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CAMBRIDGE ASSOCIATES LLC

REVISITING TACTICAL ASSET ALLOCATION

2005

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C O N T E N T S

ABSTRACT

1. As institutional interest in traditional tactical asset allocation (TAA) emerged three decades ago following the severe bear market of 1973-74, interest in global tactical asset allocation (GTAA) has expanded following the 2000-02 bear market. With lowered prospects for equity "beta," the primary traditional source of investment pool returns, and with bond yields near their lowest level in a generation, investors have begun looking for better and more diverse sources of "alpha" generation. GTAA products have become beneficiaries of this widened search for alpha. While we have found that the recent emphasis on alpha strategies has not given sufficient attention to the reality that it is difficult to find alpha, it is plausible that GTAA managers operating in dozens of markets are more likely to find inefficiencies that would enable them to earn alpha than are managers limited to a narrower range of markets and investment strategies.

2. Over the last decade, GTAA managers have substantially improved TAA products, with the primary advantages as follows:

   - They have expanded the TAA repertoire from making a single beta decision by altering relative weights of equities and bonds (or cash) to a more diversified approach that includes relative bets in multiple equity, bond, and currency markets, complemented by numerous bets at the sub-asset class level. The great diversity of uncorrelated bets among so many different markets allows for a much higher degree of control over risk and tracking error than is found in most other investment products. As a result, risk-adjusted returns and delivered information ratios tend to be consistently higher (often 1.0 or greater) than in traditional long-only active strategies.
   - In contrast to TAA products, which typically used a single valuation model to drive decisions, GTAA products use a much broader arsenal of models and valuation techniques across asset classes, which might include analysis of macroeconomics, relative valuations, sentiment, momentum, and other factors. Both quantitative modeling and qualitative judgment are used in most strategies, although the emphasis may vary.
   - While traditional TAA products were long-only, shorting is now standard in most derivatives-based products, making symmetrical bets possible.

3. GTAA managers employ a diverse menu of styles and strategies, among which the major common denominators are global equities, global fixed income, and currencies. Currency bets are a major source of alpha for a majority of products. An increasing number of products now include commodities and real assets in the allocation mix. Most strategies involve making many small bets and changing positions incrementally over six- to 36-month time frames rather than a few large, concentrated active positions or high turnover strategies. This is consistent with the high degree of risk control that characterizes most GTAA products.

4. GTAA products can be grouped into two general categories that reflect the vehicles used to implement strategies: fully funded and overlay. Fully funded products generally do not use leverage or shorting, and as such are the natural choice for investors with mandates that prohibit these activities. The primary vehicles for these products are actively managed in-house portfolios, primarily traditional equity or bond

funds. In contrast, the defining characteristic of overlay products is their exclusive use of derivatives—typically futures, options, currency forwards, and swaps—to implement GTAA strategies. The four primary advantages of overlay products are (1) the ability to take active bets through shorting; (2) low capital requirements; (3) the ability to port alpha strategies onto any global balanced or absolute cash benchmark the client chooses; and (4) the ability to scale the bets with leverage to achieve a broad range of alpha and tracking error targets. The use of derivatives in overlay strategies also allows these managers to rebalance a client's overall investment pool back to policy portfolio weights.

5. GTAA can fill any of three primary roles.

- As one-stop outsourcing of most or all major asset allocation decisions for smaller investors with limited in-house staff or expertise.
- As a tactical carve-out of the total portfolio. In this swing role, the GTAA manager would be given discretion over intermediate-term asset class and sub-asset class alpha bets against the investor's policy portfolio. In this role, a GTAA overlay manager could also help rebalance the total portfolio through the use of futures.
- As an allocation within an investor's alternative assets or absolute return bucket. Against a cash benchmark, GTAA strategies closely resemble global macro funds, and in fact several firms offer an aggressive, leveraged version of their GTAA product in the form of a hedge fund.

6. While an investor with a small (less than $50 million) asset base and little in-house expertise on asset allocation might consider outsourcing the majority of the equity/fixed income portion of its policy portfolio to one of the fully funded GTAA products, investors using GTAA typically allocate 5% to 20% of their assets to a GTAA product or combination of products. Much depends on GTAA's role in the asset allocation structure.

7. Fee structures for fully funded GTAA products tend to be a fixed percentage of assets invested, similar to the fee structures of long-only equity products, and typically range from 50 basis points (bps) to 150 bps. Separate account minimums can run as high as $250 million, but with the broadening institutional use of GTAA, a number of products are available with minimums as low as $1 million. Overlay GTAA products, which require only small cash outlays, tend to have much more complex fee structures, either scaled to a client-determined risk target, and/or to performance. When scaling to much higher risk levels, many firms simply offer the same GTAA methodology in the form of a hedge fund, commonly with 1% management fees and 20% performance fees over a defined benchmark.

