



Erasmus Platform  
for **Sustainable**  
**Value Creation**

## Working paper

# Application of integrated SAA

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# Non-technical summary

This case study examines the integration of transitions and sustainability in strategic asset allocation (SAA). Drawing on a large body of empirical data gathered in case study research, the findings show that while transitions and climate scenarios are described in the SAA process, they remain to have limited influence on decision-making. The study develops grounded theory on the three cognitive frames that respondents use: the business case frame, the paradoxical frame and sustainability case frame. By identifying a third frame, this study observes a larger diversity in investment practice than previously described in literature. The business case frame focuses on sustainability insofar it aligned with the financial objective, while the paradoxical and sustainability case frame consider sustainability objectives more broadly. The sustainability case frame moves beyond the complexities that can limit the paradoxical frame, by adopting an integrated view that financial and sustainability objectives can be jointly achieved. A visualisation of these frames shows that respondents generally develop from a business case frame, towards a paradoxical frame and a sustainability case frame. There is a lack in shared understanding between the business and sustainability case frame, as these consider different cognitive content. The study acknowledges that the stance of all three frames are relevant, and proposes ways forward for them to converge and advance investment practice. This study shows, in line with earlier academic research, that personal sensemaking factors matter to the advancement of an organisation's sustainability agenda, and are thus relevant to consider in investment practice.

## 1. Introduction application of integrated SAA

Current environmental and societal challenges are not addressed in strategic asset allocation (SAA). Institutional investors therefore cannot steer on the contribution of their investments to transitions towards a sustainable economy. Strategic asset allocation is a process in which institutional investors, based on capital market assumptions, calculate expected risk and return and allocate investments to different asset classes (Brinson et al., 1991). Most common asset classes are equities, corporate and sovereign bonds, real estate, infrastructure, and private equity. Institutional investors ultimately aim to achieve financial return for their beneficiaries, while managing risks (Koedijk et al., 2018). Investors take important decisions in SAA, yet there is limited research on how they integrate sustainability in this process.

Roor, Schoenmaker & Maas (2025) develop a framework for SAA where sustainability is fully integrated, the so-called integrated SAA framework. This framework fundamentally rethinks SAA based on the latest academic insights on transitions and impact. This study conducts empirical research on the SAA framework in a case study. Two research questions guide the research. First, how does an institutional investor integrate transitions and sustainability in the strategic asset allocation process? Second, what cognitive frames do respondents use in discussions relating to integration of transitions and sustainability in the strategic asset allocation process? Together, these research questions provide a more grounded understanding of what happens in investment practice and yield emerging insights. The author gained unique access to investment practice at PGGM during the observation period from September 2023 to February 2024. The case study takes an inductive approach: central is the data collection through participant observation of investment practice, and through data analysis grounded theory is formed. The data analysis took place in four steps: Analysing the conventional SAA process and practices to integrate transitions and sustainability in the SAA process, analysing recurring themes, applying the Gioia methodology for systematically coding and structuring the data and, lastly, analysing the cognitive frames.

The findings answer both research questions. The answer to RQ1 provides an overview of the identified practices to integrate transitions and sustainability in the SAA. In answering RQ2, the study develops grounded theory on the three cognitive frames used by respondents: the business case frame, the paradoxical frame and the sustainability case frame. By identifying a third frame, this study observes a larger diversity in investment practice than previously described in literature. The business case frame focuses on sustainability insofar it aligns with the financial objective, while the paradoxical and sustainability case frame consider sustainability objectives more broadly. The sustainability case frame moves beyond the complexities that can limit the paradoxical frame, by adopting an integrated view that financial and

sustainability objectives can be jointly achieved. A visualisation of these frames shows that respondents generally develop from a business case frame, towards a paradoxical frame and a sustainability case frame. There is a lack in shared understanding between the business and sustainability case frame, as these consider different cognitive content. This study shows, in line with earlier academic research, that personal sensemaking factors matter to the advancement of an organisation's sustainability agenda and are thus relevant to consider in investment practice. The findings provide unique empirical insights in cognitive frames as used in practice. The study acknowledges that the stance of all three frames are relevant, and proposes ways forward for them to converge and advance investment practice.

## 2. Theoretical background and research questions

Investors take important decisions in SAA, yet there is limited research on how investors integrate sustainability in this process. Research shows that investors have ambition in sustainable investing (Kölbel et al., 2020a; Riedl & Smeets, 2017), but how this ambition translates into investment practice and the realisation of these ambitions is less understood. The dominance of quantitative research in finance has led to a divide between the literature and the real-world practice of institutional investors (Cochrane, 2022). In investment practice, much more realistic ingredients exist that are hardly considered in academic quantitative work (Cochrane, 2022). This study therefore applies grounded theory research through a single case study (see Research methodology). Through this empirical research, I provide a more grounded understanding of investment practice. The first research question (RQ1) is as follows: How does an institutional investor integrate transitions and sustainability in the strategic asset allocation process? This question focuses on the 'how', so on processes, discussions, decisions and sources used in the process. PGGM is a relevant organisation to answer the research question, as it is recognized for its sustainable investment practices (VBDO, 2024) and participates actively in sustainable investing developments in the field (PGGM, 2024b). Moreover, PGGM recently adopted the Strategy 2030, a joint strategic vision with PFZW in which it adopted an explicit sustainability strategy (see Research setting).

Emerging from initial data collection, it stood out that respondents viewed current and potential future practices quite differently, despite the fact that they were all working on implementing Strategy 2030. This led to further data collection on four themes that respondents shared different views on, and that seemed to matter in light of ongoing discussions relating to RQ1. After the process of data analysis (see Data analysis), the results are grounded in the literature of sensemaking and cognitive frames. Therefore, the second research question (RQ2) which emerged during this study, and is answered in this study is: What cognitive frames do respondents use in discussions relating to integration of transitions and sustainability in the strategic asset allocation process?

In the literature the forming of views is called sensemaking, which is “the general process through which individuals give meaning to ongoing experiences such as work” (Aguinis & Glavas, 2019). When situations are more complex, people move from sensemaking per experience to using a cognitive frame, which is a “mental template that individuals impose on an information environment to give it form and meaning” (Walsh, 1995, p.281). A cognitive frame provides a scheme to structure what you know, assume or belief (called cognitive content) and how to arrange that content (called cognitive structure) (Finkelstein & Hambrick, 1996). Hahn et al. (2014) analyse managerial decision-making in sustainability issues and identify two cognitive frames: the business case frame and the paradoxical frame. Managers using a business case frame have exclusive focus on business logic and integrate sustainability insofar it aligns with the financial objectives. Managers using a paradoxical frame accept a higher level of complexity, and address sustainability challenges at organisational level to discuss these. In the process of sensemaking, managers with a business case frame take a pragmatic stance, in they “favor responses of limited scope based on established routines and practices, which considerably limits their proactiveness; yet their propensity to develop workable solutions can potentially bring about large-scale change.” (Hahn et al., 2014, p.34). Managers with a paradoxical frame however take a prudent stance, in which they “may consider unusual and more radical departures from established routines; yet they are hampered in their ability to implement workable solutions, because of their ambivalence and higher awareness of risk and tensions.” (Hahn et al., 2014, p.34). These frames provide a deeper analysis of how individual factors matter to organisational processes and decision-making (Aguinis & Glavas, 2019). The findings section provides insights in the cognitive frames used by respondents, and how these align with the frames by Hahn et al. (2014). Several topics arise to be relevant in these cognitive frames, among which investor impact. We define investor impact as the change that investor activities achieve in company impact, while company impact concerns the companies’ social and environmental impact through their business model (Kölbel et al., 2020a). So, companies have social and environmental impact through providing products and services; company impact. Investor impact in this case study entails the difference it makes that PGGM on behalf of PFZW invests in those companies.

### 3. Methodology

#### Research methodology

As put forward in the theoretical background, the dominance of quantitative research in finance has led to a divide between literature and the real-world practice of institutional investors (Cochrane, 2022). Quantitative research examines how constructs relate to each other. Constructs are abstract theoretical formulations about phenomena of interest, which are often formulated so that they can be



measured (Gioia et al., 2013). This allows for in depth research on relevant investment factors, insights on constructs like expected returns, betas, cost of capital and so on. Most of this research advances insights on known constructs. However, quantitative research has two weak points. As it examines known constructs, it can only provide further insights into these constructs. To quote Gioia, Corley & Hamilton (2013): 'Advances in knowledge that are too strongly rooted in what we already know, limit what we can know.' (2013, p.16). Rather than constructs, research is also needed on concepts, which are more general, less well-specified notions, that describe or explain phenomena of interest. Concepts are precursors to constructs, in the understanding of organisational and investment practice. The second weakness is that quantitative research does not provide insight into how organisations and people within those organisations use and apply these constructs (Crifo et al., 2019; Schoenmaker & Schramade, 2019).

This study does provide insights on how people use and apply constructs and examines concepts in investment practice. The research methodology is grounded theory research, applied in a single case study. Grounded theory is the discovery of theory from data, systematically obtained (Glaser & Strauss, 2017). The Gioia methodology (Gioia et al., 2013) is a common approach for conducting grounded theory research. This methodology builds on the assumption that people in organizations can explain their thoughts, intentions and actions; by giving these people voice in the research, opportunities for discovery of new concepts is created. The heart of data collection is therefore the semi-structured interview, where respondents can easily express their thoughts and views. A case study is characterized as research in practice, without controlling the context but studying phenomena in real-life settings through several data collection methods (Gibbert & Ruigrok, 2010). Case studies at a single organisation have shown to be powerful in providing new paradigms and insights (Dyer & Wilkins, 1991). The Gioia methodology prescribes three rounds of data analysis, from first order coding, second order coding to aggregate dimensions. The researcher starts to identify emerging theory from the data through this data analysis process. In tandem, existing theory can be considered to further build theory from the data (Gioia et al., 2013). In applying grounded theory research through a single case study, the study does not only provide relevant insights but also serves as an example of qualitative research bringing forth novel insights in the finance field.

### **Research setting**

The case study is performed at PGGM, a pension provider for pension administration and asset management. This study focuses on the asset management activities of PGGM, but in fact the pension administration is the larger part of the business, in terms of personnel and number of clients (PGGM, 2024a). PGGM is the second largest institutional investor in the Netherlands, investing the assets of the Dutch

pension fund for healthcare and welfare professionals (Pensioenfonds Zorg & Welzijn, PFZW). PGGM managed over €240 billion assets under management and employed 501 people by the end of 2023 (PGGM, 2024a). PGGM has the goal to become a single client organisation, by the end of 2023 99% of its assets under management (€237.9 billion) was for PFZW.

During the observation period (September 2023 – February 2024), PGGM used a project structure with several project working groups to operationalize Strategy 2030. Strategy 2030 lays down expectations with regards to the participant, investing, health and welfare sector and pension administration. In investing, it lays down a focus on creating long-term value for pension beneficiaries by combining financial return, risk and impact. The ambition for 2030 is that each invested position can be justified from a return, risk and impact dimension. The strategy outlines two key objectives: 1) A sustainable portfolio, which reflects the return, risk and impact dimensions 2) Investing with impact, to make visible impact on issues important to the participant and to contribute to important transitions. While 'impact' is stated as a term in Strategy 2030, in the implementation process this is operationalised to the broader sustainability agenda and targets, which includes the specific impact investing definition and target. The execution of this strategy entails end-to-end integration of sustainability throughout the investment process. To achieve this, several success factors are mentioned, among which change management skills and approach, and sharp concrete goals and milestones.

Besides Strategy 2030, PGGM already has had responsible investment policies and practices for many years. Most relevant is the Climate plan PFZW. This plan includes several targets to achieve a net zero portfolio by 2050: a 50% decrease between 2019 and 2030 in absolute CO<sub>2</sub> emissions for the equities, liquid credit and real estate portfolio combined, a commitment to become Paris Aligned in several asset class and the goal to invest 15% of the portfolio by 2030 in climate-related Sustainable Development Goals (SDGs). Given the different characteristics of asset classes, these sustainability metrics are not calculated for all assets classes. PFZW has three key instruments for achieving its sustainability targets: sustainable capital allocation, active ownership and the construction of the investment universe. In the annual reports of both PGGM and PFZW, progress is reported on the advancement of the process related objectives quantitative targets on climate and beyond.

As per December 2022, PFZW adopted six investment beliefs in which PFZW explicitly positions itself. In explaining its investment beliefs, the fund also provides an explanation, a substantiation of the belief and what this implies to investment management. Together with the investment policy, the investment beliefs are the foundation behind the investment strategy and execution, as prescribed by Dutch law (DNB, 2024)The first three beliefs are mostly on the financial performance of



investments, whereas belief 4 and 5 relate more to sustainable investing and the last belief relates to costs (see Table 2). Relevant to the research setting is that one of my promoters (prof. Schoenmaker) has a position on the board of PFZW. I therefore did not involve him during the set-up of the case study, the participant observation period nor the data analysis. He was involved in the discussions on the draft version of this study.

**Table 1 Investment beliefs pension fund PFZW**

Investment beliefs pension fund	
1.	Investment risk-taking leads to higher long term returns for our participants
2.	Market developments are difficult to predict, especially in the short term
3.	Diversification of investments improves the portfolio’s return risk profile but has diminishing returns
4.	Factoring ESG risks and opportunities into investment decisions results in a better portfolio
5.	PFZW makes a valuable contribution to a more sustainable world
6.	Low costs are important. High costs are acceptable only if they are in the participants’ best interests

**Data collection**

The author gained unique access to internal processes as ‘Research intern’ at PGGM. The PGGM Strategy department was the most relevant department to join, as it is responsible for both the investment policy as well as the SAA process. During the observation period, I had the role of participant-observer: being a member of the PGGM Strategy department, while employees were aware of my status as researcher (Bryman & Bell, 2007). The observation period was from September 2023 to February 2024, and the author spent 38 research days at PGGM, on average 2 days a week. During this period, a range of data collection methods is applied: interviews, observation in meetings, document analysis and focus groups. I conducted 48 interviews, with an average length of 32 minutes (see Table 3). Interviews are conducted with a range of involved PGGM employees, from the PGGM Strategy department, employees involved in Strategy 2030 working groups and the PGGM management. Interviews are conducted and coded in Dutch. While most of the interviews were semi-structured, 16 closed interviews were held to collect data on RQ2. The interview question list for the closed interviews and the original Dutch quotes are included in Appendix 1. The closed interviews draw on the respondents’ views and allows for the identification of cognitive frames. I observed in 24 meetings, which were mostly (20) working groups, working on implementation parts of Strategy 2030. These working groups included employees of several relevant departments. In these meetings, certain options for integration of transitions and sustainability in the investment process were actively discussed. For document analysis, 65 documents were coded, of which 53 internal documents and

12 publicly available PGGM documents. In total, 2,248 first order codes were given on the interview data (1,186) and in document analysis (1,149)<sup>1</sup>.

