Institute and Faculty of Actuaries

GIRO Conference 2022

21–23 November, ACC Liverpool

#GiroConf22

Institute
and Faculty
of Actuaries

Claims Inflation – What are Lloyd’s Doing?

Ajay Shah
Sanjiv Sharma
Priye Kanabar
Adhnan Chaudhry

#GiroConf22

Contents

Institute and Faculty of Actuaries

Institute
and Faculty
of Actuaries

Opening remarks

Ajay Shah
Head of Predictive Analytics,
Lloyd’s

#GiroConf22

Inflation Timeline

Mar ’21
Biden Signs $1.9 Trillion Stimulus Package

Jun ’21
Fed Hikes Inflation Projection to **3.4%** by December

Nov ’21
Fed Notes Inflation and Supply Chain Disruptions Will Persist in 2022

Dec ’21
US Inflation Hits 40-Year high at **6.8%**. Fed shifts focus to Inflation

UK Inflation Hits 10-Year High, Higher Transport and Energy Costs drive rise to **5.1%**

Feb ’22
Russia Invades Ukraine, Economic Sanctions Spike Global Energy and Food Prices

Mar ’22
ECB President Warns of ‘Supply Shock’, Growing Calls for Tighter Monetary Policy

Fed Raises Interest Rates for the First Time Since 2018, Increasing by 0.25%, Inflation hits **7.9%**

BoE Increases Interest Rates Ito 0.75%

Apr ’22
ECB says Ukraine War is Pushing Up Prices but Sticks to Gradual Response to Interest Rates

US Inflation hits **8.5%**, Fed Cites Ukraine War and Chinese Lockdowns

May ’22
ECB Announces Interest Rate Hikes in July to Counter Soaring Inflation

Jun ’22
UK is expected to Suffer Higher Inflation for Longer Than Other Nations Warns BoE

BoE Raises Interest Rates by 0.25%, Policymakers Warn Inflation Will Hit **11%**

Jul ’22
Fed Raises Rates by Most Since 1994, by 0.75%

Eurozone Inflation hits Record **8.6%**

Aug ’22
US Inflation Eases Slightly to **8.5%**, Gasoline Falling from $5 to $4 a Gallon

BoE Raises Interest Rates Sharply as Inflation Reaches **10.1%**, Warning of **13%** by Dec

Sep ’22
Fed Is Predicted to Keep Interest Rates above 4% Beyond 2023 As Per Economists

Interest Rate Rises Likely Despite Energy Bill Freeze says BoE

Oct ’22
Eurozone Inflation Hits Record High of **10.7%**

UK Grocery Inflation Hit Record High of **13.9%**

Investors expect Fed to Raise Rates to 5% in 2023

Abbreviations
BoE = Bank of England
ECB = European Central Bank
Fed = Federal Reserve

Source - Global inflation | Financial Times (ft.com)

Institute and Faculty of Actuaries

Lloyd’s definition

Claims inflation - change in claims cost of a like for like policy over time.

Claims inflation is the sum of **economic inflation** and **excess inflation**:

- **Economic inflation**: **published economic indices** relevant to a (re)insurer’s mix of business.
- **Excess inflation**: **beyond what is captured in economic indices**

Social inflation as a subset of excess inflation - as a result of **societal trends**.

A more detailed description of the definition is included at the end of these slides in the appendices.

Institute and Faculty of Actuaries

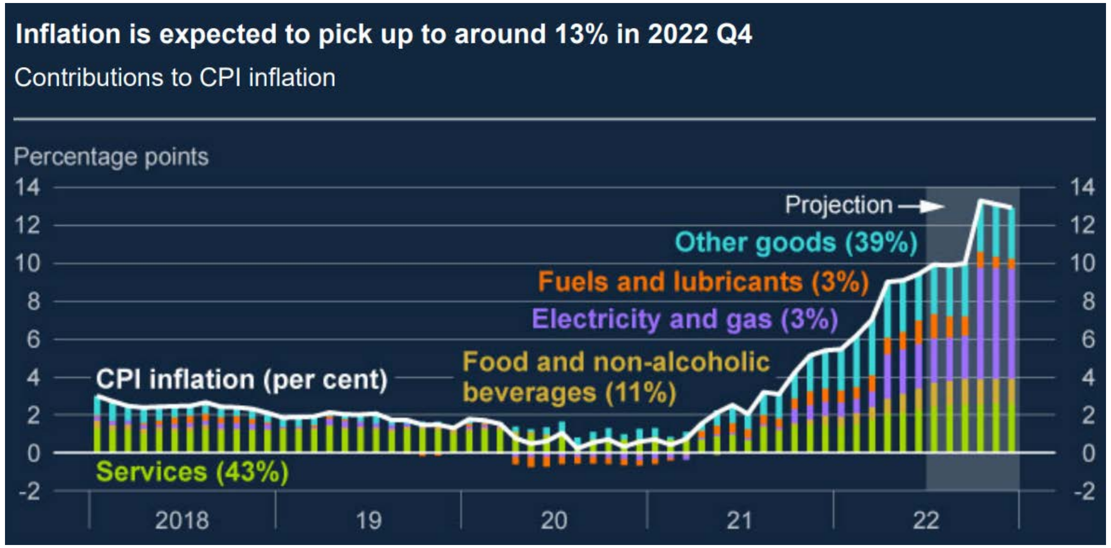
What can data tell us about historical claims inflation?

Ajay Shah
Head of Predictive Analytics,
Lloyd’s

#GiroConf22

General background

Bank of England Inflation Projection



Source: Bank of England Monetary Policy Report August 2022

Institutional Projections

Goldman Sachs	Citi
22%	18%
• Forecast that UK inflation could hit 22% in the early months of 2023 if energy prices continue to climb.	• Forecast that UK inflation could hit 18% in the first quarter of 2023, while the retail prices index inflation rate could soar to 21%.

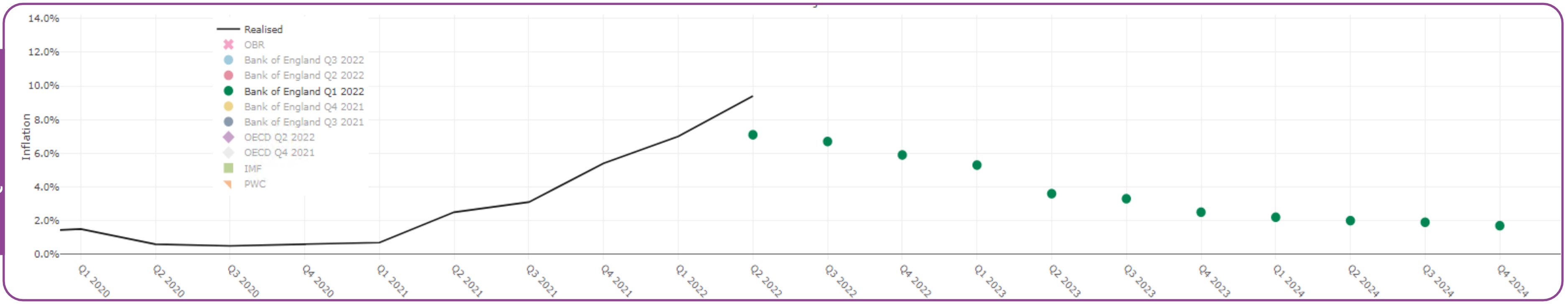
– A range of views above highlight the continued uncertainty on future economic inflation assumptions

