

Global Invested Capital Market

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Key Points

- The concept of a *world market portfolio* plays an important role in many financial theories and models
- Knowledge of each asset's share of the invested capital markets is both useful information and a good starting point for investors considering the appropriate allocation to the asset
- We estimate, primarily using established market indices, the total size of the global invested capital market from an **U.S. investor** perspective to be **USD \$101.1 trillion** at the end of June 30, 2013
- We also illustrate the historical growth and composition of global invested capital markets since 2004

Introduction

The concept of a *world market portfolio* features prominently in many financial theories and models and serves as an important foundation of our asset allocation work for our clients. The world market portfolio is the collection of all assets available to investors in proportion to their relative market value. Information about the market portfolio therefore:

- Describes the aggregate portfolio of all investors
- Describes the investment opportunity set
- Can serve as a neutral or starting point when establishing long-term asset allocation policies based on circumstances and objectives (e.g., risk, liquidity, time horizon), or views driven by information better than everyone else's (e.g., long-term capital market forecasts, medium-term views)
- Can serve as a benchmark for strategic asset allocation

Finance theory states that the market portfolio is the optimal portfolio (in terms of risk-return trade-off) and should be the portfolio of choice for a truly passive investor¹. In other words, if an investor had the same risk tolerance, liquidity needs, views, skill, etc. as the aggregate global investor, then their portfolio might look like the world market portfolio. However, in reality, investors actively choose allocations that deviate from the market portfolio based on their views and/or circumstances. **As such, our asset allocation advice is customized according to these characteristics and/or circumstances.** Table 1 below provides some illustrative examples of deviations from the market portfolio and their rationale:

¹This does not imply that the market portfolio has been the optimal portfolio in practice. Asness, Frazzini and Pedersen (2012) indicate that assuming leverage aversion, the tangency portfolio formed on the idea of risk parity between asset classes leads to a higher risk-adjusted return than the market portfolio.

Table 1

| Active Investment Decisions | Rationale |
|---|---|
| Greater allocation to return-seeking assets than market (aggregate portfolio risk level different from world market) | Risk tolerance of investor not necessarily the same as aggregate global investor |
| Some of world market portfolio excluded from investor portfolio (e.g., private equity, real estate, emerging market debt, etc.) | Liquidity issues associated with need for daily valuation, limited availability of passively managed vehicles |
| Small capitalization and value tilts in domestic equity | View that a risk-adjusted return premium exists in value and small-capitalization stocks |
| Home country bias in public equity | View that domestic equity outperforms foreign equity, liabilities denominated in domestic currency |

Our investment belief is that clients who access the full global opportunity set improve portfolio diversification and efficiency. As such, the knowledge of each asset's share of the invested capital markets is both useful information and a good starting point for investors considering the appropriate allocation to the asset. This identification of the value of existing assets and the market's aggregate portfolio allocation is important to bear in mind when formulating investment policy for any asset class.

Moreover, recent research² suggests that investors should routinely compare their asset allocations to current market proportions, as changes in asset class market values imply changes in consensus expected returns. In order to estimate market proportions, investors need better access to market values representing (at least) major asset classes.

In this paper, we estimate how the global market has allocated its collective wealth among competing investment opportunities from an U.S. based investor point of view. As such, all the estimates are quoted in U.S. Dollars. By definition, finance theory assumes that the market portfolio consists of both traded and non-traded assets (human capital, durable consumer goods, etc.). However, it is difficult to construct a good proxy for the market portfolio in the real world that captures all sources of assets. Therefore, we exclude categories like human capital, consumer goods, etc. and focus on measuring the values of the capital market securities that make up the opportunity set faced by most investors.

As our goal is to assess the composition of the global market portfolio, we also focus on the invested market portfolio (i.e., how assets are invested in the market) following Doeswijk, Lam and Swinkels (2013). The invested market portfolio represents the value of all assets already held by different investor groups.

In our analysis, we have used 21 asset classes/categories for inclusion in the global market portfolio. Our selection of asset classes was driven by factors like availability of data (e.g., we have excluded categories like farmland and gold), usage by the institutional investor community, and finally the desire to capture the

²Sharpe (2010).

global capital market as much as possible. We provide explanations of our data sources and methodology in the Appendix.

