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Four Trends Re-Shaping Investment Management

Presentation for the Economic Club of Florida

For Institutional Clients Only

Citi Business Advisory Services

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Agenda

Improved Factor Understanding Drives New Thinking About Portfolio Construction

Investors Demonstrate a Significant Shift to Passive Over Actively Managed Funds

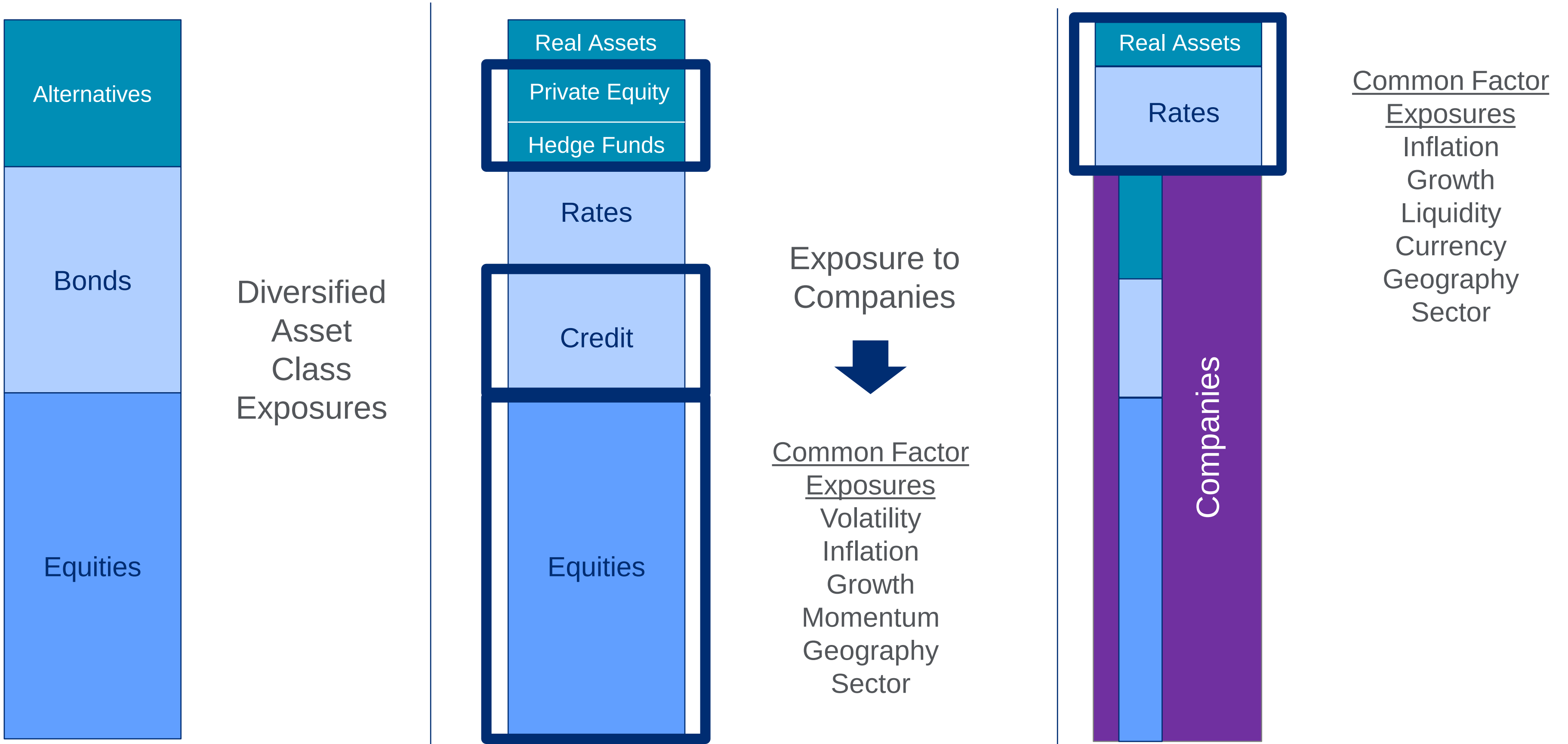
Actively Managed Funds Re-Align to High Conviction, Thematic & Alternatives

Emerging Technologies Offer Potential to Democratize Access to Real Assets

Rethinking Asset Class Diversification

Since the late 1950s, investors have sought to build diversified portfolios of asset class exposures that seek to balance risk and reward, but our understanding of risk is evolving

Evolving Understanding of Portfolio Diversification



- By diversifying across asset classes, investors should be able to find the best possible return for the least possible risk

- Asset classes are not mutually exclusive units
- Many are comprised of exposure to a set of companies that share common risks

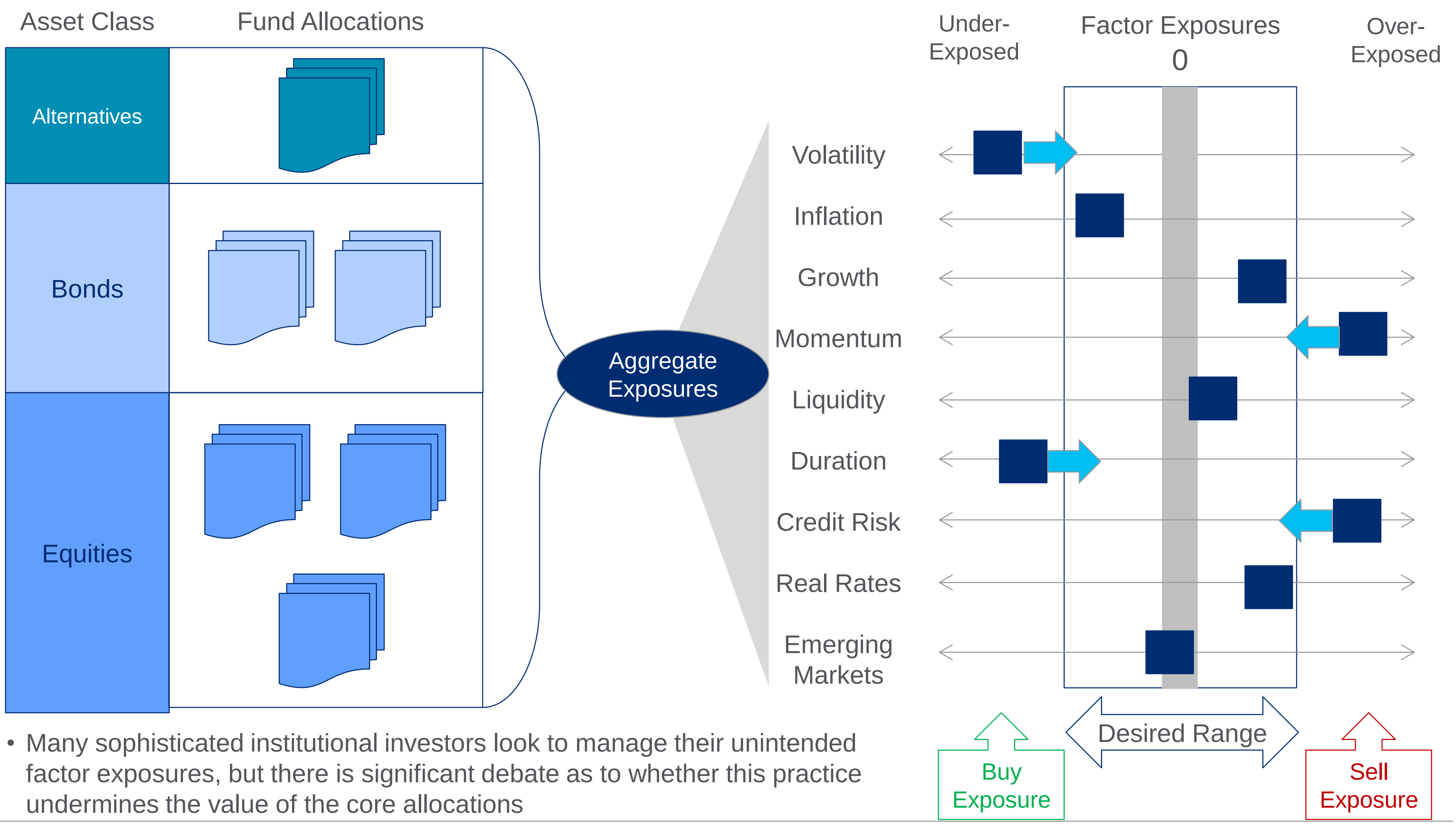
- Real assets and rate-linked investments also share many common risk factors, several of which overlap with company risk factors

Source: Citi Business Advisory Services

Risk Balancing

To ensure diversification without disrupting their existing fund allocation, some institutions go long or short specific factor exposures outside their desired range to balance their portfolio holdings

