

## Sustainable Retirement Investments: Shifting Paradigms at Williams College

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### Abstract

This paper presents a comprehensive analysis and strategic plan for integrating Environmental, Social, and Governance (ESG) retirement funds into Williams College's retirement investment options. It begins with an exploration of the non-monetary benefits of ESG funds, particularly in relation to addressing climate change. Subsequently, it examines Williams College's commitment to sustainability and highlights the strategic alignment of ESG funds with institutional goals. Statistical analyses, utilizing both national and college-level performance data, underscore the financial viability and resilience of ESG funds. Additionally, a parallel analysis of ESG funds from other US colleges reveals compelling options with strong relative annual performance and stable volatility levels. The paper concludes with recommendations for engagement and implementation strategies, communication plans, and proposals for collaboration and expansion, emphasizing the pivotal role of sustainable retirement investments in advancing institutional sustainability goals and combating climate change.

### Introduction

Sustainable investing (also known as “socially responsible investing” and “impact investing”), emphasizing environmental, social, and governance (ESG) considerations, has been gaining ground among investors over the past decade. The global assets committed to sustainable investments reached \$35.3 trillion in 2020, a 15% increase from 2018,<sup>1</sup> reflecting a growing interest in aligning investment decisions with ethical values and long-term sustainability goals. More

recently, ESG funds have become heavily politicized in the U.S. and been criticized globally as greenwashing and for a lack of transparent, comparable performance data.

Distinguishing sustainable investment from conventional approaches lies in the selection of assets for portfolio construction. Stocks in sustainable funds adhere to various ESG prescriptions and ethical guidelines, catering to personal and political beliefs. Both individual and institutional investors are progressively attuned to ESG issues, prompting the investment community to adapt. The evolution of sustainable investment includes ethical, impact, and socially responsible investment varieties, supported by international efforts such as the United Nations Principles for Responsible Investment (UN PRI) and the Social Investment Forum.

The relevance of sustainable investment becomes pronounced in the context of retirement investing, particularly for institutional investors like pension funds and individuals with retirement accounts. With investment horizons spanning several decades, retirement investments cause long-term consequences, such as effects on climate risk. Balancing sustainable, long-term returns with investment risk management is crucial for retirement portfolios.

Global interest in sustainable investing continues to surge, with nearly \$2 trillion invested globally in sustainable funds. The first quarter of 2021 witnessed a doubling of net inflows to sustainable funds in the United States.<sup>2</sup> The demand reflects organizations' desire to align investment processes with their values, as highlighted in a survey where 57% of institutional investors cited alignment with organizational

<sup>1</sup> Capital Partners. “The Rise of Sustainable Investing.” 2023. <https://www.lccapital.com/blog/rise-of-sustainable-investing/#:~:text=According%20to%20a%20report%20by,a%2015%25%20increase%20from%202018>

<sup>2</sup> Jessop, S., Murugaboopathy, P. “Sustainable fund inflows hit record high in Q1: Morningstar.” 2021. <https://www.reuters.com/business/sustainable-business/sustainable-fund-inflows-hit-record-high-q1-morningstar-2021-04-30/>

values as a primary motive for ESG strategies.<sup>3</sup> The performance of sustainable funds further supports their attractiveness, with consistent outperformance in seven of the last ten years and an average growth of 4.6% compared to 1.1% in the first quarter of 2021. This paper aims to motivate Williams College to introduce more options of sustainable retirement funds/bonds by presenting a qualitative analysis of the College's retirement investing impact on its carbon footprint and alignment with sustainability plans. Additionally, an extensive quantitative examination of eight years of mutual funds/bonds performance data from Teachers Insurance and Annuity Association of America (TIAA) aims to discern any performance differences between ESG funds and conventional counterparts.

This study addresses key questions regarding sustainable retirement investing at Williams:

*1. What are the non-monetary benefits of sustainable assets?*

Analyzing contemporary trends in climate action and its intricate relationship with environmental and social justice is essential for comprehending the rationale behind incorporating green investment options. Furthermore, this investigation will consider the interplay between the drive for achieving zero net emissions and its alignment with the strategic plans of Williams College.

*2. Does sustainable retirement investing entail a tradeoff in performance?*

This question is answered by analyzing the performance of both conventional and sustainable funds currently offered at Williams, expanding the scope to include additional green funds available at other US Colleges.

*3. Do sustainable retirement funds carry more risk than conventional funds?*

This inquiry involves an analysis of variance among funds, considering performance metrics and focusing on the coefficient of variance.

*Terminology Note:* to streamline the discussion in this paper, it's important to note that terms such as responsible investment, impact, green, sustainable, and ESG investment, as well as funds and bonds associated with these concepts, will be used interchangeably. While recognizing that each term may have nuanced differences, for the purpose of this paper, we consider them as part of a broader landscape without delving into specific distinctions.

### Literature Review

*What are the non-monetary benefits of sustainable assets?*

The 2015 Paris Agreement marked a pivotal moment when governments globally acknowledged the imperative for immediate action to combat climate change, recognizing its potential catastrophic consequences on both humanity and the planet. Unsustainable business practices, leading to deforestation, biodiversity loss, and the degradation of ecosystems, contribute to the deterioration of natural capital—comprising air, water, soils, forests, plants, and animals.

Existing literature generally suggests that sustainable investments, particularly Environmental, Social, and Governance (ESG) funds, do not adversely impact financial outcomes for pension investors in comparison to conventional investments. However, a significant gap in these studies pertains to the lack of consideration for institutional investors like colleges, with notable examples like TIAA. This paper aims to build on existing literature by addressing this specific institutional perspective.

### Literature on Climate Change Analysis

The literature consistently underscores the urgent need for immediate and substantial action in response to the escalating climate crisis. Climate scientists unequivocally warn of the potentially catastrophic consequences resulting from the significant human-induced production of greenhouse gasses, leading to disruptions such as heatwaves, wildfires, droughts, famines, flooding, melting ice, sea-level rise, mass migration, pandemics, and war.

The global mean atmospheric temperature has already increased by approximately 1.0°C since the Industrial Revolution, causing tangible harm and presenting substantial risks to human well-being and the

<sup>3</sup> Natixis Investment Managers. "ESG Investing Survey Insight Report." 2021. <https://www.im.natixis.com/sg/research/esg-investing-survey-insight-report>

environment.<sup>4</sup> The Paris Agreement, a landmark international accord signed by 195 nations, commits to limiting global temperature increases to well below 2°C above pre-industrial levels and pursuing efforts to cap the increase at 1.5°C.<sup>5</sup> Achieving these targets requires significant reductions of 25% in greenhouse gas emissions by 2030 and net-zero emissions by 2050 or 2070, depending on the temperature goal.<sup>6</sup>

However, the current trajectory, if left unchecked, could result in a devastating increase in global mean temperature (by 3.7°- 4.8°C by 2100), far exceeding the limits set by the Paris Agreement.<sup>7</sup> This alarming scenario underscores the critical need for comprehensive risk assessment, adaptation, and mitigation efforts to address the severe consequences of climate disruption.

