Allocating to infrastructure

Restoring, upgrading and building new infrastructure offers a major opportunity for the global economy.

In the short term, additional spending on transportation, telecommunications, and utilities could boost growth.

In the longer term, such investment could raise the economy's productivity and potential output.

For investors, the potential benefits of investing in infrastructure include steady cash flow, inflation hedging, and portfolio diversification.

Investing in infrastructure can be achieved through baskets of selective securities, capital markets strategies, passive and active funds, and private equity.

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Is infrastructure spending the cure?

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Increasing investment in infrastructure could help revive flagging global demand, enhance growth and create potential opportunities for investors.

The world economy is in the doldrums. Since the global financial crisis (GFC) of 2008-09, real GDP growth has averaged just 2.6% a year, compared to 3.7% for the five previous years. This weakness comes in spite of unprecedented monetary stimulus from many of the world's leading central banks. As well as cutting interest rates to record lows, they have also purchased many trillions of dollars' worth of assets. Their efforts have helped keep borrowing costs low and drive risky asset prices higher. However, there is growing skepticism that monetary policy alone can reignite solid economic growth. Something more must be done.

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Infrastructure and demand

Could fiscal policy come to the rescue? If governments cut taxes and spend more, it is possible they could reverse the persistent weakness in demand that has dogged developed economies in recent years. In the aftermath of the global financial crisis, many governments prioritized raising taxes and cutting spending to reduce public indebtedness. However, some policymakers are now warming to the idea of greater spending on infrastructure, such as transportation, telecommunications, energy, and water and sanitation. Such infrastructure investment not only augments demand, but also adds to the economy's productive capacity and can even boost its 'potential growth rate' in the long-run, especially if it incentivizes complementary private capital expenditure.

To the extent that increasing infrastructure spending creates jobs, companies and employees would spend the income they receive, leading firms to grow production and employment further. This so-called fiscal multiplier effect is especially welcome if there is economic slack: underemployment of labor and idle capital equipment.

Investing in infrastructure for the sake of economic stimulus can all too easily result in bridges to nowhere and airports that serve few passengers.

Over longer time periods, better roads, faster trains, more reliable power supplies, cleaner water and broader wireless access have lasting positive effects. Goods can be shipped more cheaply and rapidly, the workforce becomes more mobile, and businesses can operate more efficiently. Firms can then spend these efficiency savings on goods and services elsewhere in the economy by increasing capital expenditure or distributing them to their shareholders, who can spend the windfall or invest it at home or abroad. A virtuous circle of investment and growth can ensue.

Whether or not the short-term demand-driven benefits are felt in practice depends on the state of the economy at the time of the spending. In a depressed economy, there is little competition for resources, and fiscal multipliers are larger. Covering a wide range of circumstances looking at various countries worldwide over the last fifteen years and more, an increase in infrastructure investment equivalent to 1% of GDP has been associated with a 1.2% increase in GDP.

Potholes and leaky pipes

Not all infrastructure spending is equally beneficial, however. Investing in infrastructure for the sake of economic stimulus can all too easily result in bridges to nowhere and airports that serve few passengers. Governments are often tempted to back projects for electoral rather than economic motives. Funds intended for infrastructure investment are sometimes siphoned into the pockets of corrupt officials and their cronies long before a spade ever breaks the earth. Inefficiency and corruption are more likely when projects are ultimately funded by the central government - or through foreign aid - but implemented and managed by state, provincial and local governments.

The risk of wasteful infrastructure investment may be lower today, however, especially in a country like the US, where far too little has been spent on maintaining and building water, power, transportation and telecommunications infrastructure for some time. Rusty and excessively bendy railway tracks, potholed roads, rickety bridges, undersized ports, run-down, inefficient airports and sub-standard wifi speeds are a costly hindrance to businesses and consumers alike.

US state and local spending on infrastructure peaked in 1965 at around 3% of GDP. It is now down to less than 2% of GDP. Net infrastructure investment – spending less depreciation – has probably been negative for years. In its last four-yearly report, the American Society of Civil Engineers rated US infrastructure as ‘poor’ overall and either ‘poor’ or ‘mediocre’ across sixteen sub-categories, including dams and hazardous waste. The US ranks thirteenth in the world for the quality of its infrastructure – **figure 1**.

The need for both repairs and new capacity extends well beyond the US. Since the GFC, infrastructure investment has declined as a share of GDP in eleven of the G20 economies. Currently, actual global infrastructure investment is estimated at US$2.5 trillion a year – or about 3.5% of world GDP.

Figure 1. Ranking of infrastructure quality in different countries

Country	Overall rank (out of 144)	Score (1-7)
Switzerland	1	6.5
UAE	2	6.4
Hong Kong	3	6.4
Singapore	4	6.4
Netherlands	5	6.3
Finland	6	6.2
Japan	7	6.2
Australia	8	6.0
Iceland	9	6.0
France	10	5.9
US	13	5.8
UK	24	5.3
China	51	4.5
South Africa	59	4.3
India	74	3.96
Brazil	123	2.9

Source: World Economic Forum, Citi Research, as of Oct 2016.

