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# Functional Allocation Framework

**WHITEPAPER**
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**Institutional investors of all types and sizes make use of numerous classes, or buckets, when allocating investment assets within portfolios. A functional allocation framework, where assets are aligned based on their functional role within a portfolio, represents a departure from the classic asset class allocation paradigm that has dominated the industry for decades. While the origin of such functional frameworks is generally believed to have occurred in the early-2000s[1], such structures did not experience broad adoption until after the Global Financial Crisis ("GFC") of 2008-2009. Despite the fact that hundreds of billions of dollars are allocated via functional allocation frameworks[2], they still remain the minority. This paper seeks to describe what functional allocation frameworks are, why they may be useful, and what their major challenges tend to be.**

**CONTRIBUTORS**
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[1] The ATP pension in Denmark adopted a functional framework subsequent to the dot-com bubble.

[2] See Figure 10.

## Key takeaways:

- One of the biggest benefits of a functional allocation framework is that it helps to separate and better define the oversight and implementation roles of fiduciary/oversight boards and investment staffs. In most instances, functional frameworks may allow for better risk management oversight while improving implementation flexibility.
  - The functional framework provides these governing bodies with quick and intuitive transparency into the major risks and roles among portfolio components.
- Functional frameworks make it easier to find a home for assets/strategies that do not fit neatly into traditional asset allocation frameworks.
- Unlike an asset class framework, there is no consensus as to what a functional allocation framework should look like. The groupings found within portfolios that claim to utilize a functional allocation framework can vary widely. A meaningful subset of institutional investors utilizes a hybrid functional/asset class framework that can further obscure one's understanding of the concept.
- The adoption of a functional allocation framework is not a source of alpha or outperformance. Rather, the utilization of a functional allocation framework seeks to improve portfolio transparency and oversight, particularly for key decision makers such as boards or investment committees.
- Despite significant areas of overlap, there are material differences between related topics such as risk allocation, risk parity, factor investing, and functional frameworks.
- The methodology for designing an aggregate portfolio does not materially change whether one utilizes a functional framework or an asset class framework.


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## Categorization systems

Cognitive economics is a subset of behavioral economics, and it is commonly defined as "the economics of what is in people's minds." As a review from any introductory economics course, economics is the study of decision making under conditions of scarcity. With respect to the human mind, scarcity pertains to both computational/processing speed and memory. The area of cognitive economics overlaps with or shares many similar theories with areas of cognitive psychology, philosophy, and logic. For the purposes of this paper, we are largely focusing on a subset of cognitive economics that refers to categorization.

Categorial delineations, or classification systems, are inherently utilized by the human mind in order to provide a balance between high-level comprehension and granular details. In other words, humans divide the world into classes to decrease the amount of information that they must retain without materially impacting the level of understanding.

One of the most widely accepted theories on this topic is that of natural categories proposed by Dr. Eleanor Rosch in the 1970s. As part of her work, Dr. Rosch argued that humans utilize a natural conceptual hierarchy that consists of three levels: superordinate, basic, and subordinate. A basic example of this would be Figure 1.

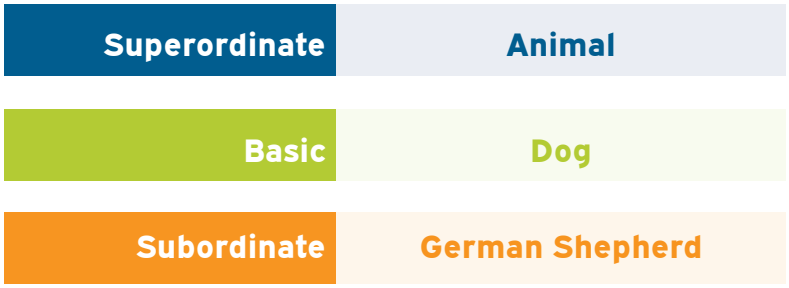


**FIGURE 1**
**3 Level Conceptual Hierarchy**

Source: Rosch, E. H. (1973). Natural categories. Cognitive Psychology, 4(3), 328–350 and Rosch, Eleanor (1978). Cognition and Categorization. Hillsdale, NJ: Lawrence Erlbaum, among others.

Under this theory, the "basic" level is what humans tend to focus on as it provides the best tradeoff between information and understanding. To build the other levels, the superordinate level is obtained by combining the basic levels to form a higher level, whereas the subordinate level is obtained by dividing the basic level via more granular details.[3] This area of research is commonly utilized in areas such as computer vision, deep learning, and the paradigm of object-oriented programming.

As it relates to functional versus asset allocation frameworks, one can think of asset classes as the "basic" level and functional classes as the "superordinate" level, although many investors segment the superordinate level into two components (e.g., strategic level and sub-class level)[4]. As such, one can argue that a functional allocation framework seamlessly fits in with the natural classification mechanisms that humans utilize across other facets of life. In-line with this concept, functional allocation frameworks, thus, seek to improve the intuition behind a portfolio's construct.

[3] Dr. Rosch's work, as well as work by others in the field, has far more detail and depth than what is provided in this paper.

[4] For example, a strategic Growth Class often contains three to four sub-classes that exhibit different levels overall risk or illiquidity, among other parameters.


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Investors ultimately have to invest in assets (e.g., equities, bonds, etc.), and asset classes tend to be what investors focus on, which is in-line with Dr. Rosch's assertion that the "basic" level represents humans' primary category focus, but it may be that examining (or allocating to) the "superordinate" levels is what provides better utility and transparency in the dynamic world that is the global capital markets.

## Historical context

Despite the never-ending expansion of investment strategy and product offerings[5], there are not that many *truly* different types of investments available to investors. Nearly every investment offering can be summarized as one (or a combination) of the following:

- Ownership in a cash-flow generating entity or operation (i.e., equity)
- Lending to an entity with the expectation of being paid back (i.e., debt)
- Ownership in a non-cash-flow generating asset with the goal of a higher subsequent price (i.e., commodity)
- A derivative of the above
- A trading strategy on/around the above
- Cash/currency

[5] As an example, the eVestment Alliance database currently contains information on over 27,000 different investment products (as of October 2022), which does not include the ever-growing area of private markets.

