

Growing Inflation

What are the implications for the insurance market?
September 2022

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Actuarial Risk Modelling Services

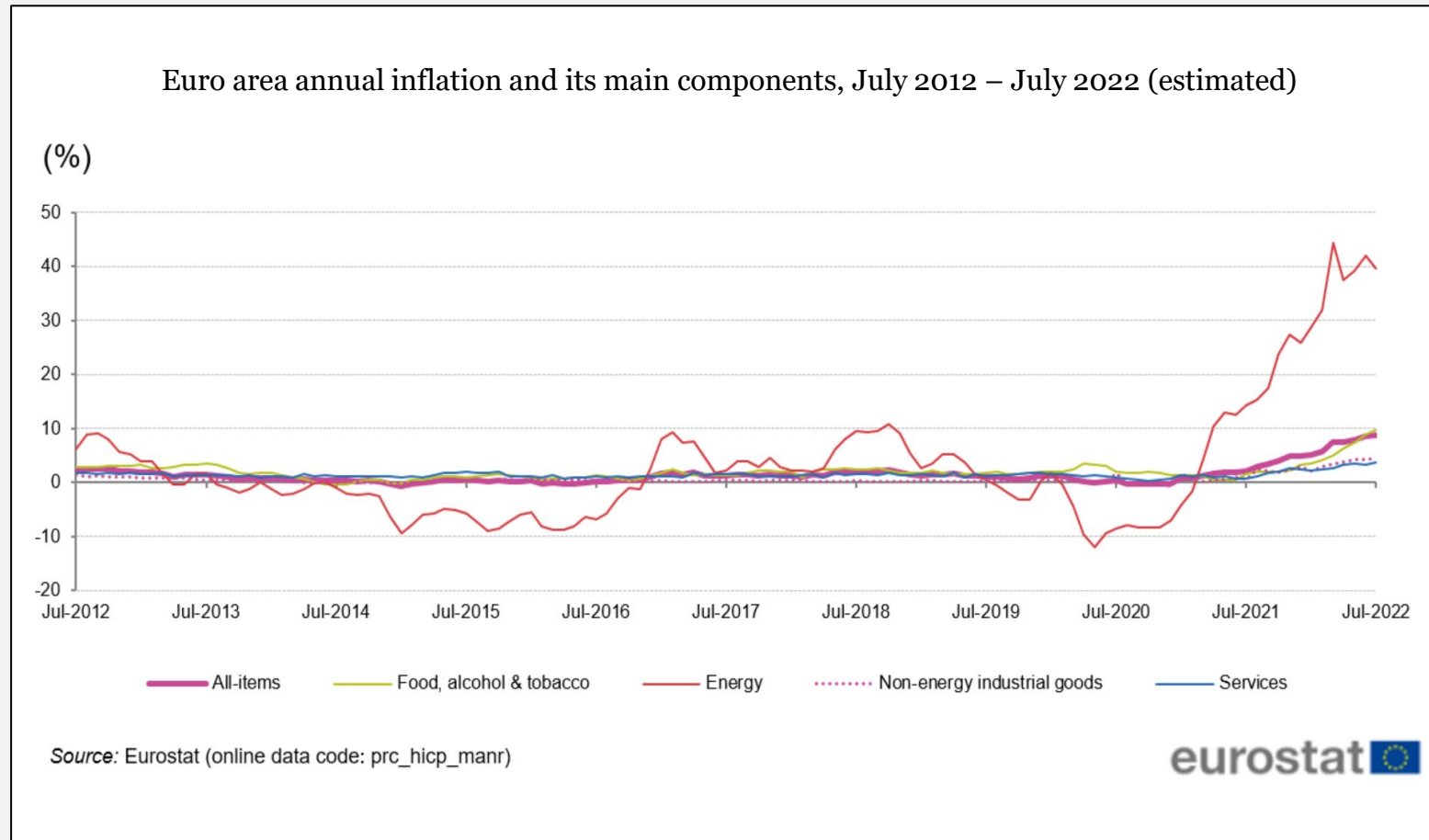


Agenda

1. Basic understanding and narratives
2. Developments in 2022 – Expectations & Challenges
3. Overview of regulatory needs
4. Reserving study

