

The Prudent Person Rule

A Portrait Based on Dutch Pension Fund Annual Reports

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osQF


11 - 12 April, 2025

Work in progress. Views expressed are those of the authors and do not necessarily reflect official positions of their employers.

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[Code](#) [Issues 2](#) [Pull requests](#) [Actions](#) [Projects](#) [Security](#) [Insights](#)

Replicate Picault & Renault (2017) #3

 Open

 **almiggggg** opened on Apr 14, 2023 · edited by almiggggg Edits ▾ ...

Reproduce Picault & Renault (2017)

I am attempting to replicate the findings of Picault & Renault (2017) by using the `compute_PicaultRenault_scores` function. However, I am having difficulty replicating Figure 6 on page 24, as the values for the MC are too low. I wanted to replicate Figure 6 on their page 24. As far as I am concerned this should work in the following way:

```
docs <- ECB_press_conferences %>% quanteda::corpus_subset(.date >= "2000-01-01") %>%
  quanteda::corpus_reshape("documents")
docvars(docs, c("MP", "EC")) <- compute_PicaultRenault_scores(docs, min_ngram = 2, return_dfm = F)
data <- as.data.frame(PicaultRenault_data)
data$date <- head(docs$date, -3)
docs <- docs %>% quanteda::corpus_subset(.date >= "2006-01-01" & .date <= "2014-12-31")
data <- data[data$date >= "2006-01-01" & data$date <= "2014-12-31", ]

length(data$date) #not 106 (?)

data$MP <- docs$MP
data$EC <- docs$EC

reg1 <- lm(R_t ~ Surprise + `R_t-1` + MP + EC ,data = data)
summary(reg1)
length(data$MRR_t)
plot( 1:length(docs$MP),docs$MP, '1')
```



Annick van Ool



Senior policy advisor at
the Dutch Central Bank

“The Dutch Pension Act states that pension funds should invest their assets in the sole interest of their beneficiaries. This is the so-called **prudent person rule**”

(Bauer, Broeders, Van Ool, 2023, Journal of Pension Economics & Finance)

What does it mean: A prudent person?



A prudent person
managing a Dutch
pension fund

Look around you: who? And would you give a different answer 10 years ago?

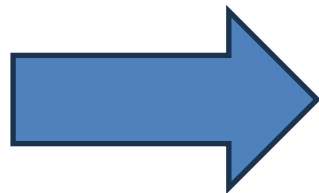
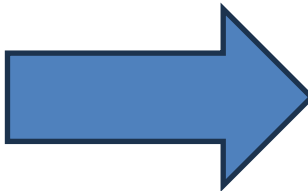
Open norm

Implementation = Latent

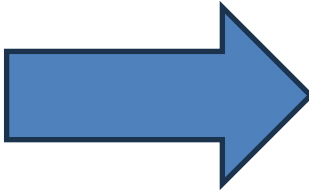
Time-varying

Heterogeneous

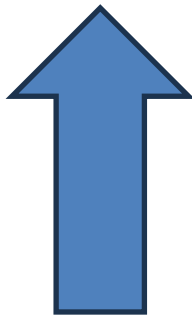
This paper: Attention to Prudent Person Rule by Dutch Pension funds



$$PPR_{i,k,t}$$



$$Y_{i,t+1}$$



$$X_{i,t-1}$$

$i = 1, \dots, 167$
 $k = 1, \dots, 4$
 $t = 2003, \dots, 2023$
Unbalanced panel
of 1827 annual reports.

Outline



A prudent person
managing a Dutch
pension fund

Introduction

1- Why the focus on Dutch pension funds?

2 - Collecting and processing the corpus of annual reports

3 - PPR Attention Scores : Computation, trends and peer analysis

4- Determinants and effects

Conclusion

Dutch Pension Funds are massive



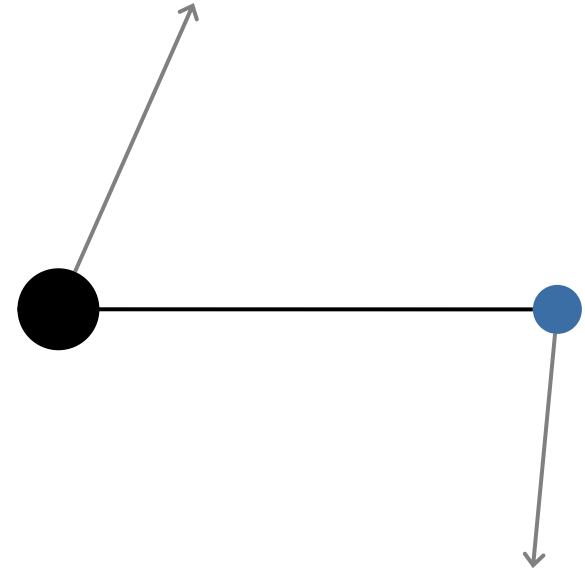
Two-thirds of all euro area occupational pension savings come from the Dutch sector.

ABP has over 500 Billion EUR of AUM and is the largest European occupational pension fund.

PFZW has over 270 billion EUR of AUM (managed by PGGM)

Dutch Pension Funds Are Active Investors (1/3)

2003: IORP I



2007: Zembla TV
programme
showing Dutch
pension funds
invested in
cluster bombs
and land mines

