

# Reflection of Inflation, Interest Rates, Stock Market Volatility, and Potential Recession on Life Insurance Business

**Recently, the high inflation in the U.S. has been making the news. The American Academy of Actuaries Life Experience Committee is discussing how inflation, and possible secondary impacts such as a potential recession and stock market volatility, could impact the work of actuaries with life insurers.** These include principle-based reserving (PBR) determinations, asset adequacy testing (AAT), input into business planning and product design. The committee's conclusion is that the impact of inflation on insurance companies will likely be different for different products and asset strategies used by companies. Also, we cannot predict how long inflation and its possible secondary effects will last. However, our committee believes that it would be helpful to develop a list of considerations that may be taken into account when a company is developing assumptions that could be influenced by inflation, higher interest rates, and a possible recession, along with providing sources of information an actuary may find useful on this subject.

## I. GENERAL ECONOMIC CONSIDERATIONS

### Relating Inflation to Underlying Interest Rates

In scenario testing, many actuaries relate the inflation rates to the underlying scenario rates. For example, the 2021 New York Department of Financial Services Special Considerations letter states that the inflation rate assumed in asset adequacy testing should be no less than the greater of 1% and one-half of the 5-year Treasury rate. Some companies have done their own studies and are using other formulae to relate inflation to the assumed interest rate in projections. If the studies on inflation versus interest rates are out of date, the actuary should consider updating the studies in order to justify the inflation assumptions being used in testing.

**Sources of Information:** One source of information is the Federal Reserve Bank of Philadelphia survey:

[Short-Term and Long-Term Inflation Forecasts: Survey of Professional Forecasters \(philadelphiafed.org\)](https://www.philadelphiafed.org/research-and-data/short-term-and-long-term-inflation-forecasts).

The broader macroeconomic survey it does is:

[Survey of Professional Forecasters \(philadelphiafed.org\)](https://www.philadelphiafed.org/research-and-data/short-term-and-long-term-inflation-forecasts).

Consumer price index (CPI) data back to 1913 can be found at:

<https://www.minneapolisfed.org/about-us/monetary-policy/inflation-calculator/consumer-price-index-1913>.



Details on the Federal Reserve System’s Federal Open Market Committee (FOMC) personal consumption expenditure (PCE) inflation projections are in the Fed FOMC meeting materials.

Example from:

[The Fed—March 16, 2022: FOMC Projections materials, accessible version \(federalreserve.gov\).](#)

Historical CPI data can be found at:

[Consumer Price Indexes \(CPI and PCE\) | FRED | St. Louis Fed \(stlouisfed.org\).](#)

Bureau of Labor Statistics information about CPI and its components can be found at:

<https://www.bls.gov/bls/overview.htm>.

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<https://www.bls.gov/bls/overview.htm>.

The U.S. Treasury publishes monthly average and end-of-month Treasury Breakeven Inflation (TBI) expectations over 0.5- to 100-year horizons, which can be found at:

<https://home.treasury.gov/data/treasury-coupon-issues-and-corporate-bond-yield-curves/treasury-coupon-issues>.

The above link enables the user to access historical Treasury Nominal Curve (TNC) yield files based on vanilla Treasury securities, Treasury Real Curve (TRC) yields based on TIPS, as well as TBI rates for which the user can access the most current data via these links:

[TBI Treasury Curve Breakeven Rates, Monthly Average: 2018–Present.](#)

[TBI Treasury Curve Breakeven Rates, End of Month: 2018–Present.](#)

TBI rates are based on constant maturity TNC and TRC yields determined via this methodology:

<https://home.treasury.gov/policy-issues/financing-the-government/interest-rate-statistics/treasury-yield-curve-methodology>.

The Cleveland Fed’s inflation expectations over 1- to 30-year horizons can be found at:

<https://www.clevelandfed.org/our-research/indicators-and-data/inflation-expectations.aspx>.

The website states “Our estimates are calculated with a model that uses Treasury yields, inflation data, inflation swaps, and survey-based measures of inflation expectations.” The forecast is generally updated on the 13th of each month. Click on “Download our spreadsheet” to see all the inflation expectations model’s outputs.