*Building upon the discourse on climate justice and social protection*, climate change presents immediate and escalating risks to communities, affecting aspects such as health, safety, quality of life, and economic growth, with vulnerable communities experiencing the most profound impact. Moreover, the rising frequency of zoonotic virus outbreaks, as illustrated by the 2020 COVID-19 pandemic, is intricately connected to climate change, as it exaggerates the pandemics by causing the migration of virus carriers, introducing supplementary threats to global health. It is well-documented that communities residing in marginalized areas bear the brunt of these challenges.

Additionally, the literature highlights the inadequacy of relying solely on national and international regulatory efforts and climate pledges to effectively

address the global climate challenge.<sup>8</sup> Therefore, this paper aims to foster a more active involvement of private institutional organizations in contributing to climate action.

Climate justice revolves around the ethical imperative of addressing the disproportionate impacts of climate change on marginalized and disadvantaged communities. It emphasizes the need for fair and inclusive policies and interventions that prioritize the well-being of those most vulnerable. By recognizing the interconnectedness of climate change, health crises, and social disparities, society can foster a more *inclusive, sustainable, and resilient future*.

### Importance of Adding ESG Funds

In light of this scientific reality, recognizing the pressing importance of addressing climate change, it is essential to consider financial strategies aligned with Environmental, Social, and Governance (ESG) principles. The urgency of the situation requires a reevaluation of personal investment portfolios, especially retirement funds, to align them with values that favor a reduction in greenhouse gas emissions and support innovative business solutions to the climate challenge.

ESG funds provide an avenue for individuals to contribute positively to the global climate challenge. By prioritizing investments in companies with strong environmental practices, social responsibility, and effective governance, individuals can actively participate in the transition to a sustainable and climate-resilient future.

This additional structural point emphasizes the role of responsible investing in addressing the climate emergency, highlighting that individual actions, such as aligning personal retirement investments with ESG principles, can contribute to the broader global efforts needed to mitigate climate change. The integration of ESG funds into investment portfolios becomes not only a financial strategy but also a conscientious response to the urgency outlined in the scientific literature above.

### Analysis of the UPenn's study and Implications for Williams College

The recent research from the University of Pennsylvania (UPenn) sheds light on critical aspects of

<sup>4</sup> Climate Analytics. "Global Warming Reaches 1°C Above Pre-industrial: Warmest in More Than 11,000 Years." <https://climateanalytics.org/briefings/global-warming-reaches-1c-abovepreindustrial-warmest-in-more-than-11000-year/>

<sup>5</sup> United Nations Framework Convention on Climate Change (UNFCCC). "The Paris Agreement." [https://unfccc.int/files/meetings/paris\\_nov\\_2015/application/pdf/paris\\_agreement\\_english\\_.pdf](https://unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_english_.pdf)

<sup>6</sup> Intergovernmental Panel on Climate Change (IPCC). "Special Report: Global Warming of 1.5 °C." 2019. [https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15\\_Full\\_Report\\_High\\_Res.pdf](https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_High_Res.pdf)

<sup>7</sup> Pachauri, R., Meyer L. Intergovernmental Panel on Climate Change (IPCC). "Climate Change 2014: Synthesis Report." 2014. [https://www.ipcc.ch/site/assets/uploads/2018/05/SYR\\_AR5\\_FINAL\\_full\\_wcover.pdf](https://www.ipcc.ch/site/assets/uploads/2018/05/SYR_AR5_FINAL_full_wcover.pdf) 8Orts, E. "Climate Contracts." 2010. <http://www.velj.org/climate-contracts.html>

<sup>8</sup> Orts, E. "Climate Contracts." 2010. <http://www.velj.org/climate-contracts.html>

the current state of sustainable retirement investment at the US Colleges.<sup>9</sup> The revelation that TIAA, the exclusive service provider for UPenn’s faculty retirement plans, has a substantial \$78 billion in fossil fuel investments serves as a stark reminder of the potential environmental impact embedded in retirement portfolios. Williams College should recognize the magnitude of this revelation as it prompts a thorough examination of its own investment strategies.

Faculty awareness at UPenn emerges as a notable concern, echoing the potential lack of knowledge within Williams College’s community regarding the climate impact of retirement investment options. The parallels between the institutions underscore the importance of transparent communication and proactive efforts to ensure faculty members are well-informed. Faculty advocacy takes center stage in UPenn’s case, where 299 individuals submitted a complaint to the Principles for Responsible Investment, reflecting a growing trend of activism. This proactive approach contributes to a more environmentally conscious investment landscape. Establishing channels for open dialogue and educational initiatives can cultivate a sense of responsibility among faculty at Williams College as well.

An alarming finding from the UPenn research is the potential discrepancy in funds labeled as “social choice” or “low carbon,” which may have higher rates of fossil fuel investment. Williams College must scrutinize the composition and performance of its future socially responsible investment options to ensure they genuinely align with environmental goals, providing faculty with meaningful choices that resonate with their values.

One of the most remarkable findings from the UPenn study is a graphic attached to the resolution, which estimates that faculty and staff retirement funds contribute to approximately 2,470,320 metric tons of carbon dioxide annually. This staggering figure *surpasses the greenhouse gas (GHG) emissions from campus operations by several times*, despite these operations being the primary focus of sustainability measures and included in the scope 1 and 2 GHG emissions accounting.

<sup>9</sup> Castiglione, E. University of Pennsylvania. “Retirement funds for Penn faculty managed by company with billions in fossil fuel investments.” 2023. <https://www.thedp.com/article/2023/02/penn-faculty-retirement-tiaa-fossil-fuel-investments>



Fig.1. Distribution of sources of GHG emissions<sup>10</sup>

The significance of this disparity and the impact of greenhouse gas emissions from retirement investments, in comparison to those from residence, campus operations, and other sources, are alarming. Remarkably, there is a lack of concerted efforts to address and reduce these emissions. The carbon dioxide emissions from retirement investments fall under Scope 3 emissions, a category not currently captured at Williams College. Therefore, the estimations from UPenn provide the closest (as for now) insight into the relative contribution of Williams College’s retirement investments to the overall carbon footprint.