What does this actually mean for <u>claims inflation?</u>

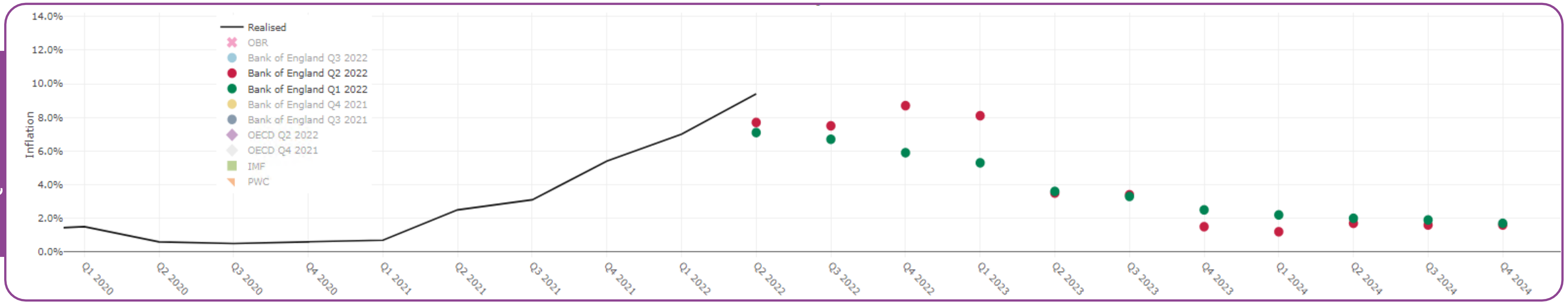
Institute and Faculty of Actuaries

Bank of England UK CPI Projections

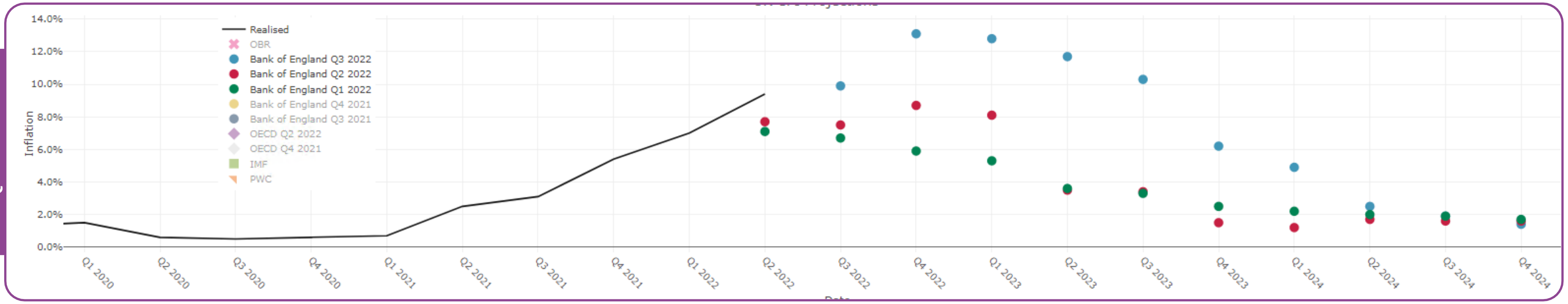
Q1 2022



Q2 2022



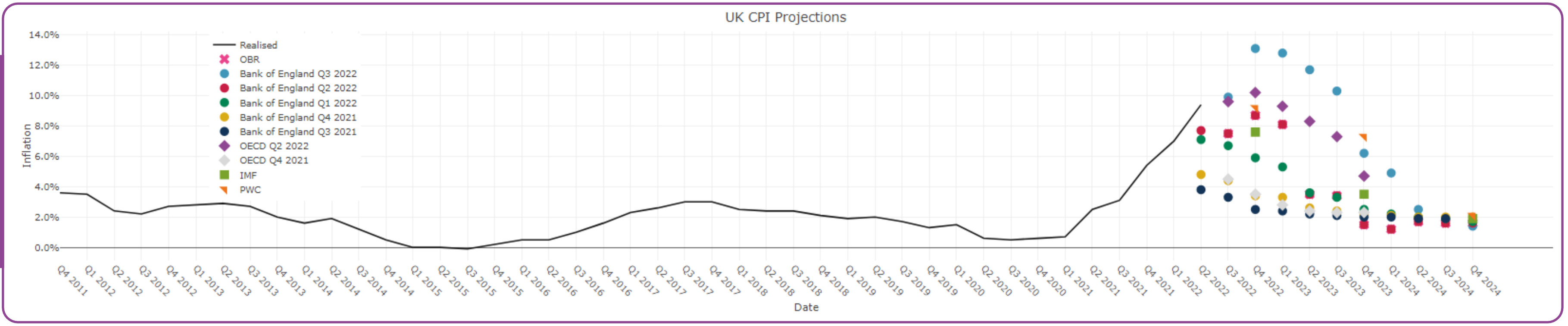
Q3 2022



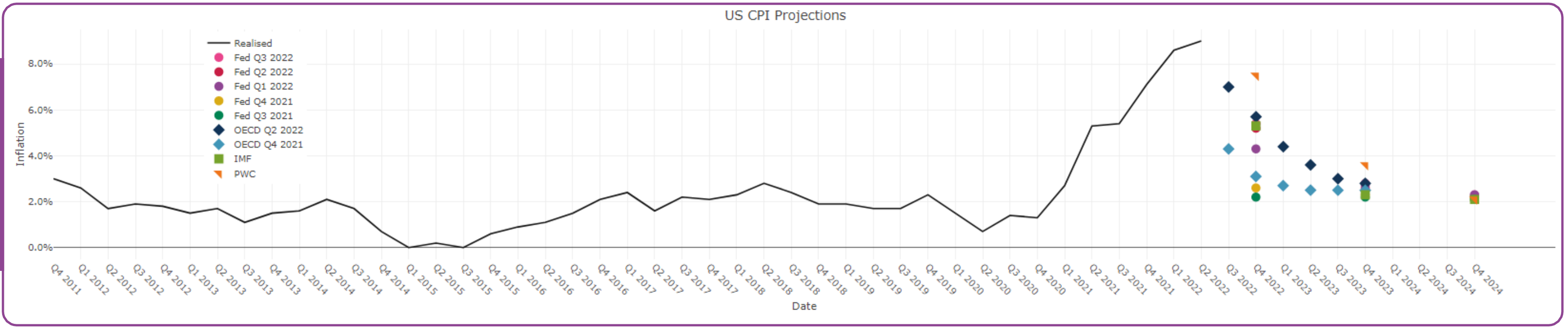
Institute and Faculty of Actuaries

Inflation Rates (Realised & Projected)

