Using Investment Consumption Value to Select Asset Classes: *A Non-Traditional Approach*

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There is general but not universal agreement that the asset allocation decision accounts for a significant part of the variability of return on investor portfolios (Brinson, Hood, and Beebower [1986]); Ibbotson and Kaplan [2000]; Kritzman and Page [2003]; and Fabozzi and Vardharaj [2007]).The decision on what asset classes are to be allocated, however, remains an important, if unclear prerequisite. In search of added portfolio value, investment managers are casting a wide net beyond the traditional asset classes of stocks and bonds. Consequently, debate abounds as to what constitutes a desirable asset class for investment purposes.

A case in point is the recent increased interest in commodities as investments and the ensuing question of whether commodities are best thought of as a permanent strategic portion of an overall portfolio or a temporary and tactical portfolio component. Some argue that they should not be considered an asset class at all.[1]

For example, Solnik and McLeavey [2004] suggest commodities are an asset class because they represent participation in the real economy and show a negative correlation with bonds and stocks. Others suggest commodities have a zero expected risk premium and thus are not a desirable asset class (Denson [2006]).

There is an abundant literature on asset allocation that applies hindsight-driven historical mean-variance analysis with the intent of defining asset classes and of optimizing the allocation to each, taking as a given an a priori set of asset classes and investor objectives. To identify these asset classes, investors apply one or several of the many variations of asset class definitions, mostly referring to common economic and financial attributes such as stocks, bonds, and real estate.

Obviously, this traditional approach is an important exercise, but it ignores the more important question of deciding ahead of time the asset classes to consider as appropriate for investment. Not only do traditional asset class identification processes use recursive historical mean-variance analysis, but they also essentially ignore how an appropriate asset class will work to support investors' current and future wealth and consumption goals.

For instance, mean-variance analysis often assumes terminal utility at a specific time horizon. But, for investors, the path along that horizon matters as well—a smooth path is clearly preferred over a volatile one.

A proper approach requires an understanding of how assets reflect investors' diverse needs and views of the future. Assets appropriate for investment serve an important role in transferring risk across time and across contingencies. So, *forward*-looking expectations and investor consumption preferences over the full investment horizon are keys to proper asset class identification. Historical mean, variance, and correlation experience is not the

appropriate framework for asset class identification and selection. For long-term success, we need a new process for thinking about what constitutes a suitable asset class.

Behavioral finance also offers some insight into this need for a new expert design. Consider this fallacious thinking in analyzing worthy investment classes. Many investors say commodities, for example, are a poor investment because over long historical horizons they have offered only flat or negative returns. Yet history is not a proof that commodities are a bad investment, even though people wrongly frame investment decisions on the basis of their experience.

To think of an example, U.S. stocks and the U.S. economy did well in the 20th century. Is that the correct frame of reference for equity allocations today, or did the U.S. have one good draw from a larger universe of simulation runs?

Historically speaking, the United States can be thought of as the winner and not necessarily representative of other markets or even representative of the future of the U.S. market. Such winning markets can give the appearance of predictability, merely because they have survived. The argument supporting allocation to a particular asset class, however, should be its appropriateness as an investment, dependent on consumption needs and desires across time horizons and contingencies.

This article introduces a process for determining asset classes appropriate for investment. The robust decision framework is aimed squarely at the client/investor and grounded in the fundamentals of economics and finance. Here, I define a new concept called "investment consumption value." As all investing is done ultimately for consumption purposes, investment consumption value focuses attention on how the consumer will ultimately benefit from an investment transaction. In this regard, investors seek a portfolio of assets that best supports their future consumption objectives. I show how this new concept helps with decisions about including such proposed asset classes as hedge funds, commodities, and human capital. The powerful intuition behind the framework is provided by insights into time-tested asset valuation models while being grounded in modern portfolio theory. I analyze some purported asset classes against the framework and find that, for example, commodities should be considered a suitable asset class for inclusion in a complete asset allocation investment program.

DETERMINING DESIRABLE ASSET CLASSES

A good place to begin the discussion on asset class qualification is with the helpful guidelines on defining an asset class offered by Maginn et al. [2007]. They suggest assets within an asset class should be relatively homogeneous, mutually exclusive, diversifying, and reasonably liquid. So, the assets as a group should make up a preponderance of world investable wealth.

This taxonomy is a good starting point, but it is incomplete because the description lacks direction on the key question of how the asset class intersects with investors needs and the macroeconomy. I discuss below an additional critical attribute of a desirable asset class—its ability to bring value to the investor or consumer by way of supporting investor welfare, not only in the terminal period, but also over the course of the investment horizon. To put it another way, how an asset transfers risk across changes in economic states over time matters as well.