Adjusting for Factor Exposures at a Portfolio Level



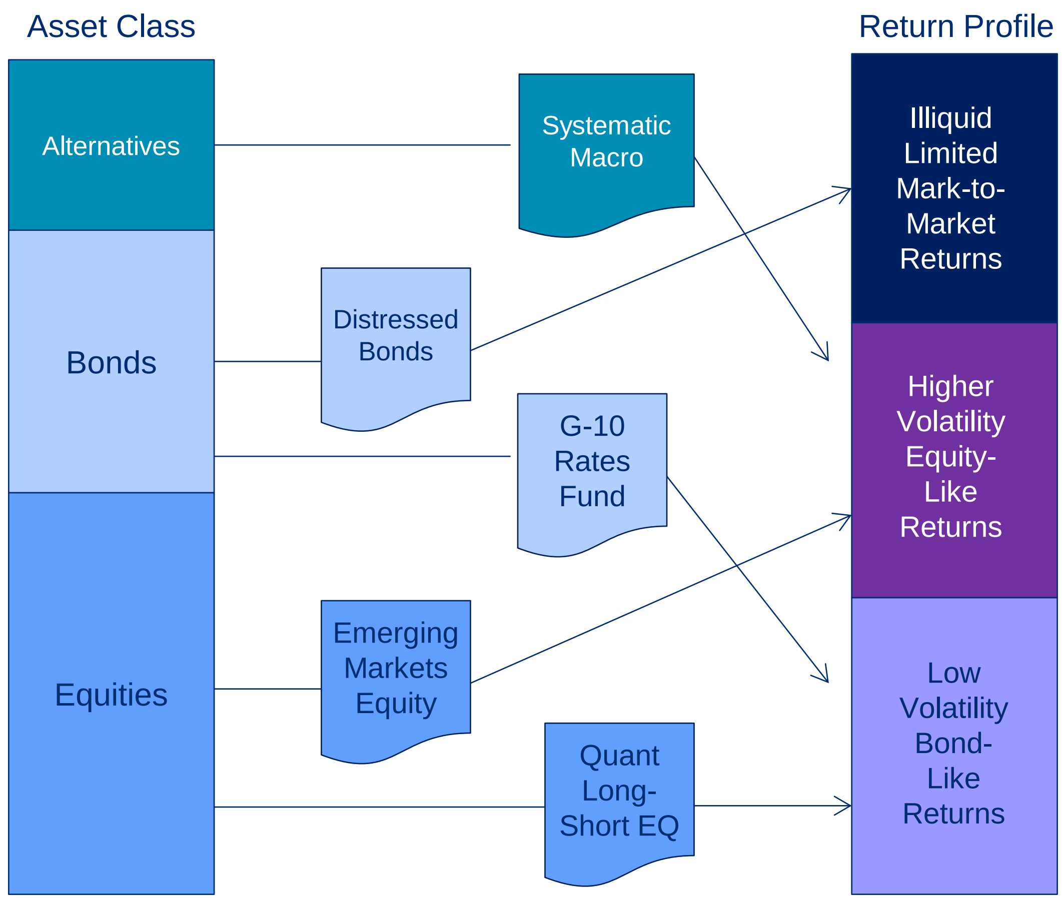
- Many sophisticated institutional investors look to manage their unintended factor exposures, but there is significant debate as to whether this practice undermines the value of the core allocations

Source: Citi Business Advisory Services

Re-Categorizing Allocations Based on Return Profile

Other investors are re-thinking whether asset classes are the best way to categorize and diversify their portfolio—many are beginning to re-assign strategies based on their return profile

Re-Assigning Strategies Based on their Return Profile



- A wide variety of sub-strategies can be found within the Equity, Bond and Alternatives buckets
- Sub-strategies offer highly divergent return profiles:
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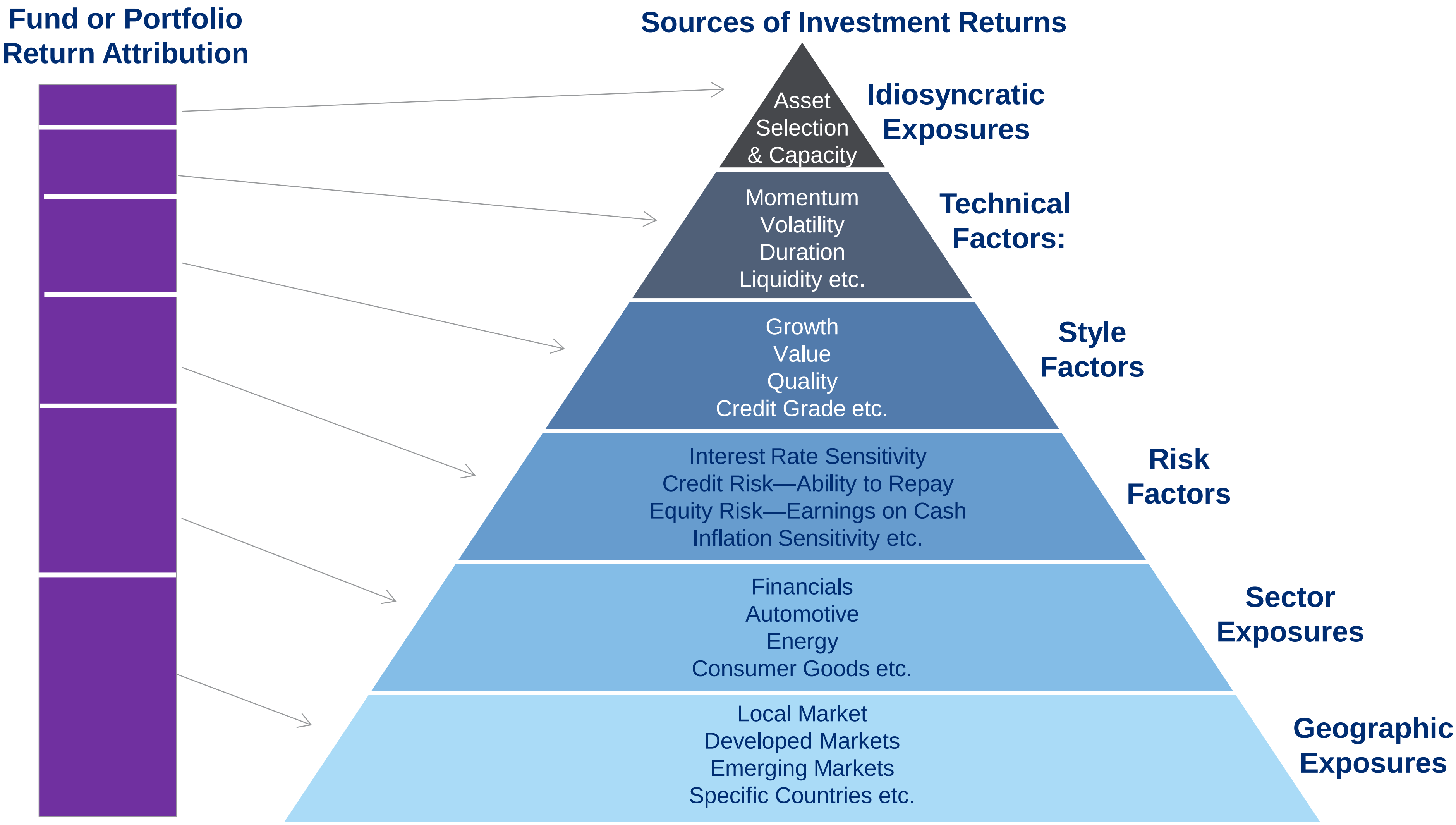
    - ,Some align to low volatility bond-like returns
    - Some align to higher volatility equity-like returns and
    - Others are illiquid and very long-term in nature and are thus only occasionally marked-to-market to track their contribution
- Some institutions have now begun to re-categorize these various sub-strategies and group them more effectively to reflect the types of risks and return streams they offer to the portfolio
- This is seen as helping ensure better diversification and more effective risk control according to participants in proprietary Citi surveys