This revelation presents a compelling argument for the urgent implementation of more sustainable retirement investment options. Recognizing and addressing this aspect of carbon emissions becomes crucial for institutions like Williams College to align their investments with sustainability goals and actively contribute to reducing their overall environmental impact.

In summary, the UPenn research underscores the urgency for Williams College to critically evaluate its retirement investment strategies. By learning from UPenn’s experiences, Williams College can enhance transparency, engage with faculty concerns, and strive for a more sustainable and responsible approach to retirement planning. The contradiction highlighted by UPenn faculty, where earnings contribute to destroying the future they aim to nurture,

<sup>10</sup> Castiglione, E. University of Pennsylvania. “Retirement funds for Penn faculty managed by company with billions in fossil fuel investments.” 2023. <https://www.thedp.com/article/2023/02/penn-faculty-retirement-tiaa-fossil-fuel-investments>

should serve as a compelling call to action for Williams College to align its investments with its commitment to environmental stewardship.

### Analysis of Williams College's strategy plans.

#### *Strategic Plan*<sup>11</sup>

1. Sustained Commitment to Sustainability  
*From the plan:*

“Williams is committed to the responsible stewardship of its campus environment and recognizes that our actions have impacts beyond its borders. Our commitment to sustainability starts with the recognition that climate change and environmental degradation are defining challenges of our time...”

Incorporating ESG retirement funds aligns with Williams College's sustained commitment to sustainability. By providing faculty members with the opportunity to invest in environmentally-conscious options, the College reinforces its dedication to addressing climate change, fostering responsible resource use, and promoting social justice. Introducing ESG retirement funds provides a tangible means for faculty members to actively participate in this mission. By selecting investments aligned with climate-focused initiatives, faculty contributions to retirement portfolios become a direct extension of the college's broader efforts to mitigate its carbon footprint and work towards a sustainable, low-emission future.

2. Educational and Research Impact:

ESG retirement funds contribute to the college's commitment to education and research in sustainability. By engaging faculty in these investment choices, Williams College creates a living laboratory for exploring the intersection of finance, environmental impact, and social responsibility. This educational component not only enhances the faculty's financial literacy but also aligns with the broader goals of the institution in teaching and research. Therefore, as a part of the implementing the ESG investment options, we are advocating for adding the educational website on the importance of sustainable investing.

3. Community Collaboration and Social Equity

*From the plan:*

“Collaborating with other colleges and universities to increase impact”

“Making clear connections between our environmental actions and social justice”

Being in touch with Amherst College and in the future with other US Colleges emphasizes the importance of collaboration considering the interconnectedness of environmental actions and social justice. Faculty members across all US Colleges, through their investment choices, become integral partners in advancing community-wide sustainability goals, fostering a sense of shared responsibility. Moreover, the crosscutting commitments to Diversity, Equity, Inclusion, and Accessibility (DEI) and Sustainability are woven into Williams College's strategic plan. ESG retirement funds contribute to these commitments by promoting responsible investment practices.

#### *Investment Office Strategy*<sup>12</sup>

1. Fossil Fuel Phase-Out

President Mandel, in April 2022, communicated the Investment Committee's commitment to gradually phase out investments in fossil fuel projects within commingled investment funds.

The addition of ESG Retirement Funds aligns seamlessly with the commitment to fossil fuel phase-out and prioritizing impact investments. It reflects a continuation of the Investment Office's dedication to investments that not only generate financial returns but also contribute to broader environmental and social goals.

2. Demonstrating Leadership

The commitment to cease new investments in oil and gas extraction projects, announced in 2021, positions the college as a leader in sustainable investing. The addition of ESG Retirement Funds further solidifies this leadership, showcasing a forward-thinking approach and dedication to positive environmental and social impact.

3. Diversification of Sustainable Investments

The Investment Office, charged in 2015, exceeded

<sup>11</sup> Williams College. “Strategic Plan 2021.” <https://www.williams.edu/strategic-planning/strategic-plan-2021/>

<sup>12</sup> Williams College. “Investment Office's strategy.” <https://investment.williams.edu/about/investment-strategy/>

the mandate to allocate \$25 million in endowment funds to investment managers specializing in reducing global greenhouse gas emissions. With a commitment of \$30 million by FY2020, the endowment has deployed \$50 million across six funds, achieving the dual objective of financial returns and measurable reductions in greenhouse gas emissions.

Integrating ESG Retirement Funds allows for a diversification of investments within the broader portfolio. This diversification is in line with the College's strategy of seeking opportunities in alternative energy and environmentally responsible ventures.

### ***Climate Action Plan***<sup>13</sup>

The introduction of ESG retirement funds at Williams College aligns with the institution's climate plan objectives. The goal of achieving a 35% reduction in net greenhouse gas emissions by 2020 emphasizes a holistic approach to sustainability, and ESG retirement funds become a crucial instrument in involving faculty members directly in this initiative.

#### 1. Endowment Investments for Environmental Benefit

*From the plan:*

“Action 6: Continue investing the endowment in impact investments that promote measurable reductions in global carbon emissions”

Williams College's commitment to investing the endowment in projects benefiting the environment includes significant financial commitments to alternative energy projects. The introduction of ESG retirement funds not only complements these existing efforts but also extends the opportunity for faculty to contribute actively to projects that align with the College's environmental goals.

#### 2. Alignment with Educational Mission

The strategic investments in the College's educational mission, such as faculty positions focusing on climate change, underscore a commitment to integrating sustainability ESG retirement funds further reinforce this commitment by providing faculty members

with an avenue to translate their financial choices into tangible contributions to the campus-wide theme of inquiry into anthropogenic climate change.

#### 3. Scope of GHG Accounting and Voluntary Scope 3 Actions

The acknowledgment that GHG accounting does not include investments highlights the need for complementary actions. Introducing ESG retirement funds becomes an integral step in addressing the voluntary Scope 3 emissions by allowing faculty to make environmentally conscious investment decisions, filling a critical gap in the overall climate strategy.

In summary, the addition of ESG retirement funds at Williams College becomes an integral component of the institution's broader strategic and climate plan. It not only addresses specific goals related to greenhouse gas emissions but also empowers faculty members to actively contribute to the college's sustainability objectives. The strategic alignment with ongoing initiatives, commitment to impact investments, and the phasing out of fossil fuel projects all highlight the synergies that can be achieved by introducing ESG retirement options.

### **Statistical Analysis of Performance and Variance of Williams College's retirement investment options**

#### ***National scope: USA***

Until recently, there has been a common misperception among decision makers and plan sponsors that selecting ESG funds for inclusion in retirement plans risked sacrificing investment performance relative to other mutual funds.