The Global Invested Capital Market: Current

Using primarily float-adjusted market values of established market indices, we estimate the total size of the global invested capital market from an **U.S. investor** perspective to be **USD \$101.1 trillion** at the end of June 30, 2013³. Table 2 shows the composition of the global invested capital market. We did not consider hedge funds as a separate asset class, as they invest mostly in categories already covered (stocks, bonds, etc.) in our analysis. Nevertheless, we show the proportion represented by hedge funds in the global invested capital market at the end of the table. Detailed information on the data sources is listed in the Appendix.

³Estimates for private real estate (debt and equity) and private equity are as of December 31, 2012.

Table 2

| Asset Class/Category | Market Size (USD; Trillions) | Proportion of Global Invested Capital Market (%) |
|---|---------------------------------|---|
| U.S. Equity ex REITs | \$18.19 | 18.0% |
| Non-U.S. Equity (Developed) ex REITs | 13.85 | 13.7 |
| Emerging Markets Equity ex REITs | 3.99 | 4.0 |
| Frontier Markets Equity ex REITs | 0.15 | 0.2 |
| Private Equity | 2.52 | 2.5 |
| Private (Unlisted) Infrastructure | 0.24 | 0.2 |
| Timberland | 0.05 | 0.0 |
| Private Real Estate Debt | 5.80 | 5.7 |
| Private Real Estate Equity | 4.20 | 4.2 |
| Public Real Estate Equity | 1.26 | 1.2 |
| Commodities ⁴ | 0.33 | 0.3 |
| High Yield Bonds | 1.85 | 1.8 |
| Bank Loans | 0.88 | 0.9 |
| Emerging Market Bonds (Sovereign; USD) | 0.55 | 0.5 |
| Emerging Market Bonds (Sovereign; Local Currency) | 1.48 | 1.5 |
| Emerging Market Bonds (Corporate; USD) | 0.68 | 0.7 |
| Insurance-Linked Securities | 0.02 | 0.0 |
| U.S. Bonds (Investment Grade) | 15.34 | 15.2 |
| Non-U.S. Bonds (Developed) | 22.65 | 22.4 |
| Inflation-Linked Bonds | 2.57 | 2.5 |
| Money Market/Cash Equivalents | 4.49 | 4.4 |
| Total Global Invested Capital Market including Hedge Funds | \$101.1 | 100.0% |
| Total Global Invested Capital Market excluding Hedge Funds | \$98.66 | 97.6% |
| Hedge Funds | 2.41 | 2.4 |
| Total Global Invested Capital Market including Hedge Funds | \$101.1 | 100.0% |

⁴We nevertheless include commodities as part of the global invested capital market while acknowledging that a large part of commodity investing takes place through derivatives (e.g., futures contracts) and the total net position in derivatives is zero.

The Global Invested Capital Market: History

Figures 1 and 2 below illustrate the historical growth and composition of the global invested capital market since the fourth quarter 2004, the earliest date that we could obtain reliable data for all the asset classes used in our analysis. The size of the global invested capital market grew from USD \$61.4 trillion in 2004 to USD \$101.1 trillion by the end of the second quarter 2013. The credit crisis of 2008–09 led to big declines in public equity assets (with offsetting increases in asset values of U.S. bonds and non-U.S. bonds). Since then, public equities have performed well, and this resulted in the current composition of the global invested capital market being roughly similar to the composition back in 2004.