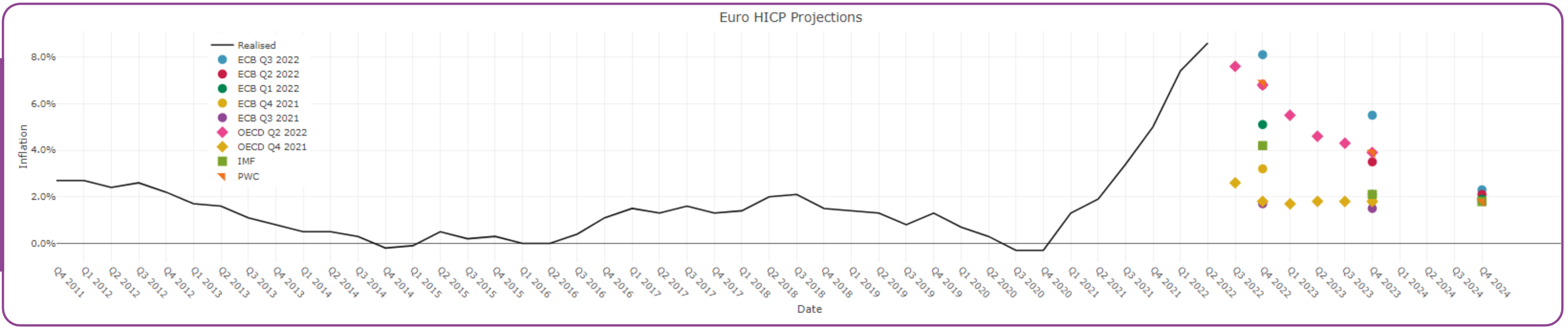
UK CPI



US CPI

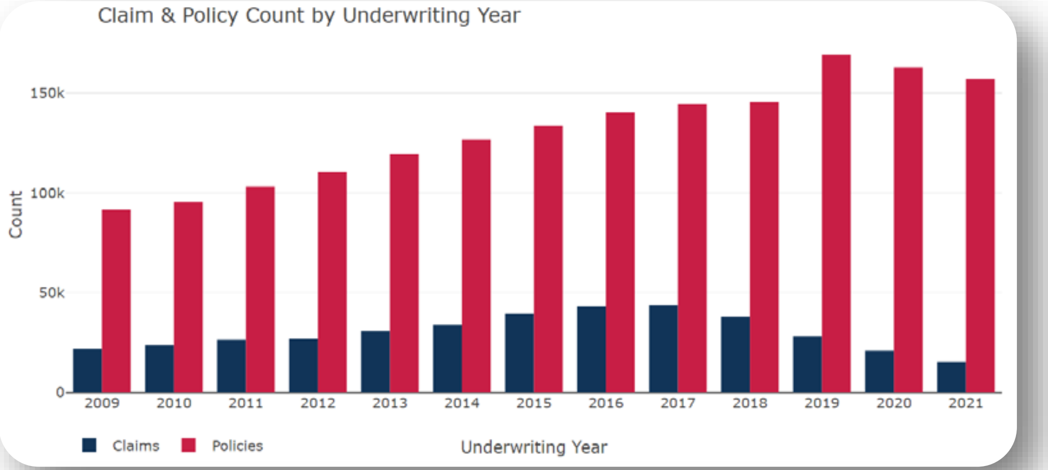


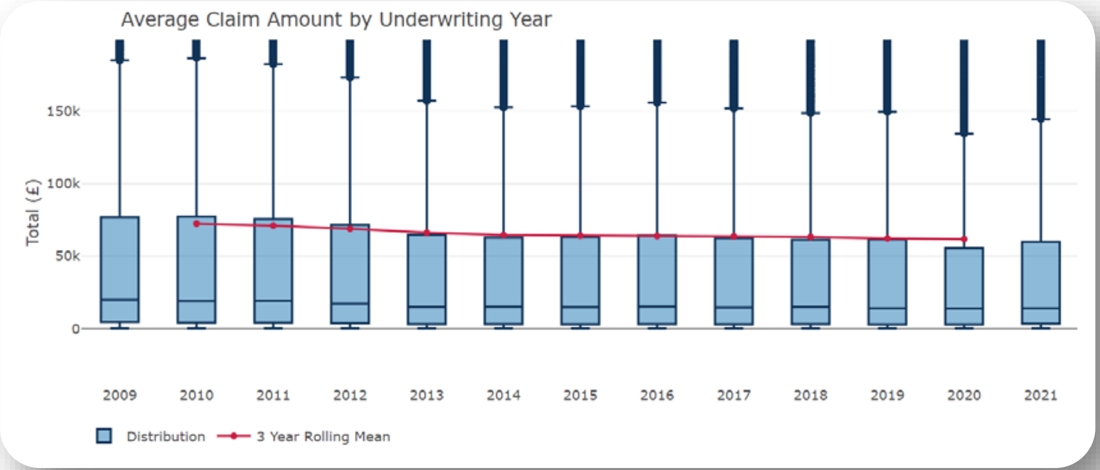
Euro HICP

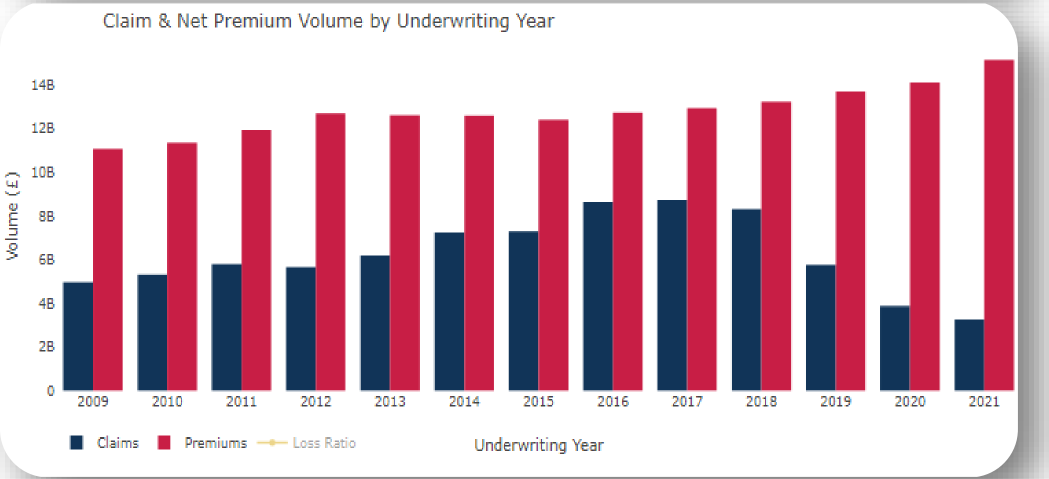


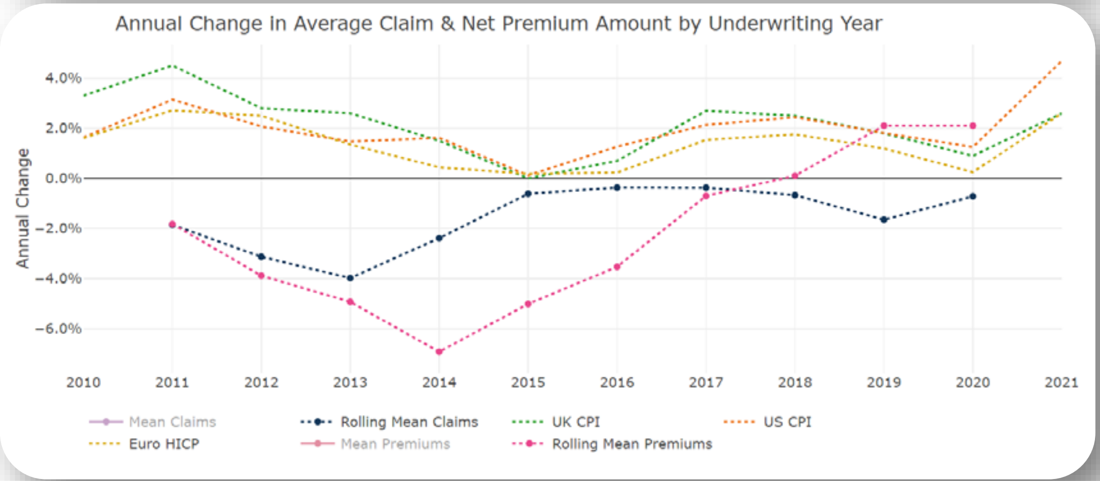
Institute and Faculty of Actuaries

Lloyd's Aggregated View (Underwriting Year)





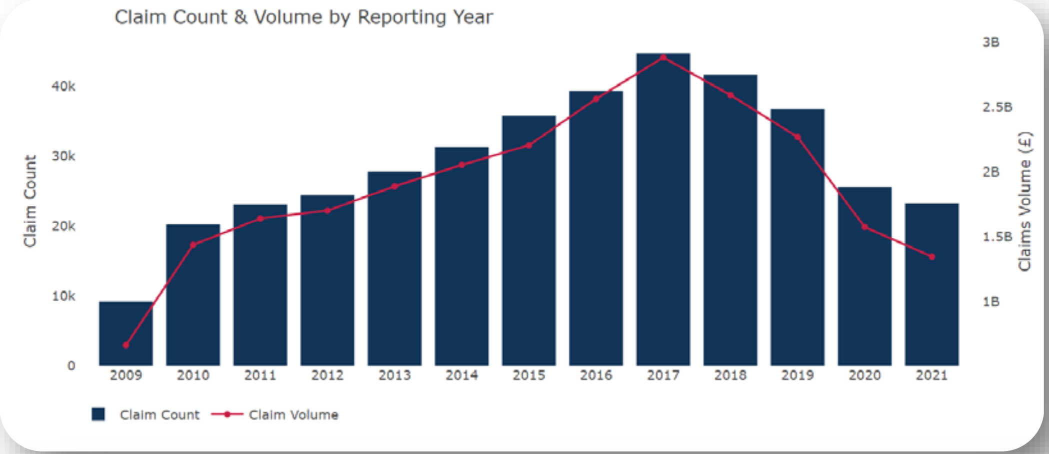


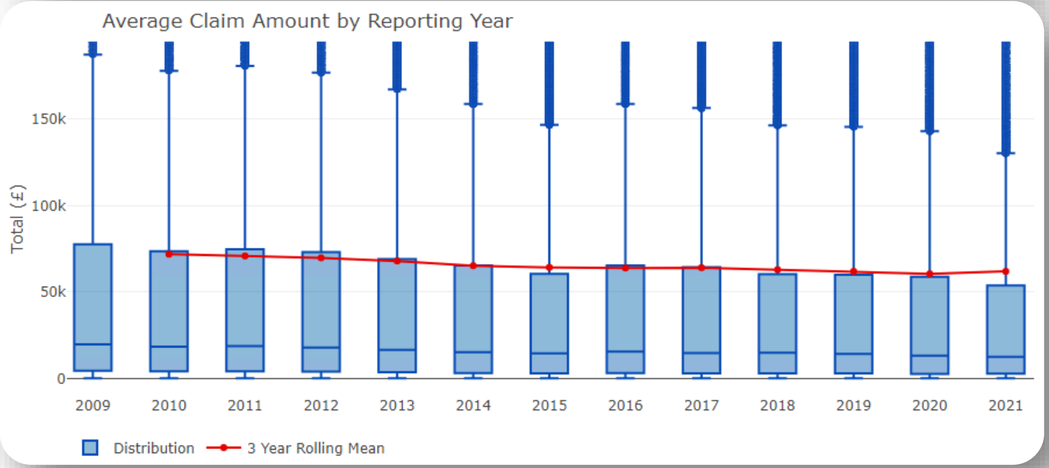


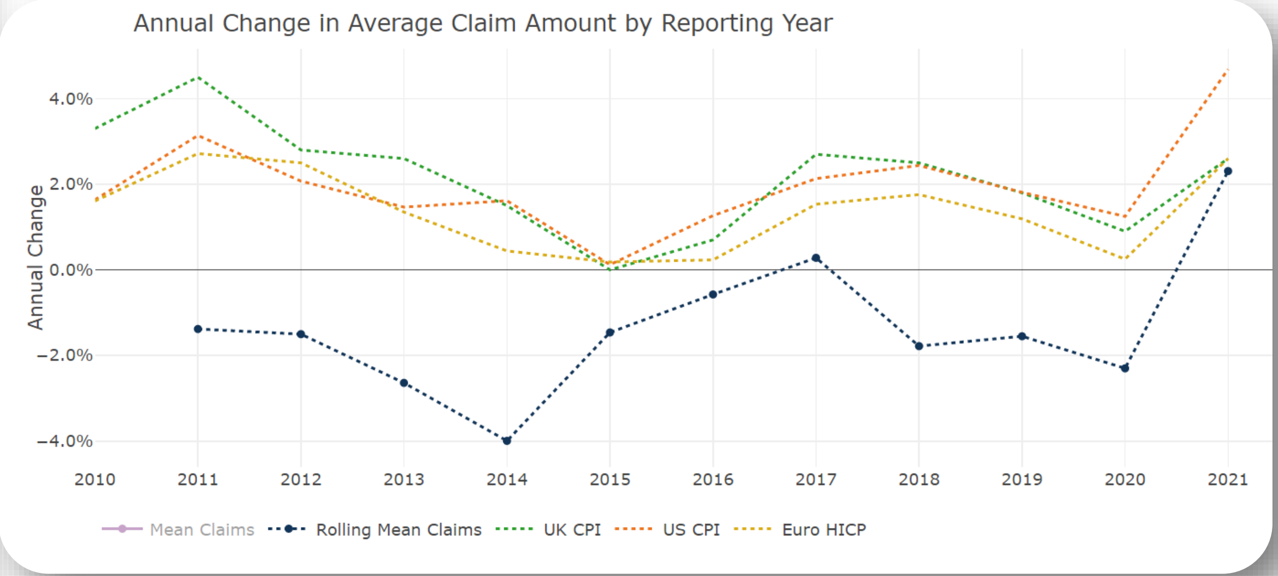
Proportion of claims data included in the analysis: 46%

Institute and Faculty of Actuaries

Lloyd’s Aggregated View (Reporting Year)