Source: Citi Business Advisory Services

Re-Thinking Sources of Investment Returns

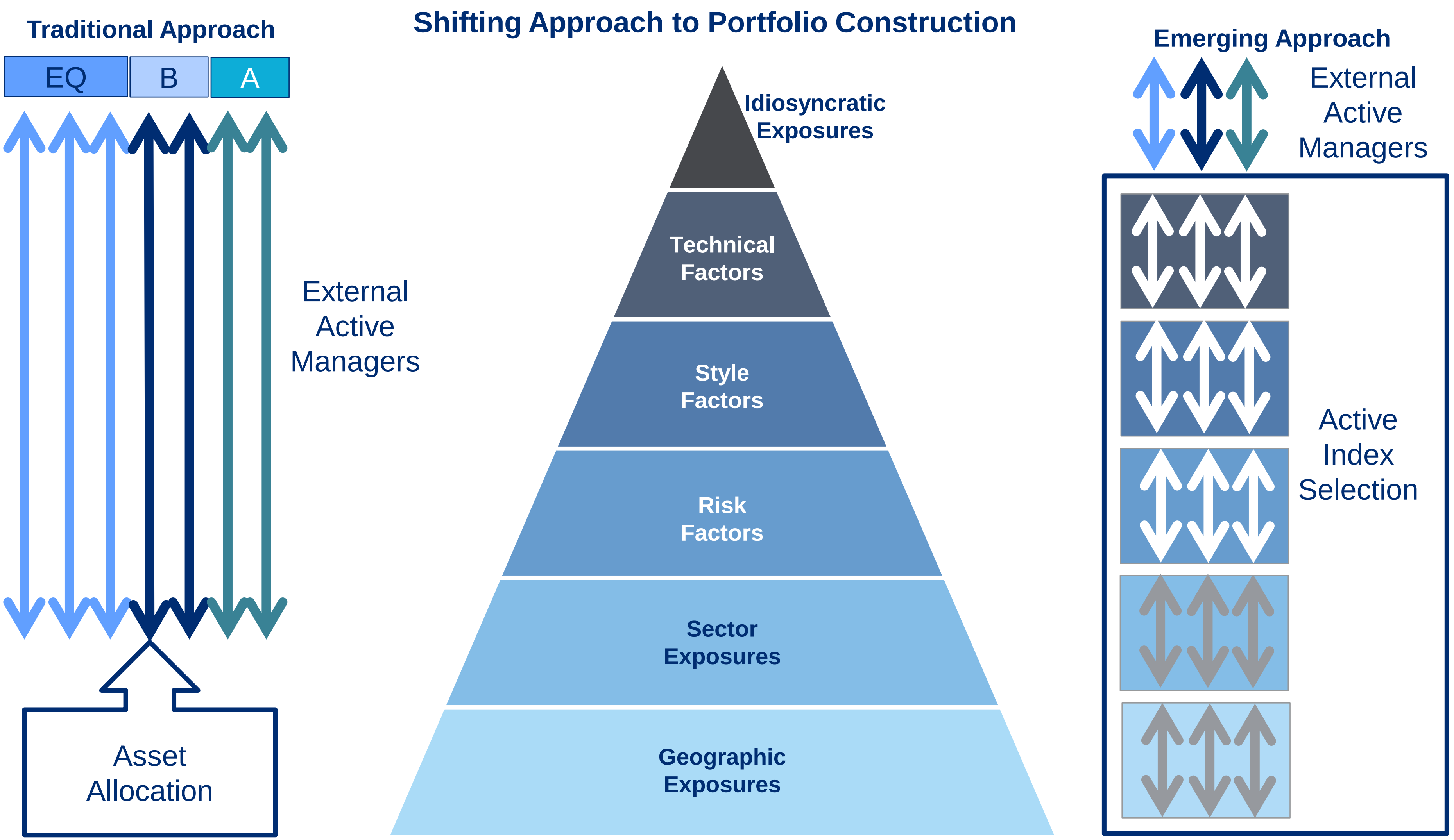
Improved risk technologies allow investors to slice and dice portfolios to look more deeply into what is the driver of returns and thus better isolate and target the specific sources of returns



Source: Citi Business Advisory Services

Increasing Use of Index Exposures in Portfolio Construction

A more precise view of the various sources of return for the portfolio allows investors to replace many expensive active managers with low cost indices for much of their exposures



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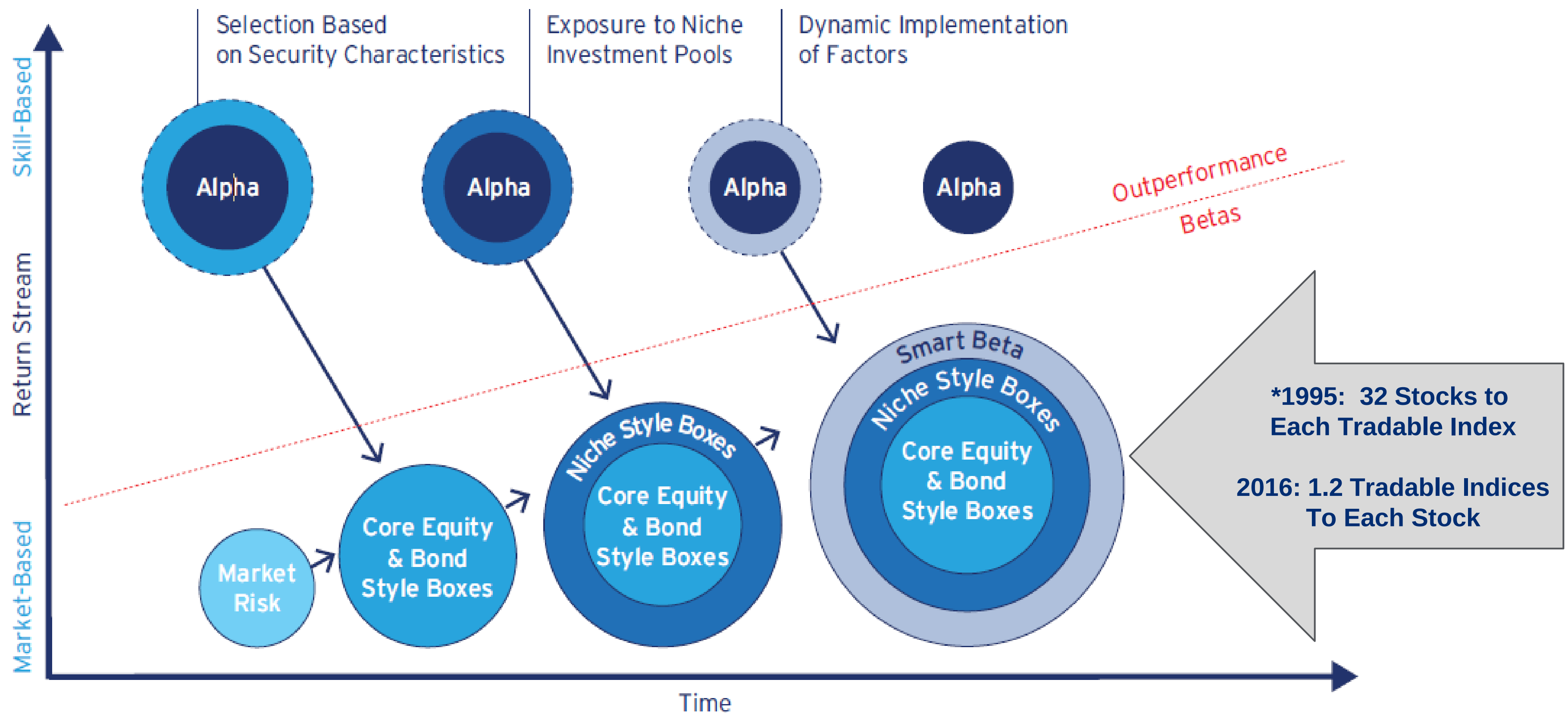
Impact of Rising Index Offerings

Technology is enabling managers to dynamically identify and construct indices or baskets of securities to provide exposure to specific factors, shifting factor-related returns from alpha to beta

Reclassification of Outperformance to Beta



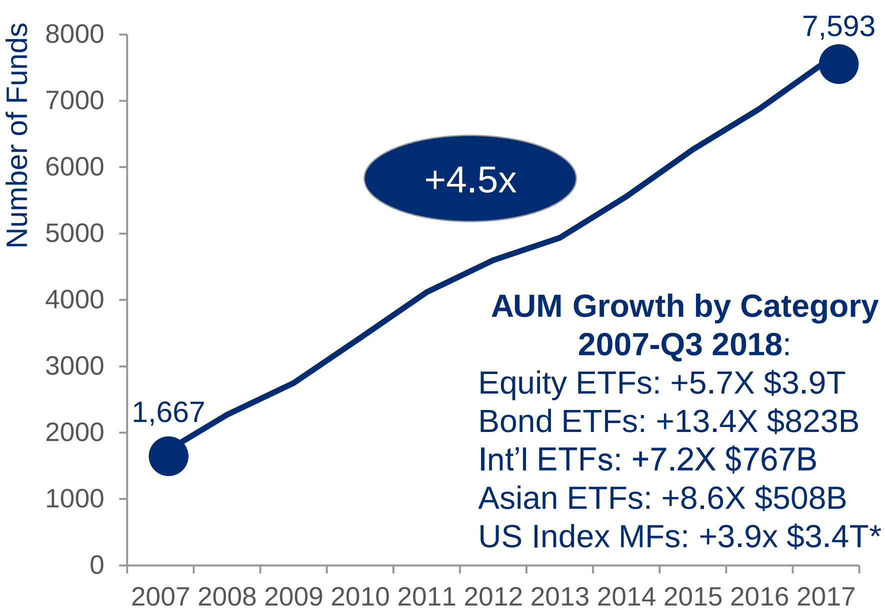
- The ever-expanding variety of tradable index offerings are allowing investors to directly access sources of return that used to only be available through active management and that were considered to be “outperformance”
- Now those return sources can be captured as an alternate type of market return or “beta”, helping to explain why increasingly, investors are only viewing idiosyncratic returns as alpha-generating

