Techniques for Today's Global Asset Allocation Strategies

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Asset allocation is a simple tool, but investors and managers generally do not apply it correctly. The recommendation here is to go back to basic theory: No one knows the future, so you must use forecasts, not history; for truly global allocations, forecast excess, not total, returns; make guesses and establish a sense of how good the guesses are and in which direction they tend to go; and let your optimizer do what it is supposed to do without constraints.

Asset allocation is responsible for somewhere between 50 percent (from someone who is belittling it) and 90 percent of portfolio earnings. If it is such an important determinant of returns, why does everyone want to know each other's latest stock pick? No one comes up to you at a cocktail party and asks, "What is your asset allocation?" Either asset allocation is very difficult to understand, or it does not give us much value as it is currently being implemented. This presentation revisits the theory of asset allocation, focusing on some of the theoretical issues, and lays out certain approaches that will help portfolio managers and investors apply asset allocation correctly.

Theory

Asset allocation theory today has changed little from the theory developed 40 years ago, but now, for the first time, probably, since asset allocation theory was developed, investors and analysts can do asset allocation properly. What business school taught about asset allocation was largely wrong, which is why we use it so poorly and get so little value from it.

In the basic concepts of modern portfolio theory, the risk of a portfolio can be lower than the risks of any of its components because of diversification. But what does "diversify and get rid of risk" truly mean? Mathematically, investing in both assets A and B is less risky than investing in either one of them separately only if assets A and B are not or only slightly correlated. Simply put, reduction in risk depends on a sufficient number of weakly correlated assets in the portfolio.

Investment managers focus on asset allocation because they want the maximum return possible for taking on a given level of risk; that is, they always want to be on the efficient frontier, shown in **Figure 1**. Investors do not want to be below the efficient frontier; investors with portfolios below the curve are taking risk needlessly and getting no

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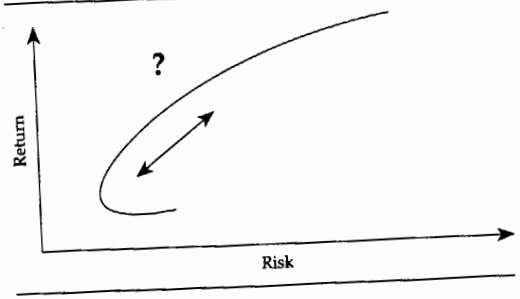
Figure 1. The Theoretical Efficient Frontier



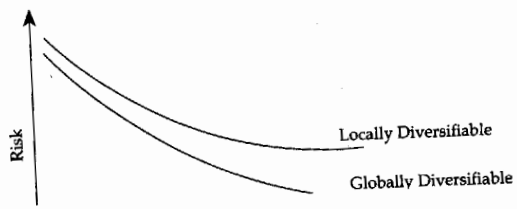
return for it. Investors can move along the efficient frontier, trading off the risk in the portfolio for the return that might result. Asset allocation supposedly helps find efficiency on this frontier. The problem is that the efficient frontier is a moving target.

A different, and simpler, way to think about modern portfolio theory is in terms of diversifiable risk. For any portfolio, risk can be separated into diversifiable and nondiversifiable risk, as shown in **Figure 2**. If managers add enough assets to their portfolios, they can get rid of diversifiable risk, which is also known as bad risk. They cannot get rid of nondiversifiable risk, also known as good risk. Why should some risk be bad and some be good? Good risk is the risk managers get paid to take. Bad risk is the kind of risk the market will not pay a manager to take. A manager can get lucky, of course, and have bad risk turn out to be good risk because the manager is on the right side of a distribution, but good risk is the kind of risk the market will pay a manager to take *ex ante*.

Figure 2 also shows locally diversifiable and globally diversifiable risk. Theoretically, even in a local market, managers can get rid of a lot of risk, but if the market is taken as the whole world, they can get rid of more risk.

How many portfolios, however, are globally diversified? For example, in Spain, Spanish investors say, "Why should I invest outside Spain? I do my optimizations, and they tell me to buy Spanish bonds." In Germany, the Germans say, "Why should I invest outside Germany? I should buy German bank deposits." And they do; about 80 percent of their investments are in fixed-income securities or deposits. In the United States, people say, "I should buy the S&P 500 Index because it always

Figure 2. Modern Portfolio Theory: A Simple View



goes up. I shouldn't buy anything overseas." And so it goes around the world. In some markets, investors may own only the fixed-income market; in others, they might own bank deposits; in the more adventurous, such as the United States, they hold some domestic equity. The Spanish have some logic behind their position; over the past 30 years, Spain had the highest real rate of return on investments, and from a risk-adjusted standpoint, the return was probably coming from Spain's fixed-income market. The German and U.S. positions are not so logical.