Figure 1

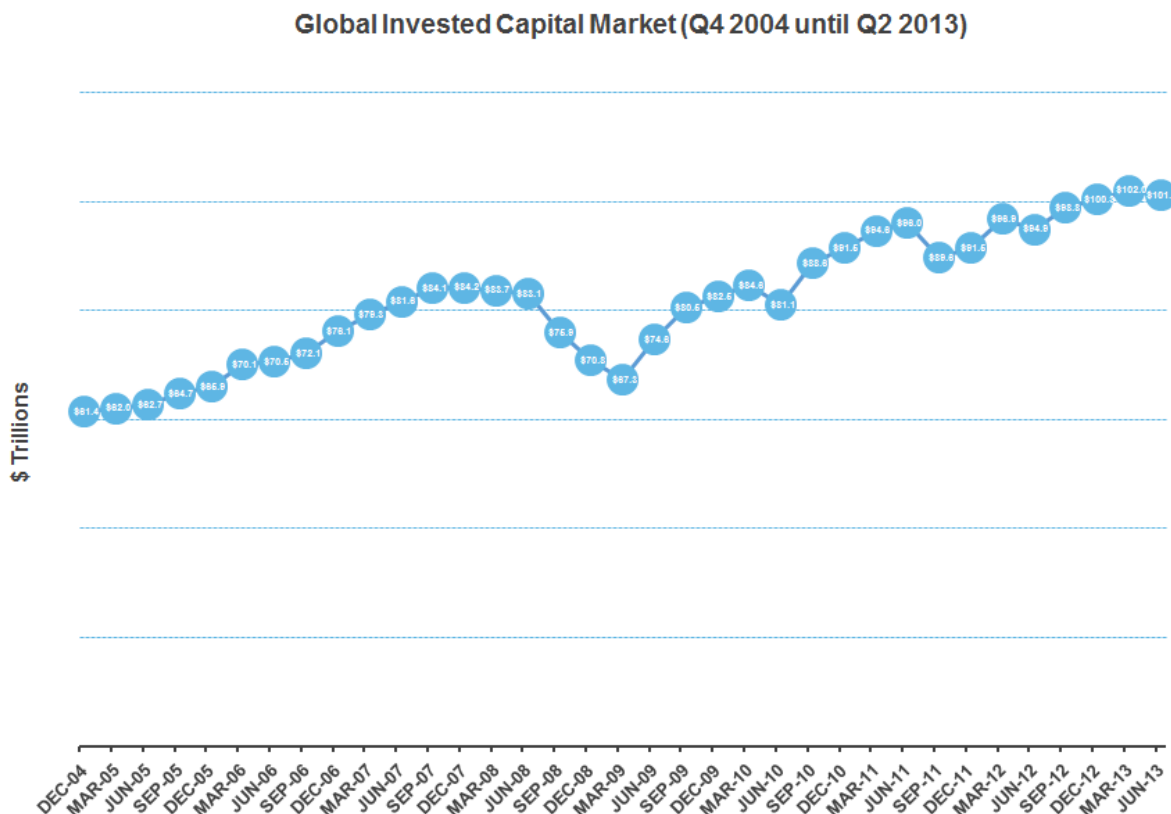
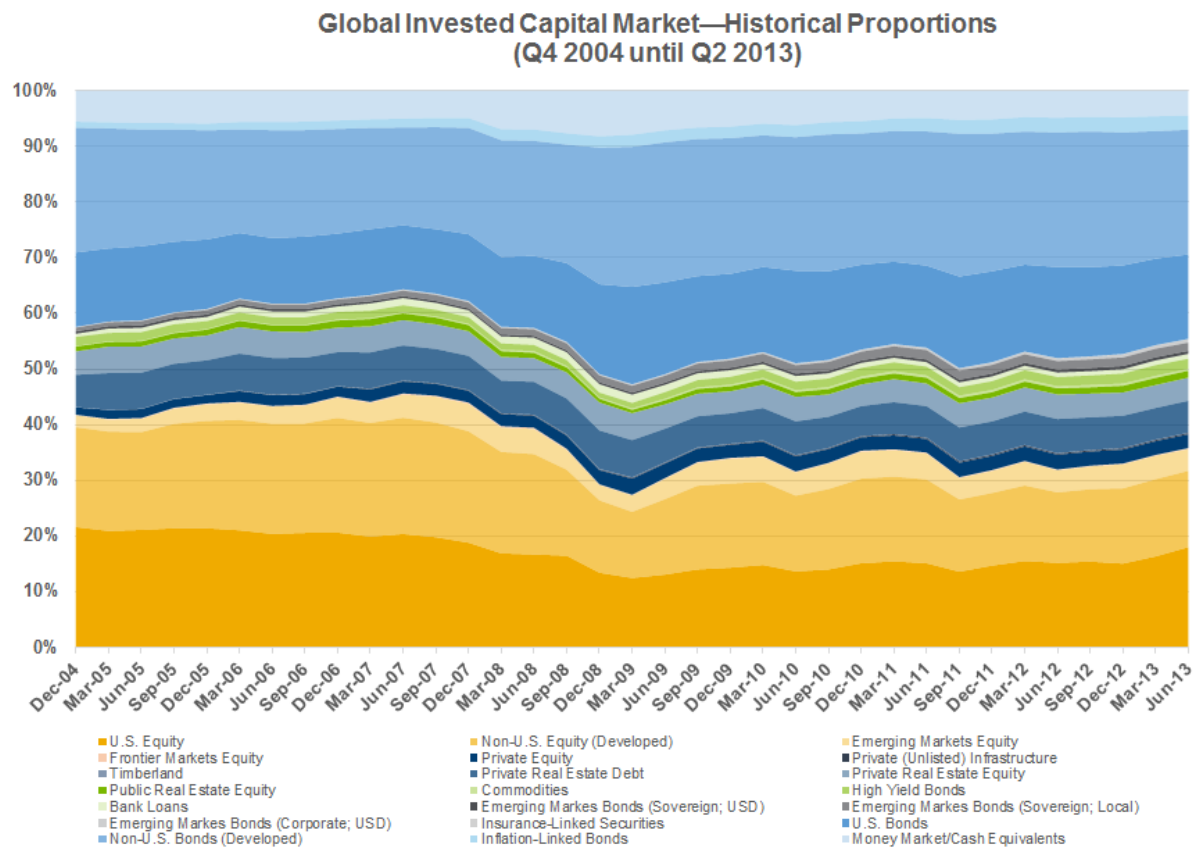