According to a study by McKinsey, a global management consultancy, this would have to increase to US$3.3 trillion a year between 2016 and 2030 merely to support world GDP growth of 3.3%. To get back to the OECD's previous forecast for a growth rate of 3.8%, Citi estimates that infrastructure investment would need to increase to 4.4% of GDP, bringing the cumulative total investment in infrastructure to 2030 to US$58.6 trillion. The bulk of this investment will come from emerging economies by virtue of their higher growth rates. The only country where there is discernibly excessive infrastructure investment is China.

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Financing costs and political will

As well as a present need for more infrastructure investment, it may also be an opportune time to finance it. Even after their recent spike upwards, bond yields across much of the developed world remain close to all-time lows. The gap between the real rate of economic growth and the real cost of borrowing has been positive in recent years. This gap implies room for developed economies to run larger fiscal deficits without any disturbing consequences for the dynamics of public debt and without 'crowding out' private investment.

By contrast, the interest rate-growth rate gap in emerging economies has been declining since 2009 and is now negative. So, despite their lower indebtedness overall, emerging economies have less room for maneuver given their higher borrowing costs. Yet even if the real interest rate exceeds the growth rate of GDP, infrastructure investment makes sense as long as the total rate of return on the investment exceeds the cost of borrowing – the interest rate.

Of course, for some types of infrastructure investment – environmental, water, and public transport – the returns may not take the form of direct cash returns, as they do in the case of toll bridges. There may not even be indirect cash returns, higher tax revenues achieved without any tax rate increases, driven by higher employment and production, sufficient to cover running costs and capital costs. To ensure fiscal sustainability when it engages in infrastructure investment of this kind, the government would have to run future non-interest budget surpluses.

However, not all political systems are robust and far-sighted enough to allow such credible commitments to future fiscal restraint to be made. This can act as a lasting drag on desirable or even essential infrastructure investment.

Admittedly, low financing costs have been available for several years, without many governments taking up the opportunity. But the political will may be changing. Most notably, Donald Trump has indicated that he will pursue significant additional infrastructure investment. His Republican colleagues in Congress will be pressured to agree, with the potential support of Democrats.

In the UK, the government has hinted at looser fiscal policy to come, with the possibility of more spending on infrastructure projects. In August 2016, Japanese policymakers unveiled ¥13.5 trillion of fiscal measures, of which almost half was earmarked for infrastructure.

This trend seems likely to accelerate in most developed economies over the coming years. In our view at Citi, there is some prospect of modest increases in infrastructure investment in the US and in the EU over the next few years, of between 0.5% and 1% of GDP annually.

Trends in emerging markets are mixed, with India potentially boosting infrastructure spending by at least another percentage point of GDP while China will probably see a long-overdue cutback in its rapid pace of public infrastructure spending, and a refocusing on urbanization-supporting infrastructure spending.

1 Infrastructure for Growth, Citi GPS, October 2016
2 2013 Report Card for America's Infrastructure, American Society of Civil Engineers

Figure 2. Infrastructure's post-election rally

Source: Bloomberg, as of 22 Nov 2016. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only. Past performance is no guarantee of future returns. Real results may vary.

The opportunity for investors

A substantial increase in global infrastructure spending might well have significant implications for investors. Political roadblocks still exist despite sound economics. Yet the early market reaction to Donald Trump's election victory – with certain infrastructure-exposed stocks rallying and Treasuries selling off on fears of larger deficits – provides a glimpse of what this might mean.