Determining asset classes appropriate for investment requires additional work to define an economic equilibrium that makes the aggregate supply of goods and services equal to the aggregate demand for those goods and services, thus equilibrating the quantities and prices of output. Here I place the solution to asset class appropriateness in a macroeconomic equilibrium framework; aggregate supply and demand informs the discovery process and leads ultimately to price and returns on an asset.

In short, the forces of aggregate supply of and demand for goods and services play *the* fundamental role in wealth generation, in that the flow of goods and services consumed by everyone constitutes the ultimate creation of wealth.[2] I argue this idea can be used to determine asset classes suitable for investment.[3]

In beginning with the macroeconomy, consider that nothing in the economy happens unless a consumer spends a dollar on a product or service to which the consumer assigns utility or unless the saver invests a dollar on which return or utility is expected. The value of an asset depends on both the extent to which it satisfies the wants of the individual and its relative scarcity. Hence, subjective value, or its value in use or exchange, is the key determinant of true value.

For instance, value can be created simply by transferring ownership of an asset from one person to another who values it more highly. Thus, in my framework, products, services, and inventories can become either valuable or obsolescent instantaneously. This subjective value

idea has far-reaching implications for defining asset classes, as we will see.

For equilibrium analysis, I work in a framework that incorporates both demand-side and supply-side approaches to market returns (Goetzmann and Ibbotson [2006]). The demand side examines the returns and risk aversion level investors define as meeting their needs and wishes. Investors demand a risk premium or return in exchange for taking certain investment risks. Market risk premiums depend on a macroeconomic general equilibrium model and related capital market flows. The supply side examines what the economy is likely to supply and capable of supplying and the share of returns accruing to the market in the overall economy, e.g., through paying dividends and through growth and inflation (Ibbotson, Diermeier, and Siegel [1984]).

For proper portfolio construction, investors must be able to construct an adequate set of risk and return expectations for each asset class. This in turn requires long-term forecasts of economic sectors placed in a general or partial equilibrium setting dependent on economic output and demand.[4] Clearly, investors benefit from capital market investments, but they also seek other products and services that will meet their investment goals and objectives through time.

Economists have long advocated calibrating output with the forces of demand for understanding the workings of the economy. For a portfolio manager, this process is brought to light in a traditional capital asset pricing model setting. For financial economists, the process is typically best understood in a consumption CAPM (CCAPM) framework or, alternatively, the state-preference approach to uncertainty first suggested by Arrow and Debreu [1954] and more recently discussed by Sharpe [2006]. Through this financial economics lens, I am interested in laying bare the mechanisms by which a portfolio should be constructed for determining which asset classes merit investment consideration.

To properly frame the discussion, I first take a brief stroll through the history of asset valuation. Each step along the way, I draw on these important concepts to develop a comprehensive approach to determining the appropriateness of various asset types in portfolio construction.

BRIEF HISTORY OF VALUATION CONCEPTS

Investment value was initially defined in terms of intrinsic value creation—more specifically, as the present worth of future cash flows estimated from the economic factors of aggregate supply and demand. The conceptual framework of intrinsic investment value creation is credited to John Burr Williams [1938], with further development by Benjamin Graham (see Graham et al. [1962]). In this framework, the investment value of an asset is determined in terms of wealth created through applying factors of production (labor and capital). Value creation is made possible by applying these factors to an asset, thereby generating a stream of cash flows, or intrinsic value.

I do not quibble with the importance of applying the concept of intrinsic value as a key asset valuation anchor. Intrinsic valuation analysis can offer an important focus for determining the appropriate value of a firm or investment. I do argue that a subjective value approach adds to the discussion as we determine true asset value and therefore investment suitability.

Some particular portfolio choice and asset pricing theories include the CAPM, CCAPM, and state-preferences.

CAPM

Building on the mean-variance work of Markowitz, (most recently Markowitz [2005]), Sharpe [1964, 1992, and 2006] laid the foundation for how investment professionals understand asset pricing today. Insights into the equilibrium risk and return components of capital markets are captured in the capital asset pricing model, which suggests whether assets are under-or overvalued. In CAPM equilibrium, investors choose some combination of the market portfolio and borrowing and lending, with the proportions determined by their willingness to bear risk to obtain higher expected return.[5]

The CAPM allocates returns according to market or systematic risk, while non-market or idiosyncratic return goes unrewarded. Under the CAPM, greater market risk translates into greater expected return, and sensible investors do not seek non-market risk. Prices and thus returns are ascribable to supply and demand characteristics for that security or asset class.