**Table 2 Summary of data collection**

Data source	Breakdown data source	Total data collected
<b>Interviews (48)</b>	36 interviews are recorded and transcribed 12 interviews are only coded based on detailed notes <sup>2</sup>	25,5 hours of interview data 48 interviews, average length 32 minutes 1186 codes on transcripts and detailed notes
<b>Observation meetings (24)</b>	20 working group meetings, part of the Strategy 2030 implementation 4 meetings, e.g. PGGM Strategy team	18,5 hours of observations 24 meetings, average length 46 minutes
<b>Documents (65)</b>	53 internal documents 12 publicly available documents	65 documents 1149 codes
<b>Total first order codes</b>		2248 codes

**Data analysis**

The data analysis consisted of four steps to answer the research questions. We present the details of our analytical steps separately, although in reality these steps were interwoven in the analytical process. The theorization and interaction with literature is interwoven in the analytical process, as is common to grounded theory research.

The first step included the analysis of the conventional SAA process and the practices to integrate transitions and sustainability into this process. First, relevant persons and processes were identified. Interviews and initial document collection provided a structured overview of the conventional SAA process, which provided a basis for the first section of the findings. Building on this initial understanding, respondents shared in more detail how transitions and sustainability play a role in the SAA process, so far, and discussions relating to this. Several documents were shared and explained upon, including its developments over the past period.

The second step entailed the analysis of recurring themes. First saturation of data collection for RQ1 was reached after a few months. What stood out in analysing recurring themes, was that respondents viewed the current and possible future

<sup>1</sup> The total number of codes is smaller (2,248) than the sum of interview data and documents (2,335 codes) as some codes (87 codes) are given twice.

<sup>2</sup> These were 9 interviews in the first period interviews, which were not recorded as part of a period of building up trust within the organisation, and 3 interviews where respondents did not share the recording of the meeting afterwards.

practices in quite different ways, although they were all working towards implementation of Strategy 2030. Personal views seemed to matter in light of ongoing discussions. Therefore, closed interviews were held to specifically collect respondents' views on four identified relevant themes (see Appendix 1).

The third step was applying the Gioia methodology for systematic coding and structuring of the data. While the Gioia methodology prescribed three rounds of coding, the significant number of first order codes (2,248 codes) lead to four rounds of coding. The first order codes are labels given to passages in interviews and documents, where the researcher tries to adhere faithfully to terms used. In second order coding, the researcher identifies emerging themes on 'concepts that might help us describe and explain the phenomena we are observing' (Gioia et al., 2013, p. 20). This included a first round where 2248 codes were grouped to 586 coding groups, and a second round, coming to 145 themes. These themes were further grouped to 9 aggregate dimensions. The structuring of the data lead to data structures: Figure 2 for RQ1 and Figure 3 for RQ2 (see Findings). Each data structure provides a structured overview of second order code groups, second order themes and aggregate dimensions<sup>3</sup>. In fact, for each aggregate dimensions there were more than three second order themes. Therefore, we included an overview of the second order themes for each aggregate dimension in Appendix 2 for RQ1 and Appendix 3 for RQ2.

The fourth step of analysis concerns the step from the data analysis and data structure to the emerging of grounded theory, that serves to answer RQ2. The closed interviews held with 16 respondents provides explicit views on four themes raised. Analysing this data led to the identification of three cognitive frames of sensemaking (Table 4 and 5 in Findings). The identification of these frames was done inductively and emerged from the data analysis. It involved listening again to views expressed in interviews, especially in comparing expressed views. Respondents that shared similar views on several themes were grouped to three, and their views listed. These views were categorised, for all three groups on similar categories. In case study wordings, these are characterized as neoclassical market economy convinced, climate informed and sustainability convinced (see Table 4). Based on the data, several respondents could be placed in two different frames, but the cognitive frames did share coherent collection of beliefs and views on relevant topics. After identifying and structuring these frames, a literature search provided theoretical understanding of these groups, in particular relating to the cognitive frames by Hahn et al. (2014) and the description of sensemaking by employees in sustainability efforts by Aguinis & Glavas (2019). The first and second group, now reframed as cognitive frames, largely align with the business case frame and

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<sup>3</sup> Given the magnitude of first order codes, this level is not included in the data structures

paradoxical frame by Hahn et al. (2014). The results on RQ2 are therefore structured along the theoretical understanding of Hahn et al. (2014) cognitive frames but enriches this theory by inductively identifying a third cognitive frame, thus developing grounded theory. The beliefs and views on relevant topics are categorised in the cognitive content, cognitive structure and treatment of tensions as Hahn et al. (2014) put them forward but further elaborated on through the case study data. This shows the iterative approach of grounded theory involved an iterative approach, going back and forth between the data and existing theory.

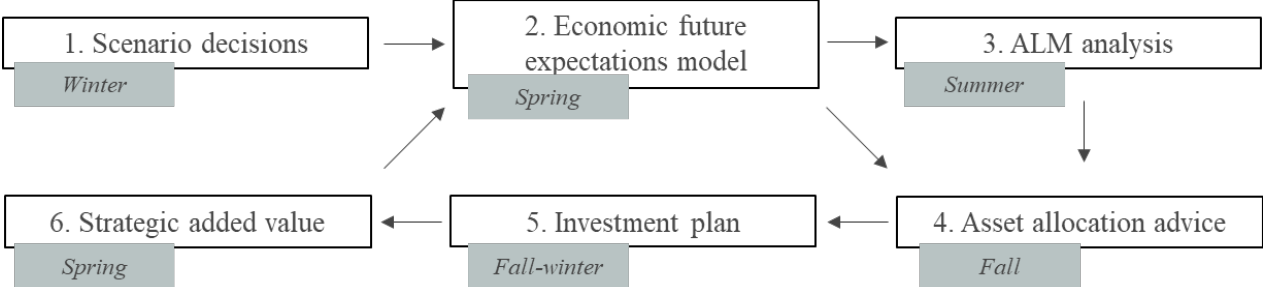
## 4. Findings

The findings section is structured according to the research questions: the practices to integrate transitions and sustainability in SAA process (RQ1) and the cognitive frames used by respondents in discussions in this area (RQ2).

### 4.1 The practices to integrate transitions and sustainability in SAA

PGGM has an annual strategic asset allocation process (Figure 1), resulting in the strategic asset allocation for the following year. In each phase, the Strategy department prepare relevant deliverables for discussion and decision-making.

**Figure 1 PGGM strategic asset allocation process**



In the period before 2022, there were several initiatives to integrate transitions and sustainability into the SAA process. The earliest notion is a memo drafted February 2007 on climate change consequences and potential actions for PGGM. Approaches in the years after proposed certain elements, but these were not implemented or discontinued at some point. Three developments lead into the phase starting in 2022, where the findings section focuses on. First, the Strategy 2030 includes explicit ambitions on integration of sustainability (see Research setting). Second, a gap analysis on the DNB Good practices on ESG risk management pension funds (DNB, 2022) showed that climate risk integration on the SAA level was missing. Third, a paper by Van Dam, Jeucken and Douma (2022) describes five ways in which sustainability can be integrated into SAA, including a clear call to action. Van Dam was working at PGGM in this period as Principal Director Strategic Policy Advice.

Table 3 provides an overview of the practices to integrate transitions and sustainability into the SAA process. By far, most discussions and practices relate to climate change effects. During the research, it became clear that investment cases and the change agenda Strategy 2030 were also relevant to answering RQ1. Investment cases outline the expectations for an asset class in the coming 3-5 years and are used as an input to the SAA process. The change agenda on Strategy 2030 is structured as several working groups working on implementation parts of Strategy 2030. The data analysis on research question 1 lead to data structure in Figure 2. This Figure shows the analysis from the 2nd order code groups to 2nd order themes to five key aggregate dimensions. These dimensions include the most important discussions arising from the data analysis and are addressed in the findings. The next section describes the integration practices per SAA step, where steps with limited integration are described shorter (step 3, 5 and 6) than the other steps.

**Table 3 Overview practices to integrate transitions and sustainability in PGGM SAA steps**

PGGM SAA step	Current and possible future practices to integrate transitions and sustainability
<b>1. Scenario decisions</b>	<ul style="list-style-type: none"> <li>- Transition analysis and influence of transitions on deterministic scenarios</li> <li>- Deterministic climate scenarios</li> </ul>
<b>2. Capital market assumptions</b>	<ul style="list-style-type: none"> <li>- Indication climate risk per asset class based on ND-Gain index, carbon pricing, and Alladin Climate module</li> <li>- Potential per asset class for reaching impact and sustainability targets</li> </ul>
<b>3. ALM analysis</b>	- None
<b>4. Asset allocation advice</b>	<ul style="list-style-type: none"> <li>- Impact of allocation advice on the realisation of sustainability targets</li> <li>- Impact of limiting 10% climate risk on allocation advice</li> <li>- Allocation advice based on climate risk assessment and potential per asset class for impact and sustainability targets</li> </ul>
<b>5. Investment plan</b>	- None
<b>6. Strategic added value</b>	<ul style="list-style-type: none"> <li>- Tracking effect of exclusions in equity investments on return</li> <li>- Indication per asset class whether 'on track' for sustainability targets</li> </ul>
<b>Investment cases</b>	<ul style="list-style-type: none"> <li>- ESG risk exposure and impact/sustainability potential of asset class</li> <li>- Contribution of asset class to portfolio-level sustainability targets</li> </ul>
<b>Change agenda Strategy 2030</b>	<ul style="list-style-type: none"> <li>- Impact targets on portfolio level</li> <li>- Development risk framework; portfolio steering on risk, return, sustainability</li> </ul>

**1. Scenario decisions**

In the first SAA phase the base case scenario and deterministic scenarios are decided on, as well as an analysis of megatrends, jointly called scenario decisions. The base case scenario for the investment policy is the result of stochastic modelling, which is a cloud of 1000 scenarios for the coming 15 years around a chosen median path. PGGM’s modelling is based on a fundamental economic equilibrium, where relevant

adjusted given capital market assumptions by IMF<sup>4</sup> and OECD<sup>5</sup>. In the base case scenario memo, it is described that transitions have effects on economic growth, but that the combined effect is heavily debated, e.g. technological developments, climate change. Moreover, it is noted that so far, most economists' best-efforts estimations show that climate change has less impact on economic growth potential than other transitions. In discussion documents on integrating climate change effects in stochastic modelling, the PGGM Strategy team identifies a few possibilities, but brings forth that these will likely not inform the asset allocations decisions in a meaningful way. The key message is that climate change impact in SAA is mostly related to currently unmeasurable uncertainties and ambiguities rather than measurable risks, which is not suitable for probability-based stochastic modelling. A respondent explains (Quote 16):

*"If climate change leads to new and unknown dynamics in the economy and financial system, stochastic models will not be able to anticipate them and will be surprised. The additional system uncertainties due to climate change require to stochastics be treated with even more caution than is currently done."*

Figure 2 shows the result of the Gioia methodology rounds of data analysis (see Data analysis): First order codes (not included in Figure) are grouped to 2nd order code groups, which are further grouped to 2nd order themes and again grouped to 3rd order aggregate dimensions. A full overview of the 2nd order themes per aggregate dimension is included in Appendix 2.

The integration of climate change effects is thus most explicitly done through adopting climate deterministic scenarios. Deterministic scenarios are scenarios with a single determined pathway, typically on a five-year horizon. They are used to perform robustness checks and sensitivity checks to the initial investment policy. In these scenarios, such as stagflation and deflation, certain capital market assumptions change, leading to changes in expected risk and return. Deterministic scenarios are deemed most suitable to integrate transitions, as these describe one scenario rather than a set of possibilities. Per scenario, the difference in capital market assumptions compared to the base scenario is calculated, which also leads to expected impact on the expected risk and return.

## Figure 2 Data structure RQ1

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<sup>4</sup> International Monetary Fund

<sup>5</sup> Organisation for Economic Cooperation and Development

<sup>6</sup> Original quotes in Dutch are included in Appendix XXX, by order of quotes. Quotes are translated by the researcher to English.



This Figure shows the result of the Gioia methodology rounds of data analysis (see Data analysis): First order codes (not included in Figure) are grouped to 2<sup>nd</sup> order code groups, which are further grouped to 2<sup>nd</sup> order themes and again grouped to 3<sup>rd</sup> order aggregate dimensions. A full overview of the 2<sup>nd</sup> order themes per aggregate dimension is included in Appendix 2.



