Greener Pensions, Greener Choices? Linking Investments to Sustainable Behavior*

Olga Balakina† Charlotte Christiansen‡ Malene Kallestrup-Lamb§¶

January 2026

Abstract

We study how access to sustainable investment options affects individual consumption behavior. Exploiting a natural experiment in the Danish pension system, where a large pension fund introduced a sustainability-focused pension plan while holding contributions fixed, we examine spillovers from financial to product markets. Using administrative data and a difference-in-differences design, we show that access to the sustainable pension option increases electric vehicle adoption and reduces vehicle-related emissions. Strikingly, these effects are driven primarily by individuals who do not adopt the sustainable pension plan. The results suggest that expanding sustainable investment opportunities can reshape real economic behavior beyond portfolio choice, even in the absence of take-up.

Keywords: Household finance; sustainable investments; sustainable consumption; pension investments; sustainable pension plans; electric vehicles; CO2 emissions

*We would like to express our sincere appreciation to the pension fund P+, for kindly making their data available to us. We are grateful for helpful comments and suggestions from seminar participants at the 19th International Longevity Risk and Capital Markets Solutions Conference 2024, PeRCent Annual Conference 2024, SAFE Brown Bag Seminar series, WIMFEH 2025, ZEW Ageing and Sustainable Finance Conference, the 9th Household Finance Workshop, European Economic Association (EEA) 2025, Goethe University Finance Brown Bag and individual help from Tobias Berg, Sabine Bernard, Martin Brown, Claes Bäckman, Gunnar Gutsche, Tobin Hanspal, Florian Heeb, Mikkel Aagaard Houmark, Lu Liu, Steffen Meyer, Ulf Nielsson, Hannah Römer, Philip Schnorpfeil, and Anna Vasileva. We gratefully acknowledge research and financial support under the Young Researchers Funding Scheme from the Leibniz Institute for Financial Research SAFE.

†Leibniz Institute for Financial Research, Germany. balakina@safe-frankfurt.de.

‡Department of Economics and Business Economics, Aarhus BSS, Aarhus University, Denmark. DFI. cchristiansen@econ.au.dk.

§Department of Economics and Business Economics, Aarhus BSS, Aarhus University, Denmark. Email: mkallestrup@econ.au.dk.

¶PeRCent - Pension Research Centre, Copenhagen Business School, Denmark.

1 Introduction

With assets exceeding USD 30.3 trillion in 2022 (GSIA, 2023), sustainable investing is increasingly regarded by policymakers, institutional, and retail investors as a key tool for addressing major societal challenges, particularly climate change (Bénabou and Tirole, 2010; Broccardo, Hart and Zingales, 2022). A rapidly expanding literature documents a robust demand for socially responsible and sustainable financial products (Barber, Morse and Yasuda, 2021; Bauer, Ruof and Smeets, 2021; Anderson and Robinson, 2022; Ceccarelli, Ramelli and Wagner, 2024), often motivated by pro-social preferences, warm-glow, identity, and signaling (Hong and Kostovetsky, 2012; Riedl and Smeets, 2017; Heeb, Kölbel, Paetzold and Zeisberger, 2023). Yet while much is known about why individuals invest sustainably, far less is known about how sustainable investment opportunities interact with real economic behavior, particularly in consumer product markets. In particular, it remains unclear whether access to sustainable investment options reinforces other pro-environmental actions or crowds them out, and thus how it affects overall sustainability outcomes (Heeb, Kölbel, Ramelli and Vasileva, 2024).

Recent theoretical work by Hakenes and Schliephake (2024) highlights that interactions between investment and consumption decisions can be central for understanding aggregate sustainability outcomes. In a general equilibrium setting, they analyze the interaction between socially responsible investment (SRI) and socially responsible consumption (SRC), showing that acting in only one domain, investment or consumption in isolation, induces market feedback effects that offset much of the intended environmental impact. As a result, coordinated action across financial and product markets is required for effectiveness in aggregate.

Separately, a growing empirical literature has examined the relationship between sustainable investment and other pro environmental behaviors. Existing studies primarily analyze whether sustainable consumption predicts investment choices (Brunen and Laubach, 2022) or whether green investing crowds out other forms of pro-social behavior, such as charitable giving or political engagement (Famulok, Kormanyos and Worring, 2024). However, this evidence does not provide causal insights into how the availability of sustainable investment opportunities affects individual behavior across domains, and remains inconclusive on whether sustainable investment and consumption operate as complements or substitutes at the individual level.

To address this gap, we exploit a natural experiment introduced by the Danish pension fund P+ in 2023. For the first time, the fund offered its members the opportunity to switch from a standard pension plan to a menu that included a sustainability-focused

alternative, while total pension contributions remained fixed. This institutional change generated plausibly exogenous variation in access to a sustainable investment option, allowing us to study how the expansion of the investment opportunity set affects individual consumption behavior beyond portfolio choice. Using detailed administrative data, we examine environmentally relevant consumption outcomes, focusing on electric vehicle purchases and the emission intensity of individuals' vehicle fleets. We find that access to a pension plan with a pronounced sustainability profile increases electric vehicle adoption and reduces vehicle-related emissions. Importantly, these effects are driven primarily by individuals who do not ultimately select the sustainable pension plan, indicating that changes in the investment opportunity set can affect consumption behavior even in the absence of take-up.

To guide our empirical analysis, we develop a two-period, partial-equilibrium conceptual framework of sustainable investment and sustainable consumption. A representative agent derives utility from consumption today and in the future and places a weight on her environmental impact. The agent can reduce her environmental footprint through two costly channels: sustainable investment and sustainable consumption. Sustainable consumption carries a price premium, while sustainable investment may involve lower risk-adjusted returns. A key feature of the framework is that the sustainable investment option is not always available. When it is offered, the agent chooses whether to allocate a fixed amount of savings to a sustainable or a conventional pension plan and how much of her consumption to devote to greener goods. Both choices affect environmental impact, and the investment decision trades off a financial gap against an environmental gain.

Within this framework, sustainable investment and sustainable consumption are jointly determined responses to environmental preferences. Standard utility maximization implies that, when the investment channel is constrained or forgone, the agent adjusts the composition of consumption. Importantly, the framework allows for state-dependent environmental preferences: the availability of a sustainable investment option increases the agent's valuation of environmental impact by activating environmental motives and self-image concerns. This preference shift is systematic and occurs only when a sustainability-oriented option becomes available. As a result, individuals who forgo the sustainable pension plan may still respond to the heightened environmental concern by increasing sustainable consumption, generating a compensation mechanism. This mechanism is consistent with cognitive dissonance and moral-consistency theories (Bénabou and Tirole, 2010; Broccardo et al., 2022; Barber et al., 2021; Anderson and Robinson, 2022).

The framework generates two testable implications that guide our empirical analysis:

selective take-up of the sustainable pension plan among individuals with stronger environmental preferences, and compensatory increases in sustainable consumption among non-adopters. By focusing on individual-level responses while keeping prices and returns exogenous, the framework complements general-equilibrium analyses of sustainability interactions across markets

Guided by the conceptual framework, we empirically examine how access to a sustainable pension option affects individual consumption behavior. Using the P+ pension fund's offer as a natural experiment, we study the causal effect of access to sustainable investment options on individual consumption behavior. We focus on car buyers among P+ members who received the offer to switch pension plans, *Treated* group, and compare them to a matched sample of car buyers from the general population, *Control* group, over time. We implement a difference-in-differences design and show that, during the pre-offer period, electric vehicle adoption and vehicle-related emissions evolve similarly across the two groups. Following the introduction of the sustainable pension option, treated individuals become significantly more likely to purchase electric vehicles and to reduce the emission intensity of their vehicle fleets relative to the matched control group.

Importantly, these effects are driven primarily by individuals who do not ultimately select the sustainable pension plan, indicating that changes in the investment opportunity set can influence consumption behavior even in the absence of take-up.

We conduct a range of additional analyses to assess the robustness and interpretation of these findings. The increase in sustainable consumption is concentrated among individuals who purchase a car after receiving the offer, rather than among those who buy beforehand, consistent with a behavioral response to the change in the choice environment. Financially educated individuals exhibit stronger improvements to the offer, but the effects are present across the broader P+ membership. We further show that wealth effects are unlikely to explain the results: the offer does not increase overall consumption, car purchase rates, or the likelihood of purchasing more expensive conventional vehicles. Finally, the increase in electric vehicle adoption is not driven by commuting-related cost savings. The response is strongest among individuals with access to home charging and among those replacing older vehicles or entering car ownership for the first time, suggesting that the effect reflects changes in consumption choices rather than mechanical demand shifts.

Focusing on pension savings rather than direct stock holdings offers several advantages. Retirement accounts are the primary channel through which most individuals participate in financial markets, and in Denmark they account for the majority of individual

wealth

Our paper contributes to the literature on sustainable finance and individual behavior in three main ways. First, we provide micro-behavioral foundations for interactions between sustainable investment and sustainable consumption. While Hakenes and Schliephake (2024) show in a general-equilibrium framework that SRI and SRC can reinforce each other in aggregate, our partial-equilibrium conceptual framework rationalizes both complementarity and substitution at the individual level. Through a compensation mechanism and heterogeneity in environmental concern, the framework generates sharp, testable predictions about adoption of sustainable investment products and about consumption responses among non-adopters.

Second, we contribute novel causal evidence on cross-domain spillovers between financial and product markets. Existing empirical work offers mixed evidence on the relationship between sustainable consumption and sustainable investment. Some studies document complementarity (Brunen and Laubach, 2022), while others point to offsetting behavior or crowding-out of other pro-social actions (Famulok et al., 2024). Using a natural experiment in the Danish pension system, we show that access to a sustainable investment option affects consumption behavior even in the absence of take-up. Individuals with stronger revealed sustainability preferences, such as prior electric-vehicle owners, are more likely to adopt the sustainable pension plan, while others respond by increasing sustainable consumption, consistent with the compensation mechanism highlighted in our framework.

Third, our analysis informs the growing literature documenting strong demand for sustainable investment products (e.g., Barber et al., 2021; Bauer et al., 2021; Anderson and Robinson, 2022; Ceccarelli et al., 2024), often driven by pro-social preferences, identity, and signaling (e.g., Hong and Kostovetsky, 2012; Riedl and Smeets, 2017). We show that the expansion of sustainable investment opportunities can generate positive spillovers to other sustainable behaviors, suggesting that the diffusion of SRI products may have broader environmental effects beyond portfolio allocation. Our findings also relate to work highlighting the role of information and salience in shaping sustainable financial engagement (Anderson and Robinson, 2022).

Methodologically, we combine a large-scale natural experiment with matched difference-in-differences estimates using administrative data. Focusing on pension savings, the primary channel through which most individuals participate in financial markets, allows for transparent identification and enhances external relevance. Our findings speak to asset design and policy by showing that expanding sustainable financial options can cat-

alyze sustainable consumption even without universal adoption, thereby complementing regulatory and price-based approaches in product markets.

The remainder of the paper is structured as follows: Section 2 outlines the conceptual framework used to understand individuals' investment and consumption choices. Section 3 presents the institutional background and introduces the data. Section 4 examines the causal effect of the sustainable pension offer on consumption behavior. Section 5 presents further discussions and robustness checks, and Section 6 concludes. Additional details and supplementary results are provided in the Appendix.

2 Conceptual Framework

Sustainable behavior has been linked to a range of factors, including altruism, warm glow, social norms, moral licensing, and sentiment (Andreoni, 1995; Kormos, Gifford and Brown, 2015; Taufik, Bolderdijk and Steg, 2015; Riedl and Smeets, 2017; Hartzmark and Solomon, 2019; Bauer et al., 2021; Heeb et al., 2023). The existing literature typically examines sustainable actions in isolation, focusing either on investment or consumption choices, with notable exceptions (e.g., Brunen and Laubach, 2022; Famulok et al., 2024; Heeb et al., 2024). We argue that sustainable behavior is inherently multidimensional, and that spillovers across domains may obscure underlying preferences for sustainability. To formalize this idea, we develop a stylized model that captures the trade-offs and behavioral responses involved in sustainable investment and sustainable consumption. The model serves as the theoretical foundation for our empirical analysis.

2.1 Environment

We model the behavior of an agent who, in addition to maximizing utility from consumption, derives utility from environmental impact. We do not impose whether the agent seeks a positive, negative, or neutral impact. For tractability, the agent can influence her environmental footprint through two channels: sustainable investment and sustainable consumption.[1] The framework builds on models of prosocial behavior and self-image concerns (Bénabou and Tirole, 2006, 2010) and is closely related to models of moral licensing across domains (Hong, Tirole and Zhang, 2024).

The economy unfolds over two periods. The agent enters period one with liquid wealth $W_1 > 0$ and has constant relative risk aversion (CRRA) preferences. A key feature of

[1]We use the term "sustainable" throughout to denote actions that reduce emissions or environmental damage.

the model is that sustainable investment is not always available.[2] Let $q \in \{0, 1\}$ denote the availability of a sustainable investment option. When $q = 0$, the agent must invest in a conventional asset. When $q = 1$, the agent may choose between a sustainable and a conventional asset.

In period one, the agent chooses total consumption $C_1 \geq 0$ and the fraction allocated to sustainable goods $\alpha \in [0, 1]$. If available, she also makes a discrete investment choice $s \in \{0, 1\}$, where $s = 1$ denotes the sustainable asset and $s = 0$ the conventional asset. The invested amount is fixed and identical across options, $I = \bar{I}$, corresponding to our empirical setting in which total pension saving is fixed while the investment menu expands to include a sustainable option. In period two, the agent consumes the proceeds from the investment. When characterizing optimal consumption choices conditional on the investment decision, we use subscripts b and g to denote outcomes under conventional and sustainable investments, respectively; these subscripts serve as labels and are not choice variables.

2.2 Preferences and Constraints

The agent maximizes her utility under her budget constraint. The lifetime utility is given as:

$$U_q(C, s) = \frac{C_1^{1-\sigma}}{1-\sigma} + \beta\, E\left[\frac{C_2^{1-\sigma}}{1-\sigma}\right] + \lambda^*(q, s)\, v(A), \qquad \text{where} \qquad v(A) = \frac{A^{1-\theta}}{1-\theta}, \quad \theta > 0. \tag{1}$$

The period-one budget constraint is given as

$$(1 + \alpha\tau)\, C_1 + \bar{I} = W_1, \tag{2}$$

The first two terms in the utility function capture utility from consumption, with risk-aversion parameter $\sigma > 0$ and discount factor β, while the final term reflects utility from environmental impact, where $v(\cdot)$ is increasing and concave. α in the budget constraint signifies a fraction of consumption allocated to sustainable goods, and $\tau > 0$ denotes the price premium for sustainable goods (Kearney, 2020).

[2] Our assumption that the exogenous expansion of the choice set affects behavior even when the newly available option is not chosen is standard in models with menu-dependent attention or valuation (Bernheim and Rangel, 2009; Masatlioglu, Nakajima and Ozbay, 2012).

The sustainability weight is state-dependent:

$$\lambda^*(q, s) = \lambda + \kappa \cdot \mathbf{1}\{q = 1,\ s = 0\}, \qquad \kappa > 0, \tag{3}$$

where λ captures the agent's baseline valuation of environmental impact. If λ is negative, the agent has anti-sustainability preferences, and if $\lambda > 0$, the agent values the environmental impact of consumption. Our assumption of a trade-off between utility from consumption and environmental impact follows the work of John and Pecchenino (1994), who analyze the potential conflict between economic growth and the maintenance of environmental quality in an overlapping generations model.

The parameter κ reflects the psychological cost of declining a sustainable investment option when it is available, capturing cognitive dissonance and moral self-image concerns (Festinger, 1957; Bénabou and Tirole, 2006, 2010). We interpret the resulting state dependence of $\lambda^*(q, s)$ as a reduced-form representation of increased salience, attention, or self-image considerations activated by the availability of a sustainability-oriented option, rather than as a structural change in underlying tastes.

