SHOULD INFLATION RISK MANAGEMENT BE YOUR GOAL?

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Should inflation risk management be your goal?

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Higher inflation over the past two years has led to a higher return hurdle for investors who have established real return objectives. This has made it harder for investors to achieve their return objectives over the short term. Is this likely to be the case over the long term?
We examine this from a historical perspective and address the following:

1. To what extent does inflation reduce the probability of meeting an expected CPI + target over the intermediate to long term?
2. Is inflation the only risk non-profit organizations should seek to manage or are there other macro risk factors that are potentially as important?
3. Can investors simultaneously minimize the portfolio's sensitivity to all macro risk factors through long-term asset allocation decisions?

Overall, we find that although it is more difficult to achieve CPI + targets when inflation is elevated, it is periods of rising inflation that are most problematic. Although investors could adjust portfolio construction to reduce exposure to unexpected inflation, it could lead the portfolio to be more exposed to other macroeconomic shocks and we therefore caution doing so without considering the balance of impacts on the portfolio and the organization.

1. Impact of Inflation on likelihood of achieving goals

Given most non-profits are aiming to maintain purchasing power through time, the stated objective is to achieve returns in line with inflation (CPI) to preserve the real value of the corpus plus an additional return premium to support ongoing spending. A period of higher-than-average inflation naturally makes this goal more challenging.

Exhibit 1 illustrates the impact of higher-than-average inflation on the ability to meet nominal and real return objectives from 1950-2022 for a simple portfolio of 80% global equity and 20% US aggregate bonds. Over this 72-year period, the average annual inflation rate was 3.56%, so an objective of CPI + 5% should be roughly equivalent to a nominal return objective of 8.5%. **Exhibit 1** illustrates the ability to achieve the objectives over all periods (for which average inflation was 3.5%), and secondarily assesses the ability to achieve the objectives over the sub-set of periods for which inflation was over 3.5%. The ability to reach the nominal return targets is relatively unchanged by the level of inflation. Achieving the inflation plus objectives are made more challenging by intervening periods of high inflation, but the overall likelihood of meeting goals is not unreasonably reduced.

> *The ability to reach the nominal return targets is relatively unchanged by the level of inflation.*

Exhibit 1: Likelihood of meeting return objectives with an 80/20 portfolio in all periods, and the sub-set of periods in which inflation is over 3.5% from 1950-2022

	ALL PERIODS			INFLATION OVER 3.5%		
	3 years	5 years	10 years	3 years	5 years	10 years
CPI + 5%	63%	61%	64%	48%	46%	52%
Nominal 8.5%	63%	61%	61%	64%	54%	61%

This is not surprising, especially when we know that the inflation expectation is a return driver for some asset classes like government bonds where it drives nominal yields (Abrahams et al., 2016) and therefore the yield earned on the bonds. In periods where inflation is higher-than-average, but in-line with expectations, the returns on the government bond portion of the portfolio should also be higher, helping keep the goal within reach. Effectively, bond yields are self-adjusting based on inflation expectations and as these rise, future expected bond returns also improve, creating higher forward-looking nominal returns for the portfolio after an initial capital loss.

However, investors typically gradually revise their expectation for inflation slowly over time as it becomes evident (Gagnon 1996, Mankiw et.al. 2003, Cieslak and Povala, 2015). This implies that in periods of rising inflation,[1] while the nominal return required on the portfolio increases, expected returns on asset classes that get impacted by expected trend inflation may change more gradually,[2] if the investors deem that the rise in inflation is persistent. This lagging behavior makes the investment objective harder to achieve over the near-term but can eventually catch up.

Exhibit 2 shows the probability of meeting the portfolio goal in periods for which the annualized inflation is over 1% higher than the preceding non-overlapping period. The results indicate that rising inflation is particularly harmful to portfolios, not necessarily the absolute level inflation of itself. As shown, the time periods where inflation is rising by over 1% have less than 50% probability of meeting the return objective.

The results [in Exhibit 2] indicate that rising inflation is particularly harmful to portfolios, not necessarily the absolute level inflation of itself.