In 2023, two deterministic climate scenarios are included: a 'Delayed transition' and '3-degree global warming' scenario (NGFS, 2024)<sup>7</sup>. These scenarios showed only limited effects compared to the base case scenario, which indicates that there is limited climate 'stress' and that they are not tail risk scenarios. Moreover, the scenarios have a 15-year time horizon, while the NGFS scenarios have more extreme effects after this period. Respondents comment that the NGFS scenarios underestimate climate change related effects, as not all relevant effects are included. Therefore, two scenarios with strong climate 'stress' are added in 2024: 'Climate disaster' and 'Climate headwind'<sup>8</sup>. Climate disaster is a short-term Minsky type of shock scenario where extreme weather events hit production and lower consumer trust, thus lowering economic growth. Climate headwind argues from a less extreme but longer-term effect through consistent high inflation. These scenarios are deemed a useful addition as they show stronger climate change effects on the portfolio. More generally, some respondents state that the importance of scenarios in decision-making will grow over time, while other respondents warn against the dependence on expert judgment in these scenarios. The following quote illustrates (Quote 2):

*"It is a pretty difficult consideration to really decide 'I do not want to end up in a certain deterministic scenario in a certain direction', as the scenario is more based on expert judgment. It might well be that the person responsible was too strict in for example effects on credit, and that credit in this scenario is less attractive, which then could directly impact the allocation advice. (...) I think that expert judgement and estimation have always played a role in deterministic scenarios. (...) I think that in climate scenarios the expert judgment element may be stronger than in stagflation or deflation, because in the latter you have more historical information."*

Beyond deterministic scenarios, there are transitions over the years which can influence this base scenario. The pension fund board in the past inquired for the effect of some of these trends on the base case, such as climate change, geopolitical tensions and ageing. The PGGM Strategy team thus identified and describes six key transitions in a so-called 'megatrends' memo. The memo argues that the average expectation of a megatrend is included in the base case, and the analysis is thus on megatrends turning out differently than expected. For example, if because of ageing, work force decreases sooner than anticipated, this can have a negative effect on economic growth. Or, in the case of China's demographic developments, where a respondent comments: 'Does it grow old before it gets rich?'. The megatrends memo indicates whether transitions affect economic growth, inflation and interest rate in a negative, positive, neutral way or whether this is unknown.

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<sup>7</sup> These scenarios are based on the NGFS scenarios 'Delayed transition' (high transition risk, low physical risk) and 'Current policies' (low transition risk, high physical risk)

<sup>8</sup> In Dutch: Klimatramp and Klimaattegenwind

Reflecting on these practices, scenario analysis seems a better fit for integrating transitions, than integration in the base case scenario. The climate scenarios are however recently developed and there is ongoing debate on whether these scenarios include all relevant effects on the economy, and thus on the investment portfolio. So far, the scenarios are discussed in an agnostic manner, whereas investors could also indicate what the likelihood of scenarios are and what are potential steps to mitigate associated risks.

## 2. Capital market assumptions model

Using a quantitative model, the ALM and Strategy team set capital market assumptions on economic growth, inflation and interest rate on a 15-year time horizon. Transitions are considered integral part of the capital market assumptions. Based on these, expected risk and return is calculated for each asset class. These risk-return expectations are informed by the investment cases for each asset class (see Investment cases). The model used for the calculations builds on strong assumptions, making it sensitive to what is put in. It is described as a tool and the use of it 'more art than science'. The level of expert judgment is considered inherent part of this calculation and less described as a problem than a respondent does for expert judgment in scenario analyses (see Quote 2). An example of the sensitivity is that based on the capital market assumptions the expected risk-return on real estate is much higher than anticipated. The following quote illustrates (Quote 3):

*"The tricky part about this figure and the whole asset allocation advice, is that the signals for real estate were incredibly favourable which is very difficult. In that sense, because why would we then not decide for a huge real estate allocation? Because on paper that yields more return and less risk."*

Based on the set of climate scenarios, in 2023 two graphs (transition risk and physical risk) are included, which indicate the exposure per asset class to relatively low, medium or high climate risk, including concise explanations. Physical risk is based on climate risks associated with physical locations, as calculated based on the Notre Dame Global Adaptation Initiative (ND-GAIN) (University of Notre Dame, 2024). This score measures the vulnerability of countries to physical climate change effects and the ability to adapt to these effects. The transition risk is calculated as the impact of carbon pricing on investees' revenue streams, based on sector level calculations. The results are accompanied with the explicit notion that transition effects are broader than carbon pricing. During the observation period, PGGM was analysing the results of the Alladin Climate module, to see if it can be used for the capital market assumptions too. The results should concentrated impact in a few sectors, therefore showing limited climate risk on the portfolio's return until 2050. Respondents deem this a underqualification of how climate change will affect the economy, as is the case with the NGFS scenarios, but also appreciate that the module provides a way in which the total portfolio can be consistently assessed on physical climate risk, with results comparable across asset classes. Quote 4 illustrates:

*"So now we decided to use Alladin. Alladin is a system which includes physical effects, but only partially. We have simply underlined that in a number of reports and made clear, that*

*we do indeed get a feeling for it, but that it is not yet the full picture. That is also what you see from, for example, the English actuarial society, who also specifically said: climate effects in the current models are simply underestimated."*

The scenarios and calculations made so far, and its limitations, lead to discussions on the dimension of 'How to act on climate change effects' (see Figure 2). Respondents share that approaches so far underestimate climate change effects as climate change effects are wider than the transmission channels used. The need to calculate climate risks with credible source is also raised. Some respondents see the need to form an own explicit view on climate change scenarios, while other respondents deem this too much subject to individual knowledge or preferences. Given these considerations, a respondent comments on the level of comfort needed to use the scenarios and calculations in the allocation advice (step 4) (Quote 5):

*"If you really want to push buttons – you want to reduce physical climate risk and you are going to look at which asset classes have the lowest risk – then you want to do that in a consistent way. Because otherwise, it would mainly be which party you use for that or which data you use that would determine how you push the buttons. I wouldn't want to surrender to that at the moment, that's putting quite a lot of trust in something that also potentially has quite a lot of impact. Only to find out later, that we didn't turn push the buttons quite right."*

Going forward, possible future practices relate to adding the impact or sustainability potential per asset class. This concerns the degree to which asset classes can contribute to achieving the sustainability targets, including the specific targets on impact.

### **3. Asset liability management (ALM) analysis**

The ALM team provides an ALM analysis on the pension fund level: how to invest the assets in order to meet the liabilities to the pension beneficiaries. Certain indicators calculated and advised on are part of the pension legislation in the Netherlands. In its liabilities, the age distribution of beneficiaries, as well as average life expectancy are large factors. The ALM analysis contains an advice on how to constitute the investment portfolio's three building blocks: a return portfolio, a matching portfolio and an advice on interest rate hedging. So far, there are no elements integrated relating to transitions or sustainability. This is partly due to the peak in work related to pension law changes and partly due to the fact that certain respondents see limited opportunities for integration in this step. Two quotes illustrate how respondents view the opportunities for integration differently (Quote 6 and 7):

*"In principle, it is a bit more difficult for us to implement ESG because, obviously, the more in detail you can intervene in the portfolio, the more sense it makes. This is the easiest at the level of individual asset categories and what we advise on are the ALM building blocks. (..) If building blocks change, this shift may make it more difficult to achieve ESG objectives, if you can do less in one building block than in the other. We can make that visible, which is at least a good step to take."*

*"The ALM has all sorts of calculations and bandwidths for return and risk. Within those bandwidths, I can make different choices in the portfolio: sustainable choices and less sustainable choices. As long as I can promise a pension result that will be delivered with a certain degree of probability in the long term, as indicated in the ALM analysis, then I still have room to make choices on sustainability. So that also makes 3D investing possible."*

#### **4. Asset allocation advice**

The asset allocation advice then follows, including advice on a further allocation to asset classes. The advice mostly explains the proposed changes as compared to previous years and the considerations therein, where some changes are part of longer-term phase out periods and others relate more to recent decision-making. The portfolio resulting from the advice is assessed against several criteria, such as optimisation, liquidity, ALM criteria, steerability, costs and the upcoming pension law changes. The advice also includes graphs of what asset classes add compared to the most liquid alternative (e.g. equities or liquid credit), in order to show the added value of each asset class in the portfolio.

Currently, the advice already includes the impact of the proposed allocation changes on three sustainability targets (CO2 emissions, Paris Alignment and SDG investments). For example, if the allocation to an asset class with low carbon emissions is lowered, the average portfolio's carbon intensity will increase. As the sustainability targets are or cannot be measured for all asset classes (see Research setting), the potential impact of allocation changes is not always straightforward. The advice also includes an analysis on a hypothetical limit on climate risk, by indicating the impact of a 10% reduction in physical and transition climate-related risk on the allocation. As transition risk is currently measured through carbon pricing, effectively asset classes with relative low exposure to high emission sectors are then preferred over asset class with high exposure to high emission sectors.

Going forward, several possible future practices for integration are put forward. The allocation advice could include advice based on the climate risk assessment as well as based on the potential per asset class for reaching impact and sustainability targets. The climate risk assessment is developing practice, as bottom-up analysis and top-down analysis are being calculated and advancing over time (see Capital market assumptions).

#### **5. Investment plan**

Based on the decisions taken in the CB where the asset allocation advice is discussed, the investment plan is approved by PFZW, which includes the decision-making on ALM and strategic asset allocation for the following year. So far, this plan does not include practices relating to transitions and sustainability. Going forward, whenever decision-making relating to transitions and sustainability is being done in

the ALM and allocation advice steps, these could be integrated in the investment plan.

## **6. Strategic added value**

The last step of Strategic added value is a reflection on whether the allocation indeed led to the intended results. This reflection is the starting point for the new SAA cycle, in terms of the discussion points and agenda within the next cycle and combines quantitative analysis with interpretation of figures and graphs. In terms of current integration practices, it includes an analysis of the effect of exclusions on return, within equity investments. It shows how deviations from the total investable equity universe affected the return of the equity portfolio over the years, which is limited. Second, an indication is included per asset class on whether it is 'on track' towards achieving the sustainability targets. As this document is less discussed in interviews, limited views are shared on the possible future practices to further integrate transitions and sustainability.

## **Investment case**

The Strategy team prepares an investment case per asset class, which is part of the product approval process rather than the SAA process. The product approval process is the process from setting requirements to mandating execution per asset class, and is updated each 3 to 5 years, depending on internal and external developments. An investment case contains the key motivation to invest in this asset class, the characteristics, risk-return expectations and costs. The risk-return characteristics are input to the capital market assumptions model (step 2).

During the observation period working groups were actively discussing how a 3D investment case for liquid credit and equities would look like. The 3D investment cases have the objective to justify each position from a risk, return and sustainability dimension, and to invest with impact, part of the Strategy 2030 objectives (see Research setting). They thus include sustainability targets on carbon reduction and SDG investments and were awaiting the impact targets developed by the impact targets working group (see next section). Relevant to the 3D equity investment case was also the investable investment universe, as this determines the framework within which risk, return and sustainability can be considered. The developments towards 3D investing were topic of many discussions (see Figure 2 dimension '3D investing is iterative process'). Respondents describe 3D investing as new and in development. The forming of 3D investment cases is described as iterative processes, where advancing insights are being used over time. By some it is considered a challenge, as there is not one target for the sustainability dimension, but multiple. Also, the pace of the change process is actively discussed, as some participants indicate that for good decision-making, more time for considerations

and discussions is needed. Once the 3D investment cases are set, the sustainability objectives are integral part of the investment cases, and hence of the input to the SAA process step 2 and 4.

### **Change agenda Strategy 2030**

Part of the data collection was done in three working groups working on implementation parts of Strategy 2030: 1) impact targets, 2) a new risk framework and 3) formulating a 3D investment case (see Data collection). In these meetings, possible future practices were actively discussed.

The working group on setting impact targets set up a PGGM framework for defining and measuring impact and split up in smaller groups to work on impact targets on climate change, health & welfare and biodiversity. In line with PGGM's impact framework, the objective is to set outcome-based targets on portfolio level, that can guide investment strategy towards where that real-world impact can be achieved. One respondent comments on the climate change target setting (Quote 8):

*"Within climate, we are really focusing on the energy transition, because you see that around 50% of global greenhouse gas emissions come from the energy sector. So, if you really want to make a difference in the world, that is a good place to start. So, we argued outside-in like: where is capital needed? For the energy transition. Then we asked ourselves: What are the specific challenges within the energy transition that investors can contribute to? Then we look at impact investments that we can measure and know the impact of."*

On the dimension 'Setting and steering on sustainability targets', respondents broader than this working group provided views (see Figure 2). Many respondents deem target setting challenging but important, as it can guide decision-making once set. Several respondents indicate that particular investments in health & welfare sector and in the energy transition are clear and tangible to pension participants. Brought forward in this regard is also the importance of collecting preferences of pension participants on sustainability and impact targets.

The working group focusing on a new risk framework has the goal to be able to actively consider return, risk and sustainability in investment decisions. As there are many different understandings of risks and their use, the working groups aims to understand the use of risk measures within the investment process and propose relevant measures for managing a 3D portfolio. For example, a respondent notes that setting a tracking error on a benchmark for a particular asset class, serves to manage the asset class's execution risk. The respondent notes that the benchmark serves as a means, not a goal, as it does not provide information on the ultimate pension provision. Moreover, by setting detailed limits on a range of risk measures throughout the portfolio, it is no longer possible to actively consider risk, return and sustainability jointly, as the resulting decision room for investments is limited. This

also relates to the fact that investment cases, in which risk measures are set, are updated only every 3 to 5 years. By formulating a risk appetite on portfolio level, with risk measures relevant to achieving the pension fund's objective, a more active 3D consideration can be realized. Respondents refer in this regard also to total portfolio management, where risk and return are actively managed on the portfolio level by looking at risk factors and fund objectives. This is different than the current SAA, where performance is managed on asset class level through benchmarks, and thus, through relative return rather than absolute return. If new risk measures are set on portfolio level, this can lead to more decision room for steering on sustainability throughout the SAA process.

## 4.2 Cognitive frames

After analysing the findings for RQ1, it stood out that while respondents jointly work on implementing Strategy 2030, they view current and possible future practices to integrate transitions and sustainability in SAA quite differently. Personal views seemed to matter, and through additional data collection these views were explicitly collected (see Data collection). Through the fourth step of data analysis (see Data analysis), I analysed and identified three groups of coherent beliefs and views on relevant topics. In case study wordings, these are characterized as neoclassical market economy convinced, climate informed and sustainability convinced (see Table 4). After identifying these groups, a literature search led to the analysis that the first and second group largely align with cognitive frames as put forward by Hahn et al. (2014): the business case frame and paradoxical frame. A cognitive frame is a mental template that individuals use to give information form and meaning (Walsh, 1995). Respondents in this case study however also use a third cognitive frame, which I called the sustainability case frame.

