



March 13–15, 2023
San Diego, CA
Loews Coronado Bay Resort

Ratemaking, Product and Modeling Seminar



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IP Inflationary Pressure!

IP Industry Panel!

**HOO
RAY?**

Closing General Session
Wednesday, March 15, 2023
1:45pm-3:15pm

LIVE POLL

Which of our Panelists was
NOT a cheerleader in college?

☐ Stephanie

☐ Jim

☐ Sean

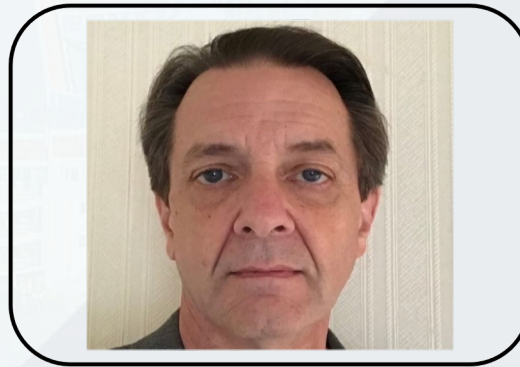
Meet Our Panel



Sean Cooper

Workers Compensation

WCIRBCalifornia™
Objective. Trusted. Integral.



Jim Lynch

Social Inflation

Words & Numbers
James Lynch Casualty Actuary



Frank Schmid

Reinsurance

General Reinsurance
Corporation



Agenda: What has Inflation meant for P&C Industry?

Macro View of Inflation

There's More: Social Inflation

Inflation's Influence on Select Lines of Business

What's Next?

Q&A!

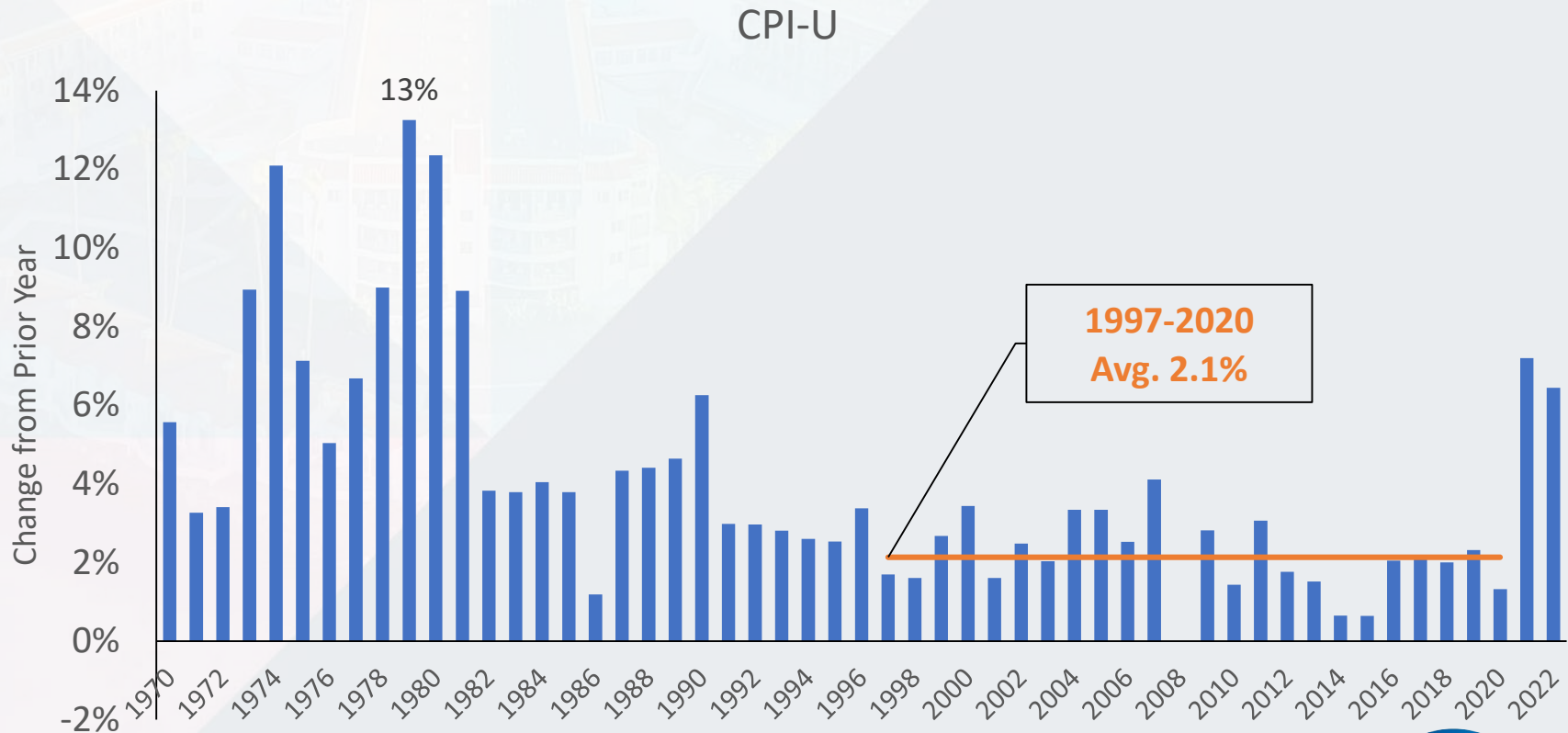


A wooden picture frame is held by two hands at the bottom corners. The frame is empty, showing a view of a blue sky with some light clouds. The text "Macro View of Inflation" is centered within the frame.

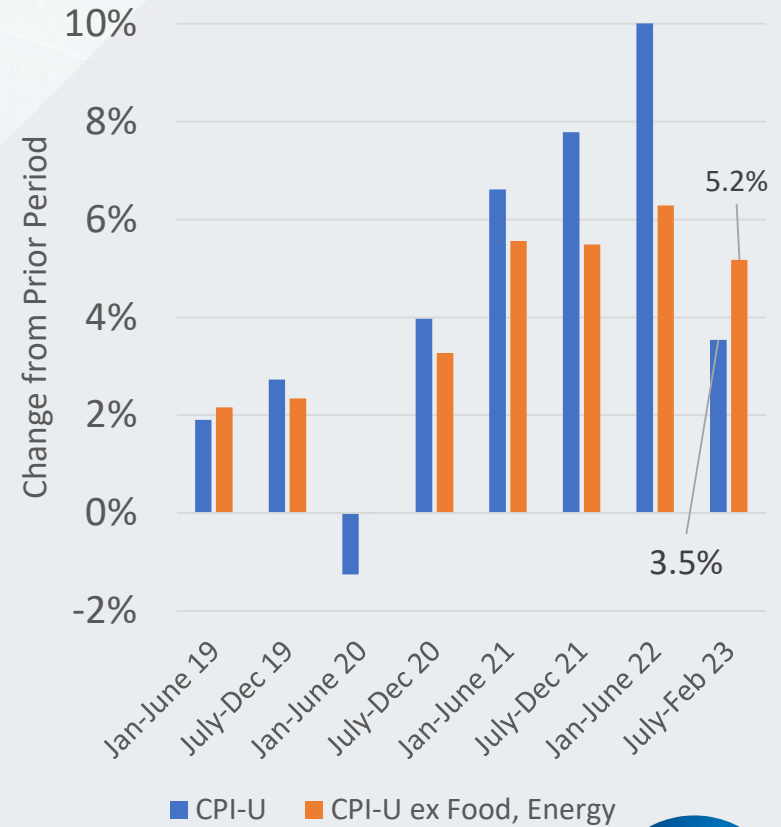
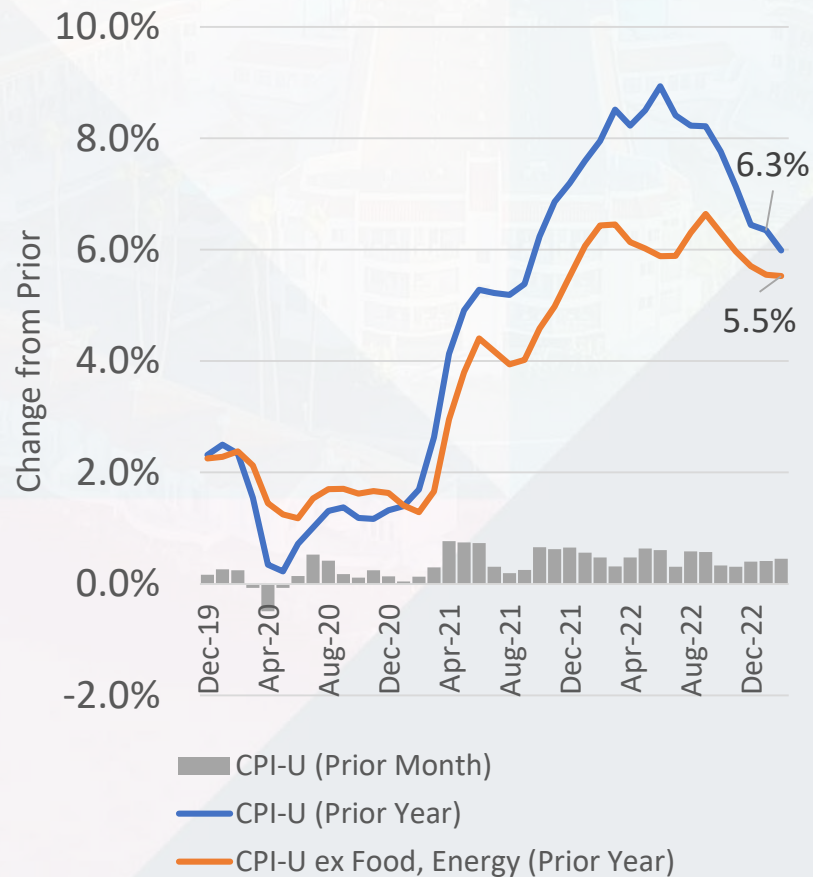
Macro View of Inflation