8. While GTAA products tend to have excellent risk control, they are not without risk. With extensive exposure to derivatives, many overlay GTAA products have the potential for large and open-ended losses in extreme situations. Should losses be sufficiently large, an investor could be called upon to put up additional cash to cover them. The significance of this risk varies considerably with the way in which an overlay strategy is implemented. For example, a leveraged overlay strategy might result in investors having to sell off assets at depressed prices or incur the opportunity cost of selling off appreciating assets in order to fund additional margin requirements. In addition, with non-exchange-traded derivatives such as swaps, there can also be counter-party risk.

SUMMARY

Introduction

Tactical asset allocation (TAA) began three decades ago as the practice of making short- to intermediate-term (six months to three years) relative bets on the asset classes traditionally found in a U.S. investor's policy portfolio (i.e., U.S. equities, bonds, and cash). For most of its early history, TAA was limited to tactical deviations from the target weights in a client's policy portfolio, usually within ranges dictated by the client.

The last decade has seen the emergence and growing dominance of **global** tactical asset allocation (GTAA) strategies, which have expanded the TAA repertoire to relative bets in multiple equity, bond, and currency markets, complemented by numerous bets at the sub-asset class level (countries, sectors, small- versus large-cap, and value versus growth). As the asset classes in typical policy portfolios have expanded, so, too, has the opportunity set used in GTAA, and a number of GTAA products now also make allocations to gold, energy, other commodities, and REITs.

Origins and Evolution of TAA

The development of TAA strategies can be traced back at least as far as Charles Dow, founder of *The Wall Street Journal*. He published his views on timing the stock market in a series of editorials at the end of the 19th century, culminating in a set of rules known as "Dow Theory."

Institutional interest in an exclusive market timing strategy (going beyond traditional stock selection and a stable mix of bonds and equities) grew significantly in the 1970s after the severe bear market of 1973-74 took back many of the stock market gains of the postwar bull market. Worried by the decimation of their stock portfolios and the decline in their assets, investors looked for alternatives to traditional buy-and-hold strategies.

However, it is William Fouse who is credited with introducing the term "tactical asset allocation" into the investment lexicon and developing the first institutional product at Wells Fargo in 1973. At the time, there was a deeply embedded skepticism about timing the stock market, reinforced by Eugene Fama's classic 1970 article laying out the Efficient Market Hypothesis, Burton Malkiel's 1973 *A Random Walk Down Wall Street*, and Benjamin Graham's opinions expressed in the 1959 edition of *The Intelligent Investor*. But the late 1970s also saw a growing academic literature on inconsistencies in the Efficient Market Hypothesis, highlighted by documentation of the strong negative relationship between future stock prices and short-term interest rates. These gave a boost to the credibility of Fouse's valuation-based, relative-timing strategies for equities versus bonds.

Critical to the development of TAA strategies was the advent in the early 1980s of stock index and bond futures, which for the first time offered low-cost, efficient vehicles for tactically switching equity and bond allocations. A nascent interest in TAA products mushroomed rapidly in the late 1980s when the few products available successfully avoided the "Crash of '87," in stark contrast to the utter failure of the highly touted portfolio insurance strategies.

TAA from the 1990s to the Present

Just as the introduction of U.S. futures markets as efficient trading platforms gave a boost to the first U.S. TAA products, so the global expansion of futures markets in the 1990s increased the opportunity set for tactical asset allocators, and GTAA strategies began to emerge and compete successfully with U.S. TAA.

After their striking success in 1987, most traditional U.S. TAA products performed poorly over the next 13 years, tarnishing their image. In particular, the valuation models used in most TAA products viewed the U.S. stock market as massively overvalued by the late 1990s and, therefore, significantly underweighted equities, leading to terrible relative performance. Before the bubble burst in 2000, many U.S. TAA products underperformed themselves out of existence. However, the emerging GTAA strategies, which were far more diversified in their approach, mostly survived this period and have become the dominant form of TAA.