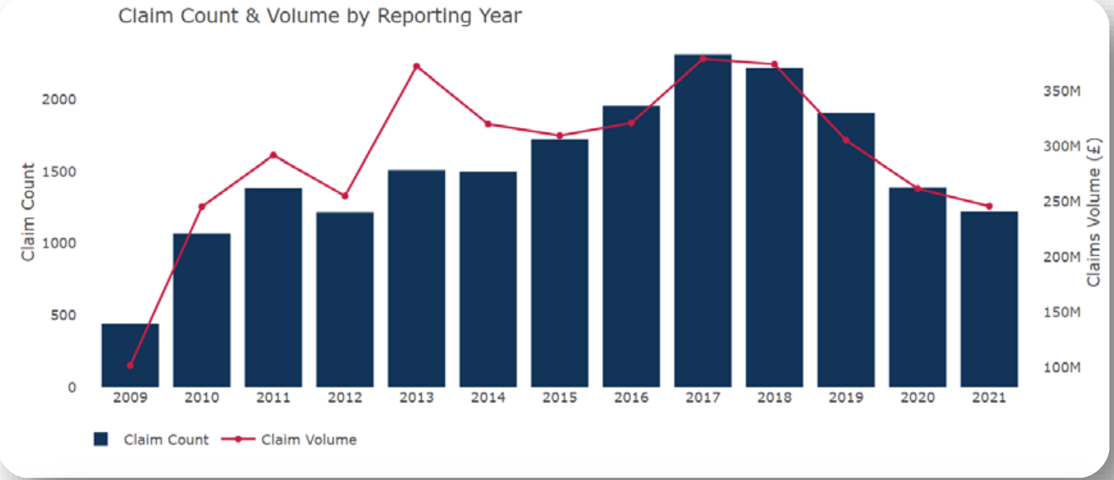


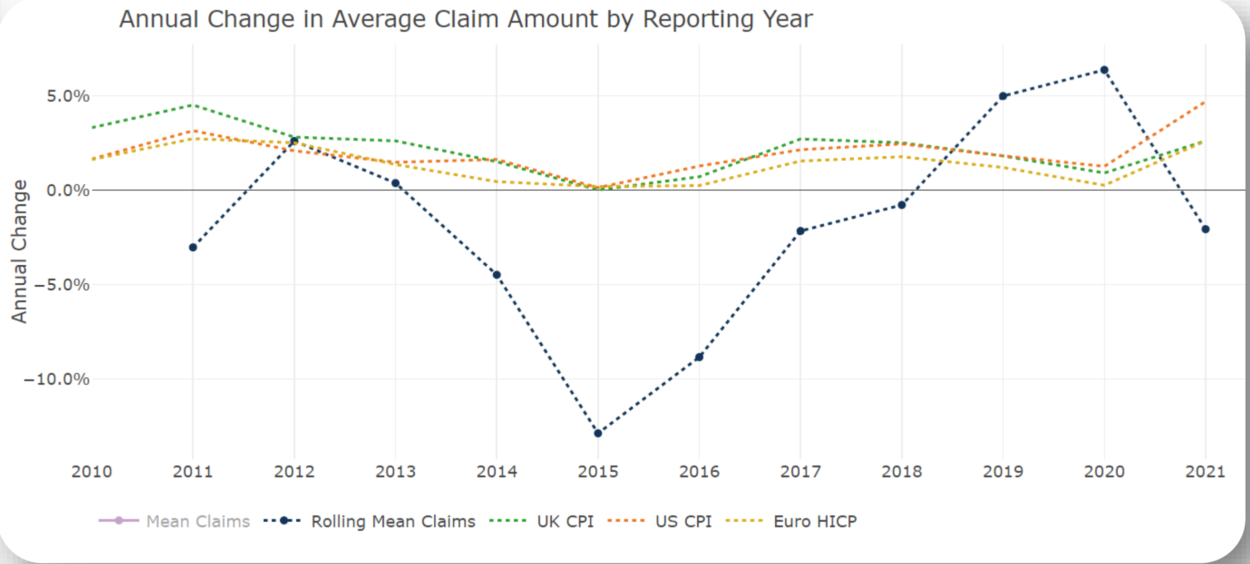


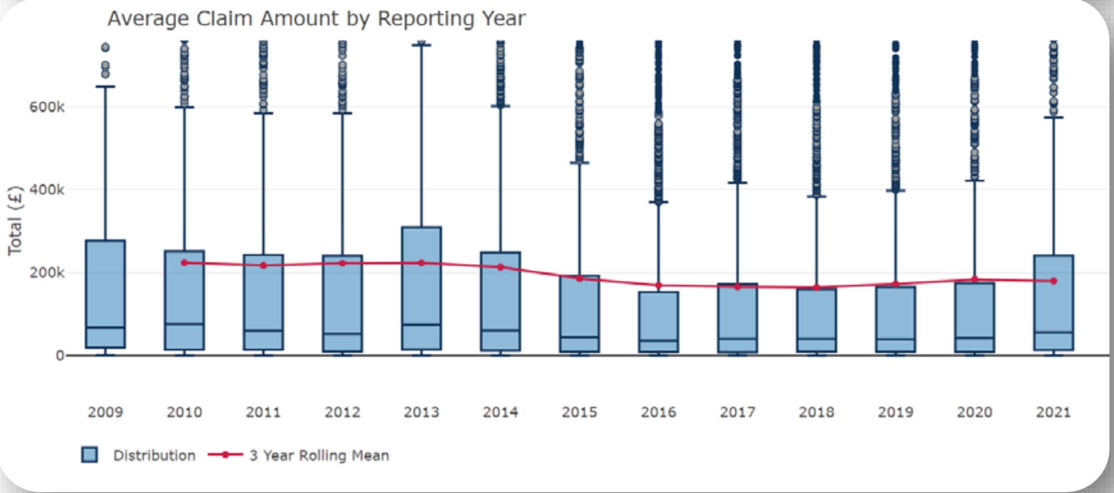
Proportion of claims data included in the analysis: 46%

Institute and Faculty of Actuaries

Energy View (Reporting Year)