20+ Years of Low Inflation

Many actuaries never experienced significant inflation



Inflation Across the Board

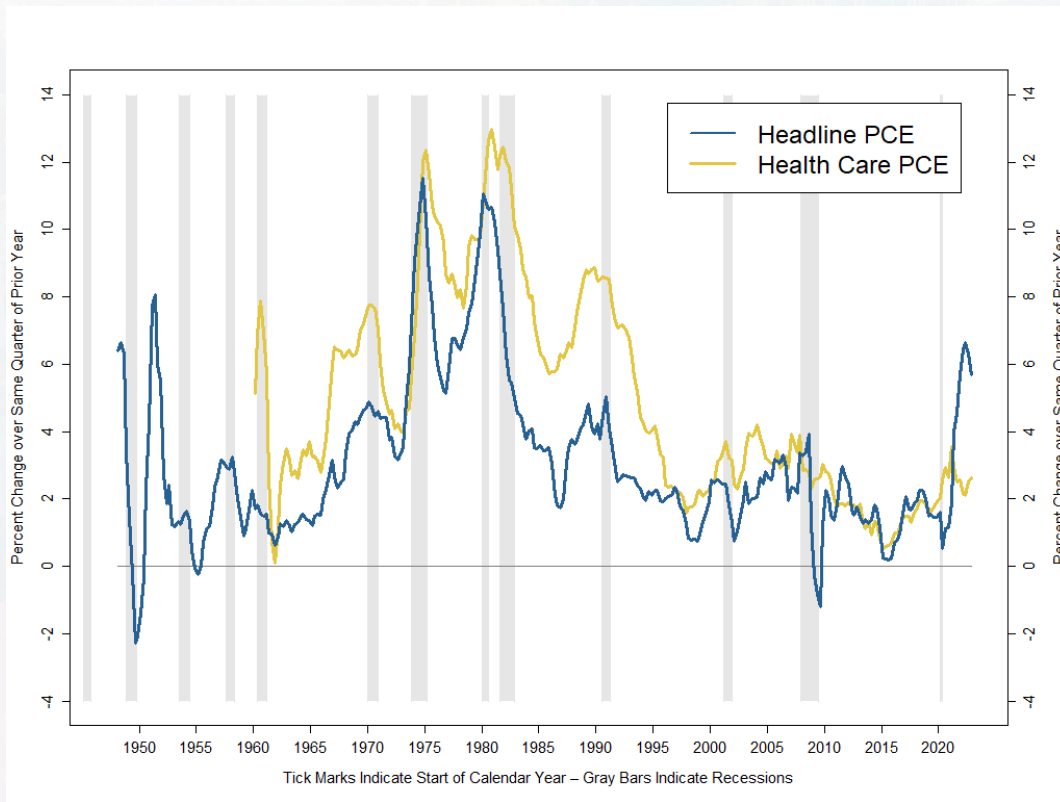


Data through January 2023. Source: Bureau of Labor Statistics (CUSR0000SA0, CUSR0000SA0L1E). Calculation: James Lynch Casualty Actuary LLC.



Medical Inflation Is Well-Contained

Health Care Component of the PCE Deflator



Health care services in the PCE index include services purchased out of pocket by consumers and services paid for on behalf of consumers – for example, health care services paid for by employers through health insurance, as well as health care services paid for by governments through programs such as Medicare and Medicaid.⁽¹⁾

By source of funds, private health insurance accounts for the highest share of health care spending (28 percent), followed by Medicare (20), Medicaid (16), and consumer out-of-pocket (9).⁽²⁾

Source: Bureau of Economic Analysis, National Income and Product Accounts, Table 2.3.4, accessed on March 14, 2023, https://apps.bea.gov/iTable/index_nipa.cfm. Latest observations: Q4/2022.

Note: The personal consumption expenditure (PCE) deflator "arguably does a better job measuring medical inflation" than the consumer price index (CPI). Ben S. Bernanke (February 3, 2003) "'Constrained Discretion' and Monetary Policy," <https://www.federalreserve.gov/boarddocs/Speeches/2003/20030203/default.htm>.

1) Bureau of Labor Statistics (BLS) (May 2011) "Differences between the Consumer Price Index and the Personal Consumption Expenditures Price Index." *Focus on Prices and Spending* 2(3), <https://www.bls.gov/opub/btn/archive/differences-between-the-consumer-price-index-and-the-personal-consumption-expenditures-price-index.pdf>. The Medical Care component of the CPI tracks out-of-pocket expenses only.

2) Centers for Medicare & Medicaid Services, *National Health Expenditures 2020 Highlights*, <https://www.cms.gov/files/document/highlights.pdf>.



Empirical Properties of the Rate of Inflation

The rate of inflation is highly persistent

- The rate of inflation is close to a random walk.
- In plain English, changes to the rate of inflation are largely unpredictable – admittedly, there is a degree of mean reversion in the rates of inflation in energy and food prices.
- It has been shown that there is no macro-econometric model that consistently outperforms a random-walk based model in predicting the future rate of inflation.¹⁾
- A simple random-walk based model is to predict the inflation rate of the next four quarters by the inflation rate of the past four quarters.¹⁾
- The random walk assumption is not inconsistent with causal narratives.
- The random walk property does not a priori invalidate theories that try to explain shocks to the rate of inflation with economic, societal, or physical factors.
- It is the arrival of such factors (natural catastrophes, pandemics, wars, financial crises, etc.) that must be considered random events.



1) Stock, James, and Mark W. Watson (2009) "Phillips Curve Inflation Forecasts," in: J. Fuhrer, Y. Kodrzycki, J. Little, and G. Olivei (eds.) Understanding Inflation and the Implications for Monetary Policy. Cambridge: MIT Press, 99-202, <https://scholar.harvard.edu/files/stock/files/forecastinginflation.pdf>.



There's More:
Social Inflation

LIVE POLL

What lines of insurance are most impacted by Social Inflation?

- ☐ Workers Compensation
- ☐ Commercial Auto
- ☐ Reinsurance
- ☐ Medical Malpractice
- ☐ Other



What is social inflation?

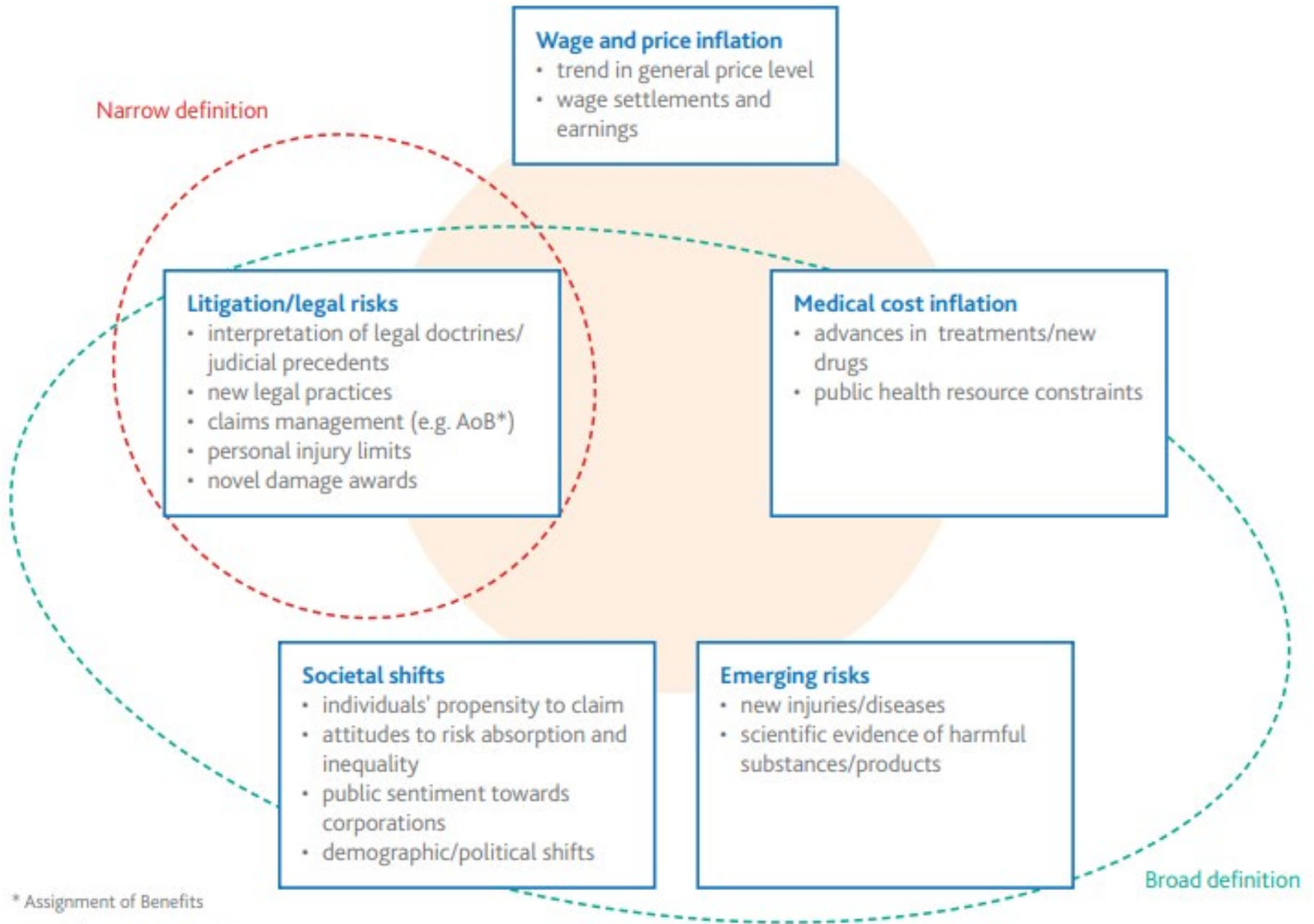
“ . . . a broadening definition by society and juries of what is covered by insurance policies.”

