

# Impacts & Implications of Inflation on Insurance & Pensions

Dr Alexander Dotterweich DAV

Samuel Achord MA FIA DDA CERA\*

*AAE Low Interest Rates Working Group*

*\* Disclaimer: the views expressed are mine and do not reflect those of my employer*



# Today's journey

## **Macroeconomics & Finance (10m)**

- Inflation now
- Static & dynamic effects of rising rates & inflation on assets & markets
- Aggregate effects on insurance & pensions

## **Impacts on the Insurance Industry (10m)**

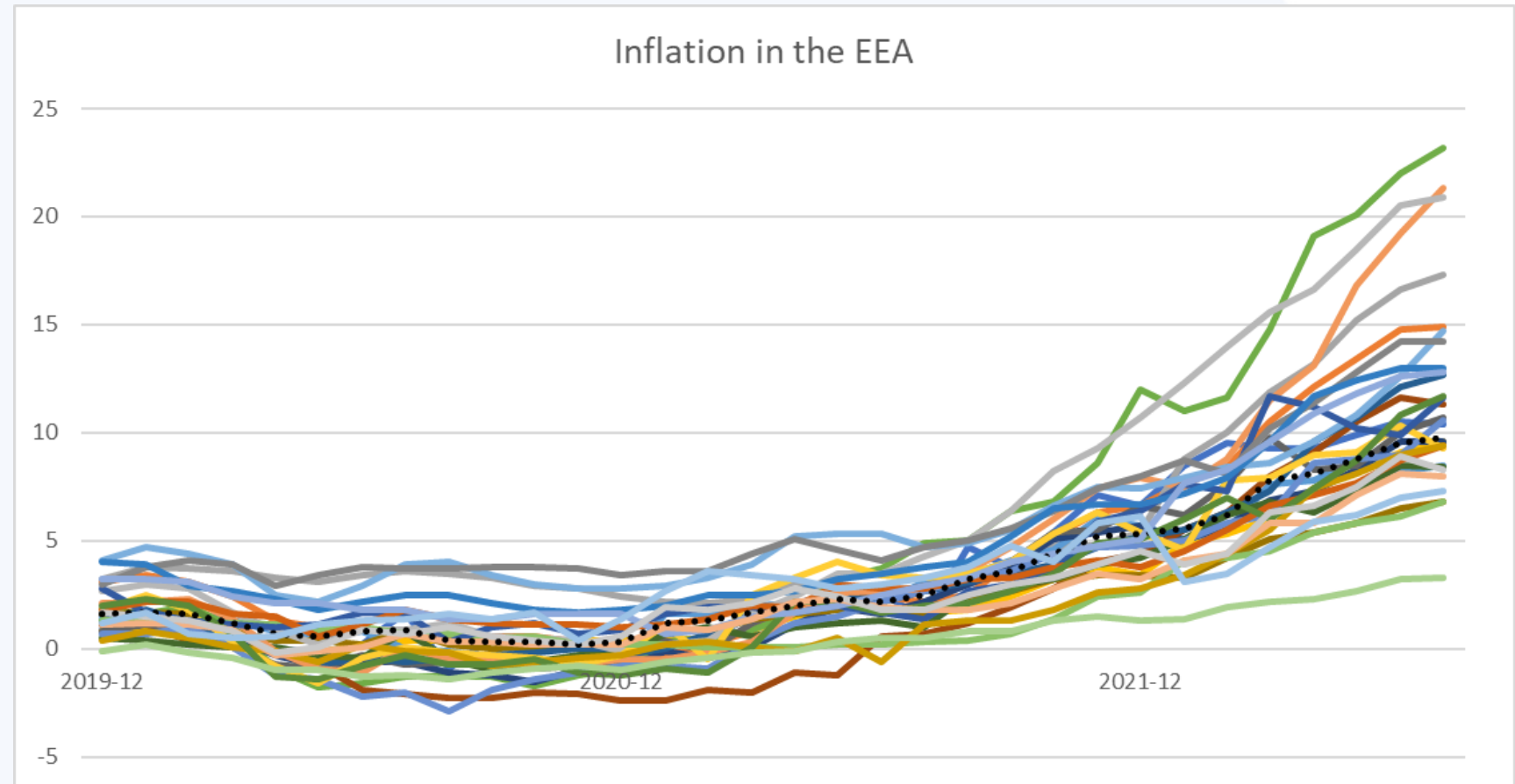
- Impact on P&C, L&H and ALM
- Data quality, models, reasonable assumptions

