen TCFD disclosure practices to improve granularity, reliability and interoperability of metrics with respect to climate metrics, targets, and climate transition plans.
- Encourage the use of science-based interim targets and disclosure of annual progress in a quantitative and comparable format within climate transition plans.
- Consideration of overall verification processes for low-carbon and renewable strategies and plans, so that market participants are better able to make sound investment decisions based on commitments and implementation of emissions reduction over time.
- Improve the transparency and clarification of stewardship plans of major asset managers and institutional investors in their engagement with Boards and executive management on reduction of climate intensity and commitment to emissions targets. Asset managers could be expected to disclose principles and information on the implementation of climate transition plans, and remedial actions when issuers do not adhere to their stated plans.
- Ensure pilot scenario analysis for financial institutions to assess potential losses from carbon exposures against anticipated valuation increases from renewable energy and new green technologies.
- Greater assessment by the appropriate government policy makers on how a range of climate-related policies could better support and incentivise the transition.

Overall, greater international co-operation is needed to ensure that ESG and climate transition-related practices progress in a manner that ameliorates the current market fragmentation, and strengthens investor confidence and market integrity. Addressing challenges related to information on sustainability-related risks and opportunities will help ensure that capital can be effectively allocated to investments that support the low-carbon transition and sustainable growth, and merits the attention of the Sustainable Finance Working Group under the Italian G20 Presidency.

Introduction

ESG investing has become a leading form of sustainable finance, and has shifted from early stages of development toward mainstream finance in a number of OECD jurisdictions. Forms of ESG investing have risen to almost USD 40 trillion (Bloomberg, 2021[1]), which generally refers to the process of considering environmental, social and governance (ESG) factors when making investment decisions (OECD, 2020[2]).[1] ESG ratings, which are now applied to companies representing around 80% of market capitalisation in 2020, have evolved in recent years to incorporate long-term financial risks and opportunities in investment decision-making processes.

The growing use of ESG, from ratings to investment approaches, draws attention to the extent to which the environmental pillar of ESG offers an effective measurement of environmental impact, carbon emissions and green investments. As market participants show greater awareness and concern that climate risks may present implications for long-term value and financial stability, ESG products are increasingly being used to assess companies' commitments and actions to transition to renewable energy and green products. To meet this demand, asset managers and ESG rating providers increasingly integrate a host of metrics that are captured in the environmental 'E' pillar of ESG ratings and investing. To underpin such metrics, disclosure of climate-related factors (including risks and opportunities) are growing, facilitated by TCFD and ESG frameworks, yet the quality of forward looking metrics and the extent to which they align with science-based interim targets warrants further attention.

This report will highlight the main findings from recent OECD research on ESG rating and investing and offer policy considerations to strengthen ESG practices to foster global consistency and comparability, as well encourage greater alignment of environmental metrics with a low-carbon transition.[2] The report is divided into 4 sections: **section 1** will outline ESG rating approaches and provide analysis on the performance of ESG-related products; **section 2** will explore the environmental 'E' pillar of ESG rating and investing to assess the extent to which practices align with a low-carbon transition; **section 3** outlines a framework to understand how facets of a low-carbon transition can affect market pricing and support an orderly transition to low-carbon economies, and; **section 4** will offer policy considerations to strengthen practices, foster global interoperability and comparability, and improve the tools and methodologies that underpin disclosure, and valuations in financial markets to support a low-carbon transition.

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[1] OECD (2020), *OECD Business and Finance Outlook 2020: Sustainable and Resilient Finance*, OECD Publishing, Paris, https://dx.doi.org/10.1787/eb61fd29-en

[2] The contents of the report, and supporting publications, have benefited from engagement with Members of the OECD's Committee on Financial Markets, and Financial Roundtables with market participants (including investment banks, asset managers, commercial banks, pension funds and ESG rating providers).

1. Alignment of ESG rating and investing approaches

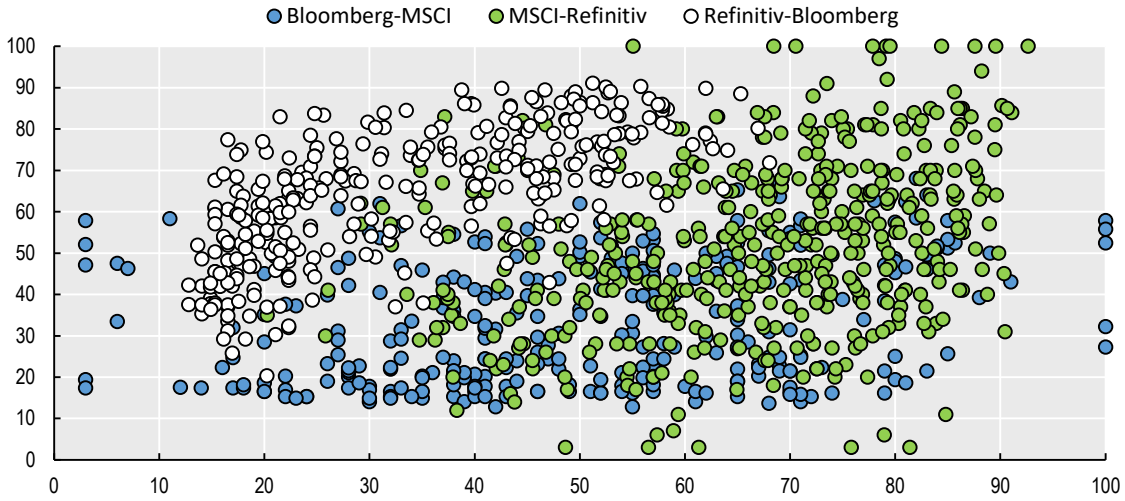
1.1. ESG rating and investing approaches

ESG disclosure, ratings and investment approaches represent an increasingly important tool for integrating sustainability considerations into investment processes, and in concept could serve to support investors in making informed decisions and value judgments about asset allocation. If fit for purpose, ESG practices could help financial investors who seek to evaluate the financial materiality of non-financial reporting as to the conditions, practices and strategies related to environmental, social and governance risks and issues over the medium term (Steinbarth E., 2018[3]). In addition, they could also support risk management to reduce the impact of climate change and other sustainability risks on corporate performance over time, and navigate a shift to renewables strategies which could bring new growth opportunities over time.

However, ESG ratings by leading rating providers tend to differ substantially, and result in low correlations between ESG scores across different rating providers (Figure 1). At the current stage of development, outputs across providers show a low degree of correlation as to what constitutes a high or low scoring ESG rating, due to differences in subcategories, the number of metrics, weighting and scope (OECD, 2020[2]). The absence of a universally accepted global set of principles and guidelines for consistent and meaningful reporting further creates a barrier to the effective comparability and integration of sustainability-related factors into the investment decision process (Boffo, 2020[4]). As such, inconsistencies in the construction of ESG ratings prevent them from supplying consistent and comparable information on ESG-related risks across firms and jurisdictions, and underlines the difficulties faced by investors in interpreting differences in ratings across providers. ESG ratings are also opaque in their calculation and differ substantially in terms of the metrics on which they draw, as well as the methodologies used in their calculation. They typically rely on techniques such as data extrapolation and estimation methods which vary between and within each provider (Boffo, 2020[4]).

Figure 1. There is a lack of correlation among ESG scores across leading rating providers

S&P 500 ratings correlation for different providers



Note: Providers' names in the legend correspond to the Y axis when at the left and to the X axis when at the right (e.g, Bloomberg (blue), MSCI (green) and Refinitiv (white) on Y axis and MSCI (blue), Refinitiv (green), Bloomberg (white) on X axis). Data from three leading rating providers (Bloomberg, MSCI, Refinitiv) with OECD Staff calculations. For full methodology, refer to source.
Source: Boffo and Patalano (2020), ESG Investing: Practices, Progress and Challenges, OECD Paris

1.2. Performance of ESG-related products

Measures of risk-adjusted returns on ESG-related products show mixed results over the past decade, and largely depend on the scores used and investment strategy employed, raising questions as to the true extent to which ESG drives performance. OECD research tests benchmark and fund performance based on several prominent industry databases,[3] providing an assessment of several strands of portfolio theory[4] to understand how the integration of ESG factors in the investment process affect performance and volatility when compared to traditional investments. Results show a wide range of financial performance of ESG investments between indices, portfolios, and investment funds (Boffo, 2020[4]).

Over the past decade, studies have shown that ESG portfolio tilting and integration of ESG factors can have a range of impacts on portfolio and corporate financial performance, resulting in over-performance and underperformance relative to market returns. On the one hand, a number of studies indicate that specific aspects of underlying ESG factors can have a positive impact on corporate financial performance over time due to improved governance and risk management. On the other hand, a growing number of studies observe market underperformance of ESG-tilted indices and portfolios relative to traditional (ESG neutral) market portfolios that dampens risk-adjusted returns. OECD analysis suggests that ESG approaches have yet to provide consistent performance benefits based on absolute and Sharpe ratio return metrics, but do appear to help reduce lower maximum drawdown, used to assess tail risk over a specified time period (Boffo, 2020[4]), and is consistent with the observed performance of some ESG products throughout the Covid-19 market stress, whereby ESG funds appeared to have lower underperformance than non-ESG counterparts suggesting relative resilience against the materialisation of

[3] OECD analysis is based on commercially available ESG ratings from major providers, therefore ESG portfolios and proprietary ratings could exhibit superior risk-adjusted returns, just as a portion of active managers are able to achieve such returns against traditional market indices.