- Warren Buffett,
1978

“The concept of social inflation is hard to define, which makes it hard to find empirical evidence that supports or disproves it.”

- Christopher Mackeprang, Gen Re
- 2020





* Assignment of Benefits

Source: The Geneva Association

Link ratio analysis

Comm'l Auto Liab

Net Paid Loss & DCC Link Ratio - P&C Industry

Acc Year	12-24	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	CYR 12-60
2000	2.097	1.420	1.198	1.097	1.050	1.019	1.011	1.007	1.004	
2001	2.058	1.422	1.201	1.095	1.045	1.021	1.011	1.005	1.003	
2002	2.080	1.481	1.225	1.110	1.051	1.023	1.010	1.005	1.003	
2003	2.117	1.454	1.232	1.116	1.050	1.020	1.010	1.005	1.005	
2004	2.041	1.442	1.236	1.115	1.049	1.021	1.010	1.006	1.002	4.128
2005	2.140	1.439	1.226	1.105	1.046	1.019	1.010	1.003	1.004	3.984
2006	2.064	1.444	1.213	1.107	1.043	1.023	1.011	1.005	1.004	4.220
2007	2.099	1.424	1.222	1.106	1.049	1.022	1.007	1.006	1.003	4.097
2008	2.048	1.433	1.228	1.111	1.049	1.022	1.010	1.006	1.002	4.142
2009	2.081	1.440	1.238	1.117	1.053	1.022	1.012	1.006	1.005	3.910
2010	2.125	1.450	1.232	1.120	1.051	1.025	1.011	1.005	1.004	4.033
2011	2.129	1.440	1.242	1.127	1.057	1.023	1.012	1.007		4.157
2012	2.155	1.454	1.249	1.127	1.050	1.025	1.012			4.246
2013	2.169	1.465	1.273	1.130	1.056	1.029				4.273
2014	2.174	1.515	1.262	1.145	1.057					4.386
2015	2.273	1.489	1.288	1.135						4.486
2016	2.287	1.518	1.284							4.941
2017	2.293	1.511								4.854
2018	2.358									5.137
2019										5.191

- Pink cells = link higher than previous year
- CYR 12-60 – product of each diagonal thru 60 months



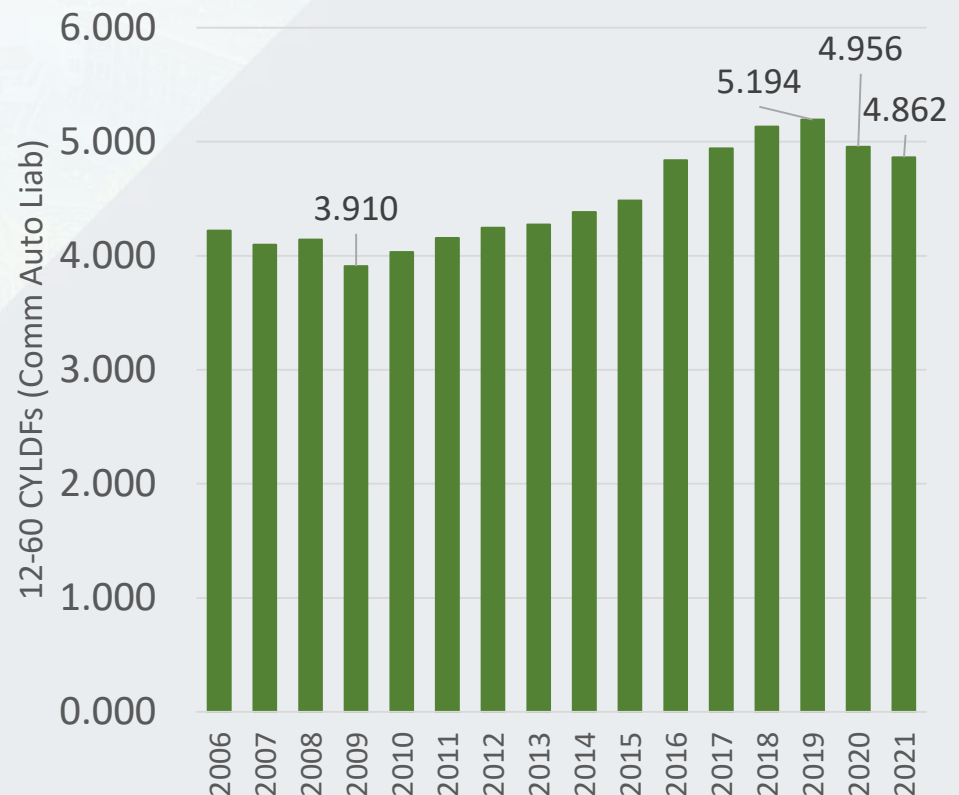
Impact of rising LDFs (comm auto liability)

Amounts in Millions		A	B	C	D = A*(Alternative LDF)	E = B*(Alternative LDF)	F = D - C	G = E - C
Year	Per 12/31/YYYY Schedule P		Per 12/31/2019 Schedule P		Implied Net Ultimate Loss & DCC using Alternative LDFs		Variance to Booked	
	Net Paid Loss & DCC @ 12 months	Net Case Incurred Loss & DCC @ 12 months	Net Ultimate Loss & DCC		3yr Weighted Average as of 12/31/2008 (Paid)	3yr Weighted Average as of 12/31/2008 (Case Incurred)	3yr Weighted Average as of 12/31/2008 (Paid)	3yr Weighted Average as of 12/31/2008 (Case Incurred)
2010	2,305	5,959	10,836		10,522	10,015	-314	-821
2011	2,447	6,193	11,714		11,168	10,407	-546	-1,307
2012	2,453	6,299	12,028		11,196	10,587	-832	-1,441
2013	2,554	6,603	13,065		11,657	11,097	-1,407	-1,968
2014	2,655	6,946	14,065		12,119	11,673	-1,946	-2,392
2015	2,791	7,504	15,275		12,739	12,611	-2,536	-2,664
2016	2,917	8,081	16,236		13,318	13,581	-2,918	-2,655
2017	3,078	8,465	16,647		14,051	14,226	-2,595	-2,421
2018	3,379	9,404	18,468		15,426	15,803	-3,042	-2,664
2019	3,554	10,375	19,856		16,222	17,436	-3,633	-2,420
Total	28,131	75,829	148,189		128,419	127,436	-19,771	-20,753
% Variance							-13.3%	-14.0%



New research

- Update thru '21
 - LDFs off-peak, above but remain high
 - \$30B excess losses in CAL 2012-2021
- Physicians' Medical Malpractice
 - 8-11% of losses linked to social inflation
 - \$2.4B - \$3.5B



Source: Lynch and Moore, *Social Inflation and Loss Development – An Update; Medical Malpractice Claims-Made Social Inflation and Loss Development Report*





Inflation's Influence on Lines of Business



LIVE POLL

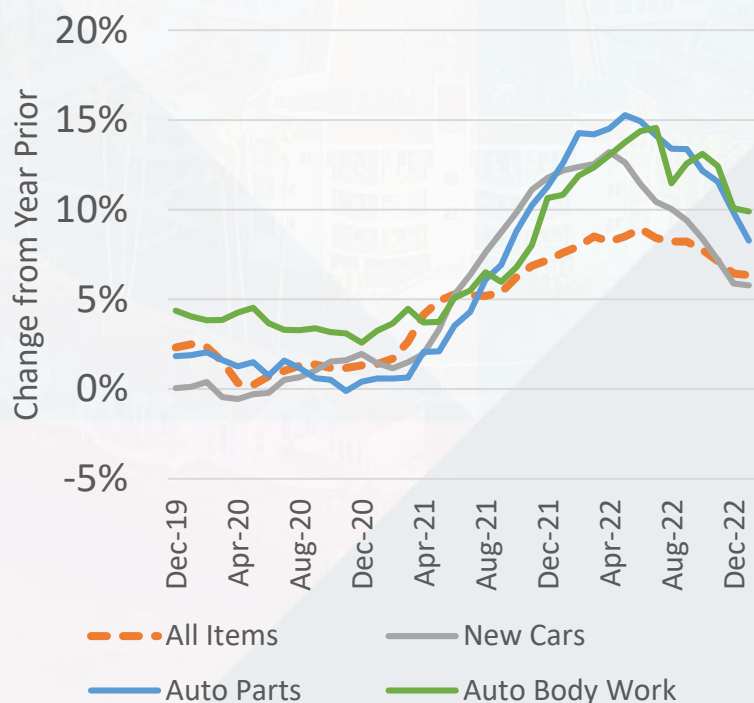
My Company's Pricing Has
Been Adjusted to Fit Inflation

-
- ☐ We're way ahead of our competitors
-
- ☐ We need to do more still
-
- ☐ Inflation? What's That?

