



BRUCE D. PHELPS
PGIM IAS



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QMA & PGIM Institutional Advisory & Solutions (IAS)
Institutional Investing in Real Assets
APRIL 2020

Real Assets Research

- Institutional investors have **increased allocations**:
 - Meet investment objectives like
 - Diversification;
 - Inflation protection; or
 - Growth protection

- Need for **dedicated research**:
 - The term “real assets” is broadly applied – need for more detailed analysis
 - New real asset classes have recently emerged
 - How to construct a real assets portfolio to target an investment objective?

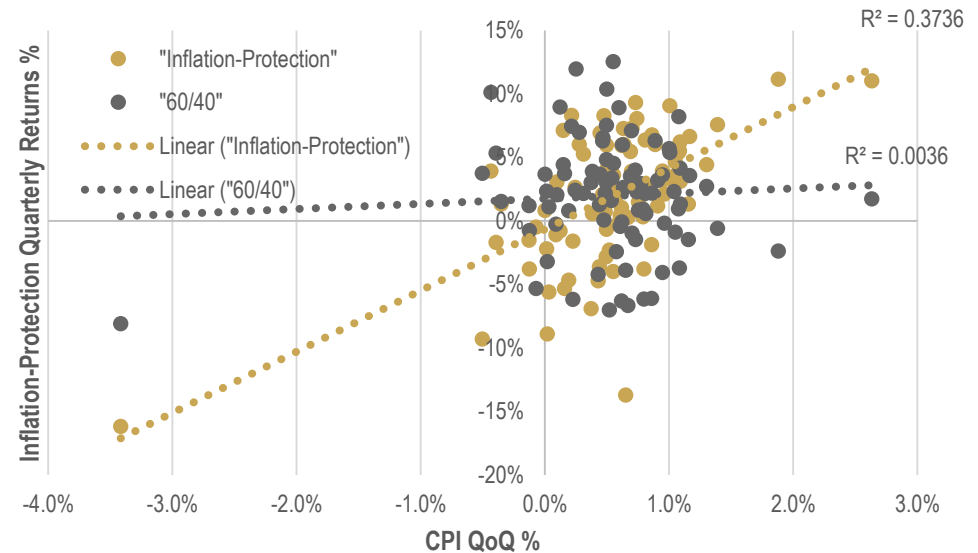
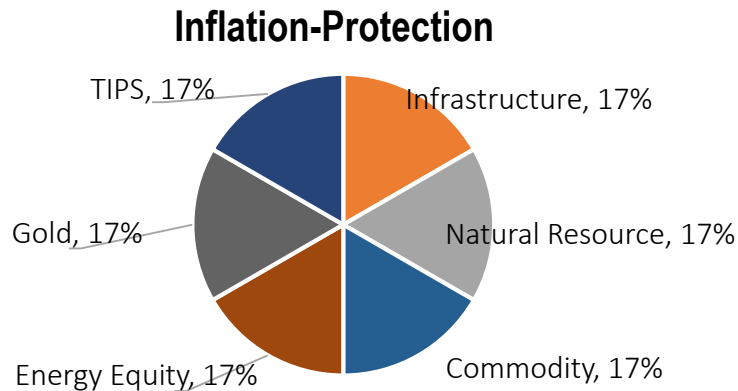
Some Key Findings

- There is **diversity across real assets** in their sensitivities to market and macroeconomic factors
 - Accounting for real assets sensitivity differences in portfolio construction is key for a CIO
 - Depending on the investment objective, the composition of a real asset portfolio can vary significantly

- A CIO's **investment horizon is important** when identifying a role for real assets
 - For example, Gold can serve different portfolio roles depending on the horizon

Constructing a Real Asset Portfolio – Inflation Protection

Inflation-Protection Strategy – performs when actual/unexpected inflation is high; public pension plans with COLAs