Pension funds invest in weapons trade

March 19, 2007

DutchNews

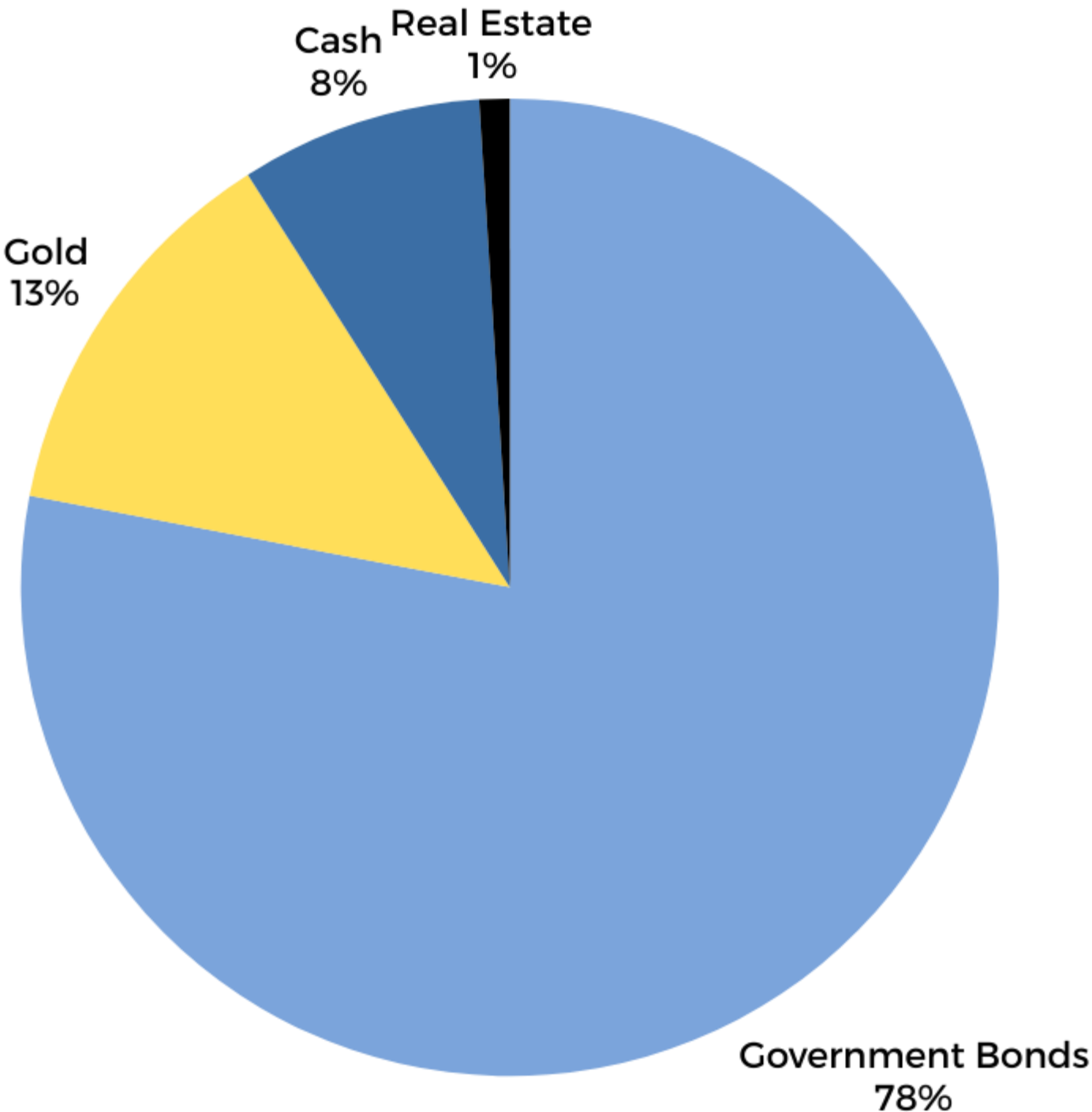
Dutch ABP, PGGM say sold shares in weapons producers

By Reuters

August 9, 2007 11:10 PM GMT+2 · Updated 18 years ago



Dutch Pension Funds Are Active Investors (2/3)



Pension fund allocation for Vereenigde Glasfabrieken, 2008

Regulator's View (DNB)

Not Prudent

Excessive gold exposure → Ordered reduction to 2-3%

Court Ruling

Prudent

Overtured DNB's directive, emphasizing a case-specific application of the prudent person rule

Court overturns Dutch regulator's order to slash gold allocation

By [Leen Preesman](#) | 16 March 2012



Dutch regulator forced to pay €4.8m after failing to convince high court

By [Nelleke Trappenburg](#) and [Leen Preesman](#) | 12 December 2014

Court orders DNB to compensate pension fund for ordering it to divest gold holdings

Dutch Pension Funds Are Active Investors (3/3)

One of world's biggest pension funds to stop investing in fossil fuels

ABP says it will no longer invest in sector and will sell €15bn of holdings by first quarter of 2023

The
Guardian

Europe's Largest Pension Fund Sold Tesla Stake Over Musk's Pay



Elon Musk. Photographer: Samuel Corum/Bloomberg

By [Cagan Koc](#)

January 12, 2025 at 9:43 PM GMT+1

Save

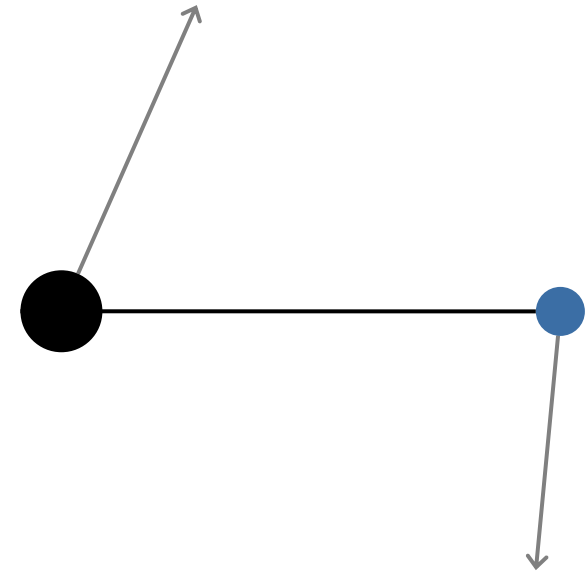
Translate

Europe's largest pension fund sold its entire €571 million (\$585 million) stake in [Tesla Inc.](#) in the third quarter partly due to disagreement with Elon Musk's remuneration package.

"We had a problem" with Musk's pay package, a spokesperson for [Stichting Pensioenfondsen ABP](#) said by phone on Sunday. The fund also considered costs, return and responsible investment requirements in its decision to sell its investment.