There have been over 2,000 studies designed to understand the relationship between ESG criteria and corporate financial performance. Based on a review by Sustainable Finance and Investment research, “90% of all studies showed a non-negative relationship, indicating that the inclusion of ESG factors did not affect performance. In fact, the majority of the studies reported a positive relationship, indicating that ESG criteria improved market performance.”<sup>14</sup>

<sup>13</sup> Williams College. “Climate Action Plan 2022” <https://docs.google.com/document/d/1rbF3knDXPEw-2yPk4AetG3urH1HSvTh8HBPMXtgTJYQ/edit#heading=h.ympd y6we0762>

<sup>14</sup> Boffo, R., Patalano, R. OECD. “ESG Investing: Practices, Progress and Challenges”, 2020. [www.oecd.org/finance/ESG-Investing-Practices-Progress-and-Challenges.pdf](http://www.oecd.org/finance/ESG-Investing-Practices-Progress-and-Challenges.pdf)

The Morgan Stanley Study<sup>15</sup> of over 10,000 funds found:

1. There is no financial tradeoff in the returns of sustainable funds and traditional funds. No consistent or statistically significant difference in total returns existed between ESG-focused and traditional mutual funds.
2. Sustainable funds may offer lower market risk. Sustainable funds experienced a 20% smaller downside deviation than traditional funds, a consistent and statistically significant finding.

The Morgan Stanley Study, along with others, indicate that a comparative analysis between ESG Funds and other mutual funds bolsters favorable perceptions of sustainable investing, which are becoming more widely accepted among investors and asset managers, who see potential for sustainable portfolios to yield attractive financial returns, alongside positive environmental or social impact. The Morgan Stanley Study found that: U.S. sustainable equity funds outperformed their traditional peer funds by a median total return of 4.3 percentage points. U.S. sustainable equity funds' median downside deviation was 3.1 percentage points less than traditional peer funds.

As for market cycles or long-term volatility, the same Morgan Stanley Study referenced above found that “in years of turbulent markets, such as 2008, 2009, 2015 and 2018, sustainable funds' downside deviation (a measure of downside risk that focuses on returns that fall below a minimum threshold or minimum acceptable return) was significantly smaller than traditional funds.” Based on this information, adding ESG funds to a retirement plan lineup appears to be financially prudent.

The analysis of ESG fund performance unlike any other supports the broader narrative that incorporating environmental, social, and governance considerations into investment strategies can contribute to financial resilience.<sup>16</sup>

<sup>15</sup> Morgan Stanley. “Sustainable Investing Offers Financial Performance, Lowered Risk.” 2019. [https://www.morganstanley.com/content/dam/msdotcom/ideas/sustainable-investing-offers-financial-performance-lowered-risk/Sustainable\\_Reality\\_Analyzing\\_Risk\\_and\\_Returns\\_of\\_Sustainable\\_Funds.pdf](https://www.morganstanley.com/content/dam/msdotcom/ideas/sustainable-investing-offers-financial-performance-lowered-risk/Sustainable_Reality_Analyzing_Risk_and_Returns_of_Sustainable_Funds.pdf)

<sup>16</sup> Hale, J. The ESG Advisor. “Takeaways from a Record Year for Sustainable Funds in the U.S.” 2021. <https://medium.com/the-esg-advisor/takeaways-from-a-record-year-for-sustainable-funds-in-the-u-s-f66d02ba74c7>

Appropriately, when funds are being considered in a retirement plan, ESG funds should at least be part of the conversation and analysis, as ESG funds seek to improve financial outcomes with an appropriate risk/return analysis.

### *Local scope: Williams College*

To assess the relevance of these national performance and variance results of sustainable investment options, we conducted a comprehensive analysis of the retirement investments data from Williams College.

### *Data Overview*

The primary data source for the performance evaluation was the TIAA website,<sup>17</sup> which provided a comprehensive list of available investment options not only for Williams College but also for a majority of other U.S. colleges. While the website offered essential information such as fund types, annual return rates, and, in some instances (~20% of the investment options), risk metrics, monthly and yearly performance data of funds/bonds were notably absent. Attempts to obtain this performance data through direct contact with the TIAA office and online searches proved unsuccessful.

To overcome this challenge, a detailed analysis of the HyperText Markup Language (HTML) data of each fund's individual pages on the TIAA website was conducted. While the TIAA presented performance graphs for individual funds over the years, the crucial underlying data for comparative analysis was not readily available. Recognizing that the individual performance graphs must be based on a hidden table of data undisclosed by TIAA, an examination of HTML codes led to the discovery of the code responsible for the data in the graphs. A solution emerged using the “pandas” library in Python, specifically tailored for web scraping. (For code access, please send your request to [diliara.sadykova.04@gmail.com](mailto:diliara.sadykova.04@gmail.com).)

Furthermore, we conducted an extensive analysis of the available investment options offered by TIAA across over 40 colleges in the United States. This analysis encompassed institutions with diverse profiles, including liberal arts colleges and larger university entities. The examination involved a thorough review of their websites and retirement plans,

<sup>17</sup> TIAA. “View All Investments - Williams College.” <https://www.tiaa.org/public/tcm/williams/view-all-investments>

unveiling 10 additional ESG funds and bonds that are actively invested in these institutions but not yet implemented at Williams College.

These newly identified ESG funds and bonds, along with their corresponding performance and variance metrics, have been integrated into our considerations. They emerge as prime candidates to be proposed to the Williams’ HR office for implementation due to their proven track record as sustainable options actively utilized by colleges similar to Williams. In the subsequent sections, these funds will take center stage in our analysis, providing a focal point for comparison with other conventional funds.

**Performance and Variance Metric Analyses**

The methodology employed for analyzing the TIAA investment options dataset started with importing and cleaning the data in R. (For R code access, please send your request to diliara.sadykova.04@gmail.com.) Upon inspecting the dimensions of the cleaned dataset using the “dim” function, it was revealed to consist of 38 rows and 108 columns. 28 rows encompass Williams College’s available funds, comprising both conventional and sustainable options, while an additional 10 rows feature newly discovered green funds from other colleges. The columns correspond to the time period, spanning 8 years from 2015 to 2023. This specific timeframe was selected for its representativeness, encapsulating multiple economic business cycles and aligning with the inception dates of the funds under consideration.

*Ranking Performance of Williams’ existing funds and bonds by their performance and variance over the years*

Subsequently, exploratory data analysis was conducted, generating graphs to rank the performance of Williams’ existing funds and bonds based on their monthly returns. Plots were created for “AnnualPercent,” “SD” (standard deviation), and “CoefOfVariation” (Coefficient of Variation) using the “ggplot2” library. Rows which are highlighted are Williams College available ESG funds: CREF Social Choice Account (QCSCPX) and TIAA-CREF Social Choice Low Carbon Equity Fund Institutional (TNWCX).

