

Liquid Alternatives

A Primer

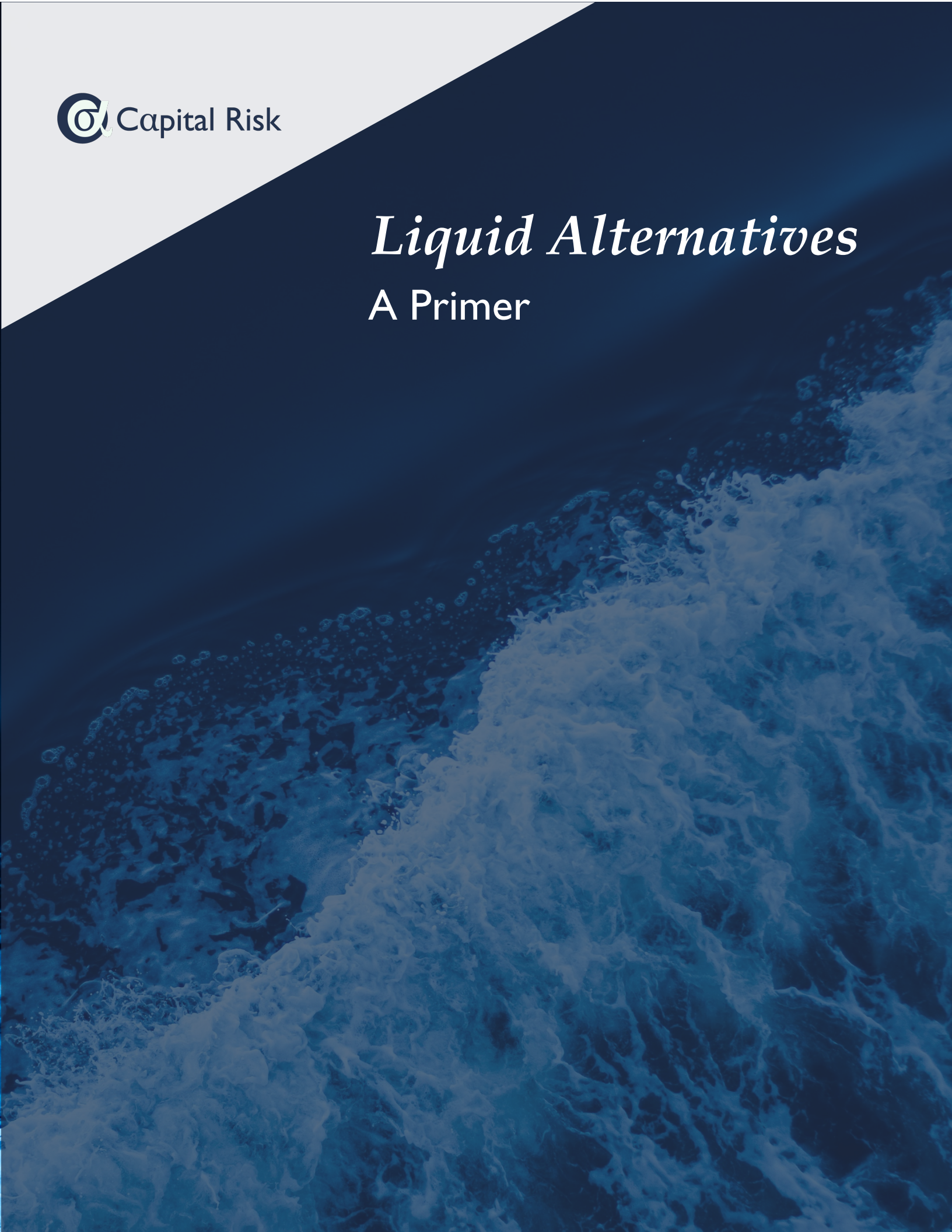


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The key to successful long-term investing is managing risk. Liquid alternatives are a meaningful tool for the investor to access a hedge fund's return profile. Accessibility to hedge funds is a paramount concern for investors, particularly in an environment of low interest rates and highly correlated equity markets. The investment process is long, arduous, and requires experienced professionals using sophisticated analytical tools to ensure value to the portfolio. Liquid alternatives overcome these barriers for the investor.

The key benefits of liquid alternative investments include:

- **Diversification delivers Portfolio Efficiency** – varying strategies provide diversification to alternate return factors that *enable a more efficient portfolio*.
- **Lower Costs meet a Fiduciary Standard** – Reduced management fees better *aligns the investment with the investor*.
- **Liquidity empowers Accessibility** – reduced manager search costs and daily liquidity *improves accessibility*.
- **Transparency augments Risk Management** – The ability to assess the underlying positions empowers robust risk management for the investor, *which turns insight into action*.

The practicality of liquid alternatives enables a timelier transition into a hedge fund while improving that allocation's liquidity. Liquid alternatives *invest without compromise*.

Liquid Alternatives Invest Without Compromise

The Pandemic brought unparalleled volatility to financial markets in 2020. A recovery followed a sharp drop in the equity markets that was unprecedented in its speed. A similar outcome occurred in the credit markets with spreads returning to pre-pandemic levels due to the Federal Reserve's quick action. Commodities dropped also as future demand appeared weakened by the Pandemic. Thus, investors are increasingly sensitive to *higher volatility* and the prospect of *low returns* on their fixed income portfolios. The natural response is to seek alternative asset classes that mitigate portfolio risk while achieving a more consistent return stream.