In this context, financial equilibrium is determined by the prices of the securities and the consumption stream (demand) of economic agents. High demand relative to supply leads to higher market clearing prices and thus higher returns, ceteris paribus. Investors hold a particular asset class only if some combination of the expected return and covariance with other parts of their portfolio compensates them for higher risk relative to the risk-free asset.

The single-period CAPM, however, does not apply in a multiperiod setting if investor preferences change across time, or if the available investment opportunity set changes across time. Addressing this challenge, Merton [1973] developed a multiperiod intertemporal capital asset pricing model, or ICAPM, where changes in the investment opportunity set affect future asset returns, which in turn affect consumption.

Clearly, the ICAPM has important implications for determining asset classes appropriate for investment. Here, the investment opportunity set reflects the underlying structure of the economy, which eventually affects consumption at some horizon because aggregate consumption is subject to a budget constraint.

CCAPM

A common variation on the CAPM, the so-called consumption CAPM (CCAPM) takes the next step in aiding an understanding of how the investor or consumer benefits from the purchase of an asset. The CCAPM expands the CAPM by looking beyond the financial economy; it connects the activities of individuals across the financial economy *and* the macroeconomy.

All investors choose a level of consumption and an asset mix that maximize their own expected utility across all time horizons and economic states. As consumption levels change, and the economy cycles between highs and lows, certain asset classes become more or less desirable.

As Mehra [2003] points out, assets that pay off when times are good and consumption levels are high are less desirable than assets that offer equivalent payoffs when times are bad. The latter set of assets must therefore offer a premium return as inducement for investors to hold them.

The stream of cash flows accruing to an asset emanates from its share of aggregate output. In the CCAPM context, then, capital market returns relate to the state of the economy. Resulting investor portfolios therefore vary according to individual needs.[6]

In my consumer-driven approach to defining asset classes appropriate for investment, I borrow from the CCAPM the notion that investors choose goods and services in accordance with their covariances with current and future consumption needs. Investors hold a particular asset class only if they expect an improved future return and risk profile that compensates them for forgoing current consumption. In this framework, the risk and return explanation incorporates investor risk aversion as to consumption preferences. Asset prices and returns, therefore, depend on the trade-off between the utility derived by current consumption and the utility derived by investing capital in a particular asset class for future consumption purposes.

Current consumption utility equals the anticipated gain in utility when the asset pays off in the future.[7]

A nice feature of the CCAPM is that it prescribes the discount rate to apply in order to bring this stream of cash flows to the present as the (risk-adjusted) opportunity cost of capital. Risk premium is an *ex ante* concept representing the return expectations of investors over the risk-free rate. So, both the estimated (excess) cash flows and the appropriate discount rate are set in the CCAPM framework. This makes sense, because the consumption CCAPM bridges the economic sectors and financial sectors. Establishing the appropriate opportunity cost of capital simply means adding the appropriate risk premium for that particular investment to the risk-free rate, where the risk premium depends on the covariance of returns with aggregate output.[8]

In the CAPM, investors are rewarded with higher expected return for taking market risk, while non-market risk goes unrewarded. By incorporating a wide set of possible outcomes, while being consistent with the CAPM, the CCAPM expands on the CAPM equilibrium by accounting for investor preferences beyond capital market investments.

State Preferences

In the Arrow-Debreu state-preference approach to portfolio construction, investors assign probabilities to the occurrence of any given state. In this generalization of mean-variance analysis, rather than rely on standard deviation to assess risk, investors use information to assign probabilities to alternative economic states. Investors buy or sell assets for any possible outcome contingency and, accordingly, payoffs occur depending on these various states.

State-preference theory, in accordance with the CCAPM, suggests rewards can be obtained from taking both market and non-market risk. In making portfolio choices, investors consider investment in assets outside their traditional market portfolios to meet needs across time and outcomes. They use their human capital in the form of salary income, and seek protection from adverse outcomes or economic conditions such as with the purchase of insurance policies. Life insurance, for example, transfers purchasing power from good times to bad times when it may be needed more.

DEFINING INVESTMENT CONSUMPTION VALUE

It should be clear that desirable asset classes go beyond traditional and systematic (capital market) investments. Investors seek to transfer the risk of adverse outcomes across time and various contingencies. Not all investors are mean-variance investors, meaning the market portfolio is not the only efficient portfolio (Markowitz [2005]). The efficient portfolio for an investor is not necessarily the market portfolio but is instead heterogeneous across investors. Importantly, my framework suggests the choice of asset classes may differ significantly among investors.

Under traditional valuation approaches, historical data can tend to offer some guidance on estimating how asset classes may come together to form a desirable portfolio, but the data offer imprecise estimates, at best, of future performance. Hence we need a more robust framework for defining worthy asset classes a priori.