[4] Including Markowitz modern portfolio theory, and Fama-French factor model.

tail risks (S&P, 2020[5]) (Bloomberg, 2020[6]). Therefore, the present concern is that the current lack of comparability, consistency, and alignment of materiality across approaches is undermining the informational value of ESG for investors to support long-term value.

In order to further unlock material information that could effectively contribute to long-term value, improving transparency, comparability and materiality of ESG approaches will be integral. In principle, and supported by some evidence, ESG investing can over a longer time horizon improve corporate practices and in turn risk-adjusted returns as investors better understand factors that could affect climate transition, and social issues such as human rights and labour practices. However in their current form, it is difficult for all but the most sophisticated investors – even with transparent and comparable data – to assess the ESG contribution to portfolio returns relative to other factors. The interaction between ESG approaches and strategy are complicated further when strategies – such as impact or momentum – may exploit inefficiencies in ESG investing to maximise returns (Steinbarth E., 2018[3]) (Bannier, 2019[7]). Therefore, labelling and disclosure are critical to ensure investors have adequate information to make critical decisions about investment and voting.

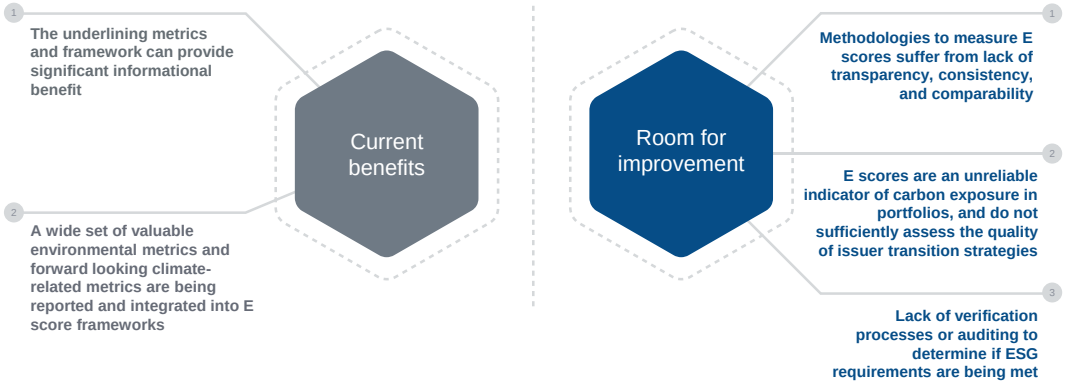
While progress has been made, the factors outlined in this section could hinder the potential benefits of ESG investing and raise the need for greater consistency and comparability of approaches, including a more thorough assessment of how aspects of financial and non-financial materiality are captured in ESG data and ratings. Currently, the various ESG reporting and rating approaches do not sufficiently or clarify either financial materiality or non-financial materiality (e.g. social or environmental impact), so investors are not currently able to get a clear picture of whether the measurements suggest a net positive or negative effect on financial performance, or even the extent of tangible alignment with societal values. In this respect, proprietary methodologies have resulted in ESG ratings that diverge materially for individual issuers, which limits any understanding of which attributes drive ESG ratings and performance. Such proprietary methodologies may also give rise to biases that put SMEs at a disadvantage in capital raising, with lower-scoring ESG firms tending to be much smaller in terms of market capitalisation.

2. Alignment of the environmental pillar of ESG ratings with low-carbon transition

As a range of market participants incorporate ESG approaches in their investing and risk management practices, environmental 'E' pillar scores are also being used by some as a tool to better align portfolios with the low-carbon transition. In this respect, the E pillar score within ESG ratings is increasingly being considered to assess and rebalance investor portfolios to better align them with climate-related risks and opportunities. Numerous central banks are also in the process of integrating ESG assessments into investment approaches as one of several tools used to align with a transition to low-carbon economies (Bua, 2021[8]; Bernardini E., 2019[9]; Lanza A, 2020[10]).[5] While, in principle, E pillar scores within ESG ratings have the potential to provide valuable forward-looking information on company exposure and management of a transition to renewables, a number of challenges currently undermine their use for this purpose. Notably, ESG ratings and E pillar scores differ substantially in their calculation across various rating providers, not only in terms of the underlying data on which scores are based, but how these data are used, weighted and – in places – extrapolated in the calculation of the overall rating (Figure 2). This section explores such challenges and outlines the underlying methodological practices that may impede their alignment with a low-carbon transition.

[5] The Network for the Greening of the Financial System, which comprises of 83 central banks and financial supervisors, has made progress in developing recommendations for central banks' role in combating climate change, two such recommendations include: i) integrating climate-related risks into micro-supervision and ii) financial stability monitoring, and integrating sustainability factors into central bank portfolio management. In 2019, the network's survey showed that 25 central banks already adopted SRI (Principles for Responsible Investment) in their investment approach (or were planning to do so), ranging from environmental, social, and governance (ESG) considerations to a climate-specific focus. See OECD (2017), *Investment Governance and the Integration of Environmental, Social and Governance Factors*, OECD Paris, https://www.oecd.org/finance/Investment-Governance-Integration-ESG-Factors.pdf.

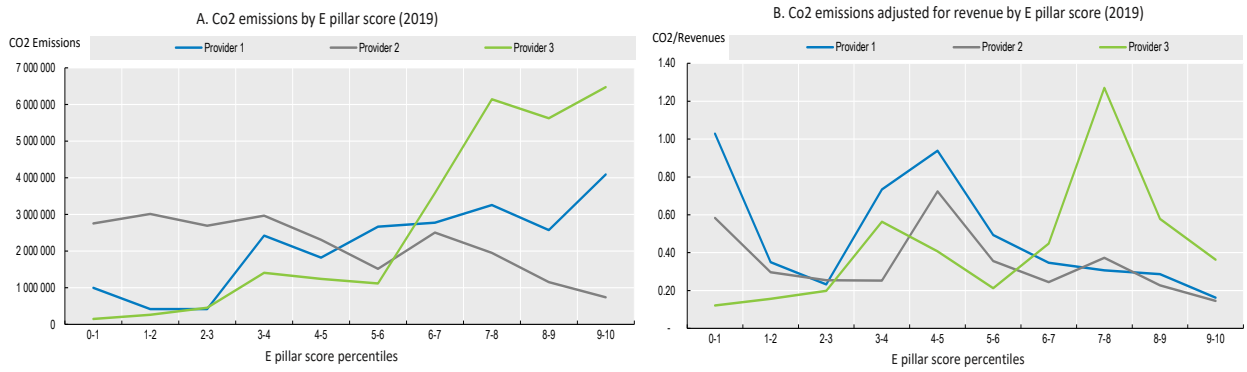
Figure 2. The environmental pillar of ESG rating and investing can unlock forward-looking information, including on climate risks, yet has room for improvement



2.1. Analysis of alignment between environmental pillar metrics, carbon emissions, and climate transition risks and opportunities

While environmental pillar scores have the potential to unlock information on companies' exposure to climate transition, the extent to which these factors are captured in ESG ratings is heavily dependent on methodologies and calculation of metrics that vary substantially across rating providers. This is in part reflected in the low correlation between overall ESG ratings and their E pillar constituents (OECD, 2020[2]). In addition, for some ESG rating providers, high E pillar scores positively correlate with high carbon emissions (Figure 3) (Boffo, 2020[11]). This suggests that firms' plans to reduce emissions play a significant (and positive) role in determining their E pillar scores, rather than their current level of emissions. While this is not unexpected, it confirms that investing in high E-scoring or high ESG-scoring portfolios do not necessarily mean that such tilting includes companies that have received high ratings for managing their carbon emissions or risk management with respect to climate change.[6] In turn, this could impact the performance of portfolios and raises the importance of investor engagement with issuers to ensure the implementation of transition plans.

Figure 3. In cases, high E pillar scores actually correlate with higher CO2 emissions and higher revenue adjusted CO2 emissions

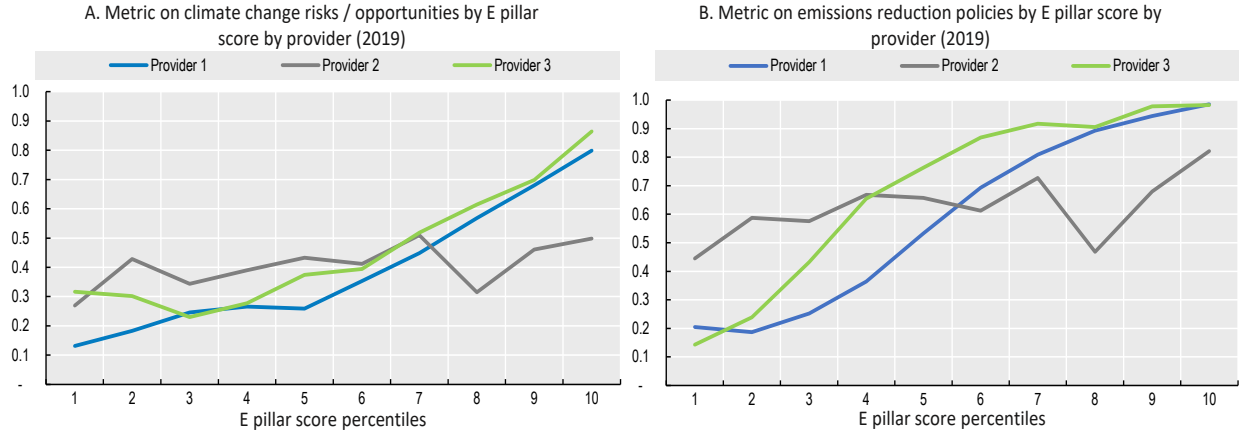


Note: Average tonnes of estimated CO2 emissions (Scope 1 and Scope 2, and average tonnes of estimates CO2 emissions divided by revenues as reported by Refinitiv's methodology for estimating emissions) by E pillar deciles for different providers. Data from three leading rating providers (Bloomberg, MSCI, Refinitiv) with OECD Staff calculations. For full methodology, refer to source.
Source: Boffo, Marshall and Patalano (2020), ESG Investing: Environmental Pillar Scoring and Reporting, OECD Paris.

