The liquidity trade-off

Short-term financial market worries should not deter investors from seeking the higher returns potentially available from long-term investments.

The current private-equity cycle is looking mature, with the valuation of many target companies at high levels.

We still see compelling reasons for investors willing to sacrifice some liquidity to add selective private equity and real estate investments.

In private equity, we favor collateralized asset lending to commercial real estate and medium-sized corporates and providing capital for business growth to financially healthy energy companies.

In real estate, we favor investing in prime logistics real estate in select European and Asian markets.

Visit our Outlook 2017 homepage

INVESTMENT PRODUCTS: NOT FDIC INSURED · NOT CDIC INSURED · NOT GOVERNMENT INSURED · NO BANK GUARANTEE · MAY LOSE VALUE

The liquidity trade-off

David Bailin, Global Head of Managed Investments
Steven Wieting, Global Chief Investment Strategist

Despite high, late-cycle valuations, we still see compelling reasons for selective investments in private equity and real estate.

Could the election of Donald Trump be positive for private equity investing? The possibility of tax reforms, reduced regulation, and greater credit availability would all be constructive. Among those he has nominated to serve his administration are corporate and private equity executives who might influence policy towards business in a favorable direction. So, even as the current private-equity cycle is looking mature – with the valuation of many target companies at high levels – we still see compelling reasons for investors willing to sacrifice some liquidity to add selective private equity investments.

The two primary reasons for holding illiquid investments such as private equity and real estate are the potential for diversification and return enhancement. Since the 2008 recession, both these asset classes have performed even more strongly than developed market equities and corporate fixed income.

What might the future hold for these illiquid asset classes? Our proprietary strategic asset allocation methodology estimates that Private Equity and Real Estate could deliver annualized returns over the next ten years of 12.2% and 10.7% respectively. By contrast, our return estimates for Global Developed Equity and Global Developed Investment Grade Fixed Income are 6.3% and 2.1% – **figures 1 and 2**.

Figure 1. Strategic Return Estimates

Asset class	SRE (%)
	Nov '16
Global Developed Equity	6.3
Global Developed Investment Grade Fixed Income	2.1
Private Equity	12.2
Real Estate	10.7

Source: Citi Private Bank Asset Allocation Team, preliminary estimates as of 30 Nov 2016. Returns estimated in US dollars; All estimates are expressions of opinion and are subject to change without notice and are not intended to be a guarantee of future events. Strategic Return Estimates are no guarantee of future performance. For further information, please consult Adaptive Valuation Strategies 2017, due for publication in Feb 2017.

Within Private Equity and Real Estate, we believe present conditions favor three particular areas where there may be strong risk-adjusted return opportunities. The first of these is a result of sustained dislocations in financial markets caused by regulatory changes and geopolitics. The second relates to temporary imbalances in the supply and demand for energy. And the third is being created by a long-term transformation in the delivery of goods to consumers. Besides the return environment that we envisage, we also expect managers to take creative approaches to the way they structure investments. For example, some private equity managers may be able to structure debt securities with equity-like return profiles or as preferred equity with warrants or performance optionality.

In order to take advantage of these opportunities, investors need to be comfortable with an average of seven years of illiquidity. That said, early realizations may return significant capital proceeds prior to the expiration of such investments' term.

In lieu of the banks

Global banks continue to face an increasingly uncertain global economy and pressure to deleverage in order to meet new regulatory requirements. In 2016, the market capitalization of developed economy banks has fallen by some US$430 billion, increasing the challenge of addressing banking system vulnerabilities, particularly for weaker European banks.[3] As a result, the private debt industry has nearly tripled in size since 2006, with assets under management increasing from US$152 billion to US$523 billion as of 30 September 2016.

Currently, we see an opportunity in collateralized asset lending to commercial real estate and medium-sized corporates. Manager investments in this sort of lending can take the form of whole loans or retained interests in transactions originated and underwritten directly by asset managers or banks.

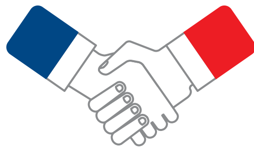
Diversification does not ensure against loss.

Figure 2. Illiquid asset classes' strategic return estimates

Source: Citi Private Bank, as of 30 Nov 2016. Strategic Return Estimates (SREs) are no guarantee of future performance. All estimates are expressions of opinion and are subject to change without notice and are not intended to be a guarantee of future events. Please see asset class glossary for full definitions of Private Equity, Real Estate, Developed Market Large-Cap Equity, and Developed Market Corporate Fixed Income. 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 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.