The Case for GTAA in the Current Market Environment

The increased interest in GTAA over the past few years has the same root cause as the initial surge of interest after the 1973-74 bear market. The 2000-02 bear market was the most severe in 30 years, creating substantial losses for many investors that had grown accustomed to high rates of return during the 1990s. In the post-bubble environment, equity return expectations for the next few years have fallen sharply. With lowered prospects for equity "beta," the traditional primary source of investment pool returns, and with bond yields near their lowest level in a generation, investors have begun looking for better and more diverse sources of "alpha." One consequence has been a substantial shift of institutional portfolios into alternative assets such as hedge funds; GTAA products also have become beneficiaries of this widened search for alpha. While we have found that the recent emphasis on alpha strategies has not given sufficient attention to the reality that it is difficult to find alpha, it is plausible that GTAA managers operating in dozens of markets are more likely to find inefficiencies that would enable them to earn alpha than are managers limited to a narrower range of markets and investment strategies.

There are a number of features of current GTAA products that differentiate them from the less successful U.S. TAA strategies that dominated the period 1973-2000.

- Most U.S. TAA products aim to generate excess returns by making a single beta decision: altering relative weights of equities and bonds (or cash) in a portfolio. They are long-only (no shorting) and fully funded. Usually there is a single valuation model driving decisions (such as modeling the regression to the mean of the equity risk premium). Returns tend to be lumpy over longer periods, and may add little value for prolonged stretches during which equity and bond returns are highly correlated. The track record is especially poor in periods when markets overshoot normal valuation parameters, such as the late 1990s. Historically, performance potential was often further reduced by client constraints on the magnitude of the equity/bond allocation shifts that could be made away from normal policy portfolio weights.

- Current GTAA products offer substantial improvements and advantages over traditional U.S. TAA. First, the opportunity set within which bets are made has broadened substantially. Significant exposure to non-U.S. bond and equity markets is almost universal; and the range of asset classes utilized and types of alpha bets made within asset classes have greatly expanded. Currency bets are now a part of most GTAA strategies; allocations to nontraditional asset classes such as gold, energy, other commodities, REITs, and emerging markets debt are a feature of many products. Shorting is now standard in most derivatives-based products, which makes possible symmetrical bets unavailable to long-only products. Indeed, the traditional beta bet on equities versus bonds has now been relegated to a very minor role in most products as many managers have come to believe that this is the most difficult tactical bet to get right.

- GTAA products also use a much broader arsenal of models and valuation techniques across different asset classes, which might include macroeconomic analysis, relative valuation, sentiment, momentum, and others. Both quantitative modeling and qualitative judgment are used in most strategies, although the emphasis may vary. Because portfolio construction may involve scores of individual bets using multiple model inputs, optimization is commonly used in portfolio construction. The great diversity of uncorrelated bets among so many different markets allows for a much higher degree of risk control and control of tracking error than would be found in most other investment products. As a result, risk-adjusted returns and delivered information ratios tend to be consistently higher (often 1.0 or greater) than in traditional long-only active strategies.

How GTAA Managers Make Bets and Add Alpha

GTAA products have evolved for different reasons and from different core skill sets at different firms. Exhibit 2 shows a representative sample of firms offering GTAA products and the range of asset classes and different emphases of each firm. Because of the necessity of having knowledge of, and alpha generating skill in, so many different markets, the GTAA product universe is dominated by large, global firms. At some, GTAA products evolved from tactical strategies developed at proprietary trading desks employing the firm's own capital. Other firms started with a currency overlay product and subsequently expanded to other asset classes. Still, others have built up a broad array of active equity and fixed income products and evolved a GTAA product to help grow and retain assets in those traditional areas.

The result is a diverse menu of GTAA styles and strategies, among which the major common denominators are global equities, global fixed income, and currencies. Within equities, allocation bets are commonly made between regions and countries, and sometimes by global sector, by capitalization, or by style (growth/value). Within fixed income, bets between developed countries are the most common, with some GTAA products also providing exposure to emerging debt and high-yield markets. Currency bets are a major source of alpha for most products, but with less emphasis in strategies using actively managed internal products rather than derivatives. Finally, an increasing number of products now include commodities and real assets in the allocation mix.

Most strategies involve making many small bets and changing positions incrementally over six- to 36-month time frames rather than a few large, concentrated active positions or high turnover strategies. This is consistent with the high degree of risk control that characterizes most GTAA products. Some managers take active positions in more than 70 countries, utilizing models that draw from a broad range of macroeconomic, fundamental, sentiment, volatility, and momentum inputs. None of those managing well-established GTAA products today would describe what they do as market timing.

GTAA Strategy Implementation

GTAA products can be grouped into two general categories that reflect the vehicles used to implement strategies: fully funded and overlay (Exhibit 3).