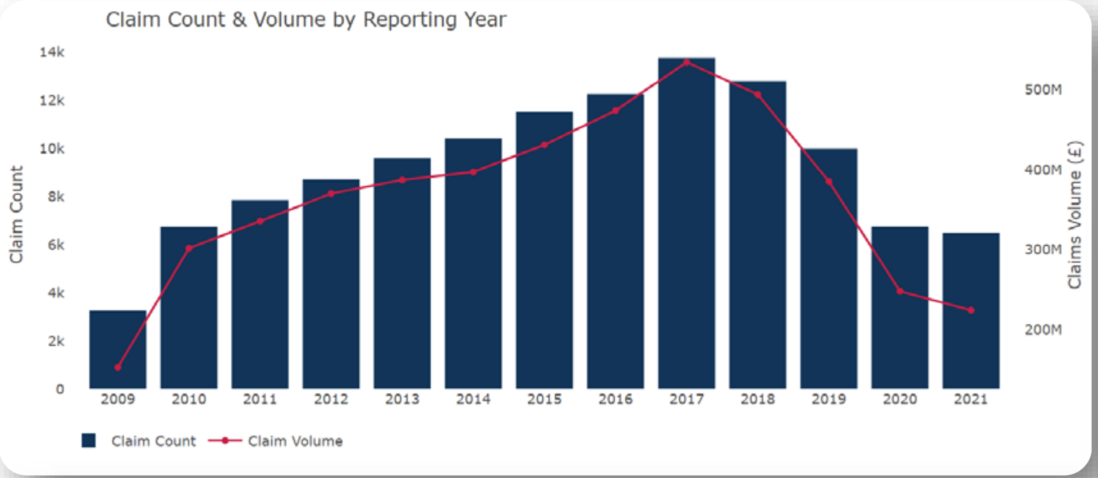


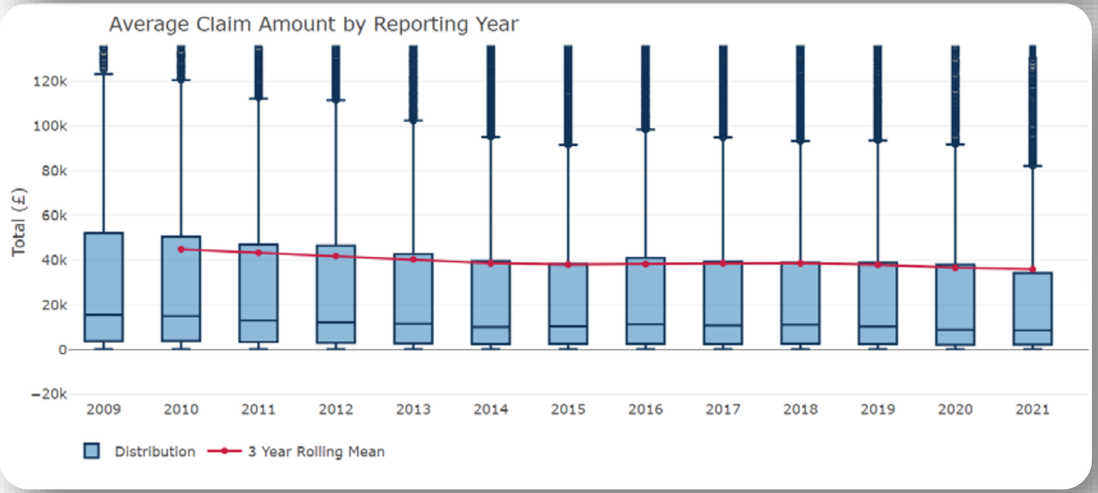


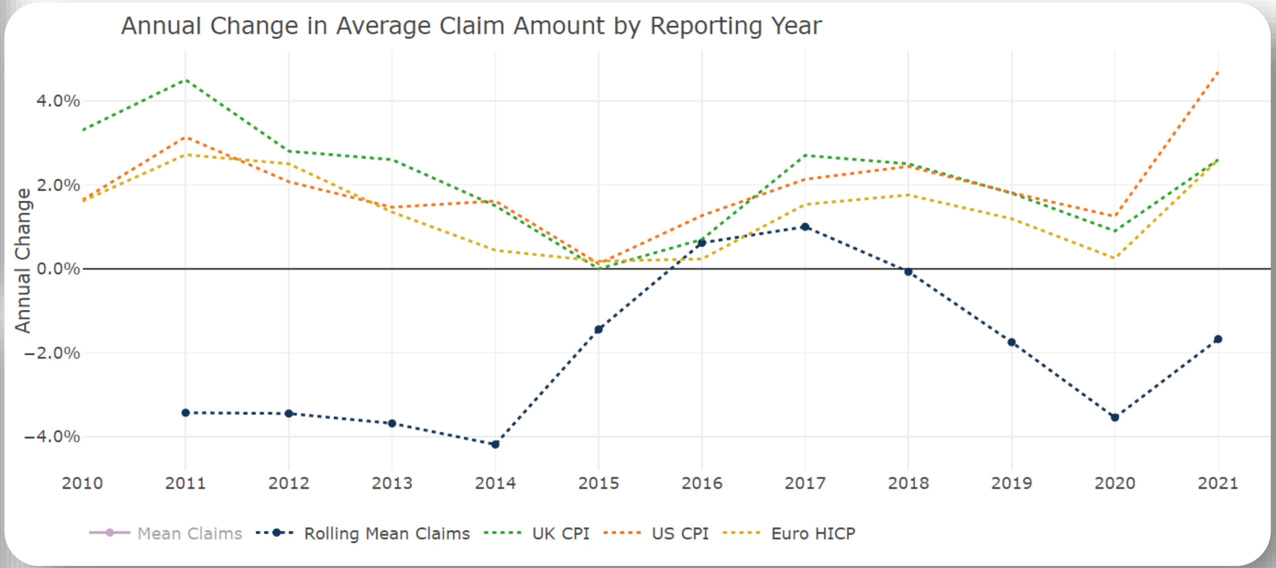
Proportion of claims data included in the analysis: 78%

Institute and Faculty of Actuaries

Marine View (Reporting Year)







Proportion of claims data included in the analysis: 63%

Institute and Faculty of Actuaries

Institute
and Faculty
of Actuaries

Reserving – Insights from Actuarial Oversight and the Market Reserving Exercise

Priye Kanabar
Senior Actuary, Lloyd's

Sanjiv Sharma
Senior Actuary, Lloyd's

#GiroConf22

Lloyd’s communication so far

To help the market tackle this complex issue, Lloyd’s has shared inflation related reserving material in recent months

June

Lloyd’s NED session

This session focused on:
- Defining Claims Inflation.
- Potential approaches and considerations on quantifying the impact of inflation.

June

Reserving Guidance – Allowing for Inflation

This memo sets out Lloyd’s expectations on reserve setting for managing agents in response to the high inflationary environment and provides additional guidance.

July

LMAG – Lloyd’s Update

Discussions in this LMAG update included:

- Observations from our thematic review of inflation.
- Summary of best practice approaches
- Limitations of currently adopted approaches

August

Lloyd’s Reserving Thematic Review Report

- Provides greater detail on the findings shared in the LMAG with greater focus on recommendations for the market

These can be found on the Lloyd’s website, with specific locations included at the end of this presentation

Institute and Faculty of Actuaries

Lloyd’s reserving expectations of syndicates

*“We expect syndicates to **explicitly consider economic and excess inflation** (including social inflation) in their reserving process **when setting best estimate reserves.** This is particularly important when historical data is unlikely to be representative of the future and traditional reserving techniques do not address this.*

*Where syndicates are not making an explicit additional allowance in their best estimate reserves for inflation, they must be able to **explain why their approach is appropriate** and how they have gained sufficient comfort that their reserves are adequate.”*

Our expectations:

1. Inflation to be considered explicitly as part of the best estimate reserving
   - Explicit consideration by class of business and geography

   This doesn't mean you should apply an additional allowance to every class of business, unless that is appropriate and not excessively prudent.

2. Be able to clearly explain how inflation has been allowed for
   - To allow challenge by various stakeholders across the business

   Allowing for inflation is not straightforward but communication needs to be clear on what the assumptions imply.

3. A considered approach will be taken to reserving for claims inflation
   - That appropriately reflects the specificities of your claims costs

   Broad-brush approaches are unlikely to be appropriate given that they are likely to under or over-estimate the impact by class.

Which approach did you use to allow for inflation?

Most recent approach used to allow for heightened inflation - select all that apply

slido.com with **#4012514**

1. Uplift cashflows
2. Explicit allowance within IELRs
3. Explicit IBNR loading
4. Inflation adjusted chain-ladder
5. Implicit allowance (within margin)
6. Implicit allowance (within best estimate)
7. Adjustments to frequency/severity assumptions
8. Other/additional detail – open comment

Institute and Faculty of Actuaries

Lloyd's Market Reserving Exercise

Allowing for the current heightened inflationary environment at a market level

The Lloyd's Market Reserving Exercise has a number of uses including providing an internal view of the market level of reserves as well as identifying areas of concern for oversight purposes.

- Consistent with our expectations of Syndicates we have **explicitly considered the impact of economic and excess inflation, as well as social inflation in the 2021 year-end Market Reserving Exercise.**
- Where appropriate material assumptions have had **insights from subject matter experts and challenge from the internal Inflation Working Group as part of a robust feedback loop**.
- **We have used stress and scenario testing to gain comfort with selected assumptions,** given the uncertainties involved in this estimate.

Establishing historical inflation by class is important to avoid over projecting uplifts required. Historical inflation has been determined based on judgement and syndicate returns.

Inflation uplift methodology and assumptions

Key Considerations

- Impact on older years of account
- Treatment of case estimates vs IBNR
- Cashflow uplifts
- Policy limits
- Adjusted chain ladder
- Reinsurance
- Cat vs Attritional
- Duration of heightened inflation environment
- Frequency/ Severity
- Granularity of indices/data (e.g. Construction materials price index)
- IELR selection
- Geography/ jurisdiction

Institute and Faculty of Actuaries

Which approach did you use to allow for inflation?

Most recent approach used to allow for heightened inflation - select all that apply

slido.com with **#4012514**

1. Uplift cashflows
2. Explicit allowance within IELRs
3. Explicit IBNR loading
4. Inflation adjusted chain-ladder
5. Implicit allowance (within margin)
6. Implicit allowance (within best estimate)
7. Adjustments to frequency/severity assumptions
8. Other/additional detail – open comment

Institute and Faculty of Actuaries

Lloyd’s inflation uplift approach

Cashflow uplifts based on expert judgement

The selected methodology for the Market Reserving Exercise balances simplicity for ease of communication with expert judgement. The feedback loop with Lloyd’s Markets team (‘Underwriting’) forms the basis of the method:

- Future cashflows uplifted for unpaid claims
- Assuming inflation will emerge over the next three years in line with BoE/Fed projections as at Q2 2022
- Inflation impact on 2022 YoA based on expert judgement from Lloyd’s Markets team at Lloyd’s 60 level
- Allowance by class for historical inflation
- Adjusted uplift for reserves on older years of account
- Close the loop with review and sense check by Lloyd’s Markets Team

Institute and Faculty of Actuaries

Example of a good approach in the Market

- Consider OS case reserves, pure IBNR, specific IBNR by Attritional, Large and Cat – are they in scope of review?
- Use payment patterns to derive expected cashflows
- Two inflation indices derived: base index and heightened index
- Excess factor derived and applied to expected cashflows to estimate uplift

At COB level and by collaborating with the wider business

Future Year	1	2	3
Base inflation assumed	2%	2%	2%
Revised inflation forecast	10%	5%	2%
Base index	1.02	1.04	1.06
Revised index	1.10	1.16	1.18
Excess factor	**1.078**	**1.110**	**1.110**