[6] This could also have implications, such that investors that tilt their portfolios to higher E pillar scoring companies may, in certain circumstance, risk making their portfolios more exposed to carbon emissions.

E pillar scores strive to capture some forward-looking information on climate risks and opportunities, and emission reduction processes; however, these metrics are largely based on corporate *awareness* of risks and do not reflect verifiable actions to accelerate the transition (Figure 4). Forward-looking metrics such as climate-related corporate policies and targets will be integral to implementing a low-carbon transition, however the inclusion of these in E pillar scores lack verification and often represent binary metrics that measure corporate awareness and disclosure of emissions reduction plans rather than the quality of such plans in line with science-based targets to meet a 2 or 1.5. degree scenario. As such, they give higher ratings to firms that publish climate transition plans, rather than the extent to which such plans will guide the issuer in effectively managing climate risks and opportunities (Boffo, 2020[11]). Improving the verification of transition plans and strategies, to the extent that adherence to climate transition plans is a core component of E pillar scores, will be important to ensure markets are more resilient and able to facilitate the low-carbon transition.

Figure 4. While E pillar scores appear to show a stronger correlation with some forward looking transition metrics, these may not effectively capture the quality of issuers' transition plans



Note: Data from three leading rating providers (Bloomberg, MSCI, Refinitiv) with OECD Staff calculations. For full methodology, refer to source.
Source: Boffo, Marshall and Patalano (2020), ESG Investing: Environmental Pillar Scoring and Reporting, OECD Paris

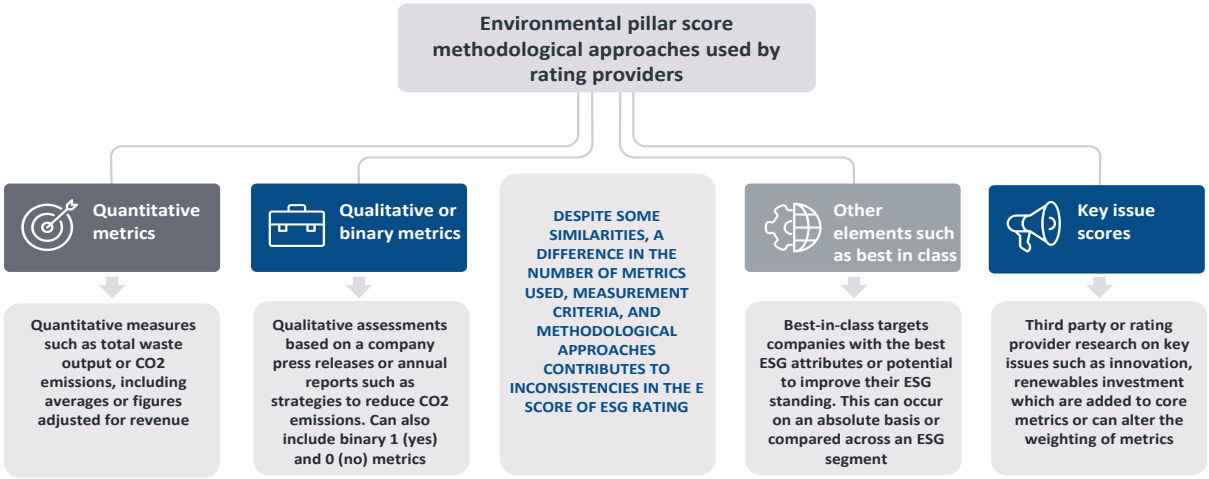
2.2. Environmental pillar metrics and methodologies

ESG ratings combine a wide range of metrics on environmental impact and climate-related factors into one E pillar score; while relevant, differences in the construction and weighting of such metrics across providers prevent them from supplying consistent and comparable information on transition risks across firms and jurisdictions. On one hand, E pillar scores integrate climate transition relevant metrics such as energy efficiency, carbon footprint and intensity, climate risk mitigation, and strategies toward renewable energy. On the other hand, they also integrate metrics on environmental impact more broadly, such as biodiversity, water usage, and waste management.[7] Importantly, the level to which each company reports (i.e. disclosure on qualitative or quantitative factors) and how rating providers then compile and aggregate this information (i.e. weighting, use of binary measurements, and construction of composite metrics), will impact the benefit of the final E pillar score (Figure 5). For example, rating providers appear to under-weigh actual negative environmental or climate-related impacts while placing greater weight on the mere existence of climate-related corporate policies. It is also likely that a range of transition-relevant issues will become financially material over time and contribute to long-term (financial) value, as physical climate impacts become more widespread, damaging or costly, and as climate policies and regulation become more ambitious, which will need to be taken into consideration (TCFD, 2017[12];

[7] Based on an assessment of metrics used by Bloomberg, MSCI, Thomson Reuters, and as set out in frameworks such as those used by GRI, SASB, TCFD, European Commission and Nasdaq.

SASB, 2020[13]). While E pillar score methodologies of major rating providers and global investors appear to strive to incorporate both financial performance, as well as environmental and climate objectives (to varying degrees), questions remain as to whether risk-adjusted financial returns or alignment with low-carbon transition is being achieved in practice (Boffo, 2020[11]).

Figure 5. Environmental pillar score methodologies vary by rating provider, using a mix of approaches



Source: OECD authors' illustration

While diversity of analytical approaches could help contribute to price discovery and efficient markets, the current state of approaches and limited transparency further hinders the comparability of E pillar scores across major providers. As an increasing number of investors look to ESG ratings to help steer their climate objectives in portfolio allocation, a more standardised or comparable approach across rating providers could support capital realignment away from carbon intensive economic activities (OECD, 2020[2]). However, currently there remain wide differences in the number and choice of quantitative metrics in metric subcategories, as well as the way in which individual metrics are calculated and weighed. These differences contribute to the wide variance of scores across providers, and also the lack of alignment between emissions and waste, and overall ESG scores (Boffo, 2020[11]). In addition, methodologies such as best-in-class pillar weighting are used to recalibrate upward the rating of certain companies in high-emissions industries, such as energy. This practice, which allows for high and low scores in each industry to help reduce portfolio concentration, may also cause some companies with high emissions to nevertheless have relatively high E pillar scores.

Notwithstanding these limitations, ESG scoring and reporting of metrics have the potential to unlock a significant amount of information on the management and resilience of companies, including climate-related risks and transition strategies when pursuing long-term value. It could also represent an important market based mechanism to help investors make decisions on long-term carbon prices and climate transition risks implied by climate change mitigation policies. Despite this, in its current form, the environmental pillar of ESG rating and investing does not appear an effective tool to align portfolios with a transition to low-carbon economies (Boffo, 2020[11]). For the E pillar to be an effective tool, methodologies would need to further develop to contain and communicate metrics that clearly distinguish drivers of financial materiality and forward looking indicators to support the identification and management of climate risks and opportunities. Doing this could help improve market integrity, investor confidence, and market resilience.

3. Strengthening the alignment of financial markets with an orderly climate transition

In recent years, many governments, international organisations and private institutions have endeavoured to analyse risks and opportunities with respect to a transition to low-carbon economies, including by assessing implications for the global financial system.[8] Importantly, for such transitions to occur in an orderly manner through financial systems, they would require financial markets to efficiently allocate capital, assess and transfer risks, and facilitate price discovery to reduce exposures to stranded assets and obsolete production processes, and to support needed investments in renewable energy, efficient production processes, and green technologies.[9] Building on this, this section will provide (i) a framework to assess how data being unlocked by TCFD and other disclosure reporting standards on climate issues can help market participants and policy makers better understand how transition factors affect market pricing and therefore capital allocation to support an orderly transition, and (ii) outline and assess selected climate products and instruments to support the low-carbon transition.

While the low-carbon transition is a policy imperative, the path and pace could expose financial markets to a range of transition risks. Transition risks[10] are those that result from the process of adjustment towards low-carbon economies, and the possibility that shifts in policies or technologies designed to mitigate and adapt to climate change could in turn affect the value of financial assets and liabilities, disrupting intermediation and financial stability. Transition risks can be the result of shifts in climate policy or regulation, or technological innovations that cause a decrease in the competitiveness of high-carbon technologies and infrastructures (in turn leading to increased costs, stranded assets, stranded processes, or credit losses). In this respect, a host of policy institutions, from central banks to international organisations, offer a range of perspectives on the extent to which the transition might be disorderly. Thus, capturing granular data on company-specific climate transition factors is important to inform market participants and policy making institutions. As such, steps to limit the impact of transition risks on markets are needed to support a gradual transition of prices in a manner that reflects accurate information on the pace and magnitude of the transition.

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[8] A number of countries, following their signing of the Paris Agreement, embarked on efforts to assess the economic consequences of climate change, and how policy measures could help support the transition to low-carbon economies. See OECD (2015), The economic consequences of climate change, https://www.oecd.org/env/the-economic-consequences-of-climate-change-9789264235410-en.htm, and OECD (2017), Investing in Climate, investing in growth, https://www.oecd.org/env/investing-in-climate-investing-in-growth-9789264273528-en.htm

[9] This report focused explicitly on transition risks, it does however take into consideration that physical risks may materialise, in turn leading to actions that contribute to transitions risks over time.