*Source: Citi Business Advisory Services. *“What’s Behind the Falling Number of Public Companies*?”, Vanguard.com, https://advisors.vanguard.com/VGApp/iip/site/advisor/researchcommentary/article/IWE_InvResBhndFallPublCompanies

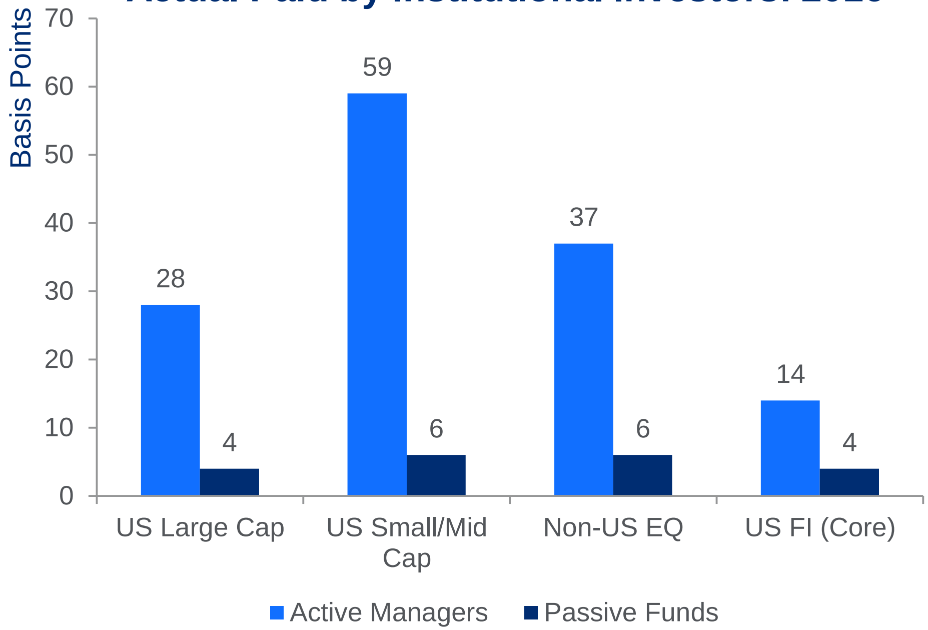
Drivers of New Portfolio Construction Approach

The number of index offerings increased 4.5X between 2007 and 2017—the growing variety of index offerings and cost advantage is helping drive the move away from actively managed funds

Growth in Number of Passive Fund Offerings ETFs & US Index Funds



Actively Managed vs. Passive Fund Fees Actual Paid by Institutional Investors: 2016



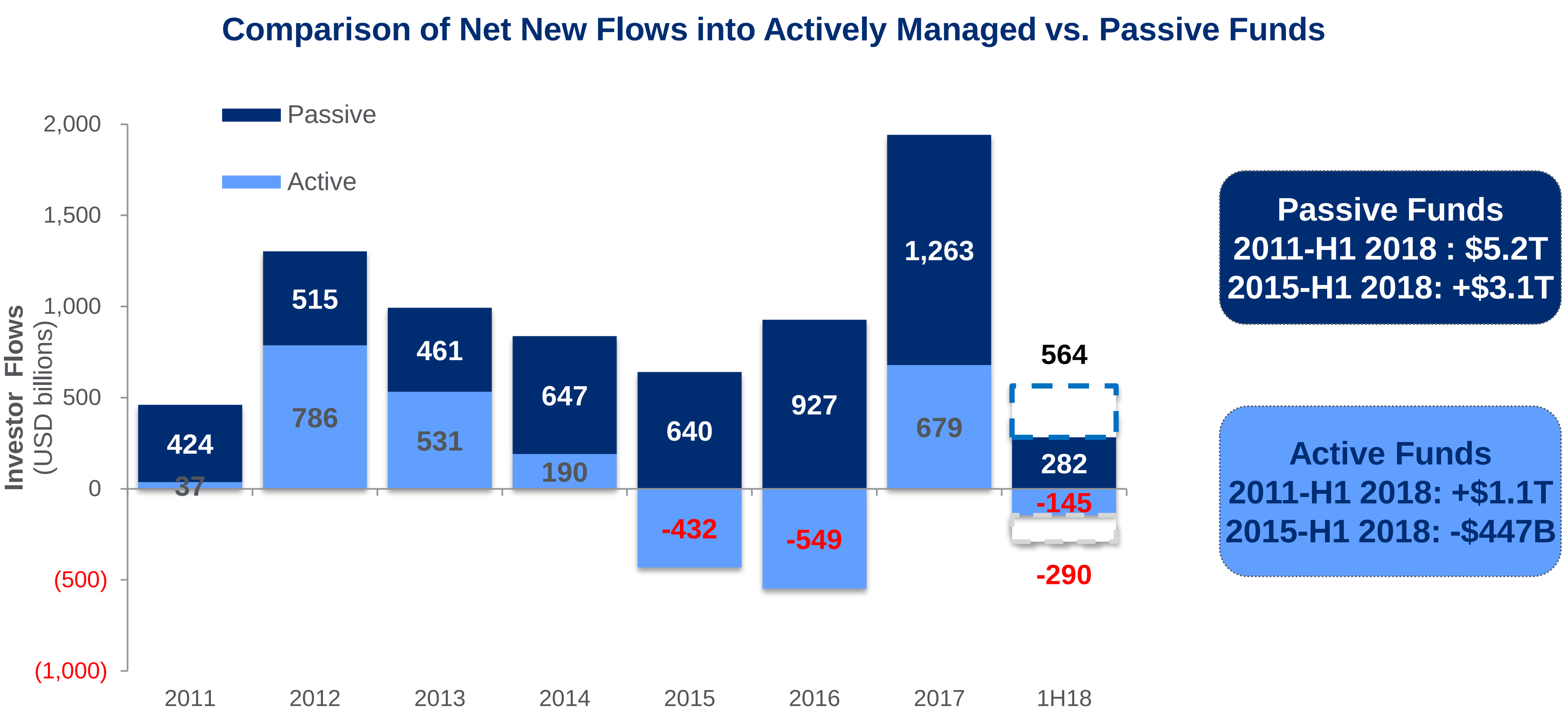
- The number of passive fund offerings has expanded dramatically in the past decade
- Growth has occurred across a wide range of categories, boosting the variety of indices that investors can choose to gain exposure
- Smart Beta funds that isolate specific technical and style factors are further expanding investor options

- Fee advantages are a major reason that many investors are choosing to utilize low-cost ETFs and indices
- The largest institutional investors that can command the lowest fees paid between 14 bps for US Core Fixed Income and 59 bps for US Small/Mid-Cap actively managed funds in 2016 according to Callan
- By contrast, the range for passive funds was 4-6 bps

**Data as of 2017. Sources: Left-hand Chart: Citi Business Advisory Services analysis based on proprietary data subscriptions to SimFund and eVestment. US Mutual fund data from www.ici.org. Right hand chart: Callan 2017 Investment Management Fee Survey. Active fees are for the largest category of investor (cheapest fees) and passive fees represent average across all investor bands. https://www.callan.com/wp-content/uploads/2017/10/Callan-2017-Investment-Manager-Fee-Survey.pdf*

Decisive Shift to Passive Fund Exposures

Since 2011,net new investor flows into passive funds has outstripped flows into actively managed funds by nearly 5X – with flows into active managers showing a net negative since 2015



- Net investor flows into passive funds topped $5.0 trillion between 2011 and H1 2018, a figure 4.7X larger than the net new flows into actively managed funds
- Active fund managers have in particular struggled since 2015 as both the financial press and global regulators have been vocal in their views about how fees negatively impact long-term returns. Since 2015, actively managed funds have registered outflows of $447 billion through H1 2018

Source: Citi Business Advisory Services based on proprietary data subscriptions to Morningstar, eVestment and Simfund

