# The Long-term Strategist

## Does cash lower or raise long-term risk?

- **Many longer-term investors hold significant amounts of cash.**
- **We have zero cash in our Strategic allocation as we believe that its lower return, while keeping the value of your savings more stable, does not help much in realizing longer-term financial goals.**
- **In this note, we simulate the impact of adding cash to equity-bond portfolios both in the accumulation stage 20 years before retirement and during the decumulation stage, when you need to fund spending out of savings.**
- **Adding cash does lower volatility and the uncertainty about the future value of your savings, both short and long term, but at a price of a reduced return.**
- **That said, when we define long-term risk in terms of falling short of your objective of reaching a particular level of wealth and spending in retirement, we find that adding cash does not lower these long-term risks and can even raise the risk of falling short of your long-term goals.**
- **This is because the volatility-reducing impact of cash is offset by its lower return.**
- **At modest allocations to cash, below 20%, the best you can hope for is that it does not actually raise long-term risk, though it still lowers returns. Above 20% in cash, you get much greater stability in the value of your savings, but a lower return and an increased risk you will fall short of your long-term objectives.**
- **The only way to have more stable savings and reduced risk to your long-term goals is to save more and spend less.**
- **Despite these results, you may still want to hold decent amounts of cash in your savings if you are quite uncertain when you will need your savings, have uncertain sources of income and/or have little to fall back on if your retirement savings fall dramatically in value.**

**Long-term Strategy**

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**We have no cash in our Strategic Asset Allocation**, as shown in the appendix at the end of this note. We know that **many individual savers do hold significant amounts of cash-like assets** in their savings beyond what they need for regular transactions. If you have substantial cash holdings, you are likely concerned about the negative impact of sudden market falls on your financial future and less about any need to earn a higher return.

The **motivation to try and protect the value of your retirement savings by holding a lot of safe assets** such as cash could come from not knowing when you will need to access your savings, from understandable worries that major market losses may not be recovered over following years, from not having a state or private defined-benefit pension to fall back on in the case your own savings are wiped out, or where lower than expected returns would seriously threaten your standard of living (that is, you go hungry).

Even rational long-term investors may thus have valid reasons to reduce the shorter-term volatility of their savings by adding cash to a traditional bond and equity portfolio. In this note, we try to assess the trade-offs and costs in holding cash in one's strategic portfolio and where and when such costs might be manageable.

We have argued that while cash may be default free, to long-term investors, who need to roll over cash all the time at unknown future yields, the eventual return on cash is uncertain though likely lower than that on bonds.[1]

Our **aversion to cash in a strategic portfolio** is based on a belief that **while cash does lower portfolio volatility over the short term, and over the long term, it increases the risk that savers will not achieve their ultimate goals which for most is a comfortable and safe retirement.** There are three drivers of this view that the relative safety of cash over the short term does not fully extend to the long-term investor. **Each involves measuring more accurately what the risk is to your savings 1 or 2 decades out and defining more clearly what your long-term goals really are.**

The first, developed several years ago in our Bonds time diversify much better than you think, Feb 14, 2020, is that certain assets have **returns that tend to mean revert** over the years, thus reducing the possible range of the ultimate long-term returns relative to that implied by short-term volatility. In many financial pricing models, it is assumed that long-term returns are a sequence of short-term returns that are uncorrelated over time and have identical distributions. This allows one to convert short-term volatility into long-term risk via **square root of time rule**. Accordingly, the volatility of the 10-year pa return will be 1-year volatility divided by the square root of 10. If returns are negatively correlated over time – they mean revert – then 10-year out risk will be lower. And vice versa if returns are positively correlated – they have momentum. We found that asset classes sitting in between the pure equity and bonds world – we call them hybrids – such as preferred stocks, utilities, infrastructure, real estate, convertible bonds, high-yield bonds have long-term return volatilities much lower than that implied by their short-term volatility. The long-term investor with patience and an ability to ignore the short-term noise of markets can thus be more confident about what such hybrids will be worth some 10 years out and thus has little need to stabilize his savings with large holdings of cash.

A **second** argument for lower long-term risk, developed in Short- vs long-term risk, Feb 1, 2023, is that risk should be defined as downside to your return expectations. Risk is thus not mere volatility but the odds and extent that you will be wrong in your expectations about the future value of your savings. On that basis, the long-term investor has one advantage over the more tactical investor in that they know the price/IRR of the asset class they are buying and that knowing their entry point allows one to narrow the range of long-term returns one is likely to earn on those assets to below what is implied by short-term volatility. Again no major reason to hold a lot of cash, although the argument weakens a bit when one has an investment horizon well beyond 10 years as the ability of current IRRs to accurately forecast future returns can weaken beyond 10 years out.