The challenge for investors is that non-traditional asset classes (e.g., hedge funds and private equity) that provide diversification are notoriously illiquid. This trait may heighten an investor's risk when *they require liquidity*. Thus, access to the alternative risk premia is only valuable to an investor when it *enables* accessing their investments in turmoil times. When combined with returns that did not exceed the traditional asset classes over the last ten years, the case for higher fees and lower liquidity is not compelling.¹

Liquid alternatives remove the liquidity constraint by matching the factor profiles of alternative strategies with liquid markets investments. Further, they provide an investment vehicle that reduces fees, delivers hedge fund-like returns, and helps manage total portfolio risk in a traditional portfolio. These benefits offer investors *more choices* to achieve their *specific* portfolio objectives. *Liquid alternatives invest without compromise.*

¹ For the 10-year period ending June 30th, 2020, the total return was: 13.8% for the iShares US Total Market ETF (ITOT), 3.7% for the iShares US Aggregate Bond Index (AGG), and 1.2% for the iShares 1-3-year US treasury Bond ETF (SHY). In comparison, the return was 2.1% for the HFR Investible Liquid Alternative Universe Index and 3.3% for the CS Liquid Alternative Beta Index. CRM calculations.

The Benefits of Fungibility and Accessibility

Fungibility enables tactical decisions.

The value of liquidity emanates from its *fungibility*. Since the returns of assets are time-varying, liquidity offers the ability to switch into another investment offering a better relative opportunity. These relative value investments may arrive when illiquidity occurs because of a credit crisis, the popping of an equity bubble, or another market event. Liquidity permits an investor to exploit market events dynamically.

The liquidity challenge is the trade-off between ready access to cash and expected return, particularly in a low yield environment. The promise of high returns in alternative asset comes at the cost of reduced liquidity. Hedge funds usually offer quarterly liquidity with advanced notice while private equity can lock up funds for five years or longer. The recent *return* performance of alternative asset classes places this trade-off in doubt.

The investor's options for accessing hedge-fund return profiles are numerous. Research into the drivers of returns in alternative asset classes shows that liquid investments can replicate most of the traditionally illiquid asset classes' return and risk characteristics (i.e., hedge funds or alternative return strategies). While this outcome seems counterintuitive on the surface, there is a readily deductible explanation.

While some hedge fund strategies enter esoteric markets outside of the liquid markets (e.g., longevity insurance and catastrophe bonds), most participate in the traditional liquid markets: equities and bonds. Since markets match buyers and sellers, every strategy is a zero-sum game with winners and losers canceling each other. An individual hedge fund manager's focused approach may provide idiosyncratic risk. In contrast, a fully diversified portfolio of strategies, like an index of hedge funds, only has the non-diversifiable or

systemic risks remaining (i.e., equities). Thus, the replication of a hedge fund index is possible *if you can identify the relevant exposures*.

Identifying the principal ingredients for a diversified hedge fund index is relatively straightforward. While *how* they implement any strategy is diverse, the *focus* of any strategy is not. Academic research identifies many inefficiencies in the financial markets that possess the potential of earning differentiated alpha. For example, the research identified the dominance of value (i.e., high book value) and size (i.e., low capitalization) in equity investing. The proliferation of exchange-traded funds (ETF) provides a means to access these factors cheaply and efficiently. Identification of exposures is an exercise is *knowing the research*.

Hedge funds are strategies, not assets.

Critical to understanding a hedge fund is that they are *strategies, not assets*. The distinction is vital to replication. A strategy is dynamic and changes positions over time. Conversely, a traditional fund manager is more static and may hold an investment position for years (i.e., value investor). In the former, exposures change over time with time-varying risk premia while constant in the latter. Thus, the crucial ingredient of liquid alternatives is to *vary the market exposures over time*.

The mantra of buy-and-hold is as old as investing. The difficulty of timing the market is canon. Yet, in a diversified portfolio, the only way to beat the market is *timing*. Widely considered the greatest investor of all time, Warren Buffet invests with two dictums. Only buy good companies (or conversely don't purchase bad companies) and *buy at a fair price*. The first is a tool to manage risk while the second a comment on *when to buy*. The research affirms these attributes: risk premiums vary through time. Thus, the investor's challenge is forecasting time-varying risk premia, a notoriously tricky proposition that humbles many investors.

Liquid alternatives access hedge fund-like return profiles.

The challenge of return forecasting is complicated and broad in scale. The diversity of strategies is as numerous as the number of hedge funds.

Overcoming the obstacle occurs by following the insights from academic research. A diversified portfolio of strategies is effectively the consensus view of the market participants (i.e., hedge funds). Extracting the exposures is possible through an analysis of the benchmark returns. Time-varying risk premia require daily measurement. Implementation requires liquid and inexpensive vehicles. Thus, the potential exists for a return and risk profile resembling a hedge fund index. A considered implementation is critical. The benefit is clear: efficiency and liquidity without the trade-off.

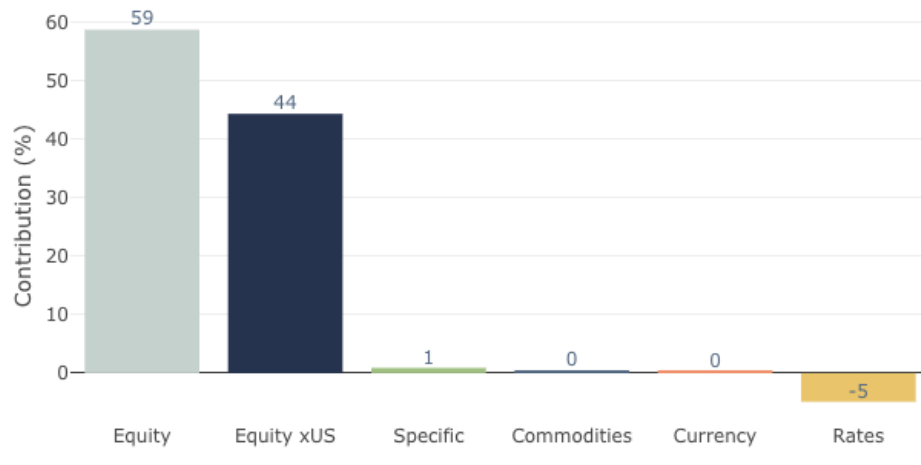
The argument is compelling. Evidence even more so. The following sections review index construction and how liquid alternatives are a viable solution for investors. The examination shows the impact of liquid alternatives on standard portfolio allocations. Of paramount importance to the investor is considering the trade-offs and probable decision points, which continues the discussion. While not necessary for every portfolio, the analysis conveys the potential benefits and costs of liquid alternatives in the portfolio to investors who demand more from their investments. *Liquid alternatives provide accessibility and fungibility through their liquidity.*