Inflation assumed implicitly in claims triangle

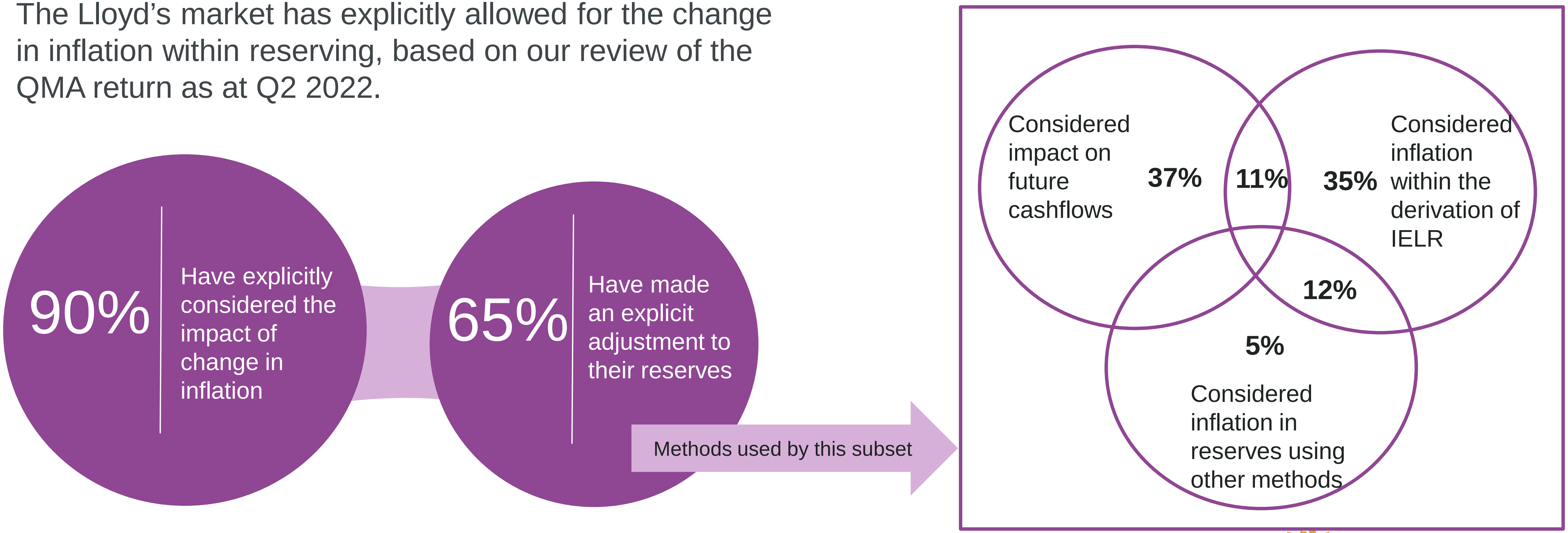
From ground up claims inflation

Cashflow uplift factors

Institute and Faculty of Actuaries

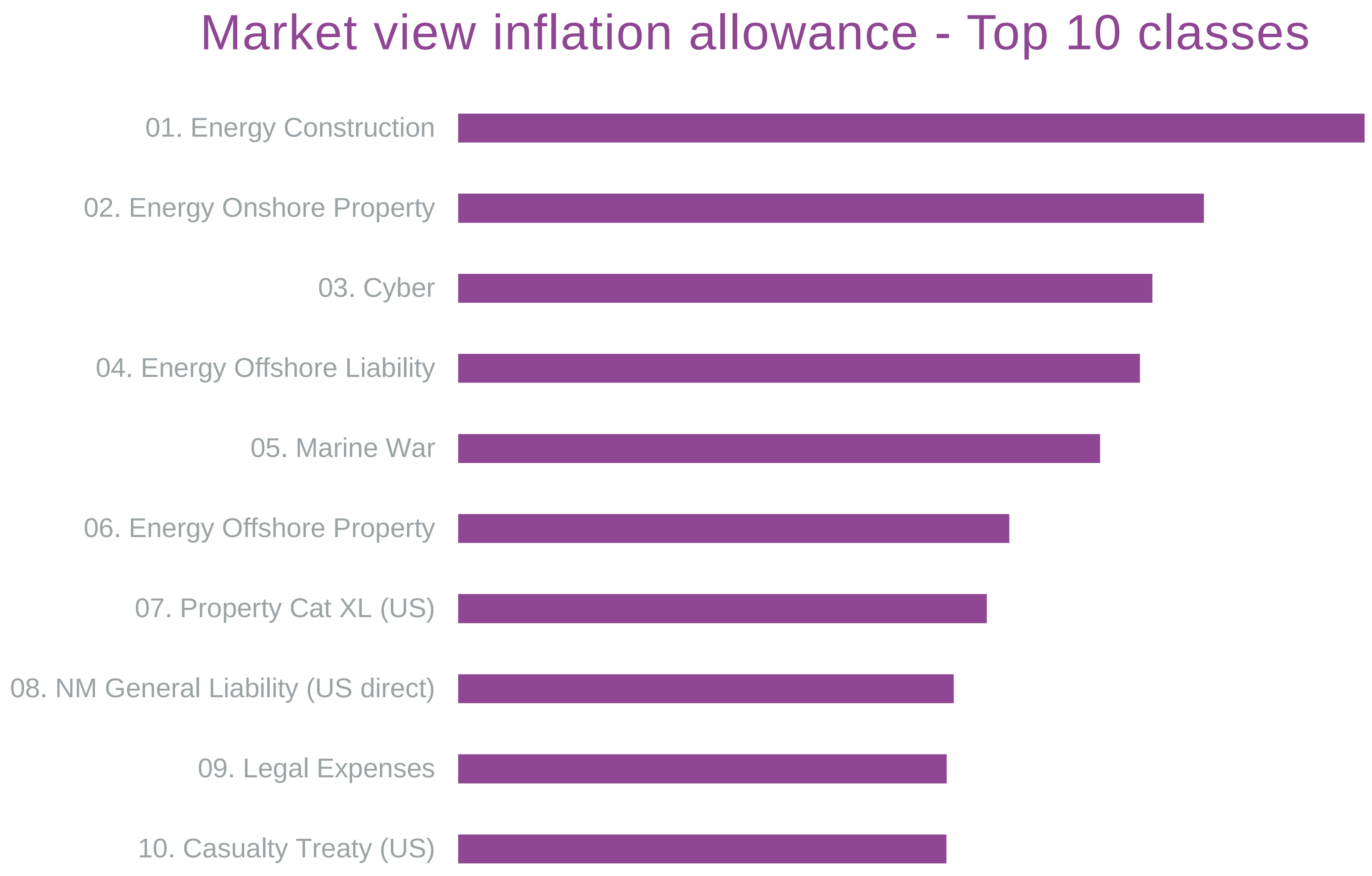
Market has taken steps in the right direction as at 2022HY

The Lloyd's market has explicitly allowed for the change in inflation within reserving, based on our review of the QMA return as at Q2 2022.



Institute and Faculty of Actuaries

Market's Inflation Uplifts to Reserves by Class



Average net reserves uplifted by **2.3%** as per Q2 2022 QMA

Appropriateness of allowance depends on risk profile of syndicate

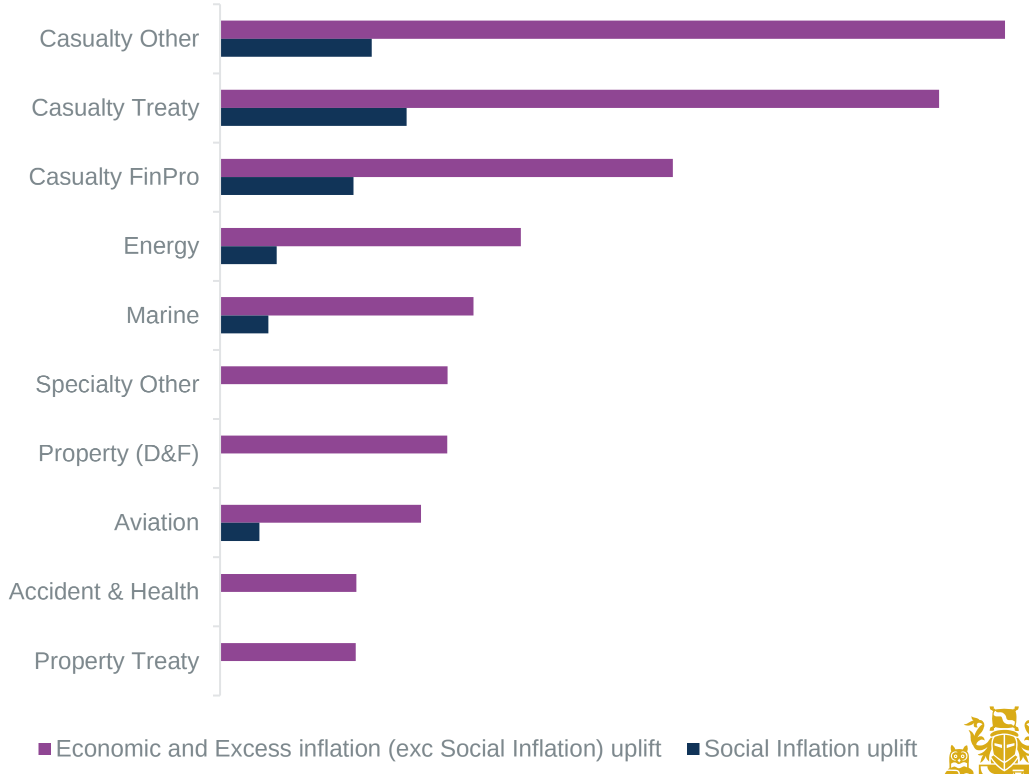
Institute and Faculty of Actuaries

Lloyd's Inflation Uplifts by Class

Longer tail Casualty classes drive majority of the uplift

- Classes which are expected to be most significantly impacted by inflation include Medical Malpractice, Non-Marine General Liability, FI and PI.
- A number of property classes are also expected to be impacted heavily, including Property D&F, Energy Onshore/Offshore and Engineering classes.
- Overall uplifts are a product of expert judgement on 2022 YoA and payment patterns.
- Social inflation has been allowed for separately with uplifts based on expert judgement.

Explicit future inflation allowance within net reserves by class (Lloyd's independent view)



Institute and Faculty of Actuaries

Work still to be done ahead of the 2022 year-end reserving

10% Are yet to explicitly consider impact of inflation

64% Reported they have plans to enhance consideration by 2022 Q4

25% Received feedback from Lloyd's highlighting our concerns

1) Where IELR's have been uplifted how has comfort been gained the older YOA are appropriately reserved?

2) Where no / little / top-down, pragmatic approaches taken, are there plans to revisit based on individual class-specificities?