Historically speaking, institutional investment portfolios tended to consist largely of two asset classes: equities and debt. In this historical context, equities tended to represent return-seeking assets whereas debt (either sovereign or high-quality corporate bonds) was seen as a safer, risk-reducing asset. Despite the difficulty of pinpointing the exact origin of the term/structure, there is a reason why 60/40 and 70/30 equity/bond portfolios are commonly used as reference portfolios or benchmarks. As we discuss later, functional allocation frameworks seek to partially revert to the historical equity/bond mix (i.e., two classes that were focused on different objectives) while still allowing for the potential inclusion of a broad set of asset classes and strategies, both new and old.

Over the years, particularly during the 1970s, 1980s, and 1990s, a new series of strategies and asset classes came into existence. It was during this period, and particularly during the 1990s and 2000s, that institutional portfolios began to incorporate strategies such as high yield debt, private equity, real estate, and hedge funds, among others. These strategies were seen as expansions of existing asset classes, as in the case of high yield bonds, or alternative asset classes, as in the cases of private equity, real estate, and hedge funds.

Figures 2 and 3 demonstrate the evolution of a large, US-based public pension system's allocation framework. In 1970, the assets were allocated across a few different debt buckets (i.e., sovereign/municipal and corporate) as well as to common stocks (i.e., public equity). Flash forward to 2022, and the allocation framework has expanded to include a materially larger set of asset classes. While this significant expansion in the


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number of classes provides the appearance of increased diversification, each class can be mapped back to equity and/or debt. In all fairness, however, the portfolio's diversification at the sector, sub-sector, and country levels was materially improved.

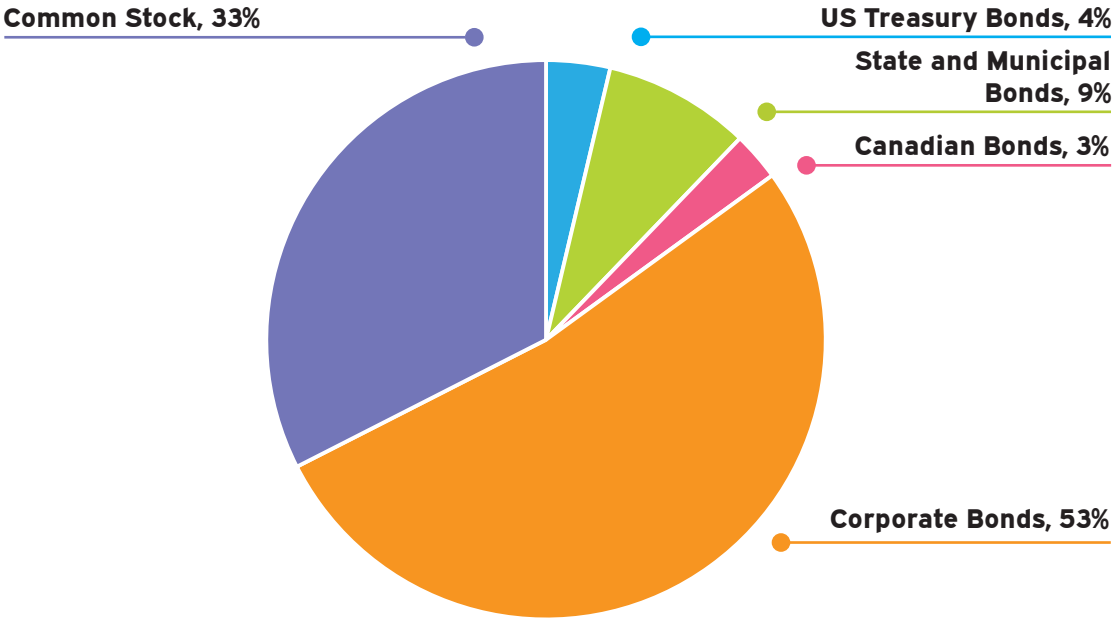


FIGURE 2

**US-Based Public Pension System's Allocation Framework in 1970**

Source: The allocations shown are for the Minnesota Combined Retirement Funds, which are overseen by the Minnesota State Board of Investment. We include Minnesota Combined Retirement Funds here as Minnesota is one of the few institutional investors who make publicly available historical documentation from 50+ years ago (https://msbi.us/annual-reports).

Note: Figures to not add to 100% due to rounding.