Enhancing Diversity: Liquid Alternatives in the Portfolio

The strategic rationale for an asset class is whether it improves portfolio efficiency (i.e., the ratio of return to risk). The transient nature of expected returns and the measurable benefits of diversification implies that the risk component is more amenable to management. This does not suggest the irrelevance of the new asset class returns. The addition of an asset class to the portfolio must achieve either a similar expected return at lower risk or a higher return at a similar level of risk. For the former objective, adding Treasury Bills to the portfolio reduces portfolio risk and increases efficiency while possibly sacrificing the portfolio’s expected return target. In the latter objective, adding a higher return asset that adds disproportionately more risk can move the portfolio off the efficient frontier. Irrespective of the objective, the addition of an asset class *must improve portfolio efficiency*.

Exhibit I. Traditional Portfolio Risk Factor Exposure

A traditional portfolio is dominated by equity risk.



Source: Capital Risk calculations. The traditional portfolio is 60% equity, 40% bonds with monthly rebalancing. Underlying investments are in ETFs. The period is January 2008 to June 2020. The performance is hypothetical and does not reflect an actual investment.

We take stock of our inventory before we go to the store to buy groceries. Portfolio management is no different. The starting point for augmenting a portfolio with a new asset is the current risk factor exposure. A traditional portfolio is dominated by equity exposure with interest rate risk providing minor diversification (exhibit 1). Thus, the investor's goal is to find an allocation that provides less equity exposure through diversification into the other factors.

An asset class must improve portfolio efficiency.

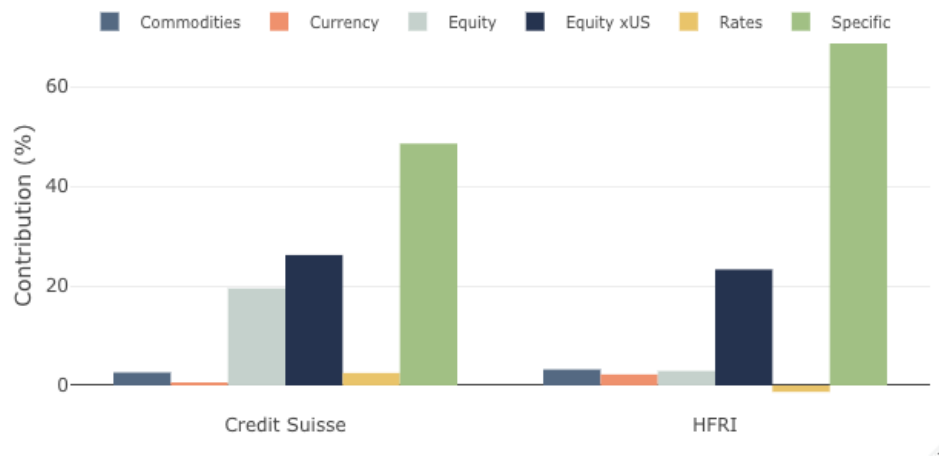
Knowing the store inventory in advance is crucial to whether you will go there. Two of the more widely available hedge fund indices are from Credit Suisse with their Liquid Alternatives Beta Index (CSLAB) and Hedge Fund Research Liquid Alternatives Universe (HRLAU). While these universes differ in constituents and weighting schemes, together, they provide broad coverage of the investable universe. Critically, they are investable indices, which makes the comparison robust. Thus, these are the firsts store to visit for the enterprising investor looking for *hedge fund-like returns and investability*.

A review of the risk factors provides a material insight into their applicability. The major risk factor, equity, is much less material to the hedge fund indices (exhibit 2). Further, the specific risk accounts for 50 to 70% of the risk.² This is a beneficial ingredient for improving portfolio efficiency for the traditional portfolio. While the other factors play a minimal role, they are larger in magnitude than the traditional portfolio, which aids in diversification at the margin. The risk analysis suggests that liquid alternatives provide beneficial diversification.

² This level of specific risk is material. The challenge is that it results from the fees, which reduce the level of return. This outcome is analogous to negative alpha.

Exhibit 2. Liquid Alternatives Indices Risk Factor Exposure

The risk factors are different in liquid alternatives.



Source: Capital Risk calculations. Data is the Credit Suisse Liquid Alternatives Beta Index and the Hedge Fund Research Investable Liquid Alternatives Universe. The period is January 2008 to June 2020. The performance is hypothetical and does not reflect an actual investment.

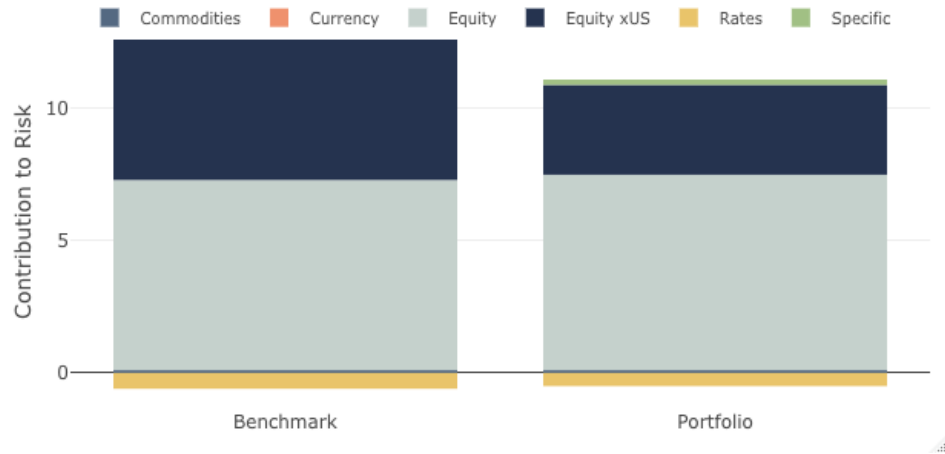
The mix of ingredients is vital to a good recipe. Portfolio construction is similar. The addition of a new asset requires the removal of another (although leverage is possible, it’s not considered here). While any of the assets are possible, the risk factor exposure provides guidance. The exposure to non-US equities would suggest that it might be fungible. Further, the low exposure to interest rates and high specific risk suggests that it may act as a replacement for shorter-term Treasury Bills and Bonds in a portfolio.³ The goal of the addition is *enhanced efficiency*.