## **Bringing it all together & Q&A (10m)**

- Be prepared & don't get "surprised" unnecessarily

# Inflation in the Euro Area

Inflation for July 2022 (% y-o-y)	
Estonia	23,2
Latvia	21,3
Lithuania	20,9
Czechia	17,3
Bulgaria	14,9
Hungary	14,7
Poland	14,2
Romania	13,0
Slovakia	12,8
Croatia	12,7
Slovenia	11,7
Netherlands	11,6
Greece	11,3
Spain	10,7
Cyprus	10,6
Belgium	10,4
<b>European Economic Area</b>	<b>9,8</b>
Denmark	9,6
Ireland	9,6
Austria	9,4
Portugal	9,4
Luxembourg	9,3
Germany	8,5
Italy	8,4
Sweden	8,3
Finland	8,0
Norway	7,3
France	6,8
Malta	6,8
Switzerland	3,3



Source: Eurostat

## Inflation in the Euro Area

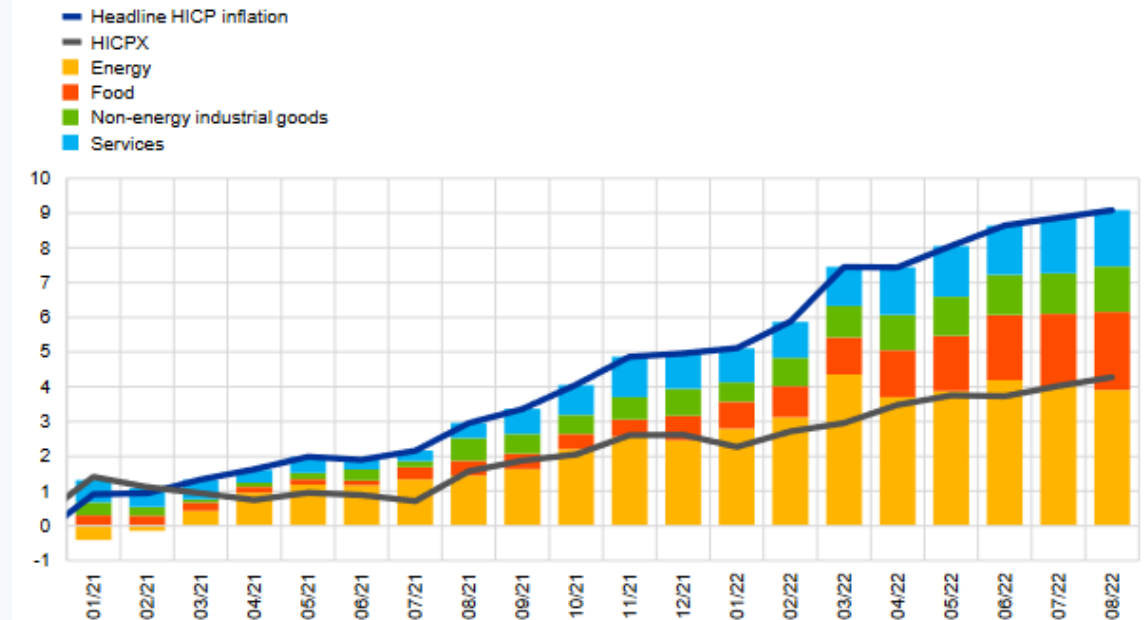
“Higher energy prices are making Europe poorer. We have to transfer a large share of our income abroad to pay for energy imports. Governments can’t do anything to change that in the short term. However, they can take targeted measures to ease particular hardships and prepare for the future. [...]”

Source: ECB, Interview with Isabel Schnable, 15<sup>th</sup> September 2022

**Chart 9**

### Headline inflation and its main components

(annual percentage changes; percentage point contributions)



Sources: Eurostat and ECB calculations.

Note: The latest observations are for August 2022 (flash estimate).