The total environmental impact is determined in period one:

$$A = \eta\, s\, \bar{I} + \gamma\, \alpha\, C_1, \tag{4}$$

where $\eta > 0$ measures abatement per euro of sustainable investment and $\gamma > 0$ measures abatement per euro of sustainable consumption.

The risk-adjusted returns differ for sustainable and conventional investments. Let $(1+R_\xi)$ denote the stochastic gross return of asset ξ in period two with $\xi = \{b, g\}$ and define

$$\tilde{m}_\xi := E\big[(1 + R_\xi)^{1-\sigma}\big].$$

2.3 Optimal Consumption and Compensation

We solve the model by backward induction. For a given investment choice s, the agent first chooses total consumption C_1 and its sustainable share α to maximize utility, taking the investment decision as given. Because the investment choice is discrete, it does not enter the first-order conditions. The agent then compares the resulting maximized utility levels across $s = 0$ and $s = 1$ and selects the investment option that yields the highest utility.

The first-order conditions imply

$$\tau\, C_1^{-\sigma} = \lambda^*(q,s)\gamma\, A^{-\theta}, \tag{5}$$

$$C_1^{-\sigma} + \lambda^*(q,s)\gamma\,\alpha\, A^{-\theta} = \Lambda(1+\alpha\tau), \tag{6}$$

where Λ is the Lagrange multiplier on the budget constraint.

Solving eq. (5) yields the optimal sustainable consumption share:

$$\alpha_b = \Big[1 - \frac{\tau\, C_b^{\sigma+\theta}}{\lambda^*(q,0)\,\gamma^{\,1-\theta}}\Big]_0^1, \text{if agent chooses a conventional investment, and} \tag{7}$$

$$\alpha_g = \Big[1 - \frac{\tau\, C_g^{\sigma+\theta}}{\lambda^*(q,1)\,\gamma^{\,1-\theta}(\eta_s \bar{I})^{\theta}}\Big]_0^1, \text{if she chooses a sustainable asset.} \tag{8}$$

Eq.s (7) and (8) imply $\alpha_b \geq \alpha_g$, with strict inequality unless both shares are zero. Sustainable investment and consumption are substitutes: when the agent forgoes investment-based abatement, she optimally compensates by increasing sustainable share of consumption. When the sustainable investment option is available ($q = 1$), this compensation effect is amplified by the increase in $\lambda^*(q,s)$ for agents who decline the option.[3]

2.4 Investment Choice

To determine the investment decision, we substitute optimal consumption choices into utility. Define the financial gap

$$\Delta_u := \beta\, \frac{(\tilde{m}_g \bar{I})^{1-\sigma} - (\tilde{m}_b \bar{I})^{1-\sigma}}{1-\sigma},$$

and the environmental gain

$$\Delta_a := \lambda^*(q,s)\big[v(A_g) - v(A_b)\big].$$

The sustainable asset is chosen if and only if

$$\Delta_u + \Delta_a \geq 0. \tag{9}$$

[3]The substitution result relies on concavity of preferences and the presence of a budget trade-off between consumption and sustainability, and does not depend on the specific CRRA functional form

Definition. The *threshold sustainability weight* $\hat{\lambda}$ is the smallest non-negative scalar satisfying

$$\hat{\lambda} := \frac{-\Delta_u}{\Delta_A}, \qquad \Delta_A := v(A_g) - v(A_b) > 0. \tag{10}$$

For $\lambda^*(q, s) \geq \hat{\lambda}$, the agent strictly prefers the sustainable asset over the conventional asset whenever it is available.

2.5 Discussion and Empirical Implications

The model implies that observed sustainable investment choices are an imperfect proxy for underlying sustainability preferences. Agents with weak or even negative baseline preferences may adopt the sustainable asset for financial reasons, while agents with strong environmental concerns may optimally decline it and compensate through sustainable consumption. The introduction of a sustainable investment option, therefore, reshapes behavior across domains rather than mechanically increasing aggregate investments.

These predictions map directly into our pension-fund setting. If the introduction of a sustainable pension plan triggers a compensation channel, we should observe (i) selective take-up by members with high inferred sustainability valuation and (ii) increased sustainable consumption, such as electric-vehicle adoption, precisely among those who decline the sustainable plan. Sections 4 test both implications empirically.

3 Institutional Settings and Data

This section describes the institutional setting that gives rise to our natural experiment—the introduction of a sustainable pension option by a Danish occupational pension fund. We then introduce the administrative data and present preliminary descriptive evidence for the pension plan choice.

3.1 The P+ Pension Fund and Sustainable Pension Offer

The Danish pension system is structured around three pillars, which together combine universality, flexibility, and security, ensuring it remains one of the most effective systems globally (OECD, 2023).[4] The first pillar (state pensions) provides pension payments irrespective of the labor history. The second pillar (occupational pensions) plays

[4]Comparative assessments place Denmark alongside leading systems such as those of Finland, Iceland, the Netherlands, Norway, and Sweden, with Australia often grouped in because its superannuation system mirrors Denmark's large occupational direct-contribution funds, even though its base pension is means-tested rather than universal.

a pivotal role in ensuring retirement security due to its magnitude (Ministry of Finance, 2020; Mercer, 2024). Occupational pensions are typically mandatory and are negotiated through collective agreements between employers and trade unions (Bovenberg, 2012; Balter, Kallestrup-Lamb and Rangvid, 2020). The occupational pensions are sizable by international standards, with contribution rates typically ranging between 12 and 18 percent of gross salary, depending on sector and collective agreement (Ministry of Finance, 2020; OECD, 2023). For P+ members employed in the public sector, the contribution rate is 18.07 percent, underscoring the large financial stakes involved in pension-plan choices. These schemes are funded and defined-contribution based. Finally, the third pillar consists of voluntary individual pension plans.

We analyze the administrative data set of the pension fund P+, a Danish pension fund serving approximately 110,000 members.[5] The fund provides occupational pension schemes for individuals eligible for membership in two trade unions, primarily targeting university graduates in fields such as law, economics, social sciences, business administration, and engineering. In 2023, P+ had DKK 150.1 billion in assets under management (around USD 20.9 billion).

In 2023, P+ introduced the option to transition from the existing standard variable-annuity plan to new pure variable-annuity plans. The existing plan features a predetermined medium-risk profile and incorporates basic sustainability elements set by the pension fund. The offer was presented exclusively to "standard" members, whereas "special" members such as retirees, expatriates, and inactive members were excluded. Table 1 presents the sample of non-retired members, representing approximately 85% of the total members. In addition, 18% of standard members did not receive an offer.

Members receiving the offer had the option to take no action and retain the existing pension plan (*no choice*). Alternatively, they could actively select one of four new pure variable-annuity plans: three plans featuring *conventional sustainability* levels, each differentiated by its risk profile (low, medium, or high), or a plan focused on *strong sustainability* with a fixed medium risk profile.[6] P+ Sustainable is the the first labor-market pension plan in Denmark that promises a carbon-neutral portfolio as early as 2030 (see Figure 4 in the Appendix). The strategy for the sustainability plan tightens screening for brown firms (including outright bans on fossil-fuel extraction, weapons, tobacco, and alcohol) and accelerates disinvestment if companies fail to meet human rights, labor rights, biodiversity, or tax-governance standards. To underpin those ambitions, P+

[5]For more information about the P+ pension fund, see pplus.dk/en.

[6]From 2024 and onward, i.e. after our natural experiment and sample period, members of P+ can also choose the risk level of the sustainable plan (low, medium, or high).

signed the UN-convened Net-Zero Asset Owner Alliance, setting five-year science-based decarbonization targets and disclosing its stance on thermal coal, oil, and gas.[7] In 2024, P+ went further, announcing it would exclude any new companies dedicated to fossil-fuel extraction.[8].

Figure 1 illustrates the structure of the offer and the related decision-making tree. The sustainability-focused medium-risk portfolio has delivered one-year returns equivalent to those of the conventional medium-risk benchmark, helped by the performance in renewable infrastructure and green equity.[9]

From February to November 2023, eligible P+ members received the offer via a secure digital letter directing them to their personalized P+ webpage.[10] Figure 2 presents the share of members receiving the offer every month.

To explore and activate the offer, P+ members were required to log in to their personalized P+ webpage, which displays individual pension information. The webpage communicated the differences between the four pension plans by presenting relevant outcomes, including best-case, expected, and worst-case yearly future pension payouts. Neither explicit measures of volatility nor similar risk metrics were provided, nor was it explicitly defined how the sustainable plan differed from the conventional plans. The members were informed by P+ that, *"expect that both the risk level, costs, and returns can be compared to investments without an extra high focus on ... sustainability. However, you may experience greater return fluctuations along the way"*.[11] Prior studies indicate that individuals infer a financial asset's environmental friendliness from its name; hence, a pension plan labeled "P+ sustainable" is likely to be perceived as green (Cooper, Gulen and Rau, 2005; Christiansen, Jansson, Kallestrup-Lamb and Noren, 2023). Trust in P+ is high among its members, reflecting the broader trend of strong institutional trust within the Danish population (Misiura and Rozkwitalska, 2019). Consequently, green-washing is not considered a significant concern in this context.

Before presenting the new pension options in P+'s personalized webpage, members were given a survey designed to assist them in making an informed decision.[12] The survey assessed the member's preferences regarding risk and return, attitudes toward financial losses, and the importance the member placed on environmental sustainability. Based

[7] See www.unepfi.org.
[8] See www.newprivatemarkets.com.
[9] See pplus.dk/en/investments/return-on-investments/historical-returns.
[10] The letter content is reproduced in Appendix A.2.2.
[11] The P+ site links members to the industry portal faktaompension.dk/risiko, which details the investment strategy and risk of all Danish pension plans, including P+.
[12] Appendix 2.2 reproduces the survey questions.

on the survey responses, each member was presented with a list of the four available options, with one option highlighted. For members who indicated that sustainability was important, the sustainable plan was highlighted. For the remaining members, the conventional plan that aligned with their risk preferences was highlighted.

The survey data cannot be combined with the register-based dataset; nonetheless, it enables us to analyze how ex ante sustainability preferences align with ex post pension choices. Figure 3 presents the survey results, where the vertical axis captures the highlighted option after the survey, and colored bars denote the choice made by the member. The figure reveals a strong alignment between the members' stated sustainability preferences and their selected investment plans. Among individuals with the sustainable plan highlighted, 93% opted for the sustainable pension plan. Similarly, 94% of the members who were guided toward the medium-risk conventional plan adhered to that choice. In contrast, notable deviations were observed for the high- and low-risk conventional plans. For the high-risk plan, 10% of the members, despite indicating that sustainability was not a priority, selected the sustainable plan, diverging from their stated risk and sustainability preferences. For the low-risk plan, a large proportion of members transitioned to the medium-risk conventional plan instead, reflecting a shift in their risk tolerance.

3.2 Dataset

This paper combines individual-level administrative data from two sources: the P+ pension fund and Danish population registers provided by Statistics Denmark. Both datasets rely on anonymized personal identification numbers, allowing Statistics Denmark to merge pension records with rich demographic, income, wealth, and consumption data. While Danish register data have been widely used in the household finance literature (e.g., Andersen, Chebotarev, Filali-Adib and Nielsen, 2024; Epper, Fehr, Fehr-Duda, Kreiner, Lassen, Leth-Petersen and Rasmussen, 2020; Jensen and Johannesen, 2016), the use of detailed administrative data from a large occupational pension fund is novel in this context.

The register data contain annual information on demographics (gender, age, marital status, number of children, and municipality of residence), education, labor-market outcomes, income, wealth, and financial portfolios for the full Danish population. Income and wealth measures are sourced from tax records, while financial institutions report deposits and securities holdings, ensuring comprehensive coverage of individual balance sheets. Educational records allow us to observe both the highest completed degree and the field of study. We use these data to construct indicators of financial sophistication, classifying individuals with a university degree in economics, business, or finance as financially

sophisticated. The employer–employee dataset includes demographics, firm and plant identifiers, addresses, and employment characteristics such as industry and managerial status.

We proxy sustainable consumption using individual vehicle choices. Cars represent a large and salient component of individual consumption and have been widely used as a consumption proxy in prior work (e.g., Jensen and Johannesen, 2016; Berg, Nielsson and Streitz, 2024). Vehicle-level data are drawn from the Danish Motor Vehicle Registry and include monthly and annual records on ownership, vehicle type, fuel technology, purchase price, and technical characteristics such as certified $CO2$ emissions.

Denmark has implemented a series of policies to encourage electric vehicle adoption. While pure electric vehicles were fully exempt from registration taxes prior to 2016, this exemption was gradually phased out by 2019. A comprehensive reform introduced a $CO2$-based vehicle taxation scheme and long-term electric vehicle incentives starting in 2021. Importantly for our setting, vehicle taxation rules—including those applying to electric vehicles—remained stable from 2022 through 2024, the period covering our natural experiment.

Throughout the analysis, we define electric vehicles as pure battery electric vehicles and exclude plug-in hybrids. We measure sustainable consumption in two ways. First, we consider whether an individual purchases or owns an electric vehicle. Second, we compute the average $CO2$ emissions of all vehicles owned by an individual in a given year, using the certified emission values reported in the vehicle registry.[13] While individuals may not observe precise emission levels, annual vehicle taxes in Denmark are directly tied to $CO2$ emissions, making emissions a salient and interpretable measure of vehicle sustainability.

Importantly, we distinguish clearly between ownership and purchase behavior. Descriptive statistics focus on vehicle ownership and emissions in 2022, the year prior to the pension-plan offer, in order to characterize pre-treatment differences across individuals. The causal analysis, by contrast, exploits vehicle purchase decisions observed between 2019 and 2023, allowing us to study changes in individual behavior following the offer.

The P+ pension fund dataset covers 93,156 non-retired members and provides detailed information on pension-plan offers, plan choices, timing of the offer, pension balances,

[13] Average emissions are calculated as follows: $\text{Emissions}it = \frac{1}{Nit} \sum_{j=1}^{N_{it}} \text{Emissions}jit$, where $\text{Emissions}jit$ represents the certified emission characteristics of vehicle j registered to individual i in year t, and N_{it} is the total number of vehicles owned by individual i in that year.

returns, and insurance features. We observe whether and when individuals received the offer in 2023, whether they actively chose a new plan, and which plan they selected. After merging with register data and applying sample restrictions, the final dataset includes just under 80,000 active P+ members (see Appendix Table A1).

Table 2 presents descriptive statistics for P+ members measured in 2022, including demographics, education, income, wealth, and vehicle ownership. The table highlights unconditional differences across pension-plan choices. For example, individuals choosing the sustainable plan are more likely to already own an electric vehicle prior to the offer, and financially sophisticated individuals are less likely to select the sustainable plan. Table 3 complements these statistics by comparing vehicle purchases in 2023 across P+ members and the general population. P+ members are less likely to purchase a car overall but, conditional on purchasing, are more likely to choose electric vehicles and to buy vehicles with lower average emissions.

3.3 Predictors of Sustainable Pension Choice

As a first step, we examine which individual characteristics predict the choice of a sustainable pension plan among P+ members. This analysis provides descriptive evidence on how ex ante preferences and characteristics relate to sustainable pension choice and helps motivate the causal analysis that follows. We further show that the results are robust to alternative definitions of the relevant conventional investment choice.

To identify individual characteristics measured in 2022, including car ownership, that predict sustainable pension choice in 2023, we estimate the following linear probability model:

$$p_i = P\left[y_i = \text{Sustainable}\right] = \alpha + \beta X_i + \epsilon_i, \tag{11}$$

where y_i denotes the pension choice of individual i, X_i represents a vector of the explanatory variables of interest, and ϵ_i is the error term.