In the case study, respondents often did not fit fully into one or the other frame, which is also not the intention of presenting these frames. Rather, these ideal-type cognitive frames provide a means to understand how what people know, assume and belief (cognitive content), translates to how people understand and interpret what is going on (cognitive structure), and then leads to way in which people act and respond in the process analysed (stance). These key elements per cognitive frame are summarized in Table 4 and detailed out in Table 5. The data structure on research question 2 (Figure 3) shows the aggregate dimensions, that are embedded in Table 5: views on efficient markets and climate change effects, views on investor impact, investment beliefs coherence and mission PFZW, stance.

Respondents using a neoclassical market economy convinced frame, or business case frame, consider sustainability insofar it aligns with the financial objective. They structure the information in a simple manner and take a pragmatic stance in the process. Respondents that use a climate informed frame, or paradoxical frame, embrace multiple objectives with different rationales, and try to integrate sustainability whenever possible. This leads them to adopt a prudent stance. The third cognitive frame emerged as an additional frame in this case study: sustainability convinced or the sustainability case frame. Respondents using this frame integrate



financial and sustainability objectives and consider them to be jointly achievable. In this way, they also try to simplify the cognitive structure as the business case frame and adopt a proactive stance in the process.

Table 4 Overview cognitive frames

Cognitive frame	Business case frame	Paradoxical frame	Sustainability case frame
Case study description	Neoclassical market economy convinced	Climate informed	Sustainability convinced
1. Cognitive content	Business case thinking: Only integrate sustainability insofar it aligns with financial objective	Paradoxical thinking: Juxtaposition of financial and sustainability objectives, even if contradictory	Sustainability case thinking: Integrated view on financial and sustainability objective, convinced they can be jointly achieved
2. Cognitive structure	Low degree of complexity	High degree of complexity	Medium degree of complexity
3. Stance	Pragmatic stance	Prudent stance	Proactive stance

## Cognitive content

The first element of the cognitive frame is what a respondent knows, assumes or believes, called cognitive content. For the business case frame, this comes down to integrating sustainability only insofar it aligns with the financial objective. The paradoxical frame experiences a juxtaposition of financial and sustainability objectives but wishes to consider them even if they are contradictory. Respondents using the sustainability case frame explicitly combine a financial and sustainability objective and are convinced that these can be jointly achieved. In line with the first section of Table 5, this section illustrates per cognitive frame the views expressed on a range of topics.

Respondents using a business case frame build on cognitive content from neoclassical market economy principles, for example rational behaviour – individuals act based on rational preferences –, utility maximization – individuals maximize utility in their own interest – and market efficiency – individuals and thus financial markets, reflect all relevant market information at each point of time. Given these principles, their beliefs build on the notion that sustainability can be integrated insofar it aligns with the financial objective. They describe the mission of PFZW to create the best allocation possible to achieve the financial objective; all deviations are potential violations as you construct an optimal portfolio on your risk-return objective function. Respondents therefore also identify a tension between investment belief 2, being ‘Market developments are difficult to predict, especially in the short term’ and belief 4, ‘Factoring ESG risks and opportunities into investment decisions results in a better portfolio’. A respondent explains as follows (Quote 9):

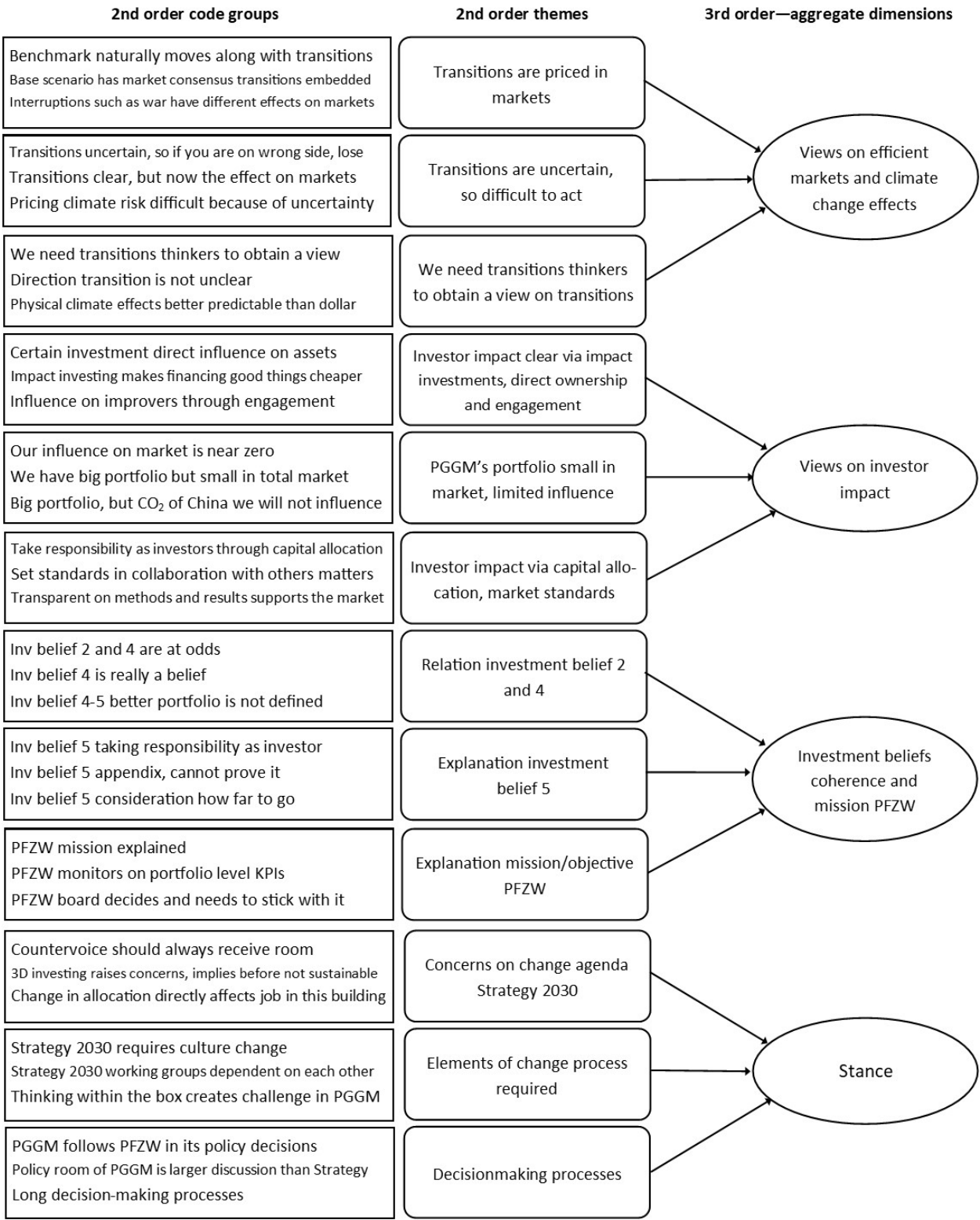
*“It is more on the belief that short term market developments are not easy to predict. You could say, climate change is not something that is only relevant in the short term, but also on the long term. Even so, acting on the incorrect pricing of climate risks assumes that you have a better vision than what is currently priced in in the market. Yes, that is significantly different from how the investment policy has been set up so far.”*

In line with the tension, respondents typically state on efficient markets that markets have shown to be highly efficient, so who are they to think different? Yes, climate change effects affect the economy, but there are always ongoing transitions, where the market incorporates a consensus of expectations in market prices. Neoclassical market economy principles are dominant in academic economic education, which most respondents enjoyed and still value as academic evidence for investment practice. This leads however to a narrow focus on evidence from this academic field, rather than from other academic fields or evidence contradicting these principles (Hahn et al., 2014). The narrow focus used by the business case frame allows people to keep the content concise but also leads to a confirmation bias (Hahn et al., 2014). Regarding investor impact, Quote 10 elaborates on a respondent’s view:

*"I do believe in the way that capital allocation steers prices on a large scale, but that is many times larger than what PFZW is and ever will be. I don't see much added value in engagement, and I see those results to a limited extent. The fact that we make our portfolio more sustainable does not necessarily make a difference; for us 10 others that buy the share and then we are not engaging with this company. The impact that we claim is mostly the impact made by the company itself, which would probably have been there, even if we had not invested. Our added value is close to zero, nothing more than a kind of market signal, in which I do think we are a frontrunner together with other Dutch investors. But I don't have the impression that we are the ones here in Zeist creating a more sustainable world."*

Most respondents with a business case frame acknowledge that PFZW's portfolio is only a fraction of the worldwide capital market. Respondents also mention that investing sustainably still matters, as it shows pension participants that you invest on their behalf in a responsible manner.

**Figure 3 Data structure RQ2**



This Figure shows the result of the Gioia methodology data analysis (see Data analysis): First order codes (not included in Figure) are grouped to 2<sup>nd</sup> order code groups, which are further grouped to 2<sup>nd</sup> order themes and again grouped to 3<sup>rd</sup> order aggregate dimensions. The aggregate dimensions are part of the cognitive frame elements (Table 5). A full overview of the 2<sup>nd</sup> order themes per aggregate dimension is included in Appendix 3.

Table 5 Detailed overview cognitive frames

Cognitive frame	Business case frame	Paradoxical frame	Sustainability case frame
Case study description	Neoclassical market economy convinced	Climate informed	Sustainability convinced
<b>1. Cognitive content</b>	<b>Business case thinking:</b> Only integrate sustainability insofar it aligns with financial objective	<b>Paradoxical thinking:</b> Juxtaposition of financial and sustainability objectives, even if contradictory	<b>Sustainability case thinking:</b> Explicit combination financial and sustainability objective, convinced to be jointly achieved
Mission PFZW	Best allocation possible, all deviations are potential violations of financial objective	Where possible, contribute to sustainability while achieving financial objective	Best allocation possible to achieve integrated objective of risk, return and sustainability
Investment beliefs coherence	Tension between no view short term and factoring in ESG risks/opportunities	Coherent, ESG risks and opportunities are long term. Beliefs give room for interpretation.	Coherent, ESG risks and opportunities are long term. To make a valuable contribution is aligned with mission PFZW.
View on efficient markets	Markets have shown to be highly efficient, so who am I to think different?	Markets are not efficient, as many effects are uncertain and thus not reflected	Markets are not efficient, as investors do not adequately assess climate change effects
View on climate change effects	A consensus of the expectations is incorporated in prices. There are always ongoing transitions.	Effects are not priced in as they are uncertain. Climate change effects matter, but we do not know how they will take place.	Effects are not priced in, so we need to act on those material risks not yet reflected. The world will move towards identified transitions.
View on investor impact	We are small player on total capital market. What we do matters mostly to our beneficiaries.	Mention several elements of investor impact, generally positive about taking responsibility as an investor	Active engagement is an effective method. Impact investments make a difference, and act as a hedge against climate and transition risk.

Table 5 continues on next page

Cognitive frame	Business case frame	Paradoxical frame	Sustainability case frame
<b>2. Cognitive structure</b>	<b>Low degree of complexity</b>	<b>High degree of complexity</b>	<b>Medium degree of complexity</b>
Degree of elements and interconnections	Low number of frame elements Low degree of interconnections, as focus on achieving financial objective	High number of frame elements, by considering all relevant information High degree of interconnections with a plurality of reinforcing, neutral and conflicting relationships	Medium number of frame elements, focus on coherent narrative of integrated objective Medium degree of interconnectedness with proactively establishing relationships and solving certain conflicting relationships
Degree of dilemmas	Low	High	Low-medium
<b>3. Stance</b>	<b>Pragmatic stance</b>	<b>Prudent stance</b>	<b>Proactive stance</b>
Stance elaborated	Incremental proposals Role of critic caster	Proposal for iterative cycles of learning Role of considering arguments, constructive	Radical proposals Role of designer, forward-looking
Brings to the table	Finance logic, need for academic evidence	High degree of relevant elements, interconnections and resulting dilemmas	Provide solutions to conflicting relationships, bring integrated narrative, broaden scope in fields of expertise
Concern	Concern of potential financial consequences of sustainability focused decisions	Concern of acting too quickly or wrong on transitions, due to uncertainties and complexities	Concern of being stuck in 'old thinking' and excuses, concern of acting too late

Bridge to other  
cognitive frames

Consider more elements,  
interconnections and dilemmas

Connect with other two frames through  
structuring relevant considerations

Acknowledge dilemmas and potential  
financial consequences of sustainability  
focused decisions



Respondents using the paradoxical frame explain the mission of PFZW with regards to sustainability, to take decisions where possible to contribute to sustainability while achieving financial objective. They do not see a tension between investment belief 2 and 4, as 2 concerns the short term and 4 concerns long term elements. Respondents do however note that belief 4 and 5, 'PFZW makes a valuable contribution to a more sustainable world', are not specified as to what a 'better portfolio' or 'valuable contribution' means. Through noting this, they accept the interpretation room that is inherent to these beliefs. In their views on markets and climate change effects, they state that markets are not efficient, as many effects are uncertain and thus not reflected in market practices. They share that climate change effects matter, but as the transition direction is uncertain and we do not know how effects will take place, there is a difficulty in pricing and acting on these effects. Raising and acknowledging these difficulties is typical for the paradoxical frame. In a memo on the effects of climate change, this is described as follows (Quote 11):

*"The problem is that climate change is not about (measurable) risks, but about (unmeasurable) uncertainties and ambiguities. There is an accumulation of these: the future climate is uncertain, how that will affect the economy is uncertain, and how that affects investments is uncertain. And how all those layers of uncertainty interact via transmission channels, is also uncertain."*

The point that transitions are uncertain, and therefore difficult to navigate is made by a substantial number of respondents. On investor impact, respondents using a paradoxical frame mention several elements of investor impact that they think matter, such as an explicit choice for the investment universe (referred to as inclusion), the capital allocation role, engagement and impact investments. Respondents generally view these practices positively, as a way to take responsibility as an investor. One respondent comments that it depends on your personal view, whether you deem the investor impact sufficient.