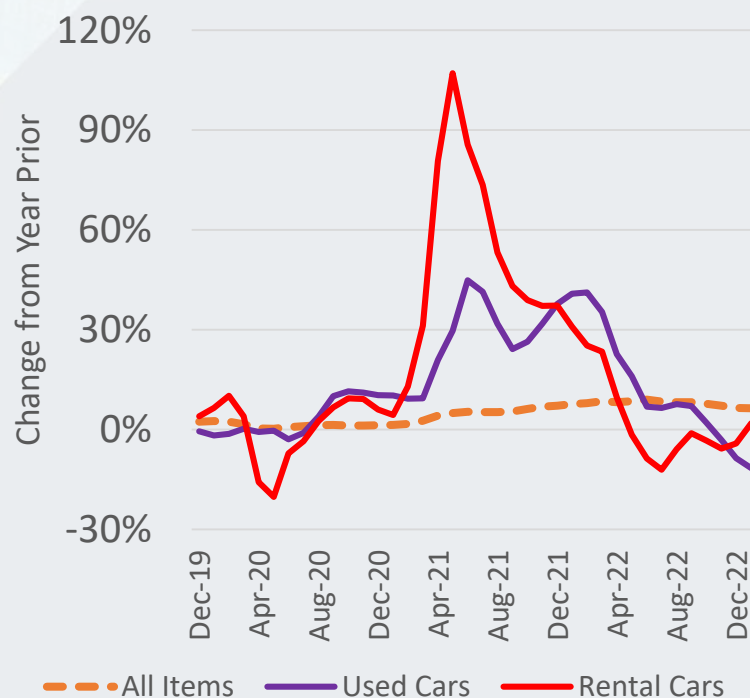


P/C-Focused Inflation

CPI-U, Selected Areas



CPI-U, Selected Areas



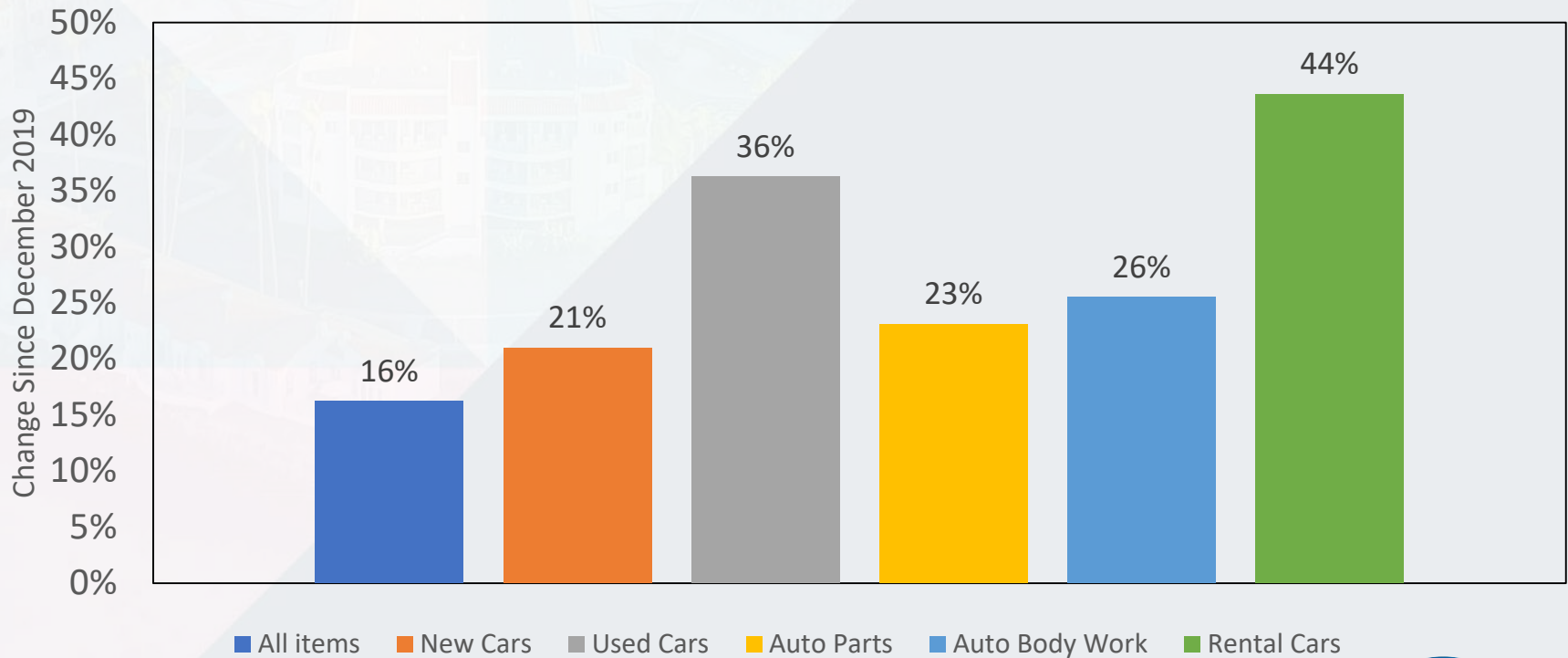
Data through January 2023. Source: Bureau of Labor Statistics (CUSR0000SA0, CUSR0000SETA01, CUSR0000SETA02, CUSR0000SETC, [CUUR0000SETD01, CUUS0000SETD01], CUSR0000SETA04). Calculation: James Lynch Casualty Actuary LLC.



Impact to Date

Inflation hit some P/C-related costs extremely hard

CPI-U, Selected Items



Data through January 2023. Source: Bureau of Labor Statistics (CUSR0000SA0, CUSR0000SETA01, CUSR0000SETA02, CUSR0000SETC, [CUUR0000SETD01, CUUS0000SETD01], CUSR0000SETA04).
Calculation: James Lynch Casualty Actuary LLC.



Rates of Inflation are Cointegrated

U.S. Rates of Inflation Follow Random Walks

- A linear combination of two non-stationary variables can be stationary.
- For instance, two variables that are integrated of order 1 (that is, follow random walks) may share a common stochastic trend.
- In this case then, there is a stable, long-term relation between the two variables.
- Two nonstationary variables, a linear combination of which is stationary, are said to be cointegrated.
- In addition to the long-term relation, cointegrated variables share a short-run dynamics that corrects deviations ("errors") from the cointegrating relation.
- Headline PCE and Health Care PCE inflation, which have been shown to be nonstationary, may be cointegrated, forming a stable, long-term relation.



PCE Health Care and Headline Inflation Rates

Health Care and Headline Form a Long-term Relation

- The long-term relation between PCE Health Care inflation and PCE headline inflation reads (based on continuously compounded rates rates):

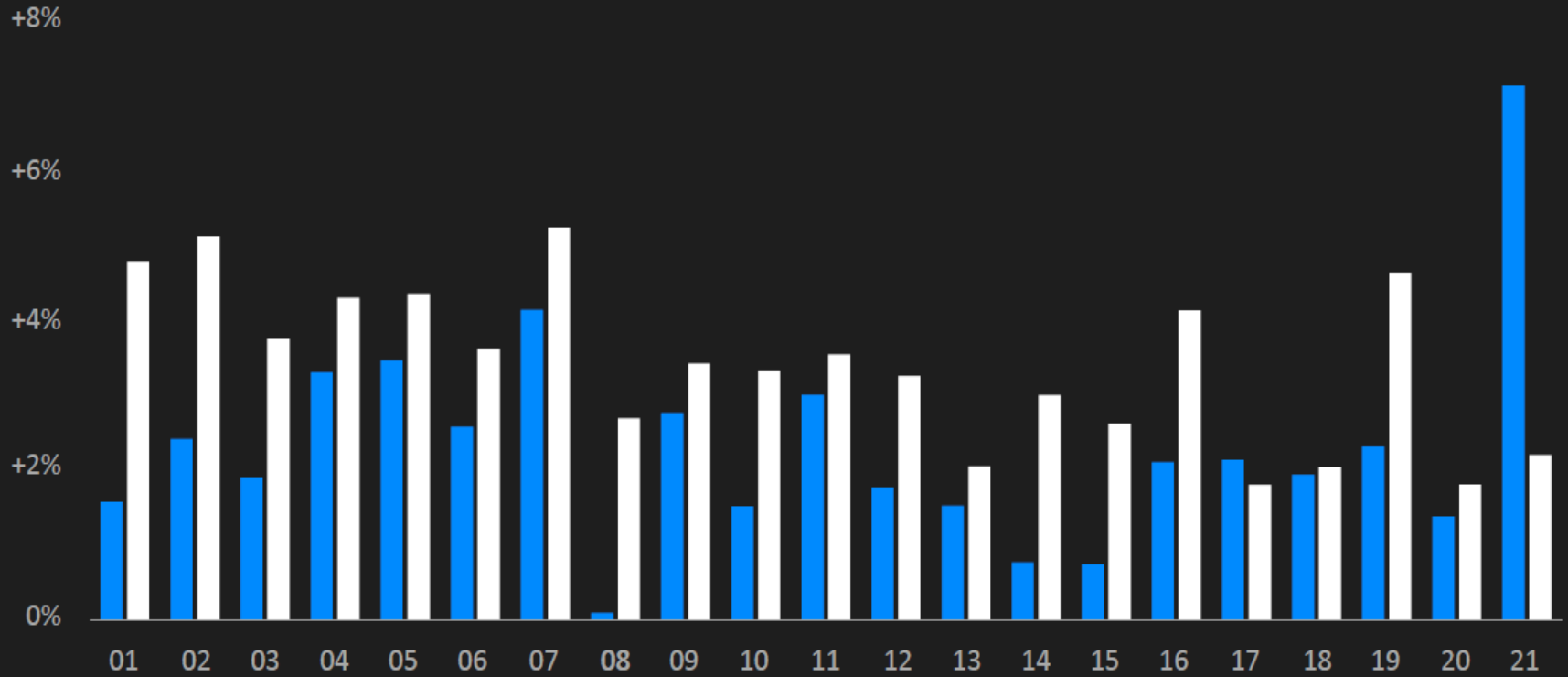
$$PCE\ Inflation_{Health\ Care} = 0.012 + 1.06 \cdot PCE\ Inflation_{Headline} + \eta$$