We begin by comparing the choice of the sustainable pension plan to all conventional alternatives, regardless of risk level. The dependent variable equals one if individual i chooses the sustainable (medium-risk) plan and zero if she chooses any conventional plan (low, medium, or high risk). Column (1) of Table 4 reports the results.

Two patterns stand out. First, prior sustainable consumption is a strong predictor of sustainable investment. Individuals who owned an electric vehicle in 2022 are substantially more likely to select the sustainable pension plan in 2023. This finding suggests that sustainability preferences manifest consistently across consumption and investment

domains when the opportunity arises.

Second, financial sophistication is strongly and negatively associated with sustainable pension choice. Individuals with a university degree in economics, business, or finance, higher income, greater stock market participation, and higher risky asset shares are significantly less likely to select the sustainable plan. In contrast, women and married individuals are more likely to opt for the sustainable option.

Crucially, this negative relationship between financial sophistication and sustainable investment persists, and becomes even stronger, when we condition on risk preferences. In Column (2) of Table 4, we restrict the comparison to individuals choosing between the sustainable medium-risk plan and the conventional medium-risk plan. In this specification, the coefficient on the economist indicator increases in magnitude (from -0.059 to -0.123) and remains strongly statistically significant. This result rules out differences in risk tolerance as the primary driver of the observed selection pattern.

Instead, the findings suggest that financially sophisticated individuals systematically evaluate the sustainable pension option less favorably, even when facing a conventional plan with the same risk-level. A natural interpretation, consistent with Bauer et al. (2021), is that financially sophisticated members are more attuned to potential return shortfalls, uncertainty about long-run performance, or skepticism regarding the real environmental impact of sustainable investment products. This interpretation is further reinforced by the information provided by P+, which explicitly notes that sustainable investments may involve greater return fluctuations, potentially triggering heightened concern among financially literate investors.[14]

These ex ante patterns align closely with the conceptual framework developed in Section 2. In the model, individuals differ in their valuation of sustainability (λ) and in their perceptions of the costs and benefits of sustainable investment. Financial sophistication can amplify perceived financial or impact-related costs of sustainable investment, pushing some individuals with positive, but moderate, sustainability preferences to opt out of the sustainable pension plan. For such individuals, the framework predicts that sustainability concerns may instead be expressed through other channels.

This interpretation motivates the analysis in the next section, where we study whether access to a sustainable pension option causally affects sustainable consumption behavior. In particular, the ex ante evidence suggests that individuals who decline the sustainable pension plan may nonetheless respond to the offer by reallocating sustainability efforts

[14]For more details refer to the translation of the Offer letter A.2.2.

toward consumption, consistent with the compensation mechanism at the core of our framework.

4 Sustainable Pension and Consumption Choices

In Subsection 3.3, we documented correlational evidence showing that individuals with stronger sustainable consumption patterns are more likely to invest sustainably when given the opportunity. We now turn to identifying the causal effect of access to sustainable pension options on individuals' sustainable consumption behavior.

Motivated by our conceptual framework in Section 2, we hypothesize that while large financial stakes, uncertainty about the impact of pension investments, and low engagement may limit active pension reallocation, the availability of a sustainable investment option can nevertheless affect behavior in other domains. In particular, if individuals value sustainability, changes in the investment opportunity set may spill over into consumption choices.

We proceed in three steps. First, we estimate the causal effect of receiving an offer to invest in a sustainable pension plan on sustainable consumption using a difference-in-differences design with a matched control group from the general population. Second, we condition on pension-plan choices to distinguish responses by adopters and non-adopters of the sustainable plan, allowing us to test the compensation mechanism implied by our conceptual framework. Third, we examine heterogeneity by financial sophistication and conduct robustness checks to assess alternative explanations.

4.1 Effect of Offer: Matched Sample

We begin by estimating the causal effect of receiving an offer to invest in a sustainable pension plan on sustainable consumption. To do so, we employ a difference-in-differences (DiD) design that compares changes in consumption behavior among P+ members who received the offer to those of a matched control group drawn from the general population. This specification identifies the effect of access to a sustainable investment option, independent of individuals' actual pension-plan choices.

We proxy sustainable consumption using car purchases, restricting the sample to individuals who bought a car between 2019 and 2023. Because car purchases are infrequent, the data form an unbalanced panel. The treatment group consists of P+ members who received the offer in 2023, while the control group consists of matched car buyers from

the general population.[15] We designate 2019–2022 as the pre-treatment period and 2023 as the treatment year, and track individuals' likelihood of purchasing an electric vehicle as well as the average $CO2$ emissions of their vehicle fleet over time.

P+ members differ systematically from the general Danish population, most notably in educational attainment (see Table 2). To construct a suitable control group, we match P+ members who purchased a car in a given year and received the offer in 2023 to car buyers from the general population in the same year using coarsened exact matching (CEM; Iacus, King and Porro, 2012). Matching is performed on age, gender, income, education level, and municipality of residence. Table 5 shows that the matched sample closely resembles the treated group along these dimensions, including pre-treatment measures of sustainable consumption.[16]

We now estimate the following DiD regression model for the sustainable consumption:

$$\begin{aligned} Y_{it} = &\sum_{k=2019}^{2021} \gamma_k 1\big[Year_t = k\big] \times \text{Offer}_i + \beta_{offer} 1\big[Year_t = 2023\big] \times \text{Offer}_i \\ &+ \text{Offer}_i + Year_t + X_{it}^{\top}\theta + \varepsilon_{it}, \end{aligned} \tag{12}$$

where Y_{it} measures sustainable consumption of individual i in year t. We consider two outcome measures: (i) an indicator equal to one if the individual i purchases an electric vehicle in year t and zero if the purchase is a combustion-engine vehicle, and (ii) the average $CO2$ emissions of all vehicles owned by individual i in year t. Offer_i equals one for individuals who received the pension-plan offer and zero otherwise. Year fixed effects control for aggregate time trends, while the interaction terms for 2019–2021 allow us to assess pre-treatment trends relative to the omitted base year 2022.[17] The coefficient of interest, $\beta offer$, captures the causal effect of the offer on sustainable consumption, with a positive value indicating a positive effect and a negative value indicating the opposite.

Columns (1)–(2) of Table 6 present the results for average vehicle-fleet $CO2$ emissions and electric vehicle adoption, respectively. We find that P+ members who received the offer are significantly more likely to purchase an electric vehicle and exhibit lower vehicle-related emissions compared to the matched control group. Importantly, the pre-treatment coefficients are small and statistically insignificant, supporting the parallel-

[15] Treatment status is defined based on receipt of the offer in 2023, and individuals' car-purchase behavior is observed in both the pre-offer and post-offer periods.

[16] Results are robust to alternative combinations of matching variables; including education and age yields particularly strong balance.

[17] All coefficients are reported relative to 2022.

trends assumption. The results confirm that the information treatment, in the form of offering members the opportunity to save sustainably, has a positive spillover effect on their sustainable consumption behaviors.

Columns (3)–(6) of Table 6 show that these effects are present for both individuals who already owned a car at the time of the offer and new car owners. While reductions in $CO2$ emissions are concentrated among existing car owners, electric vehicle adoption increases in both groups.

Finally, Columns (7)–(10) demonstrate that the effect is driven entirely by P+ members who purchase a car after receiving the offer. For individuals who bought a car before the offer, the DiD estimates are small and statistically insignificant. This timing pattern supports the interpretation that the offer affects consumption choices when individuals actively make a relevant decision, rather than mechanically altering outcomes.

4.2 Effect of Offer: Financial Sophistication

We next examine whether the response to the sustainable-investment offer varies with individuals' financial sophistication. This analysis serves two purposes. First, it assesses whether the offer effect documented above reflects a broad behavioral response or is driven by a particular subgroup. Second, it provides a test of the mechanism emphasized in our conceptual framework, namely that individuals who forgo sustainable investment may compensate through more sustainable consumption.

Prior work suggests that financial sophistication plays a central role in sustainable investment decisions. Anderson and Robinson (2022) show that financially literate investors are more responsive to information about green investments and that sophistication, rather than environmental concern per se, predicts engagement with green financial products. In contrast, in our setting, we find that financially sophisticated individuals are less likely to select the sustainable pension plan. A natural interpretation, consistent with Bauer et al. (2021), is that financially sophisticated individuals are more attuned to expected return differences or uncertainty associated with sustainable investments and therefore more likely to forgo the sustainable option on financial grounds. Within our conceptual framework, this makes financial sophistication a particularly informative dimension along which to test the compensation mechanism. A natural question: while financially sophisticated individuals are more likely to decline the sustainable pension plan, are they also more likely to compensate by adjusting their consumption behavior?

To address this question, we split the treated group by financial sophistication, using a university degree in economics, business, or finance as a proxy. This classification is well-

suited to our setting, as approximately 26 percent of P+ members hold such a degree. We re-estimate the difference-in-differences specification in equation (12) separately for financially sophisticated and less-sophisticated individuals, comparing each subgroup to an appropriately matched control group from the general population.

The results, reported in Columns (3)–(6) of Table 7, show that both financially sophisticated and less-sophisticated P+ members significantly increase electric-vehicle adoption following the offer, relative to their matched controls. Reductions in vehicle-fleet CO emissions are statistically significant for financially sophisticated individuals but weaker for the remaining members. Importantly, when financially sophisticated P+ members are compared to a control group consisting only of financially sophisticated individuals from the general population, the estimated treatment effects remain similar in magnitude and direction.

Taken together, these findings imply that the increase in sustainable consumption following the offer is not driven exclusively by individuals with very high levels of financial sophistication. Instead, the offer induces behavioral responses across the broader P+ membership. At the same time, the evidence is consistent with the compensation mechanism highlighted in our conceptual framework: financially sophisticated individuals, who are more likely to recognize potential financial trade-offs and therefore more likely to reject the sustainable pension option, nonetheless increase sustainable consumption following the offer. This pattern suggests that declining sustainable investment does not reflect indifference toward sustainability but rather a reallocation of sustainability efforts across domains.

Finally, this heterogeneity analysis helps rule out alternative explanations based on mechanical differences in car preferences or investment awareness. If the offer effect were driven solely by greater attentiveness or preexisting sustainability tastes among financially sophisticated individuals, we would expect qualitatively different responses across groups. Instead, we observe similar directional responses. This reinforces the interpretation that the offer changes the choice environment and activates cross-domain behavioral adjustments, rather than merely revealing latent preferences.

4.3 Choice of Plan and Sustainable Consumption

Having established that receiving an offer to invest sustainably affects sustainable consumption on average, we now examine whether this effect differs by individuals' pension-plan choices. This analysis sheds light on the mechanism underlying the offer effect and provides a direct test of the compensation channel highlighted in our conceptual frame-

work.

Specifically, we distinguish between individuals who adopt the sustainable pension plan and those who instead select a conventional plan. Conditioning on plan choice within the treated group allows us to assess whether the increase in sustainable consumption is driven by adopters who reinforce sustainability across domains or by non-adopters who compensate for declining the sustainable investment option. Based on our framework, both responses are theoretically plausible for individuals who value sustainability, but they imply fundamentally different mechanisms. Because pension-plan choice is itself an endogenous response to the offer, this analysis should be interpreted as a decomposition of the overall offer effect rather than as a causal comparison between adopters and non-adopters.

To assess these mechanisms, we decompose the overall offer effect by estimating post-offer changes in sustainable consumption separately for adopters and non-adopters of sustainable pension plan, relative to a matched control group from the general population. The coefficients of interest capture changes in sustainable consumption among adopters and non-adopters, respectively.

$$\begin{aligned} Y_{it} = & \sum_{k=2019}^{2021} \gamma_k 1_{[Year_t=k]} \times \text{Sustainable}_i + \beta_{sust} 1_{[Year_t=2023]} \times \text{Sustainable}_i \\ & + \sum_{k=2019}^{2021} \mu_k 1_{[Year_t=k]} \times \text{Conventional}_i + \beta_{conv} 1_{[Year_t=2023]} \times \text{Conventional}_i \\ & + Year_t + \text{Sustainable}_i + \text{Conventional}_i + X_{it}^{\top}\theta + \varepsilon_{it}, \end{aligned} \tag{13}$$

where Sustainable_i equals one if individual i chose the sustainable pension plan in 2023, and Conventional_i equals one if individual i chose a conventional plan. The treatment group consists of P+ members who made a pension-plan choice and purchased a car, while the control group is the matched sample of car buyers from the general population. The coefficients of interest, β_{sust} and β_{conv}, capture changes in sustainable consumption for adopters and non-adopters, respectively.

Table 8 reports the results. Columns (1)–(2) show that P+ members who adopted the sustainable pension plan do not exhibit statistically significant changes in electric-vehicle adoption or vehicle-fleet $CO2$ emissions relative to the control group. In contrast, individuals who selected conventional pension plans display a significantly higher likelihood of purchasing an electric vehicle and significantly lower vehicle-related emissions following the offer.

These patterns persist when distinguishing between current and new car owners (Columns (3)–(6)). In both subsamples, the increase in sustainable consumption is driven by individuals who decline the sustainable pension plan, rather than by adopters.

Table 9 further decomposes the results by specific pension-plan types. The estimated treatment effects are insignificant for individuals choosing the sustainable plan and for those selecting the low-risk conventional plan. In contrast, significant increases in sustainable consumption are concentrated among individuals choosing medium- and high-risk conventional plans.

Taken together, these findings show that the effect of the sustainable-investment offer on consumption is not driven by direct adoption of the sustainable pension plan. Instead, the offer generates behavioral spillovers among individuals who decline the sustainable investment option. Consistent with our conceptual framework, these individuals appear to respond to the expanded choice set by reallocating sustainability efforts toward consumption, rather than investment.

The results align closely with the model's predictions. Individuals with strong revealed sustainability preferences are more likely to adopt the sustainable pension plan, but show little additional adjustment in consumption once both channels of sustainability are active. In contrast, individuals who value sustainability but perceive financial or return-related costs of sustainable investment respond to the offer by increasing sustainable consumption instead. This compensation behavior is consistent with a state-dependent increase in the salience of sustainability considerations triggered by the availability of the sustainable option.

The central empirical takeaway of this section is that the sustainable-investment offer affects consumption primarily through individuals who decline the sustainable pension plan. Overall, the evidence indicates that expanding the menu of sustainable investment options reshapes behavior across domains rather than mechanically increasing sustainable investment. Informational and choice-based interventions in financial markets can therefore induce meaningful sustainability responses even in the absence of direct take-up, operating through precisely the compensation channel emphasized in our framework.

5 Discussion

The results above indicate that an offer to invest pension savings sustainably increases sustainable consumption, with the effect concentrated among individuals who decline the sustainable pension plan. In this section, we assess alternative explanations for this

pattern and report robustness checks.

5.1 Wealth Effects of Offer

The offer received by P+ members may not only convey information about a sustainable investment opportunity but also act as a salient reminder of their pension wealth. Such reminders, particularly when pension balances are unexpectedly large, may generate a wealth effect, potentially increasing consumption. In psychology, Wang, Liu, Lin, Liu, Wu and Cui (2022) show that even brief interventions that elevate perceived socioeconomic status can increase the desire for status goods and conspicuous consumption. In economics and finance, wealth shocks, such as housing wealth gains, are associated with higher marginal propensities to consume (Aladangady, 2017; Bartzoka, 2023).

In the context of our natural experiment, increased awareness of pension wealth could therefore induce higher consumption or shifts toward more expensive goods, such as cars, particularly electric cars. We evaluate this explanation using three complementary tests.

First, we examine whether the offer increases car demand on the extensive margin. If the offer induces a wealth effect, treated individuals should be more likely to purchase cars overall. Table 10 reports descriptive statistics on car buying and selling behavior for treated and matched individuals. On average, P+ members who received the offer are not more likely to purchase a car in 2023 relative to the pre-treatment period (2019–2022). If anything, they are slightly more likely to sell a car or leave their vehicle fleet unchanged.