THE LIQUIDITY TRADE-OFF

Sacrificing liquidity for several years can help to target higher returns.



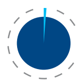
In lieu of the banks

Weaker European banks in particular are having to cut back their lending.

The private lending industry has nearly tripled to US$523 billion since 2006.[i]

We favor private equity investments that lend to commercial real estate and medium-sized corporates.

The energy recession



Annual oil demand could grow 1.2% a year through 2021.[ii]

Many upstream and midstream oil companies cannot access funding via the public markets.

We favor investing in private equity that lends to financially-healthy energy firms to finance growth.

E-commerce real estate

E-commerce firms are growing fast in many countries at the expense of traditional retailers.

They are taking up much more space to accommodate their supply chains: warehouses etc.

E-commerce is currently 20% of all new logistics leasing, up from less than 5% five years ago.[iii]

We see a potential opportunity in investing in prime logistics real estate in selected European and Asian markets.

Sources
i The International Monetary Fund Global Financial Stability Report, Oct 2016
ii Medium-Term Oil Market Report 2016, International Energy Agency, 2016
iii The Global E-Commerce Revolution, Prologis, Sept 2016

All forecasts are expressions of opinion and are subject to change without notice and are not intended to be a guarantee of future events. Past performance is no guarantee of future events. Real results may vary.

Disclosure: Strategies and investments mentioned in this document may not be suitable for all investors. Products, strategies and services discussed herein may have elegibility requirements that must be met prior to investing. Each investor should carefully view the risks associated with the investment and make a determination based upon the investor's own particular circumstances, that the investment is consistent with the investor's objectives.

The energy recession

The oil sector remains depressed. While energy prices have recovered from their most recent trough, West Texas Intermediate crude oil is currently hovering at around US$50 a barrel, more than 60% below its peak level of 2014. However, we see the long-term outlook for oil as positive. The International Energy Agency expects 1.2% annual demand growth through 2021 driven by emerging markets and faster overall global economic growth.[4] If this forecast proves correct, the world would consume 100.5 million barrels a day in 2020, well above current production levels of 96.4 million barrels a day. It is unlikely that global oil production will grow sufficiently to meet this demand unless oil prices rise.

We believe a potential opportunity lies in private equity managers providing capital for business growth to financially healthy energy companies that cannot access capital markets. High yield debt issuance in the energy sector peaked in 2014 at US$37 billion and was just US$0.2 billion through June 2016.[5] Public capital issuance by Master Limited Partnerships has decreased from US$67 billion in 2014 to US$15 billion through June 30, 2016.[6]

Given these dynamics, we favor investing in prime logistics real estate in select European and Asian markets.

E-commerce real estate

The internet has transformed many areas of real estate investment and management but nowhere as rapidly as in logistics and industrial buildings. The flipside of retail store closures in the United States is the growing need for sophisticated, 'just-in-time' supply chain warehouses – see **Transforming commerce: technology's creative destruction**. These include large logistics facilities adjacent to major cities, as well as smaller, local hubs, from which goods go on directly to consumers' addresses.

Prologis, a global industrial property developer, notes that e-commerce currently comprises 20% of all new logistics leasing, up from less than 5% five years ago.[7] In Europe, the logistics industry will require another 15 million square meters of space by 2021. In Asia, Cushman & Wakefield, a commercial real estate consultancy, says that the proliferation of mobile technology is driving e-commerce sales faster than anywhere in the world. For example, China's online retail sales of physical goods had increased 25.7% year-on-year by November 2016. Colliers, a real estate services adviser, predicts that new supply in Asia will not keep pace with accelerating demand until 2021 at the earliest.

Given these dynamics, we favor investing in prime logistics real estate in select European and Asian markets. This may enable investors to earn potentially higher returns with less risk than are available with comparable prime retail and office asset classes. In particular, we are attracted to properties whose size, layout and usage can be altered over time in order to seek to take advantage of robotics and other technological improvements – see **Transforming commerce: the robotics revolution**.