- The autonomous component, which equals 1.2 percent on the logarithmic scale, comes to 1.3 on the raw scale, after rounding.
- For a headline PCE inflation target of 2 percent, the rate of PCE Health Care inflation is estimated to run at 3.4 percent (on the logarithmic and raw scales).
- The error-correction model was estimated using annual data, 1929-2021.



Price Indices

CPI - All Items vs CPI - Medical Care



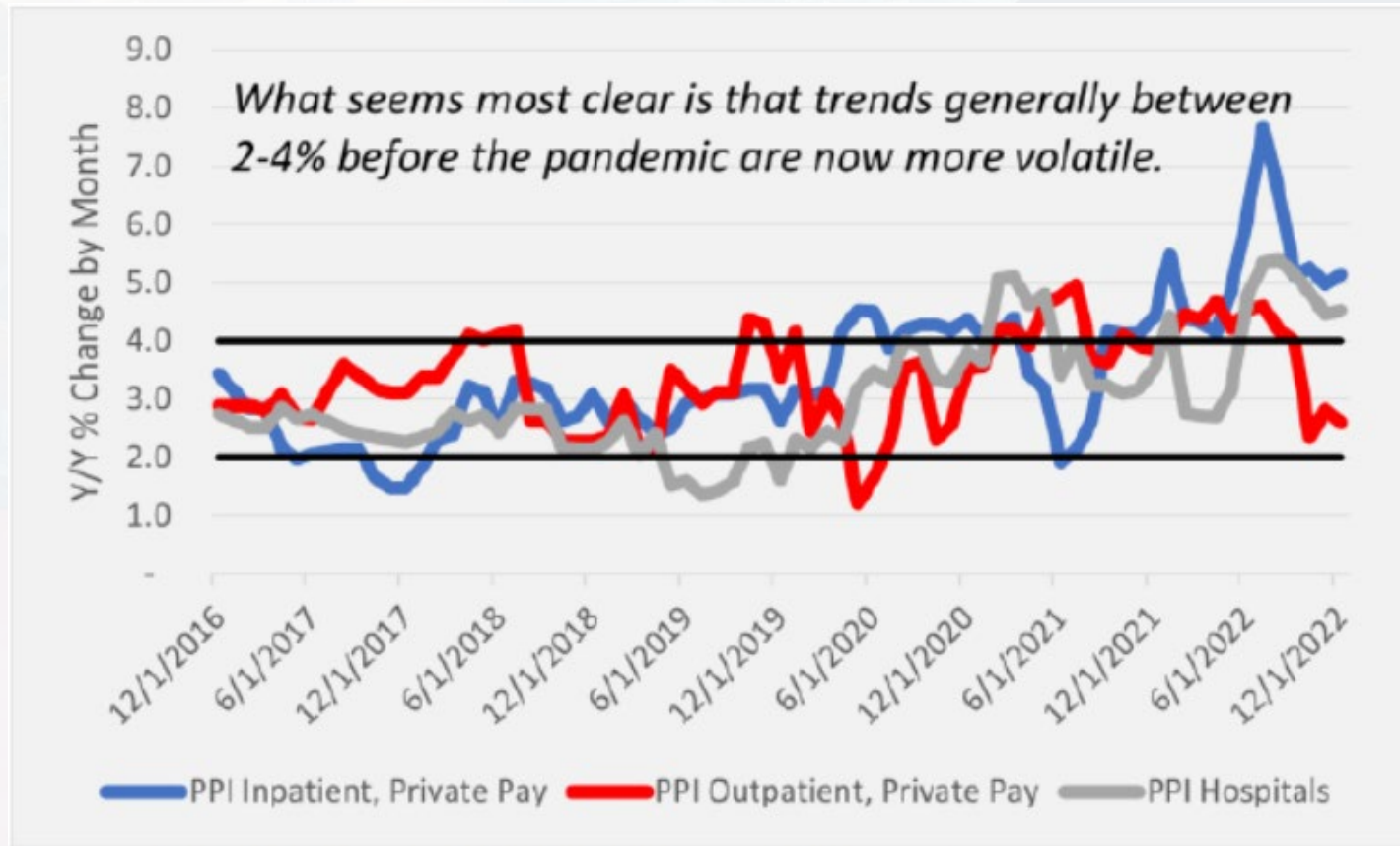
Source: Bureau of Labor Statistics

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2022



Changes in PPI for Notable Medical Costs

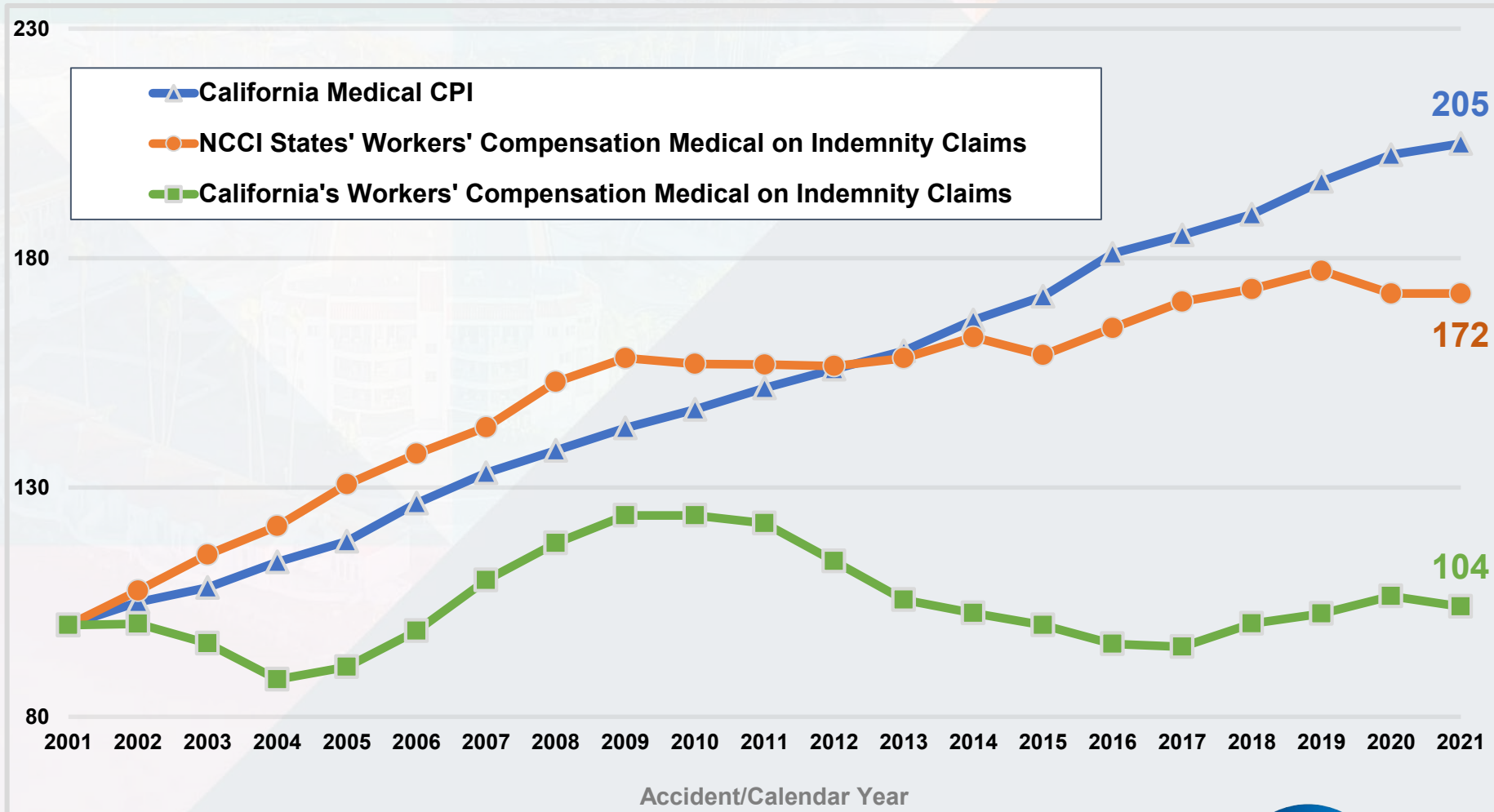


Source: BLS via St. Louis Fed (FRED), Assured Research