For a set of 1-year to 30-year inflation rates as of a given date under one of the above capital markets approaches (i.e., using Treasury or Cleveland Fed data), one can calculate a set of implied forward inflation rates (e.g., a set of forward 1-year rates for periods ending in 1 to 30 years).

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Members of the Life Experience Committee, which authored this issue brief, include Donna Claire, MAAA, FSA, CERA—*Chairperson*; Robert Astleford, MAAA, FSA; Mary Elizabeth Caramagno, MAAA, FSA; Lori Helge, MAAA, FSA; Al Klein, MAAA, FSA; Len Mangini, MAAA, FSA; Melissa Miller, MAAA, FSA; Craig Morrow, MAAA, FSA; Maambo Mujala, MAAA, FSA; Alan Routhenstein, MAAA, FSA; Mary Simmons, MAAA, FSA; Connie Tang, MAAA, FSA; Kyle Wan, MAAA, FSA; and Haofeng Yu, MAAA, FSA.

Another federal source of information will also give the bond market's CPI inflation expectations as of a recent market close for 5y, 7y, 10y, 20y and 30y (Treasury constant maturity yield minus Inflation indexed yield):

<https://www.federalreserve.gov/releases/h15>.

Discussions on the Federal Reserve meetings are published periodically, for example, a June 15, 2022, *Bankrate* publication of the Federal Reserve meeting:

[“Fed Hikes Interest Rates By Three-Quarters Of A Point To Combat Inflation” | Bankrate](#).

Consensus Economics ([consensuseconomics.com](https://consensuseconomics.com)) polls more than 700 economists each month to obtain their latest forecasts and views on various economic metrics (e.g., inflation, 3-month and 10-year Treasury rates) for almost every country you can think of. The April and October editions contain 10-year forecasts. The other monthly editions contain one-year forecasts. After a sample look, one must pay for the data.

### Length of High Inflation/ Secondary Impacts

**Interest Rate Increases:** At this point, inflation is exceeding the current interest rates. Interest rates typically do also spike when inflation spikes. The interest rates in the 1940s, after World War II, spiked to 23.7%; but the high rates lasted only a few years. The high interest rates around 1980 lasted about 10 years. The actuary performing scenario testing may want to reflect a temporary spike in inflation and interest rates in the scenario testing done.

**Sources of Information:** A source of information on the U.S. inflation rate is:

<https://tradingeconomics.com/united-states/inflation-cpi>.

Information on the 1940s inflation and interest rates can be found at:

<https://www.federalreservehistory.org/essays/treasury-fed-accord>.

A source on economic cycle length is:

<https://www.nber.org/research/data/us-business-cycle-expansions-and-contractions>.

An article on inflation that also gives a link to U.S. inflation history is:

<https://advisor.visualcapitalist.com/the-inflation-rate-in-the-u-s-past-present-and-future/>

### Possible Recession

A number of economists are projecting that the current inflation and increasing interest rates can lead to recession. There are some predictions of a recession to hit in 2023 or 2024. The actuary performing scenario testing may test the possibility of a recession in the next couple of years.

If the consensus among most economists as of a valuation date is that a recession is likely, the actuary should consider reflecting a recession in a prudent estimate CPI assumption or other formulae to prudently relate inflation to the assumed interest rates in projections; otherwise, one or more recession scenarios could be modeled as stress scenarios.

If some economists forecast as of a valuation date that there is a material chance of a near-term recession, then if the actuary does not reflect a recession in a prudent estimate CPI assumption or other formulae to prudently relate inflation to the assumed interest rates in projections, the actuary should consider whether one or more of the stress scenarios to be modeled should be recession scenarios.

### Sources of Information:

A source of information on the impact of inflation/deflation on life and P&C companies is the following:

<https://www.soa.org/globalassets/assets/files/research/projects/research-2012-02-effect-deflation-report.pdf>, particularly sections 1.5, 3.2, and 4.

