ISSN 2392-1641
e-ISSN 2450-0097

Economics and Business Review

Volume 9 (1) 2023

CONTENTS

Poznań University of Economics and Business Press

Paper based publication

ISSN 2392-1641
e-ISSN 2450-0097

POZNAŃ UNIVERSITY OF ECONOMICS AND BUSINESS PRESS
ul. Powstańców Wielkopolskich 16, 61-895 Poznań, Poland
phone +48 61 854 31 54, +48 61 854 31 55
www.wydawnictwo.ue.poznan.pl, e-mail: wydawnictwo@ue.poznan.pl
postal address: al. Niepodległości 10, 61-875 Poznań, Poland

Printed and bound in Poland by:
Poznań University of Economics and Business Print Shop

Circulation: 200 copies

sciendo

sciendo

Economics and Business Review
https://www.ebr.edu.pl

Vol. 9 (1), 2023: 65-93
https://doi.org/10.18559/ebr.2023.1.3

Divest or engage? Effective paths to net zero from the U.S. perspective

Andrew G. Buks[1]

Konrad Sobański[2]

Abstract

The aim of this article is to critically review and evaluate two ESG-based investment strategies—divestment and engagement for alignment of investment portfolios with climate change mitigation goals of the United Nations. The article compares both approaches in terms of their effectiveness of decarbonization, using the case study method. First, the case on fossil fuels divestment by Harvard Management Company is analysed. The second case study discusses shareholder engagement endeavors by Engine No. 1 hedge fund and its investment in ExxonMobil. The findings indicate that divestment may have non-immediate impact on corporate behavior and carries political and legal retribution risks. Engagement, on the other hand, presents itself as a more plausible option as it takes less time to deploy and, therefore, can produce more immediate and impactful results. Nevertheless, both divestment and engagement can play mutually supportive roles in addressing climate change by the investment industry.

Keywords

- divestment
- engagement
- ESG
- net zero transition
- decarbonization

JEL codes: G10, G11, G15, G24

Article received 19 December 2022, accepted 7 April 2023.

Suggested citation: Buks, A.G., Sobański, K. (2023). Divest or engage? Effective paths to net zero from the U.S. perspective. *Economics and Business Review*, *9*(1), 65–93. https://doi.org/10.18559/ebr.2023.1.3

[1] Black Hills State University, College of Business and Natural Sciences, Spearfish, SD, U.S.A., andrew.buks@bhsu.edu, https://orcid.org/0000-0001-8210-6068.

[2] Poznań University of Economics and Business, Institute of International Business and Economics, Department of International Finance, al. Niepodległości 10, 61-875 Poznań, Poland, konrad.sobanski@ue.poznan.pl, https://orcid.org/0000-0002-4941-7443.

Introduction

In 1912 a New Zealand newspaper reported that burning fossil fuels leads to CO_2 emissions into the Earth's atmosphere, causing climate change and resulting in global warming for thousands of years to come (Rodney, 1912). Over 100 years later the effects of climate change have become increasingly more visible and extensive in every place on planet Earth and addressing atmospheric global warming is humanity's highest priority (IPCC, 2022). The atmospheric carbon dioxide levels have reached the highest point in 800,000 years (Lüthi et al., 2008). Its effects cannot be overturned for decades to come and the potential outcomes associated with our economies' decarbonization efforts will not be seen for several generations (Collins et al., 2013). It is also hard to predict the impact of our global decarbonization efforts. However, without mitigation efforts to achieve net zero by 2050, the likelihood of a climate crisis will increase. Currently the mean global temperature is expected to increase by four degrees Celsius by the end of the 21st century, leading to catastrophic outcomes not only for our ecosystems but also changing the way of life on Earth (Collins et al., 2013). The investment community has responded by factoring climate change risk into asset allocation models and launching ESG-based (Environmental, Social and Governance) investment funds across the globe with Europe and the United States being the biggest markets (Diab, 2021). The popularity of such investment vehicles continues to grow, and the ESG-based investing landscape is becoming increasingly regulated. To support decarbonization efforts, investment strategies and asset allocation models vary from divestment to engagement of fossil fuel companies in hopes that fossil fuel companies embrace decarbonization and thus preserve their long-term value by reaching net zero (Funk & Walker, 2021). Divestment includes negative and exclusionary screening of non-ESG stocks whereas engagement involves investing in non-ESG stocks and shareholder activism with the aim of leveraging shareholder power to affect corporate behavior (Cole et al., 2020).

The aim of this article is to critically review and evaluate two ESG-based investment strategies—divestment and engagement—available to investors for alignment of investment portfolios with the climate change mitigation goals as per the 2015 Paris Agreement (COP21) and the 2021 Glasgow Climate Pact in Glasgow (COP26). The article compares divestment vs. engagement and analyzes their advantages and drawbacks in view of the decarbonization goals for the globe. The paper applies the case-study method. The first case study discussed is fossil fuel divestment campaign by the Divest Harvard student-led movement and Harvard Management Company managing Harvard University's endowment fund. The second case study focuses on shareholder

activism via an engagement strategy by Engine No. 1 hedge fund and its investment in ExxonMobil Corporation.

The article is organised as follows: In Section 1 stylised facts about greenhouse-gas emissions and their implications for the United States are presented. Section 2 provides a brief description of the global decarbonization goals and issues with their implementation. In Section 3 decarbonization goals and responsibility of the investment industry are discussed. Section 4 reviews the literature on sustainable investing, ESG-based investing, and impact investing. Section 5 critically analyzes advantages and disadvantages of divestment and engagement strategies. The article concludes with policy recommendations and directions for further research.

1. Stylised facts about greenhouse-gas emissions and their implications for the United States

Since the beginning of the Industrial Revolution in the mid 18th century the concentration of carbon dioxide (CO_2) in the Earth's atmosphere has increased exponentially causing climate change and leading to global warming of our planet (Friedlingstein et al., 2022). Between 1850 and 2021 the cumulative fossil carbon dioxide emissions reached the level of 465 ± 25 GtC (gigatons of carbon) and during that period, 46% of fossil carbon dioxide emissions came from burning coal, 35% from burning oil, 15% from burning natural gas, 4% from decomposition of carbonates and flaring (Friedlingstein et al., 2022). As of 1917 the United States has been the largest contributor of the cumulative carbon dioxide emissions and for the period of 1850–2021, the United States is responsible for 115 GtC (24% of the global emissions) followed by the European Union with 80 GtC (17% of the global emissions), and China with 70 GtC (14% of the global emissions) (Friedlingstein et al., 2022) (see Figure 1).

In 2020 the largest source of greenhouse gas emissions in the United States came from burning fossil fuels for transportation (27%), electricity production (25%), industry (24%), commercial and residential (13%), agriculture (11%) (EPA, 2023)[3]—see Figure 2.

Global warming caused by climate change is having a significant impact on the United States and is affecting many aspects of United States' environ-

[3] Land areas can act as a sink (absorbing greenhouse gas emissions from the atmosphere) or a source of emissions. In the United States, since 1990, forests and other lands have absorbed more greenhouse gas emissions from the atmosphere than they emit (EPA, 2023). This is why the US government should support nationwide and global reforestation and afforestation efforts.

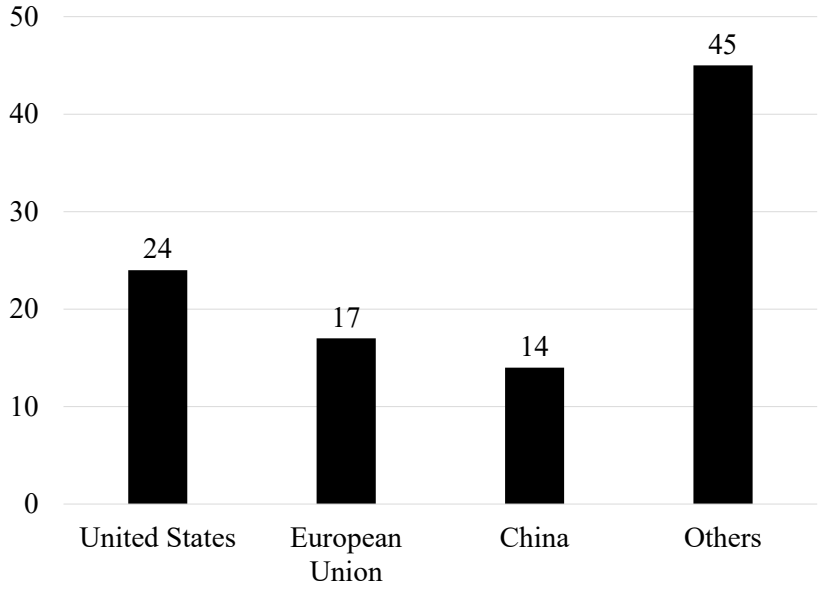

Figure 1. The major emitters of carbon dioxide, 1850–2021

Note: Share of countries in the global carbon dioxide (CO_2) emissions from 1850 through 2021 (%).

Source: Based on data provided by (Friedlingstein et al., 2022).

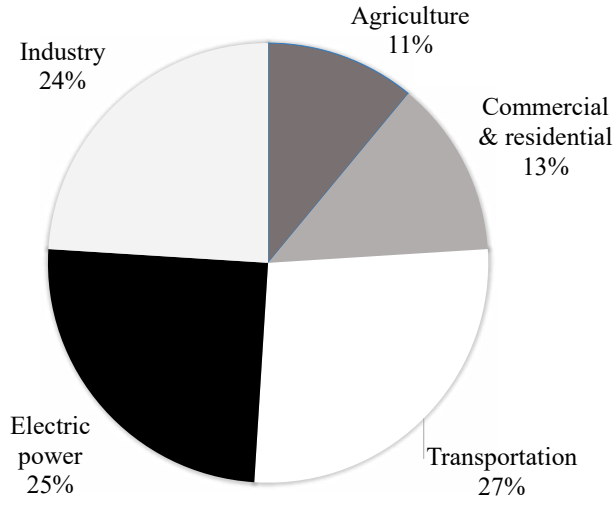

Figure 2. Total US greenhouse gas emissions by economic sector in 2020

Notes: Share of economic sectors in the US greenhouse gas emissions in 2020. Greenhouse gas emissions include carbon dioxide (CO_2), methane and nitrous oxide.