Exhibit 2: Likelihood of meeting return objectives with an 80/20 portfolio in all periods, and the sub-set of periods in which inflation is rising by over 1% from 1950-2022

	ALL PERIODS			INFLATION IS RISING BY OVER 1%		
	3 years	5 years	10 years	3 years	5 years	10 years
CPI + 5%	63%	61%	64%	43%	28%	19%
Nominal 8.5%	63%	61%	61%	52%	39%	31%

We noted how periods of rising unexpected inflation and inflation shocks can clearly reduce the probability of meeting the portfolio goal. If there are asset classes that produce higher returns in periods of rising unexpected inflation, an investor can allocate to them such that the portfolio returns increase in-line with the higher CPI + target.

2. Considering portfolio success risk factors beyond inflation

However, before constructing a portfolio focused on protecting the portfolio from unexpected inflation shocks, it is important to remember that inflation shocks are not the only macro factor that can make it difficult to reach objectives. Shocks to aggregate economic growth can also have a significant impact on portfolio outcomes. An example of a growth shock is a recession, with negative real growth over two consecutive quarters, but you can also have a growth shock without a recession.

Exhibit 3 looks at the impact of a negative real growth shock (e.g., recession) by comparing periods in which total annualized real growth is decelerating by 1% or more relative to the entire period. Negative growth shocks impair the portfolio's ability to meet both inflation-relative and nominal return objectives.

> *Negative growth shocks impair the portfolio's ability to meet both inflation-relative and nominal return objectives.*

Exhibit 3: Likelihood of meeting return objectives with an 80/20 portfolio in all periods, and the sub-set of periods in which real growth is decelerating by more than 1% from 1950-2022

	ALL PERIODS			REAL GROWTH IS DECELERATING BY OVER 1%		
	3 years	5 years	10 years	3 years	5 years	10 years
CPI + 5%	63%	61%	64%	42%	40%	22%
Nominal 8.5%	63%	61%	61%	50%	40%	22%

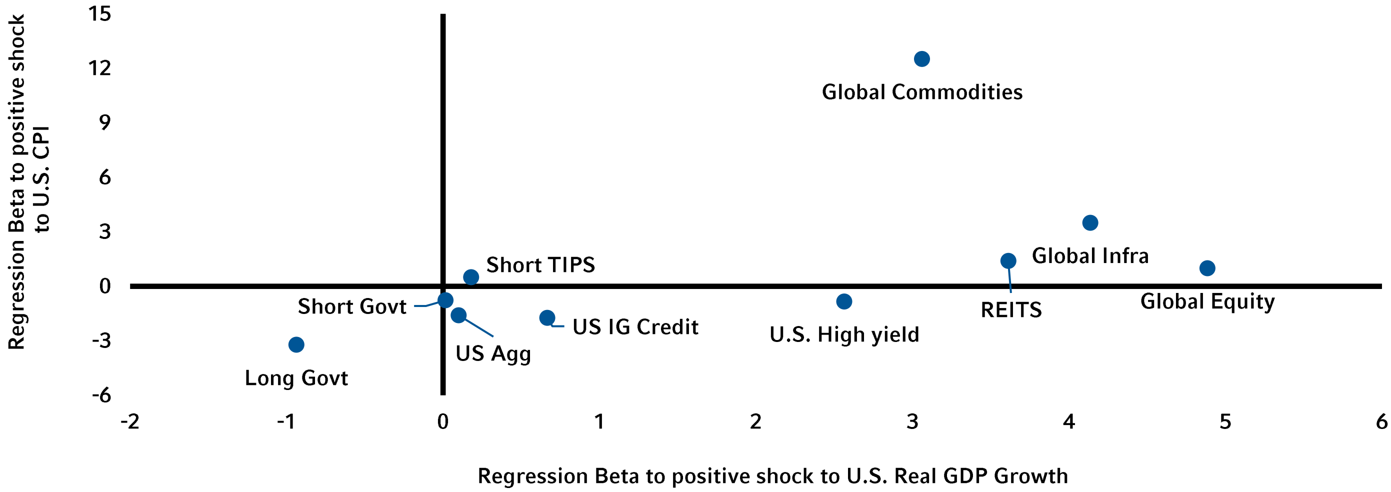
As shown, the probability of achieving the return objective decreases where real growth is decelerating by over 1%. This happens because, while on one hand the portfolio target has no direct relationship with economic growth, the asset classes used to build the allocation exhibit linkages (betas) to both inflation and growth shocks. Understanding the beta to inflation and growth for each asset class provides historical context for these economic periods.