Controversy regarding Pension Fund Decisions

2003: IORP I



2024-2025:
Politicians
question Dutch
pension fund
management

Kamer wil dat pensioenfondsen niet meer activistisch beleggen: 'Rendement moet op plek 1, 2 en 3 staan'

Door ONZE PARLEMENTAIRE REDACTIE
04 jun. 2024 in FINANCIEEL

De Telegraaf

Dutch defence minister locks horns with pension sector over defence investments

Pension funds bear responsibility for weapons and ammunition shortages in the Netherlands because they are investing too little, says Kajsa Ollongren

23 February 2024

IPE

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Collecting the Annual Reports: 2003-2023



Processing the reports (1/4)



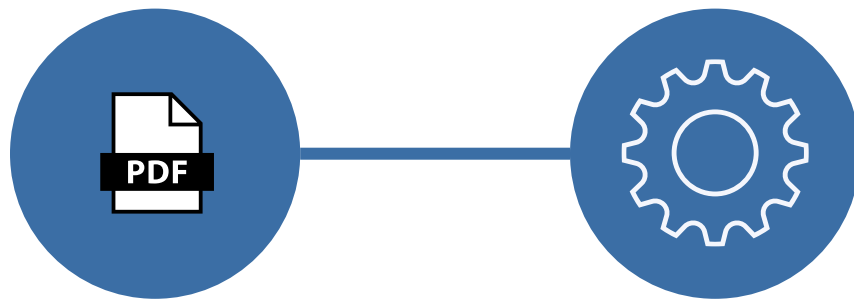
1. Start with highly unstructured PDF text.



Figure 4: ABP Annual Report

Note: Page 13 of the 2023 annual report. A document in PDF format which is highly unstructured

Processing the reports (2/4)



2. Advanced layout parsing to identify page structure (headers, tables, body text) and determine reading order.

```
# Define input and output directories
input_folder = "/content/drive/MyDrive/all_reports"
output_folder = "/content/drive/MyDrive/Output_all_pages_OCR"

# Ensure the output folder exists
os.makedirs(output_folder, exist_ok=True)

# Set environment variables
os.environ['EXTRACT_IMAGES'] = 'False'
os.environ['OCR_ENGINE'] = 'surya' # Change to 'ocrmypdf' or 'None' as needed
os.environ['DEFAULT_LANG'] = 'Dutch' # Change the default language
os.environ['TF_CPP_MIN_LOG_LEVEL'] = '2' # Optional: Suppress TensorFlow INFO and WARNING messages

# Construct the command with the correct options
command = (
    f"marker '{input_folder}' "
    f"--output_dir '{output_folder}' "
    f"--workers 5 "
    f"--force_ocr "
    f"--languages nl"
)

print(f"Running command: {command}") # For debugging

# Execute the command
result = subprocess.run(command, shell=True, capture_output=True, text=True)

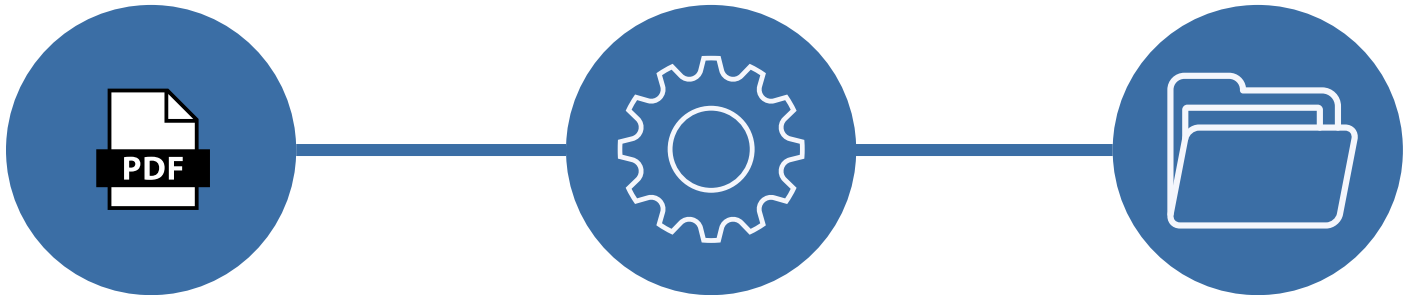
# Check the result and handle errors
if result.returncode != 0:
    print(f"Error running marker command:\n{result.stderr}")
else:
    print("Marker processing completed successfully.")
```

Running command: marker '/content/drive/MyDrive/all_reports' --output_dir '/content/drive/MyDrive/Output_all_pages_OCR' --workers 5 --force_ocr --languages nl

Figure 5: Code Snippet OCR.

Note: We use Google Colab with GPU support to run the OCR engine Syra with Dutch as default language.

Processing the reports (3/4)



3. Markdown File with the pure text. Json file with document stats (appendix).

```
Samen bouwen aan goed pensioen
in een leefbare wereld

Jaarverslag 223
# Inhoud

ABP in een oogopslag 3 Kerncijfers 4 Meerjarenoverzicht 6 Belangrijke gebeurtenissen in 2023 8 Profiel 9 Waardecreatiemodel 10 Overige gegevens 138
Statutaire winstverdeling 139 Actuariële verklaring 140 Controleverklaring van de onafhankelijke accountant 142 Assurance-rapport van de onafhankelijke
accountant 156 SFDR-bijlagen 161 Overige informatie 185 Over dit verslag 186 GRI content index 188 Belangrijkste lidmaatschappen en commitments 193
Personalia 194 Afkortingen en begrippen 198

## Pensioen Dichtbij: In Gesprek

Voor dit jaarverslag gingen twee duo's met elkaar in gesprek: Eva Schoonderbeek en Arno Lammeretz van de Pensioenkamer, en deelnemer Florian van Altena en
uitvoerend bestuurder van ABP Yolanda Verdonk-van Lokven.

Samen drie jaar gewerkt 'onder de motorkap', nu bouwen aan vertrouwen 52 Eva Schoonderbeek, werkzaam bij CNV Arno Lammeretz, werkzaam bij het ministerie
van BZK Pensioen? Zijn wij daar niet te jong voor? Florian van Altena, deelnemer, werkzaam bij het ministerie van BuZa Yolanda Verdonk-van Lokven, lid van
het uitvoerend bestuur van ABP

30
Bestuursverslag 12 Trends en ontwikkelingen 15 Onze strategie 2023-2026 17 Wat onze belanghebbenden belangrijk vinden 20 Resultaten 2023: pensioen als
onderscheidende arbeidsvoorwaarde 24 Resultaten 2023: bijdragen aan leefbare wereld 32 Resultaten 2023: meerwaarde bieden voor deelnemers en werkgevers 46
Resultaten 2023: collectief vertrouwen 49 Resultaten 2023: solide fundament 54 Risicomanagement 57 Governance 62 Verantwoording en toezicht 68 Verslag van
het niet-uitvoerend bestuur 69 Verslag van het verantwoordingsorgaan 72 Oordeel van het verantwoordingsorgaan 78

## Leeswijzer

Pensioen is een ingewikkeld onderwerp. Daarbij komt dat we in ons jaarverslag moeten rapporteren over bepaalde verplichte onderdelen. We proberen alles zo
begrijpelijk mogelijk toe te lichten voor onze lezers, maar soms ontkomen we niet aan het gebruiken van een bepaald begrip. Daarvan geven we een uitleg of
omschrijving in de begrippenlijst achter in ons jaarverslag.

Jaarrekening 84 Jaarrekening 85

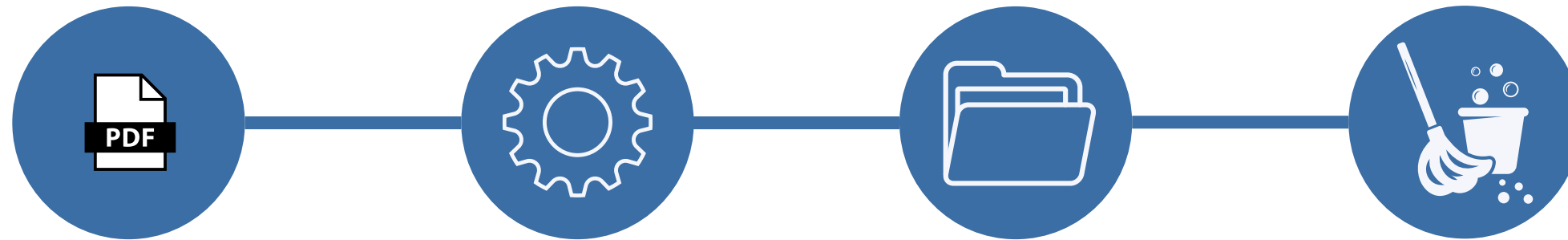
| 3,1 |
|-----|

# Abp In Een Oogopslag Gegevens Per Jaareinde
```