Respondents using the sustainability case frame describe the mission of PFZW to achieve the best allocation possible, to achieve the integrated objective of risk, return and sustainability. Like the paradoxical frame, they view the investment beliefs are coherent as ESG risks and opportunities are a long-term element (belief 4) as opposed to short term market developments (belief 2). Respondents with this frame feel encouraged by the adaptation of investment belief 5, as it confirms their view that PFZW should take its role as investor to avoid negative impact and increase positive impact. These respondents are convinced that financial markets are not efficient, as investors do not adequately assess climate change effects. Some respondents comment on the business case frame's narrow focus on finance-related literature, while evidence from climate change research is abundant. As important climate change effects are not priced in, they see a need to identify and act on those risks. They state that the world will need to act on climate change

effects, sooner or later, regardless of which climate change scenario ultimately plays out. A respondent states (Quote 12):

*"Look, the physical trends are clear enough, and the physical consequences, those are also fairly clear. I mean, you can probably predict the climate better than the dollar rate."*

This leads to a strong view on the need to act now, and the proposal to develop a view on anticipated climate change scenarios, so you can take meaningful action as an investor. Setting impact targets supports decision making and steering on real-world impact. Two respondents state (Quote 13 and 14):

*"I think that within now and say 10 years, we will be operating in a completely different environment. An environment in which pension funds and other financials are asked: what did you do during the war? Do you remember where you were, when we could still take action. Maybe 10 years is short, so then 20 years. Our children, they will soon ask us like: you knew it, but you did not act. Yes, marginally perhaps a little bit, but we are not judged by what we do about it, but on acting as if we do it."*

*"I think that PFZW can really make a contribution, partly by seeing the trends in transitions and investing in them, but also largely by being a role model, that you attract other investors on the market with: 'it can be done differently'. So, an example of how I think on the energy transition. (...) Large oil and gas companies are faced with a choice: if I invest my capital in renewable energy, am I not cannibalizing my legacy business? That is something that introduces a economic inefficiency. The future-oriented investments are no clean choices, namely by parties that have a lot to lose. So PFZW or another financial party can (...) see those trends and find investment opportunities in them and also create them. (...) This creates new opportunities and risks. These could turn out badly in the short term, you never know. It could take a while before you see a return on that, or it could take a long time."*

The latter quote also illustrates the standpoint on investor impact, namely that PFZW has a role to play in facilitating transitions and it can realize both a good pension result and contribute to a more liveable world. They think that pension result can be achieved in various ways, so that real-world impact can be realized at the same time. Summarizing, the beliefs and views shared by respondents with the three cognitive frames showcase a divergence in how PFZW's mission and investment beliefs are interpreted, how to act on climate change effects and what the investor impact of PFZW is and potentially can be. This translates to how people understand and interpret what is going on, which is the cognitive structure analysed next.

### **Cognitive structure**

Cognitive structure concerns "how the content is arranged, connected or studied in the executive's mind" (Finkelstein & Hambrick, 1996: 57). It concerns the understanding and interpreting of content. Hahn et al. (2014) analyse the cognitive structure in terms of the number of elements considered and the degree of

interconnectedness between these elements<sup>9</sup>. In this case study, we find that the degree of dilemmas or conflicting relationships between these elements is another element that matters in this sensemaking stage. Through the process of data analysis, Figure 4 is developed, which plots the cognitive frames on these dimensions, and indicates the general continuum or development that people can have, which this section elaborates on further.

**Figure 4 Cognitive structure of cognitive frames**

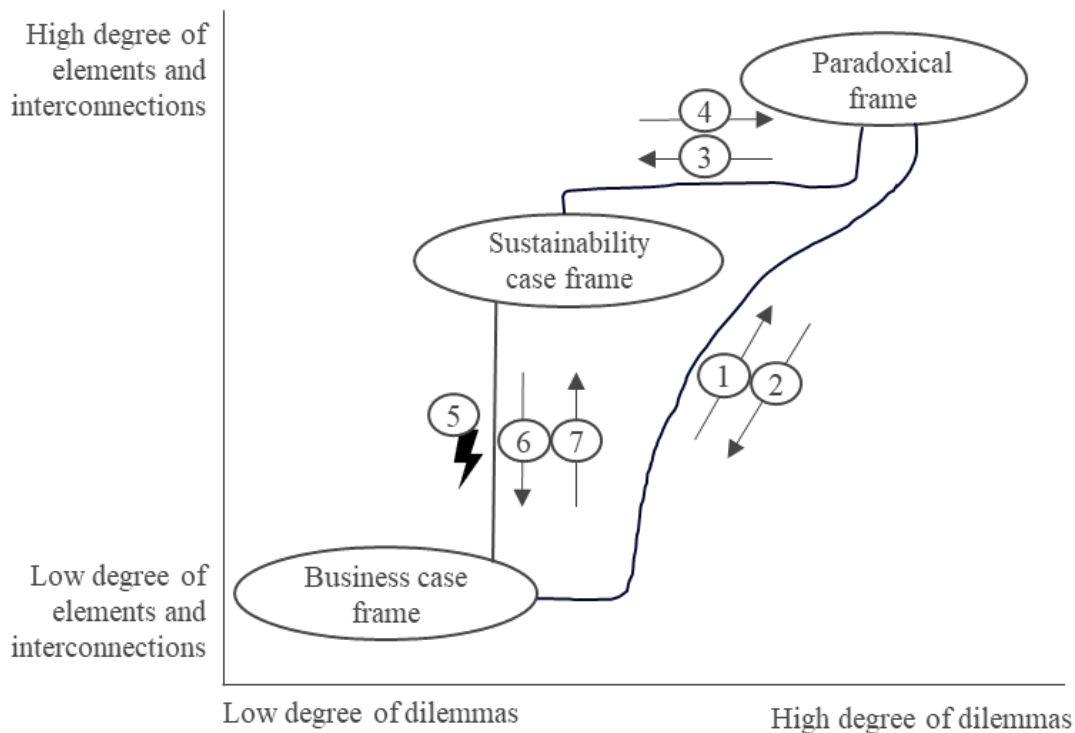


Figure 4 shows the cognitive frames plotted on the degree of elements and interconnections, and the degree of dilemmas. The connections show the general continuum or development that people are on. Generally, respondents move from the business case frame towards the paradoxical frame (arrow 1), towards the sustainability case frame (arrow 3). Between the business case frame and sustainability case frame, there is a lack of understanding as they use a different set of elements and interconnections (lightning 5). The other developments (arrow 2, 4, 6 and 7) are not observed in the case study.

The number of considered elements and interconnections considered by the business case frame is low, as only information relevant to the financial objective is considered. This leads to a low degree of dilemmas, as sustainability considerations are left when not aligned with the financial objective. It is in line with the narrow focus on finance related literature, as described in the previous section. An example

<sup>9</sup> In line with Walsh (1995), Hahn et al. (2014) refer to the number of elements within a frame as differentiation and the degree of interconnectedness among these elements as integration. For clarification purposes, I refer to these jointly as the degree of elements and interconnections.

is that certain respondents consider climate risk insofar it poses financial risks, but see less relevance for considering how the PFZW's investment portfolio affects climate change. The following quote 15 illustrates the use of a low number of elements:

*"This is your base scenario and no matter how you look at it, in the end only three factors really matter: inflation, interest rate and economic growth, or stock returns. Then things can go well or go wrong, so then you only have eight possibilities. A few possibilities are very unlikely or useless, so then you have about 5 stress scenarios left. (...) Actually, you don't need any storytelling at all. In fact, you can state: (...) it doesn't matter whether there is an oil crisis, or that China goes into lockdown, or that Saudi Arabia is on fire; in the end they are all positive or negative supply shocks, and you end up in stagflation. This never made it, because you notice that board members want to understand what a stagflation scenario entails. What does it mean? What happens in such a scenario? Then I can't come up with a positive or negative supply shock, doesn't matter where it comes from, you end up here."*

Respondents using a paradoxical frame, however, consider a high number of frame elements and a high degree of interconnections. They see a plurality of reinforcing, neutral and conflicting relationships, creating a challenge to navigate these (Hahn et al., 2014). They identify many dilemmas and experience a high degree of complexity. The following quotes illustrate (Quote 16 and 17):

*"I think that if we make a wrong estimate on the impacts of climate risks, then that might affect the risk-return. And maybe we even make wrong estimates on climate change itself."*

*"A company can try to transition, but that does not mean I want to invest in it. Maybe I do not believe that it is agile enough; that if it makes a few changes, it can transition. I can believe a renewable energy transition takes place, but do I believe in hydrogen, wind energy, solar energy or perhaps something completely different, geothermal energy? I don't know which will win. There is so much uncertainty that I would not position myself on this. So, in my analysis of a wind energy company, I will therefore consider that wind energy might not be attractive."*

Respondents using a sustainability case frame experience a medium degree of complexity, as their belief that the financial and sustainability objective can be jointly achieved, solves certain conflicting relationships troubling the paradoxical frame. They see several interconnections, but try to proactively establish reinforcing and neutral relationships, supporting implementation of Strategy 2030 objectives.

Rather than static cognitive frames, the cognitive frames present a continuum or development of people alongside these frames, as illustrated in Figure 4. For example, several respondents with a business case frame at first, started to examine climate change effects, and in adopting a higher degree of elements, they are also faced with more interconnections and dilemmas related to climate change (arrow 1). In integrating the financial and sustainability considerations, the degree of

elements, interconnections and dilemmas lowers, leading to the sustainability case frame (arrow 3). Ongoing processes and discussions, lead respondents to move mostly along arrow 1 and 3, but in general people can also develop in the opposite direction (arrow 2 and 4). In adopting many arguments and considerations, the paradoxical frame has an ability to understand both the business case frame and sustainability case frame. There is less understanding however, between the business case frame and sustainability case frame, which relates to the lack of shared understanding of relevant elements and interconnections (arrow 5). The difference in cognitive content and low acceptance or consideration of dilemmas, creates a lack of ability to understand each other's standpoints. A respondent using the sustainability case frame elaborates why the focus on the finance logic by the business case frame poses a problem (Quote 18):

*"What I think is spoon-fed is the idea that there is always something of a 'reversal to the mean'. You have a dip, but you work your way out of it. Whereas a physicist or someone who studied beta science, knows that it can break. Then you have a completely different pathway, that is an absolute direction, not a relative direction. That is a completely different profession. These are all relative guys: they are already happy if they beat the benchmark by x basis points. But if you end up in a completely different scenario, where it really just breaks, that is unimaginable. (...) So the cloud is not big, or actually not creative enough to come up with that kind of scenario, so to speak (...). I think that we are not nearly creative enough in thinking of what may happen. I don't think that is in our models. I think it would be very wise for PGGM to work with systems thinkers much more. With transition thinkers who are indeed creative enough to map these kinds of developments."*

While the understanding may be limited, the following quote illustrates how a respondent using a business case frame proposes to make the beliefs used by the sustainability case frame more explicit, in order to increase a shared understanding (Quote 19):

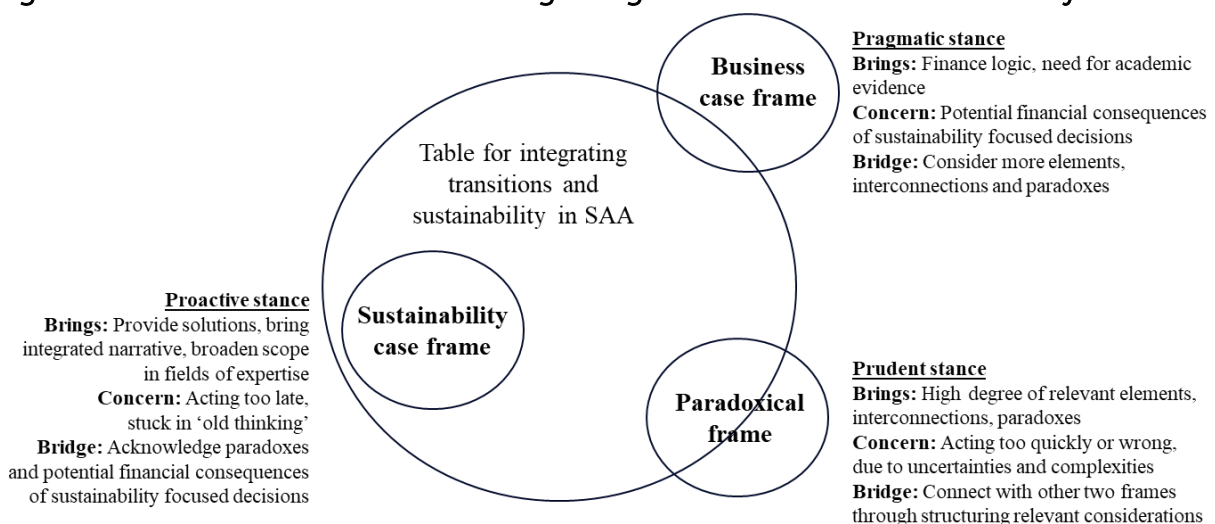
*"If you assume that transition risk premiums are not priced in yet, and that there will be a time when they will be priced in; then you better be on the right side. (...) But that has never been explicitly stated. I would like to find out whether that is indeed a belief. So, if you believe that in this case the government will intervene, that creates transition risks for companies ill-prepared, then I understand what that implies. But that is an assumption. (...) Then an oil company is stranded, if the CO2 price is very high. But if no intervention is made at all, and we move towards a 5- or 6-degree scenario, then the wind farm is stranded."*

Moving directly between these two frames (arrow 6 and 7) is not observed in the case study (arrow 6 and 7). Moving from a business case frame to a sustainability case frame (arrow) can be caused by an explicit experience or acknowledgment on how environmental and social developments relate to the economy (REF). Quotes 18 and 19 show how the cognitive structure of respondents leads them to a particular response to these developments. The next section elaborates further on these stances.