Exhibit 4 shows asset class betas to growth and inflation shocks.[3] As an illustration, a beta of 0 implies that there is no relationship between unexpected inflation and the portfolio returns, while a beta of 1 implies that portfolio returns are expected to increase by 1% for every 1% of unexpected inflation. With notably meaningful betas of ~13 (commodities) and -3 (long government bonds), if inflation were to be 1% above expectations, we would correspondingly expect an increase in the return to commodities of 13% and a decrease in the return of long government bonds of 3%. To target the inflation sensitivity of a CPI + return objective, a portfolio would need to be constructed with a beta of 1 to unexpected inflation.

Similarly, a beta of 1 to real GDP (growth) shocks implies that portfolio returns are expected to increase by 1% for every 1% of unexpected real GDP growth and decrease by 1% for every 1% reduction in real GDP growth. A diversified growth-oriented portfolio would naturally have a positive beta to growth and is therefore also exposed to downturns in growth and downside risk would only be lessened by reducing the total portfolio allocation to growth shocks.

Exhibit 4: Asset class betas to inflation and growth shocks[4] from 1988-2022[5]

Sensitivity to macro shocks

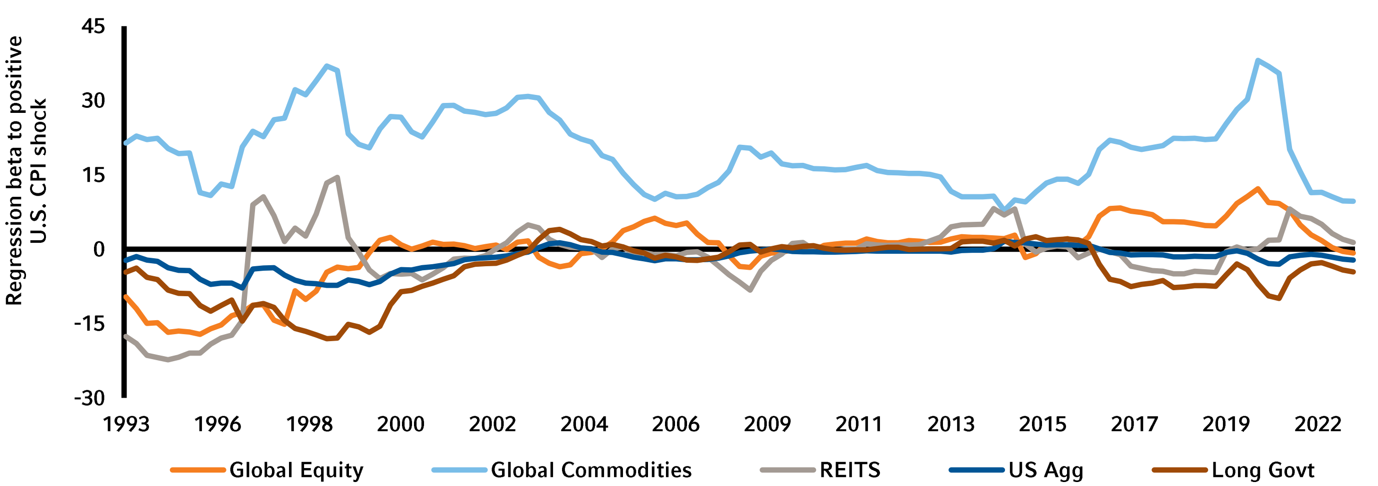


We believe that rather than being concerned about high inflation alone, non-profit investors should be concerned about the multiple macro risk dimensions their portfolio could be exposed to inherently within their implemented asset class mix. As we saw in the earlier analysis where either rising inflation or falling real growth can be problematic; falling growth is potentially more problematic even with an inflation plus objective.