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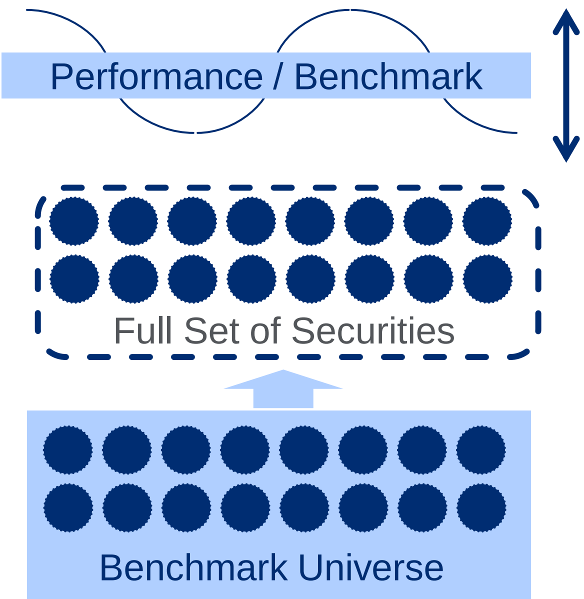
Shifting Goals for Actively Managed Funds

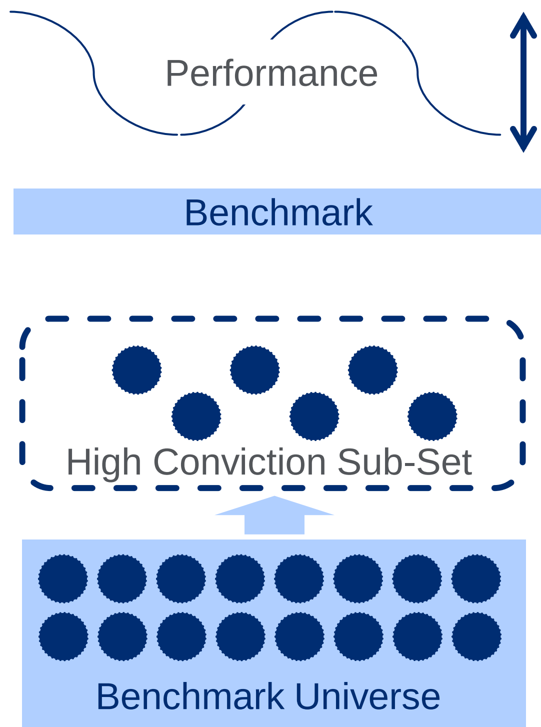
Active managers with returns too close to a benchmark that can be replicated through a cheaper index fund are becoming more active in their security selection to generate differentiated returns

Traditional Active Funds



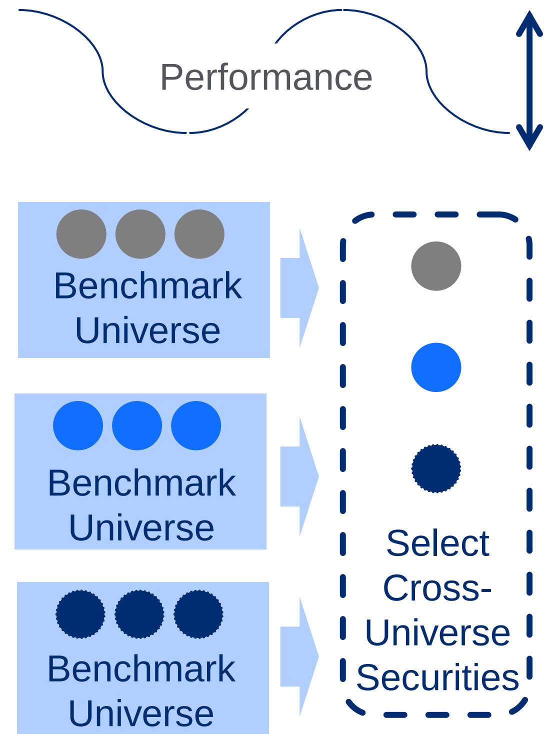
- Traditional actively managed funds overweight or underweight securities across the entire benchmark universe to outperform—this makes for returns tightly clustered around the benchmark

High Conviction Funds



- High conviction funds choose a sub-set of securities, concentrating their bets across a fewer number of names so that correct choices can outperform the benchmark by a more significant degree

Thematic Funds

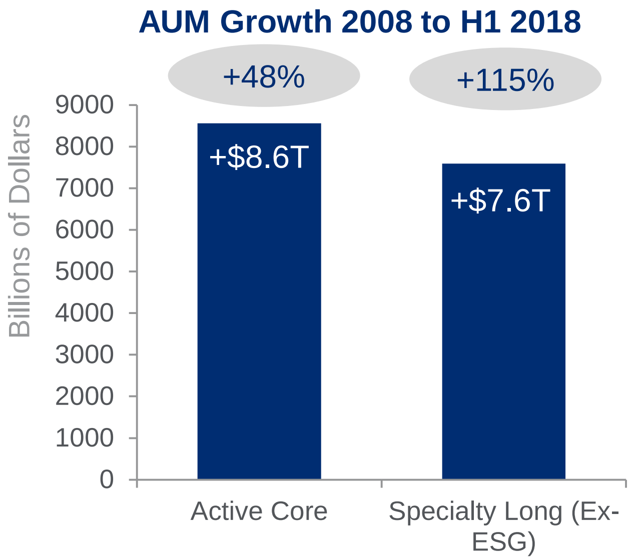


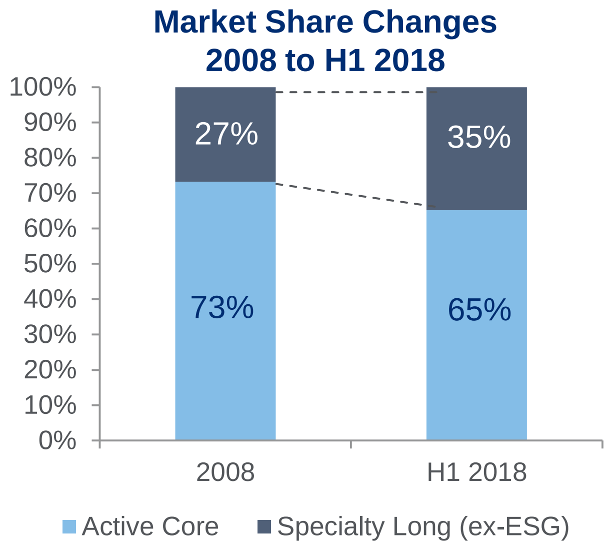
- Thematic funds choose securities across several benchmark universes, uniting those choices by a common characteristic in the pursuit of uncorrelated opportunistic returns

Source: Citi Business Advisory Services

Growth Accelerates in New Active Fund Categories

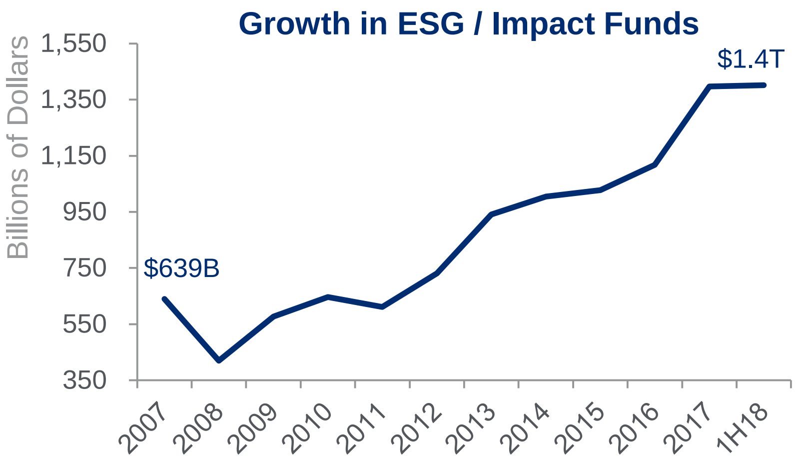
Though AUM in traditional long only active core funds rose over the past decade, the pace of growth trailed those funds that offer more specialized or thematic strategies





- Specialty long funds that include high conviction strategies added nearly as much AUM as active core funds over the past decade
- Specialty long funds grew by 115% between 2008 and H1 2018,rising from $6.6 trillion to $14.2 trillion and gaining 8% market share over active core
- Active core grew 47.5% in the corresponding period from $18.0 to $26.6 trillion—losing 8% share

- The most widely recognized category of thematic funds are those that isolate companies that lead their industries in environmental, societal or governance practices (aka ESG or impact funds)
- Total AUM has more than doubled in these funds over the past decade, rising to $1.4 trillion in H1 2018
- In our proprietary surveys, Institutional investors cite their belief that these companies will outperform their peers over time due to already existing practices and investments whereas retail and wealth investors focus on these funds as a way of impacting the world with their investment dollars