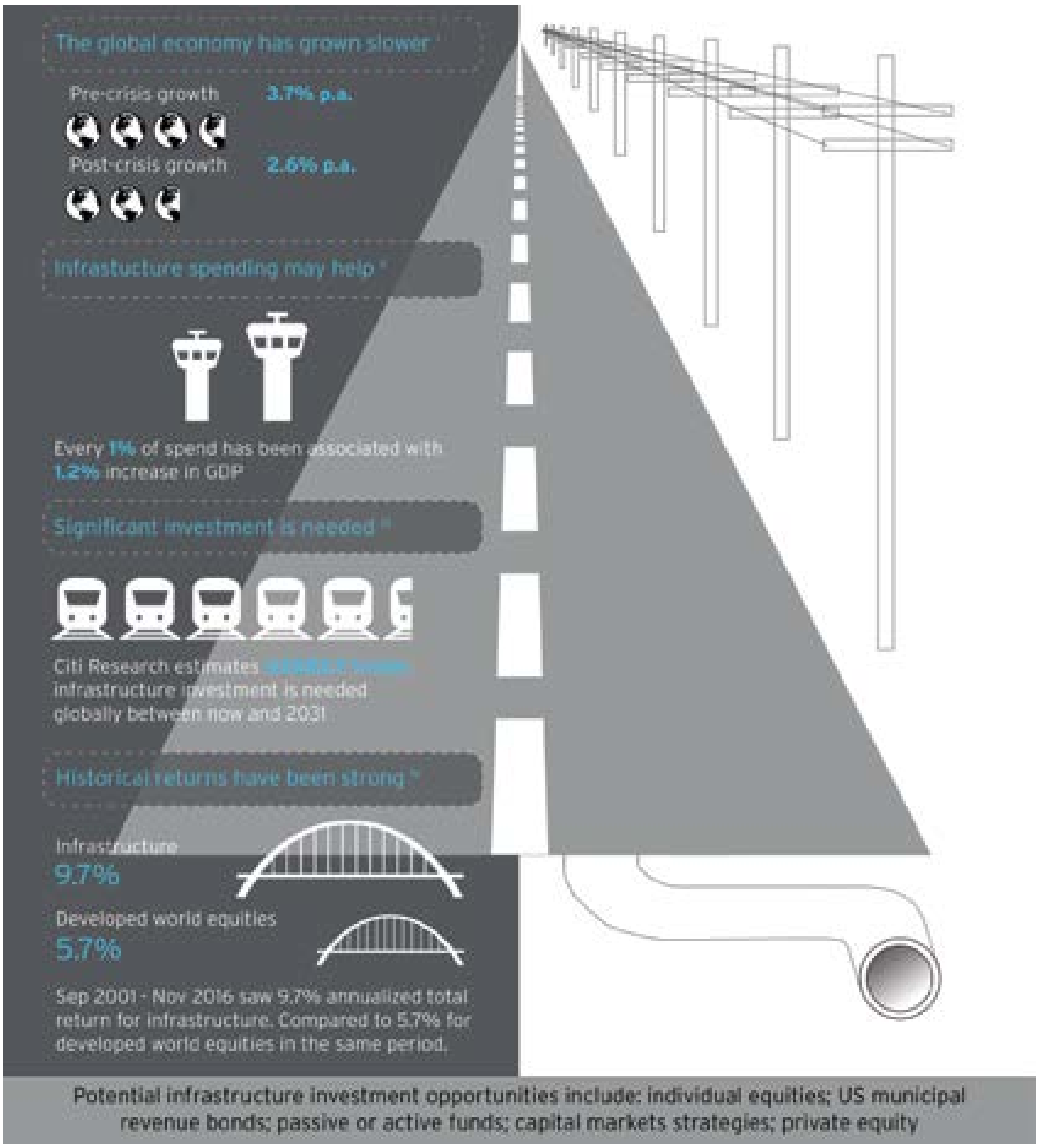
Investors could easily become too confident about the speed with which new infrastructure investments can be activated. There is likely to be a limited number of 'shovel-ready' projects and the political approval process has to find its way through both houses of Congress.

Since Trump's election, for example, the Citi US Infrastructure Index – a composite of equities across sectors that are sensitive to infrastructure spending chosen by Citi Research analysts – has spiked higher – **figure 2**. However, we see a wide range of investments that take advantage of both public and private opportunities to restore global infrastructure spending back to something closer to its sustainable long-term trend. Like the infrastructure itself, such opportunities are likely to be long-lasting.

For more on the ideas discussed in this article, please see **Citi Global Perspectives & Solutions: Infrastructure for Growth**.

IS INFRASTRUCTURE SPENDING THE CURE?

Restoring, upgrading and building new infrastructure offers an opportunity for the global economy. Likewise, investing in infrastructure can potentially benefit portfolios.



Sources:
i Infrastructure for Growth, Citi Global Perspectives & Solutions, October 2016
ii Covering various countries over last 15 years and more. Infrastructure for Growth, Citi GPS, October 2016
iii Infrastructure for Growth, Citi Global Perspectives & Solutions, October 2016. Total returns of S&P Global Infrastructure Index and MSCI World Index.
iv Bloomberg, as of 01 Dec 2016