Figure 2



Asset Class Classifications and Structures

As the number and type of asset classes/categories available for investment have evolved, different classification schemes or categories have proliferated. Among the popular ones are growth-oriented assets, diversifying assets, alternatives and real assets. While the framework used for asset classification varies by investor, common approaches to classifying (or grouping) assets include asset class roles and economic risk exposures, among others.

Investors then structure or allocate among various assets within those groupings based on factors such as their investment beliefs, asset class return and risk expectations, asset class size/opportunity set and liquidity preferences. We believe it is important to bear in mind the market share of an asset class when making allocations to various assets or structuring portfolios.

Based on global invested capital market data, Figure 3 shows current market proportions of various classification schemes described above. Please note that this is simply based on our mapping⁵ of various assets into those classification schemes. Investors can follow alternative mappings based on data shown in Table 2.

⁵We have included hedge funds in some of the classification schemes. While we recognize that double-counting takes place, it is impossible to estimate or correct for this.

Figure 3

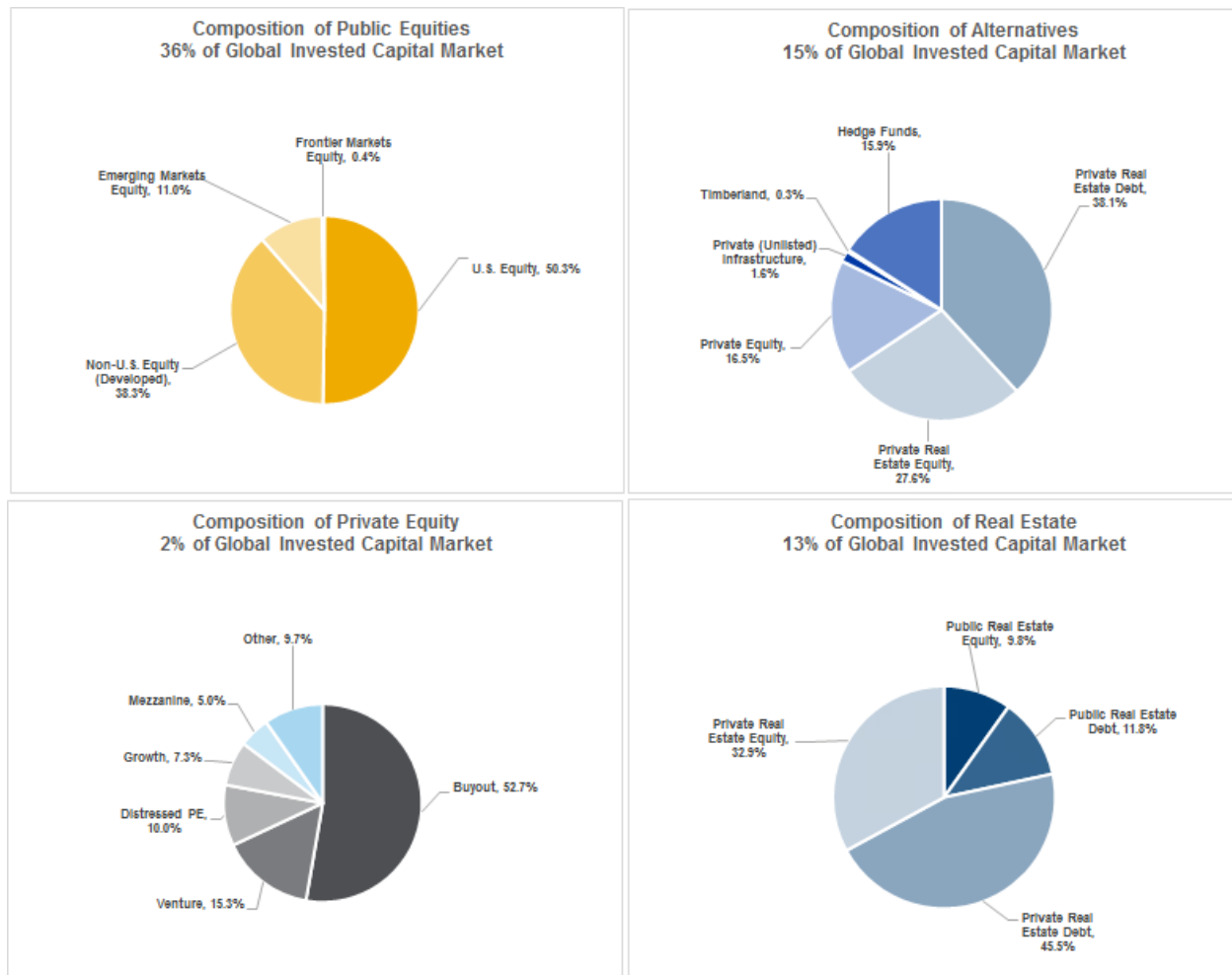
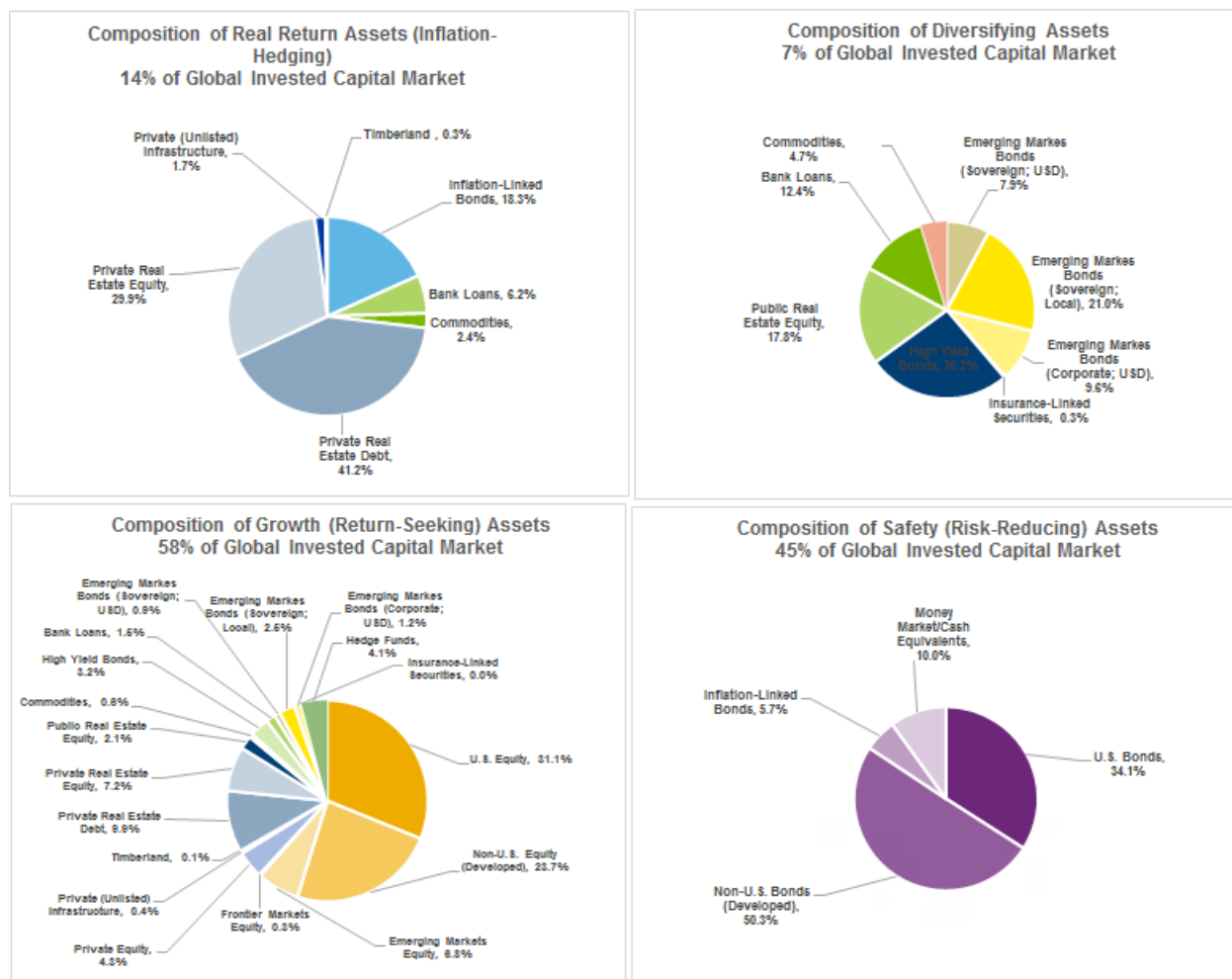