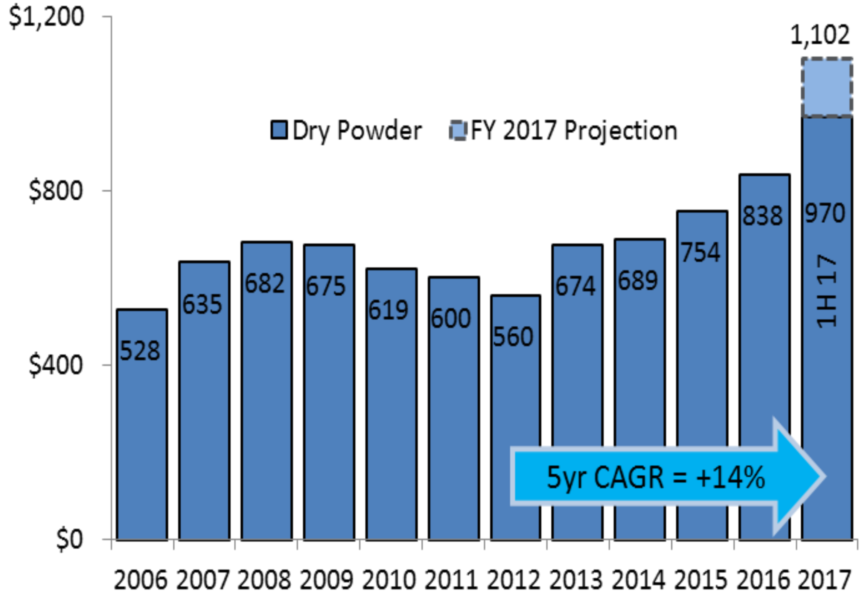


Sources: Top charts: Citi Business Advisory Services analysis based on the Boston Consulting Group Global Asset Management Study 2018, https://www.bcg.com/en-us/publications/2018/global-asset-management-2018-digital-metamorphosis.aspx Bottom Chart: Citi Business Advisory Services analysis based on proprietary data subscriptions to Morningstar and eVestment

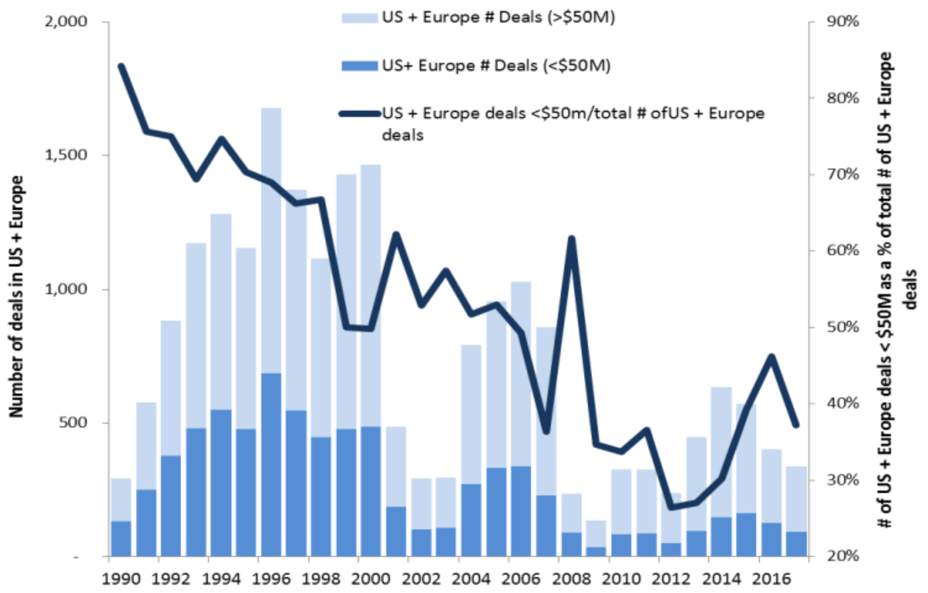
More Opportunities & Interest in Private Markets

More foundational issues exist in the publicly traded markets beyond a shifting approach to active management and the move to passive--more and more activity is occurring in the private markets

Dry Powder in Private Equity Investments



Downward trend in US & European IPOs



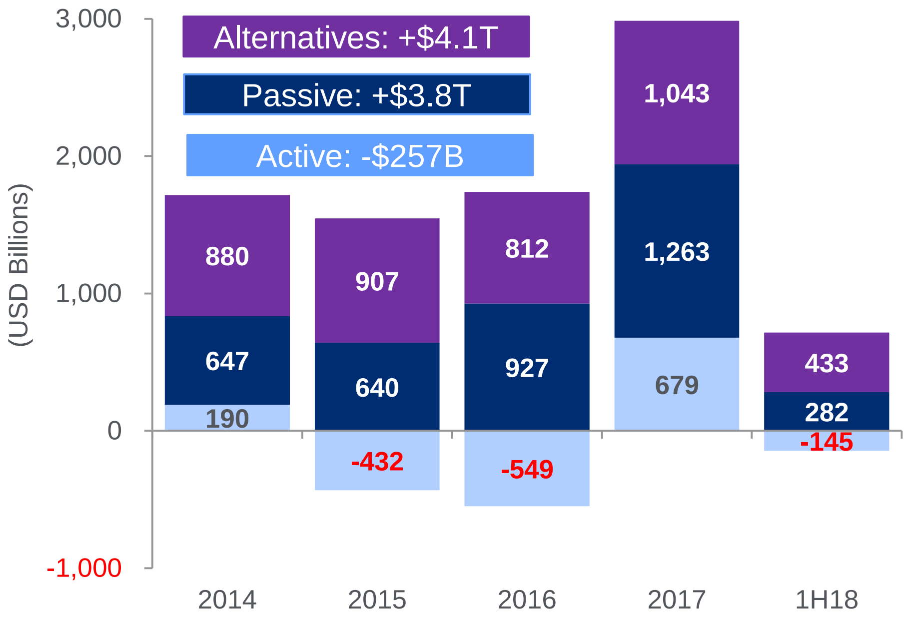
- Ready availability of private capital is allowing more companies to forego the public markets – especially small firms with valuations below $50 million; more growth opportunities are now only to be found in the private markets
- Many private companies express concern about short-termism in the public markets; institutional investors also see the focus on short-term financial results as out of sync with what is required to sustain long-term growth
- While cash may be available, staying private makes it harder for their employees to monetize their wealth tied up in these companies and boxes investors unable to meet suitability thresholds out of many growth opportunities

Source Left Hand Chart: Citi Business Advisory Services Analysis based on proprietary subscription to Preqin. Source Right Hand Chart: Citi Business Advisory Services based on Dealogic data to 30 June 2017

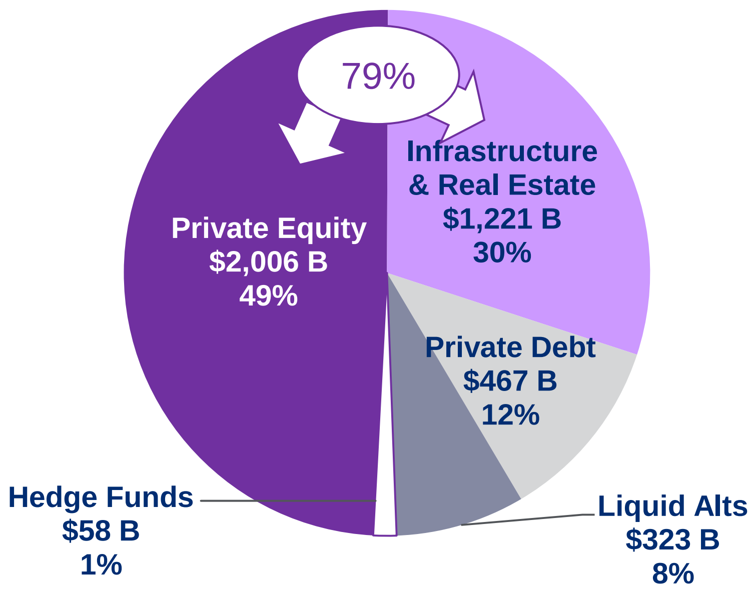
Alternative Flows Dominate, Focus on Most Illiquid

Net inflows into Alternative products outstripped passive flows in recent years with 79% of that money going to the industry's most illiquid assets in private equity, real estate & infrastructure

Total Industry Net Flows: Active, Passive & Alternative 2014 to H1 2018



Breakdown of Inflows into Alternatives
2014 - 1H18 ($4.1Tn)



- Global flow data shows that investors have moved into illiquid funds and private markets in their search for yield and diversification
- While flows into passively traded funds from 2014 to H1 2018 totaled $3.8 trillion, alternative fund flows were +8% larger at $4.1 trillion in the corresponding period. These figures compare to a net outflow of -$257 billion from actively managed funds