A **third** argument for reduced risk and the focus of this note, is that long-term investors should really broaden out their concept of risk as not just return uncertainty, but more as the probability and extent to which your portfolio may not achieve the ultimate goals of your financial strategy and needs.

## Long-term risk from the point of view of your long-term objectives

Most individual investors, and the asset managers and insurers that serve them, are saving for old age with the objective to be able to maintain their lifestyle when they retire. There are **two stages of savings management**. In the first – the **accumulation stage** – you are still working and putting part of your earnings aside to build up enough savings to be able to retire in comfort at, say, the standard age of 65. In the second phase – the **decumulation stage** – you use your accumu-

1. As argued earlier this year in Ten topics in strategic investing: How safe is your cash?, Mar 19, 2024.

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lated savings to fund your spending in retirement.

**Long-term risk** in the **accumulation stage** is the risk that your chosen portfolio fails to deliver enough return to achieve your target retirement wealth at age 65. We do not incorporate the risk here that you may be unable to save enough during your working years due to unforeseen falls in income as it is not a function of how much you put into cash, although the macro correlation of job losses and equity falls during a recession are one argument to maintain a healthy allocation to safe assets. We defined in recent notes the long-term risk in the decumulation stage as the risk that you will run out of money before passing away, either because of lower than expected portfolio returns or as a a result of living longer than expected. Short-term risk in both stages is simply the volatility of the value of your savings.

**What happens to your long-term risk** in either of these two stages **when you try to reduce short-term risk by adding cash to a bond and equity portfolio?** We know adding cash will reduce short-term volatility of your portfolio. By itself, this should also reduce long-term risk, but the lower return on cash to be expected over the long run should also be expected to reduce the ultimate value of your savings after the accumulation stage, when you are ready to retire, increasing the risk that you will not achieve your target spending in retirement. If you then also hold cash while you are withdrawing money in retirement, its lower return should raise the risk that you will run out of money before you pass away. **Which effect – lower return vol and lower return – dominates in their impact on your long-term risk?**

## Adding cash at the *accumulation* stage

We simulate adding increasing amounts of cash to a 60/40 equity-bond portfolio in the accumulation stage and to a 30/70 equity-bond portfolio in the decumulation stage that we have found to be roughly optimal at this stage, as your investment horizon is now shorter. For the first stage, we use a 20-year horizon to keep the analysis simple, avoiding the complexity of the growth in your retirement funds from annual savings out of income. An earlier starting point in retirement savings, at a younger age, will increase the impact of adding cash to long-term risk and vice versa for later starting points, but the overall impact should be qualitatively the same.

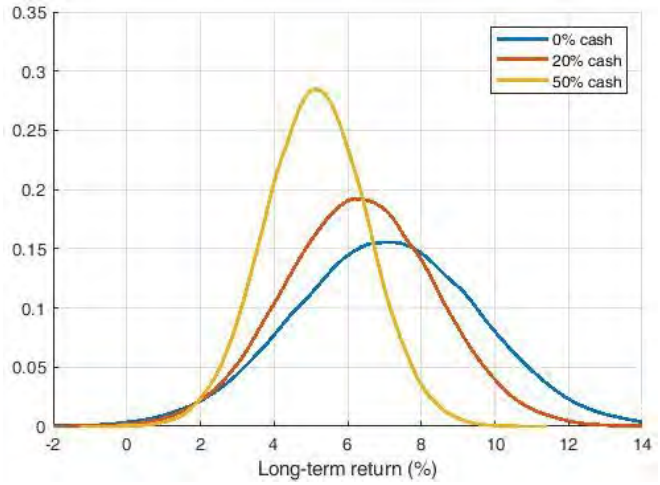
We simulate ~100k random draws from the distributions of the US Aggregate Bond Index and the S&P 500, with annual volatilities and correlations equal to those since 1976 and with means based on the very long-term return expectations we have used in recent months of 8.1% compounded pa on the S&P 500, and 4.7% on the US Aggregate Bond Index, consisting of 4.1% on US Treasuries and 5.2% on high-grade corporates. Our 60/40 equity-bond portfolio with zero cash has a 20-year out mean projected *compound* return of 7.1%.[2]

To this 60/40 equity bond portfolio, we add steadily more cash, reducing both bonds and equities in proportion. A 20% allocation to cash thus means we reduce the equity and bond holdings to 48% and 32%, respectively. Throughout, we assume that cash offers a long-term expected return of 3% pa, with volatilities and correlations to 30-70 returns defined by the historic record since 1976.[3]

Figure 1 shows the return probability density in our simulations for three different portfolios: one with zero cash; one with 20% cash; and a third one with 50 % cash. It shows how the **mean return falls, and the distribution gets tighter as we add cash**, each time moving the distribution to the left.

