Alternative Investment Analyst Review

Liquid Real Assets

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1. Introduction

With interest rates in most of the developed countries near zero in nominal terms and negative in real terms, investors increasingly are looking for ways to protect their capital against the erosion of purchasing power as well as unexpected changes in interest rate term structure and inflation. One approach that may help to accomplish this objective is increasing the allocation to real assets.

Real assets are often associated with long-term, illiquid investments in physical assets. Illiquid forms of investments may offer an additional illiquidity premium and appear to be less volatile due to appraisal-based valuations and return smoothing. However, due to minimum investment sizes, high transaction costs, and long lock-up periods, they are suitable only for large institutional investors with a long time horizon, no major liquidity needs, and no concerns over the inability to rebalance this portion of the portfolio. When investment lumpiness and liquidity concerns do matter, it is still possible to construct a portfolio of liquid instruments that help to achieve the desired characteristics and outcomes.

2. What are Real Assets?

There are two main definitions of real assets:

1. Real assets are economic resources that directly generate consumption.
2. Real assets are goods that are independent from variations in the value of money.

The first definition emphasizes tangible and physical attributes of the assets, while the second one contrasts them to investments generating nominal returns. There is substantial overlap between investments that fit these definitions, however, the latter one is the focus of this paper as it is broader and more inclusive.

Compared to traditional investments in fixed-income and equities, real assets have certain characteristics that help to improve overall investment experience and outcomes for investors:

- Distinct return drivers: benefit from increasing scarcity of product inputs (e.g., land and resources).
- Inflation protection: benefit from increasing input prices and interest rates.
- Potential for capital appreciation and stable income: lower sensitivity to business cycles and market fluctuations can lead to "fixed-income-like" cash flows and strong total returns.
- Portfolio diversification: low to moderate correlations to traditional asset classes.

Given that the focus of this paper is liquid real assets, the desired investments must also offer daily liquidity. In general, while illiquid forms of investments may offer an additional illiquidity premium and appear to be less volatile and less correlated with general market movements due to appraisal-based valuations and return smoothing, investing through publicly traded investment vehicles offers a number of advantages as well:

- Daily liquidity and pricing transparency
- Better alignment of interests between management and investors
- Access to larger projects and deal sizes
- Ability to diversify across sectors and locations with minimum investment amounts

The market segments listed in Exhibit 1 fit the desired profile, and are examined in detail in subsequent sections.

Exhibit 1 Market Segments and Real Assets

Market Segment	Liquid Investments	Illiquid Investments
Real estate	REITs	Direct real estate
Infrastructure	Listed infrastructure	Direct infrastructure
Inflation-linked bonds	Real-return bonds, TIPS	N/A
Floating-rate debt	Senior bank loans, FRNs	N/A
Commodities	Futures, ETFs, commodity stocks	Physical commodities
Timberland	Timber REITs	Timber Investment Management Organizations (TIMOs)
Farmland	Select public companies	Limited partnerships

2.1. Real Estate

Real estate investing involves the purchase, ownership, management, rental and/or sale of real estate for profit. It offers several unique benefits such as stable income combined with the potential for natural appreciation in value, valuable depreciation tax shields, and the ability to influence performance through initiatives that improve a property and increase its value.

Purchasing real estate investment trusts (REITs) is the easiest way to invest in real estate. Only equity REITs (entities with 75% of assets invested in the equity of real estate deals) should be included in the liquid real assets universe. Mortgage REITs, which predominantly invest in debt instruments, and by extension hybrid REITs, are not likely to produce the desired return characteristics of this asset class. Looking at the long-term history (see Exhibit 2), the FTSE NAREIT Mortgage REIT Index substantially underperformed the FTSE NAREIT Equity REIT Index over the 1972-2012 period (5.1% vs. 12.1% per annum) with higher annualized volatility (20.5% vs. 17.3%). Mortgage REITs only managed to beat U.S. inflation in 25 out of 41 calendar years compared to the track record of equity REITs, which beat U.S. inflation in 32 of 41 calendar years.

Even within equity REITs, companies are highly heterogeneous and, depending on their property characteristics, may exhibit different behavior. For example, properties that have high occupancy rates and long-term non-cancellable lease commitments are going to behave more like long-term corporate nominal bonds and thus not have the desired characteristics of liquid real assets. On the other hand, properties with less than full occupancy and shorter-term leases, as well as the ability to adjust rent payments in line with inflation, are more likely to generate the desired outcomes.

2.2. Infrastructure

Infrastructure includes fundamental assets and systems that facilitate functions essential to the well-being of an economy. Infrastructure investing generally produces high and stable cash flows due to inelasticity of demand for essential services and high barriers to entry. The universe of global investable opportunities has grown considerably as a result of privatization.