Source: Based on data provided by the Environmental Protection Agency (EPA, 2023).

ment and society. Some of the most notable effects include: (1) rising temperatures; (2) changing precipitation patterns; (3) sea-level rise; (4) agricultural impacts; (5) health impacts; (6) impacts on ecosystems; and (7) economic impacts (IPCC, 2022).

Average US temperatures increased between 1920–2020 by around one degree Celsius, with most of the increase occurring since 1970 (NOAA, 2022). Every year the US experiences more frequent and intense heat waves (Hicke et al., 2022). Changing precipitation patterns lead to more frequent flooding and more intense storms. Droughts across North America's midwestern and western regions affect agriculture including ranching. Sea-level rise caused by melting polar ice caps and melting glaciers in Alaska have been threatening and flooding American coastal cities and regions, particularly in the South. Coastal cities such as Miami, New Orleans, and Houston suffer from more frequent and more powerful weather events making it increasingly difficult to live for millions of residents (Hicke et al., 2022). Climate change also negatively impacts US's agriculture affecting crop productivity and causes challenges for farmers and ranchers, changes in pest and disease pressure, and shifting growing seasons. Climate change is a leading factor contributing to an increase in air and water pollution, and exacerbating existing health problems such as allergies and heat-related illnesses.

Lastly the effects of climate change are having a significant impact on the US economy including: (1) increased costs for business and governments due to the need to adapt infrastructure to climate changed-related weather events. Also the increased frequency of such extreme weather events as hurricanes, wildfires floodings or droughts is leading to increased costs for insurance companies and governments to respond to these events and assist affected communities; (2) increased costs associated with disruptions of supply chains due to changes in temperature, extreme weather events such droughts or floodings; (3) decreased revenues associated with the tourism industry. For example, the decline of such iconic species as polar bears and sea otters is affecting the tourism industry in Alaska and leading to decreased revenues for local businesses and governments; the 2022 flooding of the National Yellowstone Park in Montana led to the park's closure, negatively affecting revenues not only for local businesses, but also neighboring states (Pratt, 2022). Furthermore, declining snowpacks in the Rocky Mountain region and changes in snow precipitation patterns are affecting the ski sector leading to decreased revenues and job losses in the Colorado tourism industry; (4) climate change is affecting various industries such as fishing and forestry (Hicke et al., 2022). For example, warmer ocean temperatures are affecting the distribution and abundance of fish species leading to decreased catch levels and decreased revenues for the US coastal communities (Hicke et al., 2022). Similarly, changes in precipitation patterns and temperature are affecting the productivity and viability of forests leading to decreased timber yields

and decreased revenues for forestry communities; and (5) addressing climate change creates opportunities for growth in renewable energy industries such as wind and solar power and in energy efficiency technologies (The White House, 2022). The transition to a low-carbon economy can create new jobs in areas such as renewable energy, energy efficiency and conservation which can also help offset the job losses in traditional energy industries (Hockett & Gunn-Wright, 2019). According to the US administration it is expected that transition to renewable energy is expected to generate several million jobs (Hockett & Gunn-Wright, 2019). Additionally, investing in clean energy can increase energy independence and reduce reliance on foreign energy sources which can have positive impacts on the US economy.

Undoubtedly the effects of climate change are widespread and have a significant impact on the United States. In order to mitigate the negative consequences and adapt to climate change-related impacts extensive measures need to be taken.[4] For this reason members of the investment community are actively incorporating climate change and other sustainability goals into their investment decisions. Whether these are the Paris Agreement (COP21) or the Glasgow Climate Pact (COP26) recommendations these all provide roadmaps for the investment community as to what factors incorporate into their investment decision-making processes and, thus, fulfill their fiduciary duty to investors.

2. Decarbonization goals of COP21 and COP26 and challenges with their implementation

The 2015 Paris Agreement (COP21) set forth the following four objectives: (1) keeping global temperatures from rising two degrees Celsius above pre-industrial levels; (2) pursuing efforts to limit the temperature increase to one point five degrees Celsius; (3) strengthening the ability of countries to deal with the impacts of climate change; (4) and providing a platform for regular reviews of progress to ensure ambition in emissions reduction targets (UN, 2015). Six years following the Paris Agreement, the 26th Conference of the Parties (COP26) to the United Nations Framework Convention on Climate Change Conference met in Glasgow in the fall of 2021 to further expand on

[4] The literature taking the global perspective on carbon emissions discusses multiple measures. For instance, Akbulut (2022) indicates that in order to reduce carbon emissions it is recommended to increase environmental policy stringency. In turn, Temurlenk and Lögün (2022) call for the policies needed to transfer clean technologies to developing countries to address the problem that trade openness positively affects CO_2 emissions in the long term.

its climate change mitigation ambitions. The main objectives of the conference include: (1) reaching carbon neutrality by 2050; (2) keeping global warming below one point five degrees Celsius; (3) mobilizing finance, technology, and capacities to implement the Paris Agreement; (4) supporting developing countries in implementation of the Paris Agreement; (5) and promoting international collaboration to achieve carbon neutrality (UN, 2021, 2022a).

To implement the goals of the Paris Agreement several countries introduced cap-and-trade programs and carbon taxes. While the United States has a few cap-and-trade programs in place they have only been introduced at the state level (Stavins, 2019). The most prominent U.S. cap-and-trade program is the Regional Greenhouse Gas Initiative (RGGI) which is a market-based program that covers power sector emissions in nine Northeastern and Mid-Atlantic states: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, and Rhode Island. Under the RGGI program a cap is set on the total amount of carbon dioxide emissions from power plants and power generators must purchase allowances to cover their emissions. The cap is lowered over time which creates an incentive for power generators to reduce their emissions or purchase additional allowances. California also has a cap-and-trade program that covers multiple sectors of the economy including power generation, industry and transportation. The California program in the United States is linked with Canada's (Quebec) cap--and-trade program. There have been proposals for a national cap-and-trade system and carbon tax but none have been enacted into law (Stavins, 2019). While COP21 and COP26 were attended by several head of states including U.S. Presidents, the U.S. domestic climate change fight has encountered multiple obstacles making the implementation of COP21 and COP26 goals particularly challenging for: (1) partisan political reasons; (2) economic reasons; and (3) legal challenges.

Climate change has been a highly contentious issue in the United States with the Democratic and Republican parties having fundamentally different views regarding climate change causes and solutions. For example, in 2018 the Republican administration withdrew from the Paris Agreement which was subsequently reversed by the Democratic administration in 2021 (Blinken, 2021; Friedman, 2019).

Some politicians and businesses raised opposition to climate agreements due to fear they will negatively impact the US economy particularly in the fossil fuel sectors. In 2021, for instance, the Democratic Senator from the coal-mining state of West Viriginia voted against the Build Back Better act due to its pro-climate provisions before he agreed to support the Inflation Reduction Act of 2022 which contained concessions for the fossil fuel industry (Plummer & Friedman, 2022). In 2022, Republican-run State of South Carolina, Texas, and Florida have divested from funds that employ ESG-based investing strategies. Texas passed a new "anti-woke" law designed to protect fossil fuel com-

panies by banning the US largest asset manager, BlackRock, and nine other asset managers including Credit Suisse and UBS from doing business in the state (Kerber & Schroeder, 2022). Texas is not the only state legislating against climate conscious investors. States like Louisiana and West Virginia have recently joined in a push against ESG-based investing, especially when it calls for taking climate change risks into consideration (Crampton, 2022).

Finally, climate change is frequently a cause for litigation in the US courts. For example, in the summer of 2022, three United States Supreme Court Justices ruled in favor of stripping the United States Environmental Protection Agency of its authority to regulate emissions by delegating such authority to the United States Congress (Supreme Court of the United States, 2021). This constituted a significant victory for climate change deniers and the fossil fuel industry lobbyists (Crownhart, 2022).

The above are only some of the examples associated with challenges of implementing the Paris Agreement and the Glasgow Climate Pact. Nevertheless there are many efforts to address climate change and reduce the US carbon footprint. These efforts are closely linked to the 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015 and its seventeen Sustainable Development Goals (UN, 2022b).

3. Decarbonization goals and fiduciary responsibility of the investment industry

As nations continue to commit to decarbonization as per goals of the COP21 in Paris and COP26 in Glasgow asset managers are increasingly establishing sustainable investing practices (Gandhi & Diak, 2022). One such institutional investor is the US-based and the world's largest asset manager BlackRock with the AUM (assets under management) of $10 trillion as of the end of 2021 (BlackRock, 2022). Its CEO in his communique to the managers of all BlackRock's portfolio companies noted that companies, whether private or public, need to serve a social purpose, make a positive contribution to society, and consider the systemic threat of climate change. Companies which do not consider the climate impact of their investments are not acting in the best interest of their clients hence failing their fiduciary responsibility (Fink, 2023).