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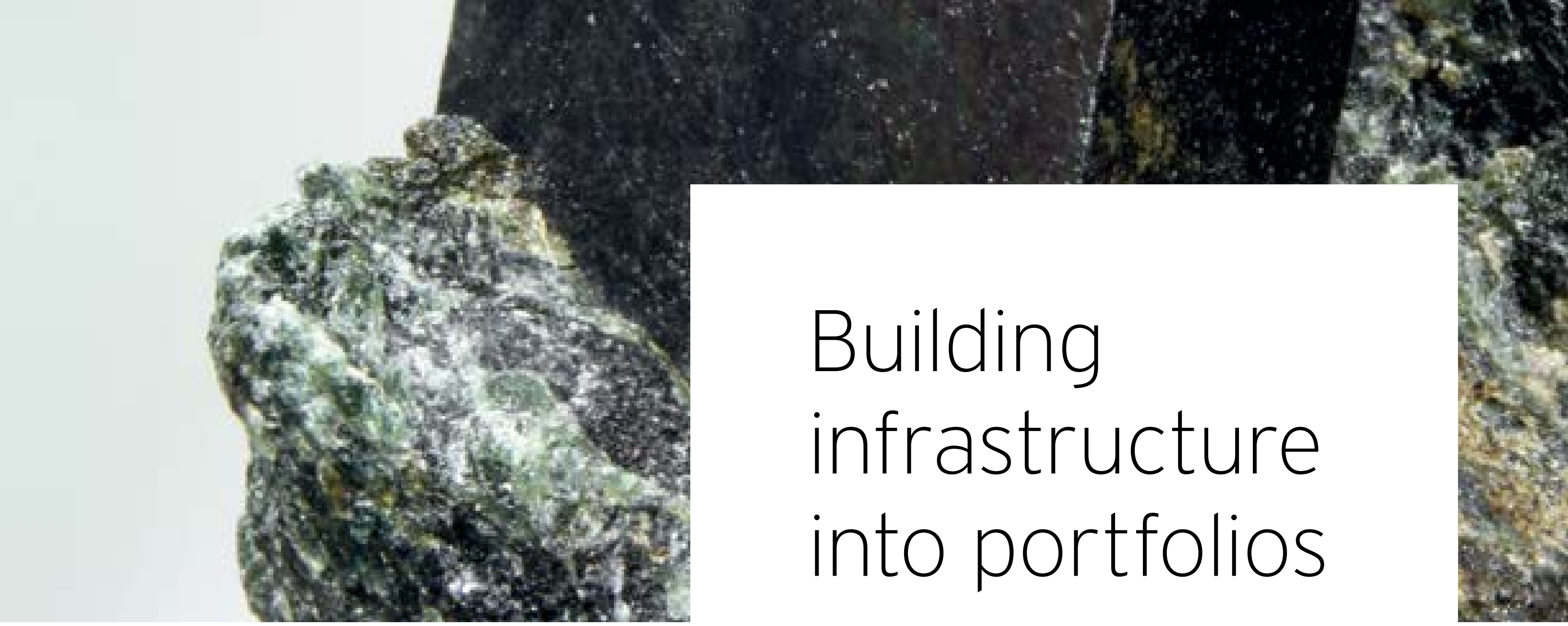


Building infrastructure into portfolios

Steven Wieting, Global Chief Investment Strategist

Government investment in infrastructure may not only help enhance economic growth but also has the potential to benefit financial portfolios.

Restoring, upgrading and building new infrastructure offers a major opportunity for the global economy. In the short term, such additional investment could boost growth. In the longer term, better transportation, faster telecommunications, and improved utilities could raise the economy's productivity and potential output. While expectations have risen quickly for many such investments in a short time, investors should be open to the potential for adding exposure to infrastructure themes.

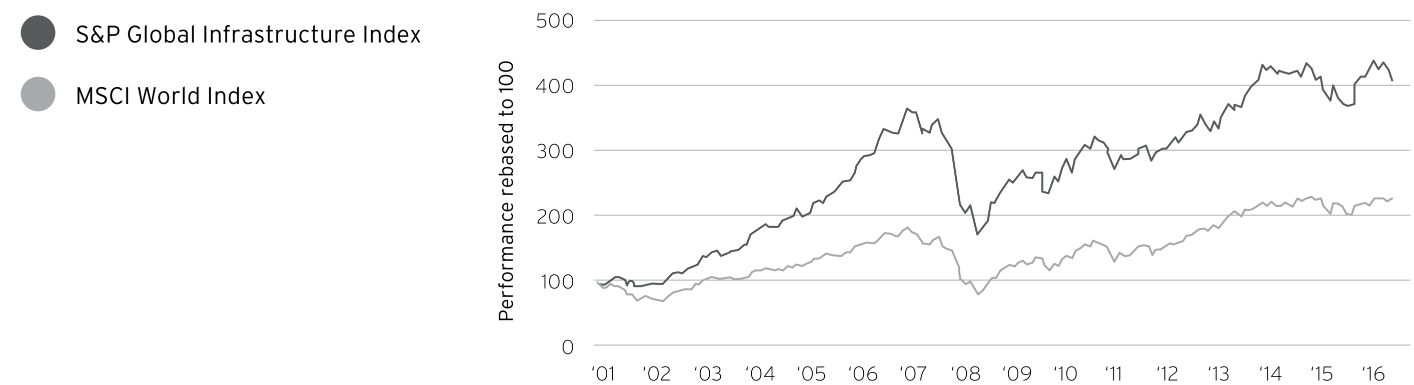
Traditionally, a significant proportion of infrastructure needs were met by the state. However, this has become less common since the wave of privatization programs in many countries over recent decades. While many governments will likely increase their infrastructure investment over the coming years, they will not be able to do so alone. Citi Research estimates that US$53.7 trillion of investment will be needed globally between now and 2031.

> Investors should be open to the potential for adding exposure to infrastructure themes.

Across the developed world as a whole, public indebtedness is stretched, but interest costs are historically low. While many emerging economies have less burdensome debts, US-driven interest rate pressures may inhibit them from increasing infrastructure investment significantly. Private sector involvement is therefore going to be essential for funding the necessary investment. Equity of infrastructure-related firms could therefore offer interesting opportunities. Where borrowing increases and yields rise – including in markets such as municipal revenue projects – lending opportunities arise.

Some segments of infrastructure-related companies have strong, steady cash generation. Utilities and telecommunications operators are an obvious example of this. Companies that win long-term contracts to build or operate infrastructure assets on behalf of the state may also offer more predictable cash flows.