Listed infrastructure as an asset class is very heterogeneous. The types of companies included in various global infrastructure indices range from hard infrastructure such as utilities and airports to soft or

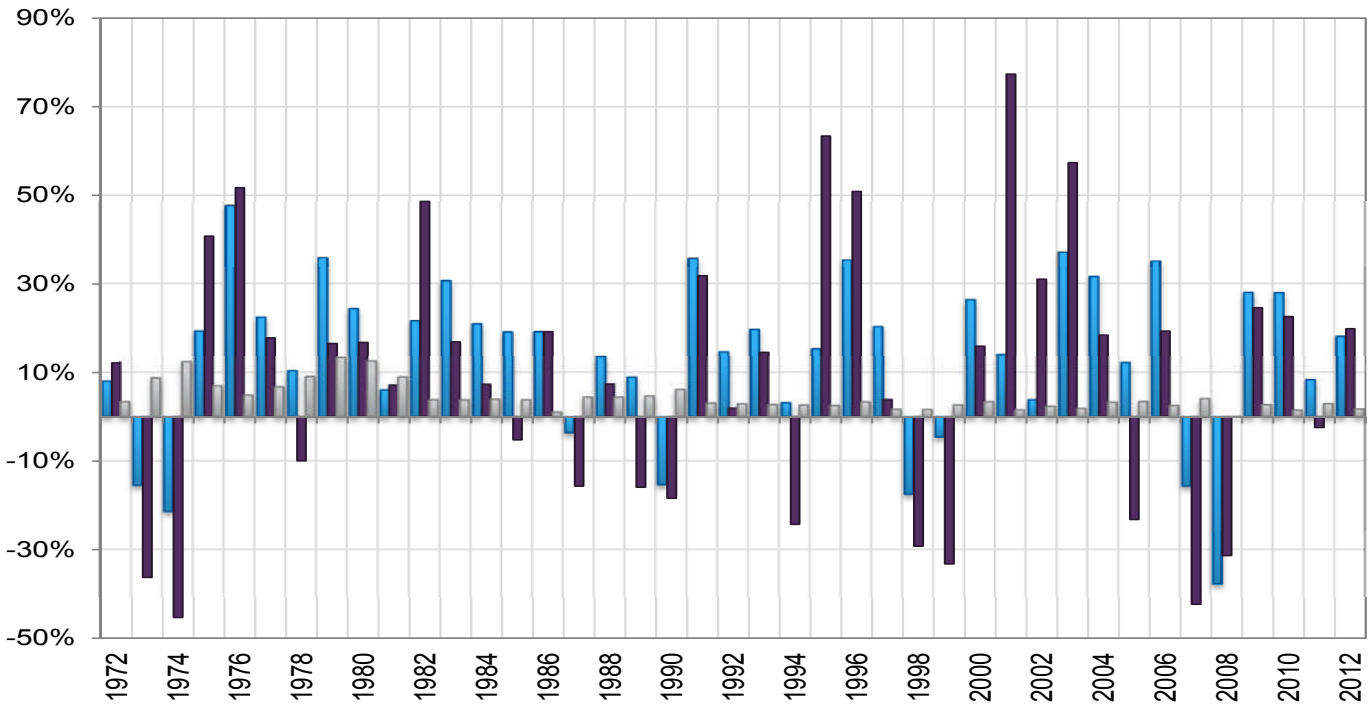

Exhibit 2 FTSE NAREIT Returns
Source: Pavilion, Bloomberg; returns are in USD

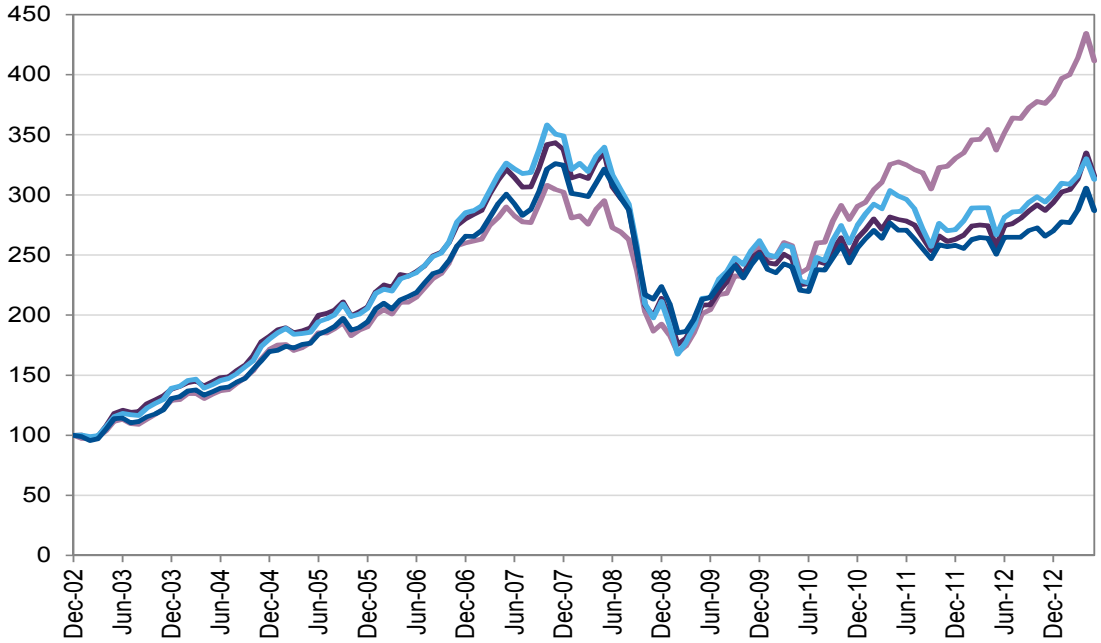

Exhibit 3 Infrastructure Performance
Source: Pavilion, Bloomberg; returns are net total returns in USD, except for Macquarie where gross total returns are used.

social infrastructure such as companies providing educational services over the internet. Generally, listed infrastructure can be divided into three main categories:[1]

- Pure-Play: Companies that own or operate infrastructure assets in industries with high barriers to entry, relatively inelastic demand, and stable long-term income derived from usage fees.
- Core: Companies that exhibit some fundamental infrastructure characteristics by virtue of regulation or contractual agreement, but have lower margins and are typically not as capital intensive.
- Broad: Companies that own infrastructure-related businesses and do not exhibit relatively stable cash flows.

Compared to other infrastructure indices, DJ Brookfield Infrastructure Index, the only index containing exclusively pure-play companies, had the best historical return and the lowest volatility since its inception on December 31, 2002 (see Exhibit 3).