3 Source: The International Monetary Fund Global Financial Stability Report, October 2016
4 Source: Medium-Term Oil Market Report 2016, International Oil Market Agency, Dec 2016.
5 Source: Bank of America Merrill Lynch; UBS, as of 30 Jun 2016
6 Source: Credit Suisse, Bloomberg, Wells Fargo, Citi, as of 30 Jun 2016
7 Source: The Global E-Commerce Revolution, Prologis, September 2016

Products and strategies may not be suitable for all investors. Products and strategies discussed herein may have eligibility requirements that must be met prior to investing. Each investor should carefully view the risks associated with the investment and make a determination based upon the investor's own particular circumstances, that the investment is consistent with the investor's objective. Products and strategies described herein involve risk and may not perform as described.

An investment in alternative investments (Private Equity and Real Estate) can be highly illiquid, is speculative and not suitable for all investors. Investing in alternative investments (Private Equity and Real Estate) is for experienced and sophisticated investors who are willing to bear the high economic risks associated with such an investment. Investors should carefully review and consider potential risks before investing. Certain of these risks may include:

- loss of all or a substantial portion of the investment due to leveraging, short-selling, or other speculative practices;
- lack of liquidity in that there may be no secondary market for the fund and none is expected to develop;
- volatility of returns;
- restrictions on transferring interests in the Fund;
- potential lack of diversification and resulting higher risk due to concentration of trading authority when a single advisor is utilized;
- absence of information regarding valuations and pricing;
- complex tax structures and delays in tax reporting;
- less regulation and higher fees than mutual funds; and
- manager risk. Individual funds will have specific risks related to their investment programs that will vary from fund to fund.

All forecasts are expressions of opinion and are subject to change without notice and are not intended to be a guarantee of future events.

Actual results may differ materially from the forecasts/estimates. Views, opinions and trends expressed within this article are subject to change without prior notice and are expressed solely as general market commentary and do not constitute investment advice and may differ from the opinions expressed by other Citi businesses or affiliates.

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.

Disclosures

In any instance where distribution of this communication ("Communication") is subject to the rules of the US Commodity Futures Trading Commission ("CFTC"), this communication constitutes an invitation to consider entering into a derivatives transaction under US CFTC Regulations §§ 1.71 and 23.605, where applicable, but is not a binding offer to buy/sell any financial instrument.

This Communication is prepared by Citi Private Bank ("CPB"), a business of Citigroup Inc. ("Citigroup"), which provides its clients access to a broad array of products and services available through Citigroup, its bank and non-bank affiliates worldwide (collectively, "Citi"). Not all products and services are provided by all affiliates, or are available at all locations.

This Communication is provided for information and discussion purposes only, at the recipient's request. The recipient should notify CPB immediately should it at any time wish to cease being provided with such information. Unless otherwise indicated, any reference to a research report or research recommendation is not intended to represent the whole report and is not in itself considered a recommendation or research report.

This Communication is provided for information and discussion purposes only, at the recipient's request. The recipient should notify CPB immediately should it at any time wish to cease being provided with such information. Unless otherwise indicated, (i) it does not constitute an offer or recommendation to purchase or sell any security, financial instrument or other product or service, or to attract any funding or deposits, and (ii) it does not constitute a solicitation if it is not subject to the rules of the CFTC (but see discussion above regarding communication subject to CFTC rules) and (iii) it is not intended as an official confirmation of any transaction.

Unless otherwise expressly indicated, this Communication does not take into account the investment objectives, risk profile or financial situation of any particular person and as such, investments mentioned in this document may not be suitable for all investors. Citi is not acting as an investment or other advisor, fiduciary or agent. The information contained herein is not intended to be an exhaustive discussion of the strategies or concepts mentioned herein or tax or legal advice. Recipients of this Communication should obtain advice based on their own individual circumstances from their own tax, financial, legal and other advisors about the risks and merits of any transaction before making an investment decision, and only make such decisions on the basis of their own objectives, experience, risk profile and resources.

The information contained in this Communication is based on generally available information and, although obtained from sources believed by Citi to be reliable, its accuracy and completeness cannot be assured, and such information may be incomplete or condensed. Any assumptions or information contained in this Communication constitute a judgment only as of the date of this document or on any specified dates and is subject to change without notice. Insofar as this Communication may contain historical and forward looking information, **past performance is neither a guarantee nor an indication of future results,** and future results may not meet expectations due to a variety of economic, market and other factors. Further, any projections of potential risk or return are illustrative and should not be taken as limitations of the maximum possible loss or gain. Any prices, values or estimates provided in this Communication (other than those that are identified as being historical) are indicative only, may change without notice and do not represent firm quotes as to either price or size, nor reflect the value Citi may assign a security in its inventory. Forward looking information does not indicate a level at which Citi is prepared to do a trade and may not account for all relevant assumptions and future conditions. Actual conditions may vary substantially from estimates which could have a negative impact on the value of an instrument.