Basic understanding and narratives

Inflation increase

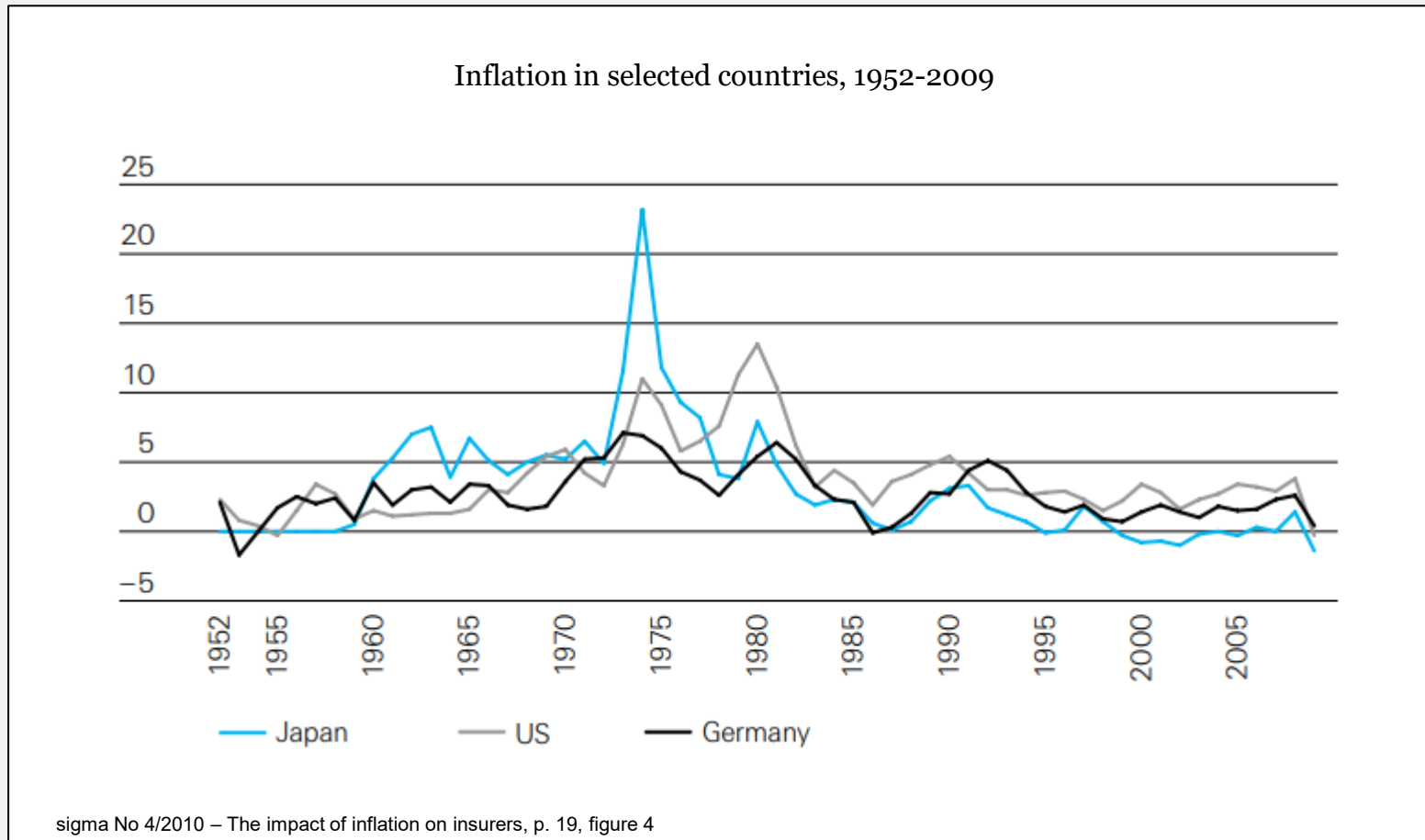


Highlights

- Food, alcohol & tobacco (increase)
- Energy (strong increase)
- Non-energy industrial goods (increase)
- Services (increase)
- High inflation affects all components and has implications for most organizations.

Basic understanding and narratives

After 2nd world war: Energy crisis driven peaks (1/2)



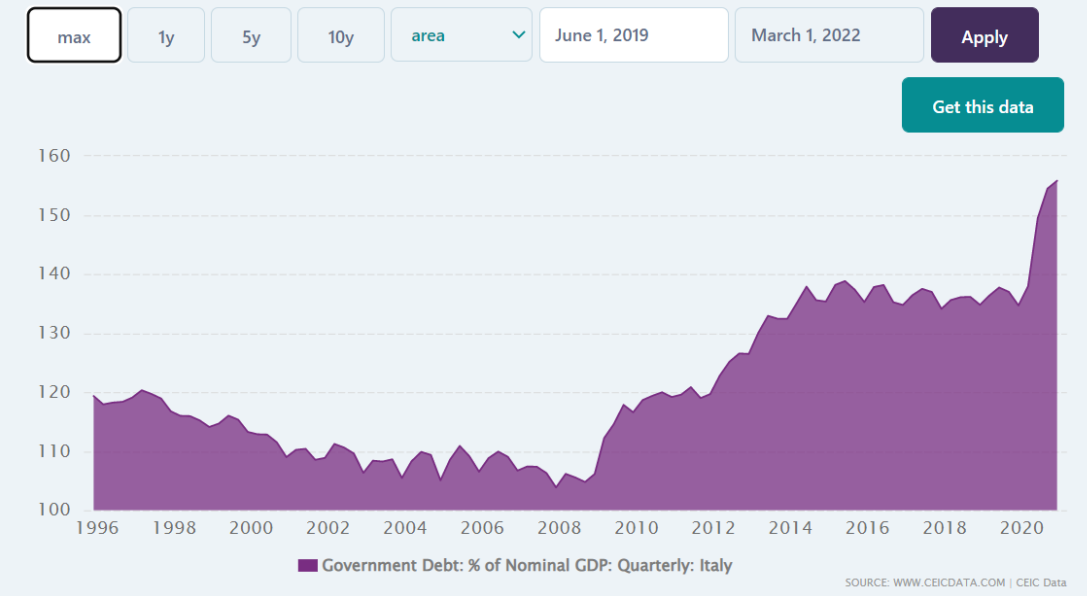
ECB, Jackson Hole, 27 August 2022:
“Inflation volatility has surged beyond
the levels seen during the 1970s”.