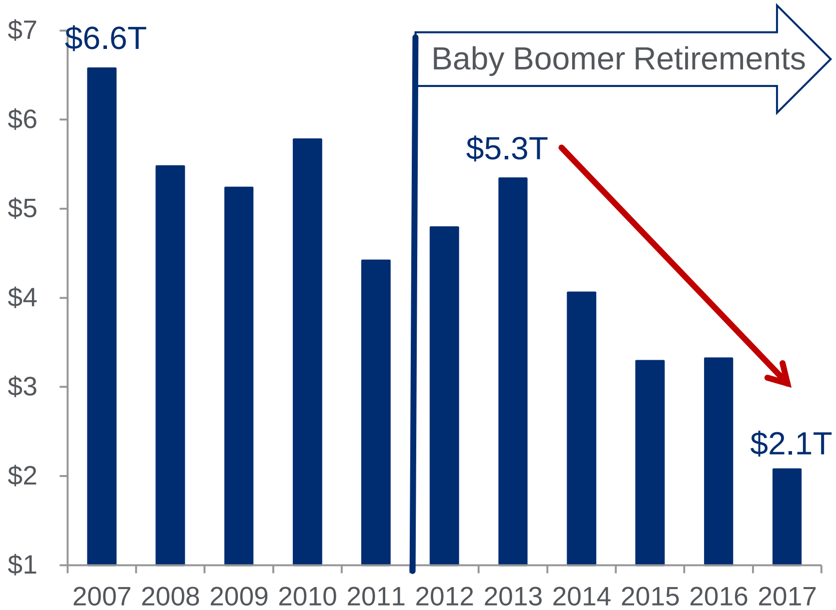
- Flows have not just been directed to alternatives as a whole, but into the **two most *illiquid* portions** of the alternatives space
- Private equity inflows totaled $2.0 trillion between 2014 and H1 2018 (49%) and real estate and infrastructure accounted for $1.2 trillion (30%)

Source left hand chart: Citi Business Advisory Services based on proprietary data subscriptions to Morningstar, eVestment, Simfund, HFR, and Preqin.
Right hand chart: Citi Business Advisory Services based on proprietary data subscriptions to Simfund, Preqin and HFR..

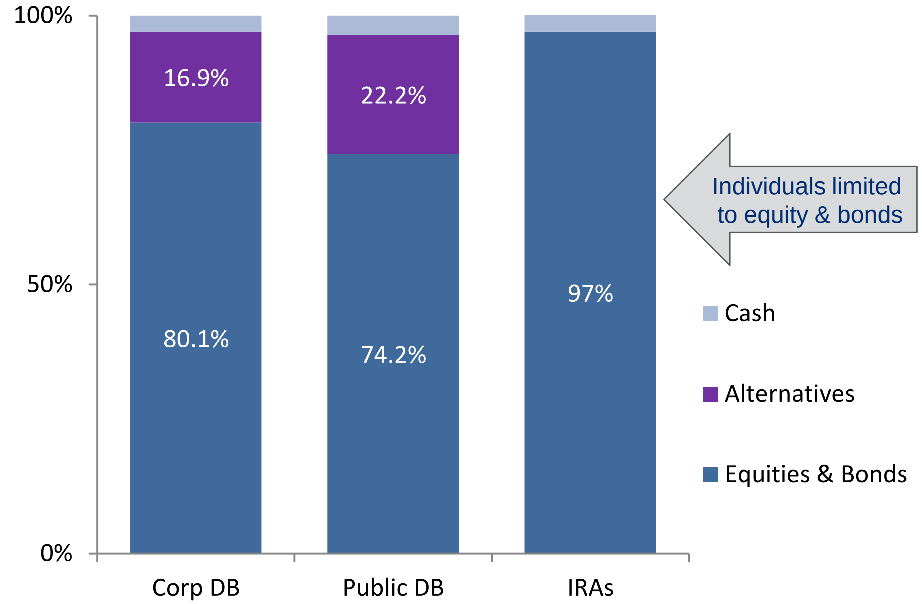
Demographic Challenges for Industry

Accelerating Baby Boomer retirements are shifting the industry to one where individuals will be left to manage more of their own money, resulting in less robust and diverse portfolios

Assets Managed for Institutions Less Assets Managed for Individuals (US)



2017 Portfolio Allocation U.S. Corporate & Public DB Plans vs. IRAs



- The bulk of professionally managed U.S. assets are invested on behalf of institutions that can use their more sophisticated status to access a wider array of illiquid and sophisticated investment options
- With Baby Boomers retiring and pulling their money out of defined benefit and defined contribution plans, there is a shift underway—by the early 2020s, more of the industry's assets are going to be managed on behalf of individuals, not institutions

- Institutional investors have shifted a significant share of their portfolio into alternative investments
- These alternative investments offer both an illiquidity premium and the potential to access cash flows uncorrelated to listed companies
- Individuals are limited to such public companies in their investment options and most are over-exposed to only one real asset—their home

Sources: Left hand chart: Citi Business Advisory Services analysis based on proprietary data subscription to Cerrulli Associates. Right hand chart: Citi Business Advisory Services analysis based on proprietary data subscription to Cerulli Associates and on Willis Towers Watson Global Pension Assets Study 2017, https://www.willistowerswatson.com/en/insights/2017/01/global-pensions-asset-study-2017, proprietary subscriptions to Hedge Fund Research (HFR), Morningstar, eVestment, SimFund, and Preqin, http://investments.yale.edu/about-the-yio/

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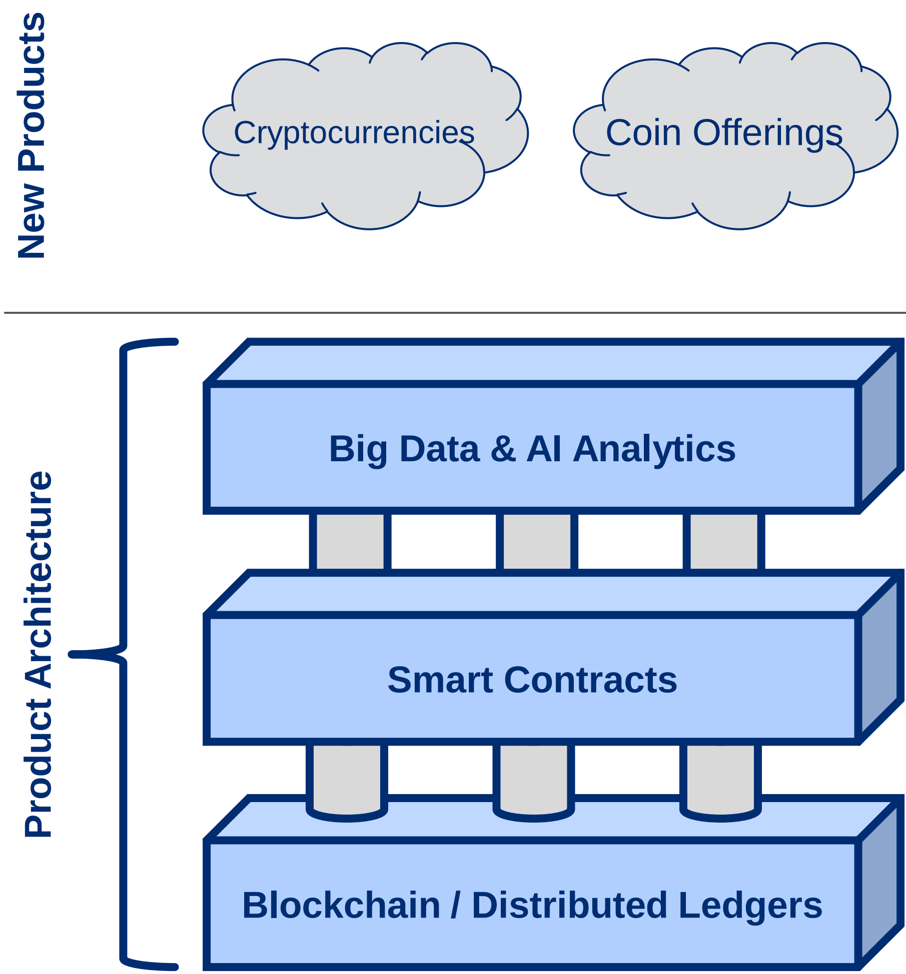
Understanding the Architecture Underlying Digital Assets

Early digital assets such as Bit Coin have been greeted with widespread skepticism by many but the architecture underlying such assets may help democratize access to alternative investments

Digital Assets & their Underlying Architecture



- New digital assets have garnered many headlines and resulted in highly volatile and unregulated parallel capital markets activity
- Regulators are looking into establishing rules for these markets, but their future is uncertain
- The architecture that these products are built upon, however, can be levered to create registered investment products that may democratize access to alternatives