3) The landscape is evolving quickly. Are inflation allowances set at Q2 still appropriate at Q4?

Our expectation by year end 2022 reserving is:

- **100% of Syndicates explicitly consider inflation and**
- **Syndicates with no explicit adjustment to the reserves should have adequate justification**
- **Syndicates should consider how inflation is present in the claims and how this may change over time**

Institute and Faculty of Actuaries

Capital - Insights from Actuarial Oversight

Adhnan Chaudhry
Senior Actuary, Lloyd's

#GiroConf22

Introduction

Prior capital communications

- Thematic review of claims inflation report (August 2021), published on the Lloyd's website*
- Capital technical guidance (July 2021)
- Market presentations:
  - CAS (October 2021)
  - GIRO (November 2021)

- Lloyd's conducted a detailed review of inflation in syndicate capital models across the market for 2023 year of account business planning
- This was based on inflation specific model data collected from all internal model approved syndicates and guided by a Lloyd's view of inflation materiality by syndicate
- This data underpins charts and figures presented on the next few slides
- We encourage syndicates not to rely on this for validating their own models – **syndicates should apply ground-up testing which is risk profile specific**

Institute and Faculty of Actuaries

*https://www.lloyds.com/resources-and-services/capital-and-reserving/hot-topics

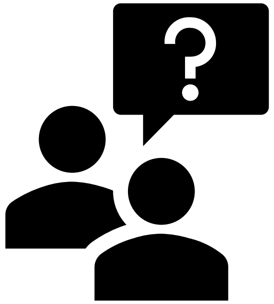
Methods to allow for inflation uncertainty

There is no one size fits all approach

Lloyd's guidance:

Syndicates need to reflect the current economic environment appropriately in their internal model.

Q: How?



Types of Inflation	Method
Economic	Inflation indices from an ESG applied to cash-flows. Indices can be weighted by currency and business mix.
Excess Inflation	**Model inputs:** Adjustment to cat exposure data and ELTs; implicit in the opening TPs; implicit / explicit in plan loss ratios.
	Parameters: Implicit in parameterisation data and on-levelling; implicit / explicit in dependency between years and classes; implicit / explicit in premium and reserve risk CoVs
	Driver-based: Explicit drivers e.g. for social inflation or economic events; demand surge and post loss amplification; overlay applied to ESG indices

How do you ensure there is an appropriate dependency between different types of inflation?

Economic Inflation – ESG versions

We challenged syndicates using out-of-date and unadjusted ESGs

Remainder either use an ESG but don’t apply the inflation indices to insurance cash-flows, or don’t use an ESG at all

86% use an ESG to model inflation volatility

66% use a q2 2022 version

34% use an alternative version

Adjustment to older ESG releases tended to increase economic inflation volatility only

39% make adjustments

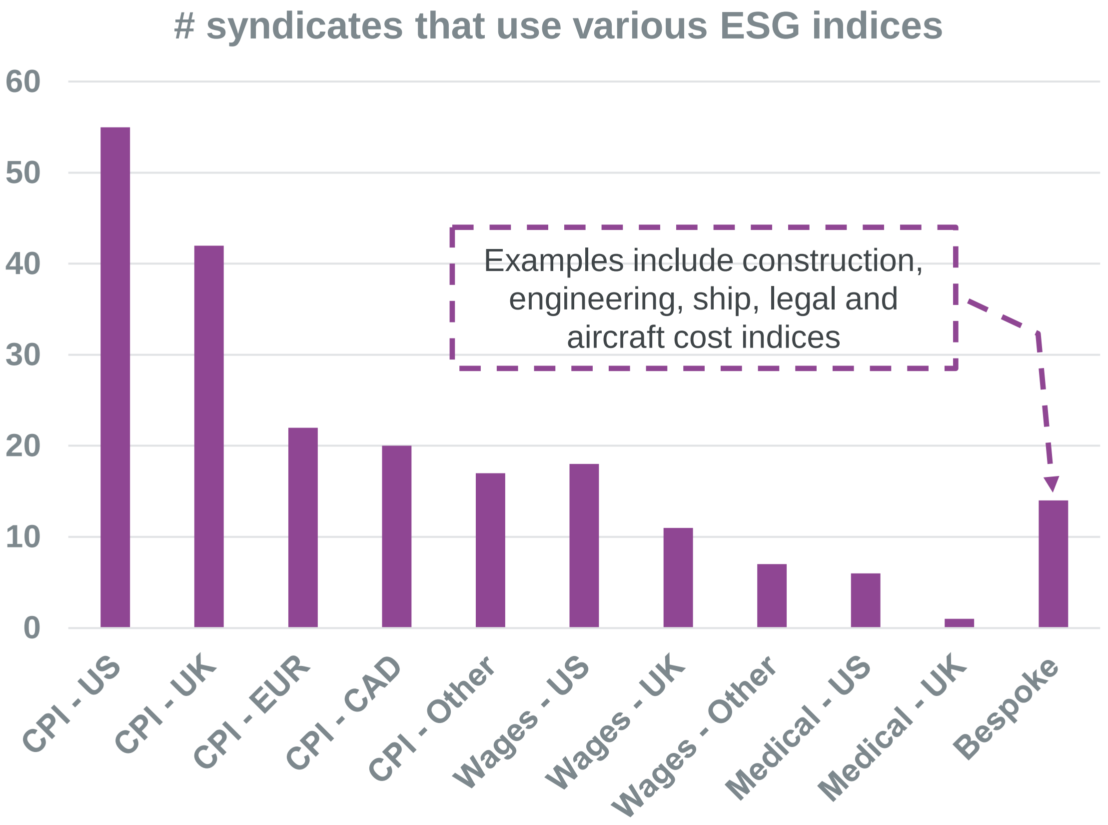
68% make adjustments

To increase volatility of economic indices and / or make the indices more representative of total claims inflation

Institute and Faculty of Actuaries

Economic Inflation – ESG indices

A range of methods used to achieve desired level of inflation related dependency



- Most syndicates apply a single index by class (e.g. CPI – US)
- Indices can be blended by type (e.g. wage and price for a class covering property and liability risks) and currency
- For some syndicates a certain index may be most representative of their business mix but another is used from the ESG because it is more volatile and increases capital (e.g. CPI picked over wage)
- There was a range of approaches used for diversification:
  - Some syndicates apply different indices by class (by type and / or currency), which creates diversification because the indices are not fully correlated
  - Others apply the same index to all or groups of classes, to reduce diversification benefit and strengthen inflation related tail dependency
  - Some syndicates don't apply the ESG to all claim types
- Whichever approach is adopted, **we expect to see justification using the risk profile, sensitivity testing and validation against alternative approaches**.

Institute and Faculty of Actuaries

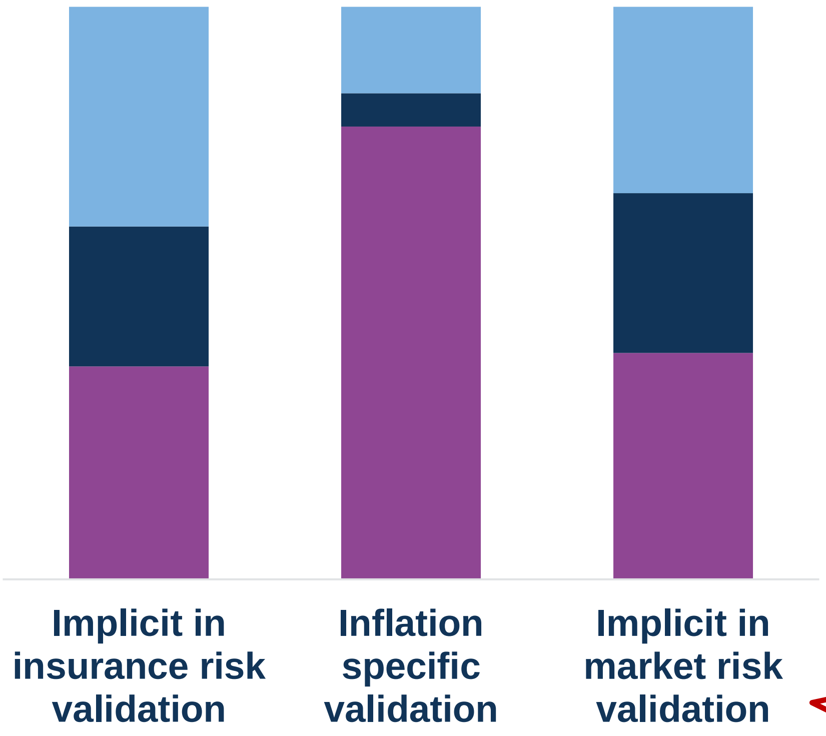
Excess inflation

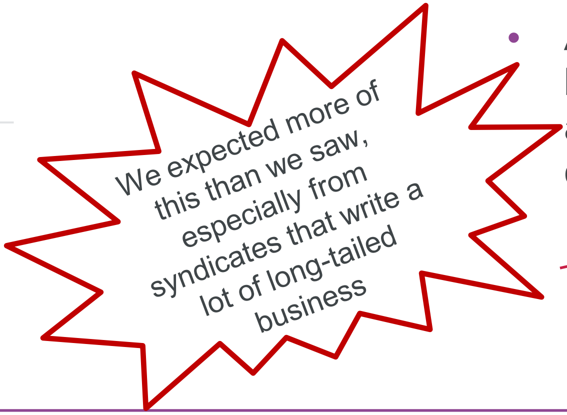
Many syndicates enhanced their excess inflation modelling approach

- Examples of better approaches we saw were:
  - Adjust existing / introduce new tail drivers to mimic an inflation stress on similar cohorts of business
  - Adjust ESG indices to be more representative of claims inflation rather than economic inflation (with complexity ranging from simple scaling to ARMAX modelling)
  - Methods which considered how different sources of excess inflation should be correlated with economic
  - Using explicit excess inflation risk drivers, for example court awards, medical advancement and social inflation, in the process to set correlation between classes, years and risks
  - Assessment of exposure to inflation, for example in cross-function working groups, that directly and explicitly influence parameterisation (e.g. via parameter uplifts / scenario development)
  - Quantifying inflation in the on-levelling process and CoVs for materially exposed classes, this enabled alternative sets of parameters to be developed for testing.