Basic understanding and narratives

After 2nd world war: Energy crisis driven peaks (2/2)



View Italy's Government Debt: % of GDP from Dec 1995 to Mar 2022 in the chart:



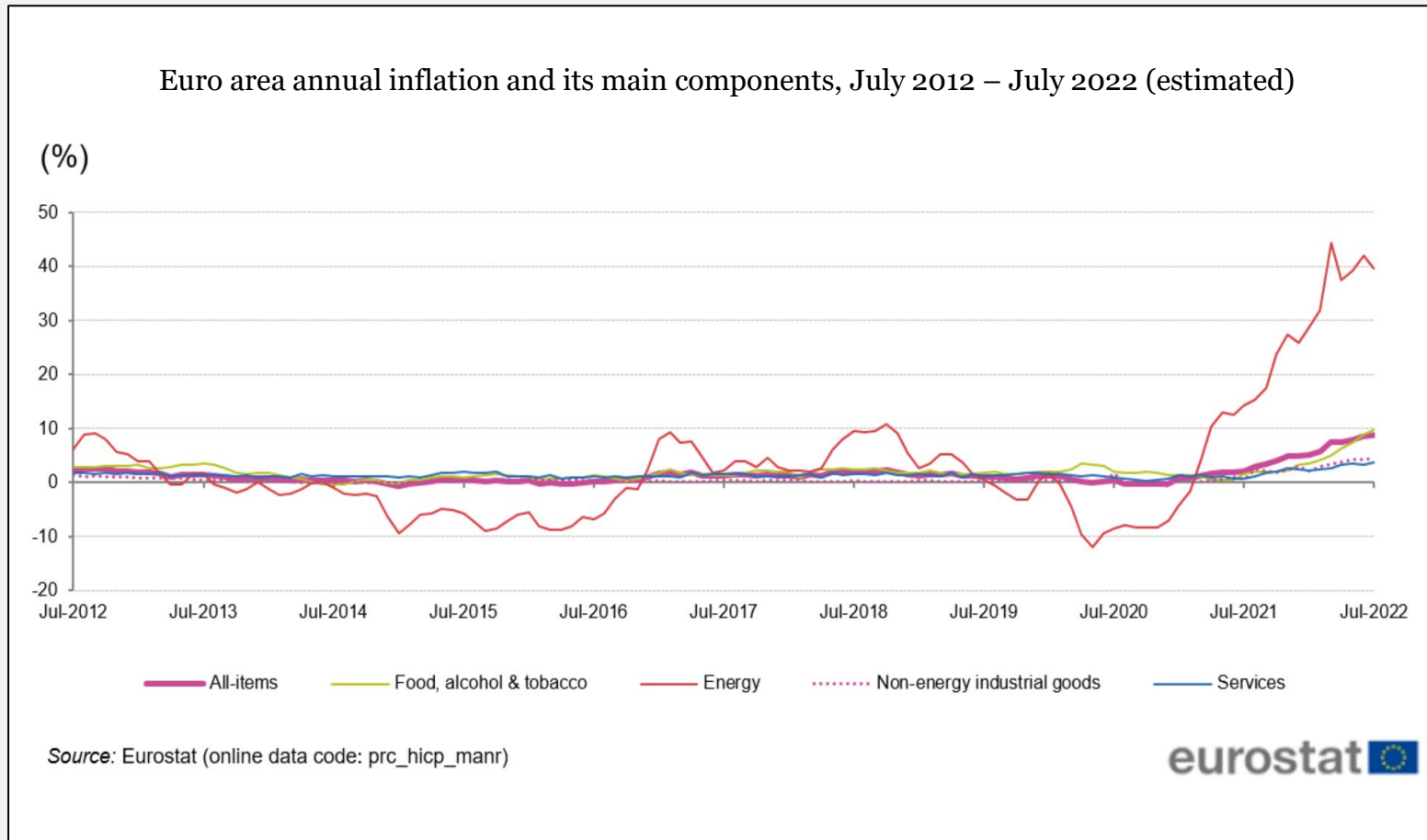
Basic understanding and narratives

Inflation peaks

- Fundamental understanding of the inflation experience as basis for projections to the future
- „In the long run [general] inflation is always a monetary phenomenon“ (Bundesbank)
- Natural interest rate, underlying the Solvency II ultimate interest rate
- UFR'23 EIOPA BOS 22/161: 60 years of experience: 3,4%
 - expected inflation rate (EUR): 2%
 - expected real rate is the same for all currencies; it is calculated as a simple average of the past real rates of a basket of representative countries since 1961: 1,4%
- Further impact from CB's interest rate decision
- Inflation models get more important; e.g. Wilkie investment model
 - for the retail prices and wages, share dividend yields/dividends/prices, long-term and short-term interest rates