The reality is that people have a local focus. Most people tend to ignore diversification in general, but even if they do diversify, it is local. Part of the reason is probably the difficulty of accessing foreign markets in the past and the resulting exorbitant transaction costs for international investing. Twenty years ago, a U.S. investor could hardly consider a stock in, say, Italy; the transaction costs associated with simply getting one's hands on such a stock were prohibitive. Today, however, global markets are as accessible as local markets—at least through indexing. So, the question remains: If global markets are as accessible as local markets, why so little global diversification? One or two aspects of the concepts of global diversification and asset allocation may help explain why people tend to stay home rather than invest globally.

Use Excess Return Space

Global efficiency should be in excess return space, not total return space. Theory discusses risk relative to the no-risk alternative. For years, the risk-free rate meant the credit-risk-free rate, but that is not necessarily correct. The risk-free rate is the known rate for the investor's

will not get excess return? So, the efficient frontier should be developed on a graph of risk and return that pictures returns in excess of the risk-free rate, not total returns, which is misleading.

Several years ago, I gave a presentation on this concept to the portfolio managers at Bankers Trust, and they said it does not matter whether one is talking about excess returns above the risk-free rate or total returns: "Anybody can simply make the adjustment." So, I told them to go build an ECU (European currency unit) portfolio, a German mark portfolio, a Japanese yen portfolio, and a U.S. dollar portfolio, optimize them, and bring them back. When the exercise was done—the same optimizations, same risk targets, and same volatility assumptions—the result was four different portfolios, each of which was "globally" efficient. How can four different portfolios be *the* efficient portfolio? It is impossible. But investment managers produce them because of the currency problem.

Global efficiency should be currency independent, not currency dependent. And as soon as analysts move into excess-return space, returns are 99 percent currency independent. In excess-return space, "globally efficient" is also no longer home-country dependent. So, an efficient portfolio in U.S. dollar terms looks the same as an efficient portfolio in Spanish peseta terms, with the exception of the currency hedges to bring the portfolio back to the excess return above the risk-free return, which is different for the Spanish, the German, and the U.S. investor.

Stressing the use of excess returns may seem pedantic and unimportant, but it is critical for performing asset allocation correctly. Otherwise, not only are the portfolios

over time, as the next series of figures will show. **Figure 3** is a graph of risk and return in excess-return space for various asset classes and markets for the five-year period beginning in January 1975. It reveals some interesting information about where investors obtained excess returns for the risk they were taking in this period. The figure compares the MSCI (Morgan Stanley Capital International) country indexes, the MSCI World Index, U.S. stocks (the S&P 500), and U.S. 10-year government bonds; risk, or annualized volatility, was measured as standard deviation of return. The riskiest market, but it sure provided return, was the United Kingdom. Japan was a winner in providing reasonable risk for high return. The MSCI World and the S&P 500 indexes were low risk and low return. For this five-year period, the choice assets were Japan and maybe Germany. France and the United Kingdom were pretty good. The worst allocation was U.S. government bonds; they were low risk but had negative returns.

Figure 4 shows the next five-year period, 1980 through 1984. Suppose that, on the basis of the 1975–79 period, an investor had invested in the United Kingdom. How would that investment have done? The equity was still high risk, but the return for the period was low, less than 2 percent. Germany at least gave a return for the risk taken during this period. The S&P 500 was lower risk with some return. U.S. government bonds simply became more risky for negative returns. Japan still looks like the place to invest: Five years before, Japan was a great place to invest, and it was a great place to invest this five-year period. So, to get ready for the next five years, in typical recommendation terms, "based on the last five years of data, Japan is recommended."

Look at the next five years. In **Figure 5**, Japan shows up as still the one place an investor can consistently go. France is now performing and, in hindsight, should have been bought. And all of a sudden, U.S. government bonds and the S&P 500 have started to look good.

Finally, **Figure 6** shows the final five-year grouping, 1990 through September 1995. The place to be was the S&P 500 and U.S. government bonds. The one asset that was always up in the past periods, Japan, gave up everything in this period that it had returned in the previous 15 years.

