

Milliman September Breakfast Briefing

Kevin Manning

Aisling Barrett

Joseph Collins

Joseph Sloan

26 SEPTEMBER 2023



Agenda

1

Welcome &
Introduction
Kevin Manning

2

Life Insurance
Market Update
Aisling Barrett

3

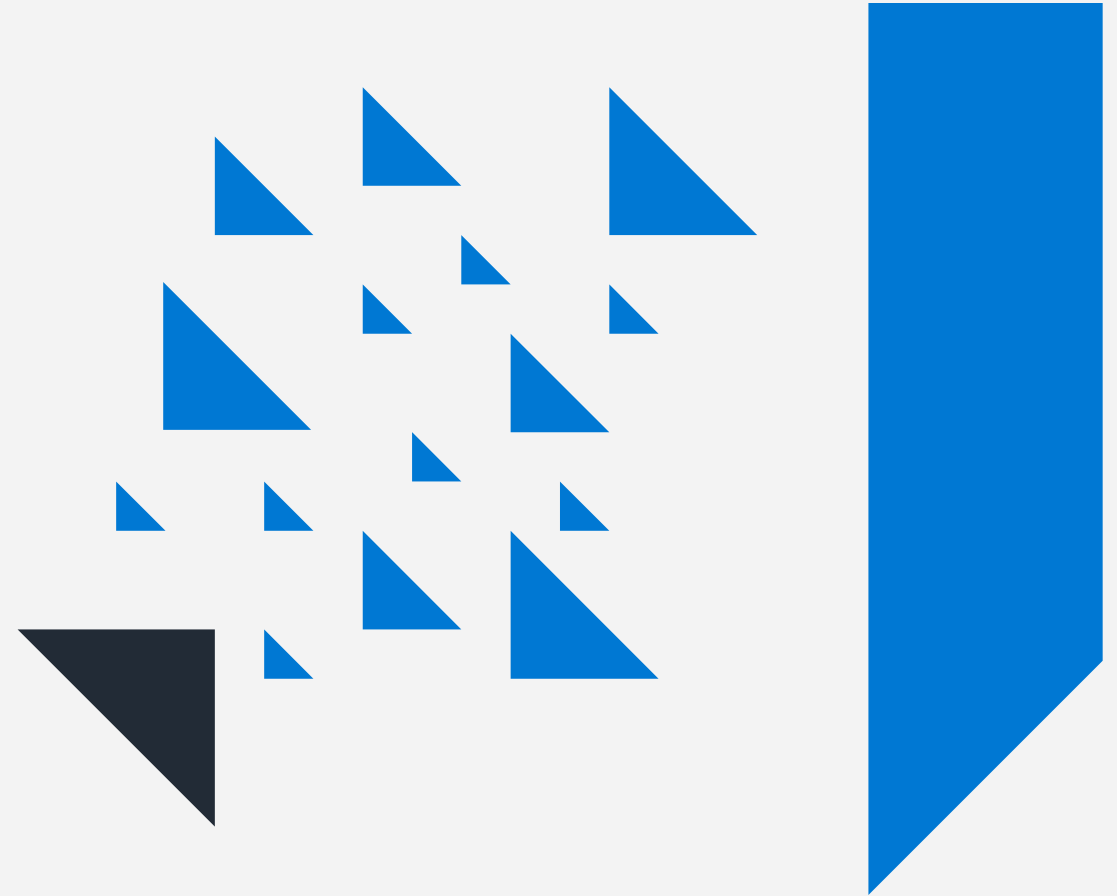
Solvency II
Review
Joseph Collins
Central Bank of
Ireland

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Process
Automation
Joseph Sloan

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Q&A, Wrap up &
Close
Kevin Manning



Life Insurance Market Update YE 2022

Aisling Barrett

26 September 2023

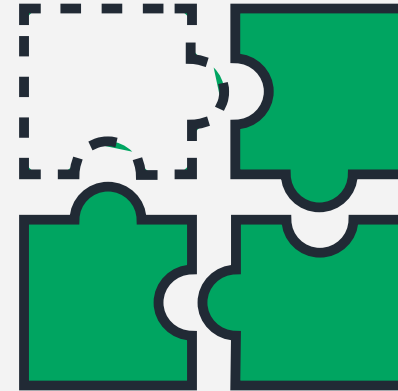


Agenda

- **Companies**
- **Premiums**
- **Investments**
- **Solvency Coverage**
- **Measures Used**
- **European comparisons**

All information sourced from published Solvency and Financial Condition Reports (“SFCRs”) for life insurance companies based in Ireland at YE 2022 and available in our report:

<https://ie.milliman.com/en-GB/insight/ireland-life-insurers-sfcr-year-end-2022>



Companies

Decreasing trend...



At Year-End:	2022	2021	2020	2019
Authorised Life insurance companies	35	36	37	41

Analysis of Premiums

Top 10 Irish life insurers by 2022 gross written premium

2022 Gross Written Premiums (€ millions)	
Irish Life Assurance	7,103 (+1%)
Zurich Life Assurance	4,490 (+2%)
Darta Saving Life Assurance	3,244 (-37%)
New Ireland Assurance Company	3,028 (+14%)
Intesa SanPaolo Life	2,850 (-48%)
Standard Life International	2,678 (-12%)
Utmost PanEurope	2,291 (+18%)
Aviva Life & Pensions Ireland	1,746 (+3%)
MetLife Europe	1,431 (+4%)
Seb Life International	1,428 (-39%)