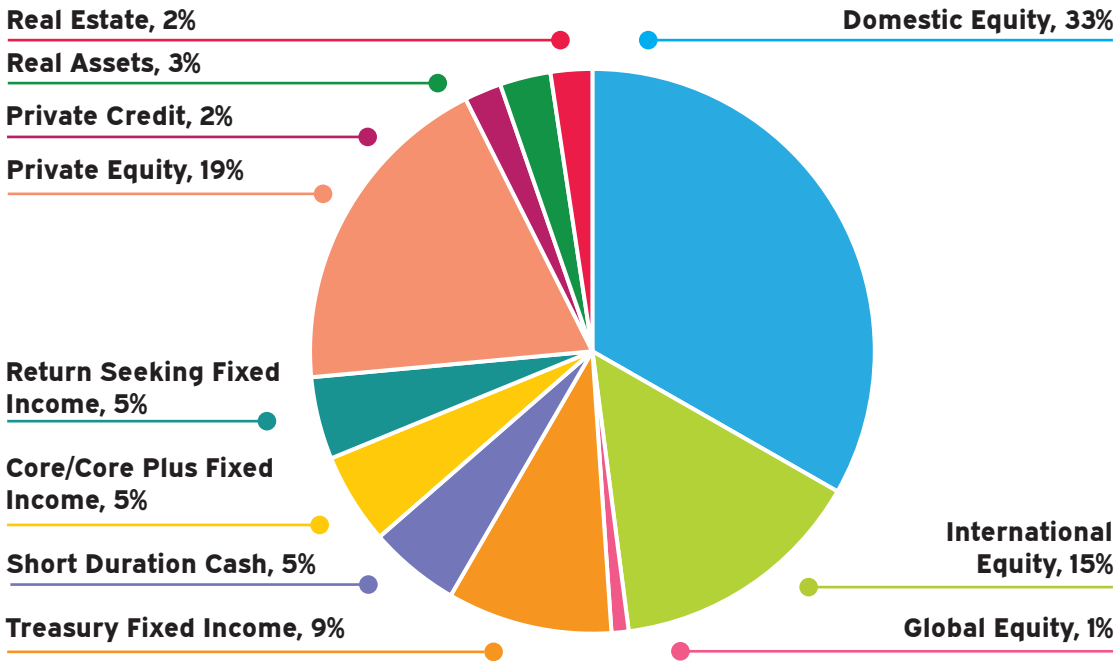


FIGURE 3

**3: US-Based Public Pension System's Allocation Framework in 2022**

Source: The allocations shown are for the Minnesota Combined Retirement Funds, which are overseen by the Minnesota State Board of Investment. We include Minnesota Combined Retirement Funds here as Minnesota is one of the few institutional investors who make publicly available historical documentation from 50+ years ago (https://msbi.us/annual-reports).

Note: Figures to not add to 100% due to rounding.


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During periods of market turmoil, particularly during the GFC, the diversification benefits of a large portfolio of asset classes proved to be illusory – this has commonly been referred to as the phenomenon of "correlations moving to 1." Despite what appeared to be a well-diversified portfolio in the sense it may contain upwards of a dozen different asset classes, the experience of investors during this period showed that there were high degrees of commonalities among different asset classes. As Figure 4 illustrates, major asset classes that were presumably quite different from each other covaried on the downside with US equity (the drawdown in core real estate was simply lagged). "Diversification in name only" became a prevalent issue across the industry.

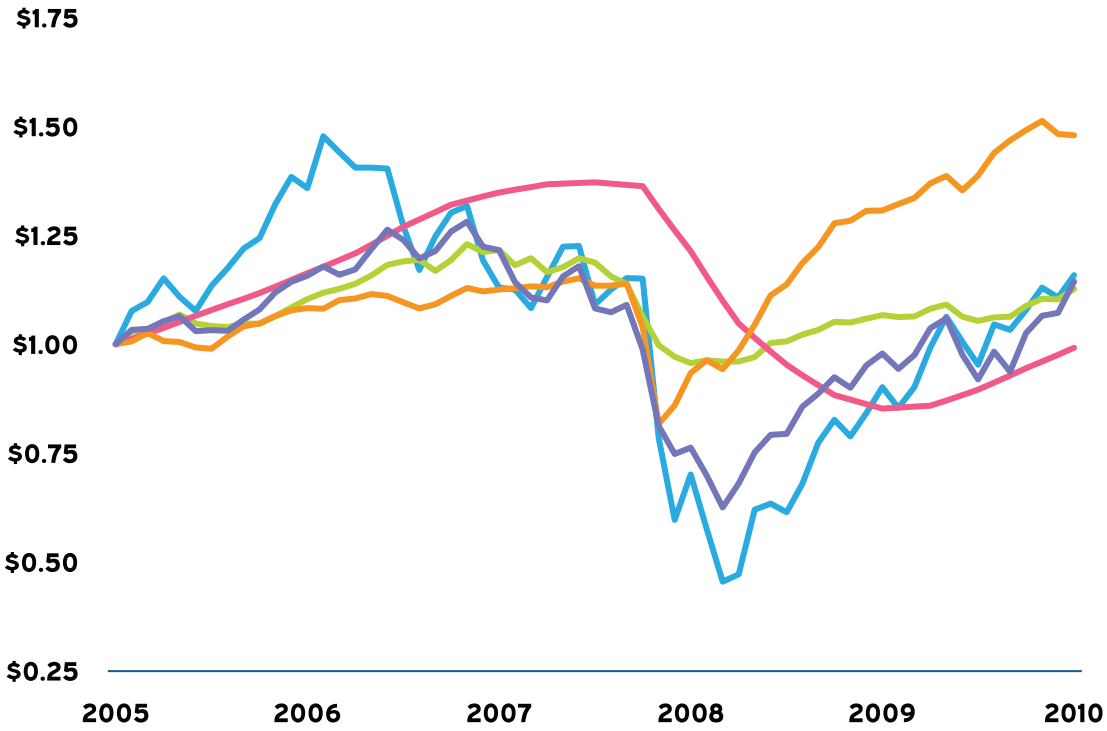


**FIGURE 4**
**GFC Drawdown Experiences - Different Asset Classes**

Source: MSCI US REITs, HFRI FOF Composite, NCREIF ODCE, 50%JPM EMBI Global Diversified/50%BB EM Corporate Hard, Russell 3000
Note: Figure 4 details the five-year period from 12/2005 to 12/2010. The drawdowns for each of the asset classes represent the maximum drawdown that occurred during this period, which were experienced during the core of the financial crisis between 2007 and 2009.

## Growth risk and growth classes

For many individuals who have been involved in the institutional investment industry at any point since the GFC, the terms "growth risk" or "growth class" have become common lexicon. As part of this section, we seek to demystify and clarify these concepts.


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"Growth risk" is short for "economic growth risk." Meketa defines this as the risk associated with changes in economic growth and/or corporate profitability.[6] Therefore, we will define asset classes that exhibit economic growth risk as asset classes that are susceptible to changes in economic growth and/or corporate profitability . Most investors understand that corporate-related investments exhibit economic growth risk. In other words, it is intuitive that during periods of economic duress, returns to shareholders may be negatively impacted and the probability that corporations may experience difficulty paying their debt may also increase, or in other words, equity and corporate bond investments are likely to decline in value. As such, equity and credit-oriented investments are natural components of a "growth class." This fundamental relationship is further explained below:

[6] The majority of the academic literature that examines macroeconomic factors and/or models are largely concerned about shocks or unanticipated changes in the macroeconomic factor, not necessarily their raw levels.