A similar investment philosophy is followed by other large US asset managers including the Vanguard Group and State Street Global Advisors which also take climate change into their asset allocation process (Funk & Walker, 2021). Global climate investing has grown exponentially in the last decade prompting investment houses to launch many green-labeled products offer-

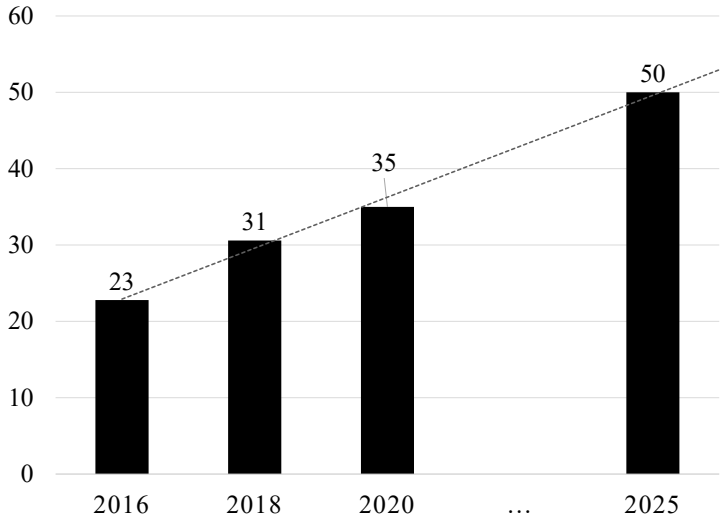

Figure 3. Global ESG assets under management (trillion USD)

Notes: The dotted line represents a linear trend. Forecast starts in 2025.

Source: Based on data provided by Bloomberg.

ing ESG-based investing and impact investing opportunities. It is expected that global ESG assets will exceed $50 trillion by 2025 representing over a third of $140 trillion in projected total global assets under management (Diab & Adams, 2021) (see Figure 3).

Climate change, decarbonization efforts and other forms of ESG-based investing have led to a robust debate on how investors can influence companies' behavior regarding their stance on decarbonization. Should investors adhere to exclusionary screening? Should investors divest partially? Should investors divest completely? Should investors engage shareholders or board members? Such questions baffle many pension plans, financial advisory firms, university endowments, or hedge funds.

This debate also brings up the role of macro-financial policies implemented by central banks on the decarbonization of the global economy. Although the issue of global warming and the climate crisis is not currently an area of interest for central banks opinions are being expressed that their role in solving climate problems could be vital. However, this is contingent on institutional changes in the international financial architecture. Chmielewska and Sławiński (2021) advocates transforming the International Monetary Fund into an international central bank to mobilize sufficient resources to decarbonize developing economies and implement a truly global climate policy. The authors take a new perspective on the old challenge related to burning coal in developing countries. This issue has been consistently raised since

the early 1970s, and many authors have advocated that developed countries should support developing nations by sharing resources (including technology) with them to minimize challenges such as the climate crisis and other impediments to economic development (see Brandt, 1982; Meadows et al., 1972; Schumacher, 1973).

4. Literature review

There is an abundance of academic and non-academic literature on sustainable investing, ESG-based investing and impact investing (Cole et al., 2020; Latinovic & Obradovic, 2013). While some academics and non-academics use these terms interchangeably each term has a different meaning and purpose. Cole et al. (2020) who defines sustainable investing as a broad range of investing strategies through which investors attempt to achieve above-average investment returns and enhance environmental, social and corporate governance standards. Sustainable investing can be divided into two categories. The first, ESG-based investing, is concerned with investments in public markets and aims to mitigate risks and create opportunities by incorporating ESG-related information into stock valuation and investment decision making process (Cole et al., 2020). The second, impact investing, is primarily concerned with private equity markets where investors are willing to accept below-market-rate returns in exchange for positive societal impact due to capital deployment (Cole et al., 2020, 2021). This article is concerned with two aspects of sustainable investing: ESG-based investing through divestment and impact investing via shareholder activism.

The ESG-based investing literature can be divided into multiple streams associated with ESG's effects on cost of capital, stock valuations and returns on investment based on material factors. There seems to be a broad lack of consensus on most of the above-mentioned aspects with the exception on the cost of corporate borrowing for companies with favorable ESG-scores. Cost of capital for ESG and non-ESG companies has been the subject of extensive research. Over the last decade there have been multiple studies on how ESG-based investing may influence the cost of capital for non-ESG stocks and ESG stocks. Earlier studies on the subject tend to reach similar conclusions that companies with favorable ESG scores have easier access to capital tend to have better credit ratings, and a lower cost of capital. A prominent study by Heinkel et al. (2001) suggests that exclusionary ethical investing leads to lower stock ownership and, therefore, higher cost of capital for non-ESG companies. Bauer and Hann (2010) evaluated over 2,000 US bond issues and correlated CSR (corporate social responsibility) scores to cost of capital. They concluded that companies

with better CSR scores had lower loan spreads. Schneider (2011) concludes that low CSR scores from negative environmental practices pose a significant risk potential for costs associated with cleanup and legal risks. These increase the lender's risk. El Ghoul et al. (2011) also suggests that US companies with better CSR scores have lower cost of equity financing. It is important to note though that many studies from the previous decade depended on scarce data coming from the first decade of the 21st century when CSR scores and reports were not widely available. Such data availability became more accessible after 2010 following the emphasis on ESG issues by the US government. The US Department of Labor recognized that ESG was not only about providing collateral benefits but also identifying material investment risks and opportunities and issued guidance on the evaluation of material ESG factors by investment funds fiduciaries as essential part of their fiduciary duty (Hale, 2020). More recent studies rely on a larger amount of data and suggest that whether companies embrace ESG metrics or not it does not have a meaningful impact on companies' access to capital. Berk and van Binsbergen (2021) evaluate the quantitative impact of ESG divestitures. The study compares companies from FTSE USA vs. FTSE USA 4Good and concludes that divesture initiatives have a minimal impact on the cost of capital of 0.35 basis points. Given this small number Berk and van Binsbergen are of the opinion that cost of capital is not a decisive factor in ESG-based investing strategies. Last but not least Eccles et al. (2022) find that non-ESG stocks do not experience higher costs associated with the cost of raising new equity but they experience higher costs associated with the new debt issuance.

Stock valuations and ESG-based investing have also evolved over the last two decades. Initial studies focus on the Tobin's Q ratio which measures the relationship between the market valuation and the intrinsic value of an asset. Hong and Kacperczyk (2009) suggest that companies with poor ESG-ratings (referred to as "sin stocks") have lower valuations. Ioannou and Serafeim (2014) show that greater CSR engagement generates positive analyst recommendations. Furthermore, Zhang (2019) reaffirms that environmental protection investment adds value to a company by increasing its earnings without a significant impact on the cost of equity capital. However, Eccles et al. (2022) revisit the firm value and pricing implications of the negative screenings of non-ESG stocks. This study establishes, unlike prior studies, that valuations related to non-ESG stocks are statistically indistinguishable from valuations of ESG stocks.

Returns on investment are another aspect of ESG-based investing parallel to the valuation aspect. Bauer et al. (2005) find no evidence of significant differences in risk-adjusted returns between ethical and conventional funds. Studies by Fabozzi et al. (2008) and by Hong and Kacperczyk (2009) suggest that returns of "sin stocks" (using today's nomenclature—non-ESG stocks) which include alcohol, gaming and tobacco outperform the market. Fabozzi

et al. (2008) find that a "sin portfolio" generated a return unambiguously outperforming common benchmarks in terms of both magnitude and frequency. Hong and Kacperczyk (2009) suggest "sin stocks" have higher expected returns than "non-sin stocks" suggesting that investments in non-ESG stocks are more attractive to investors from the return standpoint. Trinks and Scholtens (2017) demonstrate that non-ESG stocks generate high risk-adjusted returns in multiple markets and there are opportunity costs to negative screening. In contrast, Khan et al. (2015) suggest that by focusing on material ESG issues investors can make more accurate decisions and select investments that matter the most in terms of materiality. They demonstrate that companies with superior performance on material ESG issues outperform their peers. Morgan Stanley's 2020 Sustainability Update suggests that investing in ESG stocks has proven more rewarding for investors during market expansions and downturns. Funds which incorporate ESG criteria in general either slightly outperform or are on par with traditional funds (Morgan Stanley Institute for Sustainable Investing, 2020).

There is also literature which focuses on divestment efforts and divestment outcomes for large university endowments. Cornell (2015) in his paper on divestment by university endowments argues that divestment is going to have negligible impact on fossil fuel companies while contributing to worse performance of endowment funds due to a lack of diversification. In the case of Harvard University Cornell concludes that the financial losses would not exceed $100 million. Cleveland and Reibstein (2015) pose a question should the university endowments divest from fossil fuels? They argue that divestment strategies should not be limited to moral motives or reputational risks reasons but should also consider financial risks associated with holding oil companies' assets. They also argue that universities should learn how to invest responsibly by identifying new and cleaner investment opportunities. Deeks (2017) discusses Harvard's and Stanford's divestment movements to analyze the discourse of the fossil fuel divestment campaigns while focusing on the goals of such campaigns and fiduciary duty of endowment managers. Quigley et al. (2020) discusses the advantages and disadvantages of fossil fuel divestment for the University of Cambridge across social, moral, political, financial and reputational dimensions. Ryan and Marsicano (2020) examine how total or partial divestment impacts values for all universities as well as a select few. They conclude that either form of divestment does not have a significant effect on endowment values.

While most of the ESG investing literature focuses on answering questions about investing in ESG stocks or divesting from non-ESG stocks research on engagement has been growing as well. Funk and Walker (2021) suggest that engagement can accelerate the transition to net zero. The authors elaborate on why engagement plays a significant role for index asset managers who cannot divest due to their investment mandates. Furthermore, the authors also argue that engagement and proxy voting are "critical tools for over-

sight of corporate management on climate-related disclosure and practices" and provide several examples of successful engagement strategies including ExxonMobil Corporation, Chevron Corporation, Commonwealth Bank of Australia, Dominion Energy, and Unilever (Funk & Walker, 2021).