Figure 6: Output Markdown file.

Note: extraced text with reading order perserved. We retain more semantic meaning with table, header and figure structure.

Processing the reports (4/4)



spaCy

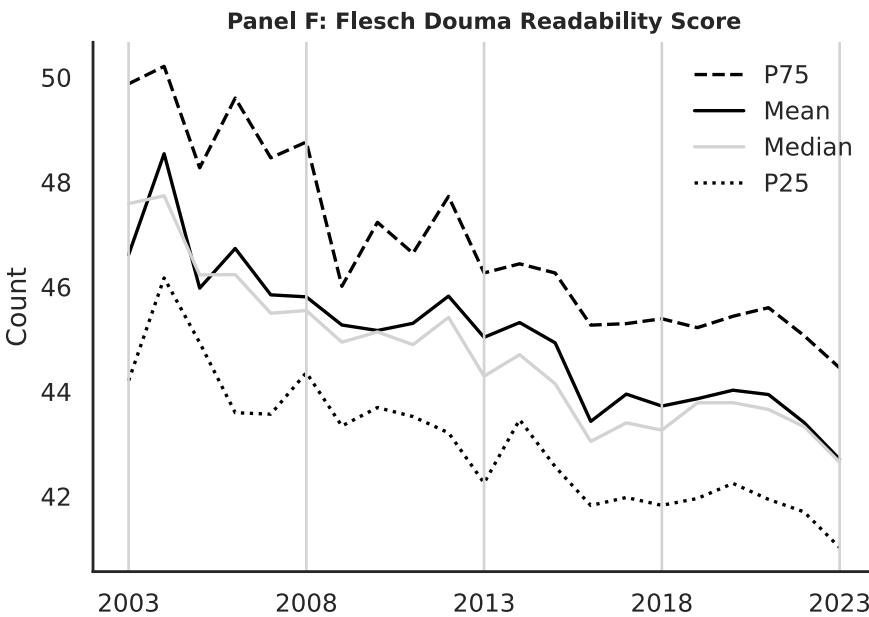
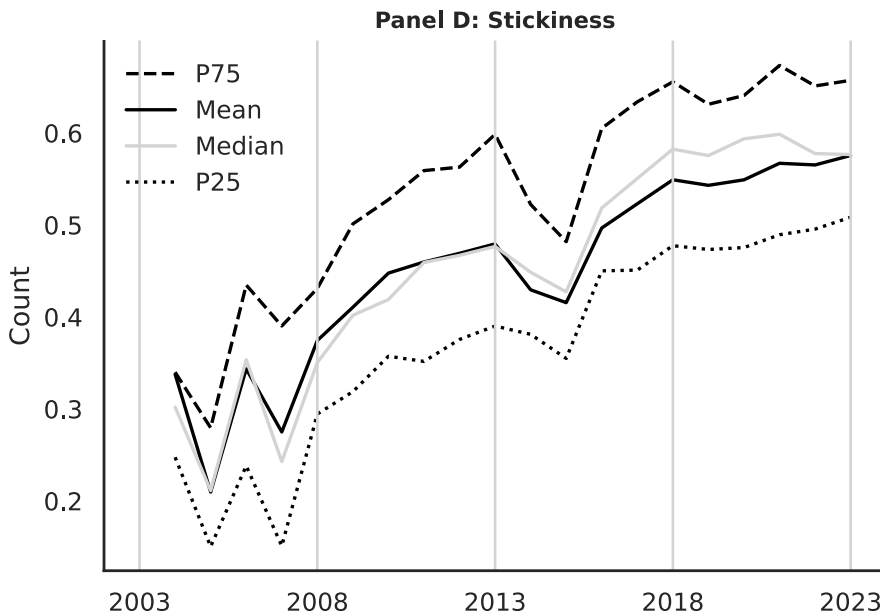
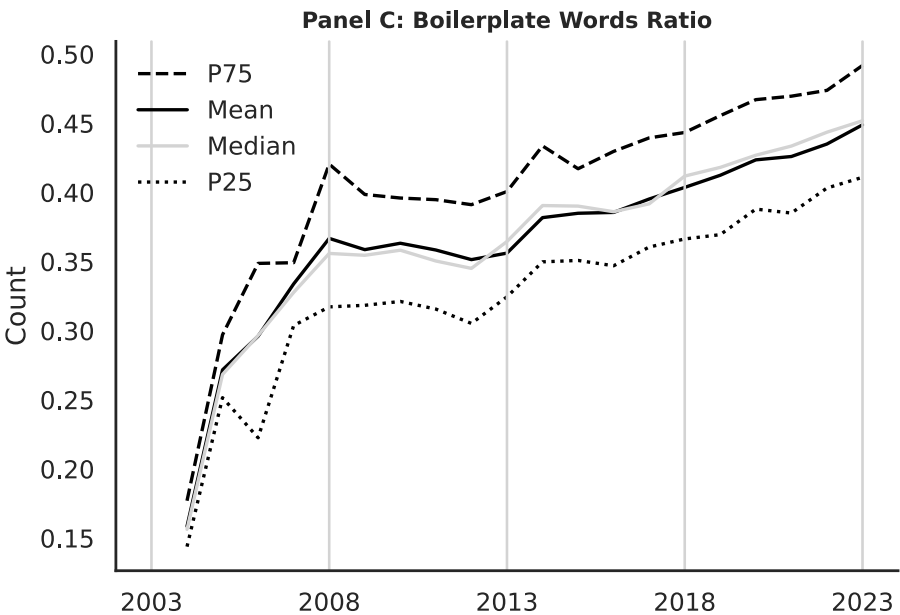
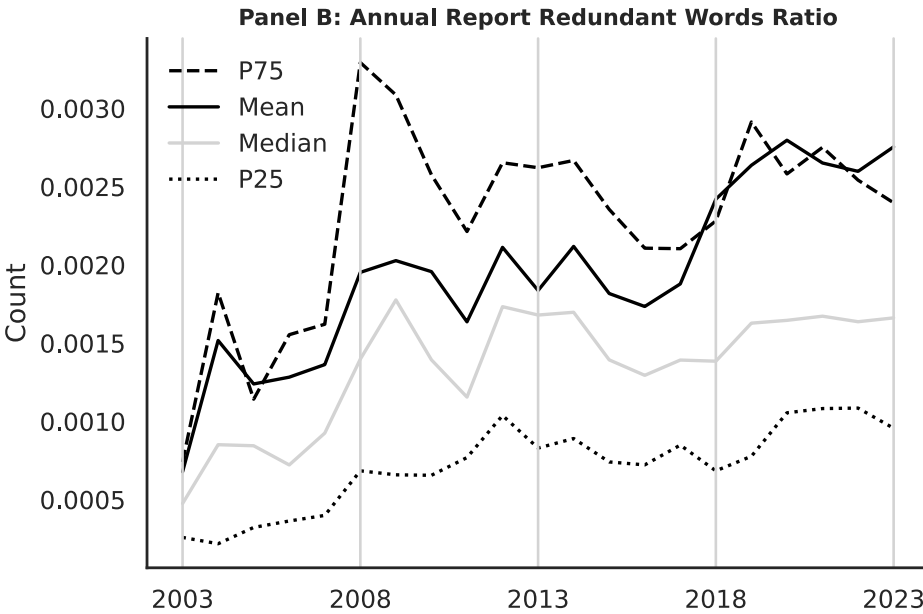
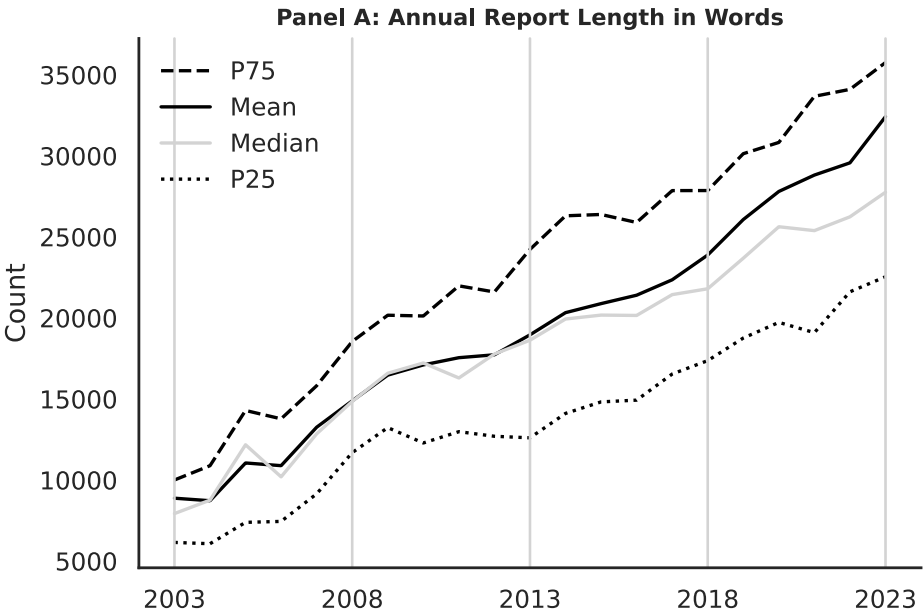
4. Final Text Cleaning