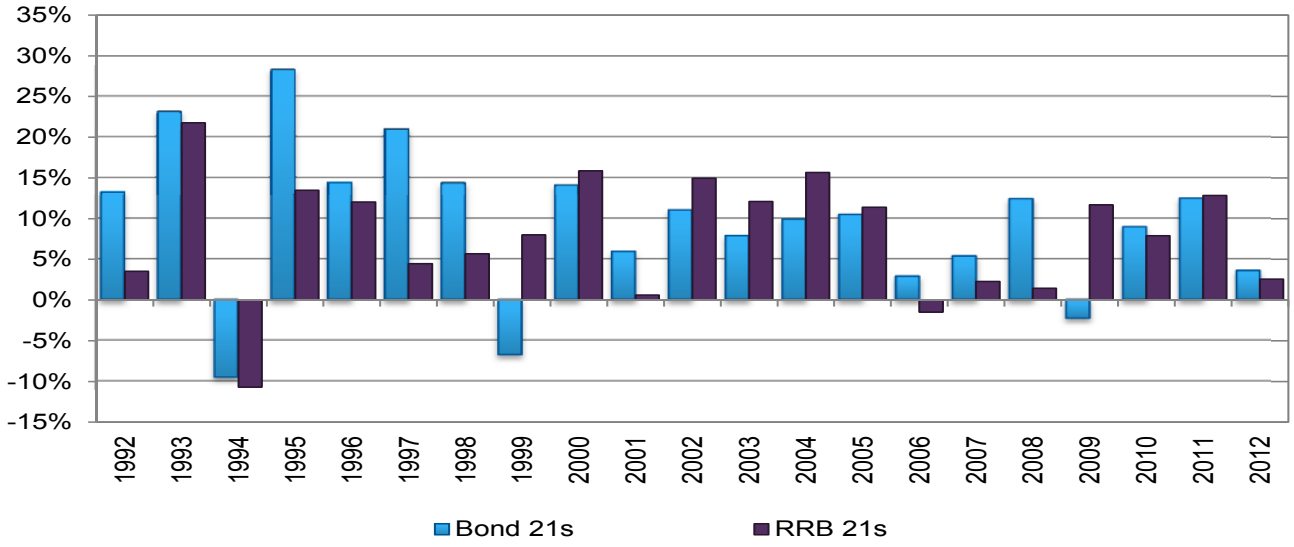

Exhibit 4 Real-Return Bond and Nominal Bond Returns
Source: Pavilion, Bloomberg

Only pure-play infrastructure companies, which most closely resemble the unlisted infrastructure universe, qualify for inclusion in liquid real assets. These companies have more than 70% of cash flows derived from pure-play infrastructure lines of business, and they typically fall into one or more of these industries: oil and gas storage and transportation; electricity transmission and distribution; communications (towers/satellites); water utilities; toll roads and railtracks; and airports and marine ports.

2.3. Inflation-Linked Bonds (ILBs)

ILBs (or real-return bonds) are bonds whose principal and coupon payments are indexed to the Consumer Price Index (CPI). In contrast to other instruments, their cash flows are explicitly linked to inflation. Certain ILBs (e.g., U.S. TIPS) also come with an embedded deflation protection of the maturity value. While it seems like ILBs offer the best of two worlds, in the long run they are expected to underperform nominal bonds under normal market conditions. The yield on a nominal bond comprises the real yield, expected inflation, and a premium for the risk that realized inflation exceeds expected inflation. As a result, ILBs are only expected to outperform when realized inflation substantially exceeds expectations.