Berk and van Binsbergen in their 2021 study on the effects of sustainable investing conclude that instead of divesting it is more advisable to exercise the rights of control to influence corporate policies to achieve desired outcomes. Atta-Daruka et al. (2022) in a paper on decarbonizing institutional assets compare portfolio tilts with engagement to curb emissions. In their study they conclude that most investors decarbonize their portfolios through tilting vs. engagement. Nevertheless there is growing evidence for engagement, especially following the Paris Agreement. Edmans et al. (2022) demonstrate how portfolio tilting instead of complete divestment may be a more effective strategy for non-ESG firms to take corrective action. Eccles et al. (2022) suggest that engagement particularly through private equity investments may lead to more promising results in advancing ESG-aligned goals of investors. However, Gupta et al. (2022) conclude that socially responsible investors can slow the pace at which companies reduce negative externalities. Lastly Broccardo et al. (2022) compares effectiveness of divestment versus engagement in advancing socially desirable outcomes in companies. In their study they establish that engagement is more effective in convincing companies to pursue socially responsible business strategies.

5. Divestment vs. engagement: Comparative analysis from the perspective of decarbonization goals

ESG-based investment strategies include divestment and engagement. Divestment can involve negative or exclusionary screening strategies by excluding certain industries or companies from a portfolio based on specific ESG criteria, for example, the entire fossil fuel industry sector or specific companies from that sector (Cole et al., 2020) Engagement involves leveraging shareholder position to influence corporate behavior through investing in target companies and direct engagement with shareholders, boards of companies or their managerial teams. For example, by engaging in an oil and gas company, activist investors can guide such a company towards developing net zero goals and commitments (Cole et al., 2020). Both strategies aim to achieve common goals of constructing value-aligned portfolios and advancing environmental and social values, although they differ in their overall strategies, risks, and outcomes.

A) Divestment

The history of divestment at Harvard University dates to the late 1980's and early 1990's when Harvard University students made headlines by demanding that Harvard University's Management Company which manages Harvard's endowment fund divested from companies that were engaged in doing business in apartheid-governed South Africa (Toffel & Gulick, 2020). While Harvard students' South African divestment campaign enjoyed the support of many faculty members it met with resistance from the university administration. Nevertheless, it paved the way for other divestment campaigns at Harvard and other prominent universities with large endowments (Rodman & Zhu, 2015) (see Table 1).

Table 1. US universities with the largest endowments at the end of 2021 fiscal year

University name	Endowment size ($)
Harvard University (MA)	53.2 billion
Yale University (CT)	42.3 billion
Stanford University (CA)	37.8 billion
Princeton (NJ)	37.0 billion
MIT (MA)	27.4 billion

Source: Based on (Wood, 2022).

Harvard's divestment debate from fossil fuels dates to 2012 when the Divest Harvard movement was formed. The movement included Harvard students, faculty members and alumni who pressured the Harvard Management Company to divest Harvard University's endowment fund from fossil fuel companies (Toffel & Gulick, 2020). On the outset of Divest Harvard in 2012 this effort was supported by 72% of Harvard students and between 2012 through 2017, students and faculty members organized several divestment-related events to exert pressure on Harvard's leadership to divest from fossil fuels (Toffel & Gulick, 2020). Initially the arguments of Divest Harvard climate activists failed to convince Harvard's President who in 2013 argued the endowment was not an instrument of social and political change (Faust, 2013). This did not deter Harvard students from their mission. In 2014 an open letter with 93 faculty signatures called for Harvard to divest from fossil fuels (Harvard University, 2014). This was followed by a 2014 lawsuit of seven Harvard students who claimed that Harvard was breaching its fiduciary and charitable duties by investing in fossil fuels. While the lawsuit was dismissed, it helped generate significant public attention to Divest Harvard (Urist, 2015).

In 2017 faced with more public scrutiny Harvard Management Company announced that it would pause its fossil fuels investments and is unlikely to invest in them in the future (DeBenedictis & Park, 2017). While this certainly was a victory for Divest Harvard it still did not constitute an official university policy to divest from fossil fuels. This led to a resignation of a member of the Harvard Board of Overseers in 2018 and the same year's motion by Harvard faculty calling for Harvard Management Company to divest from fossil fuel companies (Guillaume & Halper, 2018; Rosenberg, 2019; Toffel & Gulick, 2020). In 2021 in an emailed letter sent to the Harvard community Harvard's President stated "climate change is the most consequential threat facing humanity" and Harvard "does not intend" to make any future investments in fossil fuels (Bacow, 2021). Undoubtedly the Divest Harvard student-led movement accomplished a significant victory in 2021 but it took Harvard almost a decade to reach this landmark decision.

Despite the considerable length of time and effort it took the Divest Harvard campaign to set Harvard University on the path to net zero the campaign had proven successful. According to Harvard Management Company's 2022 Climate Report, the endowment fund is committed to the following goals: (1) achieving carbon neutral operations; (2) investing in climate transition; (3) collaborating with investors to encourage climate change-related disclosures and reduce greenhouse gas emissions; (4) avoid fossil fuel holding exposure; (5) continue to phase out legacy fossil fuel holdings and (6) improve data access when engaging external asset managers to better understand climate-related risks associated with such investments and developing methodologies for calculating greenhouse gas emissions exposure across Harvard Management Company's portfolio (HMC, 2022). Furthermore, in 2021 Harvard Management Company doubled its climate investment from 2020 and its climate investments made up 1% of the endowment (HMC, 2022).

The Divest Harvard movement also has had a profound impact on other American higher education institutions leading to full fossil fuel divestitures at sixteen American universities and colleges and partial divestitures at another six universities between 2011 and 2015 (Ryan & Marsicano, 2020). The trend continued and between 2016 and 2020 thirteen American universities divested from fossil fuels (Ryan & Marsicano, 2020) and expanded beyond higher education institutions. In 2022 there were over 1,500 educational, philanthropic, faith-based, governmental, healthcare and non-governmental institutions representing a total value of $40 trillion in assets under management which are either partially or fully divesting from fossil fuels (GFFDCD, 2023). It is worth noting that despite its initial opposition to Divest as of September 2021 Harvard University is the largest university endowment committed to achieving full divestment but also the first university endowment committed to reaching net zero by 2050 (Bacow, 2021). Considering the above Harvard University is well positioned to fulfill its fiduciary duty to its community through

its adoption of divestment policies and to protect its endowment fund from unpriced climate change-related risks (Serafeim & Fulton, 2014).

Lastly divestment campaigns can increase public awareness and increase political pressure regarding climate change. Passing of one of the most ambitious U.S. climate laws to date—the Inflation Reduction Act of 2022—serves as an example of how divestment campaigns can help raise climate change awareness and result in meaningful climate legislation. The multi-faceted purpose Inflation Reduction Act aims at lowering healthcare and energy costs for American families, combating climate change, reducing the deficit and asking the largest corporations to pay their fair share of taxes. The climate provisions of the Inflation Reduction Act include the total investment of $369 billion in lowering energy costs, building a clean energy economy and reducing harmful pollution (The White House, 2022).

Divestment, however, comes with a set of disadvantages including: (1) a drop in portfolio value, (2) lack of diversification, (3) and political pressure. In 2022 the CEO of Harvard Management Company in his FY22 (Fiscal Year of 2022) end letter to the members of the Harvard Community informed that Harvard's endowment fund returns on investments were negative after distributions for operations and the addition of new endowment gifts. Overall the endowment shrunk from $53.2 billion (FY21) to $50.9 billion (FY22). Aside from the inferior performance of the global financial markets FY22 returns were influenced by "the necessity of focusing on long-term, risk adjusted returns" (Harvard University, 2022; HMC, 2022; Narvekar, 2022). Undoubtedly, financial aspects of divestment include focus on long-term returns, thus, eliminating opportunities to generate returns when the fossil fuel industry sector is performing well. For example, in 2016 56% of oil and gas companies paid dividends to their shareholders and in 2021 this number increased to 76% (Banerjea, 2022). Harvard Management Company due to its divestment strategy has forgone such opportunities by no longer pursuing fossil fuel investments. Disparity between the FY21 and FY22 stems from Harvard Management Company's long-term vision on generating returns from non-fossil fuel assets. Lack of diversification is potentially another reason Harvard's endowment fund underperformed especially when the fossil fuel stocks received a boost from the growing demand for fossil fuels (EIA, 2023). This was associated with the end of the COVID-19 global pandemic restrictions when the low demand for fossil fuels depressed the fossil fuel companies' stock valuations (Badruldeen, 2021). While it would have been advantageous for Harvard to participate in the growth of the energy sector Harvard Management Company did not participate in such investment opportunities because of Harvard University's commitment to reducing its exposure to fossil fuel investments and working toward honoring climate pledge to achieving net zero status by 2050 (Narvekar, 2022). Lastly one of the major drawbacks of divestment is the risk of political and legal reprisals from the

pro-fossil fuels industry politicians and lobbyists (Nosek, 2022). In the case of Harvard the university was criticized for its stance on climate change placing its tax-exempt status in peril. In 2017 the U.S. Congress passed the Tax Cuts and Jobs Act which introduced a tax on university endowment income. The Section of 13701 of the Tax Cuts and Jobs Act introduces a 1.4% tax on university endowments' income and given the enormous FY21 $53-billion size of the Harvard University's endowment it could result in significant financial consequences regarding the source of its operating income (Salam, 2018; The United States Congress, 2017).