One source of information on the possibility of recession is a *Fortune* article:

<https://fortune.com/2022/06/13/recession-economists-survey-2023-inflation-interest-rates/>.

## II. MODELING OF INFLATION ASSUMPTIONS

There are several methodologies that can be considered when modeling inflation assumptions in actuarial projections. These are discussed below:

**Prudent estimate CPI inflation assumption approaches:** There are at least four prudent estimate CPI inflation assumption approaches:

1. Level assumption based on one or more data sources
2. Initial assumption grading to ultimate over *n* years
3. Implied forward Treasury Breakeven Inflation assumptions
4. Economist forecast (or a blend of two or more forecasts)

Each approach has its pros and cons relative to the others. Each approach would include an appropriate margin unless prudently reflected via stochastic or stress scenario modeling.

**Assumptions for other inflation metrics:** The CPI has 8 expenditure categories. These categories are: Food and Beverage, Housing, Apparel, Transportation, Medical Care, Recreation, Education & Communication and Other Goods & Services. The inflation in some of these categories, may have more impacts on insurance companies than other categories. Detailed information is available from the Bureau of Labor Statistics.

**Medical care / health care inflation:** For a product or company with material exposure to medical care inflation (which is one of the CPI expenditure categories), the actuary should consider obtaining and analyzing medical care / health care inflation data, which can be obtained from various sources, including: the Bureau of Labor Statistics; and the St. Louis Fed; Some consulting firms annually publish 1-year forecasts.

**Employment cost inflation:** For a product or company with material exposure to employment cost inflation (which is **not** one of the CPI expenditure categories), the actuary should consider obtaining and analyzing employment cost index (ECI) data, which can be obtained from various sources, including: the Bureau of Labor Statistics; the Atlanta Fed and the St. Louis Fed; Some organizations publish long-term ECI inflation forecasts, including: Congressional Budget Office, which annually publishes 10-year forecasts.

### III. POTENTIAL IMPACT ON INSURANCE COMPANIES

#### Changes Due to Inflation, Interest Rates, and Possible Recession

Knowing the inflation rate does not directly answer the impact on an insurance company of a certain inflation rate. Also, the effect of possible secondary impacts, such as higher interest rates or a possible recession, will have different impacts on various companies depending on many factors such as the type of business the company is selling, the asset portfolios, and the typical customers of the company. Below are issues that an actuary may want to consider with regard to inflation and possible secondary issues. It is noted that many companies were around in the 1970s and 1980s. They may have data as to how the policyholders reacted and what issues arose with respect to the assets held by the company.

**Sources of Information:** One source of information is an older article by ResearchGate on the impact of inflation on insurers:

<https://www.researchgate.net/publication/316583500> *The impact of inflation on insurers.*

An article on inflation that also gives a link to one life insurer's view is:

<https://advisor.visualcapitalist.com/the-inflation-rate-in-the-u-s-past-present-and-future/>.

#### Potential Impact on Products of Inflation and Higher Interest Rates

**Possible Positive Impacts:** If inflation causes an increase in interest rates, the assets a company can purchase have higher returns than in the recent past. Some products could be more attractive. For example:

**Variable Products May be More Attractive:** Variable products become more attractive if sold as an inflation hedge—i.e., market returns moving in tandem with inflation; although a counter to that is that rapidly rising interest rates can depress the stock market.

**Possible New Products/Shift to Existing Products With Inflation Protection:** If people are more concerned with inflation, there may be a market for products that provide benefits based on inflation, such as the inflation indexed life insurance products currently sold in international markets. In addition, there can be more sales of products such as long-term care (LTC) products or life or annuity products that offer LTC protection with

a cost-of-living adjustment (COLA). Some guaranteed income annuities have inflation options as well, which may become more attractive as customers pay more attention to inflation. It is noted, however, that a number of cost-of-living adjustments do have caps, typically around 3%.