1. Only keep body text.
2. **Lemmatize text** using spaCy with the `nl_core_news_lg` model.
3. Replace identified stopwords, organizations, dates, persons, and non-alphanumeric tokens with **placeholder tags**.
4. Train gensim's phrase models to **detect bigrams and trigrams**.
5. **Concatenate multiword expressions**, e.g., "checks and balances" → "checks_and_balances".
6. **Remove further stopwords and entities** (MWEs containing placeholder tag, standalone tags, single-letter words, and standalone periods)
7. Calculate word frequencies and **exclude** words appearing in fewer than 2% or more than 95% of documents.

Annual reports of Dutch pension funds: 2003-2023

We find:

- 1.Longer reports
- 2.More redundant words
- 3.More boilerplate words
- 4.More sticky words
- 5.and less readability



Outline



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1- Why the focus on Dutch pension funds?

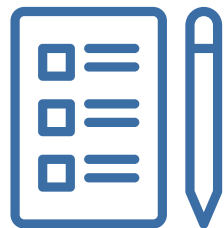
2 - Collecting and processing the corpus of annual reports

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Four PPR components



INVESTMENT POLICY

How the fund chooses its
investments



RISK MANAGEMENT

How the fund manages
its risk



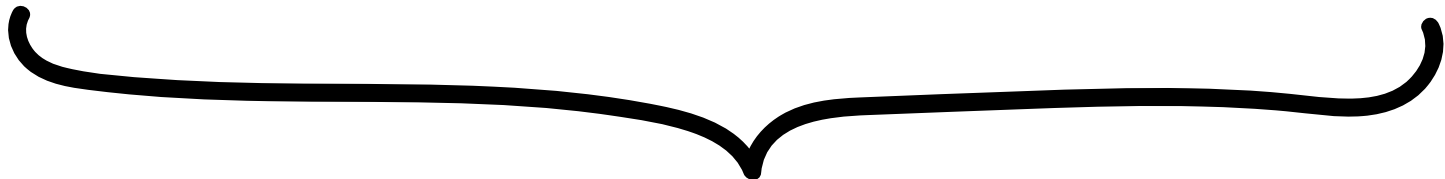
GOVERNANCE

How the fund organizes
its governance



SUSTAINABILITY

How the fund
takes
sustainability into
account



**Van Leeuwen
(2012, 2014)**



**Bauer, Broeders & Van
Ool (2025)**

Seedwords per pillars

INVESTMENT POLICY

- beleggingsbeleid
(**investment policy**)
- beleggingsstrategie
(**investment strategy**)
- beleidsplan (**policy plan**)
- beleggingskader
(**investment framework**)
- beleggingsplan
(**investment framework**)
- beleggingscommissie
(**investment committee**)
- beleggingsstijl
(**investment style**)

RISK MANAGEMENT

- risicomanagement
(**risk management**)
- inflatierisico (inflation
risk)
- valutarisico (**currency risk**)
- kredietrisico (**credit risk**)
- marktrisico (**market risk**)
- liquiditeitsrisico
(**liquidity risk**)
- concentratierisico
(**concentration risk**)
- **cybersecurity**

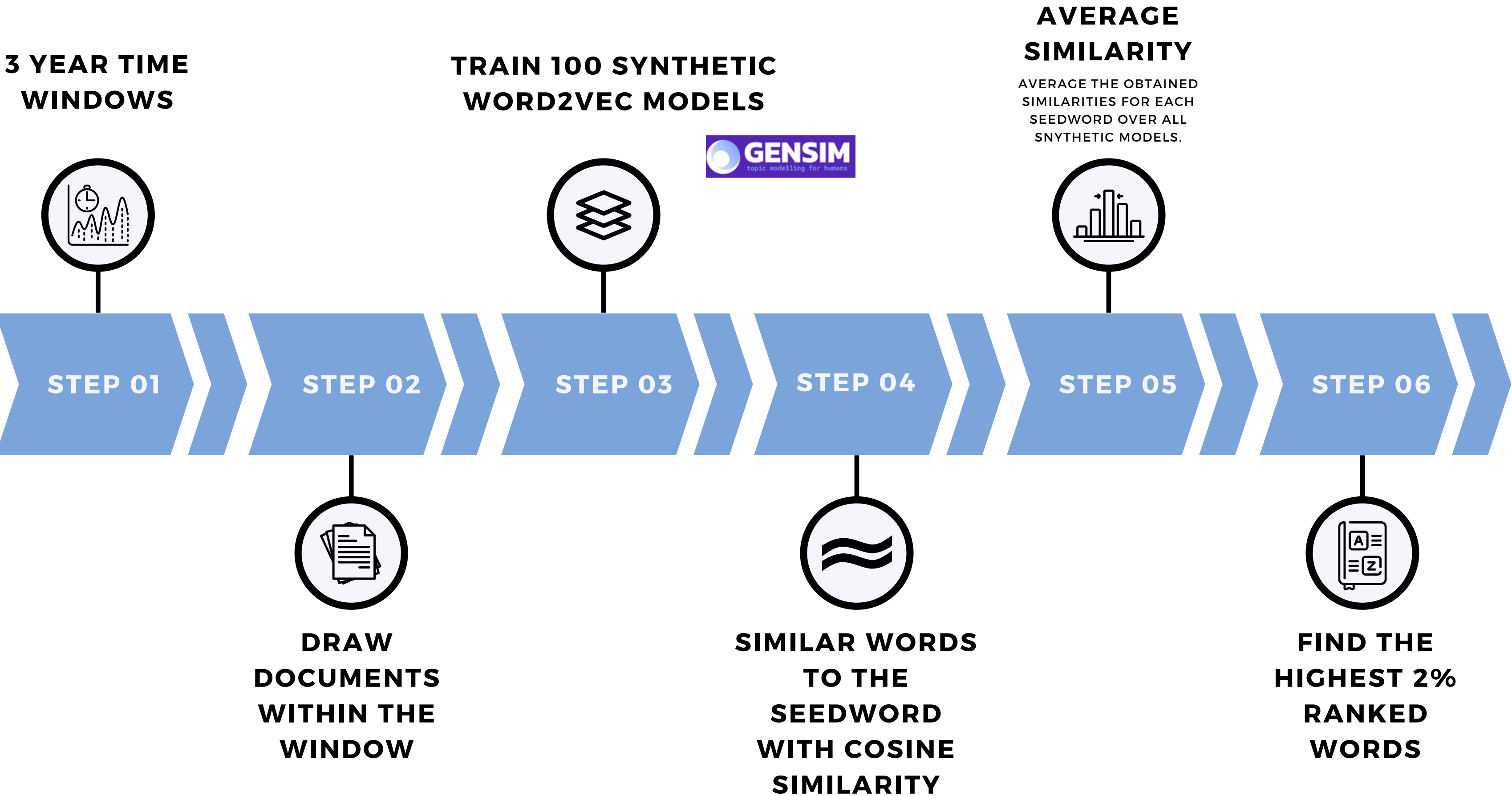
GOVERNANCE

- bestuursmodel
(**governance model**)
- governancestructuur
(**governance structure**)
- governancemodel
(**governance model**)

SUSTAINABILITY

- mensenrechten
(**human rights**)
- sociaal (**social**)
- mvb (**CSR - corporate social responsibility**)
- **screening**
- **esg**
- uitstoot (**emissions**)

Expand Seedwords into Dictionaries using local Word2Vec



**Dictionary per pillar = Union of most similar words to seed words
per period detected using word2vec and cosine similarity**

Pillar 1 - 2005



Pillar 2 - 2005



Pillar 3 - 2005



Pillar Si - 2005



Pillar 1 - 2013



Pillar 2 - 2013



Pillar 3 - 2013



Pillar Si - 2013



Pillar 1 - 2023



Pillar 2 - 2023



Pillar 3 - 2023



Pillar Si - 2023



Measurement: Start counting: PPR attention scores

$PPR_{i,k,t}$ = Percentage of words in the annual report of fund i in year t that belong to the dictionary of pillar k :

- 4 PPR attention scores
- Relative measure, easy to interpret
- The higher, the more attention to the PPR implementation in the report (“Talk”)