B) Engagement

Engine No. 1 hedge fund was founded by Christopher James who deployed his personal capital to invest in ExxonMobil in December of 2020 (Saijel, 2020). James' $38-million investment represented only a small fraction (about 0.02%) of ExxonMobil's shares (Phillips, 2020). Considering Engine No. 1 is an activist investor such a small investment could hardly result in an impact on the oil and gas giant's business strategy especially when considering ExxonMobil's role as a major contributor to climate change (Chen et al., 2022). Impact investing has grown in popularity over the last ten years and it has been estimated that by 2020 around $1 trillion has been invested in impact funds across private equity and venture capital investment funds (Kramer et al., 2021)[5]. Furthermore, impact investing is meant to accomplish two of the following goals: deliver risk-adjusted returns to investors and generate positive social or environmental impact (Cole et al., 2020). Typically, hedge funds, if they employ sustainable investing strategies, adhere to ESG-based investing. However, Engine No. 1, decided to explore impact investing in publicly traded companies to improve their ESG performance through shareholder activism. James believed that by changing the composition of ExxonMobil's Board of Directors he would be able to influence ExxonMobil's management and steer it towards transition to renewable sources of energy. James also believed that by engaging ExxonMobil's management he would be able to improve its ESG ratings, financial performance and, thus, improve its shareholder returns (Kramer et al., 2021). Engine No. 1's ownership of 0.02% equity stake in ExxonMobil would not allow for such an insurmountable task without attracting the support of other large ExxonMobil's shareholders including the so-called Big 3: Vanguard, BlackRock, and State Street Global Advisors who collectively made-up the largest block of ExxonMobil's shareholders owning 7.96%, 4.97% and 4.88% respectively (Phillips, 2020) (see Table 2).

[5] Dalal (2022) analyses the existing literature on country-level venture capital and points out that technological opportunities, macroeconomic conditions and financial market development are key determinants of this investment activity.

Table 2. Top 5 Shareholders of ExxonMobil as of end June 2020

Shareholders	Stake	Shares owned	Total value ($)
The Vanguard Group	7.96%	336 million	15.6 billion
BlackRock Fund Advisors	4.97%	210 million	9.8 billion
State Street Global Advisors	4.88%	206 million	9.6 billion
Geode Capital Management	1.49%	62 million	2.9 billion
Fidelity Management & Research Co.	1.32%	55 million	2.6 billion

Source: Own compilation based on data provided by Bloomberg.

In James' view ExxonMobil's poor financial performance stemmed from inadequate capital allocation associated with climate change denialism which was threatening its future returns (Eccles & Mayer, 2021). To address this problem Engine No. 1 started Reenergize XOM campaign making the following four recommendations through an open letter to ExxonMobil's board of directors and its shareholders: (1) refresh the board; (2) impose greater long-term capital allocation discipline; (3) implement a strategic plan for sustainable value creation in a changing world; and (4) realign management incentives (Engine No. 1, 2021). ExxonMobil refused to address Engine No. 1's recommendations making it clear for Engine No. 1 that the only way to change ExxonMobil's business strategy was to change the makeup of its Board of Directors through a proxy contest in the upcoming 2021 annual shareholder meeting. To do so Engine No. 1, through a rigorous search process, created its own slate of four candidates for the ExxonMobil's Board of Directors consisting of individuals with an extensive experience in the oil and gas industry as well as with experience in energy transition (Kramer et al., 2022). Reactions to Engine No. 1's proxy campaign were encouraging. The proxy advisors, Institutional Shareholder Services and Glass Lewis which represent the largest institutional investors endorsed three out of four Engine No. 1's candidates for the ExxonMobil's Board of Directors (Brower, 2021). Furthermore, with the support of other large shareholders including the Big 3 (BlackRock, Vanguard and State Street Global Advisors) Engine No. 1's slate of independent candidates to the Board of Directors was elected (Kramer et al., 2022). While this was a clear victory for the newly formed activist and impact investing hedge fund and ESG investors, the question remains how the new makeup of the board would be able to influence ExxonMobil's business strategy to make it climate change-friendly and help deliver improved financial returns for the shareholders? Did Engine No. 1's proxy move improve ExxonMobil's stock price?

In the case of Engine No.1 and ExxonMobil there are clear advantages for corporate board engagements considering the changes that took place at ExxonMobil in 2021. In May of 2022 Engine No. 1 published a list of actions

undertaken by ExxonMobil following its Reenergize Exxon campaign. These include a multitude of strategic initiatives undertaken by ExxonMobil aimed at reduction of Scope 1 and 2 carbon emissions, its commitment of $15 billion over a span of six years to reduction of carbon emissions, to hiring a senior-level executive to lead the Low Carbon Solutions (new core business unit added to ExxonMobil), to adhering to transparency by publishing all of its political contributions and lobbying efforts and by committing to become net zero by 2050 (Engine No. 1, 2022a). Another set of accomplishments which Engine No. 1 takes credit for includes ExxonMobil's commitment to exercise a better long-term capital allocation discipline. ExxonMobil decreased in 2021 its planned capital expenditures from $30–$35 billion to $20–$25 billion and increased its market capitalization from $174 billion at the end of 2020 to $259 billion at the end of 2021 (ExxonMobil, 2022). Furthermore, while Engine No. 1 spent $12 million dollars on its proxy fight campaign it still generated substantial profits from its $38 million investment in ExxonMobil which was trading at $38.50 per share on December 1, 2020 and was trading at $61.19 per share on December 31, 2021 (ExxonMobil, 2022) (see Figure 4). Lastly Engine No. 1 stunned and generated significant attention from the investment management community following its victory in the proxy fight. Such publicity was particularly helpful when Engine No. 1 launched its first ETF (exchange traded fund) Engine No. 1 The Transform 500 ETF in 2021 (Sharfman, 2020) and in 2022 when Engine No. 1 launched another ETF—Engine No. 1 The Transform

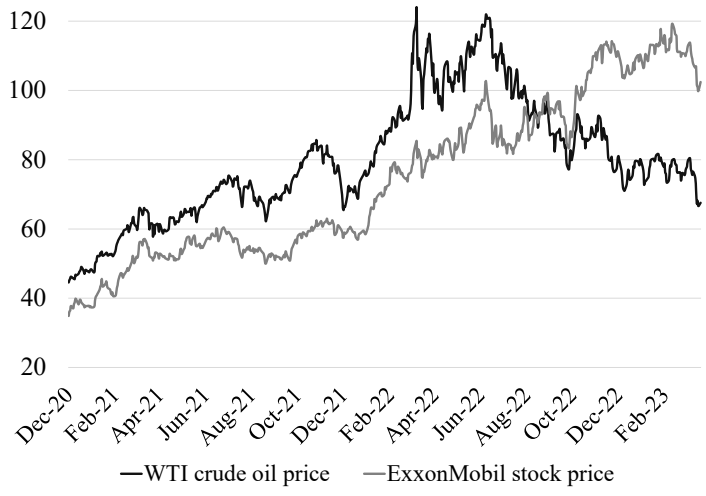

Figure 4. ExxonMobil stock price and WTI oil price from December 1, 2020 to March 20, 2023 ($ per share and barrel, respectively)

Notes: Stock price adjusted for splits, dividend payouts and other corporate events.

Source: Based on data provided by the U.S Energy Information Administration and Stooq.

Climate ETF, with assets totaling $392 million and $92 million respectively as of January 25, 2022 (Engine No. 1, 2022b).

There is, of course, a downside to Engine No. 1 and ExxonMobil engagement story. When Engine No. 1 made an investment in ExxonMobil the global oil prices were at historical lows hurting revenues of the oil producing sector especially because of the global COVID-19 pandemic (Badruldeen, 2021). However, as of January 2021 the demand for oil started growing leading to higher oil prices and, thus, boosting revenues of the oil sector including ExxonMobil (see Figure 4). This allowed Engine No. 1 to capitalize on changes in the macroeconomic trends and particularly rising oil prices (EIA, 2023). The growth in Exxon's valuation in this period might have come about because of the macroeconomic trends and not as a result of the changes to its Board of Directors make-up following Engine No. 1's Reenergize XOM campaign (Engine No. 1, 2021). The divergent development of oil prices and Exxon's stock price starting in the second half of 2022, contradicts though this assertion.

Furthermore, engagement through proxy fights can be risky to investors and expensive. Engine No. 1 embarked on its proxy fight with ExxonMobil with a war chest of $30 million, spending $12 million whereas ExxonMobil spent $35 million to deflect the activist hedge fund's efforts (Deveau, 2021). Lastly does shareholder activism help address the challenges associated with climate change or does it promote greenwashing? One could argue that Engine No. 1 investment served as a catalyst for a major change at one of the biggest climate change offenders in the world (Chen et al., 2022). At the same time ExxonMobil despite its commitment to become net zero by 2050 continues to be a major producer of fossil fuels. A brief look at ExxonMobil's official statements may make one believe that ExxonMobil is fully committed to sustainability despite being a member of the fossil fuel industry which is responsible for contributing to global warming (Chen et al., 2022). Considering that in May of 2022 the pioneer of electric vehicles, Tesla was removed from the S&P 500 ESG Index whereas ExxonMobil was rated as one of the top ESG--rated companies by the same index (Kerber & Jīn, 2022; S&P, 2023). This may mislead investors to think that ExxonMobil due to its corporate governance, ESG-related overhaul and financial commitments to becoming net zero by 2050 had become a green company leading the charge in actions on climate change. Whether ExxonMobil can live up to its climate commitments remains to be seen. Climate change is a commons problem and it will take collective action to solve it. More effort than a small activist hedge fund like Engine No. 1 or the Big 3 asset managers is needed and it will take considerable cooperation at intergovernmental and international levels to adequately address the issue. Otherwise, sincere efforts of activist investors such as Engine No. 1 may be perceived as a distraction and mislead one into thinking that the private sector may provide the efficient answer.