Canada has a longer history of issuing ILBs than the United States, and the first Canadian ILB is still in existence. Exhibit 4 compares historical returns of real-return bond CAN 4.25% 12/21 and nominal bond CAN 9.75% 6/21.

Over the 21-year period, the nominal bond outperformed the real-return bond. Compared to nominal bonds, real-return bonds failed to offer protection during crises because they are not as liquid as nominal bonds and thus do not benefit from the flight to quality. Nevertheless, real-return bonds did produce returns with lower annual volatility (9.1% vs.7.4%) and really outperformed in 1999 and 2009, the years when inflation rose unexpectedly. With current break-even inflation spreads lower than the historical average in both Canada and the United States, they are a great addition to liquid real assets.

2.4. Senior Bank Loans

Senior bank loans are extensions of credit to primarily non-investment grade companies, secured by borrowers' assets and having a senior lien or priority claim on these assets. Unlike most traditional debt investments with fixed coupon payments, these loans generate floating-rate cash flows, linked to LIBOR. As a result, senior loans, especially those with a low or no LIBOR floor, should benefit if interest rates rise.

First-lien loans rank higher in the capital structure compared to high-yield bonds and offer several advantages such as stricter covenants and higher recovery rates post bankruptcies. For instance, according to data from Credit Suisse, the average recovery rate between 1995-2010 is 70% for first-lien loans and only 43% for high-yield bonds.[2] Because senior loans are traded and settled differently from bonds and have higher back-office, administration and compliance requirements, they also may offer an additional premium that is unrelated to bearing financial risks, the so-called complexity premium. These factors allow senior loans to provide better compensation for bearing credit risk as well as the desired hedge against inflation and rising

Exhibit 5 Bond Summary Statistics

	Yield	Compensation for Interest Rate Risk	Compensation for Credit Risk	Annual Default Rate	Loss Given Default	Net Compensation for Credit Risk
5-Year BBB Bond	2.50%	0.70%	1.80%	0.30%	60%	1.60%
5-Year HY Bond	5.50%	0.70%	4.80%	4.50%	60%	2.10%
5-Year Senior Loan	5.50%	0.30%	5.20%	4.50%	30%	3.80%

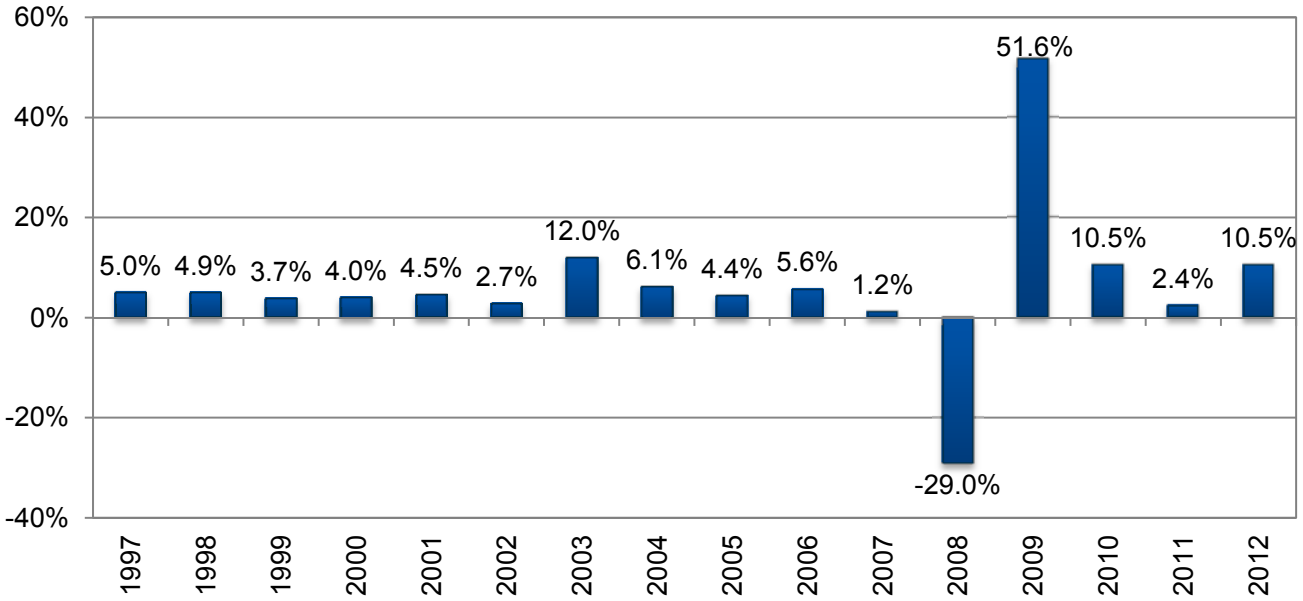

Exhibit 6 S&P/LSTA U.S. Leveraged Loan TR Index
Source: Pavilion, S&P/LSTA U.S. Leveraged Loan TR Index; returns are hedged to CAD.

interest rates (See Exhibit 5).