I can now better describe the criteria for determining a desirable asset class for inclusion in a diversified portfolio. The crux of my proposition depends crucially on individual preferences for consumption over time and various contingencies. The process examines how various investment assets outside the financial sector might combine to produce a composite portfolio to best meet consumption preferences.

To address this challenge, I meld essential elements offered by the economic insights of the powerful valuation concepts I have summarized.

I focus on what I call *investment consumption value* (ICV). Investment consumption value relates to how the consumer will ultimately benefit from the purchase transaction—that is to say, how the asset will improve overall portfolio performance across time and across outcomes. The answer is a logically consistent investment-for-consumption approach to defining a prudent mix of investments that entails both traditional and non-traditional investments and best supports their future consumption objectives.

Under ICV, the fundamental risk is consumption risk. Consider how an increase in expected future return allows investors to consume more today and in the future via consumption smoothing. Or, consider how a reduction in future portfolio volatilities allows investors to consume more today and in the future by lowering the need for precautionary savings. In short, the ICV of an asset is measured by its contribution to an overall portfolio in support of consumption needs across a diverse set of possible outcomes.

Clearly, desirable asset classes have investment value that yields benefits for investor consumption. In this sense, the ICV concept broadens our understanding of investment value. For instance, can holdings of real estate insure a portfolio against unexpected inflation, or might gold protect against adverse economic shocks? Many investors will derive utility from a smooth consumption pattern especially in adverse conditions, so an asset that provides return in a difficult environment when consumption is most valuable and needed will be more desirable, and thus command a higher return than an asset that provides the same return in a strong economic environment.

This is the crucial element; an investor's efficient portfolio is the portfolio that offers the optimal expected return and risk profile in terms of meeting consumption desires associated with different investments or economic states. When we connect economic and financial sectors, I find that asset classes appropriate for investment are those that pay off on consumption needs in various economic environments—that is, they have investment consumption value.

The idea of ICV underpins what determines a productive, suitable investment. In an ICV context, a suitable asset can be parlayed into current or future consumption. This could be accomplished via improved consumption smoothing or a reduction in precautionary savings needs. This new definition of preferences and risk tolerance gives deeper meaning to the traditional definitions of investor risk tolerance, doing more than simply reflecting an investor's trade-off between expected return and the variance of those returns.

My approach leads to a much broader view of what should be considered when choosing asset classes to be used as part of an investment process. The challenge of portfolio choice becomes much more than merely selecting for inclusion uncorrelated asset classes that constitute significant economic exposure. For instance, ruling out certain hedge fund strategies may impose suboptimal portfolio construction on some investors. Clearly, proper portfolios may differ markedly among investors.

A NEW ASSET CLASS SUITABILITY FRAMEWORK

The framework I envision extends current knowledge and traditional processes for determining suitable assets for investment. In this framework, asset classes deemed appropriate as a productive part of a portfolio have characteristics as follows:

- *Investment consumption value*: Meet current and future consumption preferences, wealth generation, income, and risk tolerances. Expected return and risk (variance and covariance) characteristics that contribute to a portfolio that yields desirable payoffs covering investor consumption needs through various states of the economy and life cycle, not just at the terminal time. Must effectively contribute to investor utility within a combined portfolio that will ultimately improve investor consumption and wealth even in adverse economic environments. Eventual future return and risk profile must compensate investor for forgoing current consumption via improved consumption smoothness or lower required precautionary savings.
- *Estimable ex ante expected contribution to ICV*: Asset must measurably contribute expected benefit to the investor's consumption desires across various economic states and views on the future. Asset performance must be definable and repeatable.
- *Homogeneous economic and financial attributes*: Common economic characteristics and basis for risk and return requirements.
- *Expand the investment opportunity set*: Assets are not perfectly correlated, both linearly and non-linearly and incorporate a broad spectrum of wealth-generating and insuring possibilities.
- *Liquidity*: The asset class can be brought into the portfolio without seriously affecting the portfolio's liquidity.

Consumer-Driven Investing

Financial markets are wonderful in that they facilitate the accumulation of capital by transforming short-term savings into long-term investment. Long-term investment, in turn, means that savers can defer consumption while diversifying or transferring their risk, thereby allowing them to decouple their investments from consumption. This in turn creates a desirably smooth life-cycle consumption pattern. Investors will certainly have different views about the desirability of consumption in alternative and future states of their life cycle, or how best to balance their consumption and investments and the concomitant risk and return throughout their lives.

This all plainly suggests investors are ultimately concerned about building and preserving wealth through various investments in order to meet future consumption goals. My new approach seeks sources to introduce into the asset mix that can provide risk reduction and wealth creation or preservation with regard to investor needs.