Basic understanding and narratives

Inflation increase

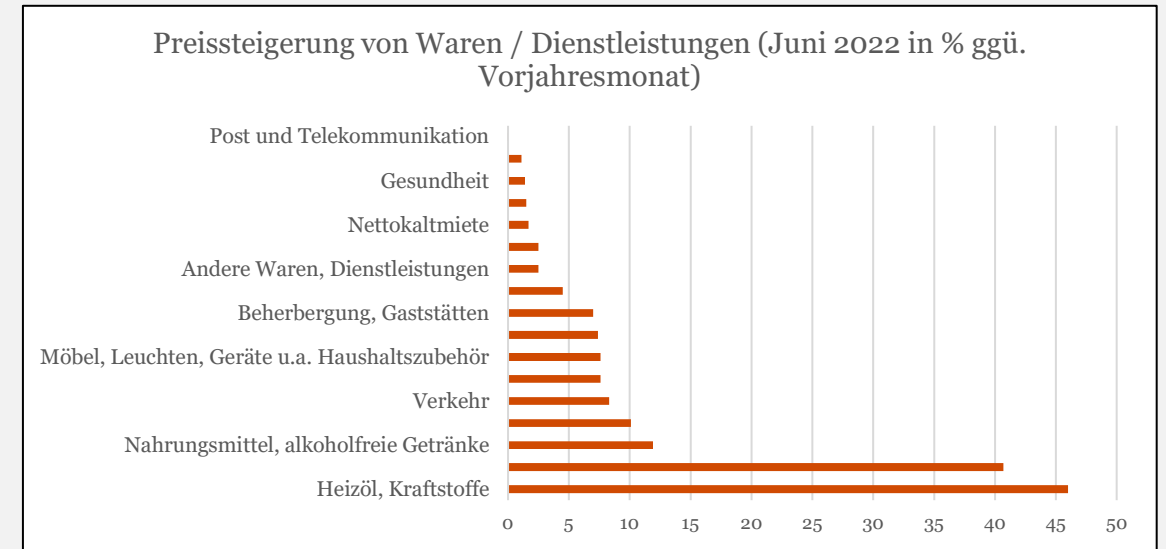
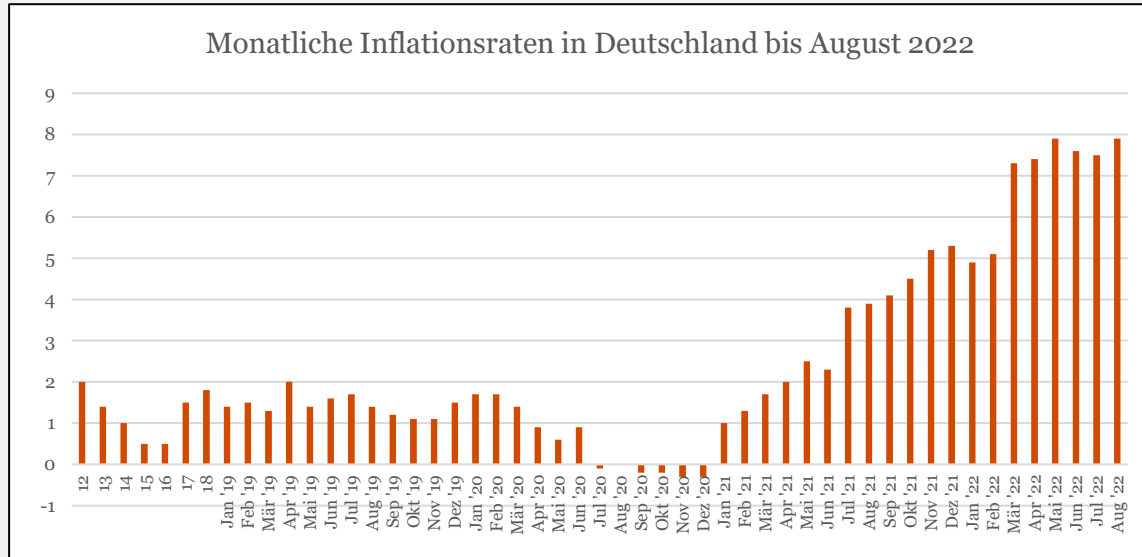


Highlights

- Average of real rate 2000-2021: 0,023%
 - Average of real rate 2000-2009: 1,32%
 - Harm. Index of Consumer Prices (HICP): 2,11%
 - Real rate 2010: -0,94%
 - Average of real rate 2010-2020: -1,16%
 - Harm. Index of Consumer Prices (HICP): 1,18%
 - Real rate 2021: -2,98%
- (based on EIOPA Data, EIOPA BOS 22/161)

Developments in 2022 – Expectations & Challenges

General Inflation in Germany



General (consumer price) inflation*

- significant increase of general inflation to 7,9 % in August 2022, but still significant differences for individual goods & services
- ECB expectation for 2022: 8,1 % // 2023: 5,5 % // **2024: 2,3 %** -> ie already **2024 back to a „normal“ level ???**