*Funds/Bonds ranked by Annual Percent – the annual growth of an asset.*

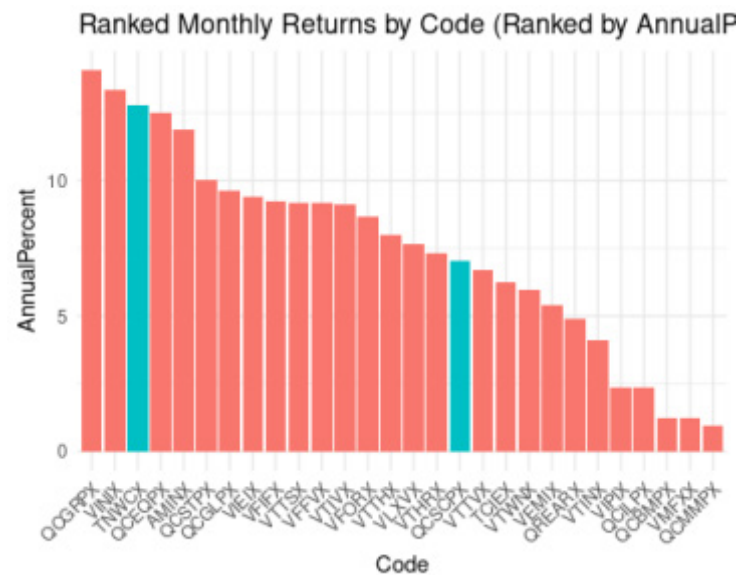


Fig.2. Funds/Bonds ranked by Annual Percent – the annual growth of an asset.

Analysis: TNWCX is ranked top-3 and QCSCPX top-17 out Williams’ 28 available investment options. These results suggest the presence of existing ESG funds that outperform conventional ones within the investment portfolios. This underscores the potential of sustainable investment choices in generating growth compared to their conventional counterparts.

Funds/Bonds ranked by the standard deviation of the asset’s value. Standard deviation (SD) is a statistical measure that quantifies the amount of variation or dispersion in a set of values.

In the context of an asset’s value, calculating the standard deviation helps investors understand the degree of volatility or risk associated with the asset’s performance.

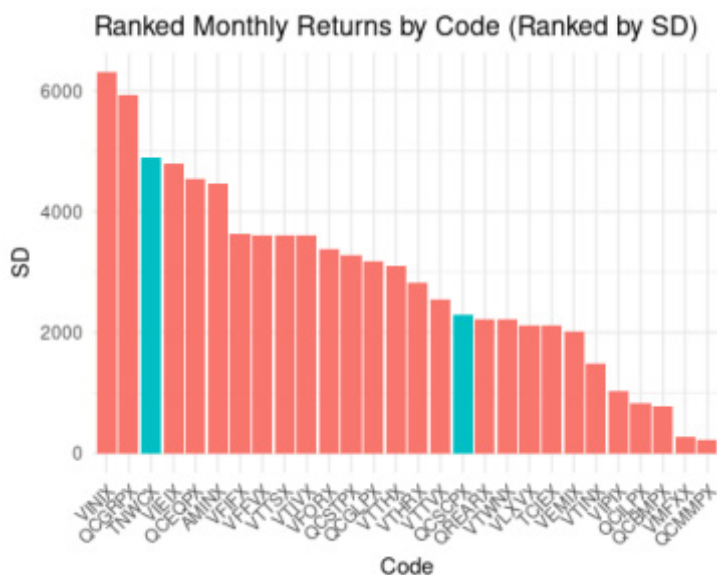


Fig.3. Funds/Bonds ranked by SD.

Analysis: TNWCX is positioned in the top-3, and QCSCPX is ranked top-17 among Williams College’s 28 available investment options based on their Standard Deviation (SD). Notably, these rank numbers align closely with their respective Annual Percent Growth rankings. This correlation implies that TNWCX, while delivering high returns, is also characterized by strong volatility. In contrast, QCSCPX, despite not yielding as significant returns, demonstrates a comparatively more stable performance. The consistent rank alignment between SD and Annual Percent Growth underscores a crucial trade-off in investment decisions between returns and volatility.

Funds/Bonds ranked by Coefficient of Variation - statistical measure that expresses the relative variability of the fund’s returns, considering its standard deviation in relation to its mean:  $sd/mean$

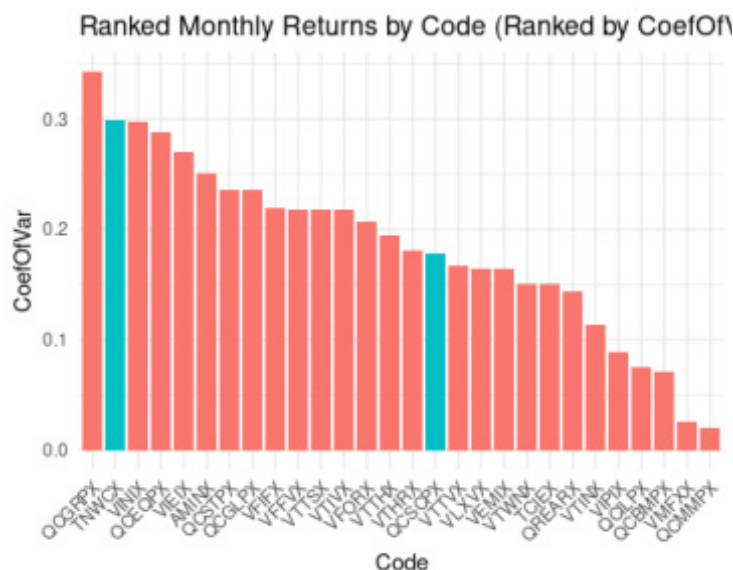


Fig.4. Funds/Bonds ranked by Coefficient of Variation.

Analysis: TNWCX holds the top-2 position, while QCSCPX secures the top-16 rank among Williams College’s 28 available investment options, as determined by their Coefficient of Variation (CV). The CV, which considers both variance and performance, provides a comprehensive view of risk-adjusted returns. In this context, these rankings emphasize that certain ESG funds, when adjusted for variance, outperform conventional options (lower CV is better than higher CV).