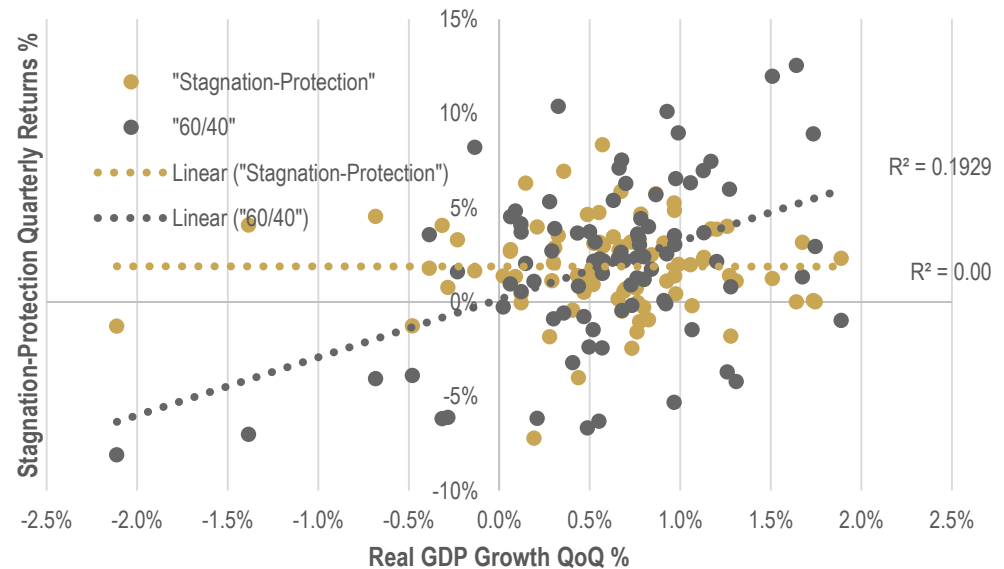
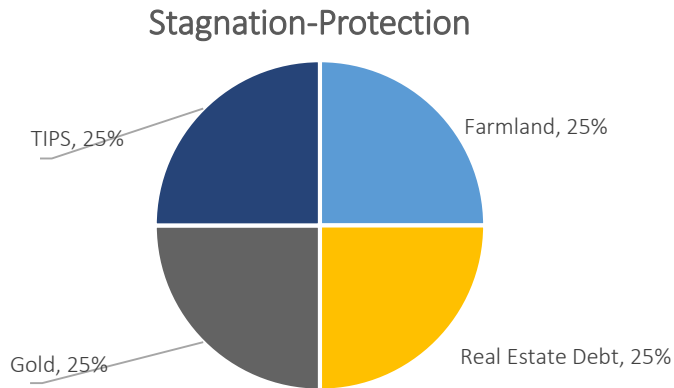


Note: Portfolios are rebalanced annually. Totals may not add to 100% due to rounding. Hypothetical example provided for illustrative purposes only. See additional disclosures.

Source: PGIM IAS, as of 30 June 2017.

Constructing a Real Asset Portfolio – Stagnation Protection

Stagnation-Protection Strategy – performs when growth is below average; corporate pension plans managing surplus risk