At a fundamental level, the value of any investment is the present value of all future cash flows. This can be mathematically depicted as follows[7]:

[7] This is commonly referred to as the Gordon Growth Model or Dividend Discount Model, depending on the specific application.

$$Price = \frac{Cash\ Flow_1}{(required\ rate\ of\ return - growth\ rate)}$$

Under this construct, an asset may experience a positive return via increased cash flow projections (numerator) and/or a lower denominator (lower required rate of return or higher growth rate). Conversely, an asset may experience a negative return via decreased cash flow projections (numerator) and/or a higher denominator (higher required rate of return or lower growth rate). What happens during periods of economic stress? It is very likely that both the numerator, via lower cash flow projections, and denominator, via higher required rates of return and lower growth rates, will be impacted to the detriment of investors. It is this exact reason why any asset that exhibits such sensitivities to economic growth risk can be held within a "growth class."

A commonly misunderstood element under this framework is the driver of the "required return" component. Critics of the "growth class" concept will argue that there are certain assets (e.g., those with contracted cash flows, high-quality and longstanding corporations such as Johnson & Johnson, etc.) whose cash flows are stable and largely immune from changes in the broader economic growth environment. While this immunity may be true to varying degrees, the formula provided above is for the *market* value of a given asset. Such a value is determined by the broader market and a key driver of any price is the "required return" component. A "required return" can be thought of as the return that a given investment must offer to attract a marginal buyer. During periods of economic stress, economic actors will naturally demand a higher required return because their marginal utility of a dollar is inherently increasing. A known dollar in their "pocket" is of greater value to


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to them. This increase is due to the fact that investors are likely experiencing losses across other investments and economic stress inherently increases the uncertainty of *any* investment. As such, even for investments with stable cash flows, the required rate of return naturally increases. An important caveat to this concept is that all of the elements of the above stated formula are unobservable and can only be estimated for the vast majority of assets. Bonds are generally the only exception.

During periods of economic stress, particularly when there is a deflationary/disinflationary backdrop, investors require lower rates of return from assets that are perceived as safe havens, such as US Treasuries. This market behavior is often compounded by central bank actions that are designed to re-stimulate the economy and stave off recessions. During periods of economic stress that have an inflationary backdrop (e.g., 2022), however, the required rates of returns (i.e., yields) on even US Treasuries can increase.

To further illustrate this point, Figure 5 examines a variety of different asset classes and their historical experiences during various periods of market turmoil.

| | US Equity | Non-US Equity | EM Equity | Private Equity | Real Estate | Infra-structure | High Yield | EM Debt (local) | Natural Resources (private) | Hedge Funds |
|---|---|---|---|---|---|---|---|---|---|---|
| COVID-19 Market Shock (Feb 2020-Mar 2020) | -35.0% | -32.7% | -31.2% | -7.4% | 0.7% | -6.3% | -20.8% | -13.9% | -22.1% | -9.1% |
| Global Financial Crisis (Oct 2007 - Mar 2009) | -45.8% | -52.1% | -51.2% | -28.2% | -28.4% | -10.0% | -22.8% | -7.9% | -31.2% | -17.8% |
| Popping of the TMT Bubble (Apr 2000 - Sep 2002) | -43.8% | -46.7% | -43.9% | -26.2% | 28.7% | 13.5% | -6.3% | 7.2% | -3.9% | -2.1% |
| LTCM (Jul - Aug 1998) | -15.4% | -11.5% | -26.7% | -3.3% | -1.2% | -0.8% | -5.0% | -34.1% | -16.9% | -9.4% |
| Early 1990s Recession (Jun - Oct 1990) | -14.7% | -9.7% | -15.9% | 1.8% | -2.4% | 0.7% | -12.9% | -10.5% | 5.6% | -1.9% |
| Crash of 1987 (Sep - Nov 1987) | -29.5% | -14.5% | -25.3% | -0.5% | -0.8% | -2.7% | -3.6% | -11.0% | -9.9% | -7.8% |
| Strong dollar (Jan 1981 - Sep 1982) | -2.3% | -18.0% | -12.1% | -3.9% | 24.4% | -1.8% | 6.9% | -2.0% | -9.5% | -3.8% |
| Volcker Recession (Jan - Mar 1980) | -4.1% | -7.0% | -6.6% | -2.7% | 4.8% | -1.0% | -2.3% | -3.2% | -9.1% | -1.9% |
| Stagflation (Jan 1973 - Sep 1974) | -42.6% | -36.3% | -44.2% | -20.1% | -10.8% | -3.8% | -15.5% | -23.9% | 19.3% | -15.7% |

**FIGURE 5**
**Cumulative Returns During Periods of Market Stress**

Source: Meketa Investment Group. Historical scenarios are modeled off of benchmark proxies when available and uses simulated returns when the proxies were unavailable. Please see Appendix for a list of benchmarks and corresponding proxies.


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As detailed in Figure 5, the vast majority of the examined asset classes historically produced negative returns during periods of market stress. When certain asset classes produced positive returns during these periods, there is often important context and nuance that must be considered. For example, it is generally accepted that with the popping of the dot-com bubble in the early-2000s, global capital left the Technology, Media & Telecom sectors and transitioned to real estate, forming the foundation of the next bubble and the GFC.

Despite the propensity of the examined asset classes to drawdown in tandem with one another (or market context explaining the opposite), there are other situations in the highlighted historical scenarios where the desired diversification worked. This represents one of the challenges to the functional framework paradigm – while it tends to group assets that perform similarly to one another under most environments, it is not an axiom. Importantly, however, this challenge is not isolated to just functional frameworks. For example, investors in calendar year 2022 have experienced material divergences at the equity sector levels (e.g., technology vs. energy) due to the prevailing market circumstances.