GROSS WRITTEN PREMIUMS

for life insurance have

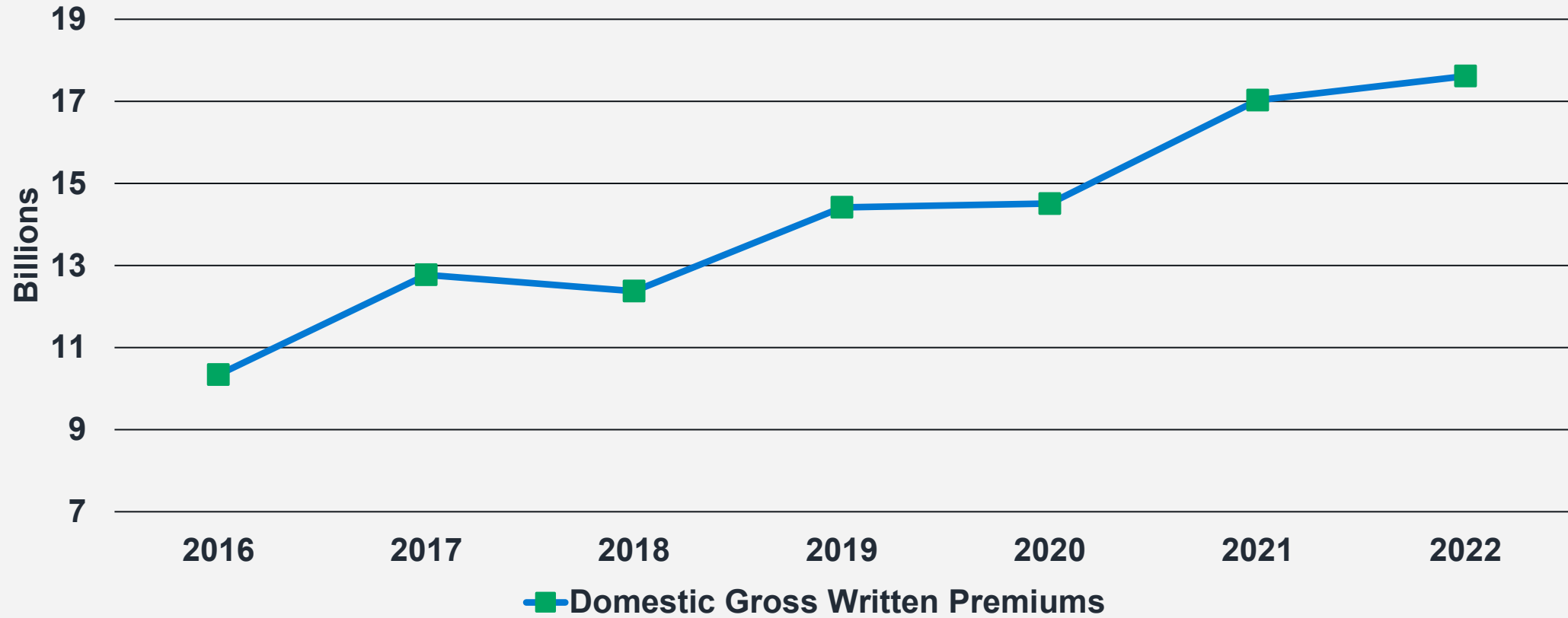
fallen significantly

from €48.1 billion in 2021 to
€40.6 billion in 2022



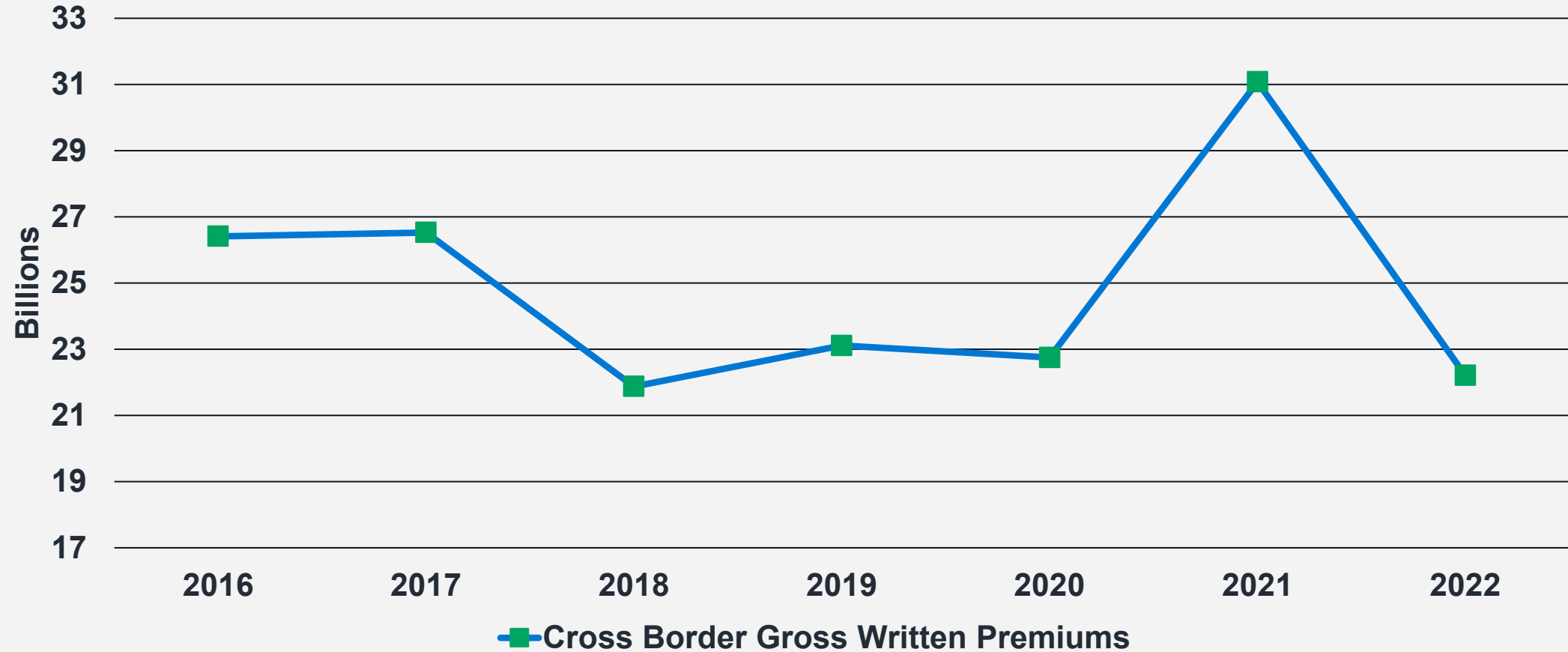
Domestic Business

Historic Gross Written Premiums



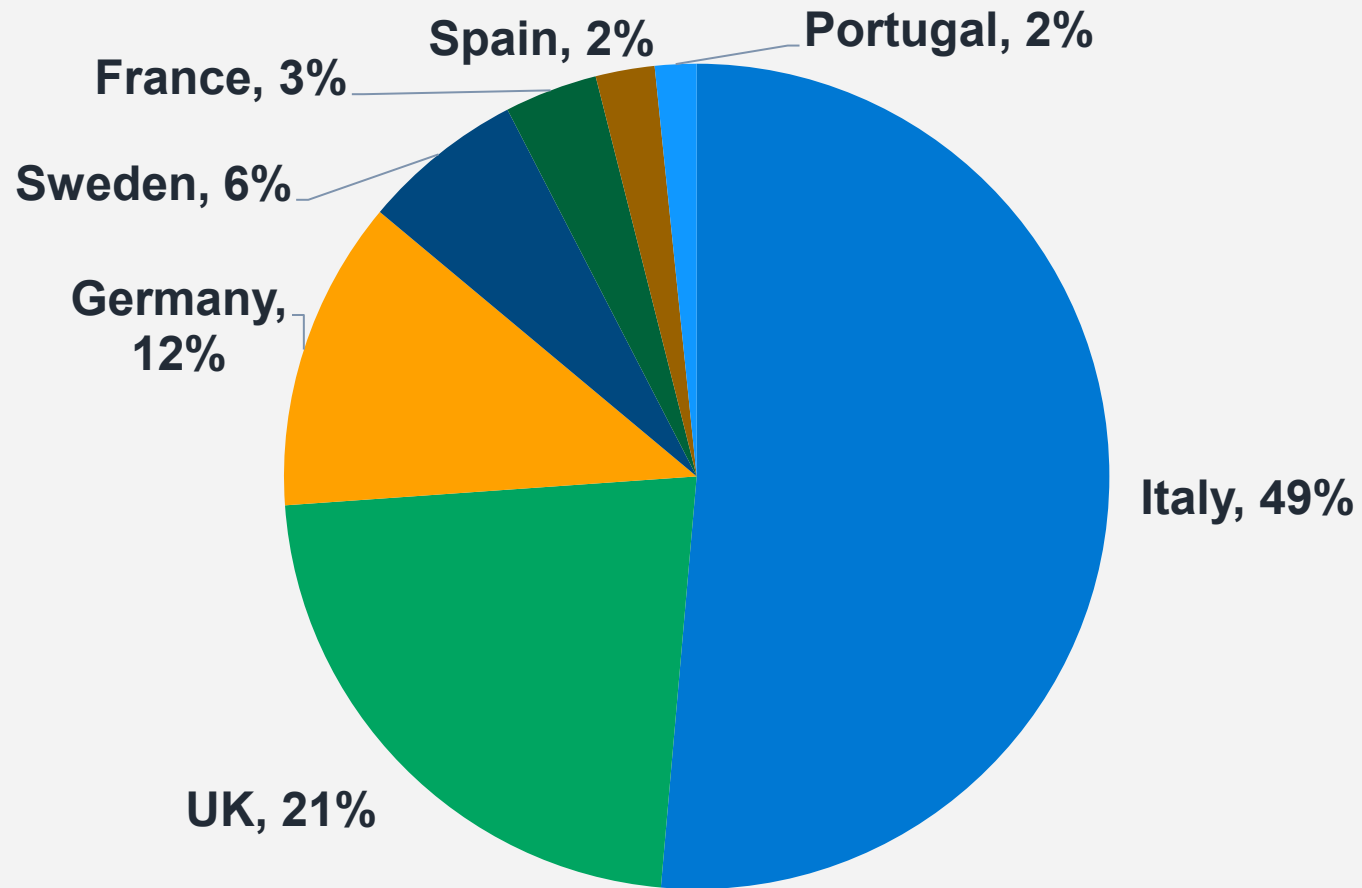
Cross-Border Business

Historic Gross Written Premiums



Cross-Border Business by Country

2022 Gross Written Premiums



Cross Border Business – Italy & UK

Gross Written Premiums

Italy



€ millions	2022	2021
Darta Saving Life Assurance	3,244	5,166
Intesa SanPaolo Life	2,821	5,480
Azimut Life	1,048	1,126
AXA MPS Financial	962	1,732
Allianz Global Life	664	908