The new portfolio replaces 10% of the Developed ex-US equities with the Credit Suisse Liquid Alternatives Beta Index and 10% of the US short-term Treasury Bonds with HFR Investible Liquid Alternatives Universe Index. The payoff is compelling. The traditional portfolio is improved for each portfolio measure (exhibit 3). The return is parallel, the risk and drawdown are lower, while the ratio is higher than the *three components*. Further, there is a marked

³ For FTSE Aggregate US Bond Index about two-thirds of the index is in Treasuries or about 25% of a traditional 60% equity and 40% bond portfolio.

reduction in risk and *its contribution from non-US equity reduced*. The benefits are palpable.

Exhibit 3. Portfolio Risk Factor Exposure with Liquid Alternatives



Adding Liquid alternatives improves every portfolio measure.

Measure	Traditional 60/40	Credit Suisse LAB	HFRI LAU	Portfolio 80/20
Return (%)	5.8	2.9	1.7	5.9
Risk (%)	12.0	5.7	3.0	10.3
Ratio	0.49	0.51	0.55	0.57
Drawdown (%)	34.7	19.2	11.5	30.7

Source: Capital Risk calculations. The benchmark portfolio is 60% equity, 40% bonds with monthly rebalancing. Underlying asset class investments are in ETFs. The portfolio replaces 10% of EAFE Equity and 10% of short-term US Treasury with 10% of Credit Suisse Liquid Alternative Beta Index (LAB) and 10% Hedge Fund Research Investable Liquid Alternative Universe Index (LAU). The period is January 2008 to June 2020. The performance is hypothetical and does not reflect an actual investment.

The case for liquid alternatives in the portfolio is compelling. While the past is not prelude and the future may be different, their inclusion improved portfolio efficiency in the period evaluated. The demonstrated benefits to the portfolio include:

Enhanced Efficiency - Liquid alternatives improve a portfolio risk-adjusted return with no sacrifice to return. Further, the result is a portfolio that is higher in efficiency than its three components. This outcome displays the value of diversification.

Capital Preservation - Liquid alternatives reduced total portfolio risk and mitigated the maximum drawdown. In the last two decades, equity drawdown approached 50% twice, and the recent Pandemic crash saw equities fall over 30%. In the two most recent equity pullbacks, the portfolio with liquid alternatives endured less of a drawdown.

Risk Factor Exposure – In an environment where near-zero interest rates could persist for years, the value of reduced exposure to interest rates is valuable in two ways. First, the risk of lower bond returns with higher interest rates is reduced. Second, the ability to earn more than the near-zero return on short-term Treasury Bill is beneficial. Further, the reduction in equity market exposure helps mitigate the next equity bear market.

While the portfolio benefits are apparent, there are more practical benefits for the investor. Transitioning into a hedge fund allocation is a long process because of the required manager due diligence and the lock-up periods that provide access monthly, quarterly, or longer. Further, the inability to exit the strategy on-demand results in the investor bearing reduced liquidity in their portfolio. Liquid alternatives address these concerns because *they are more practical*.

Liquid alternatives improve risk management.

Mimicking the Esoteric: The Source of Hedge Fund Returns

The objective of liquid alternatives is replicating hedge fund index returns (and to a lesser extent, their risk). The focus is on the root drivers of returns. There are three principal drivers in the context of hedge funds: public market beta, strategy beta, and uncorrelated return (“alpha”). The difference between the three is critical to reproducing the return stream.

Public markets are the principal source of hedge fund returns.

Public market beta is exposure to traditional assets, including equities and bonds. For US investors, typical indices that measure these returns profiles are the S&P 500 index for US large-capitalization stocks and the FTSE Broad Investment Grade Index for bonds. The price of these exposures is negligible with the advent of zero or near-zero cost ETFs for major stock indices. Beneficially, they are dominant exposure for most strategies in public or private markets.

Strategy betas are alternative factors that may include value and size for equities, carry trades in currencies, yield curve strategies in bonds, and momentum factors in all markets. While not an exhaustive list, they convey the diversity of markets and strategies employed by hedge funds. They are also the second-largest component of the potential return stream. Crucially, these systemic exposures are accessible through focused ETFs at a low cost. This combination is valuable when constructing a hedge fund index.

Alpha or uncorrelated return is a return exposure that is unrelated to the prior two components. In investment theory, this is a measure of the manager's skill with positive values preferred. Complications exist with this factor exposure. Identifying managers with skill in advance of the skill's realization is arduous and compelling research indicates its near impossibility. Even if persistently identifying the manager in advance existed, it may not matter.

Alpha disappears in diversified indices.

Since hedge fund strategies are zero-sum games, the exposure to skill is typically not present in a diversified portfolio as underperformers offset outperformers. This statement does not preclude a narrowly focused fund with a handful of managers from generating alpha. That is most likely *the only way* possible for an uncorrelated return to express itself in a portfolio. Further, some alpha is the result of the provision of illiquidity, which a liquid alternative forgoes. The expectation is for no meaningful alpha sources because the objective is a *diversified portfolio of strategies*.