Conclusions and policy recommendations

Developed economies like the United States are facing significant decarbonization challenges imposed by the public, investor community and policymakers who introduce pro-climate policies or anti-ESG measures depending on the side of the political aisle. A fundamental matter is the need for more robust response at the corporate board level to acknowledge climate change and to introduce mitigation measures to transition to net zero. For this reason shareholder activism through shareholder engagement, as per Engine No. 1's example can lead to more promising and robust results by engaging fossil fuel companies at the board of directors' level, appointing climate-friendly board members and gathering support of other shareholders to take meaningful steps to mitigate the causes of climate change. It can also produce more immediate results than divestment. Furthermore, engagement is getting more traction as divestment appears to yield little to no effects on changing corporate behavior and appears to have no financial impact on fossil fuel companies while exposing endowment funds to financial losses as per Harvard Management Company's example. Engagement has also become a matter of recommended policy by the Glasgow Financial Alliance for Net Zero (GFANZ, 2022). GFANZ indicates that the global financial sector can accelerate the transition to net zero by pursuing engagement strategies through engaging with clients and portfolio companies, financial sector peers and industry associations and engaging with governments and the public sector. Aside from engagement strategies GFANZ guidance provides a specific set of metrics and targets which provide quantitative and measurable goals to achieve net zero transition goals. GFANZ provides several examples of successfully implemented engagement strategies by major financial services organizations like Aviva, Robeco, HSBC, BlackRock, Goldman Sachs, Dai-ichi Life, Citi, Bank of America, Barclays and other leading financial institutions (GFANZ, 2022).

While divestment certainly draws positive attention to climate change and helps shift investment away from polluting industries towards more sustainable ones, it does not translate into an immediate behavior alteration of the climate polluters. It is rather engagement that encourages polluting companies to adopt more sustainable practices in a timely manner. Nevertheless both divestment and engagement can play mutually supportive roles in addressing climate change by the corporate sector. Policy makers in the US should, however, support businesses by creating regulatory frameworks on the state and federal levels to encourage sustainable investment and sustainable business practices. Whilst the 2022 Inflation Reduction Act has been the most ambitious US pro-climate change piece of legislature to date strong implementation policies are needed to create market incentives for companies to reduce

their carbon footprint and invest in sustainable business practices to make the transition to net zero by 2050 attainable.

Policy recommendations that could be implemented in the US to promote carbon reductions by the corporate sector include, in particular: (1) implement a carbon tax at a national level: this would place a fee on the amount of carbon emissions produced by businesses and individuals, encouraging them to reduce their emissions and switch to cleaner sources of energy; (2) extend public support for investment in renewable energy sources like wind, solar and hydropower which produce little to no operational carbon emissions. This could be achieved through tax incentives, public subsidies for research and development of new technologies, and investment in technology to capture carbon emissions from power plants and store them underground; (3) increase fuel efficiency standards: the government should continue to increase fuel efficiency standards for vehicles and continue to encourage the use of electric and hybrid vehicles; (4) increase energy efficiency throughout the economy: the government should encourage the use of energy-efficient buildings (Leadership in Energy and Environmental Design or net zero energy building standards) and appliances (ENERGY STAR-rated). Since climate change is a global issue the US should cooperate with other countries to implement carbon control measures; (5) implement broad mandatory ESG disclosure requirements on the federal level for US businesses. The US regulators could follow in the footsteps of the European Union where the Corporate Sustainability Reporting Directive (CSRD) will significantly transform ESG reporting starting in 2024. Under this regulation some 50,000 companies are subject to mandatory sustainability reporting, including subsidiaries of non-EU companies or businesses listed on EU regulated markets (KPMG, 2023). Affected companies will be required to report according to the European Sustainability Reporting Standards which set out rigorous disclosure requirements, including over hundreds of sustainability metrics.

Lastly more research on divestment and engagement is needed. The majority of the published research on ESG-based investing addresses financial performance of stock portfolios or individual stocks and focuses on decarbonization of stock portfolios but does not measure physical reduction of carbon emissions. To better understand ESG-based investing outcomes through divestment or shareholder engagement more research is required on how such investment strategies lead to corporate governance actions resulting in measurable reduction of carbon emissions.

References

Akbulut, H. (2022). Effectiveness of environmental policies on carbon emissions: A panel threshold analysis. *Economics and Business Review*, *8*(3), 82–108. https://doi.org/10.18559/ebr.2022.3.5

Atta-Daruka, V., Glossner, S., Krueger, P., & Matos. P. (2022). *Decarbonizing institutional investor portfolios*. Working Paper. https://www.ecgi.global/sites/default/files/Paper:%20Vaska%20Atta-Darkua,%20Simon%20Glossner,%20Philipp%20Krueger,%20Pedro%20Matos.pdf

Bacow, L. (2021). *Climate change: Update on Harvard action*. Harvard Office of the President. https://harvard.edu/president/news/2021/climate-change-update-on-harvard-action/

Badruldeen, M. A. (2021, June 3). *The impacts of COVID-19 on oil price in international markets*. http://doi.org/10.2139/ssrn.3889713

Banerjea, S. (2022, October 12). Oil & gas stocks are still good buys, for a number of reasons. *Yahoo Finance*. https://finance.yahoo.com/news/oil-gas-stocks-still-good-164604388.html

Bauer, R., & Hann, D. (2010) Corporate environmental management and credit risk. *The European Centre for Corporate Engagement*. http://doi.org/10.2139/ssrn.1660470

Bauer, R., Koedijk, K., & Otten, R. (2005). International evidence on ethical mutual fund performance and investment style. *Journal of Banking & Finance*, *29*(7), 1751–1767. https://doi.org/10.1016/j.jbankfin.2004.06.035

Berk, J. B., & van Binsbergen, J. H. (2021, August 21). The impact of impact investing. Stanford University Graduate School of Business Research Paper. *Law & Economics Center at George Mason University Scalia Law School Research Paper Series*, *22*(8). http://doi.org/10.2139/ssrn.3909166

BlackRock. (2022). *Annual report 2021*. https://s24.q4cdn.com/856567660/files/doc_financials/2021/ar/online/pdfs/BlackRock_2021_AR_Complete_040822.pdf

Blinken, A. J. (2021). *The United States officially rejoins the Paris Agreement*. The United States Department of State. https://www.state.gov/the-united-states-officially-rejoins-the-paris-agreement/

Brandt, W. (1982) The north-south dialogue: The issue is survival. *Challenge*, *25*(4), 22–30. https://doi.org/10.1080/05775132.1982.11470787

Broccardo, E., Hart, O., & Zingales, L. (2022). Exit vs. voice. *Journal of Political Economy*, *130*(12), 595–632. https://doi.org/10.1086/720516

Brower, D. (2021). Proxy adviser backs activist call for Exxon Board overhaul. *Financial Times*. https://www.ft.com/content/e466d1ad-67b7-43e6-9c8f-b79326d28da0

Chen, J., Toledano, P., & Brauch, M. D. (2022). *How much have the oil supermajors contribute to climate change? Estimating the carbon footprint of the oil refining and petroleum products sale sectors*. Columbia Center on Sustainable Investment, Columbia University. https://ccsi.columbia.edu/content/oil-supermajors-carbon-footprint-refining-sales-climate-change

Chmielewska, A., & Sławiński, A. (2021). Climate crisis, central banks and the IMF reform. *Economics and Business Review*, *7*(4), 7–27. https://doi.org/10.18559/ebr.2021.4.2

Cleveland, C., & Reibstein, R. (2015, February 12). *The path to fossil fuel divestment for universities: Climate responsible investment*. https://doi.org/10.2139/ssrn.2565941

Cole, S., Gandhi, V., Brumme, C. R, & Rahmani, M. (2020). *Background note: Introduction to sustainable investing*. Harvard Business School Publishing. http://hbr.org/product/Background-Note--Introduc/an/218072-PDF-ENG

Cole, S., Gandhi, V., Norris, M., & Masko, J. (2021). *Public equites impact investing at BlackRock*. Harvard Business School Publishing. https://www.hbs.edu/faculty/Pages/item.aspx?num=60048

Collins, M., Knutti, R., Arblaster, J., Dufresne, J. L., Fichefet, T., Friedlingstein, P., Gao, X., Gutowski, W. J., Johns, T., Krinner, G., Shongwe, M., Tebaldi, C., Weaver, A. J., Wehner, M. F., Allen, M. R., Andrews, T., Beyerle, U., Bitz, C. M., Bony, S., & Booth, B. B. B. (2013). Long-term climate change: Projections, commitments and irreversibility. In T. F. Stocker, D. Qin, G. K. Plattner, M. M. B. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex, & P. M. Midgley (Eds.), *Climate change 2013 – The physical science basis: Contribution of working group i to the fifth assessment report of the intergovernmental panel on climate change* (pp. 1029–1136). Cambridge University Press. https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter12_FINAL.pdf

Cornell, B. (2015, September 3). *The divestment penalty: Estimating the costs of fossil fuel divestment to select university endowments*. https://doi.org/10.2139/ssrn.2655603

Crampton, L. (2022). *The Texas Republican fighting Wall Street—and protecting the energy industry*. Politico. https://www.politico.com/news/2022/10/12/glenn-hegar-texas-republican-fossil-fuels-00060956

Crownhart, C. (2022, June 30). *The US Supreme Court just gutted the EPA's power to regulate emissions*. https://www.technologyreview.com/2022/06/30/1055272/supreme-court-climate-policy-epa/

Dalal, A. (2022). Meta-analysis of determinants of venture capital activity. *Entrepreneurial Business and Economics Review*, *10*(1), 113–128. https://doi.org/10.15678/EBER.2022.100108