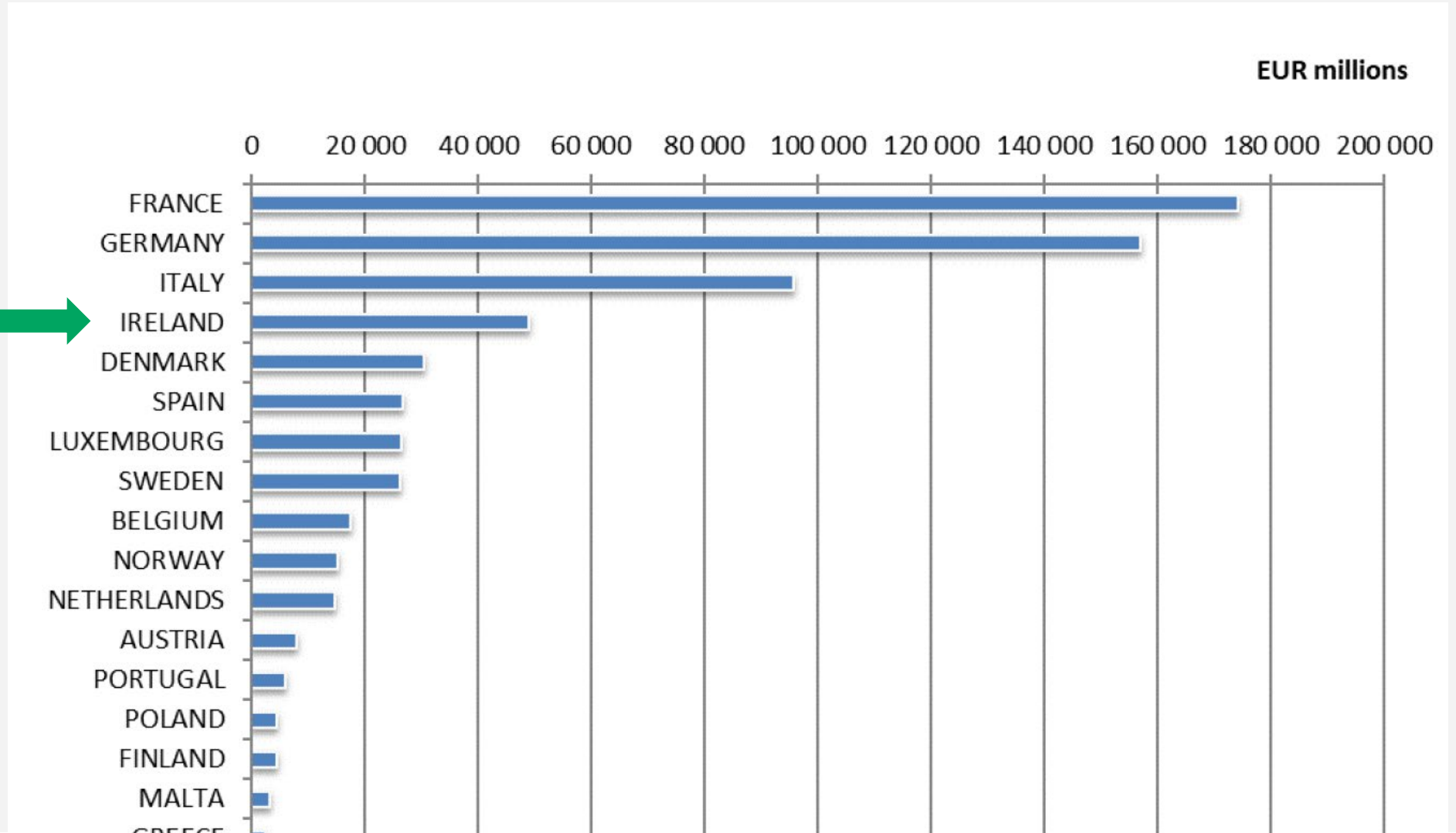
UK



€ millions	2022	2021
Canada Life International Assurance (Ireland)	975	664
St James's Place International	897	1,031
Utmost PanEurope	884	798
Standard Life International	816	928
Prudential International Assurance	552	446

EIOPA Life GWP in EEA by Country

YE 2022



Source: EIOPA
[Solo/Annual/
Published
20230901]

Balance Sheet Assets

Life insurance companies

TOTAL BALANCE SHEET ASSETS

for life insurers in Ireland have

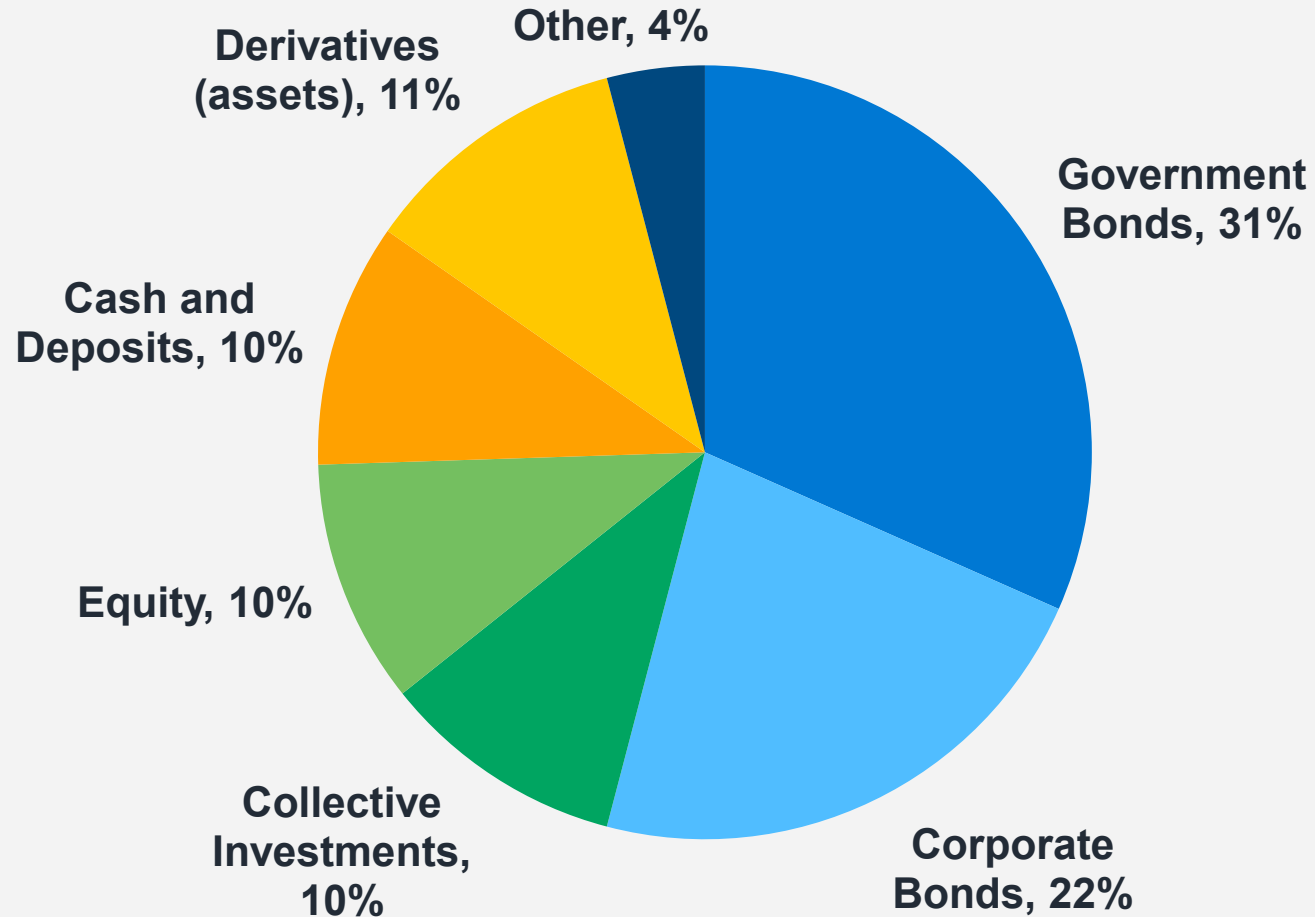
decreased from **€393 billion** in 2021

to **€344 billion** in 2022

€ billions	2022	2021
Unit-linked assets	275	311
Reinsurance recoverables	31	40
Financial assets	33	38
Other	5	4
Total	344	393