Today, U.S. investors ask, "Why should I invest anywhere but in the S&P 500 and U.S. government bonds? Look what a great return they have provided." Even if this analysis were extended to 1997, low risk and high return dominate in the United States. Of course, an investor could have said the same thing for Japan in January 1990. So, one of the lessons from this exercise is to go back to basics: The past does not predict the future. If investors simply look at the past as an indicator of the future—whether using five years, three years, or moving averages—they will choose markets just before they go down. A good rule could be: All looks bright just before the hurricane hits, at least in markets.

Figure 3. Risk versus Reward, January 1975–December 1979

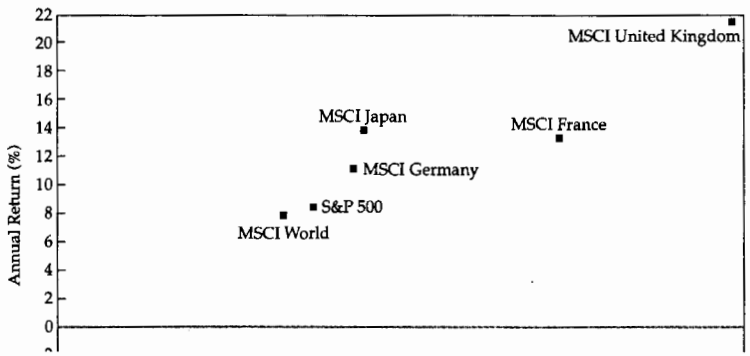


Figure 4. Risk versus Reward, January 1980–December 1984

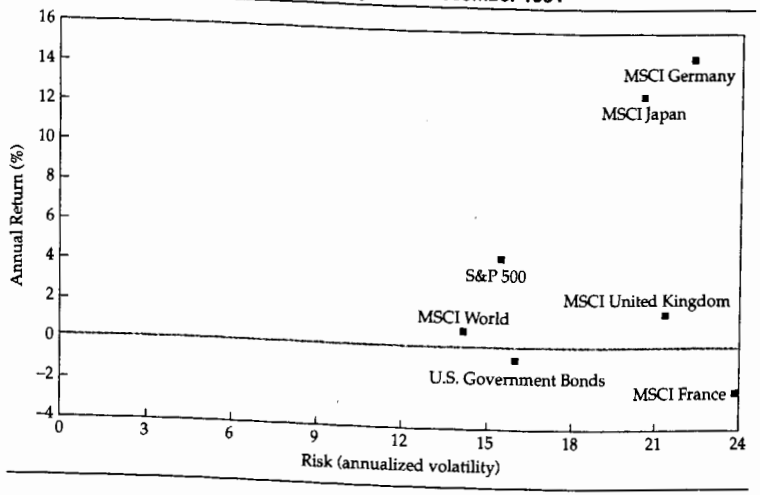


Figure 5. Risk versus Reward, January 1985–December 1989

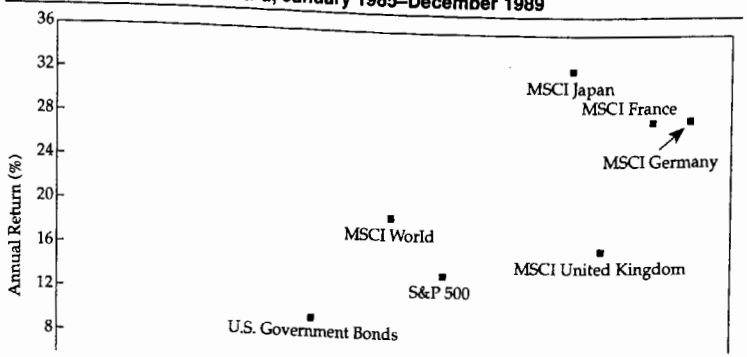
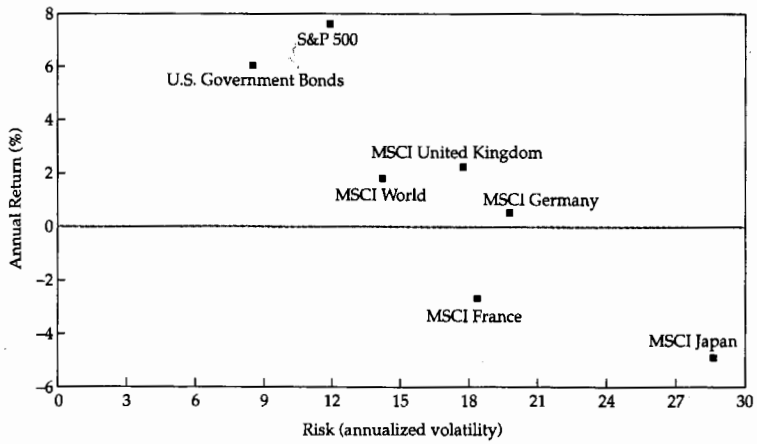