Nature of inflation validation

Lots of advancement, but more work needed to assess implicit allowances



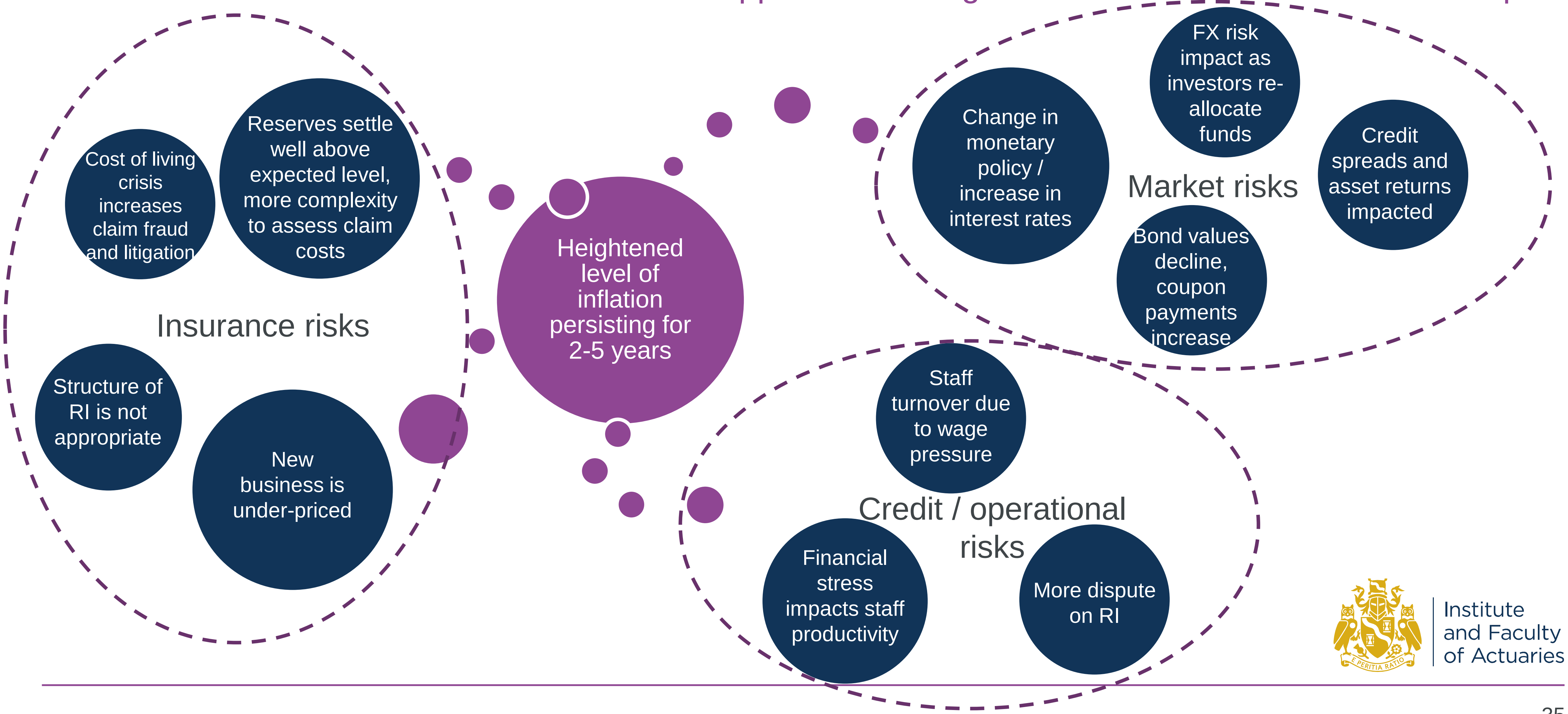


- Inflation modelling was a validation focus area for majority of the market as expected
- Validation often leveraged analysis from inflation working groups and pricing, reserving and planning teams
- Validation typically covered back-testing of ESG indices, review of updated methodologies and analysis of inflation allowances in the business plan loss ratios and opening TPs.
- A small proportion of the market developed new and bespoke quantitative tests to validate inflation volatility and in particular assess how implicit allowances contribute to insurance risk volatility and dependency

Institute and Faculty of Actuaries

Scenario testing

Scenarios could have been more severe and applied to more granular distributions than overall capital



Institute and Faculty of Actuaries

Technical challenges

Areas of modelling the market found difficult

In some cases judgements were not backed by reference to a targeted outcome, scenario analysis or sensitivity testing

- Demonstrating that excess inflation creates enough dependency
- Unpicking inflation from data
- Unpicking inflation contribution to insurance risk
- 'Over counting' inflation volatility across multiple sources of modelling
- Aligning dependencies inside an ESG to an alternative view
- Cat insured data not granular enough and / or is out-of-date
- Highly judgmental approaches are difficult to validate

The #1 challenge, especially where there is reliance on implicit modelling – more work is needed here

Ad-hoc adjustments can have unintended consequences, collaboration with vendor is recommended

Institute and Faculty of Actuaries

Institute and Faculty of Actuaries

Summary

Adhnan Chaudhry
Senior Actuary, Lloyd’s

#GiroConf22

Summary

- Current inflationary environment is highly uncertain, and assessing the impact of it on claims is not straightforward
- Key questions to consider when tackling this issue:
  - Has the most up-to-date view been considered?
  - What data is available to aid analysis, are there sources that haven't been considered before?
  - How is inflation expected to impact the business and do the reserving and internal model results reflect this?
  - Is approach and allowance appropriately communicated to stakeholders?
- There should be consistency in views of inflation across teams – higher uncertainty in the planning and reserving processes should be reflected through higher volatility in the capital model
- Developing explicit approaches aids communication of uncertainty to all stakeholders

Institute and Faculty of Actuaries

Questions

Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are those of the presenter.

Institute and Faculty of Actuaries

Institute
and Faculty
of Actuaries

Appendices

#GiroConf22

Lloyd’s definition

We define **claims inflation** as the **change in claims cost of a like for like policy over time**. Claims cost is considered as all costs in relation to the payment and settlement of a (re)insurance claim. This includes loss adjustment expenses directly associated with the claim, such as claims handling. Like for like means having consistent policy wording, exposure and level of coverage, such that the change in claims cost is considered after normalizing for changes in policy terms and other differences in the policy. Our definition of claims inflation covers changes in claims cost due to trends which affect the number (frequency) and/or size (severity) of claims.

Claims inflation is the sum of **economic inflation** and **excess inflation**:

- **Economic inflation**: Changes in claims costs as captured through **published economic indices** relevant to a (re)insurer’s mix of business. Typically, this is inflation in the cost of a basket of selected goods and services or average wage costs, which are captured in price and wage indices (such as RPI, CPI and ASHE in the UK, which are produced by ONS).
- **Excess inflation**: Changes in claims costs **beyond what is captured in economic indices**, including factors which are specific to a (re)insurers’ business and including social inflation. Typically, this is inflation associated with resources specific to the nature of the claims costs of the (re)insurer (beyond that captured in generic inflation indices); or emerging risk from new materials, medicines and technologies; changes in the legal environment; evolving social attitudes towards claiming; and political developments.

We define **social inflation** as a subset of excess inflation, which more narrowly pertains to claims inflation as a result of **societal trends**. This includes rising costs of claims resulting from increased litigation, broader definitions of liability (excluding those caused by changes in policy terms and conditions), more plaintiff-friendly legal decisions, larger compensatory jury awards and social movements.

Where Lloyd’s communications can be found

Presentation to NEDs in June 2022;
Lloyd’s Reserving Thematic Review (“Allowing for Claims Inflation in Reserving – Lloyd’s Reserving Thematic Review 2022”); and
Lloyd’s Capital Thematic Review (“Modelling of Claims Inflation - Lloyd's Syndicate Capital Thematic Review August 2021”):
https://www.lloyds.com/resources-and-services/capital-and-reserving/hot-topics

Reserving guidance – allowing for Inflation:
https://www.lloyds.com/resources-and-services/capital-and-reserving/lloyds-reserving-guidance-and-support-materials

Lloyd’s capital guidance:
https://www.lloyds.com/resources-and-services/capital-and-reserving/capital-guidance/internal-model-scr

Institute and Faculty of Actuaries

Acronyms / abbreviations

Acronym / abbreviation	Description
ESG	Economic scenario generator
CoV	Coefficient of variation
TP	Technical provisions
ELT	Event loss table
RI	Reinsurance
Nat cat	Natural catastrophe
Non-nat cat	Non-natural catastrophe
SCR	Solvency capital requirement
FX	Foreign exchange
IELR	Initial expected loss ratio
LMAG	London Market Actuaries'

Institute and Faculty of Actuaries

Institute and Faculty of Actuaries

Thank you

#GiroConf22