- **Big Data & AI Analytics**: New technologies developed by Google allow for the processing of huge, unstructured data sets and the application of "smart" toolkits such as machine learning and natural language processing
- **Smart Contracts**: New digital contracts code in the terms of execution, link such terms to specific data-driven triggers that can be monitored using Big Data & AI analytics and allow for the self-execution of those terms when a trigger is activated
- **Distributed Ledgers**: Distributed ledgers record transactions but have 3 advantages over traditional ledgers: 1) all interested parties can simultaneously see transactions; 2) each transaction is secured by two independently verified crypto-keys; 3) the entire history of each transaction is contained in each entry

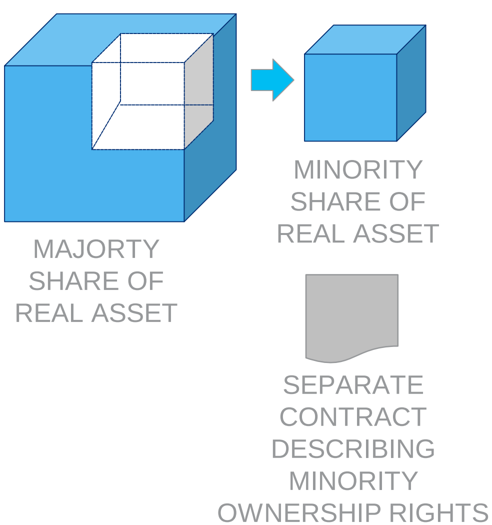
Source: Citi Business Advisory Services

New Shared Ownership Models for Access to Real Assets

Tokenization might enable today’s models around crowd-investing and unitization for ownership of real assets to extend to a more democratized set of investors with smaller liquidity thresholds

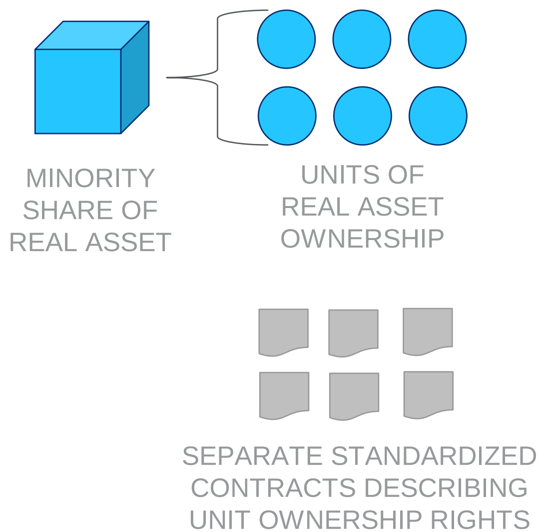
Carve Out Minority Share of a Real Asset

- Co-investing in real assets features a majority asset owner **“sharing” their ownership stake with either an outside entity or the crowd**



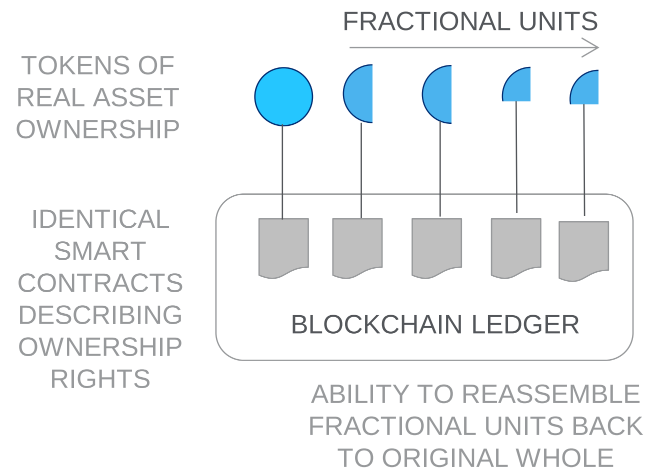
Divide Minority Share of Asset Up into Individual Units

- Unitizing assets entails breaking up the shared investable pool **into a pre-determined number of fixed pieces**



Access Natural Level of Demand by Fractionalizing Unit

- Tokenizing each investable unit allows demand be **adjusted down to fractional bits that can meet trading interest** from both large and small investors



Source: Citi Business Advisory Services

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Opportunity for Financial Instrument Innovation

Survey participants in our Industry Revolution report envision new real asset models and the blueprint underlying cryptocurrencies to create a new investment instrument--Ownits

New Solution:

- Expand the **"shared ownership" model** to a broad set of real assets
- Make this approach affordable by dividing these assets up into **units**
- Create a new **registered digital token** using smart contracts that define the rights of the unit owners and embed the contracts into the blockchain
- Facilitate fractionalization and secondary liquidity
- Leverage **existing primary and secondary market** transmission mechanisms

→

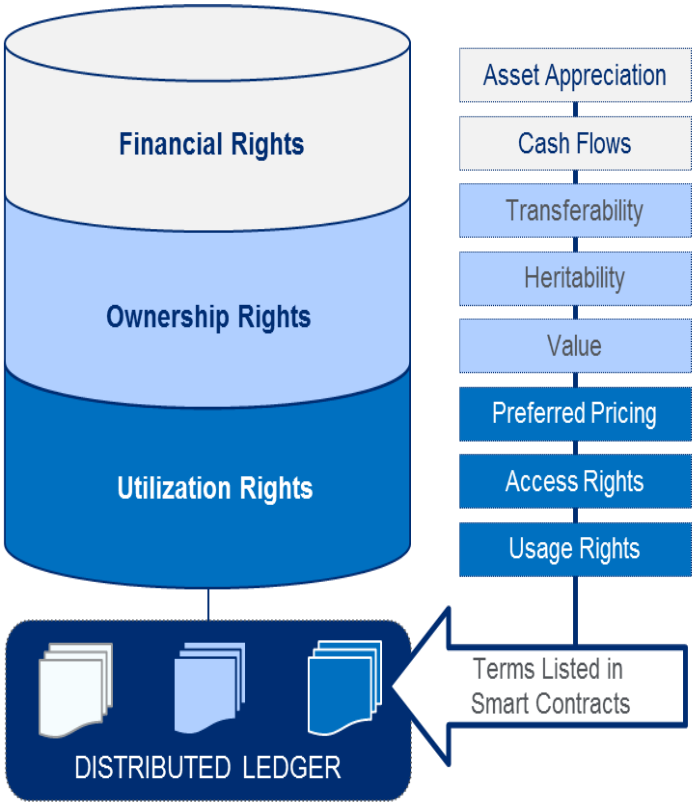
New Liquid Ownership Units (Ownits)

Source: Citi Business Advisory Services

Ownits as New Investment Vehicles

Ownits would create the ability to have a listed ownership unit that offers the owner both financial and non-financial rights to the underlying asset as well as a set of utilization rights

Model of an Ownit



Ownits may offer a series of financial and non-financial rights in the underlying asset:

- **Financial Rights**: **Total return investment,** including both **cash flow participation and long-term appreciation of the underlying asset**
- **Ownership Rights**: The Ownit owner can list Ownits on their financial statement, pass the Ownit on to their heirs or **choose to transfer ownership** to another holder
- **Utilization Rights**: Ownit holders could partake in the utilization of their asset via incentives such as **discounted rates and preferential consideration for use or access**

Source: Citi Business Advisory Services

Ownits Might Be Used to Solve Many Investor Problems

Both institutional and individual investors may find benefits through the use of real asset tokens that could both democratize access to new types of investments and support more localization

Use Cases to Highlight Potential of New Investment Template

Institutional Investor Frees Up Liquidity in Existing Real Asset Holding

- **Problem**: Institutional investor currently owns a real asset such as a shopping mall but they need some liquidity and do not wish to sell their entire stake and/or other investors are against any overall asset sale
- **Solution**: Investor might carve out a minority share of their investment and sell the right to participate in their investment to the crowd via a tokenized offering
- **Benefit**: Incoming cash for the institution and an ability for individuals to both own a portion of the property and participate in its revenue-generation and appreciation

Pension Plan Supplements Liability Shortfall via Extension of Utilization Rights

- **Problem**: Pension does not have sufficient assets to meet their full liability to members
- **Solution**: Pension might invest in an asset that individuals could utilize such as a housing community and offer members "credits" via tokens to use the asset/ live in the community to offset owed liabilities
- **Benefit**: Long-term asset that should generate income and appreciate for pension fund and utilization benefit for retired pension member to offset any benefit shortfall

Individual Business Owner Finances Capital Improvements Through Shared Ownership Model

- **Problem**: Individual owner needs capital to expand or improve their business but does not want to take on additional debt or partners
- **Solution**: Individual could allow local institutions or a pool of individuals to take on a minority ownership in their business via a tokenized offering
- **Benefit**: Incoming cash for the individual business owner and an incentivized pool of local owners to support their business and exposure to a new asset and potential cash flow for investors

Source: Citi Business Advisory Services

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