Analysis of Investments

Split of financial investments by asset class
(Excluding assets held for index-linked and unit-linked contracts)



GOVERNMENT & CORPORATE BONDS

account for

31% and

22%

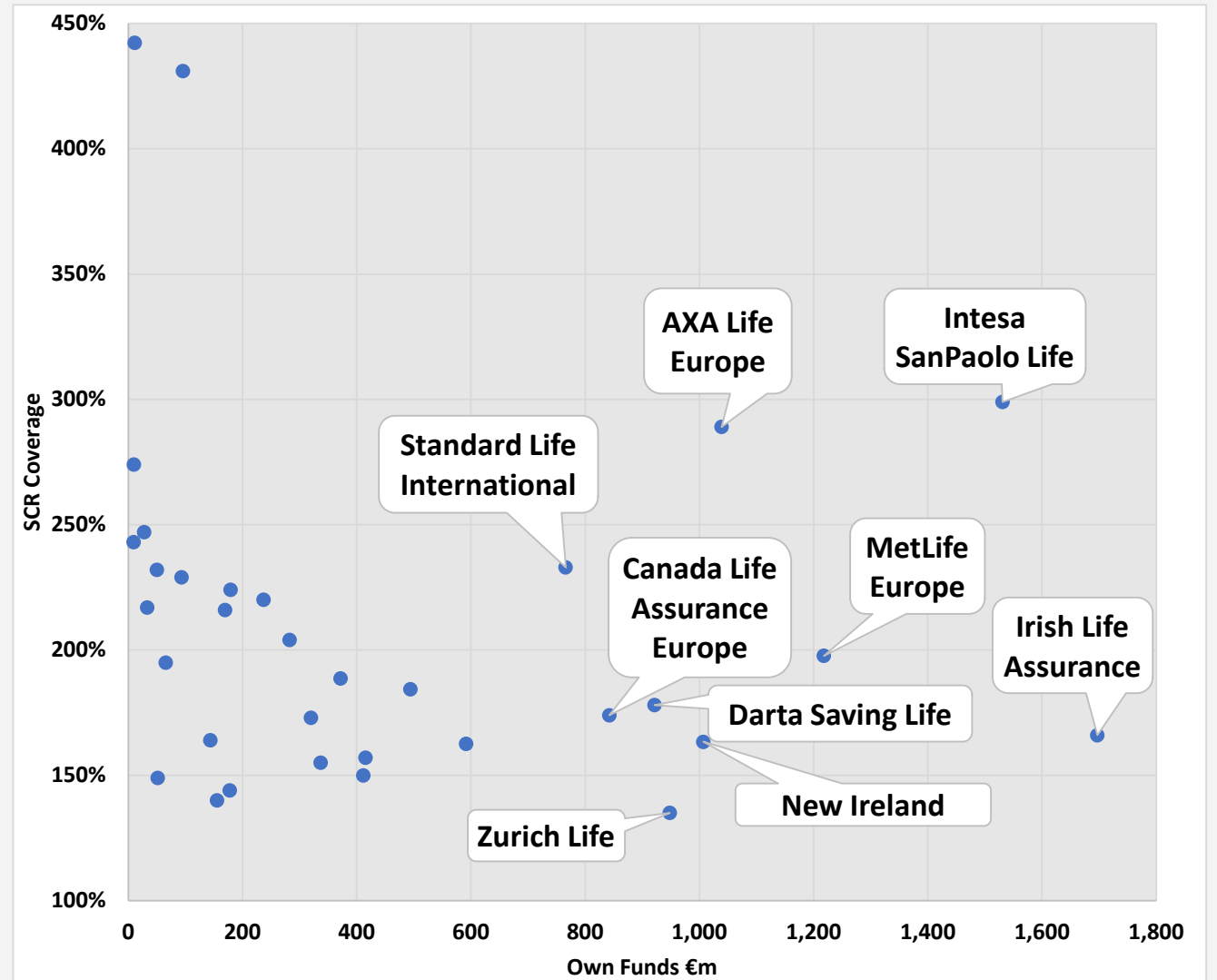
of **financial investments**, respectively.

Analysis of Solvency Coverage Ratios

The solvency coverage ratio **INCREASED** from **177%** to **188%** at year-end 2022

More detail available in our report:

<https://ie.milliman.com/en-GB/insight/ireland-life-insurers-sfcr-year-end-2022>



Measures Used

Internal models, long-term guarantee and transitional measures

A number of measures are available to insurers both in terms of transitioning to the Solvency II regime and in terms of allowing for the impact of long-term guarantees.



- 7 Irish life insurers were using the **volatility adjustment** as at YE22
- (This is the same as at YE21)



- No Irish life insurer is using the **matching adjustment** or any **transitional measures**



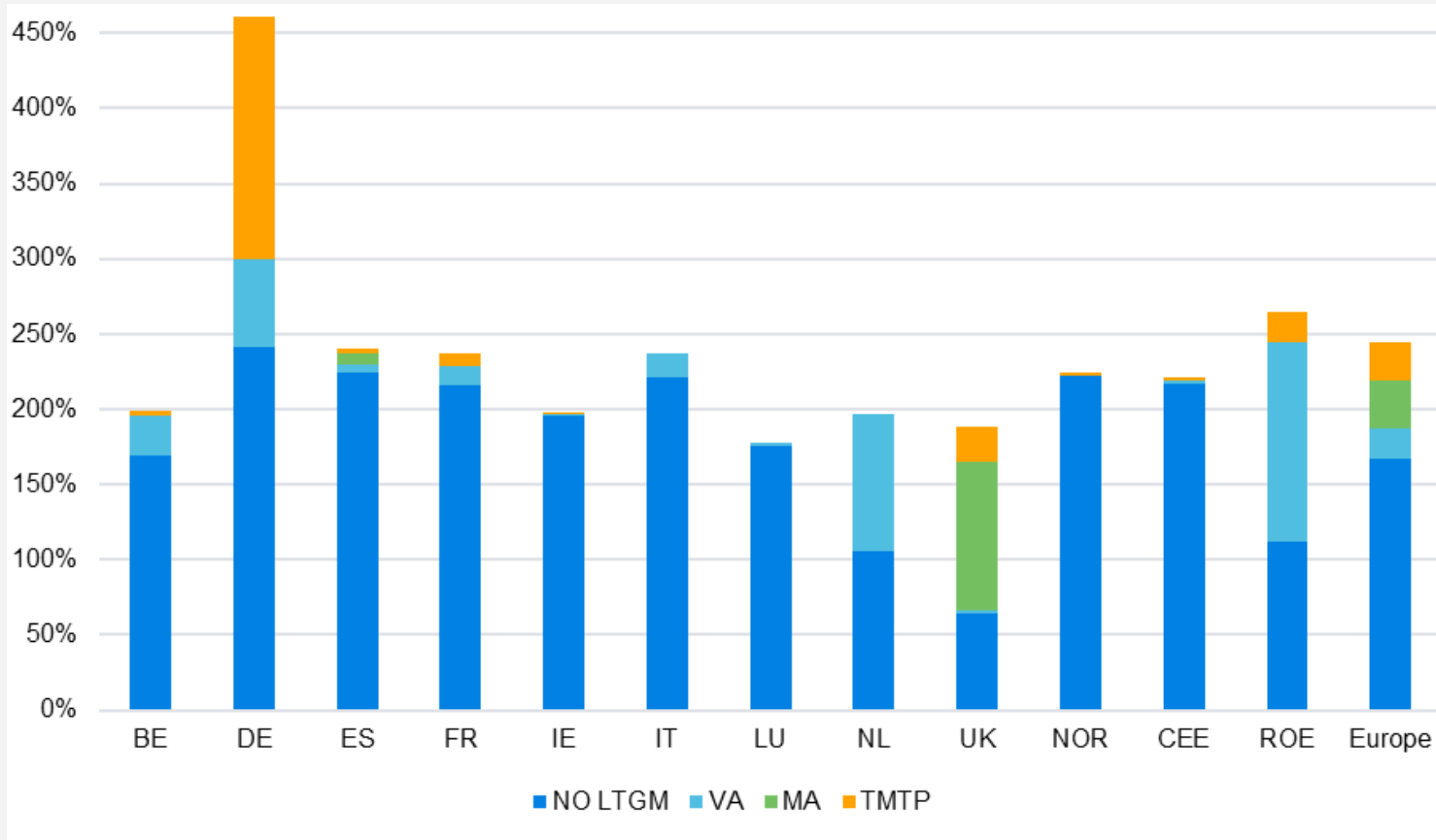
- At YE22, 3 Irish life insurers used **full internal models**: Allianz Global Life dac, AXA Life Europe dac and AXA MPS Financial dac