Fully Funded

Fully funded products are the natural successors to and extensions of U.S. TAA products, and have some of the same drawbacks, but also one key advantage over overlay products. In these products a dollar put into the account becomes a dollar invested, as in traditional long-only products. In general, leverage is not used, nor is shorting.[1] The absence of shorting reduces the ability to make symmetrical bets and by extension somewhat reduces the ability to optimize to certain risk levels. As a result, information ratios tend to be lower for these products. In addition, the long-only implementation means a much higher beta component embedded in returns than in overlay products. However, these products are the natural choice for investors with mandates that prohibit leverage or shorting or limit the use of derivatives.

The primary vehicles for these products are actively managed in-house portfolios, for the most part traditional equity or bond funds. Currency alpha strategies are largely absent, except insofar as they are used in individual funds. The major advantage these products have over overlay products is the extra layer of stock or bond selection alpha generated by the active funds used.

Overlay

The defining characteristic of overlay products is their exclusive use of derivatives to implement GTAA strategies. These typically include futures, options, currency forwards, and swaps. As noted above, a

[1] GTAA products in their current form are relatively new and the market continues to evolve. Some fully funded GTAA managers are beginning to use derivatives on a limited basis and some include derivatives and/or leverage through their allocations to internally managed hedge funds.

major impetus for the development of complex GTAA strategies over the past decade has been the dramatic growth in derivatives markets worldwide, which provide highly liquid and low-cost vehicles for taking active bets.

The use of derivatives adds a significant layer of complexity but also tremendous flexibility to the GTAA process. Overlay products have four primary advantages over fully funded products: (1) the ability to take active bets through shorting; (2) low capital requirements; (3) the ability to port alpha strategies onto any global balanced or absolute cash benchmark the client chooses; and (4) the ability to scale the bets with leverage to achieve a broad range of alpha and tracking error targets. As an example, a $1 billion foundation wishing to make a notional $100 million allocation to a GTAA overlay product might typically be required to make a capital allocation of only $15 million to cover margin and variation, with which the manager would undertake to deliver a 2% annual alpha ($2 million against the notional $100 million) with a client-determined target tracking error of 2% against the foundation's global balanced policy portfolio. The remaining $85 million could remain invested as is, be redeployed to other alpha strategies, or parked in an index fund. The investment of the remaining $85 million determines the degree of portfolio leverage and beta exposure incurred. For example, an institution investing the $85 million in cash would essentially eliminate leverage by fully collateralizing the investment, while investing in global balanced assets would result in 2:1 leverage at the portfolio level. Additional leverage may result from the investments made by the GTAA manager.

With the ability to replicate any client-defined benchmark with derivatives, overlay managers can easily gain the desired beta exposure and then overlay or port whatever they consider their best sources of alpha on top of that beta exposure. Freeing alpha strategies from the underlying beta makes diversification and optimization of alpha bets much easier and can significantly improve the risk-adjusted returns (information ratio). To give an example, a fully funded manager without good insights into the Japanese stock market would be handicapped by Japan's large weight in the global benchmark, where making significant active bets would have to include a bet on Japan, although the ability to add alpha was small. With an overlay approach, the manager could simply acquire a benchmark exposure to Japan through Topix or Nikkei futures, and then add significant alpha by making large long/short active relative bets in smaller markets such as Australia and Singapore where the insights and ability to add alpha were stronger.

The use of derivatives in overlay strategies also allows overlay managers to provide investors with the additional service of rebalancing their overall investment pool back to policy portfolio weights. This is a much easier-to-execute and lower-cost approach to rebalancing than actually moving assets around among active managers, and therefore enables an investor to rebalance more frequently and systematically. In addition, an objective, disciplined, automatic rebalancing program can be beneficial to investment committees, which find it difficult to attain consensus on ad hoc rebalancing decisions.

Scalability and leverage allow overlay managers to provide a wide spectrum of alpha and risk targets. At the aggressive end, many GTAA overlay managers simply take their GTAA alpha strategies, overlay them on a cash benchmark, and package them as absolute return global macro hedge funds with hedge fund fee structures.

Making an Allocation to a GTAA Manager

Because GTAA managers execute their global alpha strategies in such a variety of formats against almost any client-defined benchmark, it can be difficult deciding where GTAA products most appropriately fit into a policy portfolio or how best to use them. In the aggregate, GTAA can fill any of three primary roles:

- As one-stop outsourcing of most or all major asset allocation decisions for smaller investors with limited in-house staff or expertise. For such a purpose, one of the fully funded products, which select from a pool of actively managed in-house funds would be the most appropriate. Such a GTAA manager could be substituted for most or all of the equity/bond allocation, leaving the investor free to focus on manager selection in non-marketable and other alternative asset classes. However, we would caution that there are only a small number of managers who can claim to have demonstrably superior capabilities across multiple asset classes. An investor utilizing a GTAA manager for a significant portion of the equity/bond allocation should be convinced that the GTAA manager is one of these select firms.