Furthermore, comparative analyses were performed to assess the performance of Williams’s existing funds and bonds in comparison to green funds/bonds from other colleges. Different colors were assigned to highlight specific codes in the plots, distinguishing between Williams’ green funds/bonds (turquoise) and those from other colleges (coral). The use of the “dplyr” library facilitated data manipulation and the creation of new columns based on specific criteria, while the `case\_when` function was employed for conditional coloring of data points in the plots.

The motivation for conducting this comparative analysis is to go beyond evaluating Williams College’s funds and bonds in isolation. It aims to gauge their performance relative to green funds/bonds offered by other colleges. The primary objective is to identify environmentally conscious funds with strong risk-adjusted returns, intending to propose their implementation within Williams College’s retirement investments portfolio.

*Ranking Williams' existing funds/bonds + additional green funds/bonds from other colleges by their Annual Percent:*

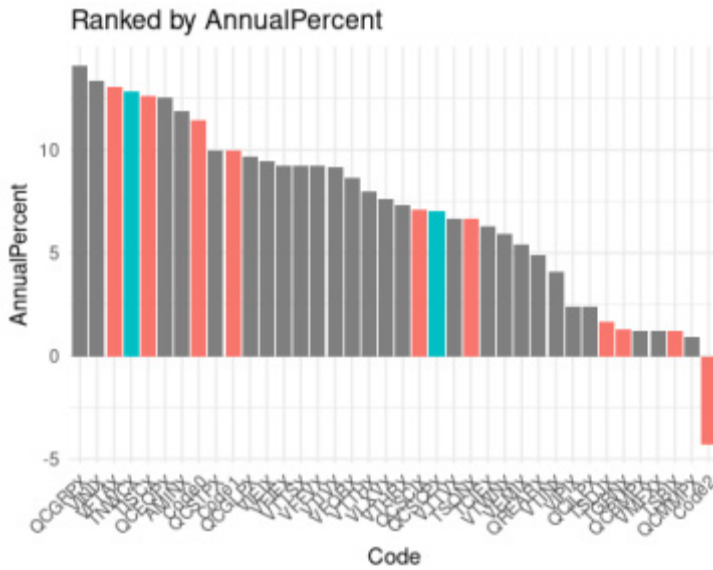


Fig.5. Williams' existing funds/bonds with additional green funds/bonds from other colleges ranked by Annual Percent.

Analysis: Other colleges feature four ESG funds with impressive relative annual performance: Vanguard FTSE Social Index Fund Admiral Class Shares (VFTAX), TIAA-CREF Social Choice Equity Fund (Institutional) (TISCX), TIAA Access Vanguard FTSE Social Index, and TIAA Access TIAA-CREF Social Choice Intl Eq. These funds emerge as compelling options, not only for their financial performance but also for the non-monetary benefits they bring. Consideration of these funds for potential inclusion at Williams would align with a holistic approach to sustainability investing.

*Ranking Williams' existing funds and bonds + additional green funds/bonds from other colleges by their SD*

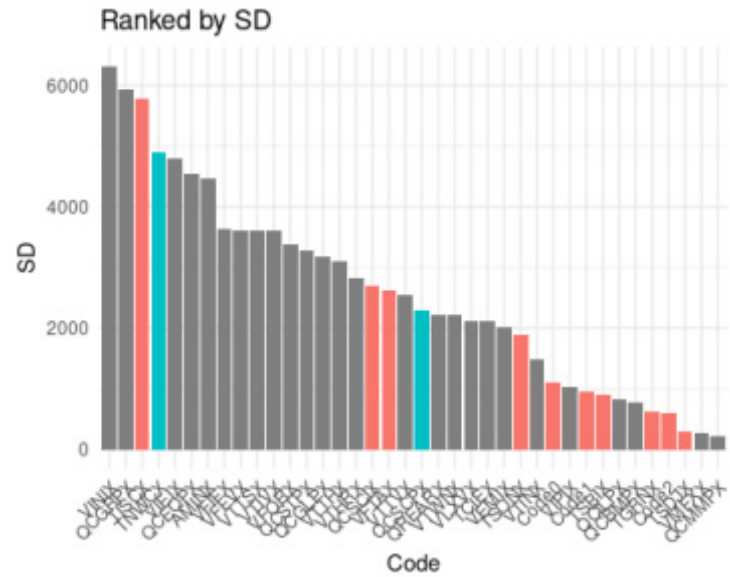


Fig.6. Williams' existing funds/bonds with additional green funds/bonds from other colleges ranked by SD

Analysis: Notably, among the high-performing ESG funds, only one—TIAA-CREF Social Choice Equity Fund (Institutional) (TISCX)—exhibits a high relative volatility. Vanguard FTSE Social Index Fund Admiral Class Shares (VFTAX) demonstrates a medium level of relative volatility, while the other two high-performing funds appear relatively stable. This observation instills confidence that ESG funds, on the whole, showcase both high performance and stability. Such a combination is reassuring and should alleviate concerns associated with implementing these assets or similar ones within Williams College's investment options.

*Ranking Williams' existing funds and bonds + additional green funds/bonds from other colleges by their Coefficient of Variation*

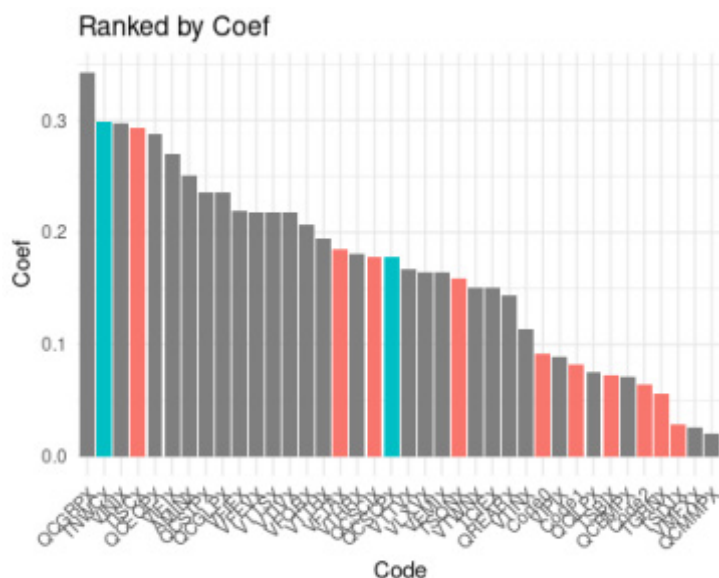


Fig.7. Williams' existing funds/bonds with additional green funds/bonds from other colleges ranked by Coefficient of Variation.