## Stance

A stance is a mental attitude towards an issue or process, leading him or her to act in certain ways (Hahn et al., 2014). In the case study, respondents taking different stances in the process of integrating transitions and sustainability in the SAA process, which is illustrated in Figure 5.

Figure 5 Stances at the table for integrating transitions and sustainability in SAA



Respondents using a business case frame take a pragmatic stance, which means they propose incremental changes based on established routines and practices. Generally, these proposals bear little risk, produce little disruption but are also novel to a limited degree. As they are based on established practice, emerging sustainability related risks can remain underestimated (Hahn et al., 2014). However, the ability to develop workable solutions using finance logic can be at the basis of larger-scale change. Respondents emphasize the need for meaningful implementation and not taking action just for the sake of it. In the implementation of Strategy 2030, they take the role of critic caster and bring the need for a sound finance logic and need for academic evidence. Their concern is that the potential financial consequences of certain sustainability motivated decisions are insufficiently discussed. The following quotes illustrate this stance (Quote 20 and 21):

*"So, again the story came with the base scenario: you do nothing with the big transitions in the world. Transitions such as the financial transition that completely sidelines banks through all kinds of new technologies, geopolitics, migration, none of that is included. It is very implicit, and the honest answer is that we can't do a lot with it either. So, then we actually drew up the megatrends note as almost a kind of sop. So, we reported: we do look at these megatrends and this is roughly what happens. We think that if things go well or wrong, this will happen, but you can't know. And even more so, if it is very extreme, then you end up in the stress scenarios we already have. (...) So we do nothing with it, and I still wouldn't know what to do with it, because you don't know if things will go well or wrong."*

*"Can you steer your portfolio on this? So does this give you a signal like take a little more equity or real estate. Well, that is the main point we made in the memo last time. The test ultimately is: we don't just want to talk about it but also take climate change into account in the portfolio. At the moment, that is still difficult to impossible at the level of asset classes."*

Respondents using the paradoxical frame take a prudent stance. In the change agenda towards Strategy 2030, they bring forth the richness of relevant elements, interconnections and resulting dilemmas. This can limit their ability to develop and implement workable solutions, considering potential conflicting or undesired side effects (Hahn et al., 2014). In this case study however, respondents with a paradoxical frame go beyond their ambivalence, by proposing iterative cycles of learning in order to overcome the identified uncertainties and complexities. One respondent stresses the need for no-regret or least regret options for PFZW to take, given the uncertainties of transitions. This also relates to the concern that if PFZW acts too quickly, they could face lock-in on transitions, and lose rather than win, because they were too early or because the transition went a different direction. In bringing all arguments to the table, the paradoxical frame can have a bridging role to other frames and act as a translator between them. They have the ability to structure relevant considerations, using both finance logic as well as a broader logic of other fields of expertise. In this way, the implementation can be advanced to develop emerging practices to integrate transitions and sustainability in SAA. This is illustrated through the following quotes (Quote 22 and 23):

[As a response to Alladin Climate module results:] *"I think it's the best we have. I just think you should put a big exclamation mark on it, saying: know that this only quantifies a part of all the effects and that a vast majority cannot yet be estimated. So, you shouldn't think that this is the impact, and that's that. It is already much larger than what the numbers show, only we don't have a clue of the order of magnitude, the direction or how that works out exactly. Either it cannot be modelled or there is insufficient data for it, there are enough limitations, this is the best we can do."*

*"I think it's important as a pension fund to not recklessly turn into one direction and then actually give up a lot. In particular, which sectors and companies do you still want to invest in? That is, I think the most important choice. (...) You have to strike a balance between an investment policy that as a whole is somewhat robust for both a 1.5-degree scenario – it could still be possible in theory – and perhaps a 3-degree scenario. But not fully commit to a 1.5-degree scenario, because that also simply poses risks that you then not mitigate. But of*



*course, also not completely abandon the fact that we as a world still have ambitions to move in a certain direction. Because that will ultimately have a potential impact on certain sectors.”*

Respondents using the sustainability case frame adopt a proactive stance, where they propose radical ways forward. They feel supported by the Strategy 2030 to act in the change process as designer and to look forward on how to achieve the set objectives. This proactive stance was not identified by Hahn et al. (2014), and I define this stance as the proactive considering of unusual and more radical departures from established routines, proposing new solutions that can bring about large-scale change. They provide solutions to some of the conflicting relationships by broadening the scope of relevant fields of expertise. They build on other fields of expertise to provide ways forward, in a more separate manner from finance logic than the paradoxical frame does. For example, the proposal to adopt an explicit view on what climate change scenario is anticipated, and to take meaningful investor action in time. They see the setting of explicit impact targets as a means to invest with positive impact, and steer on this throughout the investment portfolio. Their main concern is that people get stuck in ‘old thinking’ and excuses, and hence that PFZW will act too late. Illustrative to this point is that one respondent using the sustainability case frame finds that sustainability is overly debated, especially its potential to affect return, while other factors that affect return to a much larger degree – such as the interest rate hedge and liquidity requirements– are debated to a lesser degree. To bridge towards the other cognitive frames, respondents using the sustainability case frame need to acknowledge dilemmas and the potential financial consequences of sustainability focused decisions. While the Strategy 2030 is largely in line with the sustainability case frame thinking, these respondents are fully on board to discuss and implement new practices. Figure 5 however illustrates that the paradoxical and business case frame are not fully on board, given their concerns and considerations. Especially respondents with a business case frame express limited room for their concern, posing the risk of them leaving the table, either physically or by becoming passive or opposing in the process. The next section reflects on these findings, by providing ways forward and by reflecting of the relevance in the light of emerging academic debate on related topics.

## 5. Discussion and conclusion

The main objective of this article is to examine the integration of transitions and sustainability in the investment practice of strategic asset allocation. The article provides unique empirical data on how these practices and its advancements are discussed and considered in investment practice. We advance theoretical understanding of cognitive frames used in sustainability processes, especially by identifying and describing a third novel cognitive frame, the sustainability case frame.

This study contributes to the literature on SAA by providing unique empirical insights. In answering RQ1, this study aims to fill the gap between the finance academic literature and the real-world practice of institutional investors (Cochrane, 2022). The findings relating to RQ1 show that while initial practices are adopted, the role of transitions and sustainability in decision-making in SAA is limited. The current practice of SAA is mostly tied to estimations on the median path of economic expectations, informed by capital market assumptions and its influence on risk-return characteristics of asset classes. Non-linear transitions, climate change scenario thinking and the multifaced sustainability objectives, are a challenge to adopt in a linear process. So far, adopted practices are incremental in nature and mostly focus on climate change effects. Within the SAA process, an iterative cycle of incremental steps is proposed to advance practice, while in the working groups implementing Strategy 2030 more radical proposals are made.

Table 6 provides a reflection of the observed practices towards the integrated strategic asset allocation framework by Roor, Schoenmaker & Maas (2025). For each step, possibilities for further integration are identified in the case study, as well as in the emerging academic literature. While the observed case study practices relate mostly to climate change effects, the possibilities going forward include all relevant environmental and social transitions and impact. In general, possibilities arise when a broader range of expertise is considered, beyond the finance field. In the investment policy (step 1), setting a clear end objective in SAA can support to identify practices beyond the current modelling and methods that may be complementary to achieve the Strategy 2030 objectives. It is important that risk, return and sustainability objectives (and their interrelations) are determined and agreed upon on portfolio level, as this provides steering throughout the investment process. In forming climate market assumptions (step 2), the case study shows that climate change effects are underestimated in current practices, in line with recent academic work (Reinders et al., 2023). The starting point going forward therefore lays in applying climate science insights to identify expected effects on and of investment portfolios. This is in the first place a call for further academic research, where climate science and finance research in collaboration advance much-needed insights (Reinders et al., 2023), for cross-sector collaborations to co-create knowledge and momentum (Busch et al., 2024), as this goes beyond the scope of one institutional investor. In the meantime, investors can acknowledge knowledge gaps and develop qualitative approaches to fill these gaps in current practices. Investors can analyse transition effects by considering the sector and geographical distribution of the investment portfolio. Transitions affect certain sectors and geographies more clearly and significantly than that they affect certain other sectors or asset classes. This relates to the fundamental acknowledgment that transitions hit the real economy, build up in sectors and located in countries, rather than that the financing structure of companies or projects (leading to asset classes) determines the exposure to

transitions. An investor can identify two or three transitions that matter most, either because it anticipates the largest risks and opportunities in these or because it wants to impact these transitions positively. Investors develop transitions pathways, providing insights in the current positioning of the portfolio: investments at risk, investment opportunities and potential no- or least-regret actions or real options to take. In forming risk-return-sustainability expectations for the portfolio (step 3), the future practices mentioned in the case study could advance practice significantly: to base the allocation advice on the climate risk assessment and the potential per asset class to reach sustainability targets. This will show that asset classes (and sectors and geographies) provide a different potential for achieving return, to improve the risk profile and/or achieve sustainability targets. These insights provide a basis to discuss what objective can be best achieved where. These insights can be provided in overviews, simplified objective functions and/or visualised in figures, in line and beyond the current asset allocation advice. A relevant consideration in this step is to consider that the ability for investors is to have investor impact. This means considering the levers in investing and how to employ these. (Kölbel et al., 2020) structure these mechanisms as capital allocation, active engagement (voting and engaging with companies) and indirect impact (e.g. stigmatisation, endorsement, benchmarking, demonstration). In the last step, construct the portfolio, decision-making takes place based on previous steps. By adopting decision-making steps or options, decisionmakers can be guided in this step. In the end, it comes down to a combined top-down steering on sustainability targets, and bottom-up analysis of where the sustainability potential is. In reflecting on decision-making, it is important to analyse whether portfolio construction decisions indeed resemble the realisation, so that the room for active risk-return-sustainability considerations accurately describes the insights in investment practice to date.

In answering RQ2, this study provides unique insights in the cognitive frames observed in the case study: the business case frame, paradoxical frame and sustainability case frame. By observing and analysing the sustainability case frame, this study expands the work by Hahn et al. (2014). This study shows that in current investor practice three cognitive frames co-exist. Respondents using a sustainability case frame explicitly combine integrated financial and sustainability objective. This leads them to adopt a proactive stance, where they advance more radical proposals to achieve this integrated objective. Compared to the paradoxical frame by Hahn et al. (2014), respondents using a paradoxical frame in this study go beyond their ambivalence by proposing iterative cycles of learning and by proposing no- or least regret options. The cognitive frames show similarities with sustainability typologies as described by Dyllick & Muff (2016) and Loorbach et al. (2020), but this study advances insights based on empirical evidence. The results confirm the analysis by Lülfs & Hahn (Lülfs & Hahn, 2014) and Aguinis & Glavas (2019) that personal sensemaking factors – e.g. social norms, personal moral

norms, environmental values – matter to the advancement of an organisation's sustainability agenda. The findings provide insights in how these sensemaking factors lead to adopting different stances in adopting sustainability practices. Respondents can develop across cognitive frames over time, as visualised in Figure 4. The most often observed development is from a business case frame towards a paradoxical frame, or from a paradoxical frame towards a sustainability case frame. The business case frame and sustainability case frame lack a shared understanding of relevant elements and interconnections. The findings furthermore show that all cognitive frames bring something to the table (Figure 5). The paradoxical frame brings a range of relevant elements, connections and paradoxes to the table. The sustainability case frame brings new or radical proposals, as well as new information from a broader range of expertise. The business case frame can critically assess proposals, and come with incremental proposals based on current practices, which might serve as initial steps or even as basis for more radical proposals. When adopting more elements and interconnections, the business case frame can better understand relevant developments, a need also emphasized by (Busch et al., 2024). Combined, they can structure the information and come to relevant elements and concerns for implementation. This joint understanding forms an important basis for further integration. This integration may well be structured in iterative cycles, in which concerns can be actively addressed in interim decision-making. While these steps provide ways forward, Figure 5 also sheds light on potential risks. When the concern of people using a business case frame is not discussed explicitly, they might leave the table, either physically, by acting passively or taking opposing positions. Vice versa, the concern of people using the sustainability case frame can be addressed by people using the other frames by opening up to new solutions and ways of thinking.

On a broader notion, the cognitive frames show that a cognitive diversity of people provides a diverse set of capabilities to advance sustainability practices, and its inherent challenges. In order to advance and make use of this diversity, people need to create bridges towards the other frames, allowing that other considerations play a role in the process. When a lack of shared understanding is anticipated in collaborations, it is worthwhile the time to share people's underlying beliefs and understanding (cognitive content and structure), which lead to adopting certain stances. In organizational learning in sustainability, Osagie et al. (2022) identify three key characteristics: leadership for change (people motivating to learn and embrace change), system connection (being open to adjust practices based on community needs) and group learning. The latter can be especially relevant to discuss emerging insights and advance a shared understanding and language in sustainable investing (Loorbach et al., 2020). The results relate to a larger research body on cognitive frame (or archetype/typologies) analysis in sustainability (Dyllick & Muff, 2016; Loorbach et al., 2020). Oberlack et al. (2019) find in their systematic review on this

literature that archetypes are mostly emerging, context-sensitive models, that increase in validity when confirmed throughout several cases. Therefore, empirical research can further advance the emergence and development of cognitive frames at financial institutions.