- As a tactical carve-out of the total portfolio. In this swing role, the GTAA manager would be given discretion over intermediate-term asset class and sub-asset class alpha bets against the investor's policy portfolio. Important considerations in such a role would be for the investor to determine how large the allocation to such a swing manager should be and whether to use a fully-funded or overlay approach. For diversification, the investor might even use multiple GTAA managers within its tactical carve-out. In this role, a GTAA overlay manager could also help rebalance the total portfolio through the use of futures.

- As an allocation within an investor's alternative assets or absolute return bucket. Against a cash benchmark, GTAA strategies closely resemble global macro funds, and in fact several firms offer an aggressive, leveraged version of their GTAA product in the form of a hedge fund. Hedge fund versions of GTAA have relatively low correlations with most other hedge fund strategies, and are therefore a good source of diversification and different alpha. They also offer several advantages over global macro funds: generally less concentrated bets, superior risk control, better liquidity, no lock-up periods, and usually almost complete transparency on positions and outlook.

Sources of Risk in GTAA

Because of the role they are designed to play, GTAA products tend to have excellent risk control, actively targeting and monitoring tracking error, but they are not without risk. With extensive exposure to derivatives, many overlay GTAA products have the potential for large and open-ended losses in extreme situations. Should losses be sufficiently large, an investor could be called upon to put up additional cash to cover them. The significance of this risk varies considerably with the way in which an overlay strategy is implemented. For example, a leveraged overlay strategy might result in investors having to sell off assets at depressed prices or incur the opportunity cost of selling off appreciating assets in order to fund additional margin requirements. In addition, with non-exchange-traded derivatives such as swaps, there can also be counter-party risk.

Although risk tends to be diffused across many different types of bets using different methodologies, some GTAA products, especially fully funded versions using in-house products, may reflect particular research or style biases embedded throughout the GTAA portfolio. For example, a firm with a strong overall value approach or a firm with a similar fixed income alpha strategy across many in-house products may pose a higher risk because their GTAA portfolio would not be as diversified as might at first appear.

What is an Appropriate GTAA Allocation?

While an investor with a very small (less than $50 million) asset base and little in-house expertise on asset allocation might consider outsourcing the majority of the equity/fixed income portion of its policy portfolio to one of the fully funded GTAA products, investors using GTAA typically allocate 5% to 20% of their assets to a GTAA product or combination of products. Much depends on how the investor perceives the role of GTAA in its asset allocation structure. Allocating 20% of assets to a low-risk GTAA overlay strategy in a tactical carve-out can be functionally almost identical to, and have the same impact as, allocating 5% to a high-risk GTAA hedge fund product and putting it in an investor's alternatives bucket. The global tactical bets in either may be almost identical, but the position sizes in the latter are simply quadrupled or the leverage increased fourfold.

Is GTAA Appropriate for Taxable Investors?

In general, GTAA products cannot be considered tax efficient. For the fully funded products that use in-house active long-only products, the tax efficiency will approximate that of the actively managed portfolios used. Few of the actively managed products used in GTAA are managed for tax efficiency, although in some cases low turnover may produce a higher percentage of long-term capital gains. Given overlay products' use of futures and swaps, which are marked-to-market at the end of each year, these products will produce significant short-term taxable gains and losses every year. This is somewhat mitigated by the fact that for the majority of futures traded, 60% of gains are taxed as long-term gains, and only 40% as short term. Gains on swaps, on the other hand, are all taxed as short-term gains. There are wide variations in GTAA turnover and vehicles used and relative tax efficiency, so taxable investors should look at after-tax alpha and returns on a case-by-case basis before making an allocation.

Combining GTAA Managers

Just as it is common practice to hire multiple hedge fund managers to access diverse sources of alpha and reduce volatility, also hiring more than one GTAA manager may make sense. GTAA products in general tend to have low correlations with other alpha sources, but they also tend to be quite different from one another, both in methodology and range and types of global tactical bets. Each tends to weight bets differently. For some managers, the primary skill may be in currencies and fixed income, and those types of bets will dominate. Others may include significant bets in less conventional asset classes such as commodities, energy, REITs, or emerging debt. Still others have fully funded products that invest in in-house active products that generate an additional layer of alpha from stock selection. The resulting low correlations in delivered alpha among GTAA managers may argue for hiring more than one.