*: share of health & healthcare: < 5%, share of other goods & services: <10%

Developments in 2022 – Expectations & Challenges

Situation of the insurance industry in 2020 and 2021 as starting point for 2022 (1/2)

- **Business profitability until 2021**
 - **windfall profits** from **COVID crisis** in P&C business in the statistics of 2020 and 2021
 - hardening phase in commercial P&C lines
 - **supply chain challenges** (still ongoing)
 - care business side mainly driven by **demography**, social laws and medical inflation
 - life insurance with focus on the low interest environment
 - prospective **costs** related to modernization of **core business administration systems**
 - life reinsurers see **COVID costs linger** and mortality rates shift in First Quarter 2022 (AM Best)

Developments in 2022 – Expectations & Challenges

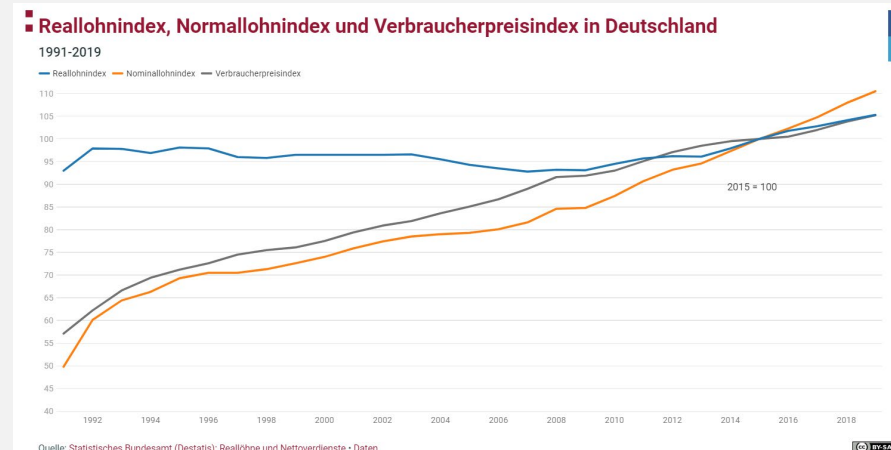
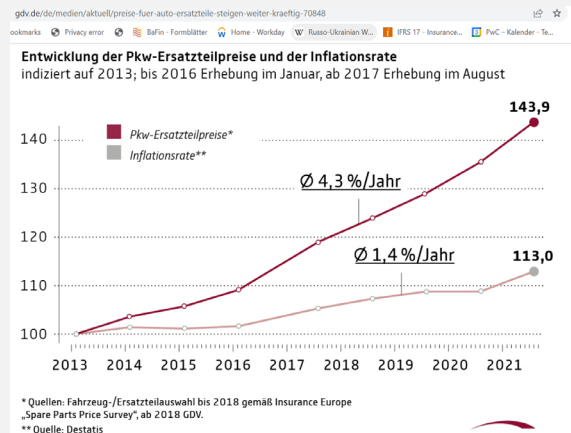
Situation of the insurance industry in 2020 and 2021 as starting point for 2022 (1/2)

- **Reserving as at year-end 2021 still based on a stable/low (general) inflation experience of the last decade**
 - **no market wide reserve strengthening** for inflation in the best estimates in P&C
 - so far already special attention to **superimposed inflation** (e.g. medical inflation)
 - improved actuarial reserving practice for peers over the years (advanced analytics and set-up of data infrastructure)
 - reference to close **contact of reserving and pricing actuaries** for assessments on inflation

Developments in 2022 – Expectations & Challenges

Indicators – more specific indicators for claims inflation (CPI + superimposed)?

(selected) line of business	typical indicators to be assessed ->are these the right ones?
Property, home buildings	buidlings/construction price index
Motor (non bodily claims)	wage index auto repair and retail, price index materials & parts, new vehicle consumer price index
Bodily claims (mainly liability)	health care wage index, health care price index (Medi und VPI Gesundheitspflege)
Long-tail business (more general view)	wage indices