Consistent with this descriptive evidence, we estimate equation (12) using a binary indicator for purchasing any car in year t as the dependent variable. Columns (4)–(6) of Table 11 show no increase in car purchases following the offer. These findings are corroborated by Table A5 in the Appendix, which reports estimates separately by pre-treatment year. Overall, there is no evidence that the offer increases car demand, as would be expected under a standard wealth effect.

Second, we test whether the offer leads to purchases of more expensive or status-oriented vehicles. Wang et al. (2022) suggest that wealth salience may operate through shifts in the composition of consumption rather than higher quantities. To examine this possibility, we re-estimate equation (12) using as outcomes the average purchase price of (i) all vehicles, (ii) electric vehicles only, and (iii) conventional vehicles only.[18]

[18]Table A5 pools 2019–2022 to mitigate abnormal price fluctuations during the COVID-19 period.

The results, reported in columns (1)–(3) of Table 11, show that treated individuals purchase more expensive electric vehicles following the offer. Importantly, there is no corresponding increase in spending on conventional vehicles. A general wealth effect would be expected to raise spending across vehicle types; the fact that price increases are confined to electric vehicles points instead to a shift in preferences toward sustainable options rather than higher purchasing power per se.

Third, we examine whether the offer increases overall consumption. While we do not observe consumption directly, we impute individual consumption using income and expense data from Danish administrative registers following Browning and Leth-Petersen (2003). Because borrowing associated with car loans or mortgages can mechanically inflate imputed consumption, we expand the treated P+ sample, exclude car buyers and home buyers, and re-run the matching procedure.[19]

Estimating equation (12) with imputed consumption as the outcome, column (7) of Table 11 shows no increase in consumption following the offer. If anything, treated individuals exhibit slightly lower consumption post-offer. This finding provides no support for a broad wealth effect arising from increased awareness of pension wealth.

Taken together, these results offer no evidence of a general wealth effect triggered by the offer. The absence of increased car demand or overall consumption, combined with the fact that higher spending is confined to electric vehicles, suggests that the observed behavioral responses reflect a reallocation toward sustainable consumption rather than increased purchasing power. As such, wealth effects do not challenge the core interpretation of our earlier findings.

5.2 Alternative Channels: Cost-Saving and Ownership History

We next address potential confounding factors that could explain the observed increase in sustainable car consumption among P+ members who received the offer to invest in a sustainable pension plan.

One alternative explanation is that P+ members may be more responsive to the financial benefits of electric vehicles. Highly educated individuals may be more aware of long-term operating cost savings, particularly if they are regular commuters or homeowners with access to home charging.

We first consider commuting-related savings. In Denmark, taxpayers are eligible for a

[19]The imputation method treats borrowed amounts as one-time consumption, introducing substantial noise; these restrictions follow Browning and Leth-Petersen (2003).

commuting allowance if their daily commute exceeds 20 kilometers. We classify individuals receiving this allowance as commuters. Table 1 shows that nearly all P+ members are non-commuters, limiting the scope for fuel-cost savings to explain increased electric vehicle adoption in this group.

A second cost-related channel concerns home charging. Individuals living in single-family homes can charge electric vehicles at lower electricity prices than those relying on public charging infrastructure. Among P+ members who received the offer, 60 percent live in single-family homes, compared to about 52 percent in the general population. Table 12 examines heterogeneity by housing type. Columns (1)–(2) show that P+ members living in single-family homes are more likely to purchase electric vehicles than their matched counterparts, while apartment residents (Columns (3)–(4)) do not exhibit a statistically significant increase in electric vehicle adoption.

Overall, these patterns suggest that cost-saving considerations may contribute to the observed behavior, particularly where home charging is feasible, but they account for only a modest portion of the overall effect.

We next examine whether prior vehicle ownership influences the response to the offer. In Columns (5)–(10) of Table 12, we classify car buyers as long-term owners (previous ownership longer than average), short-term owners (previous ownership shorter than average), and new owners (no car ownership in the previous year).

While sample sizes are limited within each subgroup, the results indicate that the increase in electric vehicle adoption is primarily driven by short-term and new car owners, rather than by long-term owners. In addition, new car owners tend to purchase more energy-efficient vehicles overall relative to the control group. This pattern is consistent with the interpretation that the offer affects behavior mainly when individuals are actively making a vehicle choice, rather than among households with entrenched consumption patterns.

Taken together, these robustness checks reinforce our main conclusions. Although cost-saving factors and ownership dynamics play some role, they do not fully account for the observed increase in sustainable car consumption. The evidence instead supports the interpretation that the sustainable-investment offer alters the choice environment and activates behavioral responses at salient decision points, consistent with the compensation mechanism emphasized in our conceptual framework.

6 Conclusion

This paper studies how access to a sustainability-focused pension plan affects individuals' consumption behavior outside the financial domain. Exploiting a one-time expansion of the pension plan menu at a large Danish occupational pension fund, we provide causal evidence that the availability of a sustainable investment option, whether or not it is ultimately chosen, leads to more sustainable consumption. Pension fund members who received the offer were more likely to purchase electric vehicles and to reduce the average emissions intensity of their vehicle fleets relative to a matched sample from the general population.

A key contribution of the paper is to reconcile this finding with ex-ante patterns in pension-plan choice. Using a simple conceptual framework, we show that when sustainable investment is perceived to involve unfavorable financial or impact-related trade-offs, individuals with moderate sustainability preferences may optimally decline the sustainable asset. Importantly, the availability of the option can nevertheless activate sustainability concerns and trigger a compensating response in consumption. The empirical evidence closely matches these predictions. Adoption of the sustainable pension plan is concentrated among individuals with strong revealed sustainability preferences, while the increase in sustainable consumption is driven primarily by those who do not adopt the sustainable plan.

Our results have several broader implications. First, they highlight the importance of jointly analyzing investment and consumption decisions. Focusing exclusively on portfolio choices risks understating the behavioral impact of sustainable financial products, as important responses may occur outside the investment domain. Second, the findings suggest that expanding access to sustainable investment options can generate positive spillovers to real economic behavior, even when take-up is limited. From a policy perspective, this implies that financial product design and choice architecture can complement traditional regulatory and price-based instruments in promoting sustainable behavior.

The paper also contributes to the literature on sustainable finance by clarifying the role of financial sophistication. While financially sophisticated individuals are less likely to select the sustainable pension plan, consistent with heightened sensitivity to risk–return trade-offs, they nevertheless increase sustainable consumption following the offer. This pattern supports the interpretation that declining sustainable investment does not reflect indifference toward sustainability, but rather a reallocation of sustainability efforts across domains.

Naturally, our analysis has limitations. The evidence is based on a single institutional setting and focuses on vehicle choices as a salient but specific measure of sustainable consumption. Future research could examine other consumption margins, longer-term responses, and different institutional environments. Nonetheless, the central insight of this paper is robust: expanding the sustainable investment opportunity set reshapes behavior beyond the portfolio. Even when sustainable investment is not adopted, its availability can activate sustainability concerns and lead individuals to adjust real consumption choices in environmentally meaningful ways.

References

Aladangady, A. (2017): "Housing wealth and consumption: Evidence from geographically linked microdata," *American Economic Review*, 107, 3415–3446.

Andersen, S., D. Chebotarev, F. Z. Filali-Adib, and K. M. Nielsen (2024): "Rich and responsible: Is ESG a luxury good?"Technical report, Danmarks Nationalbank Working Papers.

Anderson, A., and D. T. Robinson (2022): "Financial literacy in the age of green investment," *Review of Finance*, 26, 1551–1584.

Andreoni, J. (1995): "Warm-glow versus cold-prickle: the effects of positive and negative framing on cooperation in experiments," *The Quarterly Journal of Economics*, 110, 1–21.

Balter, A. G., M. Kallestrup-Lamb, and J. Rangvid (2020): "Variability in pension products: a comparison study between The Netherlands and Denmark," *Annals of Actuarial Science*, 14, 338 – 357.

Barber, B. M., A. Morse, and A. Yasuda (2021): "Impact investing," *Journal of Financial Economics*, 139, 162–185.

Bartzoka, L. (2023): "House Price Perceptions and the Housing Wealth Effect," *Available at SSRN 4629731*.

Bauer, R., T. Ruof, and P. Smeets (2021): "Get real! Individuals prefer more sustainable investments," *The Review of Financial Studies*, 34, 3976–4043.

Bénabou, R., and J. Tirole (2006): "Incentives and prosocial behavior," *American economic review*, 96, 1652–1678.

——— (2010): "Individual and corporate social responsibility," *Economica*, 77, 1–19.

Berg, T., U. Nielsson, and D. Streitz (2024): "Financial constraints and household green technology adoption."

Bernheim, B. D., and A. Rangel (2009): "Beyond revealed preference: choice-theoretic foundations for behavioral welfare economics," *The Quarterly Journal of Economics*, 124, 51–104.

Bovenberg, L. (2012): "Benchmarking the Danish pension system: a comparison with Dutch pensions," *Nationaløkonomisk tidsskrift*, 2012, 228–233.

Broccardo, E., O. Hart, and L. Zingales (2022): "Exit versus voice," *Journal of Political Economy*, 130, 3101–3145.

Browning, M., and S. Leth-Petersen (2003): "Imputing consumption from income and wealth information*," *The Economic Journal*, 113, F282–F301.

Brunen, A.-C., and O. Laubach (2022): "Do sustainable consumers prefer socially responsible investments? A study among the users of robo advisors," *Journal of Banking & Finance*, 136, 106314.

Ceccarelli, M., S. Ramelli, and A. F. Wagner (2024): "Low carbon mutual funds," *Review of Finance*, 28, 45–74.

Christiansen, C., T. Jansson, M. Kallestrup-Lamb, and V. Noren (2023): "Households' investments in socially responsible mutual funds," *The Quarterly Review of Economics and Finance*, 87, 46–67.

Cooper, M. J., H. Gulen, and P. R. Rau (2005): "Changing Names with Style: Mutual Fund Name Changes and Their Effects on Fund Flows," *Journal of Finance*, 60, 2825–2858.

Epper, T., E. Fehr, H. Fehr-Duda, C. T. Kreiner, D. D. Lassen, S. Leth-Petersen, and G. N. Rasmussen (2020): "Time discounting and wealth inequality," *American Economic Review*, 110, 1177–1205.

Famulok, J., E. Kormanyos, and D. Worring (2024): "Do investors use sustainable assets as carbon offsets?" *Available at SSRN 4349209*.

Festinger, L. (1957): "A theory of cognitive dissonance (T. 2)."

GSIA (2023): "Global Sustainable Investment Review 2022," https://www.gsi-alliance.org/members-resources/gsir2022/, Accessed: July 16, 2025.

Hakenes, H., and E. Schliephake (2024): "Responsible investment and responsible consumption," *Available at SSRN 3846367*.

Hartzmark, S. M., and D. H. Solomon (2019): "The dividend disconnect," *The Journal of Finance*, 74, 2153–2199.

Heeb, F., J. F. Kölbel, F. Paetzold, and S. Zeisberger (2023): "Do investors care about impact?" *The Review of Financial Studies*, 36, 1737–1787.

Heeb, F., J. Kölbel, S. Ramelli, and A. Vasileva (2024): "Green investing and political behavior,"Technical report, SAFE Working Paper.

Hong, F., J. Tirole, and C. Zhang (2024): "Moral Licensing: Prosocial Behaviors in Public and Private Spheres."

Hong, H., and L. Kostovetsky (2012): "Red and blue investing: Values and finance," *Journal of financial economics*, 103, 1–19.

Iacus, S. M., G. King, and G. Porro (2012): "Causal inference without balance checking: Coarsened exact matching," *Political analysis*, 1–24.

Jensen, T. L., and N. Johannesen (2016): "The Consumption Effects of the 2007-2008 Financial Crisis: Evidence from Households in Denmark," *American Economic Review*.

John, A., and R. Pecchenino (1994): "An Overlapping Generations Model of Growth and the Environment," *The Economic Journal*, 104, 1393–1410.

Kearney (2020): "Why Today's Pricing is Sabotaging Sustainability," Accessed: 2025-07-02.

Kormos, C., R. Gifford, and E. Brown (2015): "The influence of descriptive social norm information on sustainable transportation behavior: A field experiment," *Environment and Behavior*, 47, 479–501.

Masatlioglu, Y., D. Nakajima, and E. Y. Ozbay (2012): "Revealed attention," *American Economic Review*, 102, 2183–2205.

Mercer (2024): "Mercer CFA institute global pension index 2021,"Technical report, Monash Centre for Financial Studies and CFA Institute.

Ministry of Finance (2020): "Pension Projection Exercise 2021 Country Fiche Denmark,"Technical report, Ministry of Finance.

Misiura, G., and M. Rozkwitalska (2019): "Institutions, trust and the high level of innovativeness in the Scandinavian countries," *WSB Journal of Business and Finance*, 53, 44–54.

OECD (2023): "Pensions at a Glance 2023: OECD and G20 Indicators,"Technical report, Paris: OECD Publishing.

Riedl, A., and P. Smeets (2017): "Why do investors hold socially responsible mutual funds?" *The Journal of Finance*, 72, 2505–2550.

Taufik, D., J. W. Bolderdijk, and L. Steg (2015): "Acting green elicits a literal warm glow," *Nature Climate Change*, 5, 37–40.

Wang, Y., B. Liu, S. Lin, L. Liu, Y. Wu, and L. Cui (2022): "The effects of subjective socioeconomic status on conspicuous consumption," *Journal of Applied Social Psychology*, 52, 522–531.

Tables

Table 1: Descriptive Statistics, Pension Fund Members

Notes: This table reports descriptive statistics (averages and standard errors in parentheses) for the P+ pension fund members based on information from P+. Each column shows various subsamples as indicated by the headlines: All members, members in population register (BEF), members who did not receive an offer, and for members who received an offer separate for each of their choices of pension plan.