Figure 1. Listed infrastructure's long-term performance



Source: Bloomberg, as of 8 Dec 2016. Indices are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only. Past performance is no guarantee of future returns. Real results may vary.

As well as helping to meet obligations to bondholders, strong cash flows can be distributed as dividends or as share buybacks to equity investors. There are numerous listed infrastructure firms that have above-average dividend yields. Such represent a generally more stable, lower risk opportunity within the equity universe. Others include more cyclical construction-related firms, which could be significant beneficiaries if governments and private investors step up spending.

In some cases, infrastructure investments can offer a hedge against inflation. Many infrastructure operation deals are subject to regular price reviews by regulators. They often provide for prices and fees to be adjusted to reflect changes in an official index of inflation. This is especially common in areas such as water and power transmission, as well as among energy pipeline operators. Toll-road, port, and airport operators are typically able to adjust what they charge users on an indexed basis.

Infrastructure assets may also help diversify a portfolio's risks. The S&P Global Infrastructure Index tracks the performance of 75 liquid and tradable energy, transportation and utility equities from around the world. Between December 2001 and November 2016, the index had a slightly negative correlation of -0.08 with US Treasuries and a somewhat positive correlation of 0.46 with commodities. And while it has had a high correlation of 0.87 with global developed equities as a whole, its performance has been superior.[1] The S&P Infrastructure Index produced an annualized total return of 9.7% over the same period, compared to 5.7% for the MSCI World Index.

Given the potential benefits of exposure to infrastructure within a diversified asset allocation, what are the options for investors? Holding a selection of individual infrastructure equities is one of the most straightforward possibilities. Citi Research has identified some 600 listed companies globally that it believes provide the best exposure to infrastructure equities, with a combined market capitalization of US$8 trillion. From this universe, it has also come up with its 49 top picks spanning various key sub-sectors of transportation, telecoms, energy, water and engineering. Investors could either seek exposure to the entire basket of top picks or to a selection based on their individual objectives.

Another direct way of investing in infrastructure in the US is through municipal revenue bonds, which make up a sizable segment of the muni market. Despite Republican Congressional opposition, it is possible that Build America Bonds – taxable municipal bonds featuring feature tax credits and federal subsidies for bondholders and state and local government bond issuers – may be reintroduced, or some alternative program. If this happens – or if there are other Federal supports for state and local government spending – muni yields may need to rise first in order to help accommodate fresh issuance. This would then potentially represent a yield opportunity for investors.

Broad-based exposure to infrastructure can also be achieved via an infrastructure fund. Passive trackers – such those linked to an infrastructure index – are among the available options. Although this relatively simple and low-cost approach has worked well in recent years, it may prove less effective in the more uncertain market conditions we expect, especially given generally high valuations across equity markets. For this reason, accessing listed infrastructure via a specialist active manager may enable better exposure to potentially more attractive sub-themes and companies.

It is also possible to create capital markets strategies based on particular infrastructure equity or debt securities – or index thereof, such as Citi's US Infrastructure index[2] (see **Is infrastructure spending the cure?**) – in order to help meet an individual investor's specific needs. Depending on an investor's risk and return objectives, these strategies may be suitable for seeking greater participation in the price movements of the underlying securities or enhanced yield, perhaps with some element of capital preservation.

If we are correct, we would expect to see more numerous offerings of infrastructure-related private equity. These often have much longer than usual time commitments that are particularly appealing to public pension funds, but often not the desired tenor for private investors.

An increase in global infrastructure spending seems likely in coming years. A great deal is still to be determined in the political realm country by country, and with regard to the funding approach. This spending will not prevent cyclical ups and downs in economies overall. Investors may see the same in various infrastructure-related investment vehicles. However, the prognosis for increased investment in the sector is likely to reveal significant and lasting investment opportunities over time.

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1 Correlation measures how much two variables move together, where a reading of 1 = perfect correlation, 0 = no correlation and -1 = perfect negative correlation.
2 The Citi US Infrastructure Index is a composite of equities across sectors that are sensitive to infrastructure spending, chosen by Citi Research analysts.

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Glossary

Asset class definitions

Cash is represented by US 3-month Government Bond TR, measuring the US dollar-denominated active 3-Month, fixed-rate, nominal debt issues by the US Treasury.

Commodities asset class contains the index composites — GSCI Precious Metals Index, GSCI Energy Index, GSCI Industrial Metals Index, and GSCI Agricultural Index — measuring investment performance in different markets, namely precious metals (e.g., gold, silver), energy commodity (e.g., oil, coal), industrial metals (e.g., copper, iron ore), and agricultural commodity (i.e., soy, coffee) respectively. Reuters/Jeffries CRB Spot Price Index, the TR/CC CRB Excess Return Index, an arithmetic average of commodity futures prices with monthly rebalancing, is used for supplemental historical data.

Global Developed Market Corporate Fixed Income is composed of Bloomberg Barclays indices capturing investment debt from seven different local currency markets. The composite includes investment grade rated corporate bonds from the developed-market issuers.