Figure 3, continued



Conclusion

The concept of a *world market portfolio* features prominently in many financial theories and models and serves as an important foundation of our asset allocation work for our clients. It is important for investors, as part of their strategic asset allocation and portfolio structuring process, to at least consider this data as a starting point.

We estimate the current total size of the global invested capital market from an **U.S. investor** perspective at **USD \$101.1 trillion**, and also provide historical composition of the same going back to 2004.

Appendix

Data Sources and Methodology

Below we discuss our *current* data sources and the methodology that we use to arrive at our estimates of the global invested capital market. As data sources improve in quality and scope, we will continue to refine and make changes to our process. For publicly traded asset classes (e.g., stocks, bonds), we have mainly relied on the float-adjusted market capitalizations of the broadest available index proxy for the respective asset class. For alternative investment categories (e.g., private real estate, private equity), we have used estimates from third-party research providers and/or money management firms. All estimates are quoted in U.S. dollars.

Domestic (U.S.) Equities

We use the float-adjusted market capitalization of the Dow Jones U.S. Total Stock Market Index, and then subtract the weight of REITs to avoid double-counting since we include publicly listed real estate equity as a separate category in the global invested capital market. The index, with 3,664 constituents⁶, measures all U.S. equity securities that have readily available prices and is the broadest measure of the aggregate domestic stock market. (Data source: S&P Dow Jones Indices)

Non-U.S. Equities (Developed Markets)

Starting in September 2006, we began using the float-adjusted market capitalization of the MSCI World ex-U.S. investable market index (IMI), from which we subtract the weight of REITs. Prior to that, we used the full market capitalization of the index and included REITs. The index captures large, mid and small cap representation across 22 of 23 developed countries excluding the United States. With 3,394 constituents⁷, the index covers approximately 99% of the free float-adjusted market capitalization in each country. (Data source: MSCI)

Emerging Markets Equity

Starting in September 2006, we began using the float-adjusted market capitalization of the MSCI Emerging Markets investable market index (IMI), from which we subtract the weight of REITs. Prior to that, we used the full market capitalization of the index and included REITs. The index captures large, mid and small cap representation across 21 emerging market countries. With 2,621 constituents⁸, the index covers approximately 99% of the free float-adjusted market capitalization in each country. (Data source: MSCI)

Frontier Markets Equity

Starting in December 2010, we began using the float-adjusted market capitalization of the MSCI Frontier Markets investable market index (IMI). Prior to that, we used the market capitalization of the MSCI Frontier Markets standard index. There are currently no REITs in the MSCI Frontier Markets investable market index. The Frontier Markets IMI captures large, mid and small cap representation across 26 frontier markets

⁶As of April 30, 2014.

⁷As of April 30, 2014.

⁸As of April 30, 2014.

countries. The index includes 381 constituents⁹, covering about 99% of the free float-adjusted market capitalization in each country. (Data source: MSCI)

U.S. Bonds (Investment Grade)

Starting in September 2009, we began using the float-adjusted market capitalization of the Barclays U.S. Aggregate Bond Index. Prior to that, we used the full market capitalization of the index. The index represents securities that are SEC-registered, taxable and dollar-denominated. The index covers the U.S. investment-grade fixed-rate bond market, with index components for government and corporate securities, mortgage pass-through securities and asset-backed securities. (Data source: Barclays Capital)

Non-U.S. Bonds (Developed)