California Workers Compensation

Medical Cost Level Indexed to 2001



Factors Impacting Workers Comp Prices



Workers comp fee schedules



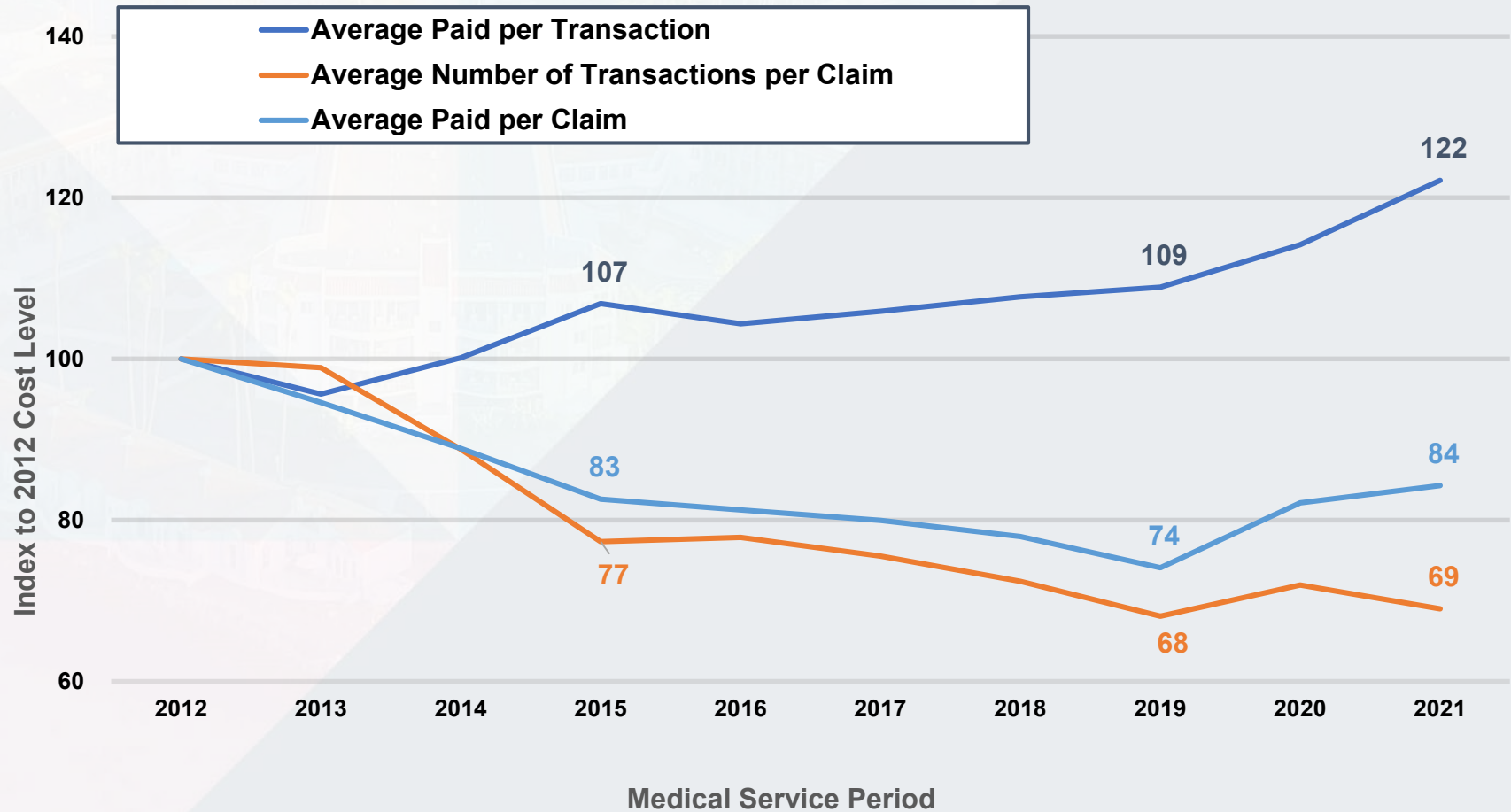
Medicare changes



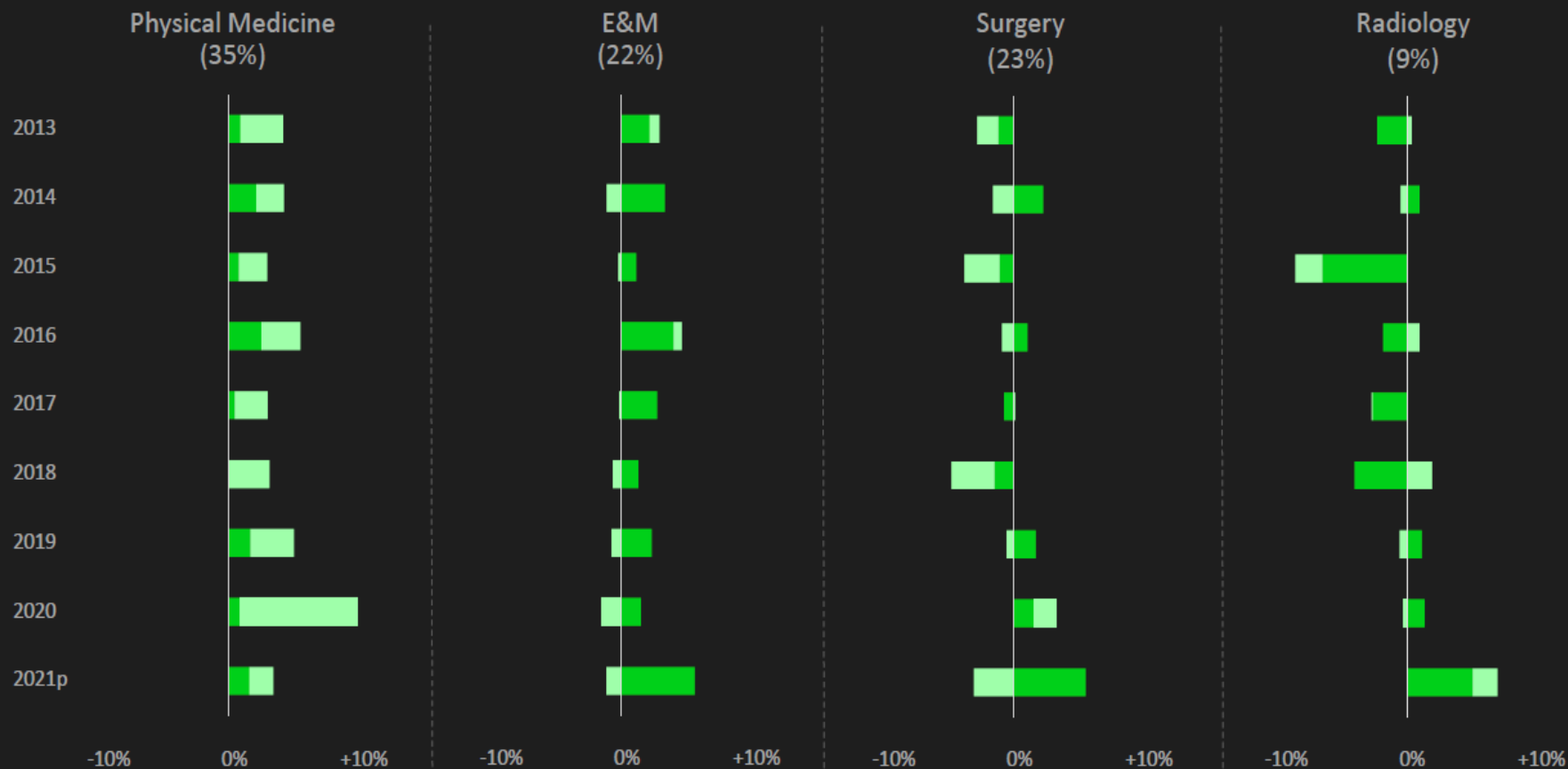
Market conditions

California Workers Compensation

Medical Cost Level Indexed to 2001



Physician Price and Utilization Changes



p Preliminary

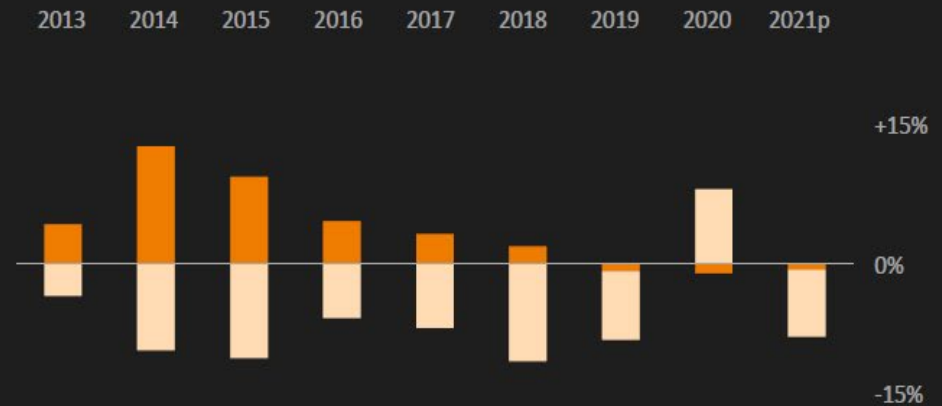
Source: NCCI Medical Data Call

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Rx Price and Utilization Changes



p Preliminary

Source: NCCI Medical Data Call

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Medical Payments by Claim Maturity