Source: ECB Economic Bulletin Issue #6, 22<sup>nd</sup> September 2022

# Macroeconomic un-avoidabilities

## Effects of rising rates and inflation

- In general, rising inflation means a general rebalancing of aggregate asset values into real assets, a shift in preferences for real assets over nominal assets
- In general, rising nominal rates means a general rebalancing of the time value of money at different maturities, a shift in preferences towards money in the short term

## This time, specifically

- Rising inflation means increased energy costs, increased food costs, increased costs of services
- In real-world terms, excepting energy companies, *in aggregate*, companies are losing revenue or profits (downside only)
- Where energy costs are passed through 1-for-1, consumers are squeezed, with lost aggregate revenue elsewhere
- General shift of future monies away from profits (asset values) towards increased energy costs

The effects of changing rates & inflation can be split into static & dynamic effects

### **Static effects (mechanics)**

- *Instantaneous* price effects
- Snapshot asset pricing & stress testing
- Mathematical finance models (DCM, DDM, etc)

### **System & feedback effects (dynamics)**

- Effects *as time passes*
- Feedback, balancing, real-world
- Market forces, market prices, investor preferences
- Rebalancing effects of risk vs return & risk premiums

## Instantaneous effects on asset values

**The assets are what they are...**

$$MV_{bond} = \sum \frac{c}{(1+r)^j} + \frac{N}{(1+r)^t}$$

$$MV_{equity} = \sum \frac{d(1+g)^j}{(1+r)^j}$$

*r = discount rate, c = coupon, N = par value, d = dividend, g = growth rate*

**The insurance and pensions liabilities are as we design them...**

**→ more complex risk-sharing mechanisms & impacts**

# Instantaneous effects on asset values

The assets are what they are...

$$MV_{bond} = \sum \frac{c}{(1 + rfr_{real} + E(i) + CS + IURP)^j} + \frac{N}{(1 + \dots)^t}$$

Only adjusts in current market yields, not in the yield to redemption when you bought it

Inflation expectations are not directly affected by recent historical inflation, but by market participants' and consumers' expectations

Affected by rising rates and inflation, differential effects by credit rating

Depending on the asset, the growth rate has a link to past inflation and expected inflation

$$MV_{equity} = \sum \frac{d(1 + g)^j}{(1 + rfr_{real} + E(i) + ERP)^j}$$

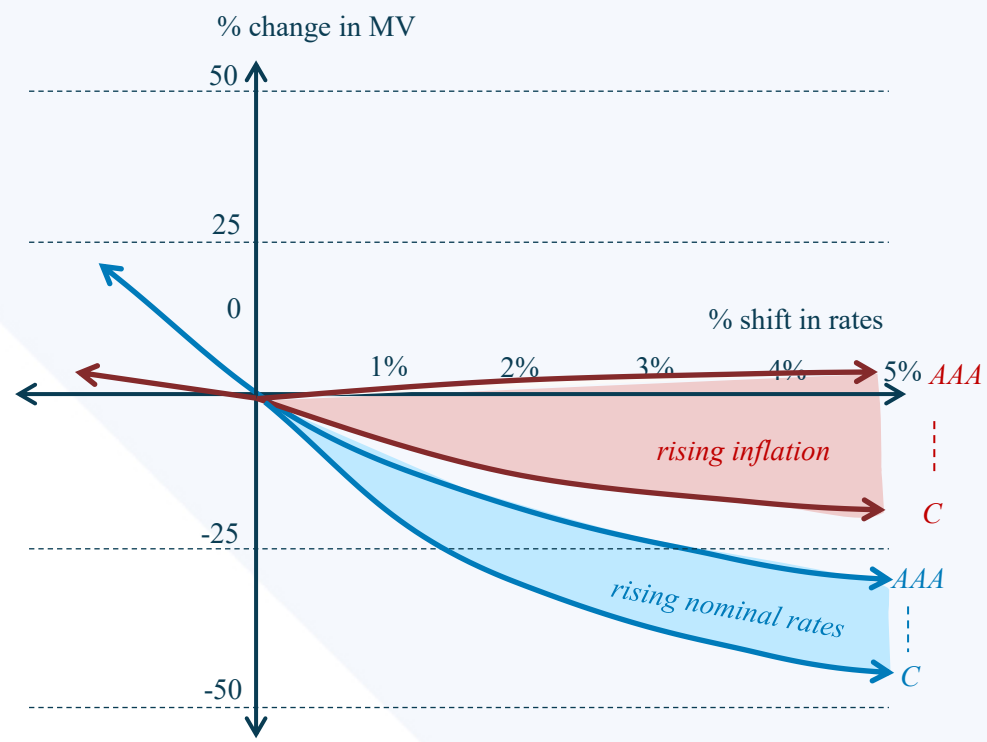
Note:  $rfr_{real}$  = real risk-free rate,  $E(i)$  = expected inflation, CS = credit spread, IURP = inflation uncertainty risk premium, ERP = equity risk premium