Analysis: The Coefficient of Variation (CV) mirrors the patterns observed in Standard Deviation (SD), indicating the presence of sustainable funds implemented in other colleges that showcase risk-adjusted returns outperforming conventional funds. This underscores the importance for Williams to explore these or similar funds. In addition to contributing to environmental justice, these funds offer not only non-monetary benefits but also demonstrate the potential for standard, high monetary returns.

In the time-series analysis, subsets of different types of investment options were created, focusing on green funds and bonds as well as conventional ones. The subsets were designed to include all available options and, separately, the best options (with best performance) within the green funds and bonds category (Williams + other Colleges options). The goal was to assess the mean performance of these subsets over time.

Subsequently, time-series linear graphs were generated using the “ggplot2” and “tidyr” libraries in R. The graphs depict the performance trends over time for all available options and the best options within each category. These visualizations aid in understanding the temporal patterns and relative performance of different investment

options, allowing for informed decision-making.

*Time-series*

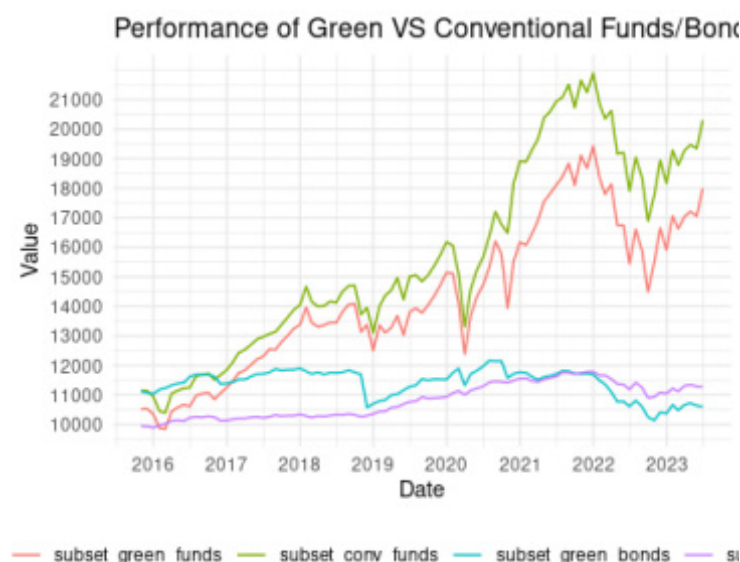


Fig.8. A linear graph (time-series) for all options of different types of investment options.

Analysis: Examining the growth of ESG and conventional funds/bonds, considering all available sustainable assets, reveals a trend. Conventional funds consistently outperform ESG funds, and while conventional bonds initially fare better than conventional funds, they eventually face challenges and fall behind. This time-series graph presents a potentially discouraging outlook for implementing new ESG assets, as it indicates a persistent advantage for conventional assets over the years. The data suggests that, over time, conventional assets tend to exhibit stronger performance compared to their sustainable counterparts.

*Modified Analysis:*

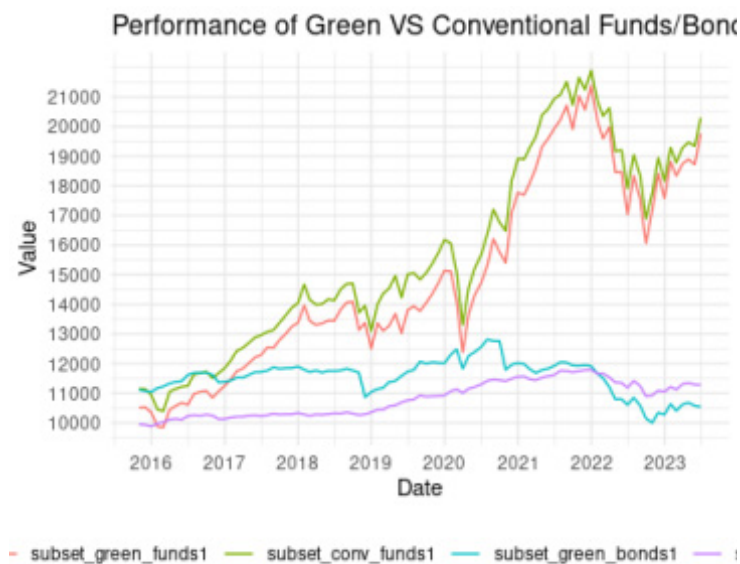


Fig.9. A linear graph (time-series) for modified options of different types of investment options.

**Analysis:** Upon excluding outliers from additional sustainable funds and bonds sourced from other colleges (not represented at Williams) with poor performance (note that the focus of this paper does not delve into the reasons for their inclusion in other colleges' investment options), a reevaluation of the time series within this refined subset reveals new trends. The situation with ESG bonds demands further investigation, as the limited availability of sustainable bonds introduces potential statistical errors.

However, a noteworthy development emerges as ESG funds begin to close the gap with conventional funds, trailing only slightly behind. The convergence of their mean values and growth rates with those of conventional funds positions them competitively, especially when factoring in the non-monetary benefits discussed in preceding sections, including climate justice considerations. These findings at the college level align with the performance analysis of ESG assets conducted by Morgan Stanley.

**Conclusion:** the implementation of more sustainable retirement investment options emerges as pivotal. From both monetary and non-monetary perspectives, ESG funds prove attractive for Williams College. This strategic shift aligns with broader trends in sustainable investing and climate action, reinforcing the rationale for adopting ESG-focused assets in the College's retirement investment portfolio.

### Further Steps

#### 1. Engagement with Williams College Offices

Throughout the project, various management and academic offices at Williams, including the Statistics and Economics departments, the President's Office, the Provosts, the HR Office, and the Investment Office, were actively contacted to propel the project forward. To sustain momentum, ongoing collaboration with the Investment Office and their retirement committee is imperative, ultimately facilitating the implementation of more sustainable retirement investment options through the HR office.

#### 2. Communication of ESG Fund Additions to the Williams Community

The integration of ESG funds demands a robust communication strategy directed at the Williams community. This educational effort should be woven into broader financial literacy initiatives, emphasizing the significance of saving and long-term investing while highlighting the interconnectedness with climate action and justice. Exploring the creation of an educational website page, akin to SUNY's model,<sup>18</sup> stands as a viable option.

#### 3. Institutional Survey/Focus Groups Among Staff/Employees

Gauging the interest of employees in incorporating ESG funds into the investment platform is pivotal. Conducting institutional surveys or focus groups helps determine whether the addition or replacement of current funds with ESG options aligns with employee preferences. This insight informs subsequent actions, such as adding one or several ESG funds or establishing a default option.