Developments in 2022 – Expectations & Challenges

Indicators – Components of CPI

	Specific inflation regimes								Combined regimes	
	US enters WW2	End of WW2	Korean War	Ending of Bretton Woods	OPEC oil embargo	Iranian Revolution	Reagan's Boom	China demand boom	Inflation (18%)	Other (82%)
Start month	Apr 1941	Mar 1946	Aug 1950	Feb 1966	Jul 1972	Feb 1977	Feb 1987	Sep 2007		
End month	May 1942	Mar 1947	Feb 1951	Jan 1970	Dec 1974	Mar 1980	Nov 1990	Jul 2008		
Total price level chg	15%	21%	7%	19%	24%	37%	20%	6%		
Total price level chg (ann'd)	13%	19%	12%	4%	9%	10%	5%	6%		
Inflation component	Average ann'd price rise in regime								Average ann'd price rise	
Cereals and bakery products	9%	32%	16%	3%	20%	9%	6%	13%	13%	2%
Meat, poultry, fish and eggs					12%	10%	5%	4%	8%	2%
Dairy	15%	34%	23%	5%	12%	8%	5%	7%	14%	2%
Fruit and veg	28%	10%	11%	4%	10%	9%	7%	12%	11%	3%
Soft drinks			24%	2%	16%	14%	1%	3%	10%	3%
Other food					22%	11%	3%	7%	11%	2%
Food outside home				6%	10%	10%	4%	5%	7%	3%
Alcohol				3%	6%	6%	4%	3%	5%	2%
Household goods and services					9%	7%	2%	1%	5%	1%
Apparel	20%	20%	17%	5%	6%	5%	5%	0%	10%	1%
New Vehicles				2%	5%	7%	2%	-1%	3%	2%
Medical goods			4%	0%	3%	8%	8%	1%	4%	3%
Recreation goods & services								2%	2%	1%
Education goods & services								3%	3%	2%
Energy products				3%	20%	25%	13%	53%	23%	1%
Energy services	-1%	-1%	1%	1%	11%	11%	2%	18%	5%	2%
Tobacco products			6%	6%	5%	6%	10%	8%	7%	6%
Shelter				6%	8%	13%	5%	3%	7%	3%
Water and sewerage				4%	6%	8%	6%	5%	6%	5%
Medical services	1%	11%	5%	8%	8%	10%	8%	4%	7%	4%
Transport services	5%	4%	11%	6%	3%	8%	6%	6%	6%	3%
Personal goods and services			19%	4%	8%	7%	4%	3%	8%	2%

CPI basket during US inflationary regimes according to “The-Best-Strategies-for-Inflationary-Times“, May 2021

Source: Henry Neville, Teun Draaisma, Ben Funnell, Campbell R. Harvey, and Otto van Hemert

Developments in 2022 – Expectations & Challenges

What is expected in the P&C insurance market for 2022 and later on (1/2)

- **Profitability in 2022**

- immediate inflation impact in the **short tail business**
- sustainable (growing) impact of service & wage costs on the **long-tail lines**
- portfolio **yield increase** with some time lag (-> reduction of pressure on the combined ratios?)
- expected increase in **insolvencies**

- **Reserving (expectation)**

- market wide increase of reserving levels in the affected P&C short tail lines
- **widening of reserving level in liability** lines as a consequence of judgmental decision making
- close look to **indexation clauses** in the annuity products and portfolios
- expected future investment profits from increased as a source to finance a **stepwise reserve increase** in long tail business

Developments in 2022 – Expectations & Challenges

What is expected in the P&C insurance market for 2022 and later on (2/2)

- **Further pricing impact and risk management perspectives**
 - ongoing supply chain challenges
 - impact from **governmental measures**
 - multiple drivers for price increases (material, wages, second order impact from energy prices)
 - **impact on nominal exposures** in property and further pressure on rates
 - (sometimes) automatic cost increase by inclusion of **indexation in tariffs**
 - cost increase for **reinsurance coverage**
 - potential decrease of the real (not nominal) **market-wide P&C premium volume in case of recession**

Developments in 2022 – Expectations & Challenges

Inflation driven challenges for the life insurance business

- **Life business**
 - fixed **nominal terms** in live products versus **cost-of-living adjustments** in disability and LTC
 - an increase of cost of living for older ages even provides **growth opportunities**
 - portfolio yield will improve (depending from **duration** -> in life business typically with a longer time lag compared to P&C)
- **Life reserving and risk management**
 - the pressure from the TV of guarantees on the SII best estimates in Life insurance is not any more the key challenge
 - **liquidity risk** and potential adverse lapse impact to be conserved as potential key risks
 - worse case scenario is a potential increase of lapses in a severe economic crisis (-> **consequence for unrealized losses?**)
 - **legal risk** -> in several countries there might be the need for a regular update **pension schemes**
 - **new business risks** relating to saving products in case of further increase of inflation (e.g. shift the inflation to 10%)

Developments in 2022 – Expectations & Challenges

ALM related challenges

- **Investment return**

- portfolio yield will improve depending from **portfolio duration of life insurers**, thus with a longer time lag compared to P&C
- **pressure** to achieve an attractive investment yield -> as (negative) real rates stay under pressure (central banks need to consider the increased public leverage)

- **Investment related risk**

- based on the typical insurer's ALM strategy an interest rate up leads to unrealized losses in the large fixed income portfolios
- uncertainty about potential **recovery of unrealized losses** in invested equities
- **participations** potentially impacted by increasing discount rates
- **further risk from the investment market** (further credit spread and market liquidity related risk)

- **Overall: Reduced flexibility for steering of business and portfolio rebalancing**

Source: Henry Neville, Teun Draaisma, Ben Funnell, Campbell R. Harvey, and Otto van Hemert

Developments in 2022 – Expectations & Challenges

Resilience on the investment side (asset allocation)