Starting in September 2009, we began using the float-adjusted market capitalization of the Barclays Global Aggregate ex-USD Index. Prior to that, we used the full market capitalization of the index. The Barclays Global Aggregate Index provides a broad-based measure of the global investment-grade fixed income markets. We use the *ex-USD* version of this index, which has the same constituents as the standard global aggregate index but excludes the U.S. dollar-denominated components. (Data source: Barclays Capital)

Emerging Market Bonds

Sovereign External/USD Denominated: We use the market capitalization of the JP Morgan Emerging Markets Bond Index Global (EMBI Global). The index tracks total returns for traded external debt instruments in the emerging markets, and is an expanded version of the JP Morgan Emerging Markets Bond Index Plus (EMBI+). As with the EMBI+, the EMBI Global includes U.S. dollar-denominated Brady bonds, loans and Eurobonds with an outstanding face value of at least \$500 million. It covers more of the eligible instruments than the EMBI+ by relaxing somewhat the strict EMBI+ limits on secondary market trading liquidity. (Data source: JP Morgan)

Sovereign Local Currency Denominated: We use the market capitalization of the JP Morgan Government Bond Index-Emerging Markets Global (GBI-EM Global), which is part of JP Morgan's suite of comprehensive emerging market debt benchmarks that track local currency bonds issued by emerging market governments. GBI-EM Global is an investable benchmark that includes only those countries that are directly accessible by most of the international investor base. The index excludes countries with explicit capital controls, but does not factor in regulatory/tax hurdles in assessing eligibility. The index is classified as the most investable among JP Morgan's suite of local currency emerging market debt benchmarks and includes all GBI-EM countries except China and India. (Data source: JP Morgan)

Corporate External/USD Denominated: We use the market capitalization of the JP Morgan Corporate Emerging Markets Bond Index Broad (CEMBI Broad). The index is part of JP Morgan's Corporate Emerging Market Bond Index series, which tracks US dollar-denominated debt issued by emerging market corporations. The CEMBI Broad is more comprehensive and includes smaller issues by covering a wider array of corporate bonds. (Data source: JP Morgan)

⁹As of April 30, 2014.

Inflation-Linked Bonds

Starting in March 2006, we began using the market capitalization of the Barclays Universal Government Inflation-Linked Bond (UGILB) Index. The index is intended to be a single broad measure of the major developed and emerging government inflation-linked bond markets, combining primarily their flagship World Government (WGILB) and EM Government (EMGILB) inflation-linked bond indices. The index includes government debt only (i.e., direct obligations of the state issuer); quasi-government and corporate debt is not included in the index. Prior to 2006, we used the market capitalization of the Barclays Global Inflation-Linked Index (Series-L). This index is the legacy version from Lehman Brothers and represents the global inflation-linked bond market. (Data source: Barclays Capital)

Money Market/Cash Equivalents

This measure is based on worldwide mutual fund assets in money market funds. The data is obtained from Investment Company Institute's (ICI Global) quarterly Worldwide Mutual Fund Market Assets and Flows report¹⁰. (Data source: Investment Company Institute [ICI])

High Yield Bonds

We use the market capitalization of the Barclays Global High Yield Bond Index. The index provides a broad-based measure of the global fixed rate, non-investment grade (high yield) debt of companies in the U.S., developed markets and emerging markets. (Data source: Barclays Capital)

Public (Listed) Real Estate Equity

We use the free-float adjusted market capitalization of the S&P Global Property Index. The index defines and measures the investable universe of publicly traded property companies domiciled in developed and emerging market countries. The index contains more than 500 property companies trading in 36 countries, and is market-capitalization weighted. The index is composed of stocks of publicly traded equity real estate investment trusts (REITs) and real estate operating companies (REOCs). (Data source: S&P Dow Jones Indices)

Bank Loans

We use *institutional* leveraged loan, market-size data from Credit Suisse¹¹. The data is aggregated for the U.S. and Western Europe. The U.S. *institutional* data (this is a subset of the overall U.S. leveraged loan market size) includes US dollar-denominated, non-investment grade fully drawn institutional term loans. The Western European *institutional* data (this is a subset of the overall Western European leveraged loan market size) includes non-investment grade fully drawn institutional term loans of issuers with assets located in or revenues derived from Western Europe, or loans denominated in a Western European currency. (Data source: Credit Suisse)

¹⁰http://www.iciglobal.org/iciglobal/stats/worldwide/ci.wv_06_13.global.

¹¹Credit Suisse Leveraged Finance Strategy Monthly publication.