I argue that all investing is done for the ultimate consumer. Investing can be thought of as delay of future consumption, and it is the predictability of cash flows over the investor's horizon that really matters. In this sense, risk can best be defined as the probability of not having the level of income desired when it is most needed.

In my examination of suitable asset classes, I look at future states of the world (outcome probabilities). The ICV framework dictates that the starting point is the development of a portfolio of assets that best matches the risk profile of the investor's future consumption objectives. For defined-benefit plans, this framework is called liability-driven investing; for individual investors, it's called consumer-driven investing.[9]

Obviously, this perspective stands in contrast to the popular literature that suggests cash as the riskless asset. As Campbell and Viceira [2005] suggest the investor's time frame is also an important factor. Asset allocation recommendations based on short-term risk and returns may not be adequate for long-term horizon investors. For instance, a portfolio of T-bills might be a suitable risk-free investment in the short run, but in the long run, T-bills do not necessarily provide a positive real yield and are thus subject to the depredation of inflation.

Role of Inflation

The possibility of a high inflation state and its corrosive impact on future consumption is an important consideration. What inflation exposures does the investor face with particular financial assets? Under inflation we must consider assets in real and nominal terms. *Nominal* assets are claims on capital for money now or in the future that do not vary according to changes in purchasing power. For example, a standard Treasury bond is a nominal asset. *Real* assets, on the other hand, provide real returns that maintain investors' purchasing power. They are claims for capital or contracts yielding amounts of money that vary according to inflation. Land and Treasury Inflation-Protected Securities (TIPS) are examples of real assets. Nominal assets must be protected against loss from inflation. Real assets generally serve as this inflation hedge.

Stocks present a combination of nominal assets and real assets. Therefore, an investor with a typical capital market portfolio of primarily stocks and nominal bonds may consequently be exposed to significant

risk if unanticipated inflation occurs, placing future consumption goals at risk.

Role of Utility

The concept of investor utility captures individual desires. Here, it is generally agreed that higher present and future consumption and a higher probability of consumption result in greater investor utility. A holistic approach to asset allocation thus incorporates all assets deemed to provide an estimable source of current or future consumption. In this sense, financial assets such as stocks and bonds represent a source of consumption, but so too do non-financial assets such as wages, salaries, owner-occupied housing, and their respective hedges such as life and disability insurance.

Again, both financial and non-financial asset types play a key role in the asset allocation decision (see Chen et al. [2006]). Investors need more than historical returns to determine appropriateness. In the final analysis, the valuation of assets must be based on forecasts of consumer utility.[10]

Clearly, not all assets offer equal or even necessarily similar opportunities for addressing risk of various outcomes over time; hence the inarguable benefits of asset class diversification. Applying the ICV concept deepens our understanding of these relations. For instance, investors place a higher risk premium on assets with less certain outcomes.

Bonds are more certain than stocks, and stocks are more certain than commodities. To see why this is so, consider that both bonds and stocks are capital assets; each has a claim on future earnings. Bonds are senior to stocks in capital structure and thus have a senior claim on future earnings; they therefore offer more certainty regarding future income. On the other hand, commodities present far less certainty regarding associated future cash flows for their owners. Their value across time and contingencies is less certain, and investors should demand a higher risk premium. The ubiquitous risk-return relation remains intact.

I wish not to draw hard and fast lines to classify all assets, but rather to build a conceptual framework for thinking about portfolio construction. The aim is to identify various types of investments that can contribute to a well-diversified portfolio. My process-driven approach extends the asset class construct considered in Maginn et al. [2007] and the three superasset class categories of Greer [1997], and Anson [2002].[11]

PORTFOLIO CONSTRUCTION WITH ICV

Below I consider asset classes appropriate to consider for inclusion in a complete asset allocation framework, following the investment consumption value idea, and present a process to identify assets in a proper portfolio design.

Commodities and Other Passive Assets as a Suitable Asset Class

Some assets are passive in that they have consumable or cash conversion value, but do not necessarily apply factors of production to generate a constant stream of added value over time. For passive assets, expected future cash flows and thus intrinsic value measurement can be unclear. They are often used as inputs in the production process, and passive assets are consumable or transformable assets that can be converted into another asset, yet do not themselves generate an ongoing economic stream of value added.[12]

Passive assets play an important role in the global economy. They are considered to be stores of value such as currencies or productive inputs such as commodities, and typically take the form of physical commodities such as grains, metals, and energy.[13]

Consider how copper brings value to the macroeconomy through a value chain. It is first mined, and then processed from its raw form into a usable commercial form. From there, copper can be transformed into a host of products, electrical wiring for one. The wiring, in turn, can be used in transporting energy for an office building. Hence, copper provides an ongoing source of value-added, and thus presents both immediate and future cash conversion value. This value can be thought of as the value of an option on some future cash flow.