For better or for worse, the name "growth class" has a secondary meaning as well. Assets that tend to exhibit sensitivities to changes in economic growth and/or corporate profitability also tend to be assets with the strongest potential for producing growth within a portfolio. That is, they tend to exhibit the highest expected returns, although as we will discuss later, there is a risk/return spectrum among these assets. This dual meaning is, unfortunately, a cause of confusion among those who are not intimately familiar with functional allocation frameworks.

## Putting it all together

Growth risk is pervasive across nearly all asset classes and/or strategies that target meaningful levels of return (i.e., near, at, or above public equity return levels). Furthermore, growth classes are often investors' first foray when transitioning from an asset class framework to a functional framework.

A more descriptive name for the "functional allocation framework" is the "functional, risk-based allocation framework." This addition of "risk-based" is where this concept shares some overlap with risk parity and factor investing. In particular, the overarching strategic classes that are commonly used within functional frameworks tend to have key risks, or factors, that drive the bulk of the return variability within the classes. For example, assets within a "growth class" are explicitly exposed to economic growth risk whereas a "risk mitigating strategies class" likely is driven by duration risk, volatility risk, and time series momentum, among others. Being aware of the driving factors within a given class is part of the core philosophy behind a functional framework. Whereas a traditional asset class framework tends to focus on "normal" or average market environments[8], functional frameworks naturally force investors to be cognizant of tail events, both good and bad.

[8] This can be exemplified by the key assumptions for mean-variance optimization, which are simply expected returns, volatilities, and correlations, all of which represent some form of an "average" outcome or behavior.


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In practice, investors who utilize the most robust functional frameworks tend to assume that all asset classes or strategies belong in a "growth class" as the default classification. This approach thus forces investors to recognize which investments are likely to covary on the downside with other growth assets, particularly public equity markets. This "bad times" lens embeds additional humility and conservatism into all portfolio constructs.

Perhaps the most common question investors ask about the framework is "what are the functional classes that we should utilize?" This question points to one of the largest drawbacks of such a framework, namely that it lacks consensus and clarity when it comes to the actual classes that are used. Outside of a "growth class," there are a wide variety of class names that investors use in practice. Furthermore, a large subset of investors who use functional frameworks actually use more hybrid functional/asset class constructs. The framework highlighted in Figure 6 represents an archetypical construct.

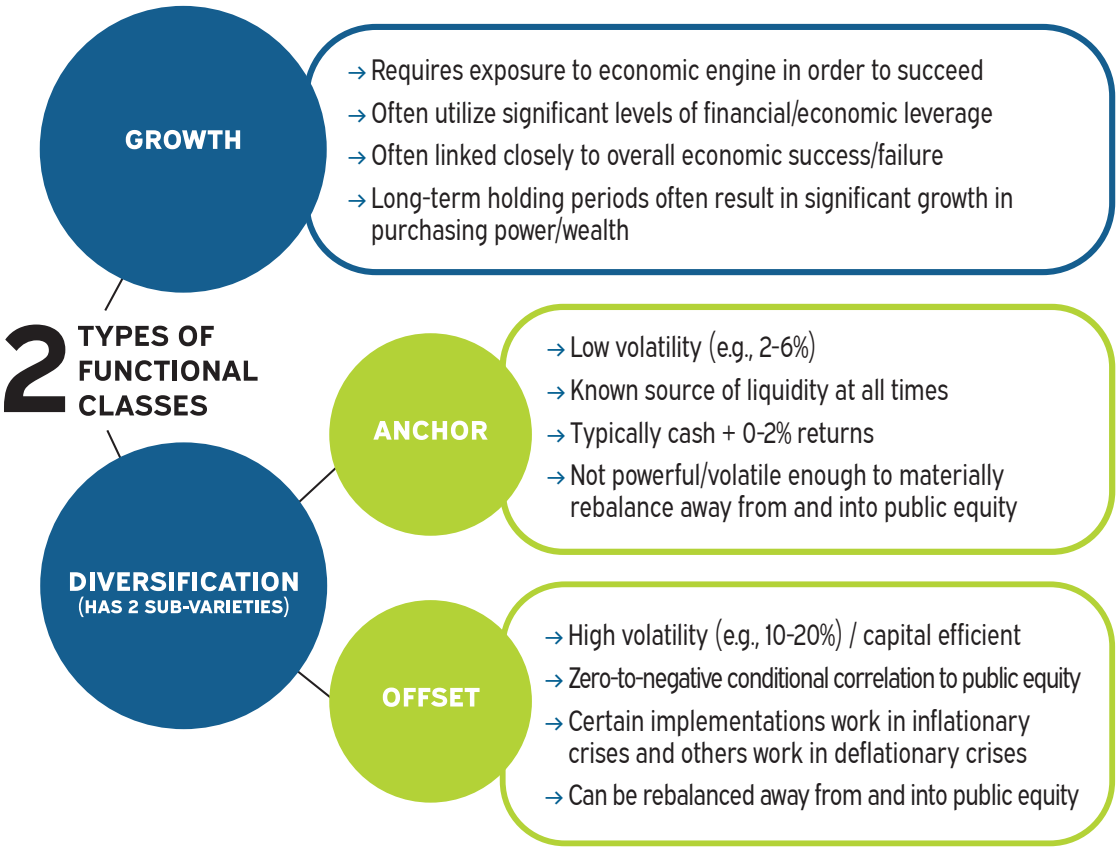


**FIGURE 6**
**Two Types of Functional Classes**

Source: Meketa Investment Group

Underneath the high-level classifications of Growth and Diversification, there are a range of sub-groups and/or strategies with different attributes. As mentioned earlier, there is not an industry-wide consensus for how these sub-components or sub-classes should be named or structured. For example, while our archetypical framework mentions two sub-varieties within Diversification, several functional frameworks in practice blur those delineations either intentionally or unintentionally in the sub-classes.