However, caution must be taken in relying upon asset classes with expected inflation shock protection as the beta estimates can be regime dependent (i.e., betas vary by period) and change with the time horizon under consideration (Brière and Signori, 2012). For example, **Exhibit 5** shows that the rolling 5-year beta of equity and REITs to inflation shocks has changed from negative to positive over the past 35 years, while that of commodities has remained positive for the entire period and duration has been fairly consistently negative.

Exhibit 5: Rolling beta to inflation shocks

Five-year rolling inflation surprise beta



3. Portfolio positioning considerations

To construct a portfolio that will best meet objectives it is important to look at the portfolio's sensitivity to risks relative to the objective from a multi-dimensional risk lens.

The CPI + objective has a beta of 1 to unexpected inflation, which means when the realized inflation is higher than expected by 1%, the investment goal itself rises by 1%. If the investor's portfolio also has an anticipated beta of 1 to unexpected inflation, it is expected to move in line with the investment objective in periods of rising inflation. For other macro risks like growth shocks, the ideal portfolio has a beta of zero to them if that could be done without impacting the return expectation. If we hold a portfolio with a beta of 1 to inflation shocks and zero to other risk factors, then we could theoretically insulate the portfolio from shocks relative to the investment objective.

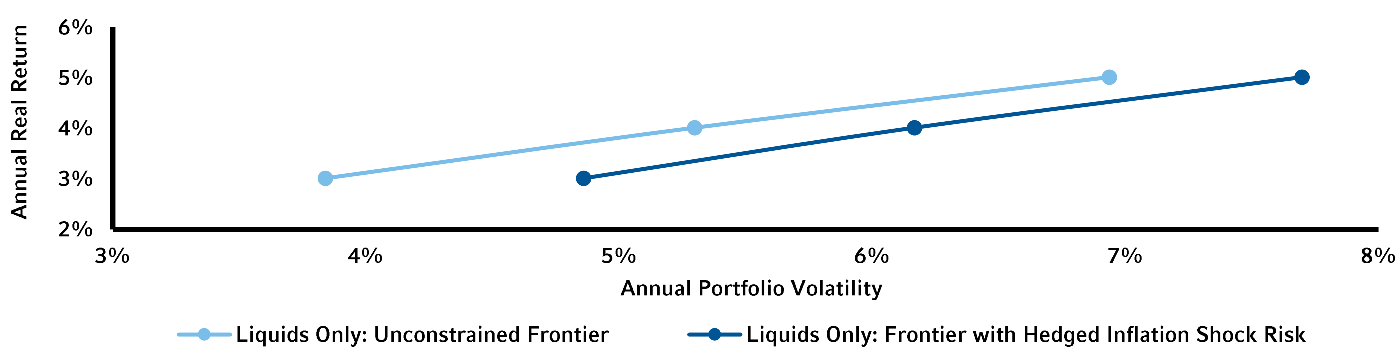
Of course, even if the sensitivity of the asset classes to macro shocks could be determined without any uncertainty, this could be difficult to accomplish. It is possible that tilting into certain asset classes helps reduce macro risk of the portfolio on one dimension, while increasing it on another and a trade-off would need to be made.

We demonstrate this using a simple example. We assume that from 1988-2022, we had perfect foresight on the quarterly returns, covariances, and growth/inflation surprise betas of key liquid asset classes.[6] Using this data, we construct two sets of minimum volatility portfolios for different portfolio return levels. In one set, we target an inflation surprise beta of 1, while in the other, we don't undertake any growth or inflation beta targeting.

Exhibit 6 shows that for a liquid only portfolio, as we increasingly tilt into inflation hedging assets, the volatility of the overall portfolio increases, for the same level of long-term return. The portfolio with a real return of 4.0% has approximately 1% less portfolio volatility and 0.25 lower beta to growth shocks if it does not look to provide protection for an inflation shock.

Exhibit 6 shows that for a liquid only portfolio, as we increasingly tilt into inflation hedging assets, the volatility of the overall portfolio increases, for the same level of long-term return.