# Stylised instantaneous effects of rising rates and inflation

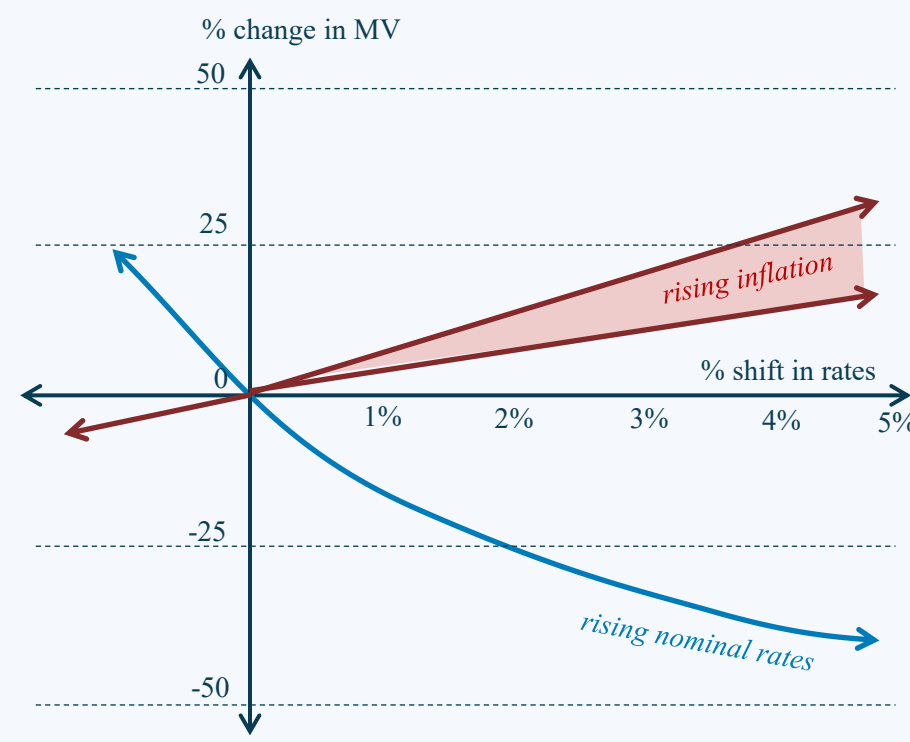
## Bonds

- Duration + convexity,  
IR & inflation effects on credit



## Equities

- DDM w/ expected inflation  
via growth in earnings



# Dynamic effects on asset values via markets

## Static effects (mechanics)

- *Instantaneous* price effects
- Snapshot asset pricing & stress testing
- Mathematical finance models (DCM, DDM, etc)

## System & feedback effects (dynamics)

- Effects *as time passes*
- Feedback, balancing, real-world
- Market forces, market prices, investor preferences
- Rebalancing effects of risk vs return & risk premiums

# Market effects on assets

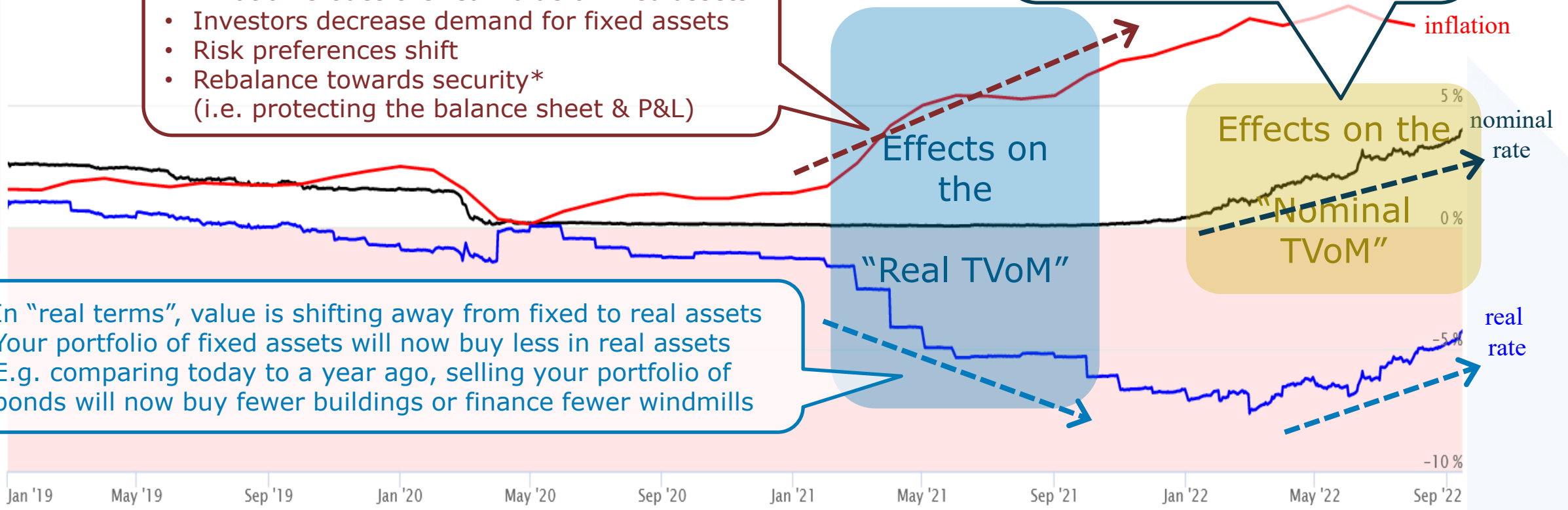
Nominal vs. Real Interest Rate vs. Inflation