That passive assets such as commodities bring significant value to an economy is incontrovertible. That added value in terms of future expected cash flows can be difficult to determine is also unquestionable. This is a challenge.

Following my asset class definition approach, let's examine the arguments as to the place of commodities in a portfolio. Given the practical difficulty in measuring any long-term risk premium, there is a lot of controversy on whether commodities are a suitable asset class for inclusion in investment portfolios. Some argue that the return to commodities is negative or zero over the long run, that

commodities generate no ongoing cash flows, and therefore have no discernible intrinsic value.

I argue that the choice to include such economic inputs as a suitable asset class depends on their value as unique economic consumables. In this sense, they are real economic assets that bring value to the overall economy. And as real assets, they also serve in part as an insurance vehicle to protect consumer purchasing power against unexpected inflation.

The unique characteristic of commodities is that they offer value in different economic environments, especially adverse economic conditions, and can serve to reduce future portfolio volatility, thereby reducing the need for precautionary savings. Hence they offer important ICV benefits and could play an important role in investment portfolios.

Naturally, asset price expectations for the future will differ, depending on the political and economic analysis. Substitutes for a particular asset could reduce its value; commodities such as copper can be replaced. Copper wiring, for instance, can be replaced by aluminum wiring. In this case, traditional valuation methods such as the CAPM do not apply.[14]

All these circumstances cause commodities to be controversial in an overall strategic portfolio. I suggest instead that the value of commodities and other economic inputs lies in their flexibility to be either transformed into a final good or consumed. Their value is reflected in their role within the economy: their contribution to aggregate production while they provide diversification in the revenue stream. The aggregate demand for these economic inputs comes to a large extent from their place in the real economy, driven by the needs of various production processes on the way to a final good. The streams of cash flows that accrue to commodities are very real, because they emanate from their share of aggregate output.

While passive commodity assets require an uncertain risk premium, I focus rather on the notion that the price of commodities depends heavily on global rather than regional supply and demand conditions of varying macroeconomic cycles. This is so in large part because commodities are not easily stored.[15]

Risk premiums for commodities are therefore largely determined by the relative levels of available commodity inventories in the economy as suggested by the *theory of storage* (see Kaldor [1939]). Some commodities are not storable at all (electricity) or are prohibitively expensive to store (natural gas), which makes commodity prices primarily determined by current economic activity. Commodity prices may be rising now because they are in limited supply in a economic cycle on the upswing, but those prices can easily decline in the future as the economic cycle flows the other way.

Investing in commodities therefore requires a knowledge and expertise that differs from that needed for other asset types, but this does not make them unsuitable for investment. For commodities, expected long-term risk premiums can be ascertained through a well-grounded risk and return outlook based on structural economic factors of supply (including storage) and demand.

Consider how departures from economic equilibrium or changes in inventories for a given commodity can yield premium returns. The reward here goes to the knowledgeable investor in the form of a knowledge premium. Ownership claims on commodities must be considered suitable investments, even though they may be investments whose expected returns are often difficult to quantify using the same lens we use for analyzing more traditional asset classes. Commodities deserve a place in portfolio construction.

Precious metals are a special class of commodities. They are a durable and recognizable passive asset, and often serve as a store of value. They are denominated in a currency unit or exchange rate, and provide stability when a currency depreciates. Gold and other precious metals have been used as currency throughout history.

Perhaps the most important example of a passive store of value is currency itself. In our exchange economy, currency acts as a medium of exchange as payment for goods and services. It also serves as a standard of value. Like economic inputs, store of value assets generally have important investment consumption value attributes.

In the recent adverse markets the U.S. dollar and gold have been considered safe haven investments, a place to maintain value in uncertain conditions. Froot [1995] also argues convincingly that holdings of certain commodities are effective in insuring a portfolio against unexpected inflation. These are investments that pay off when times are difficult. As a consequence, they offer beneficial ICV, even though we cannot completely characterize their expected ICV.

One difficulty with some passive assets is that their value beyond current cash conversion depends largely on subjective value estimates driven by the utility derived from often vague or ephemeral factors of supply and demand for

the asset. Consider, for example, art, which offers little if anything to gain from its value-added in a production chain, and so stands to produce return only from speculative price appreciation. Given that art prices can go up or down depending on consumer utility (demand) and changes in scarcity (supply), the only profit to be made directly on art is through speculation on those prices.

Thus art as an asset class offers investors little if any ICV benefit. Gauging expectations here clearly requires a special skill. Unwilling to engage in such speculation, many if not most investors will choose to avoid art and other collectibles in an investment portfolio.