[10] Climate transition risks include: risks posed by policies aimed at decreasing greenhouse gas (GHG) emissions to meet the 2 degree target by the end of the century (e.g. carbon prices); legal risks arising as a function of climate litigation (e.g. in the context of climate damages), and; technology risks that relate to the uncertainty in technological development and deployment (presenting both risks and opportunities for financial market actors).

Despite such risks, the low-carbon transition also provides significant opportunities through new green-aligned markets, products, and innovations. As the transition materialises, related opportunities could contribute to climate-resilient growth. OECD estimates suggest that achieving the 2 degree scenario by 2050 could have a net positive effect on global GDP of up to 5% (OECD, 2017[14]), with associated benefits for financial markets. Therefore, while policy changes and technological innovation may lead to transition risks, the resulting transparency and efficiency gains, if implemented effectively, could help markets price net benefits over time and smooth the effects of the climate transition, which could in turn reduce the likelihood of stress in the financial system. For this reason, accurate information on climate-related opportunities and the commitment of issuers to engage in the transition is important for market efficiency and integrity, combined with accuracy of public sector monitoring of net risks.

3.1. Framework to assess key factors that may influence market pricing associated with the low-carbon transition

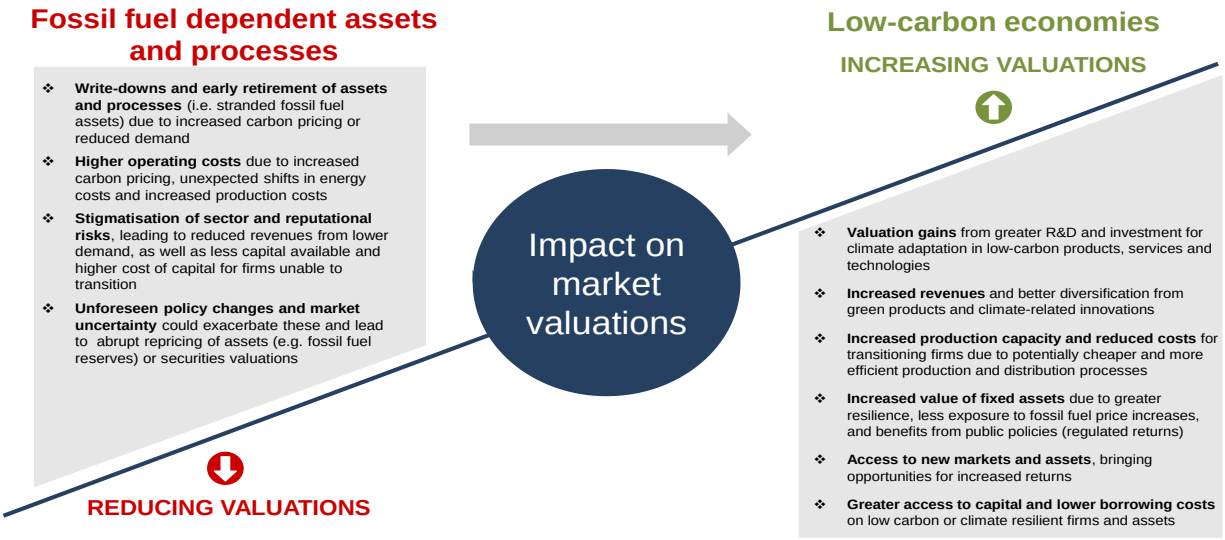
Aided by a supportive policy environment, financial markets are capable of facilitating an orderly transition, whereby gradual losses from stranded assets would be balanced by opportunities from the climate transition, and as renewable energy, processes and technologies gain scale and contribute to sustainable, climate-resilient economic growth. To achieve this, well-functioning markets require transparency through timely disclosure of meaningful and comparable data. This would allow market participants to effectively invest into the transition, and to monitor, verify, and engage with boards on verifiable efforts to pursue pathways to net zero. In this respect, reducing market uncertainties over policy decisions that address externalities is key to allowing efficient markets to redirect capital and support an orderly low-carbon transition.

Should an orderly transition occur, changes in asset prices need not, in themselves, amount to losses that disrupt financial market stability and sustainable growth if they can be absorbed throughout the financial system. Importantly, with more assertive policies and efficient and well-functioning markets, the shift away from stranded assets and toward climate opportunities has the potential to be orderly as depreciation and write-downs of obsolete assets give way to cleaner and more efficient ways of generating economic output over time (OECD, 2021[15]). This could represent price adjustments based on efficient financial markets, in a well-functioning financial system, that channels investment towards low-carbon or carbon-neutral investments.[11] However, a disorderly transition, triggered by a sudden and unexpected change in policy or technology relevant to the transition, could cause sudden price changes and heighten volatility due to uncertainty and risk aversion, which in turn could contribute to market contagion across assets exposed to the transition. To better understand valuation dynamics in line with a low-carbon transition, Figure 6 offers a conceptual framework to assess key factors that may influence market pricing associated with a transition to low-carbon economies.

[11] This does not discount the fact that mispricing of externalities associated with carbon reflects market failures, which in turn affects market pricing where fossil fuels contribute to asset valuations or profits. Efficient markets are able to transmit new information unlocked by better climate reporting at the company and national levels (e.g. through central banks, other authorities, and industry bodies) to help investors make informed decisions about how to price transitions.

Figure 6. Framework to capture the various material climate disclosure factors on market valuations related to a low-carbon transition

OECD conceptual framework to understand and assess key factors that may influence market pricing associated with the transition to low-carbon economies



Note: Non-exhaustive illustration. OECD staff assessment, including aspects of TCFD reporting with respect to climate transition risks and opportunities, and other market considerations
Source: OECD (2021), Financial Markets and Climate Transition, OECD Publishing, Paris, *forthcoming*.

Downward pressure on market valuations can occur due to the growing likelihood of stranded assets from fossil fuel reserves, as well as stranded production processes that become obsolete as the use of fossil fuels become prohibitively expensive.[12] Increases in capital expenditure to address transition-related requirements and to support climate-related risk mitigation and adaption would increase operating costs. Factors such as accelerated decommissioning (if not managed) of machinery and plants to extract and refine carbon assets bring forward costs and could, without measures, create higher net present losses (OECD, 2021[15]). In addition, the cost of capital for carbon-intensive assets could increase both as a result of factors related to asset performance (as highlighted above) and expected changes in prudential and other investment regulation. Stigmatisation of carbon intensive sectors and reputational risks could impact sales, expenses, as well as access to and cost of capital for carbon intensive firms unable or unwilling to transition. Moreover, policies that add costs to fossil fuels or carbon emissions, or increase the cost of capital, thereby decrease valuations for firms that are laggards in the transition.

Increases in market valuations can occur due to a myriad of factors that reflect expectations of rising future cash-flows or lower cost of capital. This can include gains on any assets that become in greater demand due to the demand for and consumption of various renewables. In addition, cash-flows could increase due to greater production capacity and reduced operating expenses for transitioning firms due to potentially cheaper and more efficient production and distribution processes (especially as renewable energy costs become competitive with fossil fuels). Moreover, access to new markets could bring opportunities for new investment and increased returns due to greater demand for low-emission infrastructure, technologies and services (OECD, 2021[15]). Any policies that support the transition by further penalising fossil fuel usage and CO2 emissions, reducing fossil fuel subsidies where they exist, or

[12] Stranded production processes relate to both assets (e.g. machinery) that use fossil fuels as energy, and also value chains that include producers that provide inputs that are carbon intensive. Switching costs and accelerated depreciation result in rendering these processes obsolete over time.

incentivising renewable energy and technologies could further contribute to gains for transitioning firms (NEA/IEA, 2021[16]).

The conceptual framework highlights that in an orderly transition, the depreciation of carbon intensive assets from the low-carbon transition could be offset by various positive effects, which could contribute to net valuation gains. In this respect, while an unanticipated increase in policy commitment to transition away from fossil fuels could contribute to widespread repricing of financial assets whose valuations would be determined in part by carbon prices, the extent to which this is not absorbed by markets and the financial system depends on several factors:

- **High, unexpected or concentrated losses could have greater potential to overwhelm provisions, capital and liquidity buffers that are already being eroded from the consequences of Covid-19** (NGFS, 2020[17])**, yet the duration of losses would be more manageable if absorbed over several business cycles.** The global financial system is already capable of absorbing trillions of dollars in losses over multiple business cycles, through defaults on credit exposures. Likewise, corporates depreciate many trillions as they write down the economic lives of plants and equipment over business cycles, from which they reinvest in new technologies (OECD, 2021[15]). This creative destruction can occur in a relatively orderly fashion where losses are balanced against gains within companies and industries.
- **The extent to which the transition is able to lower the relative cost and efficient use of renewable energy will determine the balancing effect of opportunities.** Energy efficiency improvements can both reduce emissions and save money for businesses or consumers through reductions in energy use, input costs and even improve the efficiency of production and distribution processes in the medium term (once up-front capital costs and operating expenditures are taken into consideration).[13] Capital investment into energy efficient processes could also bring increased value of fixed assets due to greater resilience, and less exposure to fossil fuel price increases.
- **The ability of markets and corporates to benefit from greater revenue opportunities from green investments, as well as new markets and products.** Rising research and development, and capital investment, in innovations can help raise expectations of future revenues and profits associated with shifting demand from consumers for green products and services. The automobile industry offers a compelling example whereby demand for electric and hybrid cars is shaping the transition through lower Scope 1, 2 and 3 emissions.
- **The likelihood that actions will contribute to lowering the cost of capital and improving its availability, which improves risk-adjusted long-term value.** Firms' actions to commit to and implement effective transition plans could over time improve access to capital at a lower cost (lower debt spreads and higher equity valuations).