Measuring and Comparing GTAA Performance

In contrast to the realm of long-only products, where AIMR-compliant composites are the norm and managers are measured against the same benchmarks, comparing returns among GTAA products can be a difficult and frustrating exercise. For a given GTAA product, almost every account may have a different benchmark, which could be anything from cash to the S&P 500 to a whole range of global balanced benchmarks, all with different target tracking errors, and some with different base currencies. Consequently, extreme care should be taken when doing one-on-one comparisons. In some cases, a representative account closest to an investor's desired benchmark and tracking error may be the best performance measure. Other firms create asset-weighted composites of the alpha for all GTAA client separate accounts, whatever the benchmark or tracking error. Where there is a pooled vehicle, performance measurement and comparisons are easier, but global balanced benchmarks for pooled vehicles may vary widely from firm to firm.

Perhaps the best and simplest basis for comparison among products is the delivered information ratio (alpha/tracking error against whatever benchmark is used). Risk-adjusted alpha creates a reasonably uniform comparative measure across a wide spectrum of products.

GTAA Fees, Minimums, and Vehicles

Fee structures for fully funded GTAA products tend to be a fixed percentage of assets invested, similar to the fee structures of long-only equity products, and typically range from 50 basis points (bps) to 150 bps. Separate account minimums can run as high as $250 million, but with the broadening institutional use of GTAA, a number of products are available with minimums as low as $1 million, and pooled vehicles, while providing less flexibility for the client, are increasingly common.

Overlay GTAA products, which require only small cash outlays, tend to have much more complex fee structures, either scaled to a client-determined risk target, and/or to performance. Because of the use of derivatives, fees tend to be calibrated to the notional value of the client assets to which the overlay is being applied. In a typical situation, the client might request as a risk target a 2% tracking error relative to the total global equity/fixed income portion of its policy portfolio, based on which the manager will seek to generate approximately 2% excess returns against the notional value of that portion. Many GTAA products, in fact, state as their goal an information ratio of approximately 1.0. To give a specific example of such a fee structure, a representative GTAA manager in this case would charge a base fee of 5 bps, plus 20% of the 2% target tracking error against the notional value, which works out to a 55-bp total fee.

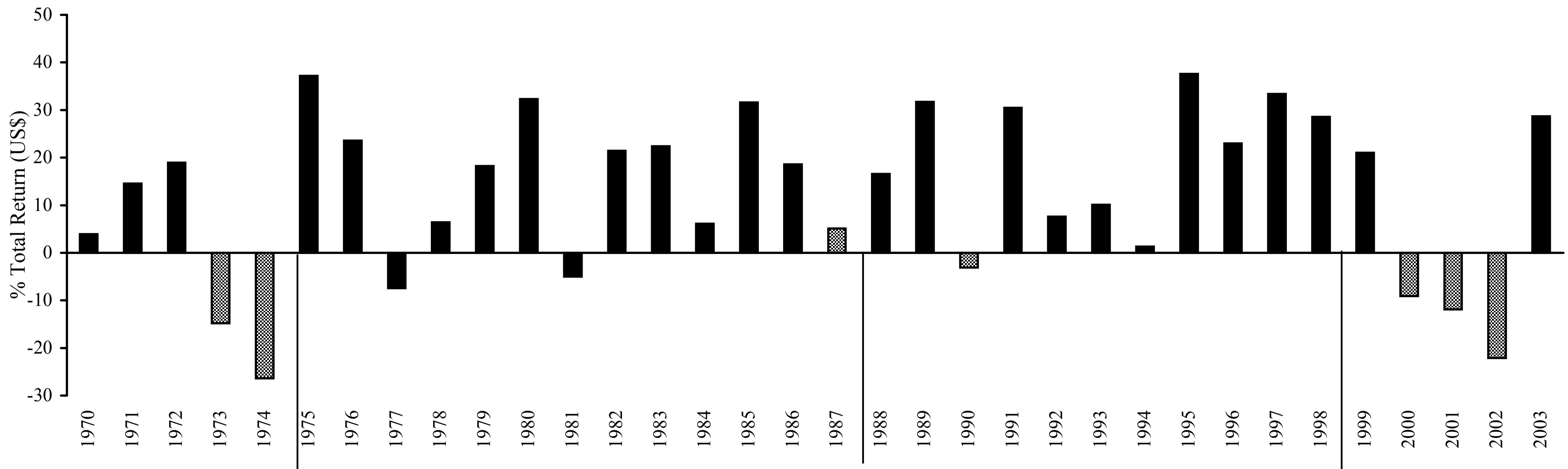
If the investor is willing to accept a higher risk target, the potential excess returns will be higher, and the fees will be scaled up proportionately. When scaling to much higher risk levels, many firms simply offer the same GTAA methodology in the form of a hedge fund, commonly with 1% management fees and 20% performance fees over a defined benchmark.