Figure 6. Risk versus Reward, January 1990–September 1995



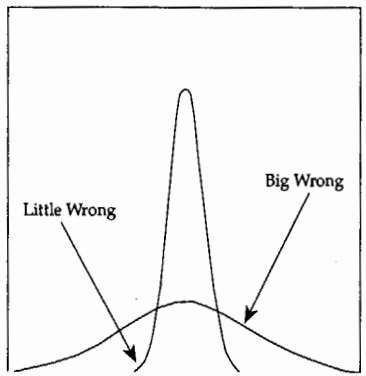
An Approach to Theoretical Correctness

The theorists said that, in a perfect world, investors should diversify everywhere, all the time, instantaneously, into everything. The theory assumes no transaction costs and no frictions. Of course, frictions and transaction costs do exist in the world, and investors cannot ignore them. What does it mean, then, to diversify a portfolio everywhere, all the time—in a friction-free world or in a world with friction?

The meaning starts with a basic principle: Investors have portfolios because they do not know the future. No one is prescient. If investors knew the future, the perfect portfolio would be one bet, because they would know the outcome.

The power of portfolio theory is that it allows investors and managers to deal with the world of uncertainty, risk. Because the concept of looking at the past, which we know perfectly, to build a portfolio is dead wrong, investors must begin by setting expectations about the future in building a portfolio. Theory demands that investors make a building their portfolios, what is critical is not the guesses but how wrong they can be—a little wrong or a lot wrong—which depends on the distribution of expected returns—that is, the volatility of what will happen next. **Figure 7** shows the distribution patterns for being a little wrong and a lot wrong. How wrong investors will be has everything to do with how good they are at forecasting, not how volatile the actual market is. An excellent forecaster will probably be a little wrong; a poor forecaster will be a lot wrong. In portfolio theory, however, that difference does not matter much because it is taken into account in the correlation matrix of risks.

Figure 7. How Wrong Will You Be?



When we in the industry use the last five years to get the volatility for the next five years, we are forgetting what the theorists were talking about 40 or 50 years ago. We do it because measuring how wrong we could be is bad for cocktail party discussions and because it is difficult to do. So, we make forecasts about future expected returns, and then we turn around and estimate how wrong we could be (future variance) based on something in the past. No wonder the resulting portfolios appear to be irrational!

Once we have our guess about the future and have some idea of how wrong we could be (the standard deviation of our guesses), we are also interested in whether we guess everything wrong in the same direction. In portfolio theory, it does not matter that one is wrong if one is consistently wrong; portfolio theory allows us to adjust for being wrong in a consistent manner. Knowing that any guess will be wrong, what the investor needs to do to create an optimal portfolio is have an idea of how wrong the guesses will be and how closely associated those guesses will be in "wrongness" space.

Nothing in the theory says that actual historical correlations must be used or that actual historical standard deviations must be used. If we use forecasts of the future from sample data and then plug in perfect guesses about future correlation and volatility, the portfolios are worse than if we had done it theoretically correctly. So, knowing what may happen in the future regarding correlations and volatilities of underlying actual prices will not build better portfolios. The idea that we do not know what prices will be but do know that volatility in the future will look like volatility in the past is wrong.