Zoom 10y 30y 50y 80y 100y All

- Inflation erodes the real value of fixed assets
- Investors decrease demand for fixed assets
- Risk preferences shift
- Rebalance towards security\* (i.e. protecting the balance sheet & P&L)

- Central banks raise rates to curb inflation
- Investors require higher yields to protect against inflation
- Yields begin to incorporate expected inflation & uncertainty

- In "real terms", value is shifting away from fixed to real assets
- Your portfolio of fixed assets will now buy less in real assets
- E.g. comparing today to a year ago, selling your portfolio of bonds will now buy fewer buildings or finance fewer windmills

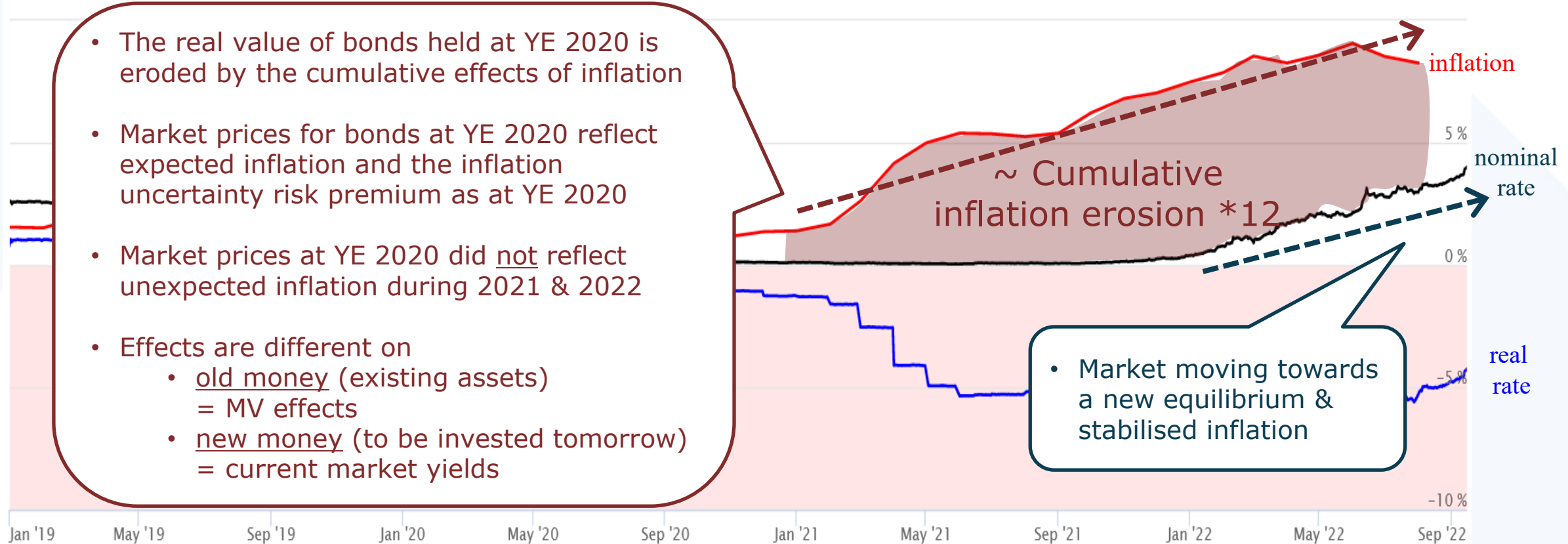


# Market effects on assets

## Nominal vs. Real Interest Rate vs. Inflation

Zoom 10y 30y 50y 80y 100y All

Jan 1, 2019 → Sep 15, 2022



Source: [Longtermtrends](#)