**More Spreads to Offer Additional Options in Products:** If there is a greater spread over the minimum interest rates guaranteed by a company to the policyholder, a portion of the excess spread can be used to purchase more hedges to, for example, offer higher participation rates on equity-indexed products, LTC benefits in life insurance and annuities, and give greater potential payouts on guaranteed living and/or death benefits on annuities. (However, for inforce products that are on a portfolio basis, it would take a while for credited rates to catch up with the new money rates unless there are significant new deposits by policyholders.)

**Possible Negative Impacts:** Some products, particularly long-term care policies or riders, may have cost-of-living adjustments. Obviously, these will be impacted by inflation. Most of these products have caps; it is likely the caps will be triggered in this environment. Some retirement products also contain COLAs, which are likely being triggered. Also, depending on the impact of inflation on family budgets, there may be less money in some families to purchase insurance products.

**New Money vs. Portfolio Products:** If inflation causes interest rates to increase, products that are on a new money basis would have an advantage in that they will likely be able to credit higher rates, which could give them a competitive advantage. This may also increase the 1035 exchanges from companies crediting portfolio rates to those crediting on a new money rate.

**Need for Non-Guaranteed Element Review:** The impact on products is that current inflation and interest environment emphasizes the need for non-guaranteed element (NGE) reviews. Inflation could impact current expense and interest rate assumption for universal life (UL) insurance, making the assumptions deviate from what were expected at pricing. This may trigger the need for NGE changes.

**Sources of Information:** There are two publications on the impact of rising interest rate environment by Oliver Wyman: The first article discusses the implications of rising interest rates on life insurance products:

<https://www.oliverwyman.com/content/dam/oliver-wyman/v2/publications/2021/nov/impact-of-rising-interest-rate-environment-life-insurance.pdf>

and; the second discusses market trends and product design considerations when interest rates are rising:

<https://www.oliverwyman.com/content/dam/oliver-wyman/v2/publications/2021/nov/market-trends-and-product-designs-in-a-rising-interest-rate-environment.pdf>

### Potential Impacts on Liquidity

There is a possibility that withdrawals could exceed revenues (cash basis) and thereby stress company liquidity sources.

### Potential Impacts on Asset Adequacy Testing

Inflation and its secondary impacts on interest rates can have impacts on asset adequacy testing done for regulatory purposes (including PBR determinations) as well as testing for company modeling.

**Positive Impacts:** A major positive impact is that companies that have relatively high minimum interest rate guarantees in their products will now be able to invest positive cash flows in higher earning assets, reducing the interest rate squeeze companies have had in the past few years.

**Negative Impacts:** For companies that had invested longer than the liability durations to pursue higher yields, higher interest rates could be a negative, as they may be forced to sell assets and incur losses to pay policyholder benefits.

### Potential Impacts on Specific Assumptions Used by Actuaries in Models

There are a number of assumptions used by actuaries in modeling. Considerations on the impact of inflation, interest rates, and possible recession are given below:

#### *Insurance Company Expenses*

Simply because the inflation rate is currently above 8%, for example, does not mean that this is the number that should be used as the rate expenses are expected to increase, even temporarily. Much of the expenses of insurance companies are salaries, which are not necessarily directly tied to inflation. Even though salaries may not increase at the rate of inflation, there may be competitive pressures to hire new employees or retain current employees because of higher inflation. It is possible for companies to see pressure to increase salaries for these reasons.

Other tasks may be done by third-party administrators (TPAs); the contracts with the TPA may spell out any increases that can be charged. When modeling a “most likely” scenario, an actuary may want to reflect the company’s expectation of expense increases for the next few years based on internal projections of what these expenses will be in the current climate.