EXHIBITS

Exhibit 1

ORIGINS AND EVOLUTION OF TACTICAL ASSET ALLOCATION

S&P 500 Annual Performance



INSTITUTIONAL INTEREST IN AND ACTIONS RELATING TO TAA

Worst bear market since Great Depression sparks interest in TAA.

But J.P. Morgan still dominates with classic balanced accounts (no tactical asset allocation); handful of "swing" managers like GMO allowed to raise cash; portfolio insurance using futures grows in popularity.

Portfolio insurance fails in October 1987 market crash; renewed interest in TAA.

Severe TAA underperformance over several years, many managers fired.

Prolonged bear market and poor 5- to 10-year outlook for equities renew interest in GTAA.

Colleges and universities raise equity exposure to record levels just before '73-'74 bear market.

Institutions react to equity collapse by raising bond exposure in policy portfolios only to be hurt by '78-'81 bear market in bonds.

Institutions overweight value managers for downside protection only to be hurt by poor performance of value managers in '90 bear market (Bernstein).

Exhibit 1 (continued)

ORIGINS AND EVOLUTION OF TACTICAL ASSET ALLOCATION

Key Moments in Tactical Asset Allocation

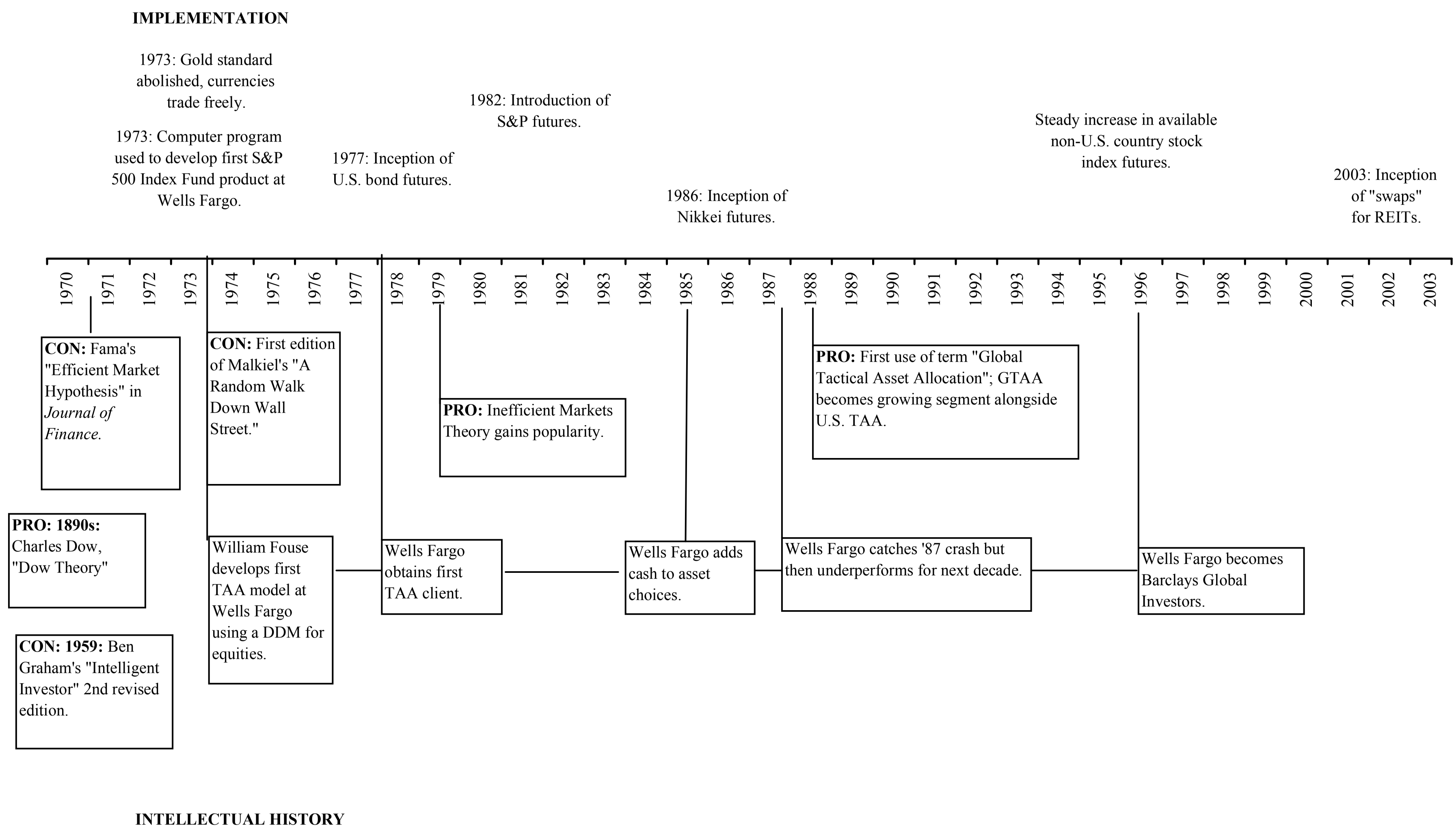


Exhibit 2

"BETA" AND "ALPHA" BETS USED BY REPRESENTATIVE GTAA MANAGERS

Firm	Beta Bets			Alpha Bets				
	Stocks vs Bonds	Stocks/ Bonds/ Currencies	Stocks Bonds/ Currencies/ Commodities/ Other	Equities by Region	Equities by Country	Equities by Sector	Equities by Size	Equities by Growth/ Value
Grantham, Mayo, Van Otterloo & Co.			√	√	√	√	√	√
Mellon		√		√	√			
Goldman Sachs		√		√	√		√	
Bridgewater			√	√	√			
PIMCO			√	√	√			
Wellington	No	No	No	√	√	√	√	√
Morgan Stanley		√		√	√	√	√	√
Barclays Global Investors		√		√	√			
First Quadrant		√		√	√			
Tactical Global Management		√		√	√			

Notes: "No" was used for Wellington under the beta stock-bond bets categories to underscore that, unlike any of the other listed products, this is an "equity-only" TAA product with an equity rather than balanced benchmark. Shading indicates areas where a manager places particular emphasis and shows a high level of experience and skills relative to other managers.