Exhibit 4: Deconstructing Hedge Fund Index Returns with ETFs

Beta	Factor	Index	ETF
Public Markets	Equities	Equity	ITOT, IVV
	Bonds	Treasury Bonds	IEF, SHY
Strategy	Value	S&P Core Value	IUSV, EFV
		MSCI EAFE Value	
	Growth	S&P Core Growth	IUSG, EFG
		MSCI EAFE Growth	
Currency	US Dollar	UUP	
Commodities	Gold, Oil	GLD, USO	
Alpha	Selection	Not applicable	
	Timing	Time-varying model	
	Liquidity	Conceded for liquidity	

This illustration is hypothetical and solely intended for demonstration purposes.

Source: Capital Risk.

Public market and strategy factors dominate hedge fund returns. Analysis of the hedge fund index returns reveals that public and strategy factors explain between 50% and 70% of the variation. At the aggregate level, the value approaches 80%. The analysis uses investable, and low-cost ETFs as the primary vehicle to access the return premium (exhibit 4). The benefits are two-fold. First, the ETFs implement their strategies at low cost. Second, the liquidity of the ETFs minimizes the execution risk. Thus, *investible strategies increase accessibility*.

The vast expansion in the number of ETFs over the last two decades permits efficient implementation of the well-reasoned rationale for a factor. The linkage between strategy, factor, and ETF is possible through an understanding of the esoteric strategies employed by hedge fund managers, a robust quantitative background, and the theoretical knowledge to link them (exhibit 4). From a practical standpoint, the data supports the theory.

Identifying the factors to represent the exposures of the hedge funds is a laborious task. While dramatic strides in computation efficiency make the job manageable from a data science perspective, they are subject to overfitting and poor out-of-sample performance. Thus, the objective is an a priori economic rationale for the exposure while finding validity in and out of sample. Significantly, a coherent argument in advance avoids the necessity of creating other indices to explain the hedge fund index returns. There is material value in simplicity because it achieves *efficient implementation*.

Liquid alternatives improve risk management.

The possibility of liquid alternatives exists because of a diversified index removes the alpha component. The remaining public market exposures are available in low-cost ETFs. Advances in computer capacity and data science enable identification of the factor exposures. Thus, there is an ex-ante rationale for liquid alternatives to replicate hedge fund index returns. The benefits enable *improved portfolio diversification and risk management*.

Mixing the Ingredients: Detecting the Factor Solution

The factor mix is critical.

Every great recipe is contingent on the ingredients and *the ingredient's proportions*. Since return premia are time-varying, the mix of factors must also change over time. A hedge fund index's relevant factors will change as the market environment changes, and the managers dynamically adjust their strategies. Factors are not different. The number of relevant factors and their weights will vary over time.

Determining how to adjust the factor exposures over time is the domain of financial theory and statistical analysis. The usual techniques to calculate the factor loadings are regression analysis using data known at that time. The range of possible techniques is limitless. Leaning towards simplicity in model selection helps to reduce the required assumptions. Tangible benefits accrue to this decision, including a ready explanation of the linkages between factors and indices, reduced model risk from parsimony in factor selection, and reduced implementation and transaction costs by focusing on a few factors.

More significant to the investor is the selection of the *appropriate hedge fund benchmark* to replicate. All investors have unique objectives for their portfolio due to their varying return requirements and risk profiles. A well-diversified portfolio may only require a completion allocation to hedge fund that directs the investor to the headline index. Another investor may seek exposure to a hedge fund equity value index to broaden their portfolio's equity diversity. Thus, each investor must determine which hedge fund index (and the corresponding factor exposures) benefits *their portfolio*.

One critical dimension for investors in hedge funds indices is the weighting scheme. Equally weighted indices avoid one strategy's dominance as it becomes widespread, and assets flow into it. The result is the factor exposure

changes. Alternately, the high incidence of equity long-short managers implies that equity exposure increases in an equal-weighted index. This outcome may be undesirable when public market equity exposure is nearly costless.

The drawbacks of the index weighting method are less material for the narrower strategy indices (e.g., managed futures or global strategies). This result occurs because the focused indices deploy varying strategies that offer more specific exposures. Even if they share similar factors, *the amount* of the exposures varies, so their performance is not fungible. Crucially, strategy-level indices provide the investor with the means to tailor the exposures to *their needs*. The potential benefit is increased diversification of their portfolio.

All hedge fund indices are amendable to replication.

There is not a general rule for an investor on which to hedge fund index to access. Index weighting methods may or may not beneficially influence the return stream depending upon the investor's portfolio. A broad index provides easy access to the return premium in a diversified manner and best corresponds to transition and completion hedge fund allocations. Specific strategy indices permit the investor to tailor the allocation to their needs. The critical requirement for the investor is that the index or replication strategy demonstrates and continually communicates their return drivers and risk exposures so that the investor can make informed decisions about *their portfolio*.

Lifting the Veil: Why Hedge Fund Replication Works

Hedge funds invest in opaque and esoteric instruments that do not appear amenable to replication *at first glance*. The explanation resides in two parallel theoretical frameworks for investment. The first is modern portfolio theory that connects their investments and strategies to the public markets. The second is behavioral economics, which connects the strategies deployed to the universe of hedge fund managers. These frameworks provide the *rationale for replication*.

Modern portfolio theory suggests that the public markets are efficient. Further, the value of a company does not come from the firm's financial structure but the provision of the goods of service they provide. The financial structure can transition the returns to one class of capital provider to another but does not change the underlying value. For example, a firm may increase leverage by issuing debt. This action results in two outcomes: higher return for the equity holders and higher risk for both capital providers.

Efficient public markets are the basis for hedge fund strategies.

The relationship to hedge funds strategies is direct. While a significant portion invests in public markets, others invest in less liquid or private markets. This latter action does not change the value of the firm. It only differs in the frequency and confidence in the valuation. Critically, most hedge funds value illiquid securities from the more robust price discovery process in the public market, and they borrow in public debt markets. They are susceptible to their public market variability, whether they invest in public or private markets because they use a *comparable public market security for valuing their instruments*. Thus, factor exposures are *similar* across public and private markets regardless of how their differing performance reporting.