Figure 1: Probability density of 20-year returns on different cash allocations on top of a 60/40 US equity-bond portfolio

%. 20-year compound pa return on x-axis. Three different portfolios with zero, 20% and 50% allocations to cash. Kernel probability density estimate.




Source: J.P. Morgan, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, S&P, Bloomberg Finance L.P.

2. Our 8.1% and 4.7% pa forecasts for US equities and bonds over the next 20 years are for compound returns. Our simulations take random draws from the return distributions of these two assets classes with annual volatilities and correlations equal to the historic record since 1976. The means of these distributions must be the mean *arithmetic* returns consistent with our projected *compound* returns. We use the approximate conversion rule of adding 0.5%*variance to the compound return to obtain a mean arithmetic return for both.

3. This cash portfolio is invested in 3-month Treasury Bills. The 3% pa return is roughly consistent with our current long-term forecast of a 0.6% real yield on 3-month bills, and our operating assumption that inflation will average about 2.5% pa in the long term.

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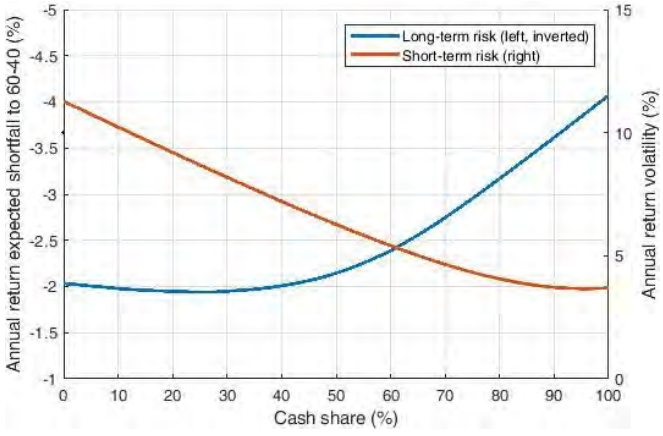
**Long-term risk** to this 45-year-old saver should be the **risk and extent to which they do not end up in 20 years' time with enough savings to afford themselves a comfortable retirement**. We take the expected growth of the zero-cash portfolio as the one that should produce exactly this target wealth at age 65. Adding cash lowers the expected return, but also makes the eventual level of your wealth less uncertain. We can combine the negative impact of lower return on this long-term risk and the positive impact of reduced uncertainty by calculating the "expected shortfall" against the target wealth position produced by the 7.1% pa compound mean return on the 60/40 portfolio. To do so, we take the expected value of the part of each distribution to the left of a 7.1% 20-year return, and from this subtract the 7.1% mean return on the 60/40 portfolio. In the case of the zero-cash portfolio, this expected value is 5.0%, giving a shortfall of about 2.0% relative to 7.1% (after rounding). For the 20% cash portfolio, this expected shortfall is nearly the same as lower uncertainty (a tighter distribution) offsets the impact of a lower return. For cash allocations above 40%, the lower return dominates, and the expected shortfall rises more sharply.

Figure 2 plots our **two measures of risk**: **the long-term risk – expected shortfall –** (left axis) and the **short-term return volatility** (right axis) of our portfolio for varying cash shares. The red declining line shows that as we add cash, the annual volatility of the portfolio steadily declines, as expected. Long-term risk, on the blue line is the expected shortfall below the expected return of the 60/40 equity-bond portfolio.

Figure 2: Long and short-term risk in the accumulation stage of saving for retirement at different cash shares

%. Portfolio consists of cash and non-cash allocations. Non-cash component is allocated 60-40 to the S&P 500 and the US Agg. Short-term risk is annual return volatility. Long-term risk is expected shortfall below 60-40 expected return.




Source: J.P. Morgan, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, S&P, Bloomberg Finance L.P.

**In short**, in the accumulating stage of saving for old age, when you are still saving to build your financial retirement nest, adding cash to our traditional 60/40 equity-bond portfolio has the expected impact of reducing both the expected return and short-term volatility of your savings. But it does not help to reduce long-term risk as the impact of more stable cash return is offset by the lower cash return making it more likely that your savings at age 65 will fall short of your needs. At relatively low allocations to cash, the two effects fully offset each other, and long-term risk does not rise. At cash levels above 40%, the impact of a lower return on cash starts to dominate and long-term risk starts rising steadily.