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| | | |
|---|---|---|
| Growth | **Aggressive Growth** | Provide growth in excess of traditional growth investments (i.e., public equity markets) through exposure to investments driven mainly by exposure to both the equity risk and illiquidity risk premiums. (e.g., private equity and non-core real assets). |
| | **Traditional Growth** | Provide growth in-line with traditional public equity markets through global public equity investments and those of similar risk/return (e.g., US equity, non-US equity, REITS, etc.). |
| | **Stabilized Growth** | Provide growth through strategies that are exposed to equity market beta, exhibiting expected returns similar to traditional growth but with 50-75% of the volatility (e.g., credit, options strategies, and core real assets). |
| Diversification | **Inflation Protection** | Serve a mixed role of part anchor (e.g., TIPS) and part offset (e.g., commodities) depending on the market environment. Designed to help protect the portfolio during periods of high inflation. |
| | **Principal Protection** | Provide an anchor to the portfolio by exhibiting low volatility with minimal or zero exposure to the equity risk premia. Designed to provide consistent, stable returns during all or most market environments and preserve principal during periods where growth investments are experiencing significant drawdowns (e.g., intermediate duration investment grade fixed income). |
| | **Risk Mitigating Strategies** | Provide an offset to portfolio growth risk through liquid exposures to systematic market and non-market based risk premiums expected to exhibit offsetting behavior to growth investments during periods of significant drawdowns (e.g., long duration Treasuries, systematic trend following, alternative risk premia, long volatility, global macro, etc.). |

**FIGURE 7**
**Example Framework A with Sub-Classes**

Source: Meketa Investment Group.

| | | |
|---|---|---|
| Growth | **Private Growth** | Provide growth in excess of traditional growth investments (i.e., public equity markets) through exposure to investments driven mainly by exposure to both the equity risk and illiquidity risk premiums (e.g., private equity). |
| | **Traditional Growth** | Provide growth in-line with traditional public equity markets through global public equity investments and those of similar risk/return (e.g., US equity, non-US equity, REITS, etc.). |
| | **Credit** | Provide exposure to economic growth risk via debt-related holdings across both public and private markets. (e.g., high yield bonds, private credit, etc.). |
| | **Real Assets** | A spectrum of illiquid strategies that represent interests directly in or derived from physical, real assets. Represents a multitude of sensitivities to economic growth, interest rates, and inflation. |
| Diversification | **Liquid Defensive** | Structured to provide significant positive returns when growth assets are producing significant negative returns. Potential strategies include long duration Treasuries, long volatility, systematic trend following, etc. |
| | **Liquid Diversifying** | Structured to produce uncorrelated returns during both crisis and non-crisis periods for growth assets. Potential strategies include global macro, alternative risk premia, equity market-neutral, relative value, etc. |
| | **Illiquid Diversifying** | Structured to produce uncorrelated returns during both crisis and non-crisis periods for growth assets but with illiquid investments or vehicles. Potential strategies include insurance-linked/reinsurance, litigation finance, etc. |

**FIGURE 8**
**Example Framework B with Sub-Classes**

Source: Meketa Investment Group.


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As described in Figures 7 and 8, there are significant possibilities for the sub-components underneath the high-level strategic classes of Growth and Diversification. This represents both a benefit and challenge of the functional framework. From a benefit perspective, the flexibility allows investors (particularly investment staff) with the ability to construct the sub-components to their preferences (e.g., based on staff structure, investment viewpoints/preferences, etc.) while maintaining a consistent high-level structure for those that may ultimately be responsible for the oversight of a given portfolio (e.g., boards, investment committees, etc.). From a weakness perspective, sub-components may have overlapping exposures/objectives and the lack of an industry-wide consensus reduces the comparability among various portfolio structures. Furthermore, with governing bodies focusing on the high-level classes and objectives, and with investment staff granted flexibility to implement at the subcomponent level, a properly designed program requires comprehensive reporting in order to help limit potential agency challenges.

## Major benefits and drawbacks

There are two significant benefits to the functional framework, one pertaining to portfolio governance and the other to portfolio implementation.

From a governance perspective, the functional framework provides governing bodies (e.g., boards, investment committees, etc.) with quick and intuitive transparency into the major risks and roles among portfolio components. Rather than examining a portfolio of 10-20 different asset classes, several of which (e.g., hedge funds, absolute return, fixed income, etc.) provide very little information into the underlying return drivers and commonalities with other items in a portfolio, a governing body can quickly examine and understand the exposures within a portfolio with a specific focus on downside risks and portfolio objectives. While this information is easily accessible/calculable under a traditional asset class framework, it is far less intuitive and requires more sophisticated calculation methods.

From an implementation perspective, a functional framework makes it easier to find a home for assets/strategies that do not fit neatly into traditional asset allocation frameworks (i.e., it alleviates the challenge of "there is no bucket in my portfolio in which to put this"). When unique and attractive strategies come to light, investors should examine the risk drivers and portfolio purpose of the strategies and, when appropriate, place the strategy in the corresponding functional class/sub-component. Moreover, this allows for strategies to effectively compete with one another for positions within a portfolio. When done properly, this activity should not significantly impact the overall risk behavior (e.g., volatility, drawdown, correlation with markets, etc.) while potentially improving the return potential of the total portfolio. Once again, all of this is possible under an asset class framework, but it requires materially more robust investment management processes and policies. While technically feasible, the complexity of incorporating similar processes within an asset class framework can be nullified simply by the adoption of a functional framework.


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There are two significant challenges to the functional framework. The first challenge pertains to the high degree of abstraction[9]. While the framework tilts the portfolio review lens towards the major risks and functions within a portfolio, this comes at the cost of decreased detail and granularity. There will certainly be times where key decision makers want to examine specific asset level exposures, and this may require peering through multiple layers. Relatedly, functional frameworks and their lack of consistency makes comparing allocations across peers/universes challenging if not impossible.

The second challenge relates to the actual design/construction of the classes. In a perfect world, asset classes would be "pure" in the sense that they are largely driven by a single factor. While there are certain asset classes where this is more or less true (e.g., US Treasury bonds, global equity, etc.), this tends to be more of an exception than the rule. Real assets and TIPS, for example, have a variety of driving forces and economic sensitivities[10]. This is an example of the imprecise nature of functional frameworks.