	All	In BEF	No Offer	Offer	No Choice	Choice	Sustainable	High Risk	Low Risk	Medium Risk
Pension Plan with Pplus:										
Member for more than 12 years	0.12	0.11	0.12	0.12	0.12	0.10	0.14	0.07	0.21	0.15
	(0.32)	(0.31)	(0.32)	(0.32)	(0.33)	(0.31)	(0.35)	(0.26)	(0.41)	(0.36)
Depot in 1000 DKK	967.60	1,005.94	407.70	1,086.92	1,078.14	1,127.70	1,145.58	886.92	1,546.36	1,591.00
	(1,280.11)	(1,301.87)	(893.01)	(1,317.92)	(1,319.72)	(1,308.80)	(1,300.01)	(1,030.97)	(1,900.60)	(1,623.83)
Ended	0.06	0.06	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.23)	(0.23)	(0.47)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Currently contributing	0.62	0.66	0.20	0.72	0.70	0.81	0.83	0.82	0.68	0.79
	(0.48)	(0.47)	(0.40)	(0.45)	(0.46)	(0.39)	(0.38)	(0.39)	(0.47)	(0.41)
Balance, no payments	0.30	0.27	0.46	0.27	0.28	0.18	0.15	0.17	0.30	0.20
	(0.46)	(0.44)	(0.50)	(0.44)	(0.45)	(0.38)	(0.36)	(0.38)	(0.46)	(0.40)
Disability Pension	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Retired	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.01)	(0.01)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Total premiums, 2022	56,358.24	59,434.89	20,389.42	64,023.59	61,993.47	73,452.10	71,865.45	72,225.18	60,153.22	76,852.29
	(49,658.40)	(49,374.38)	(38,401.54)	(48,402.02)	(48,321.47)	(47,655.71)	(41,049.38)	(45,055.32)	(46,863.52)	(54,386.18)
Number of payments, 2022	7.98	8.37	3.14	9.01	8.80	10.01	10.35	10.06	8.46	9.82
	(5.49)	(5.34)	(4.95)	(5.03)	(5.15)	(4.32)	(3.93)	(4.27)	(5.46)	(4.51)
Paid all year, 2022	0.63	0.66	0.20	0.72	0.70	0.81	0.82	0.81	0.70	0.79
	(0.48)	(0.47)	(0.40)	(0.45)	(0.46)	(0.40)	(0.38)	(0.39)	(0.46)	(0.41)
Demographic Characteristics										
Female	0.52	0.51	0.57	0.51	0.50	0.59	0.51	0.63	0.72	0.54
	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.49)	(0.50)	(0.48)	(0.45)	(0.50)
Age	44.83	44.76	45.08	44.78	45.02	43.63	43.53	41.40	55.61	47.79
	(10.81)	(10.79)	(11.68)	(10.61)	(10.66)	(10.31)	(10.43)	(9.40)	(10.38)	(10.48)
Married	0.57	0.58	0.53	0.58	0.57	0.60	0.63	0.57	0.67	0.64
	(0.50)	(0.49)	(0.50)	(0.49)	(0.49)	(0.49)	(0.48)	(0.50)	(0.47)	(0.48)
Master's in Engineering	0.27	0.27	0.27	0.27	0.28	0.25	0.33	0.21	0.38	0.26
	(0.44)	(0.44)	(0.44)	(0.44)	(0.45)	(0.43)	(0.47)	(0.41)	(0.49)	(0.44)
Master's in Economics and Business	0.24	0.24	0.23	0.24	0.23	0.29	0.18	0.31	0.23	0.29
	(0.42)	(0.43)	(0.42)	(0.43)	(0.42)	(0.45)	(0.38)	(0.46)	(0.43)	(0.45)
Master's in Jurisprudence	0.17	0.18	0.17	0.17	0.18	0.16	0.09	0.15	0.12	0.18
	(0.38)	(0.38)	(0.38)	(0.38)	(0.38)	(0.36)	(0.29)	(0.36)	(0.32)	(0.38)
Master's in Political Science	0.09	0.10	0.06	0.10	0.09	0.12	0.13	0.13	0.08	0.11
	(0.29)	(0.30)	(0.25)	(0.30)	(0.29)	(0.33)	(0.33)	(0.34)	(0.28)	(0.32)
Master's in Sociology	0.05	0.05	0.04	0.05	0.05	0.05	0.09	0.05	0.02	0.04
	(0.21)	(0.21)	(0.19)	(0.21)	(0.21)	(0.21)	(0.28)	(0.21)	(0.13)	(0.19)
Master's in Other Fields	0.18	0.17	0.22	0.17	0.18	0.14	0.18	0.15	0.17	0.12
	(0.38)	(0.37)	(0.42)	(0.38)	(0.38)	(0.35)	(0.38)	(0.35)	(0.38)	(0.33)
Observations	93,156	86,843	16,365	76,791	63,186	13,605	1,509	7,990	107	3,998

Table 2: Descriptive Statistics, Sample

Notes: This table reports descriptive statistics (averages and standard errors in parentheses) for our sample of P+ pension fund members based on information from P+ and Statistics Denmark. Each column shows various subsamples as indicated by the headlines: All members, members who did not receive an offer, and for members who received an offer separate for each of their choices of pension plan.

	All mean/sd	No Offer mean/sd	Offer mean/sd	No Choice mean/sd	Choice mean/sd	Sustainable mean/sd	High Risk mean/sd	Low Risk mean/sd	Medium Risk mean/sd
Demographic Characteristics:									
Age	43.39	42.64	43.52	43.78	42.38	42.40	40.12	54.84	46.55
	(10.59)	(10.77)	(10.56)	(10.62)	(10.21)	(10.34)	(9.27)	(10.31)	(10.39)
Married	0.57	0.54	0.57	0.57	0.58	0.62	0.55	0.68	0.63
	(0.50)	(0.50)	(0.49)	(0.50)	(0.49)	(0.49)	(0.50)	(0.47)	(0.48)
Female	0.49	0.44	0.50	0.51	0.42	0.49	0.38	0.28	0.47
	(0.50)	(0.50)	(0.50)	(0.50)	(0.49)	(0.50)	(0.49)	(0.45)	(0.50)
Kids at home	1.09	1.03	1.10	1.10	1.13	1.12	1.17	0.68	1.05
	(1.06)	(1.06)	(1.07)	(1.07)	(1.06)	(1.05)	(1.08)	(0.87)	(1.03)
Single-family House	0.60	0.58	0.60	0.60	0.62	0.59	0.60	0.71	0.66
	(0.49)	(0.49)	(0.49)	(0.49)	(0.49)	(0.49)	(0.49)	(0.46)	(0.47)
Commuter	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	(0.03)	(0.05)	(0.03)	(0.03)	(0.02)	(0.03)	(0.02)	(0.00)	(0.02)
Education:									
Master's and Higher	0.78	0.75	0.78	0.77	0.81	0.78	0.83	0.67	0.78
	(0.42)	(0.43)	(0.41)	(0.42)	(0.40)	(0.41)	(0.38)	(0.47)	(0.41)
Social Sciences	0.45	0.37	0.47	0.46	0.50	0.46	0.51	0.33	0.49
	(0.50)	(0.48)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.47)	(0.50)
Business	0.21	0.23	0.21	0.20	0.24	0.15	0.25	0.28	0.23
	(0.41)	(0.42)	(0.41)	(0.40)	(0.42)	(0.36)	(0.43)	(0.45)	(0.42)
Math/Physics/Engeneering	0.27	0.31	0.26	0.27	0.21	0.30	0.18	0.33	0.23
	(0.44)	(0.46)	(0.44)	(0.44)	(0.41)	(0.46)	(0.39)	(0.47)	(0.42)
Economist	0.23	0.24	0.23	0.22	0.29	0.16	0.31	0.27	0.29
	(0.42)	(0.42)	(0.42)	(0.41)	(0.45)	(0.37)	(0.46)	(0.45)	(0.45)
Other Degree	0.21	0.24	0.21	0.21	0.17	0.24	0.16	0.21	0.16
	(0.41)	(0.43)	(0.40)	(0.41)	(0.37)	(0.42)	(0.36)	(0.41)	(0.37)
Manager	0.09	0.09	0.09	0.09	0.10	0.08	0.09	0.08	0.13
	(0.29)	(0.29)	(0.29)	(0.29)	(0.30)	(0.27)	(0.29)	(0.28)	(0.34)
Services	0.83	0.71	0.85	0.85	0.87	0.86	0.88	0.87	0.86
	(0.37)	(0.45)	(0.36)	(0.36)	(0.34)	(0.34)	(0.33)	(0.34)	(0.35)
Workplace:									
Number of Employees	770.86	622.38	796.87	804.56	763.24	846.67	762.71	875.48	729.22
	(1,467.78)	(1,188.96)	(1,509.85)	(1,530.75)	(1,414.40)	(1,631.09)	(1,389.41)	(1,674.08)	(1,366.54)
Firm Growth	0.75	0.61	0.77	0.78	0.76	0.82	0.71	0.06	0.87
	(18.37)	(16.12)	(18.74)	(19.24)	(16.36)	(19.36)	(15.13)	(0.34)	(17.68)
Sector:									
State	0.44	0.30	0.46	0.47	0.44	0.45	0.46	0.39	0.41
	(0.50)	(0.46)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.49)	(0.49)
Region	0.06	0.03	0.06	0.06	0.07	0.07	0.07	0.08	0.07
	(0.23)	(0.18)	(0.24)	(0.24)	(0.25)	(0.25)	(0.25)	(0.28)	(0.25)
Municipality	0.15	0.08	0.16	0.16	0.16	0.17	0.15	0.09	0.18
	(0.35)	(0.26)	(0.37)	(0.37)	(0.37)	(0.38)	(0.36)	(0.29)	(0.38)
Private Sector	0.35	0.59	0.31	0.31	0.33	0.31	0.32	0.43	0.35
	(0.48)	(0.49)	(0.46)	(0.46)	(0.47)	(0.46)	(0.47)	(0.50)	(0.48)
Financial Characteristics									
LogValue of income	13.32	13.33	13.32	13.31	13.34	13.26	13.33	13.37	13.40
	(0.38)	(0.48)	(0.37)	(0.36)	(0.37)	(0.35)	(0.37)	(0.38)	(0.35)
LogValue of stocks	5.17	5.25	5.15	4.83	6.56	5.79	7.06	5.24	5.88
	(5.79)	(5.77)	(5.79)	(5.73)	(5.86)	(5.74)	(5.77)	(5.95)	(5.97)
LogValue of housingwealth	9.95	9.50	10.03	9.99	10.23	9.98	9.95	10.74	10.87
	(6.45)	(6.64)	(6.41)	(6.43)	(6.32)	(6.36)	(6.45)	(6.05)	(6.01)
LogValue of bankdeposit	11.68	11.66	11.68	11.69	11.65	11.57	11.55	12.07	11.85
	(1.51)	(1.49)	(1.52)	(1.53)	(1.43)	(1.44)	(1.39)	(1.40)	(1.50)
LogValue of mortgage	8.62	8.27	8.68	8.63	8.87	8.64	8.77	8.72	9.15
	(6.74)	(6.85)	(6.72)	(6.72)	(6.68)	(6.67)	(6.76)	(6.61)	(6.54)
LogValue of bankloan	7.45	7.56	7.42	7.41	7.51	7.11	7.68	7.20	7.32
	(5.62)	(5.62)	(5.61)	(5.62)	(5.60)	(5.66)	(5.59)	(5.56)	(5.57)
LogValue of fin_wealth	12.04	12.03	12.04	12.02	12.16	11.96	12.13	12.47	12.28
	(1.61)	(1.59)	(1.62)	(1.63)	(1.56)	(1.55)	(1.53)	(1.52)	(1.62)
Log Pension Wealth	13.79	13.50	13.84	13.84	13.85	13.77	13.65	14.62	14.26
	(1.20)	(1.32)	(1.17)	(1.17)	(1.16)	(1.16)	(1.13)	(0.96)	(1.13)
Leverage	1.27	1.25	1.27	1.27	1.27	1.16	1.33	1.05	1.18
	(3.90)	(2.44)	(4.10)	(4.47)	(1.71)	(1.29)	(1.94)	(1.19)	(1.33)
LTV	0.58	0.60	0.58	0.57	0.60	0.57	0.64	0.46	0.54
	(0.92)	(1.08)	(0.89)	(0.81)	(1.20)	(0.71)	(1.47)	(0.47)	(0.62)
SMP	0.37	0.38	0.36	0.34	0.46	0.38	0.50	0.38	0.40
	(0.48)	(0.49)	(0.48)	(0.47)	(0.50)	(0.48)	(0.50)	(0.49)	(0.49)
Risk Share	0.21	0.22	0.21	0.19	0.27	0.22	0.30	0.21	0.23
	(0.31)	(0.31)	(0.31)	(0.30)	(0.33)	(0.30)	(0.34)	(0.31)	(0.31)
Electric Car 2022	0.14	0.17	0.13	0.13	0.15	0.20	0.16	0.14	0.12
	(0.34)	(0.37)	(0.34)	(0.33)	(0.36)	(0.40)	(0.37)	(0.35)	(0.33)
Emission, CO2	95.28	92.20	95.83	96.18	94.45	83.67	93.94	93.35	98.27
	(40.34)	(42.78)	(39.87)	(39.59)	(40.95)	(47.50)	(41.47)	(46.38)	(37.22)
Emission, CO	263.48	259.65	264.15	265.95	256.87	240.92	256.13	249.61	262.56
	(177.49)	(180.68)	(176.92)	(177.66)	(173.75)	(192.59)	(172.35)	(190.14)	(170.40)
Emission, HC	7.96	8.19	7.92	8.11	7.15	5.75	7.33	19.54	6.89
	(29.56)	(30.36)	(29.43)	(29.76)	(28.00)	(24.20)	(28.54)	(47.22)	(27.22)
Emission, NOX	29.61	29.05	29.70	29.87	29.02	26.03	28.84	37.57	29.82
	(31.67)	(32.33)	(31.56)	(31.82)	(30.46)	(28.53)	(30.43)	(44.50)	(30.27)
Car age	7.36	7.27	7.37	7.44	7.08	7.54	6.99	8.53	7.06
	(6.03)	(6.15)	(6.00)	(6.00)	(6.01)	(6.28)	(6.04)	(5.97)	(5.87)
Year of car-ownership	3.59	3.21	3.66	3.69	3.52	3.61	3.26	4.61	3.95
	(3.24)	(3.09)	(3.26)	(3.28)	(3.16)	(3.22)	(2.97)	(3.47)	(3.40)
Observations	79,502	1,1851	67,651	55,055	12,596	1386	7,399	97	3,713

Table 3: Descriptive Statistics, Vehicles

Notes: This table reports descriptive statistics (averages and standard errors in parentheses) for vehicle consumption for the general population, all P+ members in our sample, and separate for each of their choices of pension plan. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively.

	Gen. Population mean/b/sd/t	Pplus Members mean/b/sd/t	No Choice mean/b/sd/t	Sustainable mean/b/sd/t	High Risk mean/b/sd/t	Low and Medium Risk mean/b/sd/t
Bought a Car	0.12	0.09	0.09	0.07	0.11	0.10
	(0.33)	(0.29)	(0.29)	(0.26)	(0.32)	(0.30)
Type of Car:						
EV or PHEV	0.20	0.33	0.32	0.48	0.35	0.29
	(0.40)	(0.47)	(0.47)	(0.50)	(0.48)	(0.45)
EV	0.13	0.24	0.24	0.42	0.24	0.20
	(0.34)	(0.43)	(0.42)	(0.50)	(0.43)	(0.40)
PHEV	0.07	0.09	0.09	0.05	0.11	0.09
	(0.26)	(0.29)	(0.28)	(0.23)	(0.32)	(0.28)
Price (Purchase Price + Profit + VAT):						
Average Price	123319.11	145570.64	145679.85	182264.08	143648.31	139347.75
	(83,402.09)	(93,691.89)	(95,415.09)	(91,350.37)	(88,177.79)	(81,927.33)
Average Price, EV or PHEV	252972.29	261486.72	263989.04	254792.88	250300.75	255565.45
	(88,764.42)	(83,244.80)	(85,977.40)	(71,861.64)	(73,159.14)	(68,568.48)
Average Price, EV	288098.15	289411.99	292872.42	262957.71	281485.98	272566.56
	(97,669.77)	(85,398.19)	(88,150.09)	(72,497.54)	(75,713.53)	(65,433.68)
Average Price, PHEV	209193.43	207475.98	206661.23	197639.00	206274.54	223688.38
	(48,999.29)	(42,508.79)	(41,294.65)	(32,888.49)	(39,143.93)	(63,904.86)
Average Price, Conventional	89,974.12	95,226.03	94,386.29	111933.12	95,617.06	100979.22
	(36,973.74)	(35,829.76)	(35,136.55)	(36,409.00)	(38,181.60)	(37,971.82)
Car age (Age at Purchase):						
New car age	8.10	5.64	5.67	5.56	5.69	5.08
	(8.50)	(6.38)	(6.29)	(7.23)	(6.64)	(6.76)
New car age, EV or PHEV	1.92	1.80	1.80	1.77	1.80	1.73
	(1.40)	(1.30)	(1.32)	(1.03)	(1.25)	(1.36)
New car age, EV	1.85	1.76	1.77	1.79	1.73	1.61
	(1.41)	(1.27)	(1.32)	(1.06)	(1.13)	(1.08)
New car age, PHEV	2.06	1.92	1.91	1.60	1.95	2.03
	(1.38)	(1.38)	(1.33)	(0.89)	(1.46)	(1.87)
New car age, Conventional	9.67	7.48	7.49	9.03	7.76	6.45
	(8.90)	(7.07)	(6.94)	(8.64)	(7.37)	(7.60)
Emissions of the Purchase:						
Average CO2 Emissions	80.69	70.64	70.90	49.96	68.25	77.44
	(47.83)	(52.71)	(52.86)	(56.20)	(51.87)	(50.33)
Average CO2 Emissions, EV or PHEV	10.18	7.69	7.57	3.18	9.39	7.04
	(14.24)	(13.07)	(13.01)	(9.32)	(14.25)	(11.63)
Average CO2 Emissions, EV	0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Average CO2 Emissions, PHEV	28.34	28.22	28.20	28.00	29.45	24.90
	(7.24)	(6.98)	(6.99)	(8.07)	(7.05)	(5.41)
Average CO2 Emissions, Conventional	108.48	110.14	110.12	112.33	109.72	110.79
	(19.89)	(20.13)	(20.59)	(19.06)	(18.55)	(17.78)
Observations	1964343	60817	49610	1255	6539	3412

Table 4: Sustainable Choice, Model Estimation

Notes: This table reports the estimation results from estimating the linear probability model in Eq. (11). The individual chooses between the sustainable plan and the conventional alternative. In Column 1, the alternative includes any conventional risk profile as specified in Eq. (11), and in Column 2, the alternative only includes the medium risk profile as specified in Eq. (11). Standard errors are in parentheses. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively.