Behavioral bias suggests common and persistent views.

Behavioral finance suggests a few commonalities that influence the replication ability. The *herding mentality* shows that managers and asset flows tend towards a common strategy or type of exposure (e.g., machine learning strategies). The investor exhibits a behavioral bias by falling for the *narrative fallacy* by seeking a good story for the currently popular strategy. The later can lead to *confirmation* and *overconfidence biases* as asset flows into a strategy and validate the strategy. *Anchoring bias* suggests that managers will continue with an approach irrespective of the performance (e.g., value investing for the last decade) and leads to *loss aversion*. *Self-attribution* bias leads managers to suggest they are the ones that delivered the good outcomes while sheer bad luck drove the poor outcomes. These biases result in *common views* and *persistent factors exposures* that enable replication for liquid alternatives.

A linkage exists between the common views and the modern portfolio theory. The hedge fund managers have differing opinions and allocations to a factor, which results in diversification of the strategies. The zero-sum outcome of strategies *removes the unique alpha exposures* in a diversified hedge fund index. The commonality is the diversified public market and strategy specific factors. With time-varying factors, the challenge is not identifying the factors. It is specifying the *amount of the common factor exposure*.

In a world of instantaneous pricing, the markets can evolve rapidly as new information enters. Thus, timeliness is paramount when managing factor exposures for an individual manager. At the index level, the result is different. The diversity of views provides efficiency to the market because not all managers frame the new information the same, nor do they share common starting points (i.e., one may be short and another long the same factor exposure). Further, the communication of data related to companies occurs quarterly in their financial reports. In contrast, economic data is monthly or longer. Thus, dissemination of information occurs gradually and results in *persistent strategy exposures*.

Augmented Reality: The Benefits of Liquid Alternatives

The conflict between investor and manager is resolved.

The challenges to hedge fund investment endure despite strides in market liquidity (i.e., ETFs) and data science (i.e., manager identification). While index return performance leaves investors wanting, it is not what provokes nascent hedge fund investors. The critique tends to center on management fees, lack of liquidity, and opaqueness. Liquid alternative indices *resolve the conflict between investors and managers.*

A comparison of liquid alternatives to hedge funds highlights their benefits (exhibit 5). Liquid alternatives provide a lower cost and efficient expression of the factor exposures that the investor seeks in their hedge fund allocation. The lower cost stems from using passive strategies in the factor exposures through ETFs. There are two cost-savings. First, the ETFs utilized are managed at a low cost. Second, the ETF asset size provides liquidity that reduces execution and market impact costs. While the capacity for a liquid alternative strategy constructed in this manner is not unlimited, its use of public market investments implies that it can offer a *similar capacity to public markets.*

The use of ETFs and other publicly traded instruments permits full and frequent transparency. In a world where investors increasingly demand to *know what they own*, this is material protection for those with a fiduciary standard. Further, in a world of increasingly advanced risk management, it permits a fuller understanding of the exposures in the portfolio. Critically, a complete understanding of their portfolio enables allocators to *turn insight into action.*

Exhibit 5: Hedge Fund Options and Characteristics

	Beta	Liquid Alternatives	Hedge Fund Indices	Fund of Hedge Funds	Single Hedge Fund
<i>Liquid alternatives offer numerous benefits.</i>	Objective	Match index return/risk profile using quantitative methods	Exposure to hedge funds with rules-based or unconstrained methods	Customized portfolio of hedge funds to meet portfolio objective	Maximize absolute returns
	Investments	Liquid securities	Hedge funds	Hedge funds	Liquid or illiquid securities
	Fees	Management	Management	Management & Performance	Management & Performance
	Liquidity	Daily	Weekly or Monthly	Monthly / Quarterly	Monthly / Quarterly
	Valuation	Daily	Weekly or Monthly	Monthly	Monthly
	Transparency	Position level	Fund level	Aggregate positions possible	Aggregate positions possible
	Constraint	Minimal	Some	Some	Material
	Access	Immediate	Weeks	Months	Months
Activity	Passive	Passive	Active	Active	

This illustration is hypothetical and solely intended for demonstration purposes.

The liquidity and transparency permit tactical positioning for the investor. This may express itself through a rapid expansion into the liquid alternative

vehicle to exploit an insight or remove an exposure. It may manifest itself by shorting the liquid alternative to offset an exposure in the less liquid hedge funds within the portfolio. This latter ability permits an allocator to maintain their capacity with a hedge fund manager that may impose gates or penalties on redemption. Thus, the strategic investor can *adapt to market events*.

Selection is simplified and operational risk reduced.

Hedge funds possess more than market risk, particularly when they are opaque. This trait creates an operational risk for the investor that is not measured in the performance data. The lack of timely or frequent transparency in the holdings brings susceptibility to a headline risk of a malevolent manager misleading the investor. Further, the complexity of the exposures and the operations presents a cumbersome and costly manager research initiative for each manager. A liquid alternative obviates this operational risk and *simplifies selection*.

Operational risk in hedge fund investment expresses itself along two other dimensions. Better performing funds may be closed to new investors, while still reporting to the index provider. The result is a narrower universe of managers for consideration and this universe may underperform the index. Further, societal or governance factors and regulatory constraints may restrict an investor from direct access to hedge funds. A liquid alternative investment provides unburdened *governance* and unhindered *accessibility*.

Virtual Reality: Implementing Liquid Alternatives

The how, when, and where are important for liquid alternatives.