	Specific inflation regimes								Combined regimes		
	US enters WW2	End of WW2	Korean War	Ending of Bretton Woods	OPEC oil embargo	Iranian Revolution	Reagan's Boom	China demand boom	Inflation (19%)	Other (81%)	All (100%)
Start month	Apr 1941	Mar 1946	Aug 1950	Feb 1966	Jul 1972	Feb 1977	Feb 1987	Sep 2007			
End month	May 1942	Mar 1947	Feb 1951	Jan 1970	Dec 1974	Mar 1980	Nov 1990	Jul 2008			
Total price level chg	15%	21%	7%	19%	24%	37%	20%	6%			
Length (mths)	14	13	7	48	30	38	46	11			
Strategy	Real return (total)								Real return (ann.)		
(P) Commodities - Energies	-3%	2%	-6%	-16%	264%	57%	201%	68%	41%	-1%	3%
(A) Trend – All assets	20%	23%	19%	135%	196%	100%	65%	17%	25%	15%	16%
(A) Trend – Commodities			1%	54%	173%	33%	132%	25%	20%	8%	10%
(P) Commodities – Industrial				115%	38%	-6%	306%	3%	19%	4%	7%
(A) Trend – Bonds				79%	54%	149%	6%	6%	15%	9%	10%
(P) Commodities – Aggregate		12%	6%	26%	85%	38%	84%	21%	14%	1%	4%
(P) Commodities – Gold					166%	154%	-18%	27%	13%	-1%	1%
(P) Commodities – Precious				28%	29%	185%	-27%	33%	11%	-2%	1%
(A) Trend – Equity	20%	23%	24%	77%	23%	-13%	13%	-3%	8%	11%	10%
(P) Commodities – Softs				-41%	243%	15%	11%	15%	8%	-3%	-1%
(A) Equity Factor – Cross-sectional Mom.	-15%	-18%	7%	35%	38%	44%	41%	26%	8%	4%	5%
(P) Commodities – Agri		12%	6%	-23%	197%	-21%	6%	33%	7%	-3%	0%
(A) Trend – FX					-14%	16%	42%	6%	4%	4%	4%
(A) Equity Factor – Quality (QMJ)				14%	-1%	-12%	40%	7%	3%	3%	3%
(P) Fixed Income – TIPS				-3%	13%	-2%	11%	6%	2%	3%	3%
(A) Equity Factor – Investment (CMA)				-7%	31%	-9%	24%	-10%	2%	2%	2%
(P) Long Equities – Energy Sector	-14%	-10%	25%	-19%	-19%	31%	31%	2%	1%	8%	6%
(A) Equity Factor – Profitability (RMW)				4%	-24%	-8%	18%	6%	-1%	2%	2%
(A) Equity Factor – Value (HML)	-4%	-17%	3%	-8%	36%	-11%	-3%	-7%	-1%	2%	2%
(P) Real Estate – Residential	-17%	4%	-4%	-2%	-7%	11%	0%	-13%	-2%	2%	1%
(A) Equity Factor – Low Vol (BAB)	-24%	-6%	-3%	28%	-13%	9%	-7%	-22%	-3%	8%	6%
(P) Fixed Income – 2 Yr. Treasury	-13%	-17%	-6%	-1%	-7%	-17%	11%	0%	-3%	2%	1%
(A) Equity Factor – Size (SMB)	-11%	-23%	-4%	45%	-43%	32%	-26%	-4%	-4%	1%	0%
(P) Fixed Income – 10 Yr. Treasury	-11%	-17%	-6%	-13%	-12%	-31%	8%	5%	-5%	4%	2%
(P) Fixed Income – High Yield	-4%	-11%	0%	-18%	-21%	-38%	-10%	-8%	-7%	6%	4%
(P) Long Equities – Market Composite	-24%	-27%	24%	-7%	-46%	-14%	12%	-17%	-7%	10%	7%
(P) Fixed Income – Investment Grade	-7%	-12%	-3%	-23%	-20%	-43%	-5%	1%	-7%	6%	3%
(P) Fixed Income – 30 Yr. Treasury	-17%	-17%	-6%	-20%	-28%	-41%	13%	2%	-8%	5%	3%
(P) Long Equities – Consumer Durables	-16%	-32%	24%	-30%	-62%	-27%	-28%	-36%	-15%	13%	7%

CPI basket during US inflationary regimes according to “The-Best-Strategies-for-Inflationary-Times“, May 2021

Source: Henry Neville, Teun Draaisma, Ben Funnell, Campbell R. Harvey, and Otto van Hemert

Overview of regulatory needs

International

- **IFRS/US-GAAP & IFRS 17**

- FAS 60 requires an ultimate view underlying CF projection
- same for IFRS 17.33 („... conditions existing at the measurement date, incl. assumptions at that date about the future“)

- **Solvency II**

- Art 29 Delegated Act (ultimate view)
- ultimate view driven by natural interest rate -> ECB interest rate policy and general inflation assumption
- consistency between interest rate and inflation requested by the revised (2022) guidelines for technical provision
- no inflation SCR stress under Pillar 1 for P&C business
- for life insurance a minor inflation stress (1%p.+) included in adverse cost risk scenario (10% adverse shift)

Overview of regulatory needs

Local

- **Local German GAAP**
 - values as at balance sheet date, no ultimate view
 - prudent valuation, in general undiscounted reserves in P&C
 - in case of discounted reserves specific consideration of any indexation clauses
 - special rules on guaranteed interest rates based on information as at end of September
 - integrated view on bonus schemes (investment income <-> insurance business result <-> expenses)