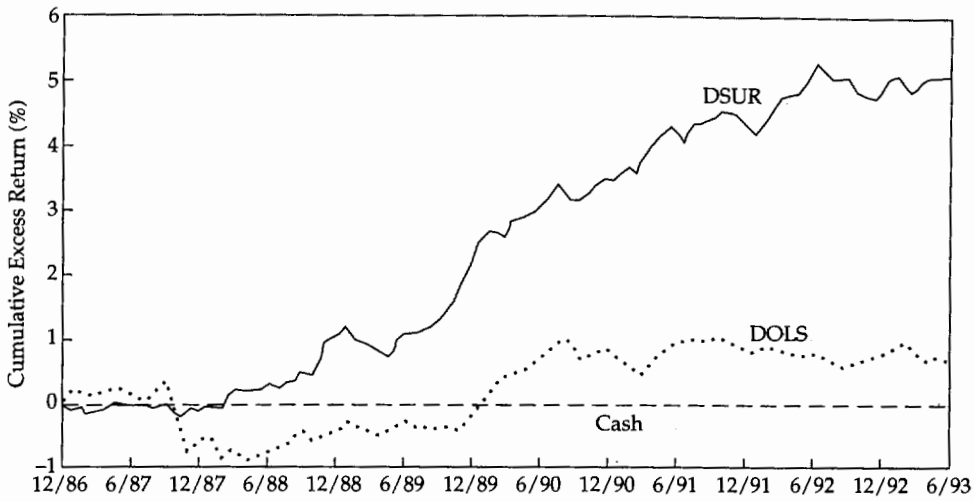
In our forecasts of the future. For example, when I get the German mark wrong, I tend to get the French franc wrong the same way. My models are so interlinked that they tend to be wrong the same way. That link is what matters, not whether the forecasts are actually right or wrong.

Consider the following forecasting approaches. The DOLS (dynamic ordinary least squares regression) line in **Figure 8** is the output of a sophisticated quantitative forecasting system for global asset allocation. It is a Bayesian error-learning system and is based on variable autoregressive principles. The model is in excess-return space, so anything above the dotted line is great and anything below that line is losing money relative to cash. The model is theoretically correct in excess-return space, but it uses a historical variance–covariance matrix for the optimization, which is common practice in the industry. The returns shown are the kinds that yield a Sharpe ratio over a five-year period of about 1.0. The results are real; I did not cheat with statistics. Most managers would be pleased with the model output.

The DSUR line in Figure 8 is based on an estimation procedure called "dynamic seemingly unrelated regressions." It reflects the performance of a portfolio created with exactly the same input data as DOLS but, instead of some historical measure of volatility and correlation, the correctly measured errors of the forecasts. The DSUR cumulative return is five times as large as the DOLS cumulative return, yet the forecasts are basically the same. The only difference between the two lines is that the DSUR one is theoretically correct.

Knowing the future volatility and correlation does not help significantly to improve returns because the theory is based on the assumption that one does not know the future of anything. We simply have guesses about the future; we are either good guessers or bad

Figure 8. DOLS and DSUR Portfolio Performance



people talk about correlation, what they should say, theoretically, is the correlation of their guesses and the errors in their guesses.

Asset allocation is a simple tool, but investors and managers ended up doing it wrong because obtaining measures of volatility and correlation that were not based on history was difficult. The technology has changed, however, and today, analysts can create methodologies so that when they make guesses about future returns, they can talk about the consistency of the direction of their errors, consistency in the volatility associated with those errors. So, technology allows correct application of the theory.

When the new technology, such as off-the-shelf optimizations, is used incorrectly—not done in excess-return space, expected returns are used but not expected variances and correlations—it reinforces investors' biases against global investment as well as global asset allocation. The resulting portfolios do not look appropriate, and managers attempt to sell the product by putting constraints on the optimization. "Constrained optimization" sounds good, but it is the worst kind of error. In the financial markets, investors and managers want robust solutions. When we constrain our optimizations, we are guaranteeing that we do not have robust solutions. When we are wrong, we are going to make big mistakes.

Conclusion

To do asset allocation correctly, start with a premise that no one knows the future. Forecast excess returns, make guesses, have a sense of how good a guesser you are and in what direction those guesses line up, and then do not constrain the system. Let it do its duty.

Consistency—in excess returns, expected returns, volatility, and correlations—is the key. You do not have to have the fanciest model in the world. You do not have to have the most sophisticated system to use portfolio theory effectively. Go back to the basics.

In global asset allocation, as soon as you operate in excess-return space, the model will come up with portfolios that have lots of global assets. In a global optimization, portfolios look the same to European and U.S. investors, who can then simply use the cheapest contract in the world, the currency forward contract, to translate the returns to home-country currency. Going back to the basics of modern portfolio theory allows you to not know the future but still provide your clients with good returns.