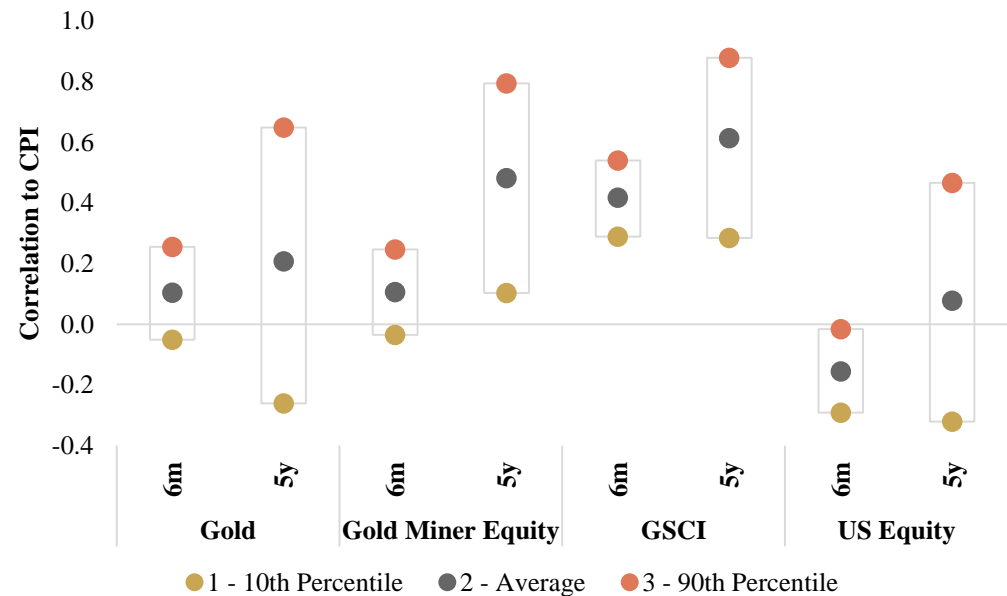


Note: Portfolios are rebalanced annually. Totals may not add to 100% due to rounding. Hypothetical example provided for illustrative purposes only. See additional disclosures.

Source: PGIM IAS, as of 30 June 2017.

Aligning Real Assets with Investment Horizon – e.g., Gold

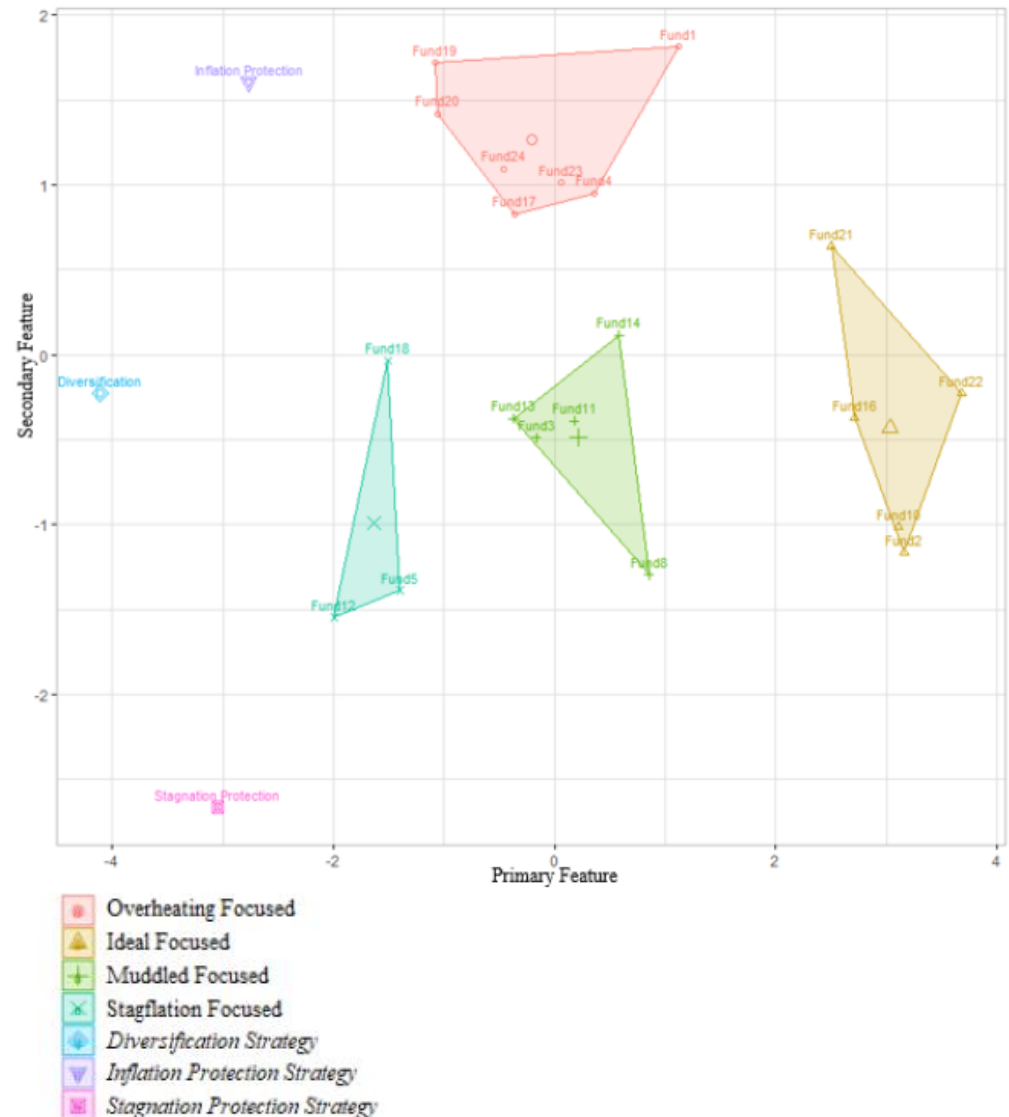
- Gold's correlations with asset classes and inflation and growth vary with horizon
- Portfolio construction should account for this uncertainty
- Gold has a role as both hedge against inflation and economic slowdown
- However, allocations differ with the investor's horizon