While the liquidity crisis of 2008 caused loan prices to be marked down substantially, fundamentals were still good and patient buy-and-hold investors earned a net return of about 8% over the two years (2008-09). Credit losses due to defaults were only about 1.5% of the value of the portfolio in 2008.

The highest ever default rate and lowest ever recovery rate actually occurred in 2009 (loss of about 5% of the value of the portfolio), which didn't preclude the asset class from regaining lost ground (See Exhibit 6).

2.5. Commodities

Commodities typically include agricultural, energy, and mining products. Investing in commodities may offer diversification benefits because commodity prices are:

- Driven by supply and demand, not by the discounted value of future cash flows.
- Positively correlated with inflation.
- Based on the current state of the economy as opposed to anticipations.
- Input costs to most companies and, as they soar, corporate profits decline.

The easiest and most liquid way to invest in commodities is through futures, however, passive long-term investments in commodities through futures may be disadvantageous. First of all, futures need to be rolled periodically. The return is eroded due to convenience yield as entities that have productive use of the commodity find it more beneficial to hold physical inventories to protect themselves against disruptive supply shocks. Finally, investing in futures contracts can have punitive tax implications for taxable clients (especially in Canada, where all gains on futures contracts are taxed on the account of income).

Investing in commodities through public equities has its challenges as well. Most energy and materials companies hedge out the desired commodity exposure to a certain extent. Many companies do it opportunistically, making it difficult to assess whether they have the desired exposure at any given point in time.

Canadian investors also may find that adding additional exposure to commodities in liquid real assets is unnecessary because of an already high exposure to this segment through Canadian equity home bias.

2.6. Timberland

Timberland is the investment in existing forest land for long-term harvesting of wood. It's a perpetual renewable resource with an interesting distinctive benefit of harvest timing flexibility; investors can accelerate or delay harvesting based on market conditions.

Large institutional investors have been investing in timberland through timber investment management organizations (TIMOs). In 1999 it became possible to invest in this asset class through a liquid instrument, the Plum Creek Timber REIT. While the number of publicly traded timber REITs has subsequently grown to four, not all of them are ideal candidates for inclusion in liquid real assets. For example, Weyerhaeuser, the newest and by far the largest timber REIT, derives about 70% of revenues from manufacturing wood products and cellulose fibers.[3] High manufacturing exposure makes timber REITs highly volatile and more tied to cyclical industries. While a couple of timber REITs can be included in liquid real assets, there is still not enough depth to make a meaningful allocation in the portfolio.

2.7. Farmland

Farmland is the investment in arable land with an option on generating a renewable stream of cash flows from crop income. Investing in farmland is also a play on the growing global population and demand for biofuel as well as the premise that the amount of arable farmland is constantly shrinking. While the investment has idiosyncratic risks of poor harvests, the crop income generated is tied to inflation as food is one of the main ingredients of CPI.

Investments in farmland are typically done through illiquid vehicles (e.g., limited partnerships). However, even in a pooled structure, the objective is quite challenging as in many parts of the world, including parts of North America, farmland ownership by non-individuals is restricted. Some investment funds get around this restriction by investing in farmland mortgages instead. However, similar to mortgage REITs, such investments do not produce the desired exposure. Buying farmland with the purpose of renting it to farmers doesn't allow the capture of crop income and is quite challenging because the arable land is valuable only to the farmers living nearby.

Among liquid investments, the ideal candidates for inclusion in liquid real assets are publicly traded companies with a significant and diversified farmland ownership on their balance sheets, as well as productive agricultural use of this land. Adecoagro (NYSE:AGRO), for example, fits this profile. It owns 286 thousand hectares of farmland in fertile regions of Brazil, Argentina, and Uruguay and uses this land to produce corn, wheat, soybeans, rice, dairy, and other agricultural products. Unfortunately, as with Timber REITs, the universe of ideal stocks is somewhat limited.

3. Implementation and Historical Analysis

Four of the building blocks identified earlier have publicly available indices with a fairly long history and

Exhibit 7 Liquid Real Assets Mix

Component	Time Period	Historical Return Proxy	Weight
Global REITs	Jan 2001 - Dec 2012	S&P Global REIT TR Index (Net)	30%
	Jan 1995 - Dec 2000	S&P Global REIT TR Index (Gross)	
Global Listed Infrastructure	Jan 2003 - Dec 2012	DJ Brookfield Global Infrastructure TR Index (Net)	20%
	Jan 1995 - Dec 2002	UBS Global Infrastructure & Utilities 50-50 TR Index (Net)	
Inflation-Linked Bonds	Jan 1996 - Dec 2012	ML Canada Inflation-Linked Government Index	10%
	Jan 1995 - Dec 1995	CAN 4.25% 12/01/2021 bond	
Senior Bank Loans	Jan 1997 - Dec 2012	S&P/LSTA Leveraged Loan TR Index	40%
	Jan 1995 - Dec 1996	CSFB Leveraged Loan Plus TR Index	