*Policyholder Behavior*

Policyholder behavior is impacted by the economy. Examples:

- 1) **If inflation and interest are high, some products may be less attractive, driving more surrenders:**
  - a) Guarantees could be perceived as less attractive in higher inflation and rising interest rate environments.
  - b) Higher lapses could also be driven by availability of new money products that offer better returns than portfolio rate products, although, if a current product has a market-value adjustment, the lapse issue can be blunted.
  - c) Policyholders are less likely to value a policy with a fixed payout/face amount if they perceive inflation would erode the value of that future payout.
- 2) **If inflation is high and salaries do not match inflation:**
  - a) **Possible increases in lapses:** Some policyowners may not be able to afford to pay their premiums, and therefore lapse their policies.
  - b) **Less money in UL, FPDAs, and similar products:** some policyholders may cut back on the premiums paid on products that do not require modal premiums, such as universal life and flexible premium deferred annuities.
  - c) **Possible higher use of loans and withdrawal provisions:** some policyowners may take out loans, particularly contracts with lower fixed rate loans. Policyholder withdrawals may increase.
- 3) **If the country is in recession:**
  - a) **Long-term care insurance/disability claim recoveries** may decrease, as there may be fewer jobs and less incentive to go back to work.

*Assets Amid Inflation and High Interest Rates*

Inflation accompanied by higher interest rates will have a negative impact on many insurance company assets. High withdrawals and lapses when market values of the assets are low can be an issue because the insurance company may take losses if it needs to sell assets to fund policyholder payouts. In the later 1970s- to early 1980s, there was high inflation and high interest rates. A number of insurance companies would have been statutorily insolvent if they had to report their assets on a market-value basis rather than a book value basis that is allowed on many insurance company assets. Countering this, if statutory accounting was all on a market-value basis, then the liabilities would also decrease in value as well. However, companies could become insolvent if their assets and liabilities are not well matched. Conversely, under book-value accounting, a rise in interest rates could result in higher lapses and assets would be sold at market value, leading to losses.

For 2022 year-end, the new Actuarial Guideline AAT will be in force, which requires much more information on most assets, particularly those that are more complex ([AG AAT—5th Exposure.pdf \(naic.org\)](#)). The actuary should carefully review the assets of the company when determining how they should be reflected for asset adequacy testing. For example:



- 1) **Assets that are longer than liabilities:** Some companies deliberately went longer on the asset durations to chase yields. This can be problematic if interest rates increase after the assets were initially purchased and these assets need to be sold.
- 2) **Swaps value changes:** For those owning the floating portion of fixed/floating rate swaps, earnings will increase.

Countering some of the potential negatives above is the fact that companies will likely be able to invest positive cash flows in higher earning assets if this new money is not being used to cover outflows (to avoid liquidation loss on sales of existing assets).

#### *Assets in a Recession*

- 1) **Residential mortgages and other loans, such as auto loans to individuals:** Defaults may increase due to inflation rates for goods higher than salary increases or, if the economy is in recession, loss of jobs. It may also be that the underlying asset will not have as high a resale value.
- 2) **Commercial mortgages and real estate:** Businesses would be impacted in the event of a recession; certain businesses will likely fail, affecting commercial properties.
- 3) **Below-investment-grade assets:** These assets typically will have higher defaults in bad economic times.
- 4) **Credit migration:** There are more assets where the credit ratings will be reduced in bad economic times. This is a consideration when modeling assets in times of recession.

It is noted that the earnings rate on the assets are not only dependent on the underlying Treasuries, but also on the spreads to Treasuries. There are times, particularly when the market is uncertain as to whether the markets will get worse or is in recession, that spreads to Treasuries will likely widen.

**Sources of Information:** NYU's Stern Business School has the following data link that aggregates calendar-year data from various asset classes; and one of the columns is U.S. inflation:  
[https://pages.stern.nyu.edu/~adamodar/New\\_Home\\_Page/datafile/histretSP.html](https://pages.stern.nyu.edu/~adamodar/New_Home_Page/datafile/histretSP.html).

Credit spreads can be found on the National Association of Insurance Commissioners (NAIC) website under the section labeled "VM-20 Current Tables":  
[Principle-Based Reserving Data | NAIC](#).

Information on defaults can be found on the NAIC website listed above as well as the S&P website:  
<https://www.maalot.co.il/Publications/TS20220424121828.PDF>.

*Margins Used in Testing*

With greater uncertainty as to future expense levels, policyholder behavior, and/or asset earnings, it may be prudent for the actuary to consider increasing margins when performing cash flow projections, PBR determinations or asset adequacy testing.

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