Global Developed Market Equity is composed of MSCI indices capturing large-, mid- and small-cap representation across 23 individual developed-market countries, as weighted by the market capitalization of these countries. The composite covers approximately 95% of the free float-adjusted market capitalization in each country.

Global Developed Investment Grade Fixed Income is composed of Bloomberg Barclays indices capturing investment-grade debt from twenty different local currency markets. The composite includes fixed-rate treasury, government-related, and investment grade rated corporate and securitized bonds from the developed-market issuers. Local market indices for US, UK and Japan are used for supplemental historical data.

Global Developed Market Large-Cap Equity. The asset class is composed of MSCI indices capturing large cap representation across nine individual developed-market countries, as weighted by the market capitalization of these countries. The composite covers approximately 95% of the free float-adjusted market capitalization in each country.

Global Emerging Market Equity is composed of MSCI indices capturing large and mid-cap representation across 20 individual emerging-market countries. The composite covers approximately 85% of the free float-adjusted market capitalization in each country. For the purposes of supplemental long-term historical data, local-market country indices are used, wherever applicable.

Global Emerging Fixed Income is composed of Bloomberg Barclays indices measuring performance of fixed-rate local currency emerging markets government debt for 19 different markets across Latin America, EMEA and Asia regions. iBoxx ABF China Govt. Bond, the Markit iBoxx ABF Index comprising local currency debt from China, is used for supplemental historical data.

Global Equity is represented by the MSCI ACWI Index, capturing all sources of equity returns in 23 developed and 23 emerging markets.

Global Fixed Income is represented by the Bloomberg Barclays Multiverse Index, with returns hedged into US dollars.

Global High Yield Fixed Income is composed of Bloomberg Barclays indices measuring the non-investment grade, fixed-rate corporate bonds denominated in US dollars, British pounds and Euros. Securities are classified as high yield if the middle rating of Moody's, Fitch, and S&P is Ba1/BB+/BB+ or below, excluding emerging market debt. Ibbotson High Yield Index, a broad high yield index including bonds across the maturity spectrum, within the BB-B rated credit quality spectrum, included in the below-investment-grade universe, is used for supplemental historical data.

Hedge Funds is composed of investment managers employing different investment styles as characterized by different sub categories – HFRI Equity Long/Short: Positions both long and short in primarily equity and equity derivative securities; HFRI Credit: Positions in corporate fixed income securities; HFRI Event Driven: Positions in companies currently or prospectively involved in wide variety of corporate transactions; HFRI Relative Value: Positions based on a valuation discrepancy between multiple securities; HFRI Multi Strategy: Positions based on realization of a spread between related yield instruments; HFRI Macro: Positions based on movements in underlying economic variables and their impact on different markets; Barclays Trader CTA Index: The composite performance of established programs (Commodity Trading Advisors) with more than four years of performance history.

Private Equity characteristics are driven by those for Developed Market Small Cap Equities, adjusted for illiquidity, sector concentration, and greater leverage.

Real Estate contains index contains all Equity REITs (US REITs and publicly-traded real estate companies) not designated as Timber REITs or Infrastructure REITs: NAREIT US REIT Index, NAREIT Canada REIT Index, NAREIT UK REIT Index, NAREIT Switzerland REIT Index, NAREIT Euro-zone REIT Index, NAREIT Japan REIT Index, NAREIT Hong Kong REIT Index, NAREIT Singapore REIT Index, NAREIT Australia REIT Index

Index definitions

The Bloomberg-JPMorgan Asia Currency Index (ADXY) is a US dollar tradable index of emerging Asian currencies, which serves as a benchmark for monitoring Asia's currency markets on an aggregate basis. It is a spot index of emerging Asia's most actively traded currency pairs valued against the US dollar.

The Bloomberg Barclays Pan-European High Yield Index measures the market of non-investment grade, fixed-rate corporate bonds denominated in the following currencies: Euro, British pounds, Danish krone, Norwegian krone, Swedish krona, and Swiss franc. Inclusion is based on the currency of issue, and not the domicile of the issuer.

The Bloomberg Barclays US Corporate High Yield Total Return Index Value Unhedged USD is a Citi's Emerging Markets US Dollar Government Bond Index (EMUSDGBI) includes US Dollar-denominated emerging market sovereign debt issued in the global, Yankee, and Eurodollar markets. The index comprises debt of more than 50 countries from Latin America, Eastern Europe, Middle East, Africa, and Asia and offers geographical diversification without exposure to local currency fluctuations. The index provides exposure to a broad array of countries and sub-indices are available in any combination of country, maturity, and rating.

Citi's US High-Yield Market Index is a US dollar-denominated index which measures the performance of high-yield debt issued by corporations domiciled in the US or Canada. Recognized as a broad measure of the North American high-yield market amongst all Citi's fixed income indices, it includes cash-pay and deferred-interest securities. All the bonds are publically placed, have a fixed coupon, and are non-convertible.