Beyond these factors, the effect of policy actions on market valuations will depend on the extent and timing of measures to address market failures. Policy actions to facilitate the transition by pricing the externalities from carbon emissions or subsidising decarbonisation could improve the competitive dynamics that allow transitioning firms to access better (more patient, less costly) capital to support the transition. Policies aimed at achieving structural economic change could boost innovation and investment, including in less climate-intensive technologies (NGFS, 2019[18]). This could, in theory, benefit some parts of the global economy, and result in the increase in some asset prices. Therefore, there is a need for transparency on the scale of stranded assets and on policies that support the reduction of carbon-intensive

[13] For example, see: Seto, K.C. and Dhakal, S., 2014. Chapter 12: Human Settlements, Infrastructure, and Spatial Planning. In Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. O. Edenhofer, R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, et al. (eds.). Cambridge University Press, Cambridge, UK, and New York. Available at: http://www.mitigation2014.org. For a contrary perspective, see, for example, Alcott, H. and Greenstone, M., 2012. Is There an Energy Efficiency Gap? The Journal of Economic Perspectives, 26 (1).

activities and encourage innovations, such as solar photovoltaics (OECD, 2021[15]). Importantly, such policies should enlist a variety of instruments that adapt over time.

While evidence is mixed, financial markets appear to be using the information available to them to start pricing in the low-carbon transition, however this is hampered by insufficient data and analytical tools to measure and manage climate transition risks. Sectoral or focused market studies also suggest that while there is mixed evidence as to the extent to which capital is being allocated in line with a low-carbon transition, whereby markets that are benefiting from increasing information are experiencing shifts in company valuations, in both positive and negative directions (De Haas, 2019[19]; Alessia, 2019[20]; Trinks, 2020[21]; Bernardini E., 2019[9]). Yet, the effective market pricing of climate transition is hampered by insufficient data, including financially material metrics and analytical tools to measure and manage climate transition risks, and lack of policy clarity regarding carbon pricing and support for renewables. Notably:

- **Average Return on Invested Capital and the Price-to-Book Ratios of coal companies have been decreasing,** reflecting the coal industry's lower profitability and rising cost of capital, while these companies have become more indebted in recent years. Covid-19 has further exacerbated the industry's challenges, with default probabilities spiking for more indebted companies, as exclusion from many ESG portfolios increases the cost of capital.
- **There is some initial evidence that at least some large oil companies that have acknowledged stranded assets and offer transition strategies are benefitting from better valuations than traditional carbon-intensive peers.** However at the same time, there is also evidence that oil and gas companies that invest heavily in alternative energy sources, acknowledge stranded assets or implement internal carbon practices are not yet seeing notable valuation gains. This could be due to a number of factors, for example oil company valuations being closely tied to oil prices (OECD, 2021[15]).
- **Valuations and the cost of capital for automotive companies appear to be impacted by the low-carbon transition underway in automobile production.** In particular, the automotive industry has seen the rapid growth of electric vehicles (IEA, 2020[22]),[14] with investors starting to reward companies for implementing transition plans over those without transition plans. In this regard, valuations in the automotive industry have decreased in the past five years for selected companies with no strategy or plan and moderately increased for those beginning to transition to low-carbon activities, due in part to a lower cost of capital and clear strategies for green (e.g. hybrid, electric automobiles). Companies exhibiting low-carbon operations as a business model, such as Tesla, have also been rewarded by investors for their forward-looking technology and electric engines.
- **Valuations of renewable energy indices have more than doubled,** with associated M&A deal activity increasing steadily in the past decade, as traditional energy firms compete to acquire growing renewables firms, and as the unit cost of renewable energy becomes more competitive and in greater demand. However, renewable energy activities that are the product of R&D or acquisitions from larger traditional power players may be burdened by stranded assets or processes, creating cumbersome switching costs. At the same time, the investment in renewables still remains relatively modest, and government support is still needed to ensure that scalability and efficiency can be achieved (IEA, 2020[23]).

In sum, financial market actors are increasingly using the information available to make investment decisions that affect price and cost of capital, yet this information is not sufficient to fully support the capital re-allocation needed for the low-carbon transition. Importantly, guidance to improve such information remains high level and subject to a range of interpretations that will only suffer from greater inconsistencies if global consistency is not addressed.

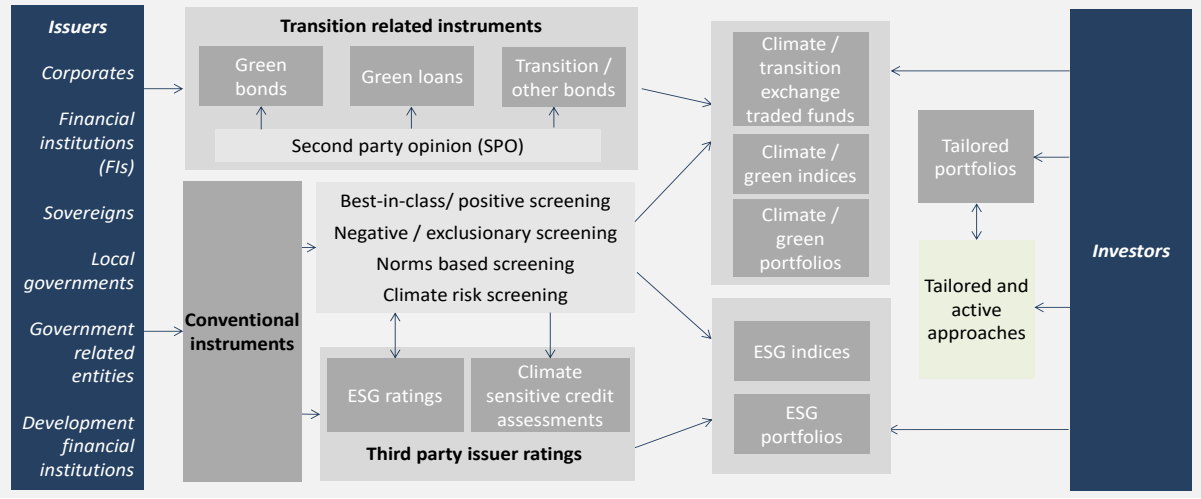
[14] IEA (2020), Global Electric Vehicle Outlook 2020, International Energy Agency, https://www.iea.org/reports/global-ev-outlook-2020

3.2. Financial market products and practices to support the low-carbon transition

As market participants increasingly grapple with and address the pricing of a low-carbon transition, a range of tools are being made available to better support the allocation of capital in line with the transition. To this end, this section highlights the range of tools that are increasingly available to investors. While they remain a work in progress, these tools are showing promise to help facilitate an orderly transition.

To the extent that they support market efficiency, further growth of tailored climate-related financial market products and practices to realign capital with low-carbon economies can help support the climate transition. Such tailored climate and transition-relevant products encompass instruments for issuers, third party ratings, as well as index and portfolio products to help channel available capital. If fit for purpose, these products have the potential to improve information flow, price discovery, market efficiency, and liquidity in support of a low-carbon transition. More importantly, in the event that the transition is disorderly and involves sudden changes in policy coordination, tailored climate and transition-relevant products could in theory help markets manage exposures, absorb losses on carbon-intensive assets, and redirect investments to parts of the market that will efficiently contribute to the transition (OECD, 2021[15]). In doing this, they can help make markets more agile in facilitating an orderly transition through price discovery and capital flows.

Figure 7. A growing number of financial market products and practices are emerging with the aim to support the climate transition



Note: Non-exhaustive illustration, OECD authors' illustration.
Source: OECD (2021), Financial Markets and Climate Transition, OECD Publishing, Paris, forthcoming

The products and instruments outlined in Figure 7 have grown rapidly from relatively early stages of development, and additional policies may be needed to ensure market resilience, integrity, confidence, and to help strengthen their ability to contribute to an orderly transition. For example, climate transition benchmarks and funds, in addition to screening strategies and stewardship (including shareholder activism) show potential to help directly support the transition and can in some cases show potential to deliver higher risk-adjusted returns. Climate scenario analysis and stress testing also show benefits in terms of identifying potential climate-related financial risks, but could also be used to help financial market actors identify opportunities (e.g. from new technologies and innovations) in the context of the transition. While increased demand for products and instruments that support the low-carbon transition is promising, more efforts are needed to improve the verifiability of underlying information and strategies related to issuers' climate transitions.

Policy considerations

Notwithstanding important progress, there are a number of impediments that hinder the role of financial markets in facilitating an orderly transition to low-carbon economies. They include insufficient data and tracking mechanisms to ensure that companies commit to and follow-up on their transition plans, and absence of established frameworks to help market participants make sense of stranded assets, transition plans, opportunities and policy developments to efficiently price transition risk into asset valuations. Reducing uncertainties and inefficiencies can help lower the cost of capital and increase asset valuations, which would provide the right incentives for sustainable finance to flow to those firms (even current high carbon emitters) that are committed to the transition.

Policy measures are therefore warranted to strengthen alignment of ESG approaches with long-term value and the low-carbon transition.[15] An orderly, well-financed, and 'just'[16] climate transition not only supports the Paris Climate Agreement objectives, but can also contribute to economic growth and the SDGs through the development of affordable and clean energy, responsible consumption and production, and quality infrastructure. Therefore, policies could be considered to strengthen ESG rating frameworks to better support long-term value and the low-carbon transition, including policies to strengthen the tools, methodologies, and products to further help support an orderly transition over time.

4.1. Considerations to strengthen global ESG practices

Despite progress, ESG approaches suffer from considerable shortcomings with respect to consistency, comparability and quality of data that undermine its broader use and the trust of investors. The following high-level considerations could help support global consistency to allow various constituencies to focus their efforts within and across markets, and avoid market fragmentation.