- Standard Life International is the only life insurer using a **partial internal model** (used to calculate the counterparty default risk and operational risk modules of the SCR)

Impact on Solvency Coverage Ratio of Measures Used across Europe

YE 2022 (includes life reinsurers)



52%

of life (re)insurers

apply the volatility adjustment with the benefit arising averaging at

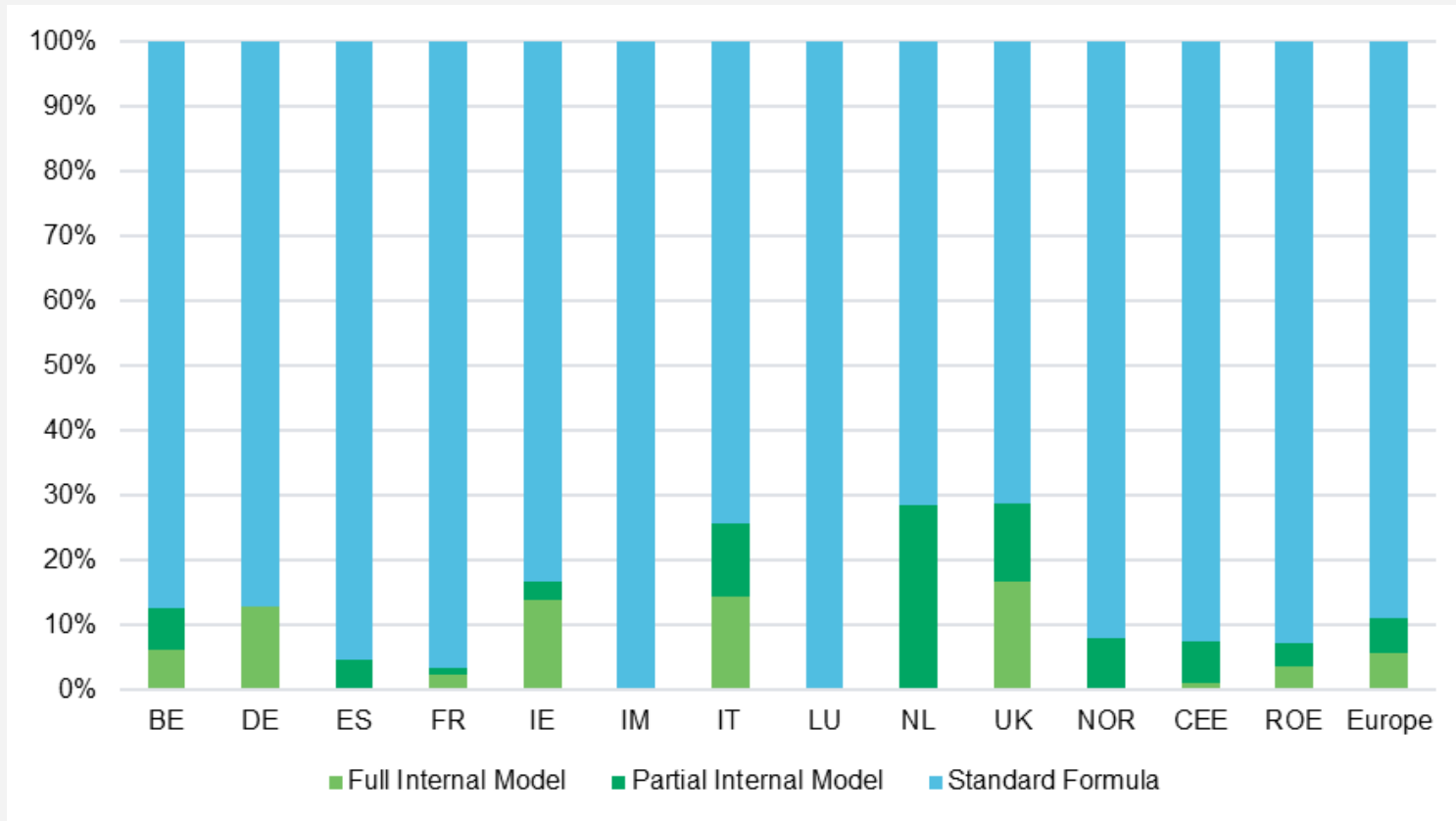
14%

Improvement in solvency coverage ratio

Source: MILLIMAN RESEARCH REPORT Analysis of life insurers' solvency and financial condition reports year-end 2022 European and UK life insurers September 2023

Use of Internal Models across Europe

YE 2022 (includes life reinsurers)