Exhibit 8 Correlations: Liquid Real Assets and Traditional Assets

Component	Global REITs	Global Listed Infrastructure	Inflation-Linked Bonds	Senior Bank Loans	Liquid Real Assets
Cdn. Fixed Income[4]	0.10	0.11	0.58	-0.07	0.13
Cdn. Equities[5]	0.36	0.31	0.24	0.42	0.47
Global Equities[6]	0.50	0.57	0.15	0.35	0.59

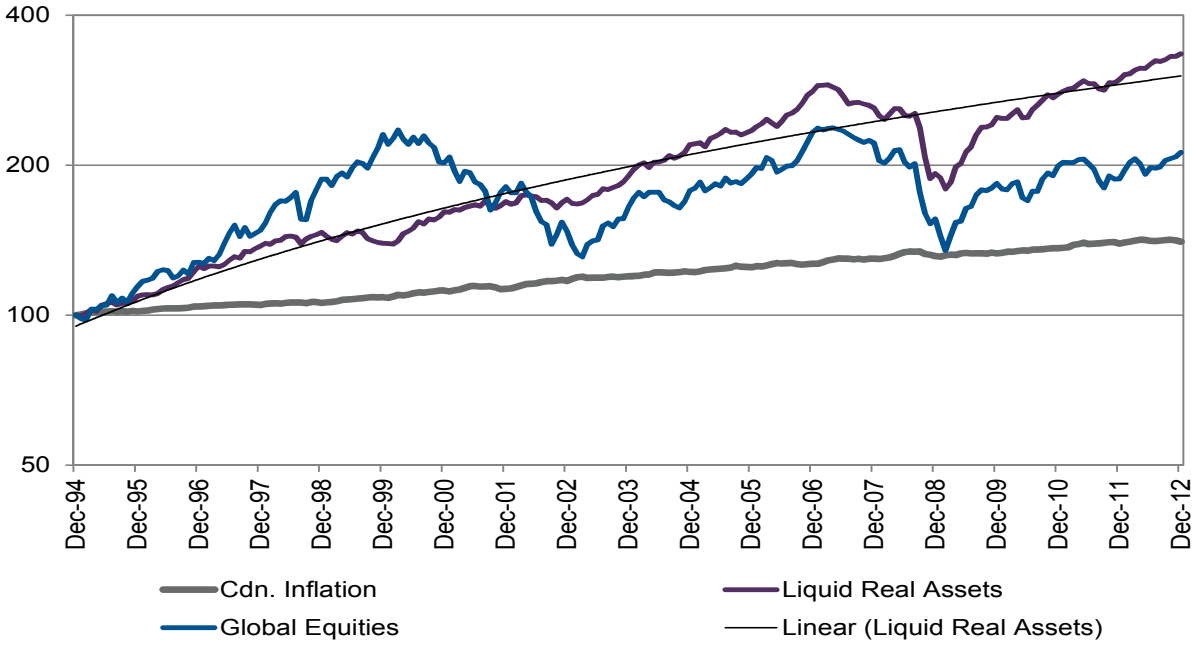

Exhibit 9 Liquid Real Asset Performance
Source: Pavilion, Bloomberg; returns are in CAD.

Exhibit 10 Assets Mix without Liquid Real Assets

Asset Mix	Canadian Fixed Income	Canadian Equities	Global Equities	Liquid Real Assets	Annualized Return	Annualized Volatility
Portfolio 1	30.00%	35.00%	35.00%	-	7.04%	9.48%
Portfolio 2	50.00%	25.00%	25.00%	-	7.29%	7.08%
Portfolio 3	70.00%	15.00%	15.00%	-	7.46%	5.02%

Exhibit 11 Assets Mix with Liquid Real Assets

Asset Mix	Canadian Fixed Income	Canadian Equities	Global Equities	Liquid Real Assets	Annualized Return	Annualized Volatility
Portfolio 1	21.30%	30.60%	30.60%	17.50%	7.03%	9.06%
Portfolio 2	43.80%	21.90%	21.90%	12.50%	7.28%	6.76%
Portfolio 3	66.30%	13.10%	13.10%	7.50%	7.44%	4.82%

a large enough opportunity set to make a meaningful allocation within liquid real assets: equity REITs, listed infrastructure, inflation-linked bonds, and senior loans. In the next section, we look at how a liquid real assets portfolio, implemented with the same mix of investments in both Canada and the United States, would have performed historically.

3.1. Canadian Perspective

In the subsequent analysis, liquid real assets are defined as the mix in Exhibit 7. All statistics are for the 18-year period from January 1995 to December 2012. All returns in this section are in Canadian dollars, and the currency exposure of senior bank loans is fully hedged to CAD.