- **Ensure global interoperability, comparability and quality of core ESG metrics in reporting frameworks, ratings, and investment practices to address global fragmentation over time.** This would include transparency on core metrics used by rating providers, financial market regulators and stock exchanges, irrespective of the industry, that form the core reporting of E, S, and G pillars. Where possible, guidance from market regulators and stock exchanges should be established and build on existing climate-related metrics and reporting frameworks to eventually cover the full range of material ESG risks. Existing global standards such as the OECD Guidelines for Multinational Enterprises and related due diligence guidance, G20/OECD Principles of Corporate Governance, UN Principles for Responsible Investment (PRI), Sustainability Accounting Standards Board (SASB) guidelines, and emerging Corporate Sustainability Reporting Directives all provide a foundation for an agreed, international approach to strengthen global ESG practices.

[15] The considerations in this section are based on thorough empirical analysis and substantial engagement with central banks, finance ministries, regulators, and financial sector participants through the OECD Committee on Financial Markets (CMF).

[16] While a number of definitions exist, 'just' transition typically refers to limiting the adverse economic and societal impacts of a low-carbon transition, including on certain countries, regions, industries, communities, or workers, and to support better alignment with the SDGs. See Allianz (2019), Climate change must change investors' portfolios, Allianz Global Investors | Climate change must change investors' portfolios (allianzgi.com); METI/JFSA (2021), Basic Guidelines on Climate Transition Finance, Japan Financial Services Agency; Ministry of Economy, Trade and Industry; and Ministry of the Environment, 20210507001-3.pdf (meti.go.jp).

In addition, sector specific guidance could be developed to support better quality reporting across core metrics.

- **Consider strengthening the relevance of ESG metrics used by ESG rating providers through alignment with *long-term* enterprise value.** Currently, ESG rating and reporting approaches do not sufficiently clarify the materiality of either financial or non-financial factors. To support this, a comparison to assess the relative weighting of metrics and financial considerations across markets and industries could be considered**.** Explicit guidance from financial market regulators and framework providers would help clarify how financial materiality of ESG metrics differs across sectors and industries, to ensure that chosen core and sector/industry specific metrics capture the important components of materiality across E, S, and G issues. Also, they should give consideration to the relative weighting of metrics by financial materiality, to help strengthen the relevance of ESG assessments and scores for mainstream investors whose objectives include long-term value. Further assessment is needed to explain the temporal nature of materiality, and how non-financial material factors could affect enterprise value over the medium or long-term.
- **Promote transparent[17] and comparable scoring and weighting methodologies for established ESG rating providers and indices.** This should include guidance support the disclosure of methodological frameworks, weightings and choice of specific subcategories and metrics. There should be transparency on the extent to which subjective judgement is used within methodologies (and in metric creation), and clarity on how methodological choices relate to financial materiality over the long-term (i.e. if responsible business conduct can improve reputation and financial standing). In addition, financial market regulators could promote greater transparency through investor education on methodologies and results of portfolio composition relative to traditional market portfolios.

On the environmental pillar of ESG rating and investing, policy makers, regulators and market participants should consider measures to improve practices to better align with a low-carbon transition:

- **Financial market authorities could facilitate greater transparency on the high-level purpose of the environmental pillar by ESG rating providers so that market participants understand the extent to which their methodology aligns with long-term value and/ or with climate related risks and opportunities.** This should include guidance from central banks[18], supervisors and financial market regulators on categories of metrics and methodological good practices within the E pillar and outline the extent to which these may be more or less relevant for climate-resilience. In addition, clear boundaries should be defined as to which areas of the E pillar are relevant to long-term financial value.
- **Improve transparency of methodological practices, metrics and category weighting to generate environmental pillar scores and indices.** This could include regulatory principles to support the consistent disclosure of clear and publicly available information by rating providers on metrics and the extent to which supplementary analysis or direct outreach with issuers is used. There should also be transparency on the extent to which rating providers over or under-weigh certain categories including for example carbon emissions and intensity, energy efficiency, investment in renewables, or forward-looking information on transition plans. These aspects will be important to clarify the weight of certain metrics, and define what drives the E pillar score.

[17] This includes transparency of the high-level elements of methodologies and areas of focus by rating providers (i.e. climate risks or energy management) and transparency of the minimum requirements rating providers set for issuers in order to support companies of all sizes in being assessed and having an ESG rating.

[18] For example, central banks that have committed to help green the financial system may wish to clarify how they use ESG integration; whether they are using the Environmental pillar to contribute to aligning exposures to climate transition, and how they will engage with high-emitting issuers within their portfolios.

- **Encourage greater transparency and precision of environmental pillar sub-categories, such as with respect to metrics that could be used to develop climate transition or environmental impact sub-scores, to improve the informational value of the environmental pillar score.** As a range of stakeholders use the environmental pillar for different objectives, financial market authorities should encourage greater transparency of sub-metrics used to calculate sub-category scores, and clarification as to whether these focus on climate transition risks and opportunities or broader environmental factors (e.g. water management), with information on how they relate to long-term value.

Overall, greater international co-operation and stakeholder engagement are needed to ensure that ESG practices progress in a manner that does not give rise to market fragmentation, and upholds investor confidence and market integrity.

4.2. Considerations to strengthen the tools, methodologies, and products to support a low-carbon transition

While there is evidence that financial markets are taking steps to facilitate a low-carbon transition, current estimates suggest that the global economy is not on track to limit CO2 emissions. Hence, at some point, abrupt policy changes could have an impact on market prices. To support an orderly transition, governments should consider policy measures available to support the flow of capital to the real economy in order to finance a low-carbon transition, these include effective carbon pricing, environmental and industrial policies, fiscal and monetary incentives, and use of public financing and blended finance.[19] In addition, strengthening the tools and methodologies that underpin disclosure, valuations, and scenario analysis in financial markets and traded products will further support an orderly low-carbon transition:

- **International co-operation between market regulators, IOSCO, IFRS and market participants (supported by international organisations and central banks) could further strengthen TCFD disclosure practices and improve granularity, reliability and consistency of metrics with respect to climate risks and opportunities.** [20] Including through mandatory sustainability corporate reporting to support greater data reliability of Scope 1, 2 and 3 emissions and carbon intensity. International and national sustainability reporting and corporate disclosure guidance should build on the TCFD framework to improve materiality of climate transition related disclosures, and guide the development of forward looking metrics on opportunities. Guidance could also be developed to improve the consistency of data with respect to fuel-efficient expenditures, R&D, and development of new products and services. Greater assessment by central banks and international organisations of the impact of anticipated policy measures with respect to carbon emissions and elements of the TCFD framework are also warranted.
- **Central banks (particularly supervisors), finance ministries and market regulators should encourage the use of science-based interim targets[21] and transparency of climate transition plans to achieve a 2 degree scenario.[22]** This should include regular assessment or verification (where existing regulation allows) of the quality of transition plans and strategies, including the

[19] While these are outside of the scope of this report, such policies will set the foundation for actions in financial markets and will be integral to support an orderly transition, whereby losses could be absorbed as they give way to gains. In the absence of such measures, financial markets may operate sub optimally, and capital could continue to flow in indiscriminate directions, rather than toward accelerating the transition.

[20] The TCFD's *Proposed Guidance on Climate-related Metrics, Targets, and Transition Plans*, published for consultation in June and July 2021, illustrates the importance of the need for better transparency, harmonisation and precision of key metrics related to transition plans.

[21] Targets are considered 'science-based' if they are in line with what the latest internally agreed climate science deems necessary to meet the goals of the Paris Climate Agreement – limiting global warming to well-below 2°C above pre-industrial levels and pursuing efforts to limit warming to 1.5°C.

[22] This is of particular importance when applied to the ICMA bond recommendations.

extent to which qualitative (i.e. binary metrics) or quantitative information is used in the development of E pillar scores. Guidance and principles on core metrics to assess the quality of transition plans and strategies could be an important component of this. While variations across geographies and industries may be justified, guidance should achieve high-level consistency on the prioritisation or near, medium term, and long-term global metrics. Central banks (particularly supervisors), finance ministries and market regulators should encourage disclosure of information on the scenarios used for transition plans by following TCFD recommendations, [23] as well as clear base and target years for companies underlined by science-based targets in transition plans. Such plans could be subject to verification by a trusted third party, and include engagement between investors and boards to facilitate emissions reduction strategies (including through stewardship plans). This could build on preliminary climate transition "checks" developed by a number of consulting and international bodies to help investors assess and compare plans (such as the Science Based Targets Initiative and any other national transition roadmaps), noting that these efforts remain at an early stage of development.