89%

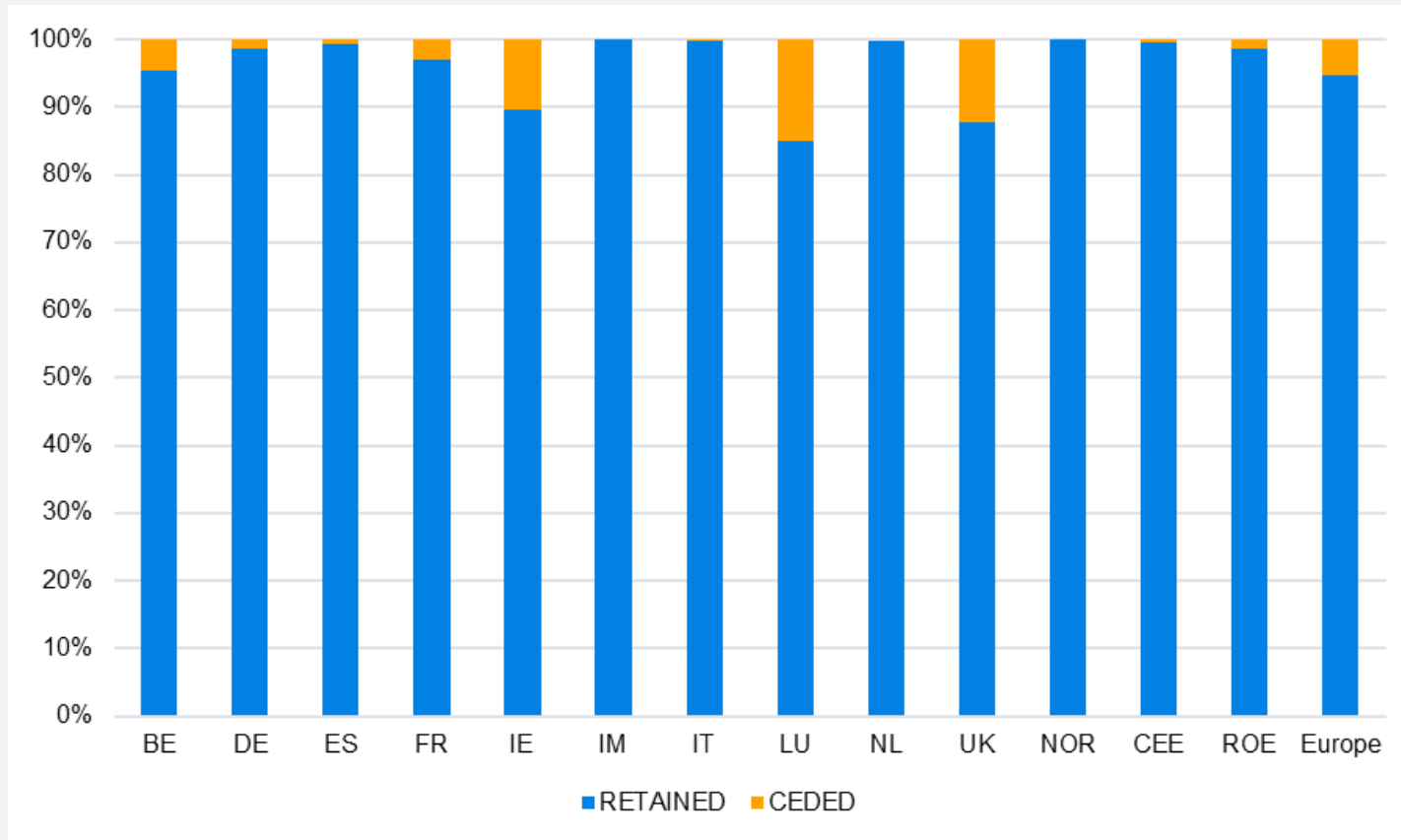
of life (re)insurers

use the Standard Formula to calculate the SCR

Source: MILLIMAN RESEARCH REPORT Analysis of life insurers' solvency and financial condition reports year-end 2022 European and UK life insurers September 2023

Use of Reinsurance across Europe

End 2022 Best Estimate Liability gross and net of reinsurance



On average,
5.3%
of the BEL of life
insurers
is **REINSURED ACROSS
EUROPE**

Source: MILLIMAN RESEARCH REPORT Analysis of life insurers' solvency and financial condition reports year-end 2022 European and UK life insurers September 2023

Summary

Life Insurance Market Update

1. A significant fall in **gross written premiums** in 2022 and in total balance sheet **assets**, driven by decreases in cross-border premiums in particular

2. An improvement in **solvency coverage ratios** overall

3. Some use of the **internal models & volatility adjustment** (no use of other measures)



Thank you

Aisling Barrett

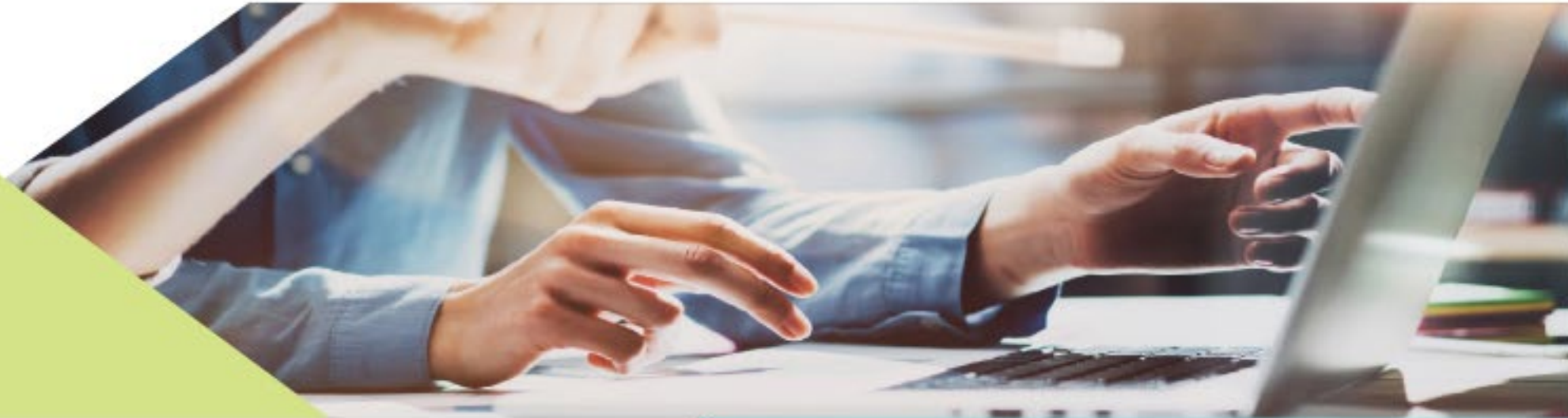
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Central Bank of Ireland

Eurosystem



Solvency II Review (S2R)

Joseph Collins

Content

- Recap
- ECON
- Next Steps



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Recap - What did EIOPA recommend?

EIOPA's approach to the Solvency II review is to address three areas where improvements are needed:



Balanced updating of the regulatory framework

EIOPA proposes changes in several areas but with balanced overall impact on insurers. This reflects the fact that Solvency II is overall working well.



Recognition of the economic situation

In particular the persistence of low interest rates. EIOPA recommends proper provisions for the risk of interest rate changes.



Regulatory toolbox completion

Including better protection of policyholders via macro-prudential tools, recovery and resolution measures and insurance guarantee schemes.

The CBI is a member of EIOPA – we voted for the overall package

Terminology – “maximum” harmonising is a thing that every NSA must do.
 “minimum” harmonising is a thing that every NSA has to at least do.



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What did COM propose?

- The Commission **largely** followed EIOPA recommendations, but argued that the “balance” EIOPA struck was too heavily weighted towards prudence, and so they:
 - Weakened the risk margin
 - Removed one of the safeguards in the volatility adjustment
 - Adjusted the interest rate risk submodule to allow for extrapolation
- The Commission also made qualitative changes, with some of the more significant ones being:
 - Rejecting some of the macroprudential tools that were requested
 - Removing the assessment against underlying assumptions from VA approval
 - Additional powers for Host member states in relation to cross-border business



Where did Council end up?

- Council **largely** followed COM proposals, but made adjustments in response to (some of the) concerns voiced by Member States, for example:
 - Allowed MS options for Audit and VA approval
 - Reversed the change to symmetric adjustment
 - Added specific language for currencies pegged to the Euro
 - Made changes to Group solvency calculations
 - Changed proportionality rules, dampened macropru tools
- Council also asked EIOPA to do more research in areas (which may lead to change):
 - Biodiversity
 - Composites (and whether the ban should be lifted)
 - Banking capital buffers



What did the rapporteur do?

- An initial report **largely** denigrated COM proposals, and removed a lot of them, for example:
 - Macroprudential tools taken out
 - Sustainability risk measures excised
 - Mandatory audit requirement expunged
- The report also suggested sweeping changes to the proposed “balance”:
 - **Moving calibrations into Level 1**
 - Extrapolation changes reversed
 - Risk margin weakened **even further**
 - DBER restrictions relaxed to let all life companies use it
 - VA proposals rejigged



What did the shadow rapporteurs do?

- They opposed the initial report
- They filed their own amendments – 100s of them
- They had some very short meetings, on the basis that they considered that there was no willingness to compromise...
- And eventually they all came to some agreement, about 9 months later than anyone had expected



Where did ECON (Parliament) end up?

- The final report **largely** kept the COM proposals, for example:
 - Macroprudential tools kept in
 - Sustainability risk measures reinserted, and built upon
 - Mandatory audit requirement maintained
- Parliament also suggested some changes to the proposed calibrations:
 - **Moving LTE into Level 1**
 - Extrapolation slightly weaker
 - Risk margin cost of capital of 4.5%



What else did ECON (Parliament) do?

- They added new stuff:
 - Gender targets
 - Crypto capital
 - Standard Formula recalibration every five years (with UK data removed)
 - Individual Stress Testing results can be published
 - EIOPA to reassess composite ban (Council added this too)
 - EIOPA to look at biodiversity risk (Council added this too)



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What happens next?