The case for hedge funds and liquid alternatives is based upon the improvement of portfolio efficiency for the investor. Liquid alternatives enable quicker implementation of this objective. Further, the liquidity profile of the investor’s portfolio improves. The following simplified case studies demonstrate these beneficial attributes, which are highlighted in exhibit 6. The studies show *how* liquid alternatives improve the portfolio, *when* an allocation can occur, and *where* the liquidity profile improves. This evidence reveals that liquid alternatives provide virtually the same risk and return profile of a hedge fund index while enabling the reality of enhanced accessibility and liquidity.

Exhibit 6: Liquid Alternatives Address the Challenges of Hedge Fund

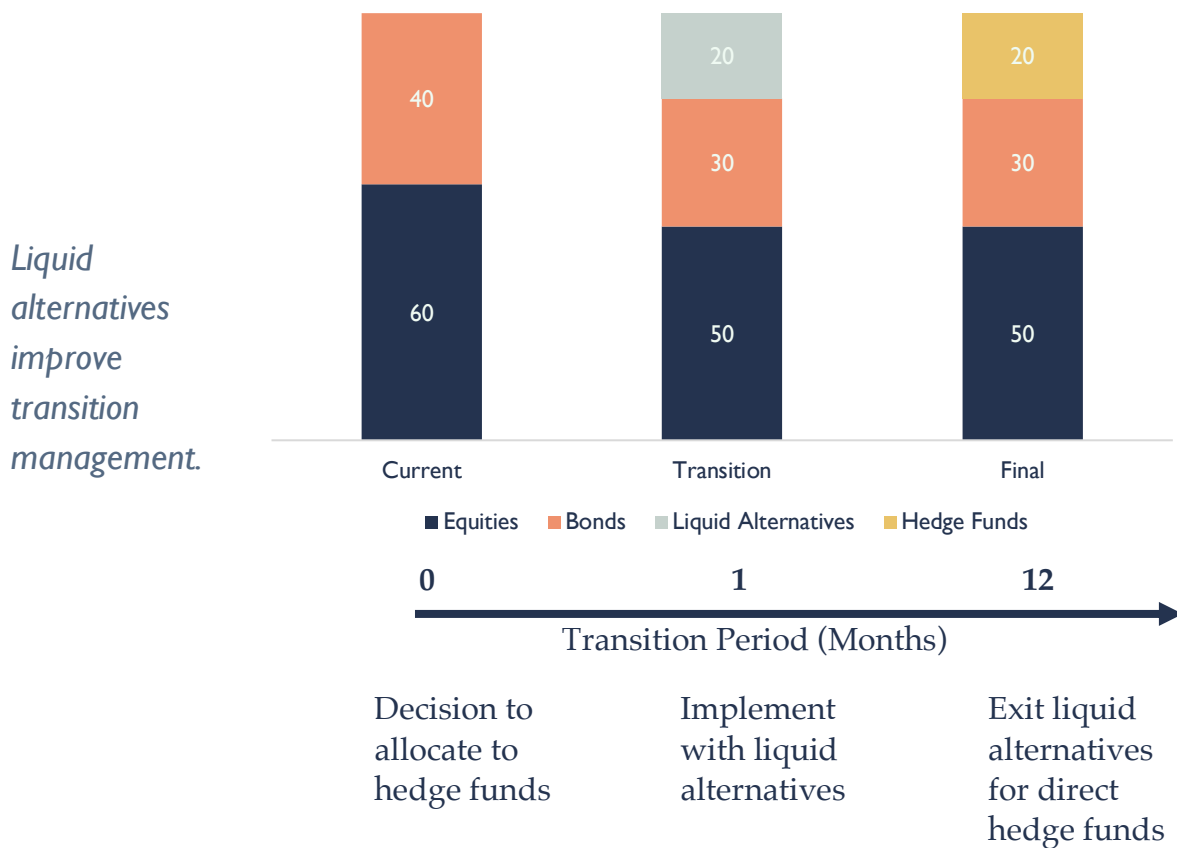
Challenge	Solution
Costs	<ul style="list-style-type: none"> • Reduced search and selection costs • Reduced management costs • Reduced oversight costs
Liquidity	<ul style="list-style-type: none"> • Daily liquidity • Decreases time to access
Policies	<ul style="list-style-type: none"> • Alleviates policy constraints • Overcomes governance burden • Reduces regulatory burden
Management	<ul style="list-style-type: none"> • Allows scaling of hedge fund exposure • Permits expression of views • Improves risk management integration

This illustration is hypothetical and solely intended for demonstration purposes.

Transforming Liquidity: Managing the Transition

An abiding complication for a hedge fund investor is the implementation time. After the labor of informing an investment committee of the benefits of hedge funds and the decision to advance, the implementation begins. This process includes multiple due diligence on prospective managers, the provision of liquidity from the current portfolio, and the final investment when the manager opens to new investment. This prolonged process might last a year. Liquid alternatives materially reduce the gap (exhibit 7). Thus, investing with liquid alternatives *considerably reduces the transition gap between decision and action.*

Exhibit 7. Transition into Hedge Funds with Liquid Alternatives



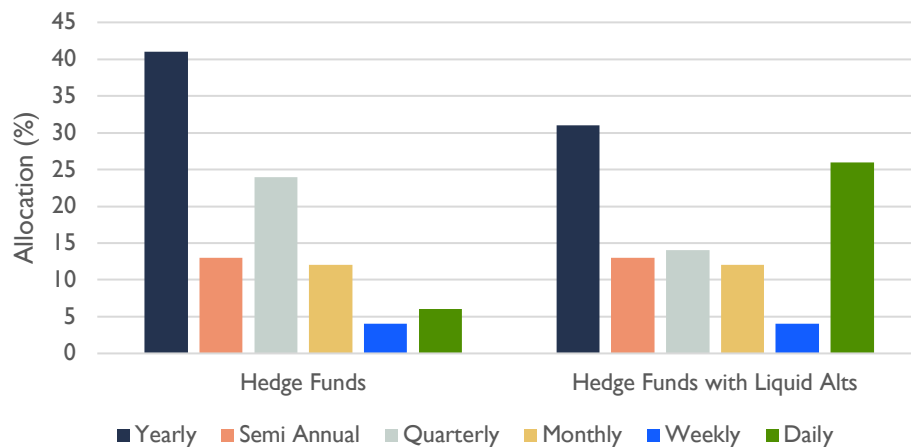
For illustration only. This example does not reflect an actual investment.