The mechanisms and size of investors' impact on companies is increasingly subject of academic debate. Several elements of investor impact are brought forward by respondents (Figure 3 and Appendix 3), in which the investor impact categories can be recognised, as described by (Kölbel et al., 2020) and Marti et al. (2023). In line with the call for reorientation towards impact aligning investments and impact generating investments (Busch et al., 2021), PGGM operationalised its impact investment definition as impact generating investments. PGGM's impact target working group emphasized the need for 'impact' in the form of real economy outcomes, a point also made by Calcedott et al. (2024). In line with the impact or sustainability potential per asset class mentioned in this article, Calcedott et al. (2024) advances the use of an 'impact budget' into strategic asset allocation, also by analyses the degree to which it is possible to realize investor impact in these categories. Advancing investment practice therefore includes analysing both the sustainability potential of investment categories, but also the ability of the investor to through its investor impact influence real economy changes.

This study is relevant to institutional investors adopting sustainability practices and objectives, as it provides insights into the dynamics at play in change processes related to these. This holds especially in the nascent field of emerging practices on integrating transitions and sustainability in the SAA process. This study shows investments that all three frames are relevant in these emerging practices, bringing their views to the table. It proposes ways forward for frames to bridge towards the others and to express their concern. This study shows, in line with earlier academic research, that personal sensemaking factors matter to the advancement of an organisation's sustainability agenda and are thus relevant to consider in investment practice.

**Table 6 Integrated SAA (Roor, Schoenmaker & Maas, 2025), PGGM's application and possibilities for further integration**

Integrated SAA	PGGM's current & future practices	Possibilities for further integration
<p>1. Set an integrated investment policy</p> <ul style="list-style-type: none"> <li>Formulate mission and investment objectives (return, risk, impact)</li> <li>Adopt investment beliefs, including impact beliefs</li> <li>Determine risk appetite</li> </ul>	<p>Case study research: Research setting</p> <ul style="list-style-type: none"> <li>Investment beliefs include both outside-in ESG risk and inside-out impact</li> <li>Sustainability objectives set in Strategy 2030</li> </ul>	<ul style="list-style-type: none"> <li>Formulate clearly end objective SAA in order to identify practices beyond current modelling and methods that may be complementary to achieve the objective</li> <li>Determine and agree on risk, return and sustainability objectives on the portfolio level</li> </ul>
<p>2. Form capital market assumptions</p> <ul style="list-style-type: none"> <li>On growth, interest rate, inflation and transitions</li> <li>Transitions requires a sector view</li> </ul>	<p>Case study research: Phase 1, 2 and 3</p> <ul style="list-style-type: none"> <li>Transition analysis and influence of transitions on deterministic scenarios</li> <li>Deterministic climate scenarios</li> <li>Consider consensus of transitions embedded in stochastic modelling</li> </ul>	<ul style="list-style-type: none"> <li>Call for academic research to build on environmental science to identify expected effects on and of investment portfolios</li> <li>Acknowledge current gaps in climate scenario's and develop qualitative approaches to fill these gaps in the meantime</li> <li>Consider the sector and geographical distribution of investments, to analyse transition effects</li> <li>Identify 2-3 relevant transitions, develop transitions pathways, and identify relevant risks and opportunities in the investment portfolio, discuss and take actions based on identified insights</li> </ul>
<p>3. Form risk-return-impact expectations</p> <ul style="list-style-type: none"> <li>Integrate impact alignment as a separate dimension</li> <li>Extend to risk-return-impact expectations on all asset classes, informed by sector views</li> </ul>	<p>Case study research: Phase 2 and 4, investment cases, change agenda Strategy 2030</p> <ul style="list-style-type: none"> <li>Impact of allocation advice on the realisation of sustainability targets</li> <li>Allocation advice based on climate risk assessment and potential per asset class for reaching impact and sustainability targets</li> </ul>	<ul style="list-style-type: none"> <li>Each asset class (and sectors and geographies) provide different potential for achieving risk, improve risk profile and achieve sustainability targets. These insights can be provided in overviews, simplified objective functions and/or visualised in figures</li> <li>Consider investor impact levers (e.g. capital allocation, active engagement and indirect impact) and how to employ these</li> </ul>
<p>4. Construct the portfolio</p> <ul style="list-style-type: none"> <li>Stochastic modelling and scenario analyses using macroeconomic and transition factors</li> <li>Results in different asset mixes with different risk-return-impact characteristics</li> <li>Construct a portfolio by optimising expected risk-return-impact, informed by sector views</li> </ul>	<p>Case study research: Phase 4, 5 and 6</p> <ul style="list-style-type: none"> <li>Development of risk framework with portfolio steering on risk, return, impact</li> <li>Per asset class indicated whether investments are 'on track' for achieving sustainability targets</li> </ul>	<ul style="list-style-type: none"> <li>Adopt decision-making steps or options, to structure the integrated decision-making, combining top-down steering on sustainability objectives, and bottom-up analysis for sustainability potential</li> <li>Reflect whether assumptions in portfolio construction decisions indeed resemble the realisation, so that the room for active 3D considerations accurately describes the insights in investment practice to date</li> </ul>

## Appendices

### Appendix 1 Information on interview data

#### Overview questions for RQ2 in closed research setting

These interviews focused on the following four questions, which were shared in advance of the interview with the respondent:

1. Do you think that the physical consequences of climate change, and how we act (climate change mitigation and adaptation) is adequately priced in, in financial markets?
2. Does what you think about this (question 1), matter to how you think PFZW should consider climate-related risks?
3. PFZW formulated investment beliefs, in which she states that 'Market developments are difficult to predict, especially in the short term' (belief 2), 'Factoring ESG risks and opportunities into investment decisions results in a better portfolio' (belief 4) and 'PFZW makes a valuable contribution to a more sustainable world' (belief 5). How do you think these beliefs relate to each other?
4. Which impact can PFZW make as an investor through impact investing? Which role does setting targets have in this? In investment decisions, how can a good consideration be made between risk, return and impact?

#### Quotes of paper in original wording (Dutch language)

Quote 1 – Als klimaatverandering tot nieuwe en onbekende dynamiek leidt in de economie en het financiële stelsel, zullen stochastische modellen niet in staat zijn die te voorzien, en verrast worden. De extra systeemonzekerheden door klimaatverandering nopen ertoe om in de toekomst nog voorzichtiger met de stochastiek om te springen dan nu al wordt gedaan.

Quote 2 - Dat is best een lastige afweging om echt te aan te geven van 'ik wil niet dat ik in een bepaald deterministisch scenario uitkomen in een bepaalde richting', wat dus toch meer gebaseerd is op expert judgement. Het kan best zijn dat een kavelhouder te streng is geweest bijvoorbeeld in de effecten op krediet dat dat dan toch uitkomt dat krediet in dat scenario minder aantrekkelijk is, en dat heeft dan wel meteen consequenties voor je allocatie adviezen. (...) Ik denk dat expert judgement en inschatting en sowieso al altijd speelde bij deterministische scenario's. (...) Ik denk dat er bij klimaatscenario's de verhouding expert judgement misschien wel sterker is dan bij stagflatie of deflatie, omdat je bij de laatste toch meer in ieder geval meer informatie of een voorstelling vanuit het verleden hebt.

Quote 3 - Het lastige van dit figuur en over het hele allocatie advies, is dat de signalen van vastgoed ontzettend gunstig waren en dat is heel erg lastig. In die zin, want waarom zou het niet een gigantische vastgoed allocatie naar toe kunnen? Want op papier leverde dat meer rendement en minder risico.

Quote 4 – Dus er is nu voor gekozen eigenlijk Alladin te gebruiken. Alladin is een systeem wat fysieke effecten kan meenemen, maar ook ten dele maar. En dat hebben we ook gewoon onderstreept in een aantal rapportages en duidelijk gemaakt, dat we er een gevoel bij krijgen, maar dat het nog niet het volledige beeld is. Dat is ook wat je ziet vanuit het Engelse actuariael gezelschap, die zei ook specifiek: klimaateffecten van de modellen die er nu zijn, worden gewoon onderschat.

Quote 5 - Als je echt aan de knoppen zou willen draaien – je wil je fysieke klimaatrisico verlagen en je gaat kijken welke asset classes het laagste risico hebben - dan wil je dat wel op een consistente manier doen. Want anders zou vooral welke partij je daarvoor gebruikt of welke data je gebruikt, bepalen hoe je aan die knoppen gaat draaien. Daar zou ik me op dit moment niet aan willen overleveren, dat is nogal een groot vertrouwen in wat ook een potentieel grote impact heeft. Om er later achter te komen dat we niet helemaal goed aan die knoppen hebben gedraaid.

Quote 6 – In principe is het voor ons iets lastiger om invulling te geven aan ESG omdat natuurlijk, wat hoe dieper in detail in de portefeuille je kunt ingrijpen, hoe handiger. Dit is het makkelijkst op het niveau van losse asset categorieën en waar wij over adviseren zijn de ALM bouwblokken. (...) Als bouwblokken veranderen, dan kan het zijn dat door die verschuiving het moeilijker is ESG doelstellingen te realiseren, omdat je daar in het ene bouwblok minder in kan doen dan in het andere. Dat kunnen we dan wel zichtbaar maken en is in ieder geval een mooie stap.

Quote 7 - De ALM heeft allerlei sommen en bandbreedtes voor rendement en risicobereidheid. Binnen die bandbreedtes kan ik dus verschillende keuzes in de portefeuille maken, duurzame keuzes en minder duurzame keuzes. Zolang ik een pensioenresultaat kan beloven die met een bepaalde mate van waarschijnlijkheid op langere termijn geleverd gaat worden, dat laat de ALM analyse zien, dan houd ik nog steeds bewegingsruimte om keuzes te maken in duurzaamheid. Dus dat maakt 3D beleggen ook mogelijk.

Quote 8 – Binnen klimaat focussen we nu echt op de energietransitie, omdat je ziet dat rond de 50% van de wereldwijde uitstoot van broeikasgassen uit de energiesector komt. Dus als je echt een verschil wil maken in de wereld, is dat een goede plek om te starten. Dus dat is vanuit die outside-in gedachte van: waar is het kapitaal nodig? Bij de energietransitie. Vervolgens binnen de energietransitie: Welke uitdagingen zijn daar specifiek waar beleggers aan kunnen bijdragen? Dan kijken we naar impact investeringen die we kunnen meten en weten.

Quote 9 - Het gaat meer om het belief dat als je op de korte termijn gelooft dat marktontwikkelingen niet goed te voorspellen zijn. Je zou ook kunnen zeggen, klimaatverandering is niet iets wat alleen op de korte termijn speelt, maar ook op de lange termijn. Maar dan nog, het acteren op het niet correct ingeprijsd zijn van klimaatrisico's gaat



ervan uit dat jij een betere visie hebt dan wat er standaard in de markt ingeprijsd is. Ja, dat is wel echt heel anders dan hoe de opzet van het beleggingsbeleid tot nu toe is geweest.

Quote 10 – Waar ik op zich in geloof is de stuurrichting van kapitaal op grote schaal, maar dat is vele malen groter dan wat PFZW is en ooit zal zijn. Ik zie niet de meerwaarde in engagement, en zie vrij beperkt de resultaten daarvan. Dat wij onze portefeuille verduurzamen, zet ook niet per se zoden aan de dijk; voor ons 10 anderen die het aandeel wil kopen en dan zijn wij niet in gesprek met zo'n bedrijf. De impact die wij claimen is vooral de impact gemaakt door een bedrijf zelf; die er waarschijnlijk ook zou zijn geweest als wij niet geïnvesteerd hadden. Onze toegevoegde waarde is daarin nihil, niets anders dan een soort marktsignaal, waarin we denk ik wel een voorloper zijn samen met andere Nederlandse partijen. Maar ik heb niet de indruk dat wij een duurzamere wereld creëren hier vanuit Zeist.

Quote 11 – Het probleem is dat het bij klimaat niet over (meetbare) risico's gaat, maar om (onmeetbare) onzekerheden en ambiguïteiten. Er is sprake een stapeling daarvan: de toekomst van het klimaat is onzeker, hoe dat de economie zal raken is onzeker, en hoe dat beleggingen zal raken is onzeker. En hoe al die lagen van onzekerheid via terugkoppelmechanismen verder op elkaar inwerken, is ook onzeker.

Quote 12 – Kijk, de fysieke trends zijn duidelijk genoeg en de fysieke consequenties, dat heeft men ook redelijk duidelijk. Ik bedoel, je kunt het klimaat waarschijnlijk beter voorspellen dan de dollarkoers.

Quote 13 - Ik denk dat we binnen nu en pak hem beet 10 jaar, opereren in een heel andere omgeving. Een omgeving waarin van pensioenfondsen en andere financiers gevraagd wordt van: wat deed jij in de oorlog? Weet je nog waar je was, toen we het nog konden regelen. 10 jaar is wellicht kort, maar dan 20 jaar. Onze kinderen, die gaan dit straks naar ons hoofd gooien: je wist het, maar je deed niks. Ja, marginaal misschien een klein beetje, maar we worden niet afgemeten aan wat we eraan doen, we worden afgemeten aan doen alsof.

Quote 14 Ik denk dat PFZW echt een bijdrage kan leveren, deels door de trends in transitie zien en erin beleggen, maar ook grotendeels door de voorbeeldfunctie, dat je andere beleggers op de markt meetrekt met: 'het kan ook anders'. Dus een voorbeeld over hoe ik over energietransitie denk. (...) Grote olie- en gasbedrijven staan voor de keuze: als ik mijn kapitaal inzet in duurzame energie, kannibaliseer ik dan niet mijn legacy business? Dat is iets wat een wat een economische inefficiëntie introduceert. De toekomstgerichte beleggingen worden niet zuiver besloten, namelijk door partijen die een hoop te verliezen hebben. Dus PFZW of een financiële partij kan (...) die trends zien en daar beleggingsmogelijkheden in vinden en ook creëren. (...) Dat geeft nieuwe kansen en risico's. Dat kan op korte termijn slecht uitpakken, dat weet je niet. Het kan even duren voordat je daar rendement van ziet, of dat kan heel lang duren.