Capital Assets and Other Active Assets as a Suitable Asset Class

Certain asset types are active in that they depend on applying the factors of production (labor and capital) in order to generate value as in a production process. Return generation for active assets comes from the income-generating capacity of an enterprise, whether the enterprise is a manufacturing company or a private equity buyout fund. The more value-adding ability, the more room there is for abnormal profits and the more interesting to the investor.

Capital assets, one type of active asset, are distinguished by an ongoing source of intrinsic value (see Greer [1997]). Capital assets are characterized by their claim on the cash flows of the enterprise. Equities, bonds, and income-producing real estate are all capital assets. Equities provide an expected residual claim on cash flow through dividends, while bonds provide expected interest payments and a return of principal. Real estate provides an ongoing stream of cash flows via rental income, along with a residual value.

Capital assets are also homogeneous and provide a common economic basis for the risks and returns of their expected cash flows. Over the relevant planning horizon, to the extent that the risk-return characteristics are consistent with the investor's consumption preferences, this class of asset clearly qualifies as suitable for investment portfolios.

Alternative Assets

As new asset classes and financial products are considered for investment, it is important to characterize them according to their investment consumption value in order to determine their proper role, if any, in the asset mix. The term *alternative* is given to almost everything beyond traditional long-only stock and bond investments. Commodities and non-owner-occupied real estate are often considered in this category.

One important consideration is whether the asset in question adds an investment dimension in an ICV world. That is, does it meet the criteria I specified earlier? For alternatives, perhaps of most importance is whether an investment offers a compensating benefit to the investor, expands the opportunity set, and whether investment performance is definable and repeatable.

Hedge funds are considered an alternative investment. Hedge funds are not homogeneous, and cannot be analyzed in a consistent way. They do not lend themselves to a unified classification system. Many hedge funds offer investment strategies that provide unique non-systematic alpha generation (although often accompanied by some systematic beta). In this way, hedge funds cover the waterfront of active alpha investment strategies operating in some general asset class and thus complement traditional investments.

Long-short equity and equity market-neutral hedge fund strategies are examples. These strategies do not so much expand the opportunity set of investments as they serve to create a hedge against them or bring greater efficiency. Here, hedge funds complement traditional investment funds; their value is derived from, say, the equity or bond markets rather than extend into new markets or asset classes.

Some hedge fund strategies, however, pursue new, true alternative asset risk premiums. As Anson [2002] points out, for instance, private equity investments extend the opportunity set of risk premiums, as do catastrophic bond investing, carbon dioxide certificates, and inflation-linked notes.

Hedge funds seem to defy categorization. If we rely on the same categorization as for other investment strategies, hedge funds may be best classified by five characteristics: asset class, direction, investment type, geographic region, and liquidity (see Bookstaber [2003]). This categorization, in turn, will lend insight into whether the investment meets with investor suitability requirements.

Human Capital

What I think is different in my framework is that I suggest sensible investors take both market *and* non-market

risk into consideration, and thus seek investments outside the typical capital market portfolios to complement their lives. In the life-cycle model, individuals progress through a regular sequence of life phases: human capital accumulation (education phase), income accumulation (work phase), and decumulation (retirement phase). In an investment consumption value context, an effective asset allocation enables the financial capital to provide smooth lifetime consumption.

For most people, the dominant asset is their human capital. But curiously, human capital is absent in most traditional asset class definitions. During their life cycles, little is more important to individual investors than building a portfolio that insures against adverse events affecting future salary income. Investors reasonably seek such products as life insurance and disability insurance to protect their human capital against loss of future expected income (see Chen et al. [2006]).

Life insurance, for example, transfers purchasing power from good times to bad times, when it is most needed. Such insurance products are essential assets that effectively represent a contingent claim against a future stream of earnings. These and other related human capital investments reduce the need for precautionary savings, thereby allowing higher spending levels over a person's lifetime. These products undeniably provide ICV, and must be integrated into any comprehensive investment planning process.[16]

SUMMARY

Traditional mean-variance portfolio theory is silent about ultimate portfolio goals. I believe my approach is novel in that it looks beyond the lens of mean-variance analysis by considering the fundamental reasons behind what constitutes a suitable asset class and, more important, the reason for investing—to meet future wealth and consumption goals. My approach at the same time complements traditional mean-variance analysis and is fundamentally intuitive. It engineers solutions that begin with the needs of the investor while reacting to global market equilibrium and changing economic conditions.

