How healthcare providers and insurers can better optimize investments while minimizing risk

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The COVID-19 pandemic has resulted in a significant reduction in nonemergency healthcare services. A recent Milliman report estimated that the impact could reduce U.S. healthcare provider revenue by up to $575 billion through the end of 2020.[1] This reduction in revenue has strained provider finances, highlighting the need for healthcare organizations to take fresh reviews of existing assets and investment strategies.

Healthcare insurers and providers will both typically manage healthcare financing and investments in the short term because many of their liabilities are in the short term. Health insurers hold some of their assets as capital and claims reserves to ensure adequate funding and liquidity for accepted medical claims risk. Similarly, healthcare providers accepting risk through accountable care organization (ACO) contracting or other alternative payment arrangements are either required to, or typically hold, prudent settlement reserves to ensure liquidity to meet annual settlements. Healthcare providers also use assets and reserves to support maintenance of existing physical infrastructure, daily operations, and short-term quality improvement initiatives.

A short-term focus has led healthcare organizations and their asset managers to traditionally hold large, conservative positions in cash or cash-equivalents. Holding cash for potential losses ensures funds will be available but generates limited investment earnings compared to more sophisticated investment strategies existing with other lines of business, such as for life insurance. For example, a life insurer will often employ complex hedging strategies over the long term to appropriately account for its liabilities and to maximize its return on investment. This paper introduces life insurance investment strategies and how many of these same concepts can be applied to healthcare insurers and providers to better manage their overall risk profiles and potentially increase future returns on investment.

How life insurers invest

Unlike in healthcare, life insurers manage long-term liabilities where it is not uncommon for life policy durations to reach 30 years. Life insurers may receive many years of premium revenue prior to a benefit payment, resulting in large reserves. These reserves must be balanced with the likelihood of benefit payouts (e.g., death benefits). Over time, successful life insurers have become experts in managing financial risk and optimizing investment returns necessary to enhance profitability.

Relying on investment income exposes life insurers to financial risks not generally considered by the healthcare industry. These risks include interest rate shifts that can devalue the stream of premium payments used for investment. Life insurers protect against interest rate shifts by matching the future stream of cash outflows with cash inflows through a process called asset liability management (ALM). Matching payment timing helps immunize against interest rate risk because rate shifts will decrease or increase the value of liabilities and assets in similar ways.

In practice, perfect interest rate risk immunization may not be possible because the market availability of investments meeting the appropriate cash flow timing are not available, and because liability cash flows may be unpredictable. Life insurers commonly apply financial tools to handle these situations too, but the additional complexity and cost involved may not always be appropriate.

[1] Rogers, H., Mills, C., & Kramer, M.J. (April 2020). Estimating the Impact of COVID-19 on Healthcare Costs in 2020. Milliman White Paper. Retrieved January 20, 2021, from https://milliman-cdn.azureedge.net/-/media/milliman/pdfs/articles/estimating-the-financial-impact-covid19.ashx.

Case study: Traditional vs. enhanced investing in healthcare

To illustrate how we can employ life insurance investment techniques in the health industry, we provide a case study for a provider in an ACO arrangement. While we focus on this specific example, the same techniques and conclusions can be extended to healthcare providers more generally and to healthcare insurers.

For the case study, consider an ACO with $25 million of investable assets, of which $15.6 million is earmarked as a prudent settlement reserve set at the 95th percentile of potential annual shared losses and associated expenses over a three-year risk-sharing arrangement. The $15.6 million reserve assumes monthly net cash outflows of $0.1 million and a shared loss settlement of $4 million annually. The excess surplus will fund longer-term reinvestment into performance improvement, enabling the ACO greater flexibility in its short-term risk appetite.

The ACO is considering a traditional and two alternative enhanced investment strategies. The traditional investment strategy (Traditional Cash) is an all-cash position yielding 20 basis points (bps) per annum. Traditional Cash offers a low return on assets but allows for the near guarantee that enough of the earmarked assets will be available at year-end to cover any settlement losses. The enhanced investment strategies consider a bond-only portfolio (Enhanced Bond) and a bond and equity portfolio (Enhanced Bond and Equity), each with increased risk and reward relative to Traditional Cash. The enhanced strategies still provide high degrees of confidence to cover near-term settlements, but with the possibility of more upside for funding long-term objectives.

Enhanced Bond comprises a laddered bond return to match asset maturities to near-term, high-likelihood settlement losses, with the remainder of assets allocated 33/67 among AA bonds of 5-year and 10-year tenures and BBB and BB bonds of 5-year and 10-year tenures, respectively (see the Appendix for a detailed allocation). Enhanced Bond and Equity comprises a portfolio similar to Enhanced Bond, except it replaces 25% of the bonds with equities (see the Appendix for a detailed allocation).

We performed Monte Carlo simulations of 10,000 trials to compare possible returns of the enhanced strategies to the static returns of Traditional Cash for the ACO's $25 million of investable assets over a 36-month horizon. The model was parametrized using historical Treasury yield rates, corporate bond credit spreads and default rates, and S&P index returns.