	Sustainable	Sustainable, fixed risk
Demographic Characteristics:		
Age	0.00342	-0.00433
	(0.00342)	(0.00756)
AgeSq	-0.0000204	0.0000112
	(0.0000356)	(0.0000767)
Married	0.0234***	0.0426***
	(0.00695)	(0.0155)
Female	0.0175***	-0.0224*
	(0.00616)	(0.0135)
Kids at home	-0.00237	0.00726
	(0.00352)	(0.00787)
Education:		
Masters degree	-0.00589	-0.000614
	(0.00758)	(0.0162)
Economist	-0.0588***	-0.123***
	(0.00627)	(0.0145)
Labor Market:		
Manager	0.00950	0.0316
	(0.0107)	(0.0228)
Services	-0.0147	-0.0387*
	(0.00939)	(0.0205)
Private Sector	0.00577	-0.00530
	(0.00698)	(0.0154)
Financial Characteristics		
Log Income	-0.0728***	-0.135***
	(0.0114)	(0.0262)
Log Pension Wealth	-0.00790	-0.0360**
	(0.00719)	(0.0163)
LTV	-0.00179	0.0189*
	(0.00236)	(0.0106)
SMP	-0.0136**	-0.00171
	(0.00683)	(0.0153)
Risky Share	-0.0249**	0.0615**
	(0.0106)	(0.0246)
Consumption: Cars		
Electric Car	0.0243**	0.0776***
	(0.0106)	(0.0242)
Rsq	0.02	0.07
Observations	11,012	4,387

Table 5: Descriptive Statistics, Matched Sample

Notes: This table reports descriptive statistics (averages and standard errors in parentheses) for the sample of P+ members who received an offer and the CEM matched (coarsened exact matching) sample from the general population, where matching is based on age, gender, income, education level, and municipality of residence. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively.

	Offer	CEM Matched Sample	T-test
Age	44.28	44.26	0.10
	(10.42)	(10.43)	(0.00)
Female	0.33	0.33	-0.00
	(0.47)	(0.47)	(0.00)
LogValue of Income	13.38	13.37	1.55
	(0.37)	(0.53)	(0.00)
Master's Degree	0.75	0.75	0.00
	(0.43)	(0.43)	(0.00)
New electric vehicle	0.33	0.33	-0.18
	(0.47)	(0.47)	(0.00)
Cars' CO2 emissions	75.95	74.16	1.93
	(52.33)	(52.10)	(0.00)
Observations	4737	48099	7404

Table 6: Purchasing an Electric Vehicle, Offer

Notes: This table reports the estimation results from estimating the difference-in-difference (DiD) regression model in Eq. (12) for the propensity to purchase an electric vehicle (*Electric Car*) and level of CO2 emissions of the new car portfolio (*CO2*) for all vehicle buyers, only for current vehicle owners, and only for new vehicle owners. The treated sample includes P+ members who bought a vehicle. Standard errors are in parentheses. Standard errors are clustered at the household level. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively.

	All		Had a car		New Car Owners		After Offer		Before Offer	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	CO2	EV	CO2	EV	CO2	EV	CO2	EV	CO2	EV
Offer	1.791*	-0.000	1.677	0.003	2.047	-0.009	1.791**	-0.000	1.791**	-0.000
	(0.930)	(0.007)	(1.118)	(0.009)	(1.672)	(0.011)	(0.753)	(0.005)	(0.753)	(0.005)
year=2019	30.736***	-0.188***	31.573***	-0.192***	29.158***	-0.180***	30.736***	-0.188***	30.736***	-0.188***
	(0.486)	(0.003)	(0.600)	(0.004)	(0.832)	(0.005)	(0.325)	(0.002)	(0.325)	(0.002)
year=2020	21.641***	-0.147***	21.612***	-0.142***	21.685***	-0.150***	21.641***	-0.147***	21.641***	-0.147***
	(0.501)	(0.004)	(0.625)	(0.005)	(0.847)	(0.005)	(0.315)	(0.002)	(0.315)	(0.002)
year=2021	9.024***	-0.080***	8.327***	-0.073***	10.215***	-0.090***	9.024***	-0.080***	9.024***	-0.080***
	(0.537)	(0.004)	(0.666)	(0.005)	(0.918)	(0.006)	(0.309)	(0.002)	(0.309)	(0.002)
year=2023	-13.661***	0.109***	-12.988***	0.104***	-15.195***	0.116***	-13.655***	0.108***	-13.657***	0.109***
	(0.562)	(0.004)	(0.676)	(0.006)	(1.024)	(0.007)	(0.316)	(0.002)	(0.316)	(0.002)
Offer×year=2019	-1.498	-0.001	-1.309	-0.006	-1.941	0.008	-1.498	-0.001	-1.498	-0.001
	(1.055)	(0.007)	(1.281)	(0.009)	(1.880)	(0.012)	(1.067)	(0.007)	(1.067)	(0.007)
Offer×year=2020	-1.192	0.001	-1.310	0.001	-1.057	0.004	-1.192	0.001	-1.192	0.001
	(1.103)	(0.008)	(1.366)	(0.010)	(1.921)	(0.012)	(1.040)	(0.007)	(1.040)	(0.007)
Offer×year=2021	0.059	0.001	0.022	-0.001	0.103	0.007	0.059	0.001	0.059	0.001
	(1.189)	(0.009)	(1.454)	(0.011)	(2.091)	(0.014)	(1.024)	(0.007)	(1.024)	(0.007)
Offer×year=2023	-2.734**	0.027***	-2.553*	0.026**	-3.157	0.031*	-4.812***	0.048***	-0.157	0.006
	(1.253)	(0.010)	(1.491)	(0.013)	(2.339)	(0.017)	(1.217)	(0.009)	(1.247)	(0.009)
Observations	227895	299836	158080	197673	69815	102163	229729	297429	229569	297212

Table 7: Purchasing an Electric Vehicle, Offer and Financial Sophistication

Notes: This table reports the estimation results from estimating the difference-in-difference (DiD) regression model in Eq. (12) for the propensity to purchase an electric vehicle (*Electric Car*) and level of CO2 emissions of the new car portfolio (*CO2*) for all vehicle buyers, only for current vehicle owners, and only for new vehicle owners. The treated sample includes P+ members who bought a vehicle. Standard errors are in parentheses. Standard errors are clustered at the household level. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively.

	All Buyers		Economists		Not Economists		Econ, matched	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CO2	EV	CO2	EV	CO2	EV	CO2	EV
Offer	1.791*	-0.000	3.814***	-0.007	2.929**	-0.005	1.609*	-0.001
	(0.930)	(0.007)	(1.217)	(0.009)	(1.188)	(0.009)	(0.953)	(0.007)
year=2019	30.736***	-0.188***	31.415***	-0.191***	30.904***	-0.189***	31.115***	-0.189***
	(0.486)	(0.003)	(0.582)	(0.004)	(0.555)	(0.004)	(0.541)	(0.004)
year=2020	21.641***	-0.147***	22.406***	-0.152***	22.069***	-0.149***	21.891***	-0.148***
	(0.501)	(0.004)	(0.599)	(0.004)	(0.569)	(0.004)	(0.548)	(0.004)
year=2021	9.024***	-0.080***	8.945***	-0.077***	8.862***	-0.081***	8.653***	-0.080***
	(0.537)	(0.004)	(0.648)	(0.005)	(0.610)	(0.004)	(0.598)	(0.004)
year=2023	-13.661***	0.109***	-13.650***	0.109***	-14.332***	0.111***	-14.207***	0.114***
	(0.562)	(0.004)	(0.671)	(0.005)	(0.633)	(0.005)	(0.621)	(0.005)
Offer×year=2019	-1.498	-0.001	-2.931**	-0.000	-2.523*	-0.000	-1.728	-0.002
	(1.055)	(0.007)	(1.361)	(0.010)	(1.325)	(0.009)	(1.087)	(0.008)
Offer×year=2020	-1.192	0.001	-2.428*	0.001	-2.315*	0.003	-1.295	0.001
	(1.103)	(0.008)	(1.459)	(0.011)	(1.401)	(0.010)	(1.131)	(0.008)
Offer×year=2021	0.059	0.001	-0.804	-0.001	1.010	-0.009	0.651	-0.000
	(1.189)	(0.009)	(1.590)	(0.012)	(1.494)	(0.010)	(1.223)	(0.009)
Offer×year=2023	-2.734**	0.027***	-3.884**	0.029**	-2.054	0.027**	-2.113	0.022**
	(1.253)	(0.010)	(1.630)	(0.013)	(1.597)	(0.013)	(1.287)	(0.010)
Observations	227895	299836	113337	146792	113337	146792	205740	271345

Table 8: Sustainable Consumption by Pension Plan Choice

Notes: This table reports the estimation results from estimating the difference-in-differences (DiD) regression model in Eq. (13) for the propensity to purchase an electric vehicle for all vehicle buyers, only for current vehicle owners, and only for new vehicle owners, conditional on their choice of a pension plan: Sustainable for sustainable medium risk plan, and Conventional for low, medium, and high risk conventional pension plans. The treated sample includes P+ members who bought a vehicle and made an explicit choice of a new pension plan. The control group is matched to the P+ members who made an explicit choice of the plan. Standard errors are in parentheses. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively.

	All car buyers		Car Owners		New Car Owners	
	(1)	(2)	(3)	(4)	(5)	(6)
	CO2	EV	CO2	EV	CO2	EV
Conventional	2.211	-0.013	-0.534	0.005	8.216**	-0.055**
	(1.912)	(0.014)	(2.335)	(0.018)	(3.296)	(0.022)
Sustainable	-21.232***	0.148***	-15.720*	0.131*	-31.479***	0.175**
	(6.952)	(0.055)	(8.772)	(0.071)	(11.014)	(0.088)
year=2019	31.066***	-0.190***	31.876***	-0.196***	29.559***	-0.177***
	(0.612)	(0.004)	(0.758)	(0.006)	(1.032)	(0.006)
year=2020	22.497***	-0.152***	22.150***	-0.149***	23.139***	-0.153***
	(0.624)	(0.005)	(0.790)	(0.006)	(1.015)	(0.006)
year=2021	10.259***	-0.087***	9.259***	-0.079***	11.968***	-0.095***
	(0.681)	(0.005)	(0.858)	(0.007)	(1.120)	(0.007)
year=2023	-14.011***	0.113***	-13.866***	0.110***	-14.399***	0.117***
	(0.713)	(0.006)	(0.874)	(0.007)	(1.239)	(0.009)
Conventional×year=2019	0.109	0.007	3.216	-0.012	-6.798*	0.047**
	(2.161)	(0.015)	(2.633)	(0.020)	(3.819)	(0.024)
Conventional×year=2020	-2.658	0.021	0.017	0.004	-8.540**	0.057**
	(2.311)	(0.017)	(2.918)	(0.022)	(3.881)	(0.025)
Conventional×year=2021	-4.331*	0.024	-0.224	-0.007	-12.630***	0.083***
	(2.481)	(0.018)	(3.043)	(0.024)	(4.300)	(0.028)
Conventional×year=2023	-5.490**	0.071***	-2.016	0.049*	-13.192***	0.120***
	(2.581)	(0.022)	(3.094)	(0.027)	(4.814)	(0.037)
Sustainable×year=2019	12.237	-0.096	4.558	-0.071	27.083**	-0.138
	(8.393)	(0.065)	(10.541)	(0.084)	(13.663)	(0.100)
Sustainable×year=2020	8.340	-0.058	7.842	-0.071	10.952	-0.043
	(8.423)	(0.066)	(10.422)	(0.085)	(13.709)	(0.104)
Sustainable×year=2021	13.478	-0.094	14.003	-0.123	11.269	-0.056
	(9.173)	(0.069)	(11.160)	(0.087)	(16.612)	(0.112)
Sustainable×year=2023	6.686	-0.050	2.344	-0.024	14.463	-0.092
	(8.715)	(0.075)	(10.947)	(0.094)	(14.608)	(0.122)
Observations	114885	149947	76754	94960	38131	54987

Table 9: Treatment Effects by Pension Plan Type

Notes: This table reports the estimation results from estimating the difference-in-differences (DiD) regression model in Eq. (13) for the propensity to purchase an electric vehicle for all vehicle buyers. The comparison and matching is done for each subgroup of treated individuals separately, depending on the plan they have chosen. Sustainable refers to sustainable medium risk plan. High, Medium, and Low refer to high, medium, and low risk conventional plans, respectively. The treated sample includes P+ members who bought a vehicle. Standard errors are in parentheses. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively.

	Sustainable		High		Medium		Low	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CO2	EV	CO2	EV	CO2	EV	CO2	EV
Plan=1	-20.887***	0.147***	-2.415	0.008	12.092***	-0.060**	-7.951	0.026
	(7.034)	(0.056)	(2.308)	(0.017)	(3.295)	(0.025)	(21.065)	(0.159)
year=2019	30.504***	-0.188***	30.866***	-0.186***	30.673***	-0.193***	41.992***	-0.262***
	(1.666)	(0.010)	(0.643)	(0.005)	(1.060)	(0.008)	(3.662)	(0.026)
year=2020	22.048***	-0.154***	22.361***	-0.148***	22.310***	-0.156***	32.336***	-0.224***
	(1.383)	(0.010)	(0.673)	(0.005)	(1.068)	(0.008)	(3.859)	(0.029)
year=2021	9.079***	-0.093***	9.926***	-0.084***	10.760***	-0.087***	19.736***	-0.170***
	(1.786)	(0.012)	(0.737)	(0.005)	(1.150)	(0.008)	(4.384)	(0.033)
year=2023	-12.722***	0.102***	14.721***	0.120***	13.716***	0.109***	-6.649*	0.032
	(1.757)	(0.014)	(0.761)	(0.006)	(1.281)	(0.010)	(3.877)	(0.032)
Plan=1×year=2019	12.606	-0.099	3.562	-0.014	-8.140**	0.055**	12.758	-0.071
	(8.491)	(0.065)	(2.666)	(0.019)	(3.598)	(0.027)	(21.939)	(0.160)
Plan=1×year=2020	8.789	-0.056	1.358	0.003	-11.558***	0.061**	-14.786	0.113
	(8.514)	(0.067)	(2.838)	(0.021)	(3.882)	(0.029)	(35.544)	(0.212)
Plan=1×year=2021	14.658	-0.088	-0.728	0.012	-12.859***	0.051	2.443	0.087
	(9.321)	(0.070)	(3.018)	(0.022)	(4.245)	(0.031)	(26.866)	(0.232)
Plan=1×year=2023	5.398	-0.039	-4.942	0.070***	-6.906	0.066*	9.201	0.302
	(8.863)	(0.076)	(3.143)	(0.027)	(4.418)	(0.038)	(26.287)	(0.219)
Observations	27276	35960	90228	117695	61230	79852	2686	3344

Table 10: Descriptive Statistics, Vehicle Demand

Notes: This table reports descriptive statistics for buying and selling vehicles before and after the offer was given for the sample of P+ members who received an offer and the CEM matched sample. Standard errors are in parentheses. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively.