Reserving study

Understanding of data & adequateness of models

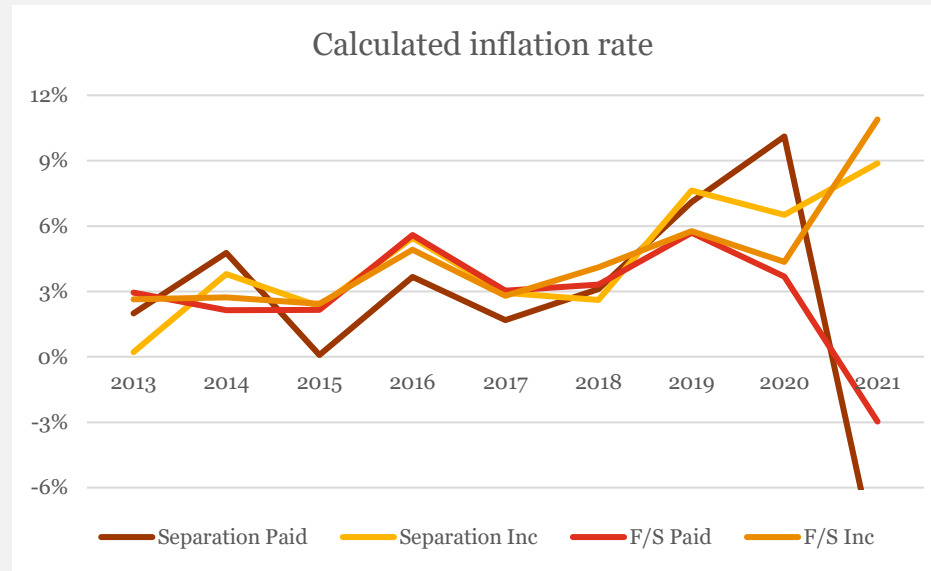
- **Understanding of historical inflation in the claims data**
 - Detailed analytics of claims structure
 - Monthly monitoring of claims KPI's
 - Frequency / severity approach
 - Separation method
- **Consideration of the increased inflation in the valuation**
 - Update of individual claims reserves
 - Adjustment of the claims triangles
 - Cashflow based assessment of observed and expected inflation

Reserving study

Understanding of historical inflation & future expectation exemplary in Motor Hull

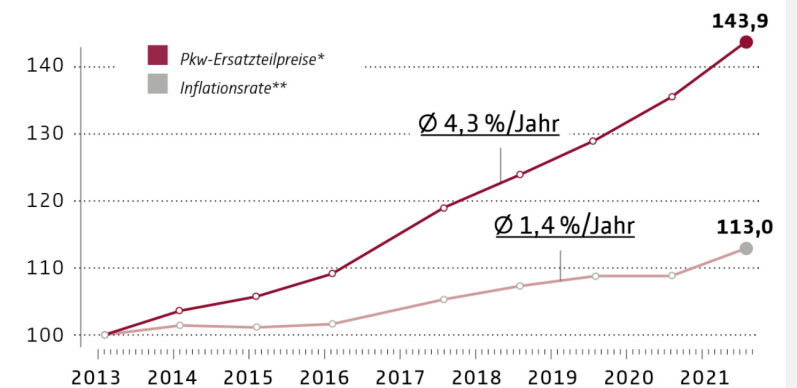
Comments

- Applying separation and frequency / severity to get an understanding of historical inflation in the portfolio
- High volatility in the annual increases
- Other special effects like the covid lockdowns need to be considered
- Average of the calculated indices are in line with market indices (wages, motor spare parts)
- Future expectation?



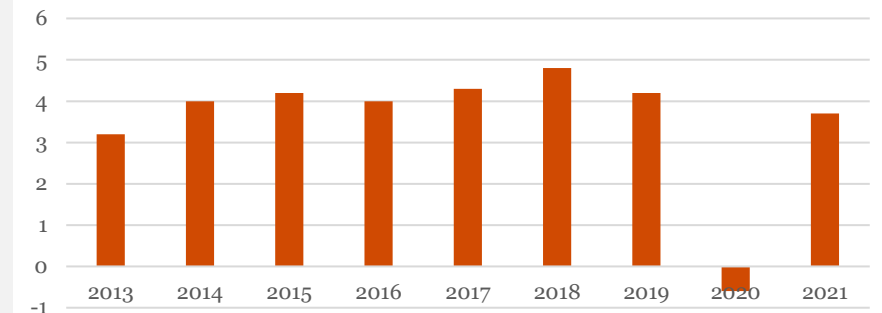
	Separation		F/S	
	Paid	Inc	Paid	Inc
Average	2,8%	4,4%	2,8%	4,3%
Average wo 2021	4,7%	4,3%	3,6%	3,6%

Entwicklung der Pkw-Ersatzteilpreise und der Inflationsrate
indiziert auf 2013; bis 2016 Erhebung im Januar, ab 2017 Erhebung im August



<https://www.gdv.de>

Gehaltsentwicklung in Deutschland bis 2021



<https://de.statista.com>

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Thank you.

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