Critical



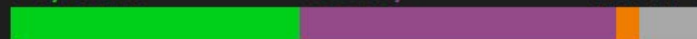
Subcritical



Medical Maintenance



Physician Facility Rx All Other



Claim
Maturity
(Years)

1



2



3



4



5 to 9



10 to 14



15 to 19



20 to 30

0%

50%

100%

Source: NCCI Medical Data Call

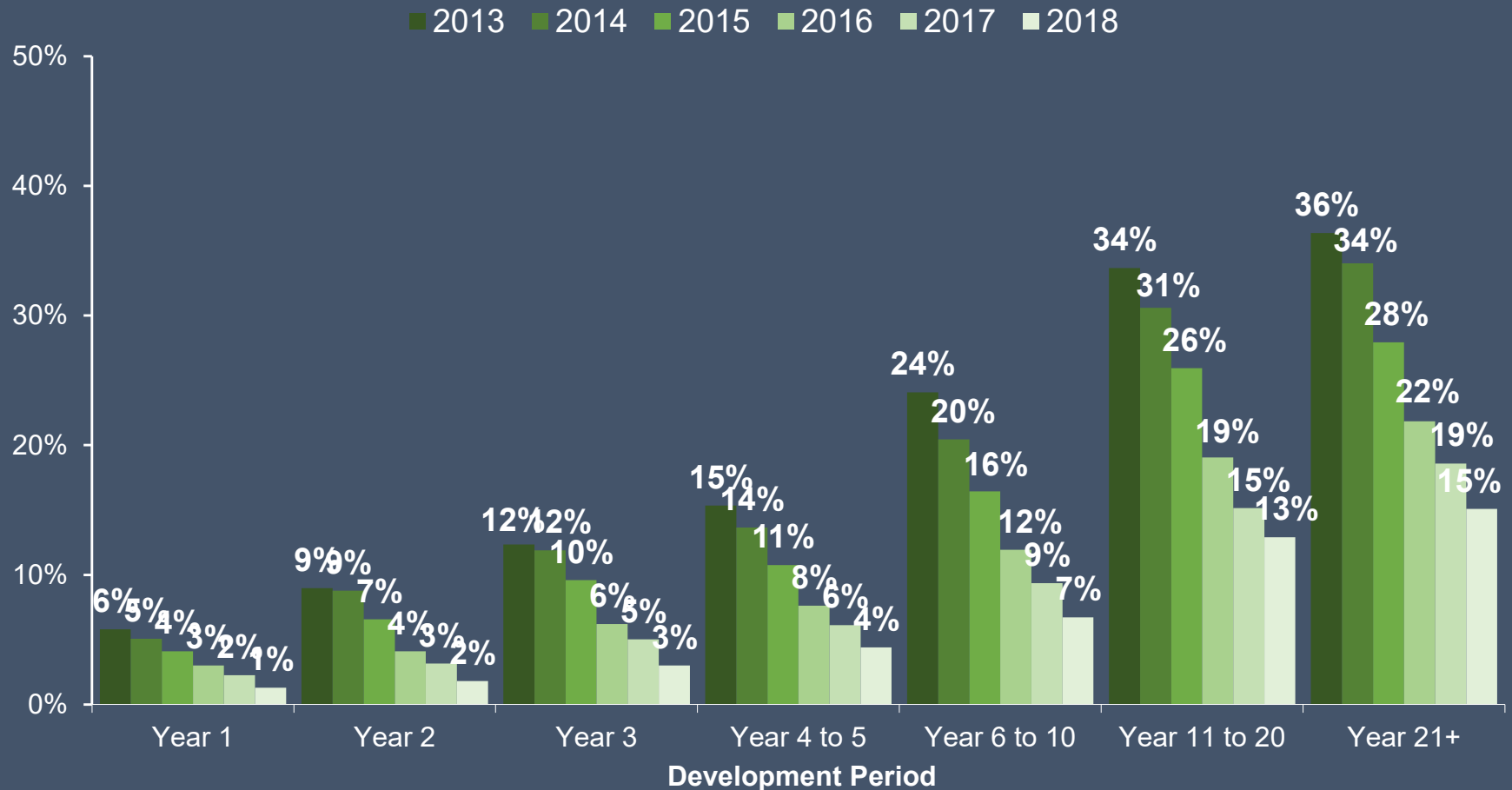
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Share of Total Pharmaceutical Services Paid By Age and Service Type

As of December 31, 2018



A Note on the “Hard” Reinsurance Market

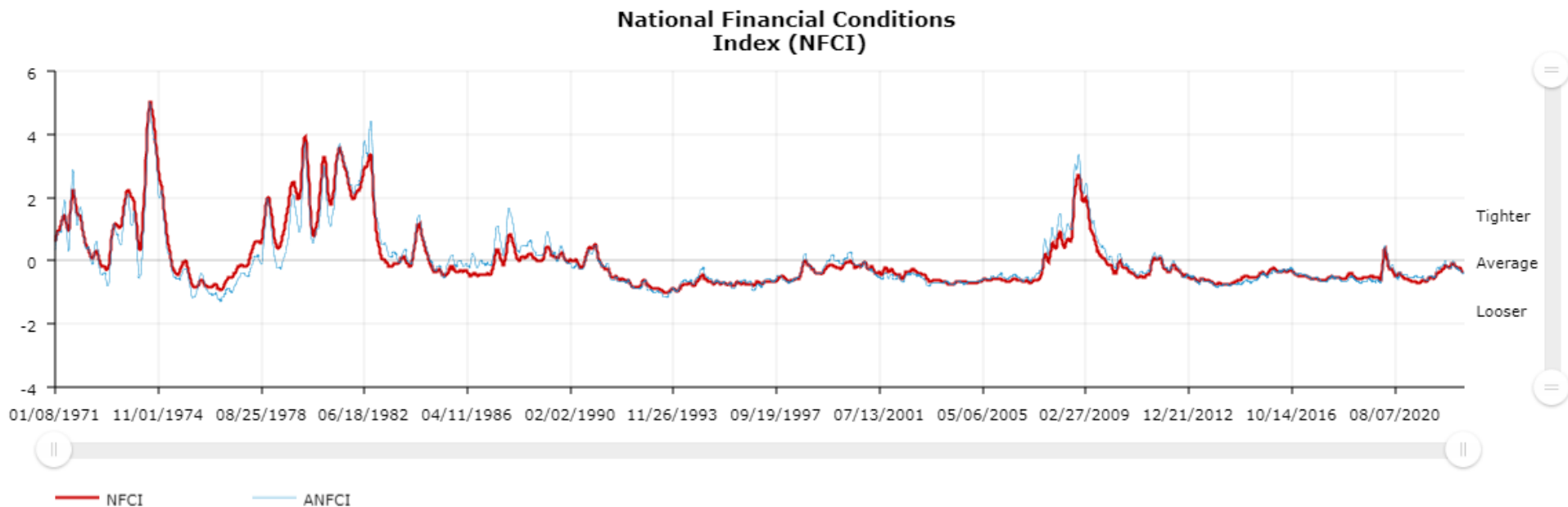
Cross-sectional and Intertemporal Risk-sharing

- Insurers write call options to policyholders, who exercise these options upon experiencing an event defined in the policy.
- Reinsurers write call options on the insurers’ call options, which creates a high degree of leverage to reinsurers.
- Reinsurers not only provide cross-sectional risk-sharing; reinsurers also provide intertemporal risk-sharing.
- Whereas financial markets are able to provide cross-sectional risk sharing (an example being the ILS market), only institutions (specifically, traditional reinsurers) are able to provide intertemporal risk-sharing.
- Intertemporal risk-sharing requires long-term contracts that are incentive-compatible, that is, no party has an incentive to behave opportunistically—these long-term contracts may be explicit or implicit.
- Hard reinsurance markets are episodes of “giving back” to reinsurers.



Availability of Capital, (Re)Insurance Included

Financial Conditions May Tighten as the Fed Keeps Tightening



The NFCI and ANFCI (Adjusted NFCI) are each constructed to have an average value of zero and a standard deviation of one over a sample period extending back to 1971. Positive values of the NFCI have been historically associated with tighter-than-average financial conditions, while negative values have been historically associated with looser-than-average financial conditions. Similarly, positive values of the ANFCI have been historically associated with financial conditions that are tighter than what would be typically suggested by prevailing macroeconomic conditions, while negative values have been historically associated with the opposite.