DeBenedictis, J., & Park, I. (2017, April 25) Harvard 'pausing' investments in some fossil fuels. *The Crimson*. https://www.thecrimson.com/article/2017/4/25/harvard-pausing-fossil-investments/

Deeks, L. (2017). Discourse and duty: University endowments, fiduciary law, and the cultural politics of fossil fuel divestment. *Environmental Law*, *47*(2), 335–427. http://www.jstor.org/stable/26491778

Deveau, S. (2021, March 18). *Exxon activist reveals high $30 million cost of boardroom battle*. Bloomberg. https://www.bloomberg.com/news/articles/2021-03-18/exxon-activist-reveals-high-30-million-cost-of-boardroom-battle

Diab, A., & Adams, G. (2021). *ESG assets may hit $53 trillion by 2025, a third of global AUM*. Bloomberg News. https://www.bloomberg.com/professional/blog/esg-assets-may-hit-53-trillion-by-2025-a-third-of-global-aum/

Eccles, R. G., & Mayer, C. (2021, January 20). Can a tiny hedge fund push ExxonMobil towards sustainability? *Harvard Business Review*. https://hbr.org/2021/01/can-a-tiny-hedge-fund-push-exxonmobile-towards-sustainability

Eccles, R. G., Rajgopal, S., & Xie, J. (2022). *Does ESG negative screening work?* http://doi.org/10.2139/ssrn.4150524

Edmans, A., Levit, D., & Schneenmeier, J. (2022, November 11). *Socially responsible divestment*. European Corporate Governance Institute – Finance Working Paper, 823. http://doi.org/10.2139/ssrn.4093518

EIA. (2023). *Petroleum and other liquids—spot prices*. United States Energy Information Administration. https://www.eia.gov/dnav/pet/pet_pri_spt_s1_m.htm

El Ghoul, S., Guedhami, O., Kwok, C., & Mishra, D. (2011). Does Corporate Social Responsibility affect the cost of capital? *Journal of Banking & Finance*, *35*(9), 2388–2406. https://doi.org/10.1016/j.jbankfin.2011.02.007

Engine No. 1. (2021, February 22). *Letter to the Board of Directors of ExxonMobil Corporation*. https://reenergizexom.com/materials/letter-to-the-board-of-directors-february-22

Engine No. 1. (2022a). *Engine No. 1 Exchange traded funds*. https://etf.engine1.com

Engine No. 1. (2022b, May 25). *ExxonMobil: One year later*. https://engine1.com/transforming/articles/exxon-mobil-one-year-later/

EPA. (2023). *Sources of greenhouse gas emissions*. United States Environmental Protection Agency. https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions

ExxonMobil. (2022). *Historical price lookup*. ExxonMobil Investor Relations. Retrieved from https://ir.exxonmobil.com/historical-price-lookup

Fabozzi, F. J., Ma, K. C., & Oliphant, B. J. (2008). Sin stock returns. *Journal of Portfolio Management*, *35*(1), 82–94. https://doi.org/10.3905/JPM.2008.35.1.82

Faust, D. G. (2013). *Fossil fuel divestment statement*. Harvard University. https://www.harvard.edu/president/news/2013/fossil-fuel-divestment-statement

Fink, L. (2023). *A sense of purpose*. https://www.blackrock.com/corporate/investor-relations/2018-larry-fink-ceo-letter

Friedlingstein, P., O'Sullivan, M., Jones, M. W., Andrew, R. M., Gregor, L., Hauck, J., Le Quéré, C., Luijkx, I. T., Olsen, A., Peters, G. P., Peters, W., Pongratz, J., Schwingshackl, C., Sitch, S., Canadell, J. G., Ciais, P., Jackson, R. B., Alin, S. R., Alkama, R., … Zheng, B. (2022). Global carbon budget 2022. *Earth System Science Data*, *14*, 4811–4900. https://doi.org/10.5194/essd-14-4811-2022

Friedman, L. (2019). Trump serves notice to quit Paris Climate Agreement. *New York Times*. https://www.nytimes.com/2019/11/04/climate/trump-paris-agreement-climate.html

Funk, C. M., & Walker, R. (2021). *Engage or invest? The question at the heart of climate impact*. State Street Global Advisors. Retrieved from https://www.ssga.com/us/en/institutional/ic/insights?g=strategies%3Aenvironmental-social-governance-esg

Gandhi, V. S., & Diak, C. (2022, November). *The role of ESG in investment strategy*. Harvard Business School Publishing. https://www.hbs.edu/faculty/Pages/item.aspx?num=63273

GFANZ. (2022). *Financial institution net-zero transition plans. Fundamentals, recommendations and guidance*. Glasgow Financial Alliance for Net Zero. https://assets.bbhub.io/company/sites/63/2022/09/Recommendations-and-Guidance-on-Financial-Institution-Net-zero-Transition-Plans-November-2022.pdf

GFFDCD. (2023). *Global fossil fuel divestment commitments database*. https://www.divestmentdatabase.org

Guillaume, K. E., & Halper, J. D. (2018, May 23). Overseer resigns over Harvard's continued fossil fuel investment. *The Crimson*. https://www.thecrimson.com/article/2018/5/23/kat-taylor-resignation/

Gupta, D., Kopytov, A., & Starmans, J. (2022, November 29). The pace of change: Socially responsible investing in private markets. Working Paper. http://doi.org/10.2139/ssrn.3896511

Hale, J. (2020). *DOL finalizes rushed anti-ESG rule*. Medium. https://medium.com/the-esg-advisor/dol-finalizes-rushed-anti-esg-rule-bfa578a8aecb

Harvard University. (2014). *Faculty Letter of 2014*. https://www.harvardfacultydivest.com/resources/timeline

Harvard University. (2022). *Harvard University Financial Report—Fiscal Year 2022*. https://finance.harvard.edu/files/fad/files/fy22_harvard_financial_report.pdf

Heinkel, R., Kraus, A., & Zechner, J. (2001). The effect of green investment on corporate behavior. *Journal of Financial and Quantitative Analysis*, *36*, 431–449. https://doi.org/10.2307/2676219

Hicke, J. A., Lucatello, S., Mortsch, L.D., Dawson, J., Domínguez Aguilar, M., Enquist, C. A. F., Gilmore, E.. A., Gutzler, D. S., Harper, S., Holsman, K., Jewett, E. B., Kohler, T. A., & Miller, K. A. (2022). North America. In H. O. Pörtner, D. C. Roberts, M. Tignor, E. S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, & B. Rama (Eds.), *Climate Change 2022: Impacts, adaptation and vulnerability*. *Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 1929–2042). Cambridge University Press. https://dx.doi:10.1017/9781009325844.016

HMC. (2022). *Climate Report – February 2022*. Harvard Management Company. https://hmc.harvard.edu/wp-content/uploads/2022/02/2022-Climate-Report.pdf

Hockett, R. C., & Gunn-Wright, R. (2019, January 1). The Green New Deal: Mobilizing for a just, prosperous, and sustainable economy. *Cornell Legal Studies Research Paper*, *9*. http://.doi.org/10.2139/ssrn.3342494

Hong, H. G., & Kacperczyk, M. T. (2009). The price of sin: The effects of social norms on markets. *Journal of Financial Economics*, *93*(1), 15–36. https://doi.org/10.1016/j.jfineco.2008.09.001

Ioannou, I., & Serafeim, G. (2015). The impact of corporate social responsibility on investment recommendations: Analysts' perceptions and shifting institutional logics. *Strategic Management Journal*, *36*(7), 1053–1081. https://doi.org/10.1002/smj.2268

IPCC. (2022). *Climate change 2022: Impacts, adaptation and vulnerability*. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change Cambridge University Press. https://doi:10.1017/9781009325844

Kerber, R., & Jīn, H. (2022). *Tesla cut from S&P 500 ESG Index, and Elon Musk tweets his fury*. Reuters. https://www.reuters.com/business/sustainable-business/tesla-removed-sp-500-esg-index-autopilot-discrimination-concerns-2022-05-18/

Kerber, R., & Schroeder P. (2022). *BlackRock, European firms face Texas pension ban over energy policies*. Reuters. https:///www.reuters.com/business/sustainable-

business/texas-comptroller-names-blackrock-credit-suisse-boycotting-fossil-fuels-2022-08-24/

Khan, M., Serafeim, G., & Yoon, A. (2015). Corporate sustainability: First evidence on materiality. *The Accounting Review*, *91*(6), 1697–1724. https://doi.org/10.2308/accr-51383

KPMG. (2023). *Get ready for the next wave of ESG reporting*. https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2023/01/csrd-thought-leadership.pdf

Kramer, M., Cole, S., Gandhi, V. S., & Zochowski, T. R. (2022). Engine No. 1: An impact investing firm engages with ExxonMobil. *Harvard Business Review*. https://store.hbr.org/product/engine-no-1-an-impact-investing-firm-engages-with-exxonmobil/222028?sku=222028-PDF-ENG

Latinovic M., & Obradovic, T. (2013). The performance of socially responsible investments. *Entrepreneurial Business and Economics Review*, *1*(2), 29–40. https://doi.org/10.15678/EBER.2013.010203

Lüthi, D., Le Floch, M.,Bereiter, B., Blunier, T., Barnola, J. M., Siegenthaler, U., Raynaud, D., Jouzel, J., Fischer, H., Kawamura, K., & Stocker, T. F. (2008). High-resolution carbon dioxide concentration record 650,000–800,000 years before present. *Nature*, *453*, 379–382. https://doi.org/10.1038/nature06949

Meadows, D. H., Meadows, D. L., Randers, J., & Behrens III, W. W. (1972). *The limits to growth: A report to the club of Rome*. Potomac Associates Books.