Exhibit 2 (continued)

"BETA" AND "ALPHA" BETS USED BY REPRESENTATIVE GTAA MANAGERS

Firm	Alpha Bets						
	Bonds by Region (Developed)	Bonds by Issuers	Bonds by Duration	Currencies vs US$	Currency Crosses	Commodities/ Real Assets	Stock-Picking or Other "Stacked" Alpha
Grantham, Mayo, Van Otterloo & Co.	√	√	√	√	√	√	√
Mellon	√			√	√		
Goldman Sachs	√			√	√		
Bridgewater	√			√	√		
PIMCO	√	√	√	√	√	√	√
Wellington				√	√	√	√
Morgan Stanley	√			√	√		√
Barclays Global Investors	√			√	√		
First Quadrant	√			√	√		
Tactical Global Management	√			√	√		

Notes: "No" was used for Wellington under the beta stock-bond bets categories to underscore that, unlike any of the other listed products, this is an "equity-only" TAA product with an equity rather than balanced benchmark. Shading indicates areas where a manager places particular emphasis and shows a high level of experience and skills relative to other managers.

Exhibit 3

REPRESENTATIVE FIRMS OFFERING GTAA PRODUCTS

Fully Funded GTAA

Grantham, Mayo, Van Otterloo & Company
40 Rowes Wharf
Boston, MA 02110
617-330-7500

Morgan Stanley Investment Management
1221 Avenue of the Americas
New York, NY 10020
212-762-7400

Pacific Investment Management Company
840 Newport Center Drive
P.O. Box 6430
Newport Beach, CA 92658-6430
949-720-6000

UBS Global Asset Management
UBS Tower
One North Wacker Drive
Chicago, IL 60606
312-525-7100

Wellington Management Company, LLP
75 State Street
Boston, MA 02109
617-951-5000

Overlay GTAA

Barclays Global Investors
45 Fremont Street
San Francisco, CA 94105
415-597-2000

Bridgewater Associates
One Glendinning Place
Westport, CT 06880
203-226-3030

First Quadrant
800 East Colorado Boulevard, Suite 900
Pasadena, CA 91101
626-795-8220

Goldman Sachs Asset Management
32 Old Slip, 32nd Floor
New York, NY 10005
212-902-1000

Mellon Capital Management
595 Market Street, Suite 3000
San Francisco, CA 94105
415-546-6056

Morgan Stanley Investment Management
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