Views, opinions and estimates expressed herein may differ from the opinions expressed by other Citi businesses or affiliates, and are not intended to be a forecast of future events, a guarantee of future results, or investment advice, and are subject to change without notice based on market and other conditions. Citi is under no duty to update this document and accepts no liability for any loss (whether direct, indirect or consequential) that may arise from any use of the information contained in or derived from this Communication.

Investments in financial instruments or other products carry significant risk, including the possible loss of the principal amount invested. Financial instruments or other products denominated in a foreign currency are subject to exchange rate fluctuations, which may have an adverse effect on the price or value of an investment in such products. This Communication does not purport to identify all risks or material considerations which may be associated with entering into any transaction.

Structured products can be highly illiquid and are not suitable for all investors. Additional information can be found in the disclosure documents of the issuer for each respective structured product described herein. Investing in structured products is intended only for experienced and sophisticated investors who are willing and able to bear the high economic risks of such an investment. Investors should carefully review and consider potential risks before investing.

OTC derivative transactions involve risk and are not suitable for all investors. Investment products are not insured, carry no bank or government guarantee and may lose value. Before entering into these transactions, you should: (i) ensure that you have obtained and considered relevant information from independent reliable sources concerning the financial, economic and political conditions of the relevant markets; (ii) determine that you have the necessary knowledge, sophistication and experience in financial, business and investment matters to be able to evaluate the risks involved, and that you are financially able to bear such risks; and (iii) determine, having considered the foregoing points, that capital markets transactions are suitable and appropriate for your financial, tax, business and investment objectives.

This material may mention options regulated by the US Securities and Exchange Commission. Before buying or selling options you should obtain and review the current version of the Options Clearing Corporation booklet, Characteristics and Risks of Standardized Options. A copy of the booklet can be obtained upon request from Citigroup Global Markets Inc., 390 Greenwich Street, 3rd Floor, New York, NY 10013 or by clicking the following link,

http://www.theocc.com/components/docs/riskstoc.pdf or
http://www.theocc.com/components/docs/about/publications/november_2012_supplement.pdf

If you buy options, the maximum loss is the premium. If you sell put options, the risk is the entire notional below the strike. If you sell call options, the risk is unlimited. The actual profit or loss from any trade will depend on the price at which the trades are executed. The prices used herein are historical and may not be available when you order is entered. Commissions and other transaction costs are not considered in these examples. Option trades in general and these trades in particular may not be appropriate for every investor. Unless noted otherwise, the source of all graphs and tables in this report is Citi. Because of the importance of tax considerations to all option transactions, the investor considering options should consult with his/her tax advisor as to how their tax situation is affected by the outcome of contemplated options transactions.

None of the financial instruments or other products mentioned in this Communication (unless expressly stated otherwise) is (i) insured by the Federal Deposit Insurance Corporation or any other governmental authority, or (ii) deposits or other obligations of, or guaranteed by, Citi or any other insured depository institution.

Citi often acts as an issuer of financial instruments and other products, acts as a market maker and trades as principal in many different financial instruments and other products, and can be expected to perform or seek to perform investment banking and other services for the issuer of such financial instruments or other products. The author of this Communication may have discussed the information contained therein with others within or outside Citi, and the author and/ or such other Citi personnel may have already acted on the basis of this information (including by trading for Citi's proprietary accounts or communicating the information contained herein to other customers of Citi). Citi, Citi's personnel (including those with whom the author may have consulted in the preparation of this communication), and other customers of Citi may be long or short the financial instruments or other products referred to in this Communication, may have acquired such positions at prices and market conditions that are no longer available, and may have interests different from or adverse to your interests.

IRS Circular 230 Disclosure: Citi and its employees are not in the business of providing, and do not provide, tax or legal advice to any taxpayer outside Citi. Any statement in this Communication regarding tax matters is not intended or written to be used, and cannot be used or relied upon, by any taxpayer for the purpose of avoiding tax penalties. Any such taxpayer should seek advice based on the taxpayer's particular circumstances from an independent tax advisor.

Neither Citi nor any of its affiliates can accept responsibility for the tax treatment of any investment product, whether or not the investment is purchased by a trust or company administered by an affiliate of Citi. Citi assumes that, before making any commitment to invest, the investor and (where applicable, its beneficial owners) have taken whatever tax, legal or other advice the investor/beneficial owners consider necessary and have arranged to account for any tax lawfully due on the income or gains arising from any investment product provided by Citi.