PPR Attention in Annual Report of Dutch pension funds

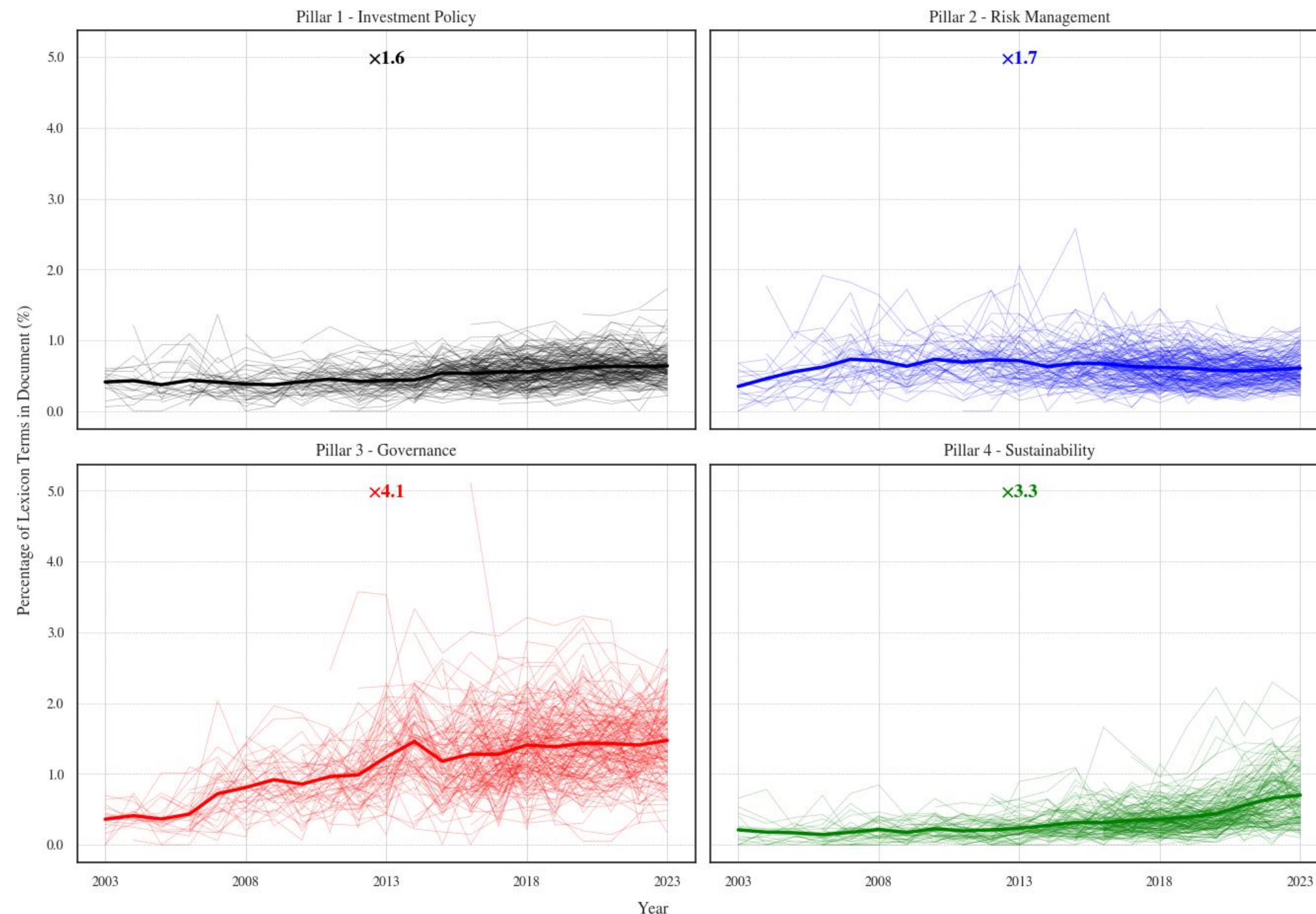


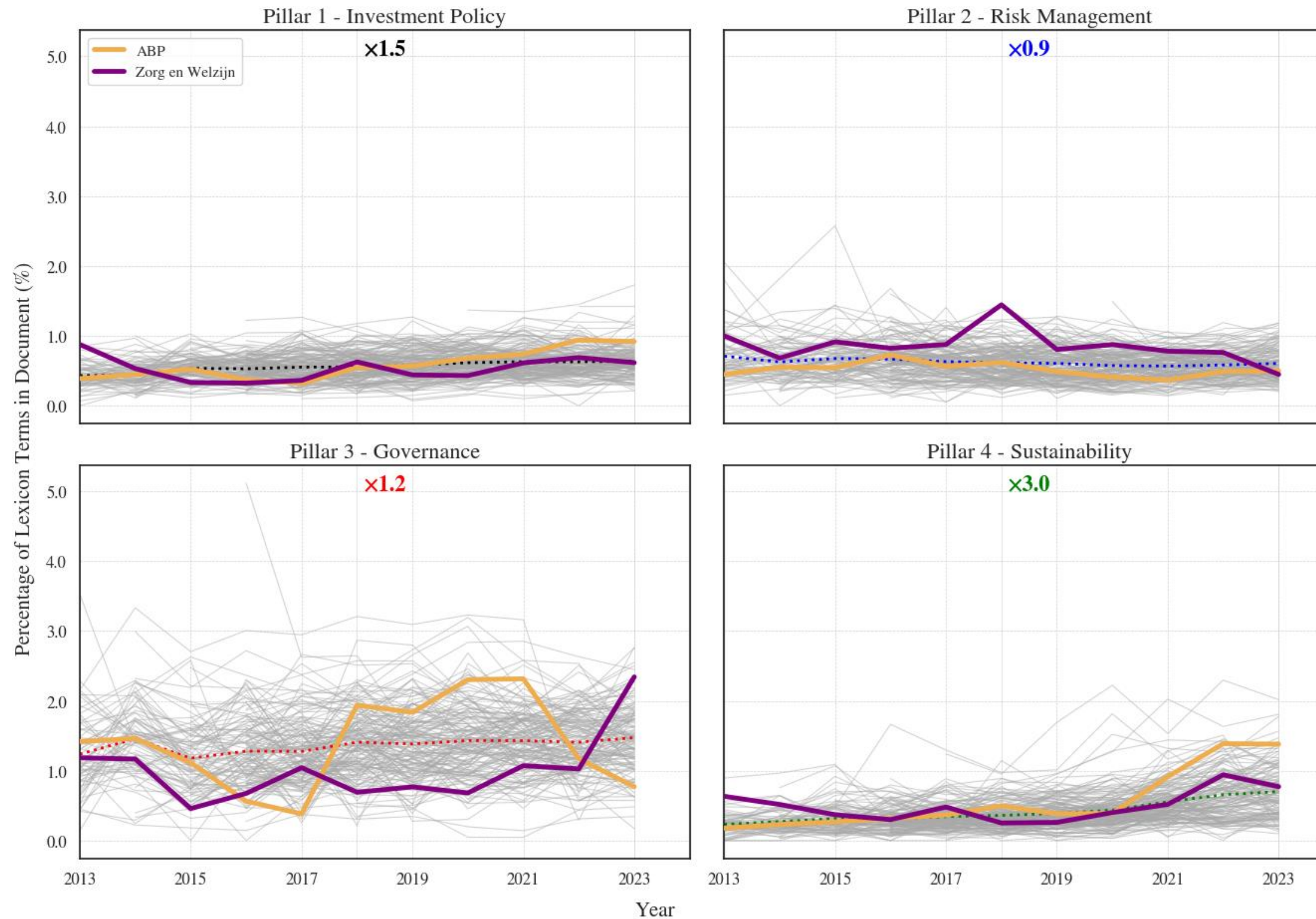
Figure 5: Trends over Time

Note: Thin lines tracks the fund-level scores per pillar over time, while the thick line denotes the overall average. The visible heterogeneity motivates our additional analysis on the panel clustering over time.

2003-2023: All four pillars of the PPR have received more attention

- First decade (2003-2012): Biggest increase in attention for how the company organizes its governance
- Second decade (2013-2023): Biggest increase in attention to sustainability

Peer analysis for the last decade: ABP vs PFZW



PPR Attention Difference for the two largest pension funds:

- ABP attached systematically more attention to investment policy in the last four years
- Consistent with that, ABP attaches substantially more attention to sustainability in the last three years
- PFZW attaches in the last year remarkably more attention to governance

Food for discussion for pension fund boards thanks our framework!

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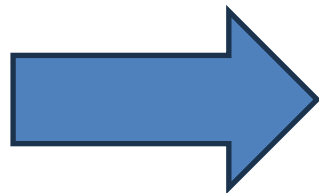
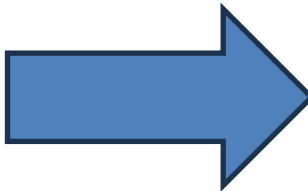
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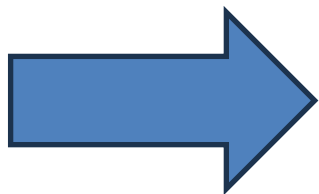
4- Determinants and effects

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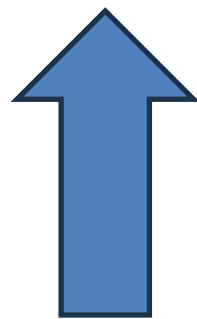
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$$PPR_{i,k,t}$$



$$Y_{i,t+1}$$



$$X_{i,t-1}$$

$i = 1, \dots, 167$
 $k = 1, \dots, 4$
 $t = 2003, \dots, 2023$
Unbalanced panel
of 1827 annual reports.

No Effects of Prudent Person Rule Talk on Return

	Pillar 1 (Inv Policy)	Pillar 2 (Risk Mgmt)	Pillar 3 (Gov)	Pillar SI
Real Funding Ratio	-0.544 (1.912)	-1.149 (2.325)	0.849 (4.964)	4.925* (2.578)
Log(Total Assets)	0.561 (4.488)	11.803** (5.456)	-11.569 (11.651)	-4.599 (6.051)
Log(Members)	-4.481 (5.974)	-7.706 (7.263)	-20.276 (15.511)	-19.644** (8.056)
Year Fixed Effects	✓	✓	✓	✓