Exhibit 6: Impact of inflation risk hedging on portfolio volatility

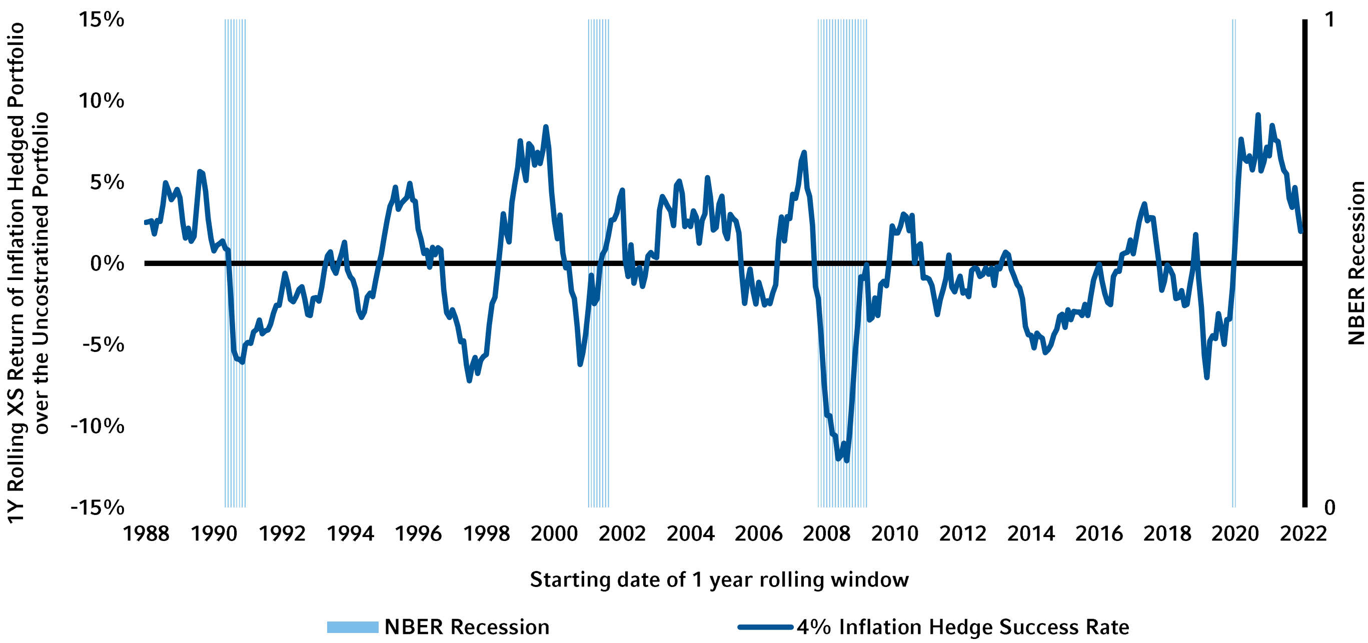


	3% REAL RETURN PORTFOLIO	4% REAL RETURN PORTFOLIO	5% REAL RETURN PORTFOLIO
Change in asset class weights			
Equity	4%	5%	5%
Real Assets	16%	17%	18%
IG Fixed Income	-1%	-2%	-1%
BIG Fixed Income	-19%	-19%	-22%
Change in Macro Surprise Betas			
Growth Surprise Beta	0.23	0.25	0.26
Inflation Surprise Beta	1.70	1.82	1.90

To target a beta to unexpected inflation of 1.0, an investor who invests only in liquid assets would need to lean into real assets such as commodities and reduce the fixed income duration of the portfolio (as seen in **Exhibit 6**) or rotate somewhat from nominal fixed income into real return bonds. However, to maintain return expectations while reducing duration and increasing commodities, the portfolio also needs to increase the allocation to equities. This leads to an increase in the total portfolio beta to growth shocks, and greater volatility and drawdown risk.

These differences in the growth and inflation surprise betas of the two portfolios resulted in significant time-varying difference in performance of the two portfolios although their long-term return was similar. While the 1970s was an era of cost-push inflation shocks, from the late 1980s until recently, most recessions have been due to demand-pull shocks that resulted in growth and inflation falling simultaneously (Brixton et. al., 2023) causing the inflation hedged portfolio to underperform the unconstrained portfolio. On the contrary, as recently as 2021 and 2022, when we saw large positive shocks in inflation, the inflation risk hedged portfolio outperformed (as seen in **Exhibit 7**) the unconstrained portfolio.