Citi US Broad Investment Grade Index (USBIG)—Corporate, is a subsector of the USBIG. The index includes fixed rate US Dollar-denominated investment grade corporate debt within the finance, industrial and utility sectors. This index includes US and non-US corporate securities (excludes US government-guaranteed and non-US sovereign and provincial securities).

Commodity Index is the S&P Goldman Sachs Commodity Index (S&P GSCI), a composite index of commodity sector returns representing an unleveraged, long-only investment in commodity futures that is broadly diversified across the spectrum of commodities.

The CBOE Volatility Index (VIX) is a measure of expectations of near-term volatility based on S&P 500 stock index option prices.

Emerging market currencies are represented by the OITP (Other important trading partners) index is a weighted average of the foreign exchange values of the US dollar against a subset of currencies in the broad index that do not circulate widely outside the country of issue. The weights are derived by rescaling the currencies' respective weights in the broad index so that they sum to 1 in each sub-index.

European equities are represented by the MSCI Europe index, which captures large- and mid-cap representation across 15 Developed Markets (DM) countries in Europe. It covers approximately 85% of the free float-adjusted market capitalization across the European Developed Markets equity universe.

Gold is represented by the commodity futures price for gold.

The High Yield Energy Bond Price index measures the price performance of US bonds with ratings below investment grade comprising energy and natural resources industries.

Japan equities are represented by the MSCI Japan index, which is designed to measure the performance of the large- and mid-cap segments of the Japanese market. It covers approximately 85% of the free float-adjusted market capitalization in Japan.

LIBOR is a benchmark interest rate that some of the world's leading banks charge each other for short-term loans. It stands for London Interbank Offered Rate and serves as the first step to calculating interest rates on various loans throughout the world.

The MSCI All Country World Index represents 48 developed and emerging equity markets. Index components are weighted by market capitalization.

The MSCI Asia ex-Japan index has large and mid-cap representation across 2 of 3 Developed Markets countries and 8 Emerging Markets countries in Asia. It captures approximately 85% of the free float-adjusted market capitalization in each country.

The MSCI China index has large- and mid-cap representation across China H shares, B shares, Red chips and P chips. With 139 constituents, it covers about 85% of this China equity universe.

The MSCI Emerging Markets Index represents the performance of large- and mid-equities from 23 emerging countries, covering approximately 85% of the free float-adjusted market capitalization in each country.

The MSCI Emerging Markets (EM) Latin America Index captures large and mid cap representation across 5 Emerging Markets (EM) countries* in Latin America. With 121 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country.

The MSCI World Index represents the performance of more than 1,600 large- and mid-cap stocks across 23 developed markets countries. The index covers approximately 85% of the free float-adjusted market capitalization in each country.

The MSCI World ex-USA Index represents the performance of large- and mid-cap representation across 22 of 23 developed markets countries excluding the United States. With 1,005 constituents, the index covers approximately 85% of the free float-adjusted market capitalization in each country.

Oil is represented by the West Texas Intermediate Crude Oil price.

The Standard & Poor's 500 Index is a capitalization-weighted index that includes a representative sample of 500 leading companies in leading industries of the US economy. Although the S&P 500 focuses on the large cap segment of the market, with over 80% coverage of US equities, it is also an ideal proxy for the total market.

US Investment Grade Corporate Debt Total Return Index is an index made up of investment-grade debt issued by US companies, measured on a total return basis.

USD vs developed currencies is a broad weighted average index of the foreign exchange values of the US dollar against the currencies of a large group of major US trading partners.

USD vs emerging markets = The OITP (other important trading partners) index is a weighted average of the foreign exchange values of the US dollar against a subset of currencies in the broad index that do not circulate widely outside the country of issue.

Other terminology

Adaptive Valuations Strategies is Citi Private Bank's own strategic asset allocation methodology. It determines the suitable long-term mix of assets for each client's investment portfolio.

Correlation is a statistical measure of how two assets or asset classes move in relation to one another. Correlation is measured on a scale of 1 to -1. A correlation of 1 implies perfect positive correlation, meaning that two assets or asset classes move in the same direction all of the time. A correlation of -1 implies perfect negative correlation, such that two assets or asset classes move in the opposite direction to each other all the time. A correlation of 0 implies zero correlation, such that there is no relationship between the movements in the two over time.

The price-to-book ratio (P/B) compares the capitalization of an individual stock or of an index of stocks to the value of that stock or that index's combined shareholder capital. It is calculated by dividing the current closing price of the stock by the most recently reported book value per share. A low P/B can indicate a lowly-valued company or index, while a high P/B can indicate high valuation.

The price-earnings ratio (P/E) measures a company's or an index of companies' current share price relative to its earnings per share. A low P/E can indicate a lowly-valued company or index, while a high P/E can indicate high valuation.

Return on equity (ROE) is the amount of net income earned as a percentage of shareholders equity. It captures a company's profitability – or aggregate profitability among numerous companies – by showing how much profit is achieved with shareholders' capital.

Strategic asset allocation is the process of creating a long-term investment plan by assembling an appropriate mix of equities, fixed income, cash and other investments. It can potentially enhance portfolio returns and help manage risk.