Risk in the investment consumption value framework is the probability of failing to achieve portfolio goals, not the standard deviation of returns of the overall portfolio. Investors have a more profound care. The entire distribution of portfolio returns matters. To satisfy their goals, investors form portfolios of asset classes defined by covariance with their consumption patterns. Financial assets provide a useful means to achieve success in financial planning, but economic assets are equally important.

What matters is the performance of the total asset mix as it relates to alternative future states of the world and how this performance dovetails with individual investor goals and objectives. So, stocks are less desirable than bonds as they offer less of a payoff in bad times, not just because they have a higher variance. Thus investors reasonably address non-market risks (e.g., life insurance and real assets) to complement their lives. It is the underlying role of an asset within the economy *and* its correlation with consumption needs that investors must consider.

My approach to portfolio construction seeks an answer to the question, how does the asset mix mitigate the risk associated with an uncertain future? In answering this question, it becomes clear that when building portfolios, the work of defining asset classes must take a back seat to the more important effort of defining the individual components. It is far more important to select relevant portfolio components that will properly build lives. Also, this broader view of potential suitable assets places a critical responsibility on agents to work in close partnership with principals in portfolio construction. That is, how does the asset mix mitigate the risk associated with an uncertain future.

The standard life-cycle model that assumes consumption is flat over the life cycle but "smoothed" through retirement may not be optimal in all circumstances, but it is a good place to start. To the extent an asset class improves the risk-return characteristics of the consumption cycle, it has investment consumption value, and should be considered in a properly constructed investment portfolio.

ENDNOTES

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[1]See Erb and Harvey [2006] and Gorton and Rouwenhorst [2006], who present the case for portfolio commodity *futures.*

[2]This was first recognized by Adam Smith in *The Wealth of Nations*. "Wealth" to Smith consists of all the goods that society consumes.

[3]A system in equilibrium is stable and balanced, or static. Sharpe [2006] further defines a financial economy equilibrium as one in which no further trades can be made. For my purposes,

the important aspect of equilibrium concerns the relation between the sources of consumption (marketable investments and non-investment sources) and other macroeconomic factors. Investors ultimately make decisions to buy and sell financial assets at market prices determined in the global market exchange economy.

[4]Brinson et al., [M.A., 1986] discuss this process in detail.

[5]The CAPM explains the logic of the market equilibrium pricing of securities:

$$R_{port} = R_f + \beta(r_{mkt}) + \alpha_{port}$$

where the movement of the price of an asset or portfolio depends on the excess return (risk premium) of the market. The framework can be expanded to account for additional risk factors beyond the market factor that influence the return on the portfolio.

[6]That returns relate to the state of the economy may have further implications for defining how asset classes might be used opportunistically in tactical asset allocation and strategic asset allocation. A theoretically consistent capital allocation rotation strategy could be constructed that varies in accordance with economic cycles and states.

[7]The CCAPM, in effect, dictates that each consumer or investor selects a portfolio that provides the highest possible correlation of individual consumption with aggregate consumption. The risk of an asset is captured by the sensitivity of that asset to the growth of aggregate consumption. The equilibrium pricing of securities is set by the risk premium, which in turn depends on the covariance of its payoff with aggregate consumption. In another variation on the CCAPM, the systematic risk of an asset is measured by the covariance with both consumption and return to the market portfolio (Epstein and Zin [1989]).

[8]That is, the expected risk premium for an asset class delivers satisfactory return, given expected return covariance with consumption needs. In a state-preference setting, this process correlates with outcome probabilities.

[9]Zvi Bodie initially coined the term, consumer-driven investment, to describe a framework for focusing asset allocation on investor goals.

[10]With respect to consumer utility, I draw upon Maslow's hierarchy of needs to provide context for my theory of investment consumption value. All investments are essentially subject to consumer utility preferences. Food, water, health, and transportation needs may be more predictable than collectibles appreciation, but the persistence of human needs allows for the kind of prediction that underpins the value of assets.

[11]The three *super* asset classes (capital assets, assets used as economic inputs, and assets that are a store of value) as defined by Greer [1997] and later by Anson [2002] who also considered alternative investments.

[12]Thanks to Dennis McLeavey for suggesting the separation of assets into active and passive according to their role in the economy.

[13]Art and collectibles are passive assets, as are land, gold, and copper.

[14]Inventory holding costs include storage (carrying) and obsolescence. Obsolescence can include changes in tastes. Think of collectibles, whether they be baseball cards, tulip bulbs, art work, antiques.

[15]This fact leads to the well-known convenience yield observed in commodity futures.

[16]Insurance vehicles do not need to have a positive expected return to be valuable investments. While insurance policies to protect one's labor asset (e.g., disability insurance) have a negative expected return they also have a very desirable negative correlation with a loss of labor income risk event.

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