[9] Abstraction is a common approach within computer science where the most intricate details of something are hidden from everyone except for the original designer. Abstraction tends to improve user intuition and often aligns with functionality.

[10] More generically, asset classes that exhibit material exposure to inflation tend to be the most challenging to classify. Inflation is a risk that can be at the forefront of the capital markets, and thus a material driving force (e.g., 2022), or it can shift to the background as a minor consideration (e.g., most of the last three decades).

## Asset class framework vs. functional framework summary

| Asset Class Framework | Functional Framework |
|---|---|
| Organizes investments based on type of instrument | Organizes investments by primary risk drivers and/or function/role |
| Fundamental drivers of results not prioritized | Improves transparency into the portfolio's underlying risk posture |
| Often leads to "diversification-in-name-only" | Incorporates portfolio flexibility to address continually changing product offerings |
| Portfolios typically contain "Alternatives" allocations that are catch-all buckets or otherwise provide no detail into the underlying return/risk drivers | Shifts the oversight prism to focus on "bad times" |
| Works well during "normal times" | Requires new strategies to be truly additive in an economic/ intuitive sense |
| Historically applicable when investments were primarily public equities and government bonds | Improves stability in total portfolio risk posture (i.e., avoids risk drift). |

**FIGURE 9**
**Major Features of the Two Allocation Frameworks**

Source: Meketa Investment Group.


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## Example portfolio allocation structures

As discussed throughout this paper, there is no industry consensus as to how functional frameworks are designed and utilized in practice. Furthermore, a material subset of portfolios that incorporate a functional framework do so in a hybrid fashion. Figure 10 shows examples of institutional investment portfolios that make use of a functional framework in part or in totality.

| Strategic Classes/Factors | | CalSTRS | Danish Labour Market Supplementary Pension Fund (ATP) | Hawaii ERS | New Zealand SF (Reference Portfolio) | Illinois SURS | Orange County ERS |
|---|---|---|---|---|---|---|---|
| | Functional/Factor Class | → Economic Growth<br>→ Diversifying | → Equity Factor<br>→ Interest Rate Factor<br>→ Inflation Factor<br>→ Other Factors | → Broad Growth<br>→ Diversifying Strategies | → Growth | → Broad Growth<br>→ Inflation Sensitive<br>→ Principal Protection<br>→ Crisis Risk Offset | → Risk Mitigation |
| | Asset Class | → Real Assets | | | → Fixed Income | | → Public Equity<br>→ Private Equity<br>→ Fixed Income<br>→ Credit<br>→ Real Assets |
| Approximate Size (USD) | | $300B | $125B | $22B | $35B | $22B | $20B |

**FIGURE 10**
**Sampling of Functional Classes within Institutions**

Source: Approximate AUM figures are as 6/2022 or 9/2022 values. Documents/links were obtained from publicly available sources as of October 2022 and may change over time.

CalSTRS: https://www.calstrs.com/files/f46b99b00/A-InvestmentPolicyandManagementPlan07-2022.pdf

ATP: https://www.atp.dk/en/dokument/factor-investing-atp-way

Hawaii ERS: https://ers.ehawaii.gov/investments/asset-allocation

New Zealand SWF: https://www.nzsuperfund.nz/assets/Uploads/The-2020-Reference-Portfolio-Review-v2.pdf

Illinois SURS: https://surs.org/wp-content/uploads/policy.pdf

Orange County ERS: https://www.ocers.org/investments

## Modeling considerations

How does one implement a functional framework? In particular, how does one utilize common portfolio construction techniques (e.g., mean-variance optimization, scenario analysis, simulation-based optimization) within such a framework? Ultimately, nearly nothing changes from a modeling perspective. Meketa recommends that investors still use asset class-specific assumptions. With that said, the modeling process may utilize a more streamlined set of asset classes with more granular strategies implemented by the day-to-day management group. For example, rather than modeling high yield bonds, emerging markets debt, bank loans, collateralized loan obligations, and other credit-oriented asset classes distinctly, practitioners may use a genericized assumption for "credit" or just use one of the asset classes and recognize that they are somewhat interchangeable during implementation.

It is important to recognize that modeling or optimizing an institutional investment portfolio is an imperfect exercise. It is impossible to recognize all of the intricate relationships and behaviors of the capital markets, and even if these were completely observable, it would be inconceivable to expect accurate forecasting by market participants. While incorporating a functional allocation framework does not necessarily impact the modeling/


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optimization process, it may impact the final modifications (i.e., qualitative adjustments) that investors often incorporate.

For example, some investors utilize mean-variance or simulation-based optimizations to guide them to a specific set of portfolios, with the final selection often determined by qualitative adjustments (e.g., updated considerations of prevailing capital market environment, asset class preferences of decision makers, etc.). When utilizing a functional allocation framework, decision makers may more clearly see the high degree of commonality among asset classes, particularly as it relates to economic growth risk exposure, and this may lead them to choose an alternative subset of portfolios with larger allocations to asset classes that offer more reliable diversification properties. Furthermore, the recognition that certain asset classes exhibit economic growth risk may cause investors to alter their allocations when they consider that the sponsoring entity shares a similar exposure that may impact their ability to make ongoing contributions to the portfolio (e.g., tax receipts, endowment donations, etc.). This procyclicality is of particular importance to portfolios that have explicit, contractual liabilities and a heavy reliance on both portfolio contributions and investment appreciation (e.g., pension systems).

## Summary

Functional allocation frameworks represent a growing trend among institutional investors when it comes to strategic allocation policy. These frameworks seek to group assets into classes/buckets in a way that may more accurately represent critical commonalities. These groupings tend to be focused on specific factor risks, particularly macroeconomic factors, and/or an alignment with portfolio functions.