	Before offer		After offer	
	Offer	Matched Sample	Offer	Matched Sample
	mean/sd	mean/sd	mean/sd	mean/sd
Bought a car	0.09	0.10	0.09	0.10
	(0.29)	(0.30)	(0.28)	(0.30)
Sold a car	0.07	0.07	0.07	0.08
	(0.25)	(0.26)	(0.26)	(0.28)
Car-owner, did nothing	0.38	0.34	0.41	0.38
	(0.49)	(0.47)	(0.49)	(0.49)
New car-owner	0.07	0.07	0.06	0.07
	(0.25)	(0.26)	(0.24)	(0.26)
Sold all cars	0.05	0.05	0.05	0.06
	(0.22)	(0.22)	(0.22)	(0.23)
Not a car-owner	0.50	0.53	0.47	0.48
	(0.50)	(0.50)	(0.50)	(0.50)
Observations	263554	592620	63853	155167

Table 11: Robustness: Prices, Demand for Cars, Imputed Consumption, After the Offer

Notes: This table reports the estimation results from estimating the difference-in-difference (DiD) regression for the prices of new cars (columns 1-3), propensity to purchase a car (columns 4-5), and imputed consumption (column 7), comparing the matched sample and Pplus members, who received an offer to change their pension plan. In columns (1)-(3), the sample includes only car buyers. Columns (4)-(6) present results for all Pplus members who received an offer, and are comparable to the matched sample. Column (7) excludes car buyers and home buyers from the treated and control samples. *Offer* is a dummy variable equal to one for the Pplus members, who received an offer, and zero for the matched sample. All years before 2023 are aggregated and the time variable *2023* is equal to zero for years 2019-2022 and equal to one for year 2023. Standard errors are in parentheses. For all estimations, the standard errors are clustered at the household level. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively.

	Price			Demand for cars			Imputed Consumption
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All cars	Electric	Combustion Engine	Any car	First car	Next car	
Offer	-4904.346***	-1.38e+04***	-232.086	-0.006***	-0.004***	-0.002*	-1.77e+04
	(809.042)	(1924.371)	(358.552)	(0.002)	(0.001)	(0.001)	(10751.799)
2023	47501.554***	15887.128***	570.407**	-0.000	-0.005***	0.005***	71508.484***
	(566.967)	(987.472)	(290.936)	(0.001)	(0.001)	(0.001)	(6817.658)
Offer×2023	6063.162***	8665.808***	1206.577	-0.004	-0.000	-0.004*	-1.55e+04
	(1849.973)	(3229.730)	(958.622)	(0.003)	(0.003)	(0.002)	(11961.669)
Rsq	0.04	0.01	0.00	0.00	0.00	0.00	0.00
Observations	202,848	49,808	153,983	873,016	873,016	873,016	710,308

Table 12: Robustness: Dwelling Type and Tenure of Ownership

Notes: This table reports the estimation results from estimating the difference-in-difference (DiD) regression for individuals living in single-family houses (*House*, columns 1-2), leaving in apartments and shared houses (*Apartment*, columns 3-4), individuals who owned the previous car longer than median time, 4 years (*Long-term*, columns 5-6), owned less than 4 years (*Short-term*, columns 7-8), and new owners (*New Car*, columns 9-10), comparing the matched sample and Pplus members, who received an offer to change their pension plan. The treated sample includes only car buyers. *Offer* is a dummy variable equal to one for the Pplus members, who received an offer, and zero for the matched sample. Standard errors are in parentheses. For all estimations, the standard errors are clustered at the household level. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively.

	House		Apartment		Long-term		Short-term		New Car	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	CO2	Electric Car	CO2	Electric Car	CO2	Electric Car	CO2	Electric Car	CO2	Electric Car
Offer	1.482	-0.001	3.870**	-0.010	1.493	-0.010	0.411	0.011	2.312	-0.008
	(1.102)	(0.008)	(1.783)	(0.011)	(1.641)	(0.013)	(1.636)	(0.012)	(1.742)	(0.012)
year=2019	33.917***	-0.213***	22.726***	-0.129***	30.756***	-0.219***	30.588***	-0.164***	29.585***	-0.182***
	(0.599)	(0.004)	(0.997)	(0.006)	(1.022)	(0.008)	(0.941)	(0.006)	(0.951)	(0.006)
year=2020	23.583***	-0.162***	16.688***	-0.105***	19.281***	-0.167***	22.064***	-0.121***	21.703***	-0.147***
	(0.626)	(0.005)	(1.000)	(0.006)	(1.064)	(0.009)	(0.953)	(0.006)	(0.990)	(0.006)
year=2021	9.132***	-0.085***	7.938***	-0.061***	6.369***	-0.082***	7.857***	-0.056***	10.897***	-0.090***
	(0.665)	(0.005)	(1.081)	(0.007)	(1.155)	(0.010)	(1.014)	(0.007)	(1.062)	(0.007)
year=2023	-13.689***	0.112***	-13.438***	0.097***	-13.805***	0.125***	-13.693***	0.077***	-14.001***	0.104***
	(0.676)	(0.006)	(1.277)	(0.009)	(1.134)	(0.010)	(1.069)	(0.008)	(1.169)	(0.008)
Offer×year=2019	-1.109	-0.001	-3.941*	0.009	-0.849	0.000	-0.105	-0.010	-2.443	0.010
	(1.258)	(0.009)	(2.013)	(0.012)	(1.912)	(0.015)	(1.882)	(0.013)	(1.946)	(0.012)
Offer×year=2020	-0.635	0.003	-4.304**	0.008	-0.966	0.017	0.021	-0.009	-1.112	0.001
	(1.344)	(0.010)	(2.023)	(0.012)	(2.066)	(0.016)	(1.959)	(0.014)	(1.998)	(0.013)
Offer×year=2021	-0.251	0.005	-0.839	0.004	0.673	-0.005	1.577	-0.003	-0.607	0.007
	(1.441)	(0.011)	(2.179)	(0.014)	(2.190)	(0.017)	(2.114)	(0.015)	(2.170)	(0.014)
Offer×year=2023	-1.907	0.028**	-4.216	0.016	-2.562	0.034*	-1.156	0.016	-4.209*	0.041**
	(1.458)	(0.012)	(2.600)	(0.018)	(2.202)	(0.019)	(2.208)	(0.018)	(2.420)	(0.018)
Observations	156398	196090	46878	69094	54346	64174	61539	79319	52603	76420

Figures

Figure 1: P+ Pension Offer Overview

Notes: This figure illustrates the offer's structure that the P+ members received and the related decision making context.

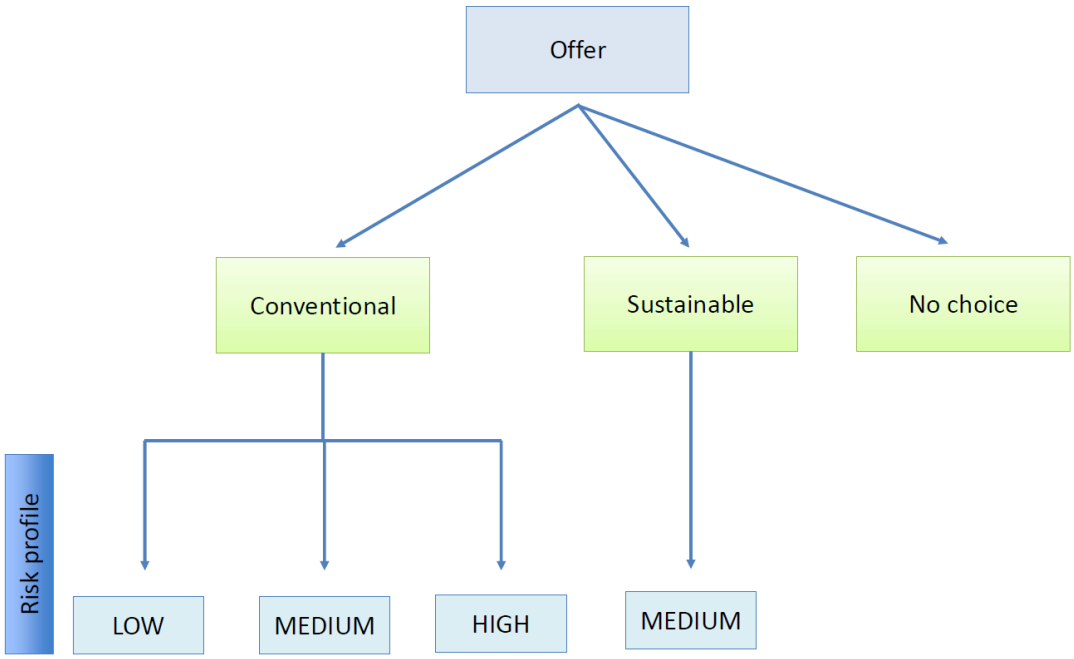


Figure 2: Timing of Offer across 2023

Notes: This figure visualizes the timing across the months of 2023 of the offer to the P+ members, the proportion that did and did not make a choice (left axis) and the average time till choice (right axis).

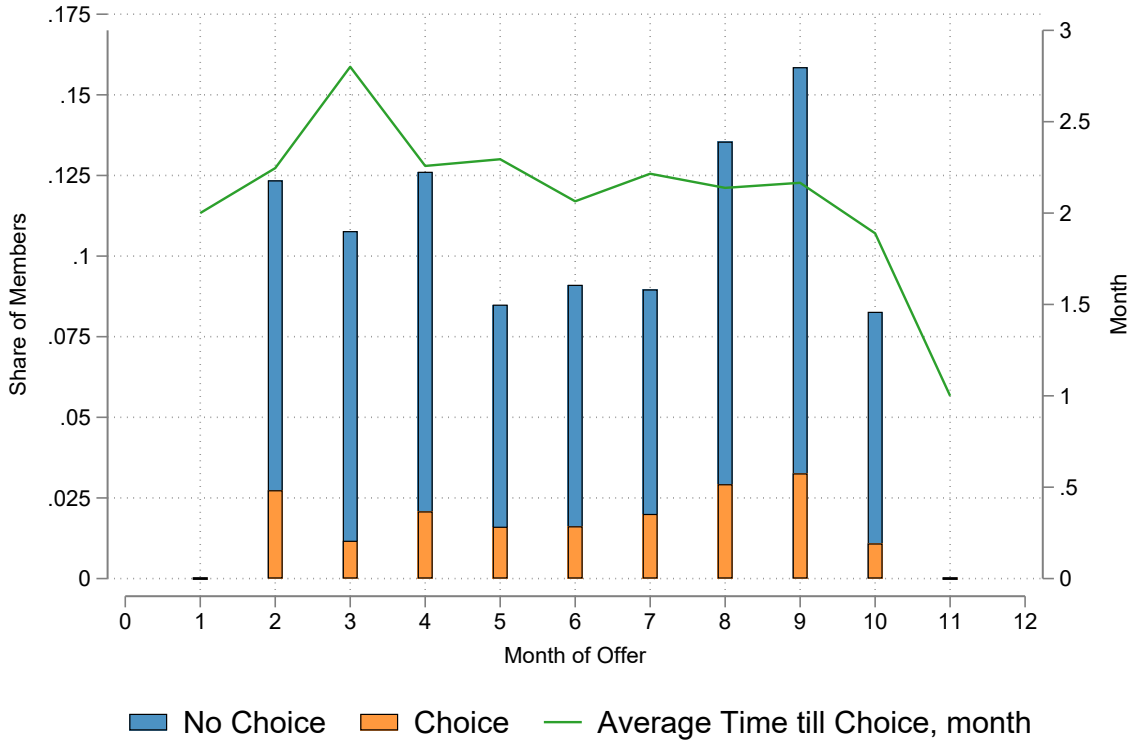
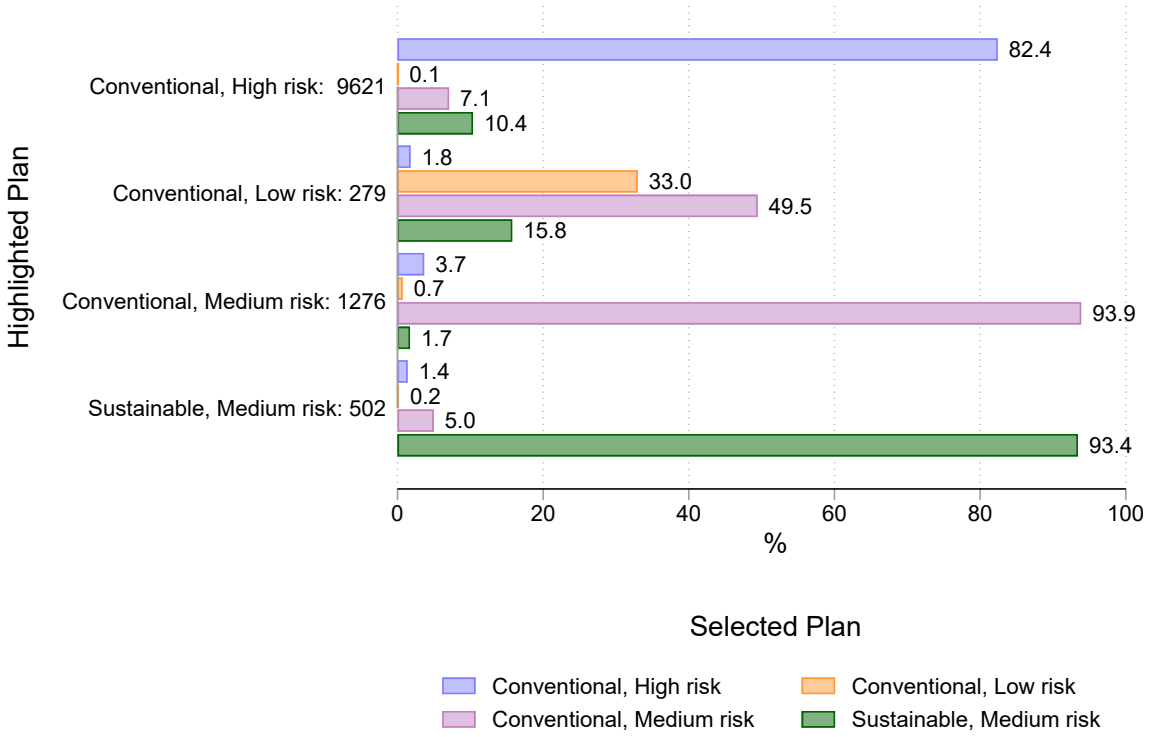


Figure 3: P+ Survey Results

Notes: This figure presents the survey results for the P+ members, where the Y-axis represents the highlighted option based on their answers, and colors denote the actual choice subsequently made by the member.



A.1 Appendix: Additional Tables

Table A1: Sample Selection

Notes: The table describes data availability and sample selection restrictions imposed on the data.

	Sample size
All members	106,828
Active Members	93,264
In Population Register, BEF	86,929
In Labor register, IDAN	79,531
In Education Register, UDDA	79,513
Positive income	79,502
Observations	106828

Table A2: Multinomial Logit Model

Notes: This table reports the estimation results from estimating the multinomial linear probability model. The individual chooses between the sustainable plan and the conventional alternatives with high, medium, and low risk levels - columns (1)-(4) respectively. Standard deviations are in parentheses. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively.