In this example, all three portfolios yield investment returns net of annual expenses and shared loss liabilities, but Enhanced Bond outperforms Traditional Cash by $60,000 and Enhanced Bond and Equity outperforms Traditional Cash by $850,000, on average by year 3, assuming current economic conditions continue.

While the enhanced portfolios perform better on average, notice that Enhanced Bond did not outperform Traditional Cash at the 25th percentile. The range of ending asset positions, net of cash outflows, of Enhanced Bond are compared to Traditional Cash after 36 months in Figure 2. The blue bars represent the distribution of potential ending asset positions of Enhanced Bond and the colored dashed lines highlight important percentiles and reference points. The dark red line represents Traditional Cash, which we consider as a proxy for "business as usual" performance.

FIGURE 1: FORECASTED INVESTMENT RETURNS AFTER 36 MONTHS UNDER EACH INVESTMENT STRATEGY

Portfolio Performance	Average	25th Percentile	50th Percentile	75th Percentile
Traditional Cash				
Investment $ Return	$113,171			
Annualized % Return	0.20%			
Enhanced Bond				
Investment $ Return	$174,847	$90,166	$189,973	$278,928
Annualized % Return	0.31%	0.16%	0.33%	0.49%
Enhanced Bond and Equity				
Investment $ Return	$964,458	$268,885	$869,708	$1,574,121
Annualized % Return	1.64%	0.47%	1.48%	2.60%

In our simulation, Enhanced Bond outperformed Traditional Cash approximately 70% of the time. A bond-only portfolio is typically considered a lower-risk strategy, but the current low interest rate environment diminishes the achievable investment returns for bonds, making this strategy less appealing than under higher interest rate conditions. An alternative to Enhanced Bond is Enhanced Bond and Equity, which yielded average earnings fivefold above Enhanced Bond and nearly ninefold above Traditional Cash.

The range of ending asset positions of Enhanced Bond and Equity, net of cash outflows, are compared to Traditional Cash after 36 months in Figure 3.

In our simulation, Enhanced Bond and Equity outperformed Traditional Cash approximately 80% of the time. Equities provide improved investment returns over bonds in the current low interest rate environment. However, equities also produce a wider spread of potential returns. Notice the potential range of ending asset positions for Enhanced Bond is between $9.0 million and $10.1 million, while Enhanced Bond and Equity's potential ending asset positions range from $8.0 million and $14.0 million.

When interpreting the distributions presented in Figures 2 and 3, please keep in mind that the only source of uncertainty in our model driving the generation of ending asset positions is investment returns. We have assumed liability cash flows to be deterministic. We caution readers not to conclude that Figures 2 and 3 present a complete range of outcomes considering uncertainty from all possible sources.

Financial managers commonly employ hedging to mitigate downside risk. With a static hedging approach, the hedges enable the purchaser to lock in a specific interest rate to guarantee a certain rate of return for a fee. In lieu of the fee but with some degree of calculated volatility, investors can enable an actively managed strategy called dynamic hedging that involves rebalancing hedge positions as market conditions change. Implementing a hedge strategy will shrink the range of potential ending asset positions so that financial returns are more predictable.

ACOs seeking less complexity and guaranteed returns may opt for the Traditional Cash approach, which leaves virtually no uncertainty in the ending asset position, given the pattern of realized outflows. Depending on the risk tolerance of the investors, the enhanced strategies could be deployed to generate expected returns above what may result from Traditional Cash.