## Adding cash at the *decumulation* stage

Once you have chosen to retire, you need to decide how to **convert your accumulated savings into a dependable income stream** such that you run only a negligible risk of running out of money. We have discussed different aspects of this problem over the past 3 months (see Library further down this note). At its most basic level, it consists of deciding how much you can spend of your savings each year to make sure you do not run out of money prematurely. Your optimal spending or withdrawal rate will depend on the expected return on your portfolio, how long you expect to live, and on how you expect your spending needs to change over time due to inflation and/or changing needs. We showed two months ago that a US male and female with average, though trend improving mortality rates can spend 5.2%/5.0 pa of their starting savings if they simply want to spend a fixed nominal amount each year for the remainder of their lives. The optimal equity bond allocation for this spending rate is about 30/70, given current entry points in the market. We will use the 5% optimal spending rate of a female, as representative.

Figure 3 plots our **two measures of risk**: **the long-term risk** (left axis) and the **short-term return volatility** (right axis) of our portfolio for varying cash shares. Unlike in the first accumulation stage, we now do not define long-term risk as the downside risk to your end portfolio as, ignoring any desire to leave a bequest, your optimal spending strategy will aim to leave nothing behind so as to maximize your consumption in retirement. Instead, we define **long-term risk as the odds of running out of your savings before you pass away**.

With no cash, a ~5% spending rate is low enough to keep the risk of running out of money to about 5% (1 in 20), and the volatility of annual returns is 8.0%. Adding cash to the portfolio raises the risk of running out of money, though somewhat modestly up to cash shares of around 30%.

This is because adding cash has **two competing effects that are initially roughly offsetting**. The negative effect on the risk of running out of money comes from the **lower long-**

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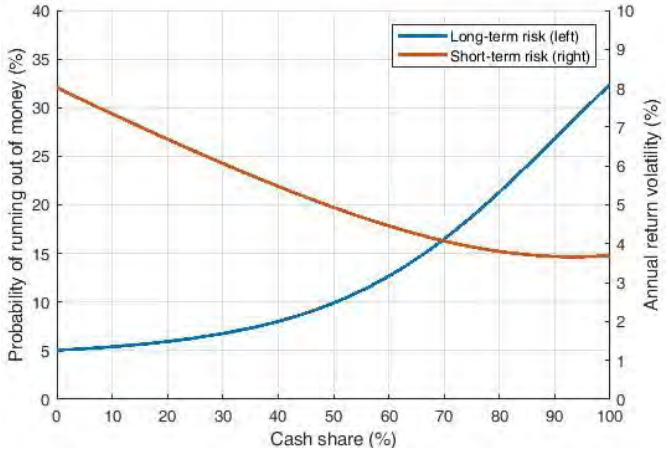
**term return on cash**. The positive effect comes from the **reduced volatility of returns**, as drawdowns are a serious risk to a retiree invested in relatively volatile assets. When starting with a relatively low allocation to cash, adding cash has a steady negative effect on volatility, and this almost fully offsets the adverse effect of lower long-term expected returns. For instance, raising the cash share to 30% reduces return volatility to about 6.1%, and raises the risk of running out of money to 6.8%.

Figure 3: Long and short-term risk in the decumulation stage of saving for retirement at different cash shares

%. Portfolio consists of cash and non-cash allocations. Non-cash component is allocated 30-70 to the S&P 500 and the US Agg. Short-term risk is annual return volatility. Long-term risk is probability of running out of money.




Source: J.P. Morgan, US Social Security Administration, Board of Governors of the Federal Reserve System, Bureau of Labor Statistics, Bureau of Economic Analysis, Robert Shiller, Refinitiv, S&P, Bloomberg Finance L.P.

However, **the negative marginal effect on volatility of adding cash to the portfolio wanes with ever higher cash allocations**. As a consequence, the **risk of running out of money picks up quickly with cash shares above 30%**. In the extreme case with a 100% cash portfolio, we estimate that the probability of running out of money is about 32%, which is likely to be unacceptably high to most people.

The effect of adding cash to a portfolio on the risk of running out of money varies meaningfully with the withdrawal rate. In general, **adding cash to the portfolio has a larger adverse effect on the risk of running out of money with higher withdrawal rates**. For instance, if the withdrawal rate were increased by 0.5%, making a 30% allocation to cash would increase the risk of running out of money by about 4.4%-points, rather than 1.7%-points. This risk would rise to almost 46% with a portfolio consisting only of cash.