Note: For illustration purposes only. Source: PGIM IAS, as of 1/31/2019.

Portfolio Level Analysis – What’s in Your Real Asset Portfolio?

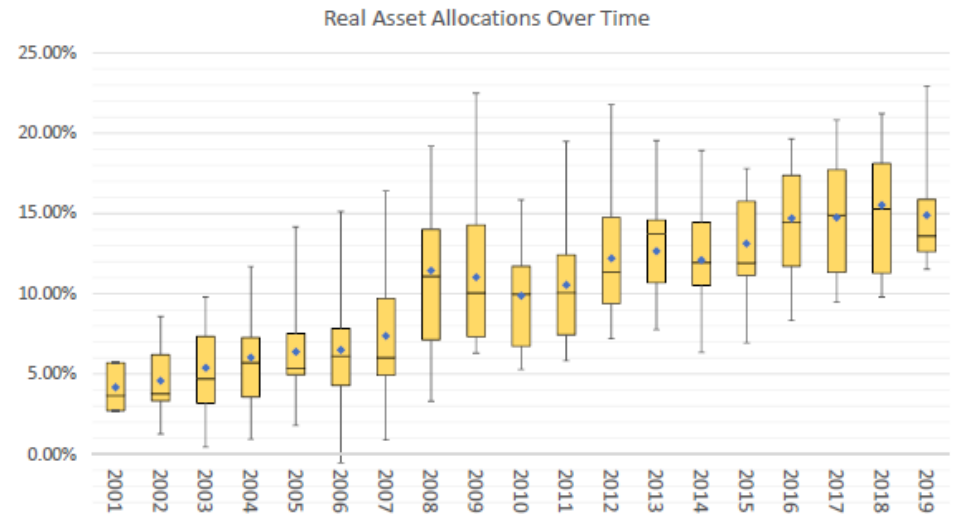
- There is wide disparity across institutional-quality liquid real asset funds
- CIOs might question how to discriminate among them?
- Which fund best aligns with their investment objective?
- RASA sensitivities can help



Note: For illustration purposes only.
Source: PGIM IAS, as of 8/31/2019.

Trends in Real Asset Investing – Peer Group Comparisons

- How are my CIO peers investing in real assets?; and how have these allocations changed over time?
- How is the composition of the real asset linked to a plan’s characteristics?
- We survey 15 large public pension plan annual financial reports and holdings



Note: For illustration purposes only.
Source: PGIM IAS, as of 6/30/2019.