- **Transparency and clarification of stewardship plans of major asset managers and institutional investors in their engagement with Boards and executive management on reduction of climate intensity and net-zero targets.** This could include guidance from market supervisors to ensure that asset managers appropriately engage with transitioning firms and heighten efforts to engage with boards and facilitate assessment of the veracity of transition plans. Asset managers are expected to also disclose principles on their sustainability investment such as their climate transition plans, and are encouraged to elaborate on actions when issuers do not adhere to such plans. Progress is being made in this area, but further efforts can be made to support due diligence in the tracking and assessment of tangible progress, such as through the amount and forms of resolutions to support TCFD reporting and the publication of annual transition plans, and the commitment to net-zero or tangible decarbonisation strategies.
- **Supervisory authorities should encourage pilot scenario analysis of financial institutions to assess potential losses from carbon exposures against anticipated valuation increases from opportunities through renewable energy, and new green technologies.** Currently, scenario analysis by institutions that highlight peak risk of disorderly transitions due to effective carbon pricing policies and technological breakthroughs to accelerate transitions to low-carbon economies may wish to better assess the offsetting benefits of the transition. In this respect, static scenario analysis that only assess the impact of the stranding of assets and processes, without testing for the dynamic aspects of the transition occurring across industries, may overstate credit losses and market disruptions in bank and non-bank financial intermediation. In this respect, scenario analysis could also take into consideration policies to mitigate such impacts, to better inform financial stability and fiscal initiatives. In addition, scenario analysis can raise financial institutions' awareness and preparedness to manage climate-related risks, and support clarification as their intention to raise the amount of capital required to withstand the level of climate risks on their balance sheets.
- **Greater assessment by policy makers on how a range of climate-related policies could better incentivise the transition.** For example, international progress to support an effective carbon price could further support financial markets in their role to channel resources efficiently to activities that reduce carbon intensity by reflecting the true cost of carbon emissions. In addition, a shift in support mechanisms from fossil fuels to renewable energy subsidies could shift operating expenses and in turn activities to support a transition. While scenario analysis exercises, more holistic assessments are needed to capture upside benefits and ways that policies can support

[23] The Sectoral Decarbonisation Approach (SDA) is one of the pathways that refers to a scientifically-informed method for companies to set GHG reduction targets necessary to stay within a 2 or 1.5 degree temperature rise above preindustrial levels.

positive transitions with net benefits for markets to contribute to more sustainable economic growth.

International co-operation is urgently needed to ensure that ESG and climate transition-related practices progress in a manner that does not give rise to market fragmentation, and upholds investor confidence and market integrity. Addressing challenges related to information on sustainable risk and opportunities is of vital importance to ensure that capital is allocated to investments that support the low-carbon transition and sustainable growth, and is a focus area of the G20 Sustainable Finance Working Group under the Italian Presidency. This report aims to support the Working Group by providing an assessment to improve ESG and environmental pillar approaches and unlock value related to carbon emissions intensity, plans to decarbonise, renewable energy innovations and green opportunities captured in climate transition plans, with recommendations to support the G20 in strengthening alignment. In particular, the report highlights the importance of having effective tracking and verification processes in climate transition finance to ensure that G20 members can assess progress in line with a low-carbon transition.

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Annex A. Overview of ESG practices and relevant OECD analysis

A.A.1. The ESG rating and investing ecosystem

ESG investing has become a leading form of sustainable finance, and has shifted from the early stages of development to the mainstream in a number of OECD jurisdictions. This has been driven in large part by two competing trends. From a value perspective, asset managers and institutional investors increasingly recognise that non-financial sustainability risks (including Environmental, Social and Governance, or ESG) can have a material impact on risk-adjusted returns in the long-term, due to better returns, lower cost of capital, and reduction of controversial event risks. From a values perspective, there has been a rise in 'social investing' as financial consumers become more attuned to how their savings are invested, with a growing share looking to avoid supporting activities that do not align with their values. As a result, the market penetration of ESG ratings globally represented the equivalent of 80% of global market capitalisation in early 2020, with indications that ESG approaches are being utilised by institutional investors managing over USD 40 trillion (OECD, 2020[2]).

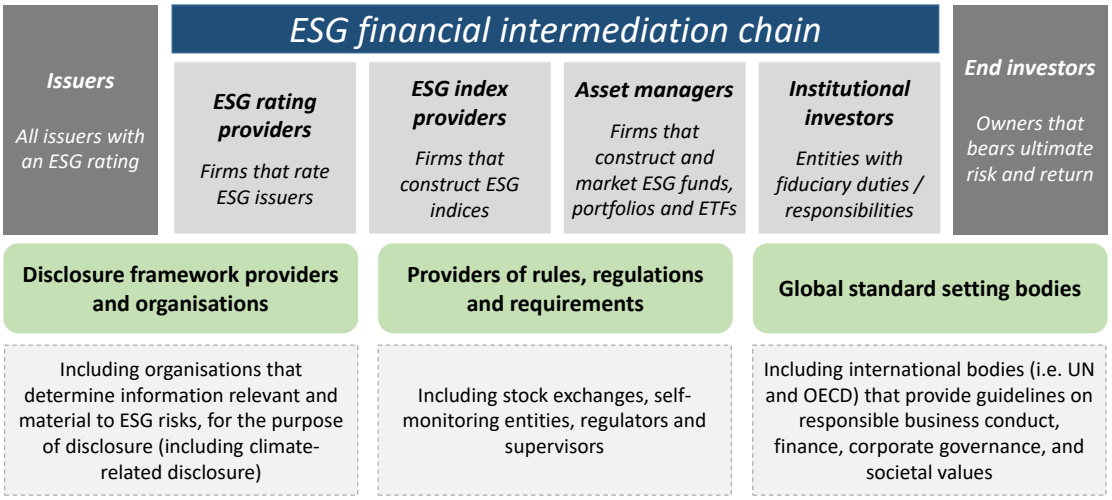
While ESG practices have progressed beyond early stages of development in a number of OECD member countries, such practices have also drawn scrutiny with respect to ESG market fragmentation, competing disclosure regimes and inconsistent metrics, and the lack of clear alignment with financial materiality. In practice, terminologies and approaches range so widely that the concepts of high-scoring ESG companies or investments are highly subject to interpretation. Disparate practices, data, disclosure, and assessment practices have raised serious concerns that ESG, in its current state of development, is not well suited to deliver on either long-term value or alignment with societal values. The risk that ESG investment practices engage in "ESG washing" are also growing, and could risk undermining market confidence and integrity, at a time where investments that are better aligned with climate transitions and a sustainable recovery from the Covid-19 pandemic are critical.

The ESG financial ecosystem consists of a number of market participants who are all involved in the development and assessment of ESG information, ratings, indices, approaches and products (Figure 8)**.** The first set of actors include issuers of capital instruments, such as governments, businesses, and financial institutions that issue debt and equity in financial markets. Each of these issuers are increasingly providing non-financial information on environmental, social and governance issues. Secondly, there are providers (typically third parties) of ESG rating and ESG indices. ESG rating providers include firms that provide sustainability metrics and information supported by a qualitative and quantitative assessment of the non-financial disclosures by issuers.[1] Some of these rating providers also develop ESG indices, which generally reflect asset class and asset selection weightings based on ESG ratings, that align with various ESG investment approaches and strategies. Thirdly, these outputs are then used by asset managers that employ ESG approaches to develop ESG-influenced investment portfolios and funds. Asset managers may include institutional investors that are asset owners, or funds that are in turn distributed to institutional and retail investors. The extent to which asset managers act upon the ratings to rebalance

portfolios toward higher ESG scores and away from lower ESG scoring issuers is largely determined by the individual asset manager, and practices range widely.

ESG reporting framework providers support market participants by developing disclosure guidance and oversight that feed into approaches, and offer guidance to the multitude of issuers that must cater to a spectrum of sustainability information needs. For example, disclosure organisations provide standards in order to offer guidance for firms that enter the ESG ecosystem. These include the Sustainability Accounting Standards Board (SASB), which focuses on financial materiality, the Global Reporting Initiative (GRI), and International Integrated Reporting Council (IIRC). In addition, framework providers specific to climate risks include the Taskforce on Climate-related Financial Disclosures (TCFD) and the Climate Disclosures Standards Board (CDSB), which reflect financial and environmental materiality in their approaches to varying degrees. These efforts have been endorsed by the International Organisation of Securities Commissions (IOSCO) to align sustainability reporting globally. Market regulators and national supervisors are also involved in drafting guidance and rules regarding ESG practices related to disclosure, taxonomies, ratings, benchmarks, and investment marketing. This includes actions by the European Union, in particular as part of the commitment to achieve the goals of international agreements such as the Paris Climate Agreement and the United Nation's (UN) SDGs.

Figure 8. The ESG financial ecosystem consists of a number of market participants involved in the development and assessment of ESG information, ratings, indices, approaches and products

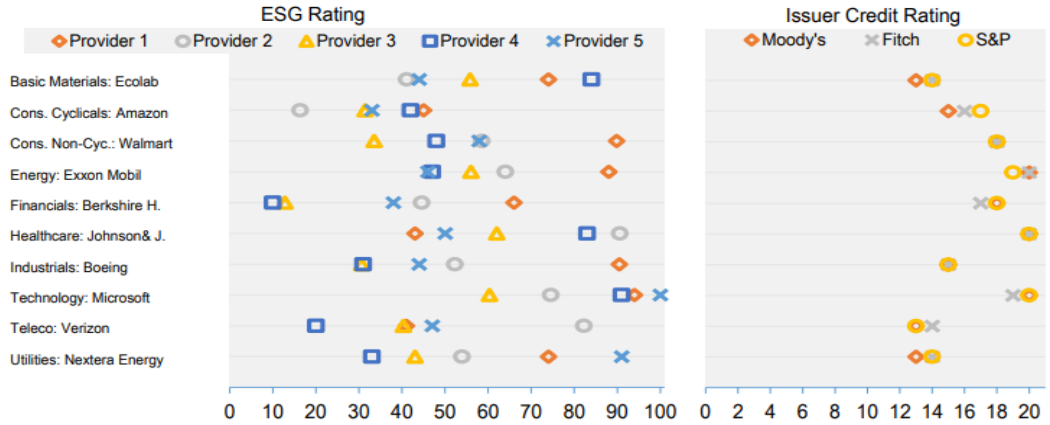


Source: Adapted from OECD (2020), OECD Business and Finance Outlook 2020: Sustainable and Resilient Finance, OECD Publishing, Paris

Widely different ESG ratings for individual issuers may be due to several challenges. First insufficient standardisation and consistency of underlying data, which – unlike information from firms' financial statements that informs credit ratings, does not benefit from well-established accounting standards. When analysing the same sample of issuers in Figure 1, credit ratings for those same issuers vary much less than ESG ratings (Figure 9). This raises important questions on the reliance of ESG ratings to make investment decisions, including for structuring investment portfolios that are considered to have a tilt toward higher ESG scores. In short, if high ESG scores are simply a judgment that varies significantly across firms, the extent to which investors can be assured that this approach either provides enhanced returns or aligns with particular societal values merits further scrutiny by policy makers and the investment community.