Fund Fixed Effects	✓	✓	✓	✓
Observations	1129	1129	1129	1129
R^2	0.569	0.520	0.535	0.633
Adjusted R^2	0.500	0.445	0.461	0.575
F Statistic	8.338***	6.863***	7.271***	10.921***

Note:

*p<0.1; **p<0.05; ***p<0.01

Which funds tend to communicate more about the PPR?

- Risk management: The larger funds communicate more
- Sustainability: The funds with a higher funding ratio communicate more, the ones with more members less [coordination challenge?]

No Effects of Prudent Person Rule Talk on Future Return

Table 9: Predictive Regressions: Return Explained by Lagged Text-Based Pillars and Controls

	Dependent variable: Return				
Lagged Pillar 1 (Inv Policy)	0.206 (0.200)				0.211 (0.212)
Lagged Pillar 2 (Risk Mgmt)		0.123 (0.163)			0.095 (0.168)
Lagged Pillar 3 (Gov)			0.001 (0.077)		-0.016 (0.081)
Lagged Pillar SI (Sust)				-0.076 (0.157)	-0.087 (0.159)
Lagged Log(Total Assets)	-1.236*** (0.293)	-1.263*** (0.293)	-1.250*** (0.294)	-1.252*** (0.293)	-1.252*** (0.294)
Lagged Log(Members)	-0.947* (0.547)	-0.932* (0.548)	-0.950* (0.548)	-0.981* (0.551)	-0.968* (0.553)
Lagged Real Funding Ratio	-2.874*** (0.682)	-2.880*** (0.682)	-2.891*** (0.682)	-2.889*** (0.682)	-2.862*** (0.683)
Year Fixed Effects	✓	✓	✓	✓	✓
Fund Fixed Effects	✓	✓	✓	✓	✓
Observations	930	930	930	930	930
R ²	0.939	0.939	0.939	0.939	0.939
Adjusted R ²	0.928	0.928	0.928	0.928	0.928
F Statistic	83.343***	83.287***	83.223***	83.249***	81.421***

Note:

*p<0.1; **p<0.05; ***p<0.01

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Portrait of A prudent person



A prudent pension manager in the Netherlands, 2025

The easy way - ChatGPT

- Prompt: Create a picture of a prudent pension manager in the Netherlands for the year 2025
- Not insightful

The hard way – Traditional NLP:

- Collect and process 20 years of annual reports of Dutch pension funds
- Define a scoring framework that allows trend and peer analysis insights

Further research: Quantify the **Walk the PPR talk**.

Thank you!

www.sentometrics.com/research