- Trilogues!!!!
- The three stakeholders (COM, Parliament, Council) argue about whose proposal is best, and agree – at some point – on a compromise
- Very optimistically, given the history, the Spanish Presidency of Council are aiming to conclude trilogue discussions before **Christmas 2023(!)**
- If that happens, go live date would probably be 1st January 2026

- Trilogues are mainly attended by Financial Attaches
- CBI experts have to provide DoF and DFA with quick and clear advice



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Process Automation

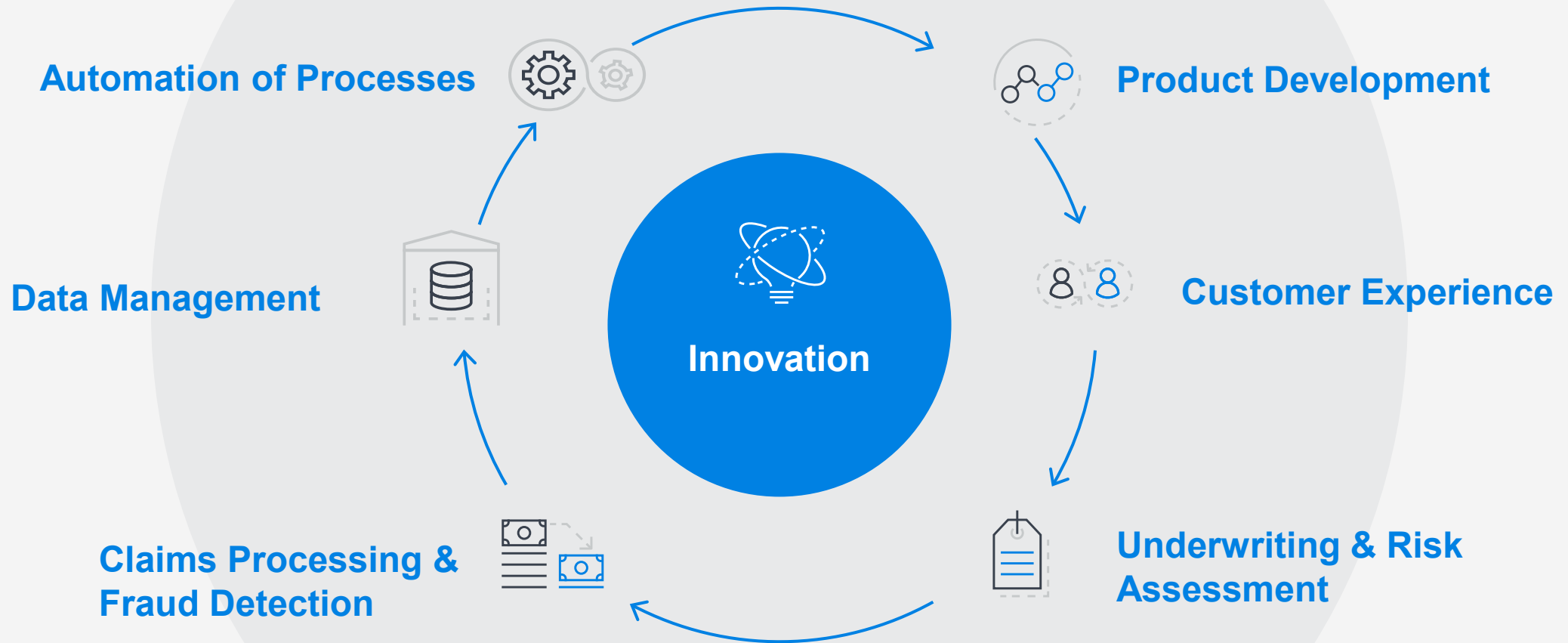
Unlocking efficiency with the latest technology

Joseph Sloan

26 September 2023



Where are Insurers using Innovative Tech?



Automating Processes – Why is there a focus in 2023?



To meet tighter reporting deadlines



To refresh Target Operating Model



To reduce operating costs



To embrace new technologies (the “Cloud”, AI etc)



To access to information faster



To allow high value resources to do high value work



To improve employee satisfaction



To mitigate risk

Case Study 1: End-to-End Valuation System in Python

What is Python and why are companies using it?

- High-level programming language
- Increasingly popular
- Open-source programming language
 - Free to use
 - Community collaboration
 - Rapidly developing
 - Customizable and flexible
- “Batteries included”
- Relatively easy to learn
- Highly extensible
- Future-proofing

End-to-End Valuation System in Python

- The previous cashflow model was no longer suitable for the client’s needs:
 - More runs required
 - Lots of different output needed
 - Faster access to information
 - Model was difficult to upgrade e.g., stochastic runs
- Original system had some limitations:
 - Heavily relied on spreadsheets and Access databases.
 - Lots of manual intervention
- **Proposed approach: modernise the end-to-end process using Python**

Case Study 1: End-to-End Valuation System in Python

What are the main features of the new model?

Fully automated workflow

- 20+ spreadsheets, 1 Access database & 1 cashflow model replaced by a single Python model.
- 4 days reduced to 1 day

Fast model run times

- Model runs take 10 minutes each (10x faster)

Better Output

- Summaries, graphs and audit trails.
- Data Checks

Fast Model Build

Upgradeable model

- E.g., convert to a stochastic model with a few lines of code.

Version Control System

Any Challenges?

- Model design
- User interface
- Skills

Large Python Community = Exciting Opportunities

Python in Excel

- Microsoft recently announced it was bringing Python to Excel
- Python code can be written directly in Excel with no set up required.
- Excel users will have access to powerful analytics via Python for:
 - Advanced visualizations
 - Cleaning data
 - Machine learning
 - Predictive analytics
- This makes Excel more powerful and Python more accessible.

```
#Announcing Python in Excel!  
DataFrame=xl("A1:B10", headers=True)  
DataFrame.groupby('Category').agg('mean')
```

Category	\$
Components	\$20
Bikes	\$17
Accessories	\$9
Bikes	\$9
Clothing	\$8
Accessories	\$4
Clothing	\$4
Components	\$3
Components	\$1

Category	\$
Accessories	\$7
Bikes	\$13
Clothing	\$6
Components	\$8

Horizontal bar chart showing mean values for categories: Components (5), Clothing (6), Bikes (13), Accessories (8).

Image Credit: Microsoft

Case Study 2: Generative AI Tools – Chat GPT



Produce a presentation slide with 4 short bullet points explaining what Chat GPT is, including one bullet point at the start explaining what generative AI is, and one bullet point on the risks associated with Chat GPT



Slide Title: Understanding Chat GPT

Generative AI:

Generative AI refers to a class of artificial intelligence that is capable of generating human-like text, images or content autonomously, often based on patterns and data it has learned

Chat GPT:

Chat GPT is a specific instance of artificial intelligence, designed for natural language processing.

It can generate human-like text, answer questions and engage in conversations.

Capabilities:

Chat GPT can assist with a wide range of tasks, from answering queries and generating creative content to language translation and code generation.

Risks :

There are risks associated with its use, including the potential for generating misleading or biased information, privacy concerns and misuse in automated content generation