This Communication is for the sole and exclusive use of the intended recipients, and may contain information proprietary to Citi which may not be reproduced or circulated in whole or in part without Citi's prior consent. The manner of circulation and distribution may be restricted by law or regulation in certain countries. Persons who come into possession of this document are required to inform themselves of, and to observe such restrictions. Citi accepts no liability whatsoever for the actions of third parties in this respect. Any unauthorized use, duplication, or disclosure of this document is prohibited by law and may result in prosecution.

In Hong Kong, this document is issued by CPB operating through Citibank, N.A., Hong Kong branch, which is regulated by the Hong Kong Monetary Authority. Any questions in connection with the contents in this document should be directed to registered or licensed representatives of the aforementioned entity.

In Singapore, this document is issued by CPB operating through Citibank, N.A., Singapore branch, which is regulated by the Monetary Authority of Singapore. Any questions in connection with the contents in this document should be directed to registered or licensed representatives of the aforementioned entity.

Citibank N.A., London Branch (registered branch number BR001018), Citigroup Centre, Canada Square, Canary Wharf, London, E14 5LB, is authorised and regulated by the Office of the Comptroller of the Currency (USA) and authorised by the Prudential Regulation Authority. Subject to regulation by the Financial Conduct Authority and limited regulation by the Prudential Regulation Authority. Details about the extent of our regulation by the Prudential Regulation Authority are available from us on request. The contact number for Citibank N.A., London Branch is +44 (0)20 7508 8000.

Citibank Europe plc is authorised by the Central Bank of Ireland and by the Prudential Regulation Authority. It is subject to supervision by the Central Bank of Ireland, and subject to limited regulation by the Financial Conduct Authority and the Prudential Regulation Authority. Details about the extent of our authorisation and regulation by the Prudential Regulation Authority, and regulation by the Financial Conduct Authority are available from us on request.

Citibank Europe plc, UK Branch is registered as a branch in the register of companies for England and Wales with registered number BR017844. Its registered address is Citigroup Centre, Canada Square, Canary Wharf, London E14 5LB. VAT No.: GB 429 6256 29. Citibank Europe plc is registered in Ireland with number 132781, with its registered office at 1 North Wall Quay, Dublin 1. Citibank Europe plc is regulated by the Central Bank of Ireland. Ultimately owned by Citigroup Inc., New York, USA.

Citibank (Switzerland) AG, Prime Tower, Hardstrasse 201, P.O. Box, 8010 Zurich, is authorized and regulated by FINMA.

Citibank NA Sioux Falls, Geneva Branch, 16 Quai du General Guisan, PO Box 3946, CH-1211 Geneva 3 is authorized and regulated by FINMA.

Citibank NA Sioux Falls, Zurich Branch, Prime Tower, Hardstrasse 201, P.O. Box, 8010 Zurich is authorized and regulated by FINMA.

In Jersey, this document is communicated by Citibank N.A., Jersey Branch which has its registered address at PO Box 104, 38 Esplanade, St Helier, Jersey JE4 8QB. Citibank N.A., Jersey Branch is regulated by the Jersey Financial Services Commission. Citibank N.A. Jersey Branch is a participant in the Jersey Bank Depositors Compensation Scheme. The Scheme offers protection for eligible deposits of up to £50,000. The maximum total amount of compensation is capped at £100,000,000 in any 5 year period. Full details of the Scheme and banking groups covered are available on the States of Jersey website www.gov.je/dcs, or on request.

In the United Arab Emirates and Bahrain Citi Private Bank operates as part of Citibank, N.A.

In South Africa, Financial Service Provider, FSP 30513.

In Canada, Citi Private Bank is a division of Citibank Canada, a Schedule II Canadian chartered bank. Certain investment products are made available through Citibank Canada Investment Funds Limited ("CCIFL"), a wholly owned subsidiary of Citibank Canada. Investment Products are subject to investment risk, including possible loss of principal amount invested. Investment Products are not insured by the CDIC, FDIC or depository insurance regime of any jurisdiction and are not guaranteed by Citigroup or any affiliate thereof.

This document is for information purposes only and does not constitute an offer to sell or a solicitation of an offer to buy any securities to any

person in any jurisdiction. The information set out herein may be subject to updating, completion, revision, verification and amendment and such information may change materially.