Exhibit 8 summarizes correlation coefficients between traditional asset classes and the underlying components of liquid real assets:

Since 50% of the liquid real assets portfolio is effectively invested in global equities, the correlation between them has been moderately high. Senior bank loans, which had almost no statistically significant correlation with equities prior to 2008, became highly correlated with equities during the liquidity crisis. During the period

Exhibit 12 Liquid Real Assets Mix

Component	Time Period	Historical Return Proxy	Weight
Global REITs	Jan 2001 - Dec 2012 Jan 1998 - Dec 2000	S&P Global REIT TR Index (Net) S&P Global REIT TR Index (Gross)	30%
Global Listed Infrastructure	Jan 2003 - Dec 2012 Jan 1998 - Dec 2002	DJ Brookfield Global Infrastructure TR Index (Net) UBS Global Infrastructure & Utilities 50-50 TR Index (Net)	20%
Inflation-Linked Bonds	Jan 1998 - Dec 2012	ML United States Inflation-Linked Government Index	10%
Senior Bank Loans	Jan 1998 - Dec 2012	S&P/LSTA Leveraged Loan TR Index	40%

Exhibit 13 Correlations: Liquid Real Assets and Traditional Assets

Component	Global REITs	Global Listed Infrastructure	Inflation-Linked Bonds	Senior Bank Loans	Liquid Real Assets
U.S. Fixed Income[7]	0.15	0.10	0.76	-0.05	0.15
U.S. Equities[8]	0.67	0.70	0.02	0.46	0.71
Non-U.S. Equities[9]	0.67	0.77	0.1	0.51	0.75

from November 2007 to February 2009, liquid real assets experienced a drawdown of 32.5%, compared to 39.2% for Global Equities. While the lost value was fully recovered within three years of the beginning of this drawdown period, the downside risk can be substantial over short-time horizons.

While Canadian inflation eroded more than 40% of the purchasing power, liquid real assets outperformed Canadian Inflation in 14 out of the last 18 calendar years (exceptions: 1999, 2002, 2007, and 2008), more consistently than global equities (See Exhibit 9).

To assess the impact of including liquid real assets in a

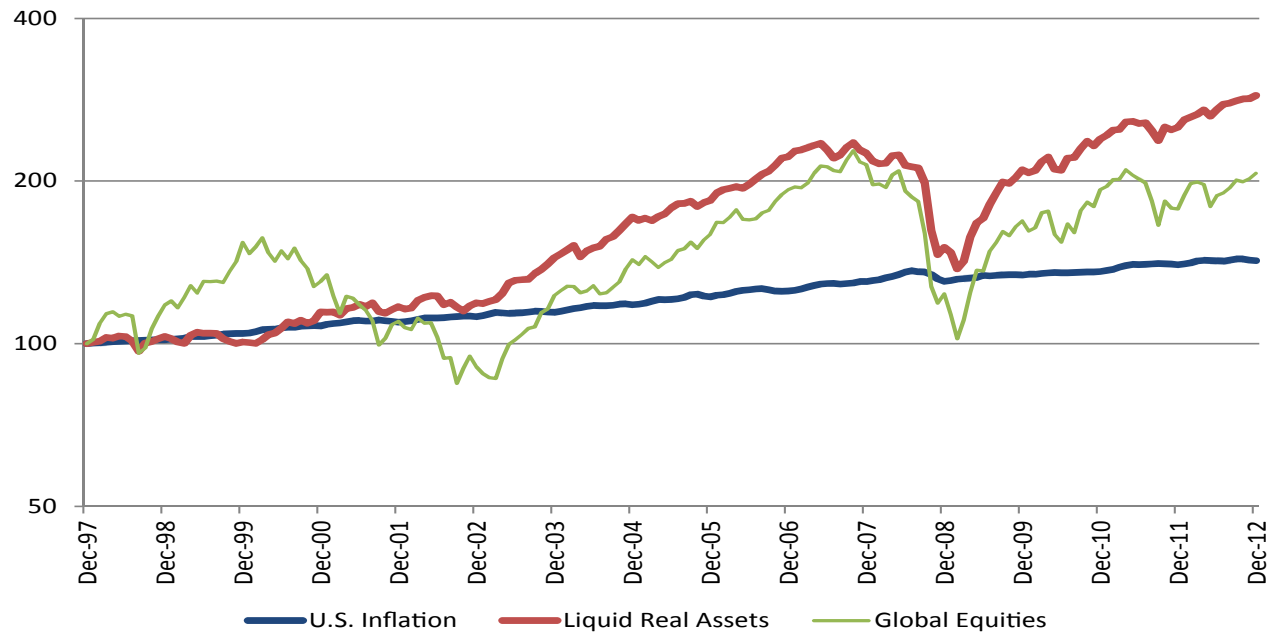

Exhibit 14 Liquid Real Assets Performance
Source: Pavilion, Bloomberg; returns are in USD.