Quote 15 – Dit is je basisscenario en hoe je het beestje ook wendt of keert, uiteindelijk zijn er maar 3 factoren echt belangrijk: inflatie, rente en economische groei, lees aandelenrendementen. En dat kan mee of tegenzitten, dus dan heb je eigenlijk maar 8 mogelijkheden. Een paar mogelijkheden zijn zeer onwaarschijnlijk of onnuttig, dus dan heb je maar een stuk of 5 stress scenario's. (...) Eigenlijk heb je helemaal geen storytelling nodig. Sterker nog, je kan ook zeggen van: (...) het maakt niet uit of er een oliecrisis is, of dat China op slot gaat, of dat Saudi-Arabië in de fik gaat; uiteindelijk zijn het allemaal positieve of negatieve aanbodschokken en kom je in stagflatie terecht. Dit heeft het nooit gehaald, omdat je merkt dat bestuurders gevoel willen hebben bij een stagflatie scenario. Wat is dat dan? Wat gebeurt er in zo'n scenario? Dan kan ik niet aankomen met: een positieve of negatieve aanbod schok maakt niet uit waar die vandaan komt, je komt hier op uit.

Quote 16 - Ik denk dus dat als we een verkeerde inschatting maken over de manier waarop die klimaatrisico's impact kunnen hebben, dat dat impact kan hebben op risico-rendement. En misschien ook wel dat we klimaatverandering op zichzelf verkeerd inschatten.

Quote 17 – Een bedrijf kan wel proberen de transitie mee te maken, maar dat wil niet zeggen of ik daarin wil investeren. Misschien heb ik wel geen geloof heb dat ze wendbaar genoeg zijn; dat als ze een paar wijzigingen doen, er ook zijn. Ik kan wel geloven in de transitie naar andere energiebronnen, maar of ik geloof in waterstof, windenergie, zonne-energie of misschien nog wel iets heel anders, geothermie? Ik weet niet welke er gaat winnen. Daarmee zit er zoveel onzekerheid dat ik hier niet op zou positioneren. En in mijn analyse van een windenergie bedrijf, zal ik dus meenemen dat windenergie mogelijk niet aantrekkelijk kan zijn.

Quote 18 – Wat volgens mij met de paplepel ingegoten is, is het idee dat er altijd iets van een 'reversal to the mean' is. Je hebt een dip, maar je werkt je er wel weer uit. Terwijl een natuurkundige of iemand die fysische wetenschap heeft gestudeerd, die weet dat het kapot kan. Dan heb je een heel andere koers om op te varen, dat is een absolute koers, niet een relatieve koers. En dat is een totaal ander vak. Dit zijn allemaal relatieve jongens: die zijn allang blij als ze de benchmark verslaan met x basispunten. Maar als je straks in een heel ander scenario terecht komt, waarbij het echt gewoon kapot gaat, dat is onvoorstelbaar. (...) Dus de wolk is niet groot, of eigenlijk niet creatief genoeg om dat soort scenario zeg maar te bedenken (...). Ik denk dat we nog lang niet creatief genoeg in het doordenken wat er allemaal kan gebeuren. Dat zit volgens mij niet in onze modellen. Ik denk dat heel verstandig zou zijn om ook als PGGM veel meer met systeemdenkers in zee te gaan. Met transitie denkers die inderdaad creatief genoeg zijn om dit soort ontwikkelingen in beeld te brengen.

Quote 19 - Als je natuurlijk de aanname hebt dat transitie risicopremies nog niet in de prijs zitten, dat er een tijd komt dat die wel ingeprijsd gaat worden; dan kan je maar beter aan de goede kant kunt zitten. (...) Maar dat is alleen nog nooit expliciet gesteld. Daar wil ik dan wel achter zien te komen of dat inderdaad een belieft is. Dus als jij gelooft dat in dit geval de overheid gaat optreden, waardoor er transitie risico's ontstaan voor bedrijven die die niet

daarop zijn voorbereid, dan snap ik wel wat er wat dat betekent. Maar het is wel een aanname. (...) Een oliemaatschappij is dan stranded, als de CO2 prijs heel hoog is. Maar als er helemaal niet wordt ingegrepen en als we naar een 5, 6 graden scenario ingaan, dan is het windmolenpark stranded.

Quote 20 - Het verhaal kwam weer met het basis scenario: jullie doen niks met de grote transitie in de wereld. Transitie zoals de financiële transitie die banken helemaal buitenspel zet door allerlei nieuwe technologieën, geopolitiek, migratie, dat zit er allemaal niet in. Het zit er heel impliciet in en het eerlijke antwoord is dat we er ook niks mee kunnen. Dus toen hebben we eigenlijk het megatrends notitie als bijna een soort zoethoudertje opgesteld. Toen hebben we gemeld: we kijken wel naar die megatrends en dit is ongeveer wat er gebeurt. We denken dat als het mee of tegenzit, dat dit gebeurt, maar je kan het niet weten. En sterker nog, als het heel extreem is, dan kom je weer op die stress scenario's uit die we al hebben. (...) Maar we doen er niks mee, en ik zou nog steeds niet weten wat we er wel mee moeten, want je weet niet of het mee of tegen gaat vallen.

Quote 21 - Kan je hiermee je portefeuille sturen? Dus geeft dit nou het signaal van: doe nou wat meer aandelen of vastgoed. Nou ja, dat is het hoofdpunt wat wij maakten in die notitie vorige keer. Ja, voor ons is uiteindelijk de toets: we willen niet alleen er over praten, maar ook rekening houden met klimaat in de portefeuille. Dat is op dit moment gewoon nog op het niveau van beleggingscategorieën nog steeds moeilijk tot onmogelijk.

Quote 22 [Als reactie op de Alladin Climate module resultaten:] Het is denk ik het beste wat we hebben. Ik denk gewoon dat je daar een groot uitroepteken bij moet zetten met: weet dat dit slechts een deel van alle effecten kwantificeert en dat een overgroot deel nog niet in kaart gebracht kan worden. Dus dat je niet moet denken dat dit de impact is, en daarmee basta. Dit is al veel groter dan wat de cijfers aantonen, alleen hebben we geen idee van de orde grootte van de richting of hoe dat precies uitwerkt. Of het is niet te modelleren of er is niet genoeg data voor, er zijn genoeg beperkingen, dit is het beste wat we kunnen.

Quote 23 Ik vind het belangrijk als pensioenfondsen dat je dus niet rücksichtslos een kant opdraait en eigenlijk dan ook wel weer heel veel opgeeft. Met name dus, welke sectoren en bedrijven wil je dan nog in beleggen? Daar is die keuze denk ik het belangrijkste. (...) Je moet een balans zoeken tussen een beleggingsbeleid dat als geheel enigszins robuust is voor zowel een 1,5 graden scenario – het zou nog steeds kunnen in theorie – en misschien wel een 3 graden scenario. Maar niet volledig inzetten op een 1,5 graden scenario, want dat heeft ook gewoon risico's die je dan niet afdekt. Maar ook niet natuurlijk volledig laten varen dat we als wereld nog wel ambities hebben om een bepaalde kant op te bewegen. Want dat gaat gewoon uiteindelijk potentieel impact hebben op bepaalde sectoren.

## Appendix 2 – Overview 2nd order themes of data structure RQ1, sorted by aggregate dimensions

### 1. How to act on climate change effects

Act on transitions with low- or no regret options  
Climate change effects already identified in certain asset classes  
Climate change effects are underestimated  
Climate change effects / NGFS first results show limited effects  
Climate change effects important to develop own view  
Climate change insights will improve over time  
Climate change new scenarios to increase effects on portfolio  
Climate risk less relevant on SAA level, more on asset level  
Climate risk managed through KRIs CO2 intensity and Paris Alignment  
Climate risk need to use credible sources  
Climate risk risk department responsible monitoring  
Difference ambition 1.5 degree and realistic expectation 3 degree world  
Emerging markets mostly affected by climate change  
ESG risk gross and net too immature in 2015  
Expert judgment so be careful in changes based on that  
In SAA combination top-down macroanalysis and bottom-up analysis way forward

### 2. 3D investing is iterative process

3D beleggen meer actief beleggen  
3D investment cases work in progress  
3D beleggen iteratief proces  
3D investing many sustainability goals at same time  
Tegenstem over consequenties en rendement te weinig gehoord  
Beleggen is meer kunst dan wetenschap, moeilijk te erkennen  
Pensioenresultaat staat centraal voor pensioenfondsen  
PFZW geeft opdracht, PGGM voert uit, afstemmen tempo van change  
3D nog niet klaar voor allocatie advies wijziging  
3D credit discussion on implications third D  
3D credit more easy than 3D equities  
Verantwoorde basis waarschijnlijk kleiner universum  
3D in ALM is difficult

### 3. Setting & steering sustainability targets

Biodiversity potential in a few asset classes, inside and outside current portfolio  
CO2 target important, also because of stakeholders  
CO2 target while Paris alignment is more forward looking  
Global south need investment, but risk also higher  
Impact investing clear to pension participants  
Impact investing climate solutions  
Impact investing is just investing  
Impact investing limited because of constraints

Impact investing measurable output-outcome high threshold  
Impact investing intentionality important  
Impact investing relates to transitions  
Impact investing theory of change and narrative important  
Impact investment important and tangible for beneficiaries  
Impact potential is next step  
Impact target challenging to set  
Insurance is risk mitigation, not sustainable investing  
Not all asset classes have climate related target  
Participant research important for impact preferences  
PFZW needs to decide on sustainability targets  
Regulatory requirement for sustainability targets  
SAA sustainability considerations already 2013  
SDI target is on impact-aligned investments  
Sector or region level in SAA not likely  
Smaller investment universe to mitigate negative impact  
So far, steering sustainability targets not effective  
Specific mandate to stimulate sustainable investing  
Stakeholders to Strategy 2030/3D investing process  
Steering on impact bridge too far  
Steering on impact iterative process  
Steering on impact structured in committee  
Sustainability data different maturity financial data  
Sustainability data insufficient for decisionmaking  
Sustainability target important to be able to steer  
Sustainability targets now achieved by where is possible, not top-down steering  
Sustainability targets on portfolio level matter  
Transparency on targets important  
Zorg & Welzijn sector expliciet in beleggen  
Academic evidence important in deciding on policy

**4. Steering risk, return, impact on portfolio level**

Risk, return, impact afweging is nog zoeken  
Impact potential per asset class meewegen  
Potential to steer on lowering climate risk  
Identify transition/climate risk is work in progress  
Allocation signals are sensitive to inputs  
ALM decisions matter most to investment portfolio  
Room for integration sustainability in SAA  
Goal of climate integration is to find useful allocation signal  
ALM is behind, but has some ideas for sustainability integration  
As long as climate risk doesn't affect growth, interest and inflation, it does not change  
ALM  
Stochastic modelling not suitable for climate integration

Investment policy is lacking on portfolio-SAA level  
Benchmark spiegel voor monitoring, maar geen doel  
Liquidity is not actively considered like sustainability  
In portfolio, asset classes have their own role  
Renteafdekking veel geld verloren, maar weinig aandacht gekregen omdat werking bekend is  
Active risk, return, impact consideration is way forward  
Different risk measures used and valued within PGGM  
Risk framework goal new risk measures to implement 3D investing, to have risk, return-impact consideration  
Risk, return, impact afweging is nog zoeken  
Separate sustainability/impact mandate not end solution  
Realizing impact most important in impact investing  
(Un)clear whether impact can cost return  
Risk, return, impact consideration possible if you know risk  
Strategy wants to be best advisor on sustainable investing  
Total portfolio management is useful

#### **5. Conventional SAA explanations**

Risk measures portfolio explained  
ALM-SAA connection described  
Base scenario explained  
PFZW, PGGM staff role in process  
Certain asset classes explained  
Risk measures portfolio explained  
SAA process include many sources and assumptions  
SAA process and roles explained  
Scenario memo explained  
Strategy/FA not responsible for execution

### **Appendix 3 – Overview 2nd order themes of data structure RQ2, sorted by aggregate dimensions**

#### **1. Investment beliefs coherence**

Agnostic on climate scenario due to inv belief 2  
Explanation mission/objective PFZW  
Inv belief 2 and 4 at odds  
Inv belief 2 don't know tomorrow, so little active management  
Inv belief 2 short term and 4-5 long term  
Inv belief 4 can potentially provide return  
Inv belief 4 is a real belief  
Inv belief 4-5 a better portfolio is not defined  
Inv belief 5 appendix, cannot prove it  
Inv belief 5 consideration how far to go

Inv belief 5 taking responsibility as investor  
Inv beliefs in investment practice active consideration  
Investment belief important to motivate academically  
Investment beliefs are wishing, because board acts on short term  
Investment beliefs mandatory and prominent displayed  
PFZW bestuur kiest richting en moet vasthouden  
PFZW monitors on portfolio level KPIs

## **2. Several aspects of investor impact**

Inv impact differs per asset class  
Inclusion (verantwoorde basis) is motivating your investment universe  
Inv Impact through direct influence on investments-set up asset class  
Inv impact through impact investments  
Inv Impact as investor you are at other side of profit distribution than employee  
Inv Impact through engagement  
PGGM does not want to stand alone in sustainability decisions, but to face uncertainty with market is  
Inv impact through capital allocation  
Inv impact through market standards, market view and by being transparent  
PGGM's portfolio small in total investment market, limited influence  
Be clear on that governments and companies also need to act  
How you view inv impact PGGM differs per employee

## **3. Transitions are uncertain, acting depends on your perspective**

Climate change effects changes world, so also e.g. mean reversion  
Efficient markets depend on the investor's perspective  
Megatrends geïdentificeerd en beschreven  
Profit from transitions if you are on the right side of it  
Transition thinkers needed to obtain transition view  
Transitions are priced in markets  
Transitions are uncertain, so difficult to act  
Transitions uncertain, so if you are on wrong side, lose  
Transition effects are lacking in SAA/portfolio construction  
Transitions are clear, but not how financial markets are affected

## **4. Change process Strategy 2030**

Concerns on change process Strategy 2030  
Elements of change process required  
PFZW, PGGM staff role in process



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