Figure 9. While both ESG ratings and credit ratings can differ across providers, credit ratings vary much less than ESG ratings for the same issuers

Selected ESG ratings and issuer credit ratings by sector in the United States, 2019



Note: Sample of public companies selected by largest market capitalisation to represent different industries in the United States. The issuer credit ratings are transformed using a projection to the scale from 0 to 20, where 0 represents the lowest rating (C/D) and 20 the highest rating (Aaa/AAA). Data from Bloomberg, MSCI, Refinitiv, with OECD Staff calculations. For full methodology, refer to source.
Source: Boffo and Patalano (2020), ESG Investing: Practices, Progress and Challenges, OECD Paris

A.A.2. Performance of ESG-related products

Notably, different ESG indices have varying risk and performances depending on how they are built. Figure 10 shows that for the ACWI minimum volatility index performs slightly better than its ESG counterpart, even though the latter has a lower drawdown risk (-7.8% against -8.7%), with that being true for most ESG indices. For instance, the ACWI Quality ESG reduces the volatility of the benchmark while maintaining the same return. This could show that investors are willing to renounce a part of returns in order to achieve higher security, namely through a lower drawdown risk. When looking at the other indices, they are treated as inefficient according to efficient frontier analysis. This might be due to the different nature of the indices analysed and the fact that they are treated as single assets when in reality they are not.

Figure 10. Different ESG indices have varying risk and performances depending on how they are built.

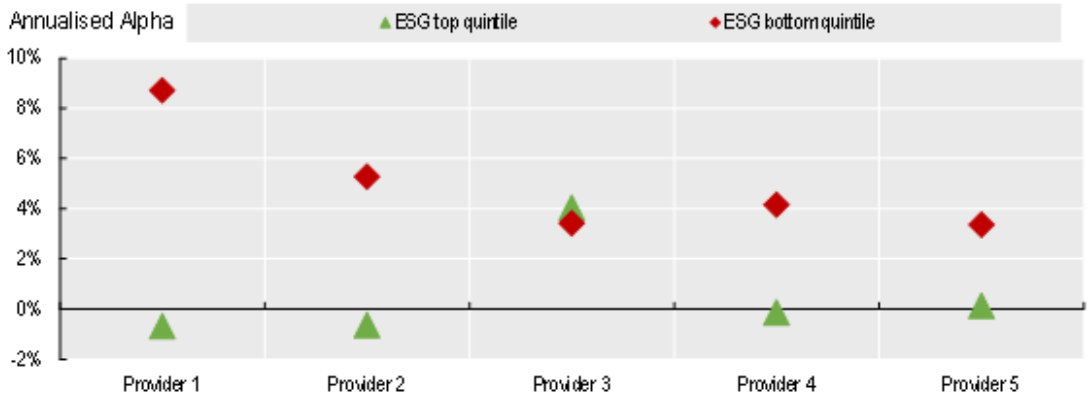
Comparison of ESG and non-ESG MSCI indices by risk-adjusted performance



Note: Data from Bloomberg, MSCI, Refinitiv, with OECD Staff calculations. For full methodology, refer to source.
Source: Boffo and Patalano (2020), ESG Investing: Practices, Progress and Challenges, OECD Paris

Figure 11. Risk-adjusted returns appear lower for high scoring ESG portfolios compared to low-scoring ESG portfolios

Annualised Alpha for different portfolios by ESG providers



Note: Data from Bloomberg, MSCI, Refinitiv, with OECD Staff calculations. For full methodology, refer to source.
Source: Boffo and Patalano (2020), ESG Investing: Practices, Progress and Challenges, OECD Paris

The lack of clarity on the relationship between ESG approaches and stronger financial performance demonstrates that more work is needed to improve the transparency, consistency and comparability, of ESG approaches, including the way in which materiality is considered in the creation of ratings. Effectively addressing these concerns may allow investors to unlock the true potential of ESG investing for long-term sustainable investing. ESG ratings methodologies range widely and, while diversity in market participants perspectives of investment value are welcome, the dispersion of ratings of E, S and G scores across major ratings providers is so wide that it undermines the common definition of what is a high-ESG scoring company. Some possible biases may also exist, with lower-scoring ESG firms tending to be much smaller in terms of market capitalisation. Such a bias could put SMEs at a disadvantage in capital raising due to lower scores.

A.A.3. Environmental pillar metrics and methodologies

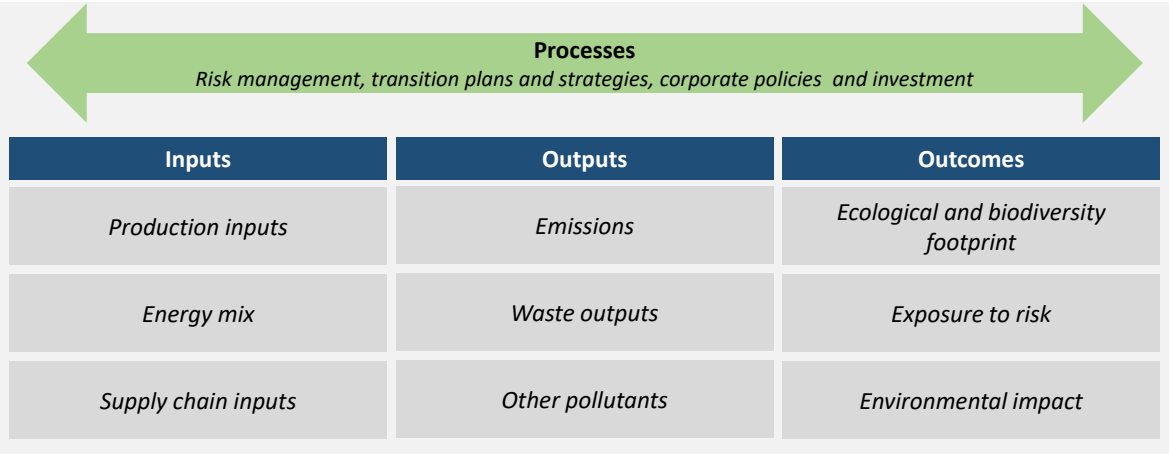
Transparent, accurate and comparable ESG data are critical for effective investment analysis and decision-making to support capital allocation in support of a low-carbon transition. (FSB, 2021[24]) In the context of the environmental pillar, it is equally important that investors have reliable information in order to prepare their portfolio for future risks that may arise from the carbon transition, and to facilitate decisions that deliver risk-adjusted returns on investment, and ability to withstand potential climate-related risks.

The difference in the number of metrics used and measurement criteria adopted by each rating provider contributes to inconsistencies. Taking the example of Bloomberg, MSCI and Thomson Reuters, the number of metrics selected can vary from 26 to 115, with a varying focus on either environmental impact, carbon footprint (or other related output metrics), or transition to low-carbon activities. For one provider, 74% of the number of metrics measure energy, carbon emissions, waste and water management, whereas for another, this represented only 19% of metrics. Similarly, climate impact, climate risk management, and environmental policies represent 46% of metrics for one provider, whereas only 22% and 7% for the other two providers (Boffo, 2020[11]).

Environmental pillar metrics can also be grouped as falling somewhere along the input-output-outcome-process chain highlighting the mix of factors and measurement amalgamated into one E

pillar score (Figure 12). Production-related metrics such as those measuring energy consumption or water withdrawals tend to be inputs. Emissions metrics, including CO2 and GHG emissions by source, regardless of whether they are expressed in unit value or as a share of revenue tend to represent outputs. Outcome focused metrics can include those that look at impact such as ecological and biodiversity. Process metrics can include binary metrics on disclosure (i.e. does a company disclose such items) or descriptions of policies and risk management practices; including for example, information on board oversight related to climate risk and transition to renewables or transition strategies and plans. The logic used in this chain can also be applied to frameworks such as those set out by the Task Force on Climate-related Financial Disclosures (TCFD) which recognises the importance of: (a) metrics on climate-related risks associated with water, energy, land use, and waste management (inputs and outputs); (b) greenhouse gas emissions using the scope 1 (direct emissions), 2 (indirect emissions from direct production), and 3 (indirect emissions from activities along the value chain) definitions (outputs and outcomes), and; (c) company management processes anticipated regulatory requirements or market constraints or other goals (TCFD, 2017[12]).

Figure 12. Environmental pillar metrics can be grouped as falling somewhere along the input-output-outcome-process chain



Note: Non-exhaustive OECD authors' illustration
Source: Boffo, Marshall and Patalano (2020), ESG Investing: Environmental Pillar Scoring and Reporting, OECD Paris

While a range of analytical approaches enrich diversity of market views that contribute to price discovery, the concentration and lack of transparency of key ESG rating providers' methodologies suggest that users may not be able to interpret why issuers received high or low E pillar scores by different raters. In sum, the aggregation of these metrics that serve different purposes for different stakeholders may not be the optimal format and would benefit from greater transparency and common definition of subcategory metrics to allow investors and stakeholders to understand which factors may have more or less importance in the methodology of each rating provider.

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