Exhibit 15 Assets Mix without Liquid Real Assets

Asset Mix	U.S. Fixed Income	U.S. Equities	Non-U.S. Equities	Liquid Real Assets	Annualized Return	Annualized Volatility
Portfolio 1	30.00%	38.50%	31.50%	-	5.85%	11.89%
Portfolio 2	50.00%	27.50%	22.50%	-	6.05%	8.58%
Portfolio 3	70.00%	16.50%	13.50%	-	6.11%	5.52%

Exhibit 16 Assets Mix with Liquid Real Assets

Asset Mix	U.S. Fixed Income	U.S. Equities	Non-U.S. Equities	Liquid Real Assets	Annualized Return	Annualized Volatility
Portfolio 1	21.30%	33.70%	27.60%	17.50%	6.10%	11.78%
Portfolio 2	43.80%	24.10%	19.70%	12.50%	6.23%	8.50%
Portfolio 3	66.30%	14.40%	11.80%	7.50%	6.22%	5.48%

portfolio of traditional stocks and bonds, the three mixes outlined in Exhibit 10 are used. The equity portion is split equally between domestic and global equities.

With Canadian fixed-income outperforming global equities on both an absolute and risk-adjusted basis over the 18-year period, substituting a portion of it with another asset class is unlikely to produce superior results when looking in the rear-view mirror only. Nevertheless, adding liquid real assets at 25% of the equity weight in each of these portfolios and funding the allocation by taking equally from both equities and fixed-income would have produced substantially identical returns with marginally lower volatility (See Exhibit 11).

3.2. U.S. Perspective

In the subsequent analysis, liquid real assets is defined as the mix in Exhibit 12. Since the first ILB in the United States was issued in 1997, the subsequent analysis is performed for the 15-year period from January 1998 to December 2012. All returns in this section are in U.S. dollars.

Exhibit 13 summarizes correlation coefficients between traditional asset classes and the underlying components of liquid real assets.

Since 50% of the liquid real assets portfolio comprises global equities and slightly more than a quarter of the portfolio is in U.S. equities, some of the historical correlation coefficients have been fairly high. Senior bank loans, which had almost no statistically significant correlation with U.S. equities prior to 2008, became highly correlated with equities during the liquidity crisis. During the period from November 2007 to February 2009, liquid real assets experienced a drawdown of 41.6%, compared to 55.1% for global equities. While the lost value was fully recovered within three years since the beginning of this drawdown period, the downside risk can be substantial over short-time horizons.

While U.S. inflation eroded 42% of the purchasing power over the last 15 calendar years, liquid real assets outperformed U.S. inflation in 11 of these 15 years (exceptions: 1999, 2002, 2007, and 2008). For comparison, both domestic and global equities managed to beat inflation in 10 out of the last 15 years (See Exhibit 14).

To assess the impact of including liquid real assets in a portfolio of traditional stocks and bonds, the three mixes outlined in Exhibit 15 are used. 55% of the equity portion is allocated to U.S. equities and 45% of the equity portion is allocated to non-U.S. equities. Domestic equities are overweighted relative to their weight in MSCI ACWI due to a home bias.

With U.S. fixed-income outperforming domestic and global equities on both an absolute and risk-adjusted basis over the 15-year period, substituting a portion of it with another asset class is unlikely to produce superior historical results. Indeed, adding liquid real assets at 25% of the equity weight in each of these portfolios

and funding the allocation by taking equally from both equities and fixed-income would have produced marginally better returns with substantially similar volatility (See Exhibit 16).

While the benefits of including liquid real assets appear to be marginal based on historical analysis, there is a general consensus among investors that there is more risk than upside with holding nominal fixed-income in the current environment, and history is becoming less and less likely to repeat itself.

4. Conclusion

Inflation can be a substantial drag on portfolio performance, and the current environment of near-zero nominal and negative real interest rates is unsustainable in the long run. However, the magnitude and timing of future changes in realized inflation and interest rate term structure are difficult to predict. Adding liquid real assets to clients' portfolios would enhance diversification, introduce additional sources of return, and help protect the capital against the erosion of purchasing power without significantly changing the risk/return profile of the portfolio based on historical analysis. While not being at a disadvantage even if the status quo is maintained, a portfolio with an allocation to liquid real assets would be better positioned for future unexpected changes in inflation and/or interest rates.

Endnotes

1. RREEF Research, A Compelling Investment Opportunity: The Case for Global Listed Infrastructure Revisited, July 2011.
2. Source: Credit Suisse, data from 1995-2010
3. Weyerhaeuser's 2012 annual report
4. DEX Universe Bond Index
5. S&P/TSX Composite Total Return Index
6. MSCI ACWI IMI Total Return Index
7. Barclays U.S. Aggregate Total Return Index
8. Russell 3000 Total Return Index
9. MSCI ACWI ex USA IMI Total Return Index (Net)

Author Bio

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Mr. Loukine holds a Bachelor of Commerce (Honors) degree from the University of Manitoba and is a CFA and CAIA charterholder.