Real Assets Performance: MTD and YTD (4/21/2020)

	YTD	March 2020
S&P 500 Index	-15.3%	-12.5%
US Aggregate Index*	5.5%	-0.6%
US Dollar Index	4.0%	0.9%
Stagnation Protection Portfolio	3.2%	-1.6%
Gold Index	10.6%	1.6%
TIPS Index	3.8%	-1.8%
Farmland REIT Index	-5.2%	-3.3%
CMBS (ERISA Eligible) Index	3.6%	-3.1%
Timberland REIT Index	-30.8%	-14.0%
Commodities Index	-26.2%	-12.8%
Natural Resource Equities Index	-30.5%	-18.1%
REITs Index	-26.5%	-22.6%
Infrastructure Equities Index	-14.2%	-13.1%
MLP Index	-44.8%	-44.3%
Infrastructure Debt Index	-2.9%	-10.6%

Past performance is not a guarantee or a reliable indicator of future results. All investments involve risk, including the possible loss of capital. Note: Data as of 4/21/2020; Stagnation Protection Portfolio is an average of Gold, TIPS, Farmland and CMBS index returns. Timberland REIT index performance is an average of 3 timberland REITs returns and Farmland REIT index performance is an average of 2 farmland REITs returns. Source: PGIM IAS, Datastream. *Full index name: Bloomberg Barclays US Aggregate Bond Index

Differences at Sector Level

- Brownfield infrastructure (airports - 37.1% YTD, seaports and toll roads) impacted
- Communications infrastructure capex increased with rise in data demand/network traffic (11.5% YTD)
- REITs (overall → -27% YTD)
 - Specialty (incl. data centers) → 3.8% YTD
 - Industrial REITs (incl. include warehouses) → -4.3% YTD

Infra	Toll Roads Index	Airports Index	Ports Index	Water Index	Oil/Gas Storage & Transport Index	Communications Index	Electricity Transmission & Distribution Index
YTD	-21.9%	-37.1%	-31.8%	-6.1%	-21.7%	11.5%	-4.6%
March 2020	-23.9%	-32.3%	-24.6%	-6.3%	-20.8%	-3.0%	-5.8%

REIT	Diversified Index	Office Index	Industrial Index	Residential Index	Retail Index	Specialty Index	Mortgage Index
YTD	-35.7%	-30.3%	-4.3%	-21.5%	-46.8%	3.8%	-30.3%
March 2020	-31.3%	-23.9%	-7.1%	-21.1%	-38.9%	-2.0%	-38.9%

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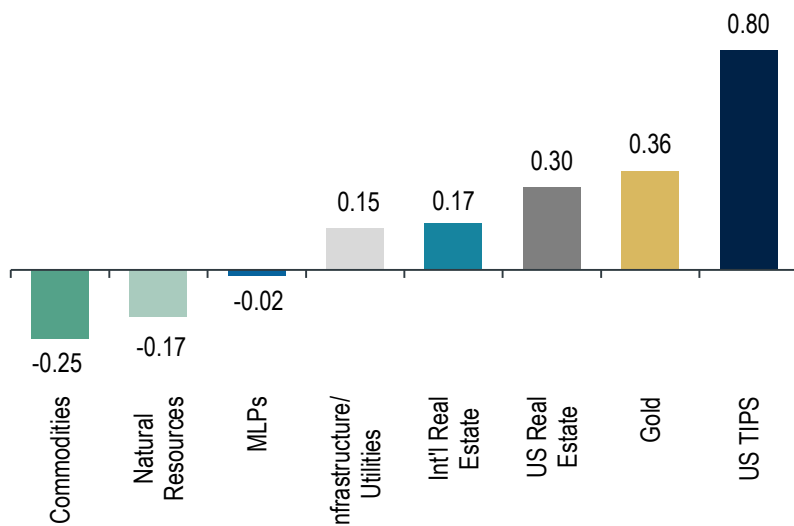
Note: YTD Data as of 4/21/2020. Source: PGIM IAS, Datastream, MSCI (REIT Data), DJ Brookfield (Infrastructure Data). For illustrative purposes. The information shown is subject to change.