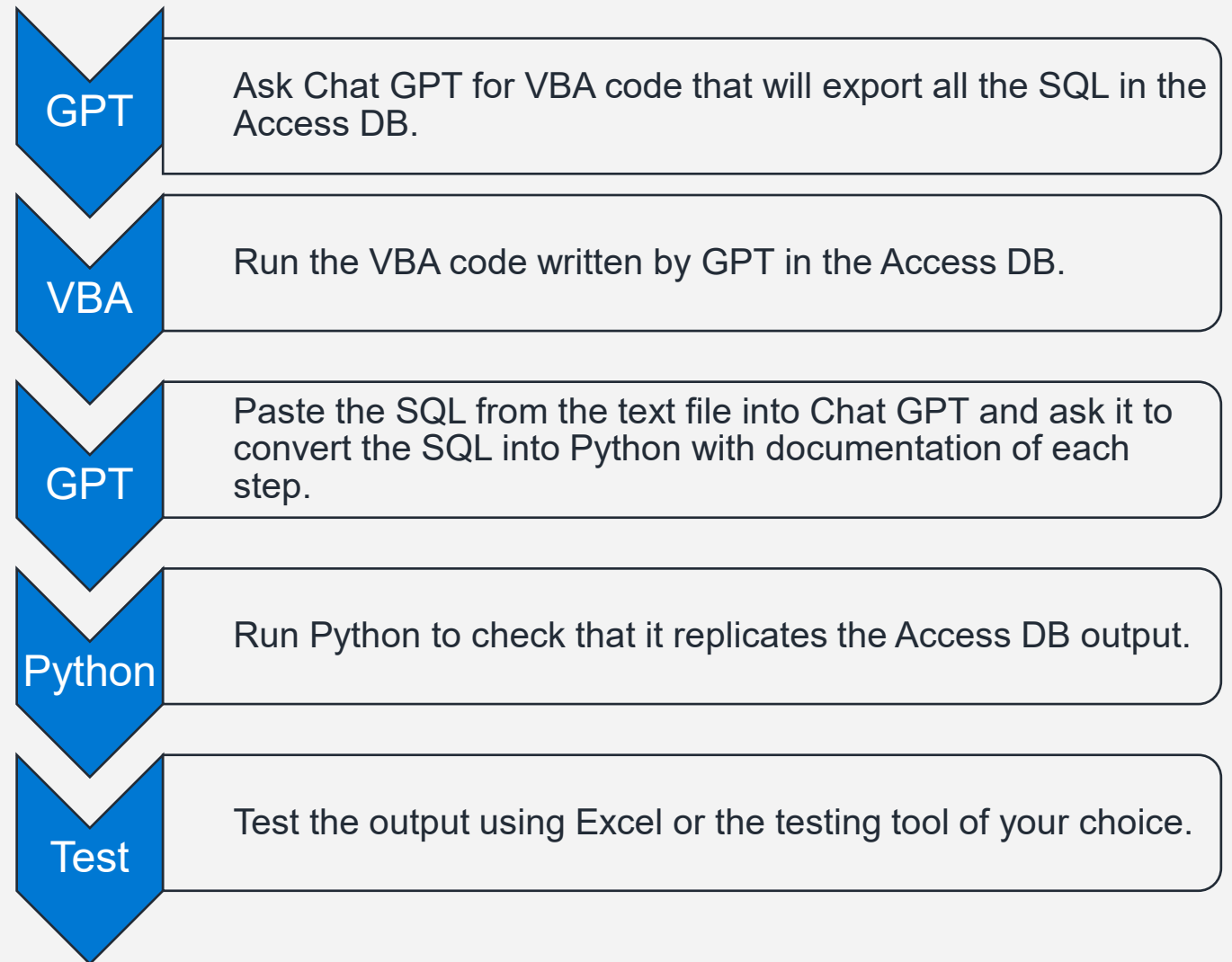
Case Study 2: Chat GPT

Problem:

Access database was too manual and time-consuming

Solution:

Move to Python & use Chat GPT to help with this



Case Study 2: Generative AI Tools – Copilot Examples

Copilots: AI-driven software assistants that work alongside human users to provide real-time support, guidance, and automation for various tasks

GitHub Copilot

Helps developers write code faster and more efficiently.

It draws context from the code that the developer is working on, suggesting whole lines or entire functions.

96% faster with repetitive tasks

88% feel more productive

74% focus on more satisfying work

Microsoft 365 Copilot

Much more intelligent alternative to the classic Microsoft Office assistant Clippy.

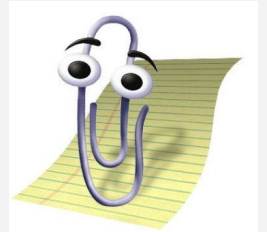
Excel – analyse data, what are the key trends

Outlook – summarise the emails I missed when I was out last week, flag important items

Word – draft an executive summary of this Word document

PowerPoint – create a four-slide presentation based on this document

Teams - summarise this call, and list the key actions in a table



Case Study 2: Generative AI Tools – Microsoft 365 Copilot

The screenshot displays the Microsoft Excel interface with a data table. The table has 12 columns and 18 rows of data. The columns are: Country, Customer, Product, Discount Band, Units Sold, Manufacturing Price, Sale Price, Gross Sales, Discounts, Sales, and COGS. The data is as follows:

	Country	Customer	Product	Discount Band	Units Sold	Manufacturing Price	Sale Price	Gross Sales	Discounts	Sales	COGS
1	France	VanArsdel	Biodegradable Cleaning Products	Low	4345	\$10	\$352	\$1,529,440	\$15,294	\$1,514,146	\$
2	USA	VanArsdel	Biodegradable Cleaning Products	Low	4245	\$10	\$352	\$1,494,240	\$14,942	\$1,479,298	\$
3	Australia	VanArsdel	Biodegradable Cleaning Products	None	4124	\$10	\$352	\$1,451,648	\$0	\$1,451,648	\$
4	Mexico	VanArsdel	Biodegradable Cleaning Products	Medium	3954	\$10	\$352	\$1,391,808	\$83,508	\$1,308,300	\$
5	France	Contoso Pharmaceuticals	Biodegradable Cleaning Products	Low	4952	\$10	\$127	\$628,904	\$6,289	\$622,615	\$
6	France	Contoso Pharmaceuticals	Recycled Can	Low	4903	\$5	\$127	\$622,681	\$6,227	\$616,454	\$20
7	Canada	Proseware	Natural Personal Care Products	Low	1954	\$270	\$302	\$590,108	\$5,901	\$584,207	\$580
8	Canada	Proseware	Biodegradable Cleaning Products	High	1990	\$220	\$302	\$600,980	\$84,137	\$516,843	\$480
9	USA	VanArsdel	Compostable Food Packaging	Low	1254	\$3	\$380	\$476,520	\$4,765	\$471,755	\$
10	USA	Proseware	Natural Personal Care Products	Medium	1465	\$224	\$302	\$442,430	\$26,546	\$415,884	\$360
11	USA	Proseware	Sustainable Snack Packaging	Medium	1410	\$120	\$302	\$425,820	\$25,549	\$400,271	\$180
12	Australia	Proseware	Natural Personal Care Products	Medium	1369	\$224	\$302	\$413,438	\$24,806	\$388,632	\$330
13	USA	VanArsdel	Compostable Food Packaging	Medium	1052	\$3	\$380	\$399,760	\$23,986	\$375,774	\$
14	Canada	VanArsdel	Compostable Food Packaging	Low	980	\$312	\$380	\$372,400	\$3,724	\$368,676	\$300
15	Australia	Proseware	Sustainable Snack Packaging	Medium	1298	\$120	\$302	\$391,996	\$23,520	\$368,476	\$170
16	Australia	VanArsdel	Compostable Food Packaging	None	954	\$3	\$380	\$362,520	\$0	\$362,520	\$
17	Canada	Contoso Pharmaceuticals	Biodegradable Cleaning Products	Low	2785	\$110	\$127	\$353,695	\$3,537	\$350,158	\$300
18	Canada	Contoso Pharmaceuticals	Biodegradable Cleaning Products	Low	2785	\$110	\$127	\$353,695	\$3,537	\$350,158	\$300

Case Study 3: Milliman Mind

Award Winning Software

Actuarial Modelling Solution of the Year 2023

Offers optimized Cloud-based calculations, easy-to-use interfaces (web interface and API), and efficient computing



InsuranceERM Awards

2018-2019-2020-2021-2023

Easily convert excel models to production models with full workflows and traceability

Excel-based so no prior coding knowledge required

No-code modelling software using a web-based platform

Takes advantage of C# coding capabilities

Case Study 3: Milliman Mind

Objective

- The client had a very manual valuation process to produce the IFRS results for 4 different countries.
- Multiple tools and sources of data were used in the process e.g., CSV files, Excel spreadsheets/models and Access databases.
- Modernisation was needed due to poor spreadsheet design, lack of automation and high risk of calculation error.

Solution: replace the end-to-end process on Milliman Mind

Outcome:

- Multiple tools replaced by one system
- Fast migration – significant coding skills not required
- Time improvements
- Can run the entire valuation process for multiple reporting bases simultaneously
- Reduced risk of human/calculation error
- Sophisticated dashboards and audit trails

Factors to consider when automating...

Choosing the best tool
for the job

IT security risks

AI accuracy and bias

Testing and validation

Legal and ethical
Considerations

Skills and resources

Usability



Thank you

Joseph Sloan

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Any Questions?