Exhibit 7: Historical 1-year rolling excess return of 4% real return target portfolio with inflation shock risk hedged vs the unconstrained portfolio



In determining the extent to which a non-profit entity should be concerned about the impact of inflationary, growth or other market shocks on portfolio growth and spending, the circumstances of the non-profit need to be thoroughly considered. For all spending non-profits, inflation will erode the beneficial impact of your spending (in tangible terms), however declining growth will also impact the portfolio and likely concurrently reduce the donations received (at just a time when increased support is needed). Weighing the probability of each risk within your strategic asset allocation is crucial, recognizing that protecting against shocks in unexpected inflation may prove to be less critical versus others, such as declining economic growth.

4. Forward-looking expectations

Naturally, Russell Investments is concerned about the impact of inflation and the likelihood that it negatively affects future growth for our client's portfolios. However, our central expectation is that inflation will normalize over the next few years. This is relatively in line with market consensus expectations as the 5-year market implied breakeven inflation rate is 2.24%,[7] although that does not guarantee there are no further inflation shocks. Although our larger near-term concern is that a recession (growth shock) negatively impacts medium-term return potential, falling growth paired with high inflation remains a tail risk concern.

In some market environments, it is rising inflation (potentially compounded by inflation resulting in stagflation), that makes inflation plus objectives temporarily unachievable, while in other market environments, it is falling growth levels that decrease returns and make inflation plus targets unachievable.

No matter what the cause, rising inflation or decelerating growth, the inability to meet the inflation plus objective for many non-profits will mean the inability to maintain target spending and the purchasing power of assets. This will leave many considering the difficult choice to reduce spending through time (or accept a gradual shrinking of the corpus to maintain historic spending rates). Any decision to reduce spending in response to realized or expected returns falling short of the inflation plus objective will be determined by the priorities of the non-profit. A retrenchment in spending will lead to an immediate reduction in the support that the non-profit can provide to its stakeholders, but it boosts the likelihood that it will be able to provide consistent support in the future.

Although our larger near-term concern is that a recession (growth shock) negatively impacts medium-term return potential, falling growth paired with high inflation remains a tail risk concern.

Conclusion

Although a persistently high level of inflation might be problematic for an organization's investment objectives, it is inflation being unexpectedly high that is the more significant concern. However, there are other risks that can knock you off your path to your CPI + objective. Unless inflation poses a specific risk to your organization, the best route forward is likely a diversified portfolio that is as robust as possible across different economic environments.

[1] We define rising inflation as an environment where the current realized inflation over a horizon (3Y, 5Y or 10Y) is higher than the inflation over a recent similar non-overlapping period in history. For example, if the realized 5Y inflation from 2015- 2020 is higher than the 5Y inflation from 2010-2015, we will classify 2015-2020 as a period of rising inflation over a 5Y horizon. It should be noted that for the ten-year horizon, all data points for rising inflation occur for ten-year horizons period ending between 1970 and 1985, and for the five-year horizon all but two are from 1968-1982, which should lead to caution in drawing robust conclusions from one period in history.

[2] See Attié and Roache (2009) for long term vs short term impact of inflation shocks on different asset classes.

[3] The beta is a regression beta calculated using quarterly overlapping data.

[4] We define inflation and growth shocks as the difference between realized 1Y CPI and Real GDP growth and their respective 1Y expectations from the survey of professional forecasters. The asset class betas are calculated by regressing the returns of the asset classes on the inflation and growth shocks over a common historical period from 1988-2022.

[5] For Global Infra and Short TIPS time periods, start at 2001 and 2002, respectively.

[6] For simplicity we use only Global Equity, REITS, Commodities, US Aggregate, US IG Credit, US High Yield, Commodities, Long Govt (as a proxy for long government bonds) and Short Govt (as a proxy for short government bonds) in our analysis. A combination of these asset classes can help change the equity beta, duration and credit risk of the portfolio as needed to meet portfolio goals.

[7] As of May 1, 2023.

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