Global Multi-Asset Solutions: Philosophy

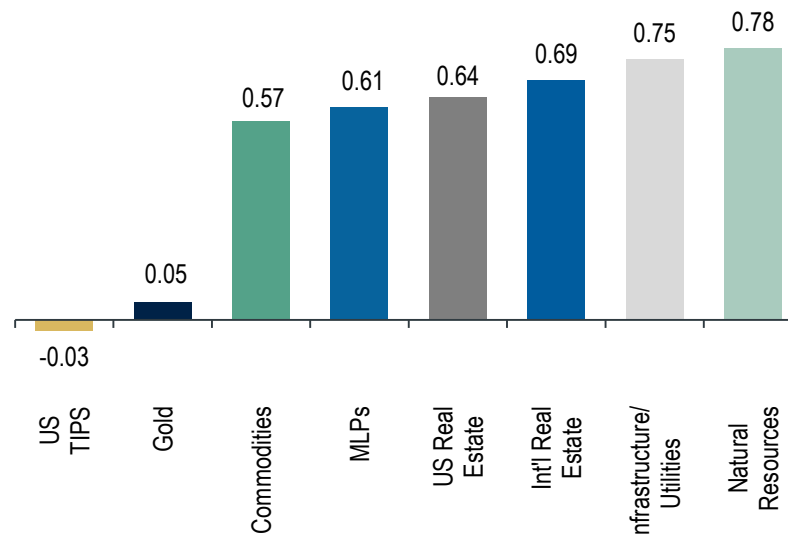
Real assets may provide long-term positive real returns, diversification to traditional assets, and a potential hedge against rising interest rates and inflation

- Investor risk appetite can have a significant impact on the risk adjusted performance of an asset class
- Quantitative techniques can be used to identify and capitalize on these opportunities
- Seasoned judgment provides key dimension of expertise