Enabling Action: The Benefit of Amplified Liquidity

A pressing concern for investors in hedge funds is the lack of liquidity. Most investors are locked for six months or longer, with nearly 80% available quarter or later (exhibit 8). This is a material constraint for investors. The risk is selling either corporate bonds or equities that declined during a market crash. Selling low is less than ideal. While no guarantee exists that the liquid alternatives do not decline also, their liquid nature and the preponderance of short-term income-producing assets provides a degree of security that their *value falls less*.

Exhibit 8. Liquidity Profile for Investors in Hedge Funds

Liquid alternatives enable timely decisions.



Source: Liquidity profile is from “Hedge Funds: Portfolio, Investor, and Financing Liquidity,” Aragon et al., 2017, Securities and Exchange Commission. Hypothetical adjustment is from CRM. For illustration only and does not reflect an actual investment.

The impact of allocating twenty percent of the portfolio to a liquid alternative fund is material. When reducing the two largest liquidity profiles by 10% each, yearly and quarterly, the average maturity drops to 122 days from 157 days. Critically, monthly liquidity or better increases to 42% from 22% for the hedge fund allocation. In the total portfolio with a 20% hedge fund allocation, eight percent is available for reallocation. This amount meets the rebalancing needs of most investors. In practical terms, liquid alternatives *enable tactical decisions*.

An Alternative Conclusion

Liquid alternatives invest without compromise.

The hedge fund universe provides a diverse array of strategies that provide alternatives to traditional asset classes. The increasing integration of the financial markets and the proliferation of hedge fund managers ensure competition for alpha. These trends are magnified by the expansion of ETFs and data science that empower more investors to access these alternate return strategies. In diverse portfolios of hedge funds, the existence of uncorrelated alpha to the major public markets is minimal. Liquid alternatives potentially offer similar risk and return profiles to hedge funds by accessing their strategy exposures at a lower cost and liquid format. Thus, liquid alternatives are a meaningful tool for investors and fiduciaries that empower them towards their strategic objective, a diversified portfolio.

The benefits of liquid alternatives are many. They improve the efficiency of a traditional portfolio and reduce the major risk factor exposures. They deliver lower costs, increased transparency, and enhanced liquidity to the investor. The demand for alternative factor exposures may increase as near-zero interest rates linger. Liquid alternatives provide a compelling argument to the investor seeking to manage their portfolio risk, liquidity, and cost.

Practicality for an investor is paramount. Liquid alternatives empower timely transition management into hedge funds, promote more tactical decisions with liquidity, and advance risk management through transparency. **Liquid alternatives invest without compromise.**

Important Information on Back-Tested or Simulated Performance

The analysis includes data from Hedge Fund Research Liquid Alternative Universe Index and the Credit Suisse Liquid Alternative Beta Index. The performance was simulated to measure how a portfolio of ETFs and indices designed to track hedge fund indices would have performed in the period beginning December 31, 2007. The simulated returns reflect execution at daily closing prices with no transaction costs. Any earned or paid interest occurred at market rates for invested or borrowed cash. The index portfolio weights were computed using daily data. Index rebalancing occurred on the first day following the computation of the portfolio weights and when all required investments vehicles were tradable in the market. Capital Risk Management, LLC (Capital Risk) conducted all analysis using a proprietary system and makes no representations or warranties to third party data used in the analysis.

The simulated performance shown is for illustrative purposes only and does not represent actual performance of the index. Capital Risk does not represent that the actual performance would reflect the simulated performance had the firm managed the index or accounts in this manner. Simulated or back tested performances are inherently limited and may include the following: (i) hindsight bias: the data used is historical and does not reflect the investment process as it might have occurred under the varying economic and market events that transpired during the period. No back tested or simulated performance can truly account for all the financial risk in actual performance and will invariably show positive rates of return. (ii) Transaction and market impact costs are not included and thus it does not reflect actual implementation of the trading strategy. (iii) Investor psychology is not addressed and thus does not account for the investors ability to withstand losses, harvest profits, or other actions that are known to impact investors. (iv) Assumptions are used in the model and they impact the outcomes. Thus, similar results may not occur in the actual management of indices. No representation or warranty is made as to the reasonableness of any assumptions made or that these assumptions are completely stated or fully considered. Assumption changes may materially impact the returns presented. This material does not represent any index's performance. Investors should not assume that they will experience similar investment performance to the back-tested or simulated performance shown. Material differences frequently occur between back-tested or simulated performance results and the actual results subsequently realized by any investment strategy.

Back tested or simulated results are achieved with the benefit of hindsight and model is designed with a retroactive application and is unlike an actual performance record based on the actual trading of assets withing a portfolio. Back tested or simulated performance does not reflect an adviser's decision-making process if the adviser were managing a portfolio when material economic or market factor events occurred. Adjustment of the investment strategy may occur at any time, for any reason and can continue to change until achieving a desired or better performance result. Thus, back tested or simulated performance results will differ from actual realized performance. The back-tested or simulated performance includes hypothetical results that do not reflect the reinvestment of dividends and other earnings or the deduction of advisory fees, brokerage or other commissions, and any other expenses that a client would have paid or actually paid. No representation or warranty is made that any index will or is likely to achieve profits or losses comparable to those shown. Other modeling techniques or assumptions might produce significantly different results and prove to be more appropriate. Historical back tested or simulated results are neither indicators nor guarantees of future returns. Frequently sharp differences between back- tested or simulated performance results and the actual results subsequently achieved occur. As a sophisticated investor, you accept and agree to use such information only for the purpose of discussing with Capital Risk your preliminary interest in investing in the strategy described herein.

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