Morgan Stanley Institute for Sustainable Investing. (2020). *Sustainable reality: 2020 update*. https:/www.morganstanley.com/content/dam/msdotcom/en/assets/pdfs/3190436-20-09-15_Sustainable-Reality-2020-update_Final-Revised.pdf

Narvekar, N. P. (2022). *Message from the CEO—October 2022*. Harvard Management Company. https://finance.harvard.edu/files/fad/files/fy22_hmc_letter.pdf

National Oceanic and Atmospheric Administration (NOAA). (2022). *Carbon dioxide now more than 50% higher than pre-industrial levels*. https://www.noaa.gov/news-release/carbon-dioxide-now-more-than-50-higher-than-pre-industrial-levels

Nosek, G. (2022). The fossil fuel industry's push to target climate protesters in the US. *Pace Environmental Law Review*, *38*(1), 53–108. https://digitalcommons.pace.edu/pelr/vol38/iss1/2

Phillips, M. (2020). Exxon's Board defeat signals the rise of social-good activists. *The New York Times*. https://www.nytimes.com/2021/06/09/business/exxon-mobil-engine-no1-activist.html

Plummer, B., & Friedman, L. (2022). Democrats got a climate bill. Joe Manchin got drilling, and more. *The New York Times Magazine*. https://www.nytimes.com/2022/07/30/climate/manchin-climate-deal.html

Pratt, S. (2022). *Catastrophic flooding in Yellowstone*. NASA Earth Observatory. https://earthobservatory.nasa.gov/images/150010/catastrophic-flooding-in-yellowstone

Quigley, E., Budgen, E., & Odgers, A. (2020). *Divestment: Advantages and disadvantages for the University of Cambridge*. https://www.cam.ac.uk/files/divestment-report

Rodman, M., & Zhu, Y. (2015, May 27). Calls for divestment: A retrospective. *The Harvard Crimson*. https://www.thecrimson.com/article/2015/5/27/divest-retrospective-reunion-1990/

Rodney and Otamatea Times. (1912). Coal consumption affecting climate. *Waitemata and Kaipara Gazette*. https://paperspast.natlib.govt.nz/newspapers/ROTWKG19120814.2.56.5

Rosenberg, J. (2019, December, 4). A faculty motion on divesting fossil-fuel investments. *Harvard Magazine*. https://www.harvardmagazine.com/2019/12/harvard-faculty-motion-on-divestment

Ryan, C. J., & Marsicano, C. (2020). Examining the impact of fossil fuel divestment on university endowments. *New York University Journal of Law and Business*, *17*(1), 95–152. https://doi.org/10.2139/ssrn.3501231

Saijel, K. (2020). *Hedge fund veteran Chris James to start impact-investing firm*. Bloomberg. https://www.bloomberg.com/news/articles/2020-12-01/hedge-fund-veteran-chris-james-to-start-impact-investing-firm

Salam, R. (2018, October 23). Elite universities are entrenching a privileged class. An endowment tax can fix that. *The Atlantic*. https://www.theatlantic.com/ideas/archive/2018/10/why-conservatives-are-turning-elite-universities/573592/

Schneider, T.E. (2011, December 30). Is environmental performance a determinant of bond pricing? Evidence from the U.S. pulp and paper and chemical industries. *Contemporary Accounting Research*. https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1911-3846.2010.01064.x

Schumacher, E. F. (1973). *Small is beautiful: Economics as if people mattered*. Blond & Briggs.

Serafeim, G., & Fulton, M. (2014, November 4). Divestment alone won't beat climate change. *Harvard Business Review*. https://hbr.org/2014/11/divestment-alone-wont-beat-climate-change

Sharfman, S. B. (2021). The illusion of success: A critique of Engine No.1's proxy fight at ExxonMobil. *Harvard Business Law Review Online*, *2*. http://doi.org/10.2139/ssrn.3898607

S&P. (2023). *S&P 500 ESG Index*. S&P Dow Jones Indices. https://www.spglobal.com/spdji/en/indices/esg/sp-500-esg-index/#data

Stavins, R. (2019, November). *Carbon taxes vs cap and trade: Theory and practice*. Discussion Paper ES 2019-9. Harvard Project on Climate Agreements. https://seors.unfccc.int/applications/seors/attachments/get_attachment?code=TJQGYTI096K3J33ANM1HDWYEU51VRXNC

Temurlenk, M. S., & Lögün, A. (2022). An analysis of the Pollution Haven Hypothesis in the context of Turkey: A nonlinear approach. *Economics and Business Review*, *8*(1), 5–23. https://doi.org/10.18559/ebr.2022.1.2

The United States Congress. (2017). *The Tax Cut and Jobs Act of 2017*. https://govinfo.gov

The White House. (2022). *Inflation Reduction Act of 2022*. https://www.whitehouse.gov/briefing-room/statements-releases/2022/08/15/by-the-numbers-the-inflation-reduction-act/

Toffel, M., & Gulick, S. (2020). *Fossil fuel divestment*. Harvard Business School Publishing. Retrieved from https://hbsp.harvard.edu/product/620026-PDF-ENG

Trinks, P. J., & Scholtens, B. (2017). The opportunity cost of negative screening in socially responsible investing. *Journal of Business Ethics*, *140*, 193–208. https://doi.org/10.1007/s10551-015-2684-3

UN. (2015). *The Paris Agreement*. United Nations Framework Convention on Climate Change-COP21. https://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf

UN. (2021). *The Glasgow Climate Act*. United Nations Framework Convention on Climate Change-COP26. https://unfccc.int/process-and-meetings/the-paris-agreement/the-glasgow-climate-pact-key-outcomes-from-cop26

UN. (2022a). *Report of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement on its third session, held in Glasgow from 31 October to 13 November 2021*. Retrieved from https://unfccc.int/sites/default/files/resource/cma2021_10_add1_adv.pdf

UN. (2022b). *The sustainable development goals report 2022*. United Nations. https://unstats.un.org/sdgs/report/2022/The-Sustainable-Development-Goals-Report-2022.pdf

Urist, J. (2015, April 29). The push for ethical investment at American's colleges. *The Atlantic*. https://theatlantic.com/education/archive/2015/04/the-push-for-ethical-investment-at-american-colleges/391697/

Supreme Court of the United States. (2022). *West Virginia et al. v. Environmental Protection Agency et al*. https://www.supremecourt.gov/opinions/21pdf/20-1530_n758.pdf

Wood, S. (2022, September 13). 10 national universities with the biggest endowments. *U.S. News*. https://www.usnews.com/education/best-colleges/the-short-list-college/articles/10-universities-with-the-biggest-endowments#:~:text=Topping%20the%20list%20at%20about,News%20in%20an%20annual%20survey

Zhang, J. (2019). Environmental protection investment and market value. *Modern Economy*, *10*, 399–411. https://doi.org/10.4236/me.2019.102027

Aims and Scope

The **Economics and Business Review** is a quarterly journal focusing on theoretical, empirical and applied research in the fields of Economics and Corporate and Public Finance. The Journal welcomes the submission of high quality articles dealing with micro, mezzo and macro issues well founded in modern theories and relevant to an international audience. The EBR's goal is to provide a platform for academicians all over the world to share, discuss and integrate state-of-the-art Economics and Finance thinking with special focus on new market economies.

The manuscript

1. Articles submitted for publication in the **Economics and Business Review** should contain original, unpublished work not submitted for publication elsewhere.
2. Manuscripts intended for publication should be written in English, edited in Word in accordance with the **APA editorial** guidelines and sent to: secretary@ebr.edu.pl**.** Authors should upload two versions of their manuscript. One should be a complete text, while in the second all document information identifying the author(s) should be removed from papers to allow them to be sent to anonymous referees.
3. Manuscripts are to be typewritten in **12' font in A4 paper** format, one and half spaced and be aligned. Pages should be numbered. Maximum size of the paper should be up to 20 pages.
4. Papers should have an abstract of about 100-150 words, keywords and the Journal of Economic Literature classification code (**JEL Codes**).
5. Authors should clearly declare the aim(s) of the paper. Papers should be divided into numbered (in Arabic numerals) sections.
6. **Acknowledgements** and references to grants, affiliations, postal and e-mail addresses, etc. should appear as a separate footnote to the author's name a, b, etc and should not be included in the main list of footnotes.
7. **Footnotes** should be listed consecutively throughout the text in Arabic numerals. Cross-references should refer to particular section numbers: e.g.: See Section 1.4.
8. **Quoted texts** of more than 40 words should be separated from the main body by a four-spaced indentation of the margin as a block.
9. **References** The EBR 2017 editorial style is based on the **6th editio**n of the Publication Manual of the American Psychological Association (**APA**). For more information see APA Style used in EBR guidelines.
10. **Copyrights** will be established in the name of the **E&BR publisher**, namely the Poznań University of Economics and Business Press.

More information and advice on the suitability and formats of manuscripts can be obtained from:

Economics and Business Review
al. Niepodległości 10
61-875 Poznań
Poland
e-mail: secretary@ebr.edu.pl
www.ebr.edu.pl

Subscription

Economics and Business Review (E&BR) is published quarterly and is the successor to the Poznań University of Economics Review. The E&BR is published by the Poznań University of Economics and Business Press.

Economics and Business Review is indexed and distributed in Scopus, Claritave Analytics, DOAJ, ERIH plus, ProQuest, EBSCO, CEJSH, BazEcon, Index Copernicus and De Gruyter Open (Sciendo).

Subscription rates for the print version of the E&BR: institutions: 1 year – €50.00; individuals: 1 year – €25.00. Single copies: institutions – €15.00; individuals – €10.00. The E&BR on-line edition is free of charge.