Correlation to Bloomberg Barclays US Aggregate Bond Index



Correlation to S&P 500 Index

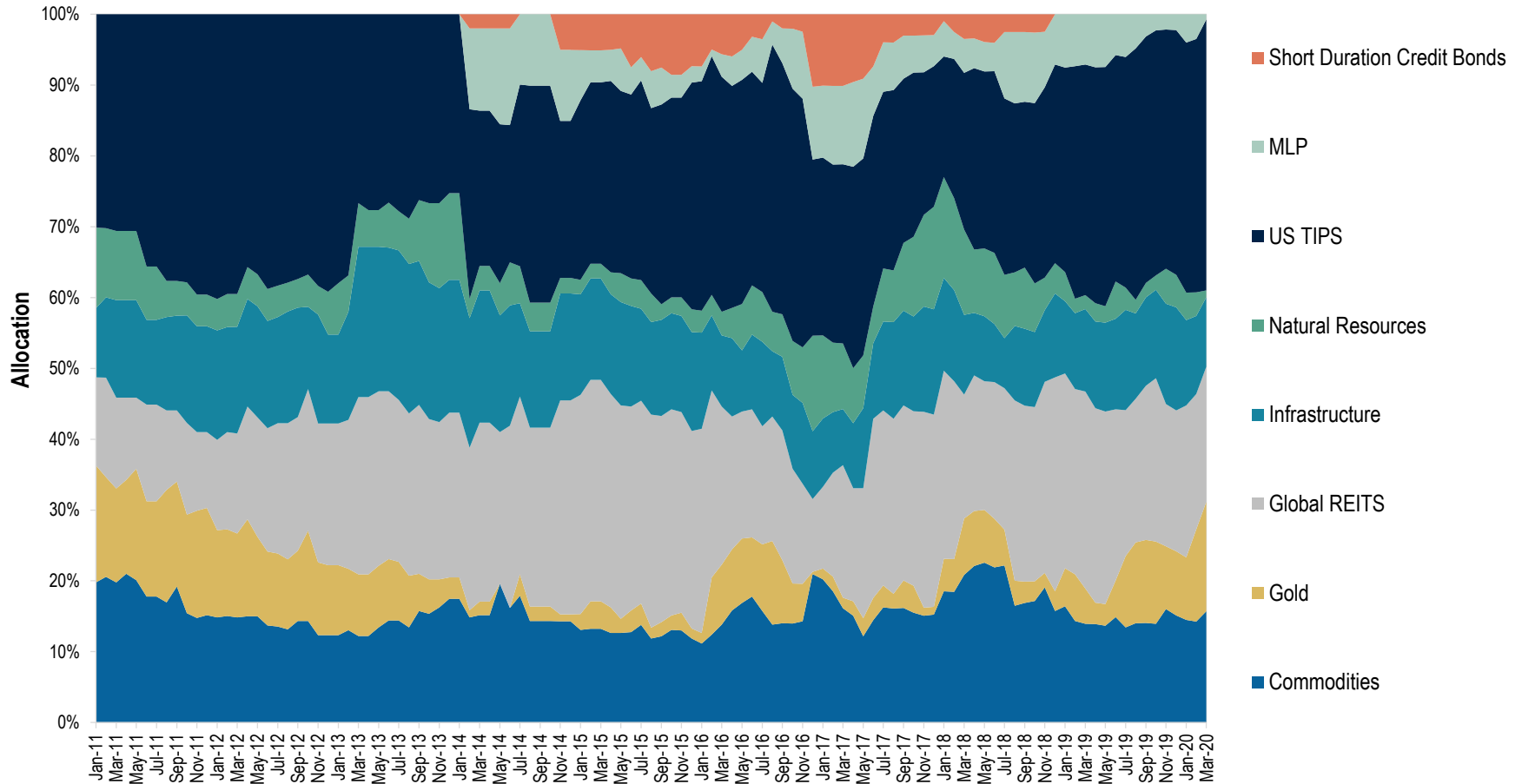


Source: QMA. Calculated by eVestment using data presented in eVestment and Morningstar software products. Time period: 12/31/2010 to 12/31/2019. In this table, real assets are represented by these indexes: S&P GSCI® Index (commodities), S&P Global Natural Resources (natural resources), S&P Global Infrastructure Index (infrastructure), FTSE NAREIT All Equity REITs Index (US real estate), S&P Developed ex-US Property Index (international real estate), LBMA Gold Price PM Index (gold), Bloomberg Barclays US TIPS Index (US TIPS), and Alerian MLP Index (MLPs). The indexes used for illustrative purposes only. All indexes are unmanaged. An investment cannot be made in an index. Past performance does not guarantee future results. Diversification does not assure a profit or protect against a loss in declining markets.

PGIM Real Assets Strategy Allocations

Sample Allocations

1/1/2011 – 3/31/2020



Source: QMA - Provided for discussion purposes only. Does not constitute a recommendation regarding the merits of any investments. Does not constitute investment advice and should not be used as the basis for any investment decision. Does not constitute a representation that any of the investments referenced or that any such investments would be profitable. Past performance is not a guarantee or a reliable indicator of future results. Allocations are subject to change. Please see Notice for important disclosures regarding the information contained herein.

IAS Real Asset Research Program

- **Research Papers**

- *“The Diversity of Real Assets: Portfolio Construction for Institutional Investors” (June 2019)*
- *“Institutional Gold!” (November 2019)*
- *“What’s in Your Real Asset Portfolio? Introducing RASA™” (forthcoming)*
- *“Real Asset Investing: Comparison Across Public Plans” (forthcoming)*

- **Real Asset Webinars**

- Quarterly series with real assets subject matter experts (e.g., farmland, permanent crops; oil)

- **Real Assets Blog (on LinkedIn)**

- Commentary on developments in real asset markets
- Analysis of industry and academic research publications
- Performance dashboard for various real assets strategies

- Visit us at

- <https://www.pgim.com/insights/real-assets> and <https://www.pgim.com/ias>

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