	Sustainable	Conventional, high	Conventional, medium	Conventional, low
Age	-0.001	0.009	-0.008	-0.000
	(0.003)	(0.005)	(0.005)	(0.001)
AgeSq	0.000	-0.000***	0.000***	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
Married	0.024***	-0.035***	0.012	-0.001
	(0.007)	(0.011)	(0.010)	(0.002)
Female	0.016**	-0.093***	0.079***	-0.001
	(0.006)	(0.009)	(0.009)	(0.002)
Kids at home	-0.002	0.015***	-0.013***	0.000
	(0.004)	(0.005)	(0.005)	(0.001)
Masters degree	-0.007	0.020*	-0.011	-0.002
	(0.007)	(0.011)	(0.010)	(0.002)
Economist	-0.060***	0.051***	0.009	0.000
	(0.006)	(0.009)	(0.009)	(0.002)
Manager	0.009	-0.004	-0.002	-0.003
	(0.012)	(0.016)	(0.014)	(0.002)
Services	-0.016	-0.003	0.018	0.001
	(0.010)	(0.014)	(0.013)	(0.002)
Log Income	-0.083***	0.098***	-0.015	0.001
	(0.012)	(0.018)	(0.016)	(0.003)
Log Pension Wealth	-0.007	-0.031***	0.043***	-0.005***
	(0.007)	(0.011)	(0.010)	(0.002)
LTV	-0.001	0.036***	-0.035***	-0.000
	(0.004)	(0.007)	(0.007)	(0.002)
SMP	-0.013*	0.039***	-0.026***	-0.000
	(0.007)	(0.010)	(0.010)	(0.002)
Risky Share	-0.028**	0.192***	-0.157***	-0.006*
	(0.011)	(0.016)	(0.015)	(0.003)
Electric Car	0.025**	0.030*	-0.055***	0.001
	(0.012)	(0.016)	(0.014)	(0.003)
Observations	11012	11012	11012	11012

Table A3: Purchasing an Electric Vehicle, Offer

Notes: This table reports the estimation results from estimating the difference-in-differences (DiD) regression model in Eq. (12) for the propensity to purchase an electric vehicle for all vehicle buyers, only for current vehicle owners, and only for new vehicle owners. The treated sample includes P+ members who bought a vehicle. Standard deviations are in parentheses. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: All car buyers			
	(1) Electric Car	(2) EV	(3) PHEV
Offer×year=2019	-0.003	-0.001	-0.002
	(0.008)	(0.007)	(0.005)
Offer×year=2020	0.005	0.001	0.005
	(0.009)	(0.008)	(0.006)
Offer×year=2021	-0.003	0.001	-0.005
	(0.010)	(0.009)	(0.006)
Offer×year=2023	0.023**	0.027***	-0.005
	(0.011)	(0.010)	(0.006)
Constant	0.297***	0.223***	0.086***
	(0.003)	(0.003)	(0.002)
Observations	299527	299836	298749
Panel B: Car Owners			
Offer×year=2019	-0.008	-0.008	0.000
	(0.010)	(0.009)	(0.006)
Offer×year=2020	0.006	-0.002	0.010
	(0.012)	(0.010)	(0.007)
Offer×year=2021	-0.007	-0.005	-0.004
	(0.013)	(0.011)	(0.008)
Offer×year=2023	0.022	0.023*	-0.003
	(0.013)	(0.013)	(0.007)
Constant	0.299***	0.227***	0.090***
	(0.004)	(0.004)	(0.003)
Observations	179135	179422	178389
Panel C: Car Owners			
Offer×year=2019	0.006	0.010	-0.005
	(0.014)	(0.012)	(0.008)
Offer×year=2020	0.002	0.001	0.001
	(0.015)	(0.013)	(0.009)
Offer×year=2021	0.006	0.007	-0.000
	(0.016)	(0.014)	(0.010)
Offer×year=2023	0.029	0.041**	-0.013
	(0.019)	(0.018)	(0.011)
Constant	0.290***	0.209***	0.082***
	(0.006)	(0.006)	(0.004)
Observations	76420	76420	76420
Offer FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Table A4: Levels of Emissions, Offer

Notes: This table reports the estimation results from estimating the difference-in-differences (DiD) regression model in Eq. (12) for the emissions for all vehicle buyers, only for current vehicle owners, and only for new vehicle owners. The treated sample includes P+ members who bought a vehicle. Standard deviations are in parentheses. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: All car buyers				
	(1) CO2	(2) CO	(3) HC	(4) NOX
Offer×year=2019	-1.498	4.724	-1.020	-0.974
	(1.055)	(4.553)	(0.788)	(0.758)
Offer×year=2020	-1.192	3.026	-0.810	-0.252
	(1.103)	(4.400)	(0.737)	(0.719)
Offer×year=2021	0.059	5.421	-0.787	-1.295*
	(1.189)	(4.409)	(0.756)	(0.715)
Offer×year=2023	-2.734**	-7.273	-0.920	-1.764**
	(1.253)	(4.529)	(0.818)	(0.713)
Constant	74.162***	223.482***	7.235***	24.190***
	(0.415)	(1.532)	(0.258)	(0.252)
Observations	227895	212898	189724	212684
Panel B: Car Owners				
Offer×year=2019	-0.938	11.094**	-0.918	-0.949
	(1.291)	(5.446)	(1.003)	(0.959)
Offer×year=2020	-0.791	4.039	-1.039	-0.132
	(1.375)	(5.228)	(0.941)	(0.916)
Offer×year=2021	0.526	9.086*	-1.051	-0.268
	(1.465)	(5.237)	(0.970)	(0.910)
Offer×year=2023	-2.014	-2.992	-1.259	-1.828**
	(1.501)	(5.282)	(1.013)	(0.877)
Constant	74.576***	222.811***	7.999***	25.356***
	(0.519)	(1.921)	(0.324)	(0.349)
Observations	144272	134712	120396	134607
Panel C: Car Owners				
Offer×year=2019	-2.443	-9.120	-0.579	-0.152
	(1.946)	(8.857)	(1.384)	(1.393)
Offer×year=2020	-1.112	3.177	-0.250	-0.110
	(1.998)	(8.498)	(1.310)	(1.292)
Offer×year=2021	-0.607	0.443	-0.573	-2.862**
	(2.170)	(8.635)	(1.327)	(1.276)
Offer×year=2023	-4.209*	-16.064*	0.255	-1.559
	(2.420)	(9.283)	(1.511)	(1.372)
Constant	74.044***	227.491***	5.795***	22.466***
	(0.849)	(3.259)	(0.658)	(0.547)
Observations	52603	49065	42943	48989
Offer FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Table A5: Robustness test: By Years

Notes: This table reports the estimation results from estimating the difference-in-differences (DiD) regression for the prices of new cars (columns 1-3), propensity to purchase a car (columns 4-5), and imputed consumption (column 7), comparing the matched sample and P+ members, who received an offer to change their pension plan. In columns (1)-(3), the sample includes only car buyers. Columns (4)-(7) present results for all P+ members who received an offer and are comparable to the matched sample. *Offer* is a dummy variable equal to one for the P+ members, who received an offer, and zero for the matched sample. Standard deviations are in parentheses. For all estimations, the standard errors are clustered at the household level. *, **, and *** denote significance at the 10%, 5% and 1% levels, respectively.

	Price			Demand for cars			Imputed Consumption
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All cars	Electric	Combustion Engine	Any car	First car	Next car	
Offer	-3028.393*	-8600.331***	2377.109***	-0.011***	-0.007***	-0.004**	-1.34e+04
	(1739.834)	(3254.266)	(844.313)	(0.003)	(0.002)	(0.002)	(39957.216)
2019	-4.26e+04***	30910.398***	1295.832***	0.005***	0.007***	-0.001	-1.11e+05***
	(723.148)	(2197.006)	(330.637)	(0.002)	(0.001)	(0.001)	(13996.493)
2020	-3.01e+04***	-4066.878***	392.267	0.016***	0.015***	0.001	-1.86e+05***
	(704.837)	(1560.642)	(329.649)	(0.002)	(0.001)	(0.001)	(13406.019)
2021	-1.48e+04***	-1.94e+04***	-1344.667***	0.015***	0.013***	0.003***	-1.06e+05***
	(707.821)	(1348.176)	(340.946)	(0.002)	(0.001)	(0.001)	(15905.027)
2023	24822.374***	10436.207***	724.089*	0.009***	0.004***	0.005***	-2.93e+04**
	(732.093)	(1261.424)	(373.591)	(0.002)	(0.001)	(0.001)	(13590.060)
Offer×2019	-1164.219	-6652.597	-3832.278***	0.010**	0.006*	0.004	-9515.734
	(2362.321)	(7589.627)	(1074.653)	(0.004)	(0.003)	(0.002)	(40579.711)
Offer×2020	-1978.621	-1.64e+04***	-2747.470**	0.006	0.001	0.005*	10583.172
	(2315.816)	(5224.325)	(1077.223)	(0.004)	(0.003)	(0.003)	(40334.929)
Offer×2021	-3299.898	-3076.400	-2964.159***	0.003	0.002	0.001	-1.34e+04
	(2336.641)	(4560.174)	(1115.283)	(0.004)	(0.003)	(0.003)	(40781.735)
Offer×2023	4187.209*	3462.863	-1402.618	0.001	0.002	-0.002	-1.97e+04
	(2394.935)	(4151.038)	(1225.890)	(0.004)	(0.003)	(0.003)	(31456.256)
Rsq	0.06	0.02	0.00	0.00	0.00	0.00	0.00
Observations	202,848	49,808	153,983	873,016	873,016	873,016	710,308

A.2 Appendix: P+ Material

A.2.1 P+ Pension Products

Figure 4: P+ Pension Products

Notes: This figure shows a comparison of the conventional (P+ Life-cycle) and sustainable (P+ Sustainable) pension products.

Comparison of P+ Life cycle and P+ Sustainable

Parameters	P+ Life cycle	P+ Sustainable
Market rate product	✓	✓
Gradual reduction of risk as you approach retirement	✓	✓
Number of listed shares in the portfolio	Approx. 2,500	Approx. 500
Target of carbon neutral pension	2050	2030
Target of percentage of climate friendly investments	15 percent in 2030	50 percent in 2030
Active ownership	✓	Enhanced
Percentage of sustainable investments	10 percent	39 percent
Possibility of different risk levels (low, middle and high)	✓	✓
Articel 8 product according to EU's sustainability-related disclosure (the product promotes sustainability)	✓	✓
Increased exposure towards companies that are sustainability front runners	-	✓
Alternative investments in infrastructure and real estate amongst other things	✓	✓
Concentration risk as a result of a reduced investment universe	To some degree	To a greater extent than P+ Life cycle
Follows P+'s general policy for responsible investment and principle for restricted investment	✓	Enhanced
Comparable expectations to return, riskl level, costs and annual costs	✓	✓

A.2.2 Letter from P+

English translation of original Danish text in the letter sent to its members using their official secure digital mailbox service, e-Boks. The letter has direct links to P+ secure members' portal "Min Pension".

Do You Say YES or NO to the New Pension Scheme?

Dear XXX,

You now have the opportunity to switch to our new pension scheme, P+ Livscyklus (P+ Life-cycle). If that sounds interesting, do not wait too long — we need your response within a month.

The new pension scheme was created because many of our members have requested a plan that offers:

- Market-based returns on the entire savings
- The ability to choose your own investment risk level
- Flexible insurance options that you can tailor to your needs

It might be the right choice for you too — but before you decide, you should know a bit more about the new scheme.

Your Savings Will Fluctuate More

A pension scheme with market-based returns means that your savings will immediately reflect the full return — positive or negative — that we achieve when we invest your savings. As a result, your savings will fluctuate more than you may be used to.

You Can Influence the Investment

With P+ Livscyklus, you have the option to choose whether your savings should be invested with a low, medium, or high risk profile. A high-risk profile gives you the potential for higher returns, but if the return is negative, you also risk a greater loss. So, you might feel more comfortable with a low and more secure investment risk — or you can take the middle ground with a medium risk.

You can also choose to place extra focus on sustainability when we invest your savings.

On "Min Pension", you can view projections of how your savings are expected to develop with the different risk profiles and compare them to your current plan.

Your Insurance Should Fit Your Needs

Just like in your current plan, P+ Livscyklus also includes insurance coverage. We have focused on making the insurance options flexible and adaptable to your needs — so you can be sure that you and your loved ones are protected if something happens to you.

On "Min Pension", you can view the insurance options included in P+ Livscyklus and compare them with the coverage you currently have. There may be terms in your current insurance that you wouldn't want to give up — so it's worth taking a closer look.

Get an Overview on Min Pension

Whether your current plan or P+ Livscyklus is the best fit for you is a decision only you can make. It depends on factors like your family situation, risk tolerance, and overall financial situation.

On "Min Pension", you can see the differences between P+ Livscyklus and your current plan based on your personal data. Here, you can also make your choice and say yes or no to switching plans. Please note that your decision is binding.

Log in to "Min Pension"

Best regards, Member Services

Would You Like to Prepare First?

Then we recommend that you join a webinar on the topic. We will explain how P+ Lifecycle differs from your current plan, and you'll have the opportunity to ask questions along the way.

Link to "Sign up for the webinar via Min Pension"

A.2.3 P+ Guide to Choosing Risk Profile

English translation of original Danish text that the members read on their personalized P+ webpage, "Min Pension".

Guide to choosing risk

The return on your pension savings depends on how they are invested. The more risk you take, the more pension payout you will potentially receive. However, when it comes to risk attitudes, people's attitudes differ. Some people are happy to take a big risk to achieve a bigger gain, while others are more cautious, even if they forego the opportunity to achieve a bigger gain. In P+ you can choose how big the risk should be when we invest

your pension savings. We generally invest your savings with medium risk, but you can also choose low or high risk, and you can always change your choice. No matter which risk level you choose, we gradually phase out the risk until you turn 68. The phase-out is done to reduce the risk that your pension will be significantly affected if the financial markets develop very negatively in the years leading up to your retirement or while you are receiving your pension.

Take the guide and choose your risk level

Return and Risk

The return on your retirement savings depends on how much investment risk you take. What is your attitude toward return and risk?

- My pension savings should be affected as little as possible when financial markets develop negatively.
- I would like my retirement savings to grow, but I am not willing to take big risks, even if it could secure me a larger pension in the long term.
- My retirement savings need to grow as much as possible, and since return and risk are related, I am willing to take greater risks because I believe it will pay off in the long term.

Your Attitude Toward Losses

How would you react if your savings lose a large part of their value due to negative developments in the financial markets?

- I fear that the savings will not regain their value and be upset that my savings were not placed more securely.
- I do not think that it is good, but I believe that it will balance out again and that the investments will increase the value of my savings in the long term.
- It will not worry me. I know that stock and bond prices fluctuate, and I am convinced that investments will increase the value of my savings in the long term.

Sustainability

Your savings are invested so that they can grow as much as possible until your retirement, within the framework of your risk profile. Do you want your savings to be invested with an *extra high* focus on responsibility and sustainability? We expect that both the risk level, costs, and returns can be compared to investments without an extra high focus on

responsibility and sustainability. However, you may experience greater fluctuations in returns along the way.

- No thanks, my savings are already invested with a sufficient focus on responsibility.
- Yes please, my savings should be invested with an extra high focus on responsibility and sustainability

Importance of Your Savings in P+

When you retire, you will have to live on your pension savings, other assets, public benefits, etc. How large a share of your total wealth do you expect your P+ savings to make up when you retire?

- My savings in P+ will become my primary source of income
- My savings in P+ will only have a minor impact.