Commodities

This measure is based on the total (institutional and retail) commodity assets-under-management data from Barclays Capital¹². The data is aggregated by combining three categories: commodity index investments (index swaps), commodity exchange-traded products (ETPs) and commodity medium term-notes (MTNs). (Data source: Barclays Capital)

Private Real Estate

The 2012 year-end data was obtained from the *Money into Property Global 2013* publication from DTZ Research¹³. Their publication focuses on the commercial real estate market and reports global invested capital across four quadrants of the real estate market: *public equity*, *public debt*, *private equity* and *private debt*. As we are concerned with *private* real estate, we use only the data on *private equity* and *private debt* categories to arrive at our estimate for global private real estate. We exclude *public equity real estate* to avoid double-counting because we include publicly listed real estate equity as a separate category in the global invested capital market. We also exclude *public real estate debt* (e.g., CMBS) as they are typically considered part of the fixed income asset class and are mostly captured in our estimates for the same (although we show this separately as part of the composition of the real estate figure). Prior to 2012, we estimated *private* real estate data using quarterly returns from the IPD Global Composite Index. (Data source: DTZ Research, Investment Property Databank [IPD is a subsidiary of MSCI])

Private Equity

This is based on total private equity assets under management (AUM) data from Preqin¹⁴. Preqin defines AUM of a private equity firm as “the sum of all uncalled commitments (dry powder) and the (unrealized) market value of the remaining companies in its portfolio.” Preqin reports this data across the following fund types: *buyouts*, *venture capital*, *distressed private equity*, *growth*, *mezzanine*, *real estate*, *infrastructure* and *other*. Our estimate of global private equity is the aggregation of data across various fund types excluding real estate and infrastructure¹⁵. We exclude real estate and infrastructure because we already include them as separate categories in our analysis. (Data source: Preqin)

Private (Unlisted) Infrastructure

Global listed infrastructure (public) is already included in our estimates of public equity markets. Here, we focus on unlisted infrastructure assets. This is based on total infrastructure assets under management (AUM) data from Preqin¹⁶. Preqin defines AUM as “the sum of all uncalled commitments (dry powder) and the (unrealized) market value of the remaining companies.” (Data source: Preqin)

¹²Barclays Capital Commodities Research (The Commodity Investor publication).

¹³<http://www.dtz.it/uus/failid/File/DTZ+Money+into+Property+2013+Global.pdf>.

¹⁴Illustrative report: https://www.preqin.com/docs/quarterly/PE/Private_Equity_Quarterly_Q3_2012.pdf.

¹⁵We had access to historical data on dry powder and unrealized market value for total private equity assets under management. We also had access to historical data on dry powder by fund type (buyouts, venture capital, etc.). However, we didn't have access to historical data by fund type on unrealized market value. Therefore, in order to estimate the yearly global private equity excluding real estate and infrastructure categories, we first calculated the proportion of dry powder values excluding real estate and infrastructure (as a percentage of total dry powder across all fund types), and then assumed that the same proportion applied to unrealized market values.

¹⁶Illustrative report: https://www.preqin.com/docs/samples/Preqin_Global_Infrastructure_Report_2012_Sample_Pages.pdf.

Timberland

Our estimate of global timberland investments is based on data provided by Forest Investment Associates (FIA)¹⁷. FIA tracks assets under management by U.S.-based timber investment management organizations (TIMOs) that make investments both in U.S. and international markets. FIA estimates this data from its own internal research on transactions, reported market values, historical data and conversations with other market participants. (Data source: Forest Investment Associates)

Hedge Funds

This measure is based on estimated assets under management data from Hedge Fund Research¹⁸. The firm compiles total capital invested in the global hedge fund industry on a quarterly basis as part of its Global Hedge Fund Industry Report. (Data source: Hedge Fund Research, Inc. [HFR])

Insurance-Linked Securities

The insurance-linked securities (ILS) market can be accessed via several instruments (e.g., Catastrophe Bonds or “Cat” bonds, Industry Loss Warranties or ILWs, Sidecars, etc.). Of these, Cat bonds represent approximately 25% of the ILS market and are the easiest to estimate. Our estimate for the size of the ILS market is based on the total outstanding catastrophe bond data from Aon Benfield Securities (Data source: Aon Benfield Securities)

¹⁷<http://www.forestinvest.com/>.

¹⁸HFR Global Hedge Fund Industry Report <https://www.hedgefundresearch.com/index.php?fuse=products-irglo>.

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