Strategic Return Estimates are Citi Private Bank's forecast of returns for specific asset classes over a 10-year time horizon. The forecast for each specific asset class is made using a proprietary methodology that is appropriate for that asset class. Equity asset classes are forecast using a proprietary methodology based on the calculation of valuation levels with the assumption these valuation levels revert to their long-term trends over time. Fixed Income asset classes are forecast using a proprietary methodology based on current yield levels. Other asset classes have other specific forecasting methodologies. Please note that hedge funds, private equity, real estate, structured products and managed futures are generally illiquid investments and are subject to restrictions on transferability and resale. Each SRE is gross of actual client fees and expenses. Components of the methodology used to create the SREs include the rate of return for various asset classes based on indices. Termination and replacement of investments may subject investors to new or different charges. Past performance is not indicative of future results. Future rates of return cannot be predicted with certainty. Investments that pay higher rates of return are often subject to higher risk and greater potential loss in an extreme scenario. The actual rate of return on investments can vary widely over time, especially for long-term investments. This includes the potential loss of principal on your investment. It is not possible to invest directly in an index.

Tactical asset allocation looks to adjust the strategic asset allocation of a client's investment portfolio to incorporate shorter-term market insights.

Yield-to-Maturity (YTM) is the total return received on a bond or index of bonds when held to maturity. The total return includes both the payment of coupons and the return of the principal at maturity.

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Alternative investments referenced in this report are speculative and entail significant risks that can include losses due to leveraging or other speculative investment practices, lack of liquidity, volatility of returns, restrictions on transferring interests in the fund, potential lack of diversification, absence of information regarding valuations and pricing, complex tax structures and delays in tax reporting, less regulation and higher fees than mutual funds and advisor risk. Asset allocation does not assure a profit or protect against a loss in declining financial markets.

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Master Limited Partnership

- Energy Related MLPs May Exhibit High Volatility. While not historically very volatile, in certain market environments Energy Related MLPS may exhibit high volatility.
- Changes in Regulatory or Tax Treatment of Energy Related MLPs. If the IRS changes the current tax treatment of the master limited partnerships included in the Basket of Energy Related MLPs thereby subjecting them to higher rates of taxation, or if other regulatory authorities enact regulations which negatively affect the ability of the master limited partnerships to generate income or distribute dividends to holders of common units, the return on the Notes, if any, could be dramatically reduced.
- Concentration Risk. Investment in a basket of Energy Related MLPs may expose the investor to concentration risk due to industry, geographical, political, and regulatory concentration.
- The price and dividends paid by Energy Related MLPs may be affected by a number of factors, including:
- Worldwide and domestic supplies of, and demand for, crude oil, natural gas, natural gas liquids, hydrocarbon products and refined products;
- Changes in tax or other laws affecting MLPs generally;
- Regulatory changes affecting pipeline fees and other regulatory fees in the energy sector;
- The effects of political events and government regulation;
- The impact of direct government intervention, such as embargos;
- Changes in fiscal, monetary and exchange control programs:
- Changes in the relative prices of competing energy products;

- Changes in the output and trade of oil and other energy producers;
- Changes in environmental and weather conditions;
- The impact of environment laws and regulations and technological changes affecting the cost of producing and processing, and the demand for, energy products;
- Decreased supply of hydrocarbon products available to be processed due to fewer discoveries of new hydrocarbon reserves, short- or long-term supply distributions or otherwise;
- Risks of regulatory actions and/or litigation, including as a result of leaks, explosions or other accidents relating to energy products;
- Uncertainty or instability resulting from an escalation or additional outbreak of armed hostilities or further acts of terrorism in the United States or elsewhere;
- General economic and geopolitical conditions in the United States and worldwide.

Mortgage-backed securities ("MBS"), which include collateralized mortgage obligations ("CMOs"), also referred to as real estate mortgage investment conduits ("REMICs"), may not be suitable for all investors. There is the possibility of early return of principal due to mortgage prepayments, which can reduce expected yield and result in reinvestment risk. Conversely, return of principal may be slower than initial prepayment speed assumptions, extending the average life of the security up to its listed maturity date (also referred to as extension risk).

Additionally, the underlying collateral supporting non-Agency MBS may default on principal and interest payments. In certain cases, this could cause the income stream of the security to decline and result in loss of principal. Further, an insufficient level of credit support may result in a downgrade of a mortgage bond's credit rating and lead to a higher probability of principal loss and increased price volatility. Investments in subordinated MBS involve greater credit risk of default than the senior classes of the same issue. Default risk may be pronounced in cases where the MBS security is secured by, or evidencing an interest in, a relatively small or less diverse pool of underlying mortgage loans.

MBS are also sensitive to interest rate changes which can negatively impact the market value of the security. During times of heightened volatility, MBS can experience greater levels of illiquidity and larger price movements. Price volatility may also occur from other factors including, but not limited to, prepayments, future prepayment expectations, credit concerns, underlying collateral performance and technical changes in the market.

Please read offering documents and/or prospectus information carefully for the risks associated with the particular MBS security you are purchasing.