Citigroup, its affiliates and any of the officers, directors, employees, representatives or agents shall not be held liable for any direct, indirect, incidental, special, or consequential damages, including loss of profits, arising out of the use of information contained herein, including through errors whether caused by negligence or otherwise.
CCIFL is not currently a member, and does not intend to become a member of the Mutual Fund Dealers Association of Canada ("MFDA"); consequently, clients of CCIFL will not have available to them investor protection benefits that would otherwise derive from membership of CCIFL in the MFDA, including coverage under any investor protection plan for clients of members of the MFDA.

Citi Private Bank is a business of Citigroup Inc. ("Citigroup"), which provides its clients access to a broad array of products and services available through bank and nonbank affiliates of Citigroup. Not all products and services are provided by all affiliates or are available at all locations. In the US, brokerage products and services are provided by Citigroup Global Markets Inc. ("CGMI") member SIPC. Accounts carried by Pershing LLC, member FINRA, NYSE, SIPC. CGMI and Citibank, N.A. are affiliated companies under the common control of Citigroup. Outside the US, brokerage products and services are provided by other Citigroup affiliates. Investment Management services (including portfolio management) are available through CGMI, Citibank, N.A. and other affiliated advisory businesses.

Citi Trust is the business name for a wide range of personal trust and estate management and related services provided by Citigroup Inc. or its affiliates to individuals, families and charitable entities throughout the world. Not all products and services are provided by all affiliates or are available at all locations. For US clients, trust services are provided by one of the following entities: Citibank, N.A., Citicorp Trust South Dakota or Citicorp Trust Delaware, N.A. For clients who are neither residents nor citizens of the US, trust services are provided by one of the following entities: Cititrust Private Trust (Cayman) Limited, Cititrust Private Trust Zurich GmbH, Cititrust (Bahamas) Limited, Cititrust (Cayman) Limited, Cititrust (Jersey) Limited, Cititrust (Singapore) Limited, Cititrust (Switzerland) Limited or Citicorp Trust Delaware, N.A. The service providers are referred to collectively as Citi Trust. Cititrust (Jersey) Limited, whose contact details are P.O. Box 728, 38 Esplanade, St. Helier, Jersey JE4 8ZT, Channel Islands, telephone number +44 1534 608000, is licensed by the Jersey Financial Services Commission for the conduct of Trust Company Business.

The views expressed in this document by the Global Investment Committee do not constitute research, investment advice or trade recommendations, and are not tailored to meet the individual investment circumstances or objectives of any investor. Recipients of this document should not rely on the views expressed or the information included in this document as the primary basis for any investment decision. Investors are urged to consult with their financial advisors before buying or selling securities.

Bonds are affected by a number of risks, including fluctuations in interest rates, credit risk and prepayment risk. In general, as prevailing interest rates rise, fixed income securities prices will fall. Bonds face credit risk if a decline in an issuer's credit rating, or creditworthiness, causes a bond's price to decline. High yield bonds are subject to additional risks such as increased risk of default and greater volatility because of the lower credit quality of the issues. Finally, bonds can be subject to prepayment risk. When interest rates fall, an issuer may choose to borrow money at a lower interest rate, while paying off its previously issued bonds. As a consequence, underlying bonds will lose the interest payments from the investment and will be forced to reinvest in a market where prevailing interest rates are lower than when the initial investment was made.

International investing may not be for everyone. There may be additional risk associated with international investing, including foreign, economic, political, monetary and/or legal factors, changing currency exchange rates, foreign taxes, and differences in financial and accounting standards. The possibility that adverse political events, financial problems, or natural disasters in a country or region will cause investments in that country or region to lose value. The risks of investing in emerging or developing markets can be substantially greater than the risks of investing in developed markets.

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.

REITS

REITs are subject to special risk considerations similar to those associated with the direct ownership of real estate. Real estate valuations may be subject to factors such as changing general and local economic, financial, competitive, and environmental conditions. REITs may not be suitable for every investor. Dividend income from REITs will generally not be treated as qualified dividend income and therefore will not be eligible for reduced rates of taxation. There may be additional risk associated with international investing, including foreign, economic, political, monetary and/or legal factors, changing currency exchange rates, foreign taxes, and differences in financial and accounting standards.

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.

© 2017 Citigroup Inc. All Rights Reserved. Citi, Citi and Arc Design and other marks used herein are service marks of Citigroup Inc. or its affiliates, used and registered throughout the world.