# Instantaneous vs dynamic effects on assets & markets

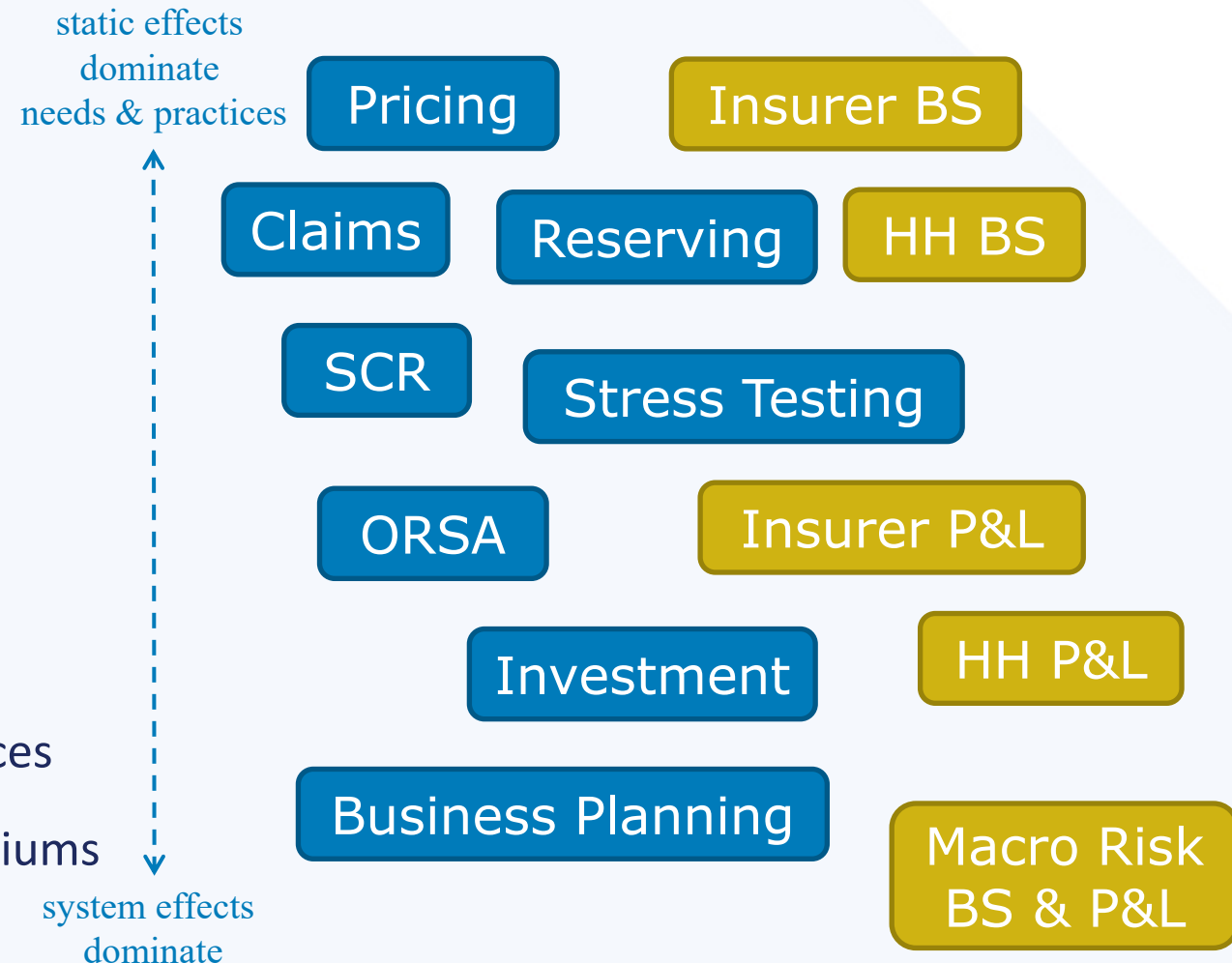
## Static effects (mechanics)