Despite this growing trend, it is important to recognize that one of the main reasons these frameworks have grown in popularity is because they have the potential to dampen the undesirable tendencies (e.g., behavioral biases) of the well-intentioned professionals who oversee institutional investment portfolios. In particular, such frameworks do not necessarily change the nature of a given investment portfolio, but rather, they provide an improved lens for examining the major risks of an investment portfolio and often spark improved conversations related to diversification. Furthermore, there may be additional benefits when it comes to implementation flexibility by the day-to-day decision makers (e.g., investment staff).

Functional allocation frameworks tend to align with the notion of "as simple as possible, but as complex as necessary." By creating an allocation framework with both high-level, strategic classes (for overseeing bodies and/or long-term policy) as well as low-level, implementation classes (for day-to-day management), these frameworks offer the potential to improve portfolio management and oversight. Despite these potential improvements, these frameworks are not silver bullets. Whereas they may address portions of the various shortcomings and challenges of traditional asset class frameworks, they exhibit their own set of difficulties that often are not easily identified until implementation is nearly complete. Meketa believes functional allocation frameworks are worth discussing for most institutional investors, but the attractiveness and applicability will vary from investor to investor.


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## Appendix: risk parity and factor investing

Subsequent to the 2008-2009 Global Financial Crisis, several new approaches (or paradigms) for portfolio construction/management grew in popularity. "Risk parity" and "factor investing" are two examples of concepts that saw growth during this period. While there are degrees of overlap among these topics, they are distinct. This section seeks to provide some insight into their commonalities and differences.

The term risk parity was first coined by Edward Qian, PhD in 2005[11], although its broader adoption within the institutional investment community did not take place until after the GFC. The intent of risk parity is to allocate (and more specifically, equally allocate) to asset classes based on their contribution to risk (e.g., volatility) within the portfolio. For example, when examining a traditional 60/40 portfolio it is well recognized that the equity portion of the portfolio typically contributes over 90% of the volatility of the aggregate portfolio. The general concept of more balanced risk exposures certainly dates back prior to 2005, including large-scale usages within the hedge fund universe (i.e., systematic strategies in particular). Perhaps the most well-known strategy is that of Bridgewater's "All Weather" portfolio which seeks to equally allocate risk across portfolios that are designed for different economic regimes. Their approach highlights several of the challenges when examining the risk parity universe: Over what (e.g., asset classes, regimes, etc.) is risk being balanced? How are correlations incorporated if at all (e.g., naïve approaches, such as All Weather, may assume a correlation of zero)? Despite these nuances and intricacies, the key concept is that the risk in "diversified" portfolios should not be dominated by one risk (e.g., equity-like risk). It is this recognition that certain risks, particularly equity-like risk, are pervasive across portfolios and should be managed accordingly that is shared among the risk parity and functional allocation framework concepts.

[11] *Risk Parity Portfolios: Efficient Portfolios through True Diversification* – Edward Qian, PhD (2005)

From a total portfolio perspective, factor investing followed a similar timeline and evolution as that of risk parity. With that said, the underlying approach of factor investing (i.e., understanding the true drivers of a portfolio's variability) dates back decades with the most prominent piece of research known as the Fama-French Three-Factor Model (1992).[12] Prior to the GFC, the majority of discussions regarding factors pertained to risk premium-oriented factors within specific strategies, such as exposure to *Value, Size, Momentum,* and *Equity Beta* within a long-only equity portfolio. Subsequent to the GFC, however, the concept of factor investing expanded to better incorporate the concept within diversified total portfolios[13].

[12] FAMA, E.F. and FRENCH, K.R. (1992), The Cross-Section of Expected Stock Returns. The Journal of Finance, 47: 427-465

[13] Two books in particular (*Expected Returns: An Investor's Guide to Harvesting Market Rewards* by Antti Ilmanen and *Asset Management: A Systematic Approach to Factor Investing* by Andrew Ang) brought these concepts to the masses.

When it comes to factors, there is not an industry-wide consensus for their classification, though the framework we discuss below would likely be accepted by academic and practitioners alike. Generally speaking, there are two types of factors:

**1)** Investment Style Factors **2)** Macroeconomic Factors


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Investment style factors refer to both traditional (e.g., equity market, credit market, duration, etc.) as well as alternative (e.g., value, momentum, carry, etc.) factors. Traditional factors are generally accessible via long-only, static portfolios whereas alternative factors are more dynamic and are more commonly accessed through portfolios with materially more trading (including long/short constructs). Macroeconomic factors are less concrete and typically cannot be traded directly. These include factors such as economic growth and inflation, among others. Despite two categories of factors, they are interrelated and often need to be analyzed and discussed concurrently. It is intuitive that macroeconomic factors impact the capital markets on a broad basis.[14] It is less, intuitive, however, to examine an investment portfolio and the traditional style factors that are present and connect those exposures to the implicit bets/biases the portfolio may have from a macroeconomic perspective. A functional allocation framework inherently brings the most important macroeconomic risk (economic growth risk) and its embedded relationships with traditional asset classes to the forefront.

[14] The first study to examine macroeconomic factors within equity return variability was Chen, Roll, and Ross (1986).


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# Appendix: historical return benchmarks

| Benchmark | Benchmark Proxy |
|---|---|
| US Equity | S&P 500 Total Return |
| Non-US Equity | MSCI EAFE Net Total Return |
| Emerging Market Equity | MSCI EM Net Total Return |
| Private Equity | Cambridge Associates Private Equity Proxy Returns |
| Real Estate | NCREIF Property Index |
| Infrastructure | Weighted Average of 60% CA Private Core Infrastructure, 20% CA Private Non-Core Infrastructure, and 20% S&P Global Infrastructure Total Return Index |
| High Yield | Bloomberg US Corporate High Yield Index |
| Emerging Market Debt (Local) | Bloomberg EM Local Currency Government Diversified Index |
| Natural Resources | Cambridge Associates Natural Resources Proxy Returns |
| Hedge Funds | HFRI Equity Hedge Total Index |

**FIGURE 11**
**Benchmark Proxies for the Historical Cumulative Returns Detailed in Figure 5.**

Source: Bloomberg or Cambridge Associates.


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