**For moderate changes in the expected long-term return on the non-cash component of the portfolio, the effect of adding cash to a portfolio does not meaningfully change**. For example, if returns on bonds and equities were each lowered 0.5%, the risk of running out of money would be roughly 2.5-3.0%-points higher with any cash allocation below 50%. With higher cash allocations, the risk of running out of money in this lower-return scenario converges to the risk in our benchmark case, as changes in the non-cash return become less relevant as it becomes a smaller part of the portfolio.

## One way out with cash is to save more and cut spending

If you want to reduce the overall volatility of the value of your savings by holding cash, but do not want to run increased long-term risk to your financial objectives, there is a way out of this quandary. It is simply to save more in the accumulation stage than what you would have to do if you invested solely in bonds and equities, without cash. In the decumulation stage, it means you accept to spend less and live on a lower income.

## Then how much cash should you hold?

The standard answer in economics is to say it depends on your preferences, or utility function in our jargon. But that is a bit of a cop-out. What can we say concretely about the choice you make on cash holdings and how much you should care about reducing short-term fluctuations in the value of your retirement savings? What are the conditions in which you should have little to no cash, and under which should you consider having more.

As economists we use a lot the term "**risk aversion**" as a "psychological" condition that we do not understand, leaving it therefore up to you how much risk to take in your investments. But it is possible to be more concrete about this. For example, if your source of income that you rely on to fund your ultimate retirement – likely your job – is not safe and is particularly risky during economic downturns when equities are more likely to fall, then it makes sense to hold your savings in assets that do not fall at the same time you lose your income. This does not make you risk averse. Instead, it makes you subject to a lot of risk, motivating you to hold more cash or other safe assets, such as bonds, in your retirement savings.

A first condition should be your **investment horizon**: your age in the accumulation stage and your life expectancy in the decumulation stage. The longer you have in front of you, the lower the need to hold cash as your longer horizon improves the odds that any significant drawdown in your savings will

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be offset by higher returns on risky assets in the future.

If you have **decent access to other sources of income**, such as a state or company defined-benefit pension on which you can fall back, or simply human capital that you can convert into significant extra income, you have little need to reduce short-term volatility with large cash holdings.

**Funding status, or how far are you from enough savings to retire on?** For a pension plan, this means the extent to which current assets can cover future pension liabilities. A recent analysis of the pension funds of Fortune 1000 companies finds a U-shaped relation between their allocation to equities and their funding status.[4] Heavily underfunded pensions have higher allocations to equities than those close to 100% funded. Translating this to individual savers is not obvious. If they are far from having enough to retire on and still far from retirement, it makes sense to be fully in risk assets and to minimize lower return cash holdings, while closer to retirement and fully funded may decide to take less risk, although this would probably involve more bonds rather than more cash.

If you have access to **other ways to reduce the risk** of significant drawdown in your savings, such as by holding an annuity, you have little reason to hold cash.

## Conclusion

We have no cash in our strategic allocation. Our motivation is that cash is lower return than bonds and equities over the long run, even as it helps to stabilize your portfolio, both short and longer term. Your decision on how to save for retirement and spend from it during retirement should be based on both expected returns, target wealth and spending levels, and risk, both short- and long-term. As always in economics and life, you can't have it all and there are significant trade-offs between these various objectives.

Specifically with respect the cash asset class, adding it to your long-term savings will lower return and volatility, but we argue and find that **cash does not lower long-term risk**. This is because we define long-term risk in terms of the odds and extent to which your asset allocation does not achieve your long-term goals of reaching sufficient wealth at the start of your retirement and being able to maintain your desired lifestyle during retirement at minimal risk of running prematurely out of money. This is primarily because the volatility-reducing impact of cash is offset by its lower return, which makes it harder to achieve your long-term goals. At relatively low levels of cash allocations, up to 20%, the best you can hope for is that it does not increase long-term risk too much, although it will still pull down returns. Above 20% in cash, the impact of a lower return implies you are likely increasing the risk you will not achieve your long-term financial goals, despite making your savings more stable. It is not irrational to hold decent strategic allocations to cash when your sources of income are quite uncertain, when you are close to retirement, when you have enough to retire on comfortable, and when you have no other sources of income or wealth to rely on.

4. 2022 Asset Allocations of Fortune 1000 pension plans, WTW, Mercedes Aguirre and Brendan Macfarland, Dec 2023.