FIGURE 2: SIMULATED ASSET POSITIONS OF ENHANCED BOND VS. TRADITIONAL CASH

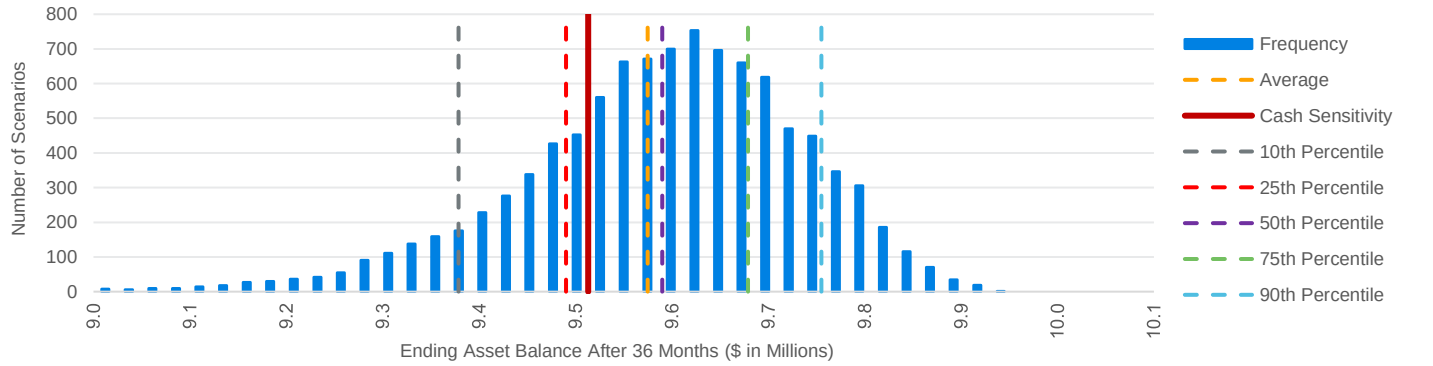
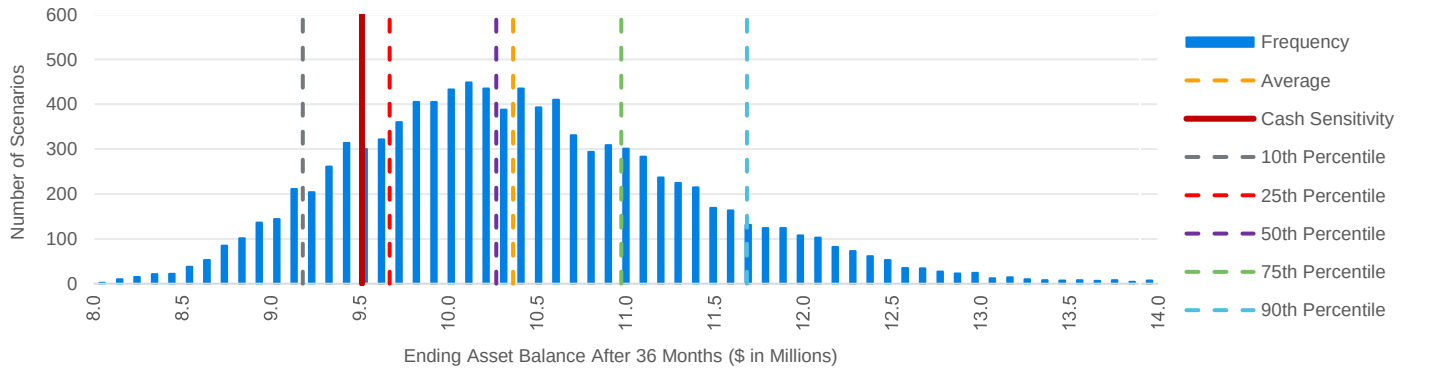


FIGURE 3: SIMULATED ASSET POSITIONS OF ENHANCED BOND AND EQUITY VS. TRADITIONAL CASH



Conclusion

Opportunities to improve returns on existing assets will become increasingly important for healthcare providers and insurers operating within tighter margins. Finding the optimal investment strategy will vary by organization based on the risk tolerance and return expectations. Incorporating some degree of asset management provides a high probability of achieving greater investment income with limited downside risk.

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Appendix: Data Source and Methodology

We started with an initial cash balance of $25.0 million. Each month there was $1.0 million of cash flow in, $1.1 million of cash flow out (expenses), and there was an additional annual (end-of-year) settlement expense of $4.0 million. Liability cash flows are assumed to be deterministic, and do not vary across stochastic scenarios. As noted earlier, bonds are assumed purchased with maturities that match the anticipated settlement expenses.

The assets were projected over a three-year period under 10,000 economic scenarios. Both stochastic U.S. Treasury yields and equity return rates were projected using the most recent (May 2020) version of the American Academy of Actuaries' Interest Rate Generator. This is a "real-world" model, which is parametrized based on historical Treasury yield rates and S&P 500 index returns. Historical month-end Treasury yields were input into the Generator up through the end of September 2020 and yields from October 23, 2020, were used as proxy October 2020 month-end yields. The average annual equity return, based on the 10,000 30-year scenarios, is 8.81%.

Bond spreads (added to the stochastic Treasury yields to approximate corporate bonds) are based on October 23, 2020, data from Bloomberg composite, and bond defaults are developed based on 20-year annual corporate default studies published by Moody's based on long-term default experience through December 31, 2018.

The portfolio used in this analysis holds three AA bonds that mature on the date of (and for the amount of) the three large end-of-year settlement payments. As a sensitivity, we considered two alternative liability patterns where the settlement payment was 50% higher and lower, respectively, such that there was a mismatch between assets and liabilities (the assets are not similarly adjusted). The remaining money in the portfolio is invested in the assets shown in the table in Figure 4.

FIGURE 4: INVESTMENTS

Enhanced Bond Portfolio	Enhanced Bond and Equity Portfolio
	25% equities
13.33% 5-year AA bonds	10% 5-year AA bonds
20.00% 10-year AA bonds	15% 10-year AA bonds
26.67% 5-year BBB bonds	20% 5-year BBB bonds
26.67% 10-year BBB bonds	20% 10-year BBB bonds
13.33% 5-year BB bonds	10% 5-year BB bonds

Additional modeling details:

- Investment expenses are assumed to be 20 basis points per year
- All bonds have two coupons per year
- The impact of taxes is not considered in the modeling
- Investment income (after defaults and investment expenses) is reinvested into the assets that comprise the portfolio, at the same percentages as the initial portfolio
- Total asset balance is the market value plus any cash balance
- "Annualized % Return" in Figure 1 above is calculated as a percentage of the monthly total asset balance