#### 4. Proposal to Sign the Sustainable Retirement Plans Pledge

A proposal to sign the Sustainable Retirement Plans Pledge,<sup>19</sup> developed by the International Endowments Network, is recommended. This pledge underscores the belief that university employees deserve a spectrum of sustainable investing retirement fund options, considering

<sup>18</sup> State University of New York (SUNY). "Sustainable Funds." <https://www.suny.edu/retirement/sustainable-funds/>

<sup>19</sup> [https://www.intentionalendowments.org/sustainable\\_retirement\\_pledge](https://www.intentionalendowments.org/sustainable_retirement_pledge)

environmental, social, and governance factors. The pledge, already endorsed by 12 U.S. colleges, including fellow liberal arts colleges, aligns with the goals of risk reduction, sustainable development, and enhanced financial returns.

#### 5. Expansion of Research and Collaboration with Other Colleges

After the implementation of more options of sustainable funds/options at Williams, efforts should be expanded to connect with other colleges. By leading the charge in transforming the field of retirement investments, Williams can foster collaborations with institutions like Amherst College (already contacted) and others, advancing sustainability in the education sector.

#### 6. Beyond TIAA Limitations

Addressing concerns raised about TIAA in the UPenn research and recognizing the limited options of ESG assets offered by TIAA, conversations with the HR and the Investment Office should explore openness to alternative platforms. Diversifying options beyond TIAA ensures a comprehensive approach to sustainable retirement investments.

#### 7. Calculation of GHG Emissions from Retirement Investments (Scope 3)

While complex, calculating GHG emissions from retirement investments (Scope 3) at Williams can serve as a compelling avenue to provide additional evidence for the implementation of ESG funds/bonds. This, however, is recommended as one of the final persuasion strategies due to its complicated nature.

### References

Boffo, R., Patalano, R. OECD. "ESG Investing: Practices, Progress and Challenges", 2020. [www.oecd.org/finance/ESG-Investing-Practices-Progress-and-Challenges.pdf](http://www.oecd.org/finance/ESG-Investing-Practices-Progress-and-Challenges.pdf).

Capital Partners. "The Rise of Sustainable Investing." 2023. <https://www.lcrcapital.com/blog/rise-of-sustainable-investing/#:~:text=According%20to%20a%20report%20by,a%2015%25%20increase%20from%202018.>

Castiglione, E. University of Pennsylvania. "Retirement funds for Penn faculty managed by company with

billions in fossil fuel investments." 2023. <https://www.thedp.com/article/2023/02/penn-faculty-retirement-tiaa-fossil-fuel-investments>.

Climate Analytics. "Global Warming Reaches 1°C Above Pre-industrial: Warmest in More Than 11,000 Years." <https://climateanalytics.org/briefings/global-warming-reaches-1c-abovepreindustrial-warmest-in-more-than-11000-years/>.

Eric W. "Climate Contracts." 2010. <http://www.velj.org/climate-contracts.html>.

Garcia, B., Roberts, E. "Carbon Finance: Environmental Market Solutions to Climate Change" 2008. <https://elischolar.library.yale.edu/cgi/viewcontent.cgi?article=1036&context=fes-pubs>.

Global Impact Investing Network (GIIN). "Need to Know: Impact Investing." <https://thegiin.org/impact-investing/need-to-know/>.

Hale, J. The ESG Advisor. "Takeaways from a Record Year for Sustainable Funds in the U.S." 2021. <https://medium.com/the-esg-advisor/takeaways-from-a-record-year-for-sustainable-funds-in-the-u-s-f66d02ba74c7>.

Intentional Endowments Network. "Sustainable Retirement Pledge." [https://www.intentionalendowments.org/sustainable\\_retirement\\_pledge](https://www.intentionalendowments.org/sustainable_retirement_pledge).

Intergovernmental Panel on Climate Change (IPCC). "Special Report: Global Warming of 1.5 °C." 2019. [https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15\\_Full\\_Report\\_High\\_Res.pdf](https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_High_Res.pdf).

International Organization of Securities Commissions (IOSCO). "Principles for Sustainable Finance - Final Report." 2021. <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD688.pdf>.

Jessop, S., Murugaboopathy, P. "Sustainable fund inflows hit record high in Q1: Morningstar." 2021. <https://www.reuters.com/business/sustainable-business/sustainable-fund-inflows-hit-record-high-q1-morningstar-2021-04-30/>.

Morgan Stanley. "Sustainable Investing Offers Financial Performance, Lowered Risk." 2019. [https://www.morganstanley.com/content/dam/msdotcom/ideas/sustainable-investing-offers-financial-performance-lowered-risk/Sustainable\\_Reality\\_Analyzing\\_Risk\\_and\\_Returns\\_of\\_Sustainable\\_Funds.pdf](https://www.morganstanley.com/content/dam/msdotcom/ideas/sustainable-investing-offers-financial-performance-lowered-risk/Sustainable_Reality_Analyzing_Risk_and_Returns_of_Sustainable_Funds.pdf).

Natixis Investment Managers. "ESG Investing Survey Insight Report." 2021. <https://www.im.natixis.com/sg/research/esg-investing-survey-insight-report>.

Pachauri, R., Meyer L. Intergovernmental Panel on Climate Change (IPCC). "Climate Change 2014: Synthesis Report." 2014. [https://www.ipcc.ch/site/assets/uploads/2018/05/SYR\\_AR5\\_FINAL\\_full\\_wcover.pdf](https://www.ipcc.ch/site/assets/uploads/2018/05/SYR_AR5_FINAL_full_wcover.pdf). State University of New York (SUNY). "Sustainable Funds."

<https://www.suny.edu/retirement/sustainable-funds/>. TIAA. "All Investments - Williams College." <https://www.tiaa.org/public/tcm/williams/view-all-investments>.

United Nations Framework Convention on Climate Change (UNFCCC). "The Paris Agreement." [https://unfccc.int/files/meetings/paris\\_nov\\_2015/application/pdf/paris\\_agreement\\_english\\_.pdf](https://unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_english_.pdf).

United Nations. "The Sustainable Development Agenda and the Retired." <https://www.un.org/sustainabledevelopment/development-agenda-retired>. Williams College. "Strategic Plan 2021." <https://www.williams.edu/strategic-planning/strategic-plan-2021/>.

Williams College. "Climate Action Plan 2022" <https://docs.google.com/document/d/1rbF3knDxPEw-2yPk4AetG3urH1HSvTh8HBPmXtgTJYQ/e dit#heading=h.ympdy6we0762>.

Williams College. "Investment Office's strategy." <https://investment.williams.edu/about/investment-strategy/#:~:text=Williams%20maintains%20a%20long%2Dterm,the%20investment%20policy%20portfolio%20benchmark>.