- *Instantaneous* price effects
- Snapshot asset pricing & stress testing
- Mathematical finance models (DCM, DDM, etc)

## System & feedback effects (dynamics)

- Effects *as time passes*
- Feedback, balancing, real-world
- Market forces, market prices, investor preferences
- Rebalancing effects of risk vs return & risk premiums

## So, which is right?





# Impacts on the insurance industry

Dr Alexander Dotterweich DAV

# Impact on the insurance industry

## Situation of the insurance industry in 2020 and 2021 as starting point

### **Business profitability P&C**

- 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)

### **Business profitability L&H**

- care business side mainly driven by demography, social laws and medical inflation,
- life insurance so far with focus on the low interest environment
- costs relating to modernization of core business administration systems
- life reinsurers see COVID costs linger and mortality rates shift in First Quarter 2022 (AM Best)

## Inflation in the last months

### Situation of the insurance industry in 2020 and 2021 as starting point for 2022

**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, data infrastructure)
- reference to close contact of reserving and pricing actuaries for assessments on inflation



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

### Profitability

- 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?)

### Reserving

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

# Expectations and challenges

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

### **Further pricing impact and risk management perspectives**

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

# Expectations and challenges

## Inflation driven challenges for the life insurance business

### **Life business in general**

- 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
- yield will improve (depending on duration → typically with a longer time lag compared to P&C)

### **Life reserving and risk management**

- pressure from the TV of guarantees on the SII BEL in Life insurance is not the key challenge
- liquidity risk and potential adverse lapse impact to be conserved as potential key risks
- 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. inflation > 10%)

**Bringing it all together**



# So what? Be prepared & don't get “surprised” unnecessarily

## Effects of past inflation

- Generic: inflation erosion
- Specific: energy cost erosion

## Near term: higher rates, higher inflation

- Volatility, uncertainty, rebalancing
- Increased risks from inflation
- Pricing to rebuilt Own Funds

## Longer term: where's $r^*$ ?

- Key policy target / tool...
- When inflation is no longer 1<sup>st</sup> priority

## Effects on the P&C sector

- Claims inflation linked to real economy
- Past pricing & current assets eroded

## Effects on the Life sector

- Life risk products similar to P&C\*
- ALM of inflation risks & guarantees?

## Effects on the Pensions sector

- Wealth register: generic & specific erosion
- Liability side: inflation links, salary links, no links → purchasing power erosion
- Unfunded: inflation increases costs

# Questions

## Impacts

- On your insurance company / pension company / fund?
- On your sector?
- On the whole insurance, reinsurance, ecosystem
- On the whole pensions ecosystem

## Hard, important questions

- What does “riding it out” look like?
- What does “overcoming & excelling” look like?
- Is win-win possible for company and policyholder?
- Where is win-win possible?
- Where is lose-lose the only possibility?

## More questions

Given fiscal & monetary tools,  
what does uncertainty around  
future inflation look like?  
What are realistic, potential  
future states of the world?

What does a worst-case  
scenario look like?  
What does a best-case  
scenario look like?

Which inflation data & models  
should feed into reserving  
models, stochastic models,  
stress testing, the ORSA, etc?

How safe are P&C insurance companies?  
How safe are L&H companies?  
How safe are pensions?  
How safe are public expenditures?

# Time to revisit the ACC, RCC & ORSA

The scenarios: choose one each from...

## Short term inflation

Controlled  
High for 1 year  
High for 3-5 years

## ST/MT inflation expectations

Low 0-2% pa  
Medium 2-4%  
High 5%+

## Future inflation

Return to 0-1% pa  
Target 2% pa  
Stable, but high 4% pa

## Short term rates

Rising  
Volatile  
Plateau'ed

## IR term structures

Rising  
Volatile  
Plateau'ed

## Future rates

Nominal rates?  
Real rates?

## Macro-economic situation

Recession  
Depression  
Hyper-inflation

## Fiscal positions

BAU  
Stressed

## Trend GDP & Output Gap

Trend—stable vs unstable  
Gap—growing vs shrinking



# ACTUARIAL ASSOCIATION OF EUROPE

Actuarial House

1 Place du Samedi 1000

Brussels Belgium

[www.actuary.eu](http://www.actuary.eu)

Follow us on LinkedIn and twitter: @InfoAAE