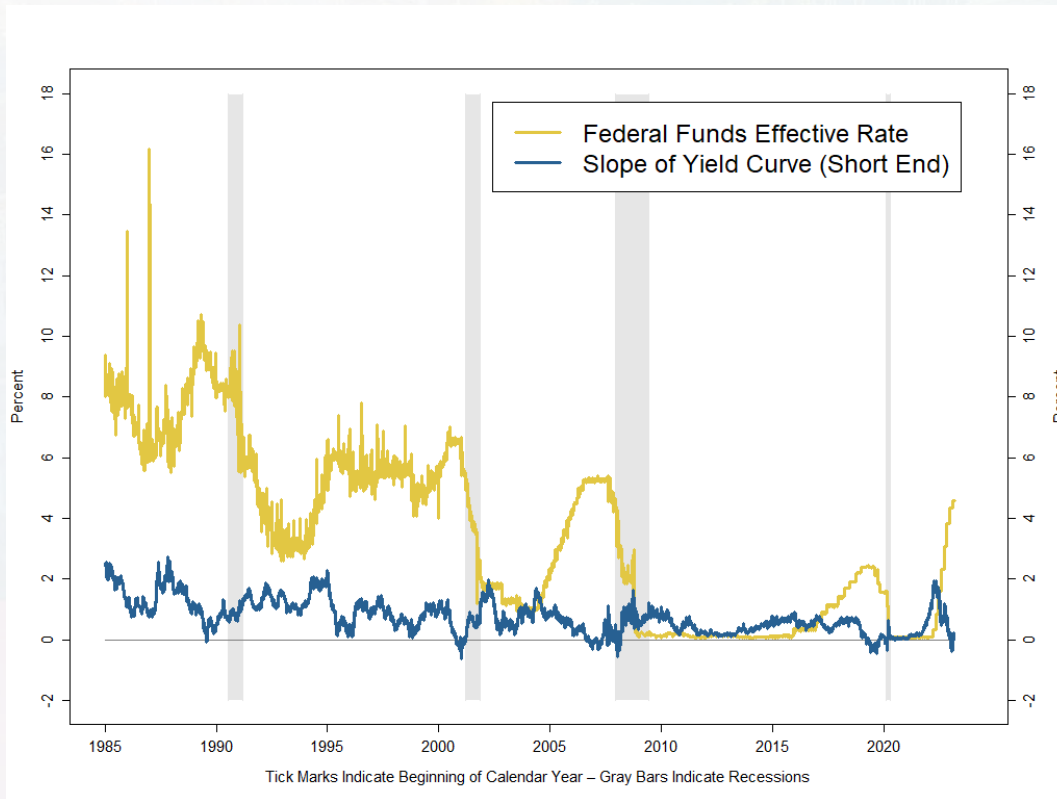


NFCI: National Financial Conditions Index; ANFCI: Adjusted National Financial Conditions Index.

Source: Federal Reserve Bank of Chicago, National Financial Conditions Index (NFCI), <https://www.chicagofed.org/research/data/nfci/about>.

Monetary Tightening Increases Recession Risk

The Federal monitors the short end of the yield curve



The short end of the yield curve informs on whether investors believe that the Fed will reverse course on monetary tightening, possibly but not necessarily to fight off an (actual or impending) recession.¹⁾

Specifically, Federal Reserve research points to the spread between the 3-month Treasury rate 18 months forward and the current 3-month Treasury rate as an indicator of recession risk.²⁾

Past yield curve inversions (as indicated by a negative slope) were followed by recessions.

Sources: (1) Nasdaq, U.S. Treasury Zero-Coupon Yield Curve, daily, continuously compounded, accessed on March 14, 2023, <https://data.nasdaq.com/data/FED/SVENY-us-treasury-zero-coupon-yield-curve>. Latest observation: March 3, 2023.

(2) Federal Reserve Bank of St. Louis, Federal Funds Effective Rate, DFF, daily; 3-Month Treasury Bill Secondary Market Rate, Percent, DTB3, daily; accessed on March 14, 2023, <https://fred.stlouisfed.org/>. Latest observations: March 10, 2023.

Note: The federal funds rate is the rate at which depository institutions trade federal funds (balances held at Federal Reserve Banks) with each other overnight. The Federal Reserve started using the federal funds rate as its main policy instrument in October 1982. The main components of the long Treasury yield are expected inflation, expectations about the future path of real short-term interest rates, and a (potentially negative) term premium.

1) Jon Hilsenrath (April 2, 2022) "Economists Seek Recession Clues in the Yield Curve." Wall Street Journal, referring to comments by Federal Reserve Chairman Jay Powell at the 2022 NABE Economic Policy Conference on March 21, 2022, https://www.youtube.com/watch?v=p_kGjqO7KLY (final two minutes).

2) Engstrom, Eric C., and Steven A. Sharpe (March 25, 2022) "(Don't Fear) The Yield Curve, Reprise", <https://www.federalreserve.gov/econres/notes/feds-notes/dont-fear-the-yield-curve-reprise-20220325.htm>.





What's Next?

LIVE POLL

What do you forecast Inflation will be for 2023?

☐ < 3%

☐ $\geq 3\%$ | < 5%

☐ $\geq 5\%$ | < 7%

☐ $\geq 7\%$



What can an Actuary do?

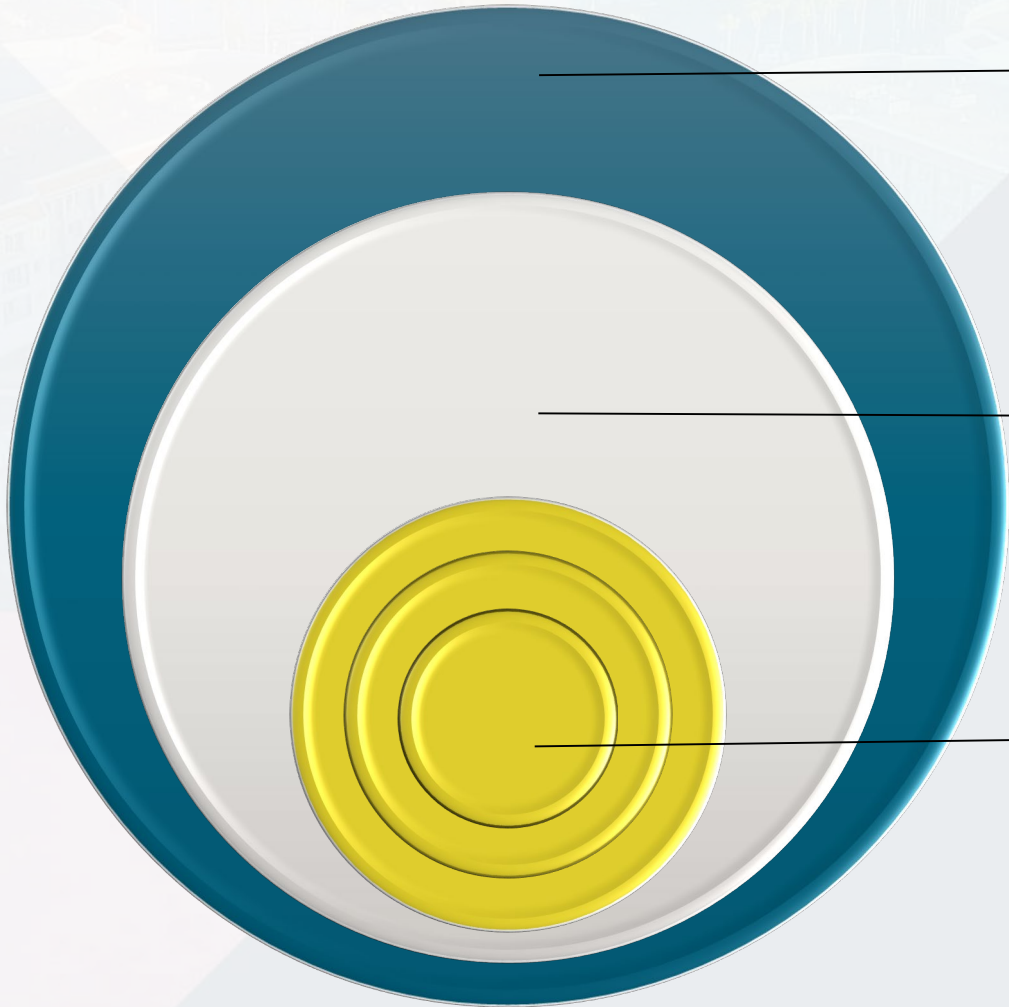
- ✓ Pick Higher LDFs (off the diagonal?)
- ✓ Communicate with other departments
- ✓ Consider more weight to paid methods



Forecast: What do we
think is going to happen
over the next year?



Unpeeling the Layers to the Insurers' Strategic Challenge



The globe is facing less capital and its higher cost

The situation impacts everyone, from investors and pension funds, to businesses and individuals reliant on them

The (re)insurance industry is not immune to these pressures

There is pressure to “right-size” portfolios to available capital, and the need to raise rates

To varying degrees, insurers will face pressure to mirror the actions of reinsurers

Those that understand their risk and adjust to new realities quickest are likely to outperform



IP Inflationary Pressure!

IP Industry Panel!

HOO

RAY?

Q&A

