



*International Investing  
And  
Portfolio Diversification*

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## ***Introduction***

After writing a recent article on a model portfolio of ETF's that did not include any international ETF's (<http://www.quantext.com/SampleETFPortfolio.pdf>), I received a number of questions as to why this might be the case. The portfolio that I started with in the paper mentioned above is the Core ETF Portfolio from David Jackson's Radical Guide (<http://www.radicalguides.com>). My analysis ran this portfolio through Quantext's Monte Carlo projection and determined that there were some ways to improve the asset allocation without increasing risk. The Monte Carlo analysis suggested that the resulting portfolio, which added a heavy allocation to energy stocks, would provide higher returns with lower risk. This portfolio had essentially no allocation to international ETF's (or to Tech-focused ETF's). The portfolio that I started with (the Core Portfolio) had a value of Beta considerably less than 100% and fairly low projected volatility. The lack of Tech stocks reflected the fact that Tech stocks and ETF's tend to have high values of Beta and thus tend to increase portfolio volatility and I wanted to maintain the initial portfolio risk level. Everyone understood this. On the other hand, people tend to feel that including international stocks or ETF's in a portfolio should have real diversification value, meaning that their inclusion will help to limit total portfolio risk. The companies included in these international ETF's are operating in non-U.S. economies which are driven by forces that are less coupled to the U.S. economy, right? Well, that's the thinking. The reality turns out to be a bit more complex.

## ***Statistical Characteristics of International ETF's***

To explore this problem in more detail, I assembled a list of some of the oldest international ETF's. I also added an ETF for US Energy as a point of comparison. ETF's are a fairly new business and when I looked for international ETF's with at least three years of history the list was still pretty short:

Ticker	Description	Category
IXN	iShares S&P Global Technology Sector	Specialty-Technology
EWY	iShares MSCI South Korea Index	Pacific/Asia ex-Japan Stk
EWD	iShares MSCI Sweden Index	Europe Stock
EWP	iShares MSCI Spain Index	Europe Stock
EPP	iShares MSCI Pacific ex-Japan	Pacific/Asia ex-Japan Stk
EWA	iShares MSCI Australia Index	Pacific/Asia ex-Japan Stk
IXC	iShares S&P Global Energy Sector	Specialty-Natural Res
EWK	iShares MSCI Belgium Index	Europe Stock
IYE	iShares Dow Jones US Energy	Specialty-Natural Res
EWC	iShares MSCI Canada Index	Foreign Large Value
ADRE	BLDRS Emerging Markets 50 ADR Index	Diversified Emerging Mkts
EWV	iShares MSCI Mexico (Free) Index	Latin America Stock
EWO	iShares MSCI Austria Index	Europe Stock
ILF	iShares S&P Latin America 40 Index	Latin America Stock
EWZ	iShares MSCI Brazil (Free) Index	Latin America Stock

Data from Yahoo! Finance (<http://finance.yahoo.com/etf/browser/mkt>)

I entered these ETF's into the Quanttext Monte Carlo model as possible components of a portfolio, and selected to use the last three years of data as the basis for calculating risk and Beta. When I ran the model, and looked at Beta and projected volatility, I got the following results for this group:

Ticker	Description	Beta	Standard Deviation in Annual Return
IXN	iShares S&P Global Technology Sector	151%	27%
EWY	iShares MSCI South Korea Index	192%	43%
EWD	iShares MSCI Sweden Index	165%	32%
EWP	iShares MSCI Spain Index	130%	25%
EPP	iShares MSCI Pacific ex-Japan	84%	20%
EWA	iShares MSCI Australia Index	97%	23%
IXC	iShares S&P Global Energy Sector	72%	29%
EWK	iShares MSCI Belgium Index	145%	29%
IYE	iShares Dow Jones US Energy	64%	31%
EWC	iShares MSCI Canada Index	108%	26%
ADRE	BLDRS Emerging Markets 50 ADR Index	159%	32%
EWV	iShares MSCI Mexico (Free) Index	154%	32%
EWO	iShares MSCI Austria Index	110%	28%
ILF	iShares S&P Latin America 40 Index		
EWZ	iShares MSCI Brazil (Free) Index	184%	47%

### Beta and Projected Standard Deviation of Return generated from the MC model

The value of Beta is preserved from the historical data, but the standard deviation in annual return is projected forward. The Monte Carlo model in this run assumed an

average annual return of 10.3% for the S&P500 and standard deviation of annual return equal to 15.07%, consistent with long-term levels. The projected volatility of these ETF's is a function of this 15.07% figure via Beta. Beta represents the coupling of the volatility of a stock or fund to the S&P500. If market volatility increases, high-Beta assets will tend to increase in volatility more than low-Beta assets.

The two things that one immediately notes about these international ETF's is that most have Beta greater than 100% and all of them have standard deviation of annual return that is dramatically higher than the volatility (the standard deviation in annual return) projected for the S&P500. The only ETF in this list with Beta substantially less than 100% is the global energy ETF (IXC). The lack of values for ILF is due to the fact that it has not actually been around for three years, so there was insufficient data.

These results explain why international ETF's did not look very attractive when we were trying to improve upon the Core Portfolio of ETF's from the Radical Guide. ETF's with high Beta (meaningfully greater than 100%) act to amplify a portfolio's sensitivity to the U.S. market rather than providing real diversification effects. Most of these ETF's cannot be said to have any real 'diversifying effect' on a portfolio of U.S. equities. This is quite counter-intuitive, of course. Most people have been taught that investing overseas makes sense largely because it hedges you against volatility in the U.S. market, but the data from the last three years appears to suggest that this is not the case for this group of ETF's.

Before continuing, I want to note that if you look at the historical data for standard deviation in annual return for the international ETF's and compare this to the value for the S&P500, these ETF's have standard deviation in annual return that is between 1.2 and 2.8 times as large as the S&P500. These are, in general, not just high Beta ETF's but also high volatility ETF's. The last several years have been fairly low volatility (low standard deviation in return) for the S&P500, with values that are only about 2/3 of the long-term historical values. If we assume that that volatility (the SD) in the future will tend towards

then historical long-term annual value of about 15%, the volatility of these high-Beta ETF's will also tend to increase.

### ***Comparing ETF Statistics to Broader Market Indices***

When looking at these results for Beta for these international ETF's, the natural question to ask is whether we have chosen too short a data history, etc. I gave this considerable thought and did some investigating and the simplest thing to check was simply to run the Monte Carlo engine for a range of international market indices (plus the Dow Jones Utility index, for reasons that will be apparent) and compare to the ETF's. The Monte Carlo engine pulls historical data for anything with a ticker, so the portfolio is simply expanded to include the following indices:

<b>Index Ticker</b>	<b>Description</b>
^DJU	Dow Jones Utilities
^HSI	Hang Sen
^N225	Nikkei 225
^FTSE	FTSE 100
^FCHI	CAC 40

When we run the Monte Carlo portfolio analysis for a group of tickers that includes all of the ETF's listed above and these indices using three years of data, we get the following result, which provides the real punch line to this analysis:

Ticker	Description	Beta	Standard Deviation (Annual)
^DJU	Dow Jones Utilities	54%	21%
^HSI	Hang Sen	95%	25%
^N225	Nikkei 225	54%	25%
^FTSE	FTSE 100	64%	14%
^FCHI	CAC 40	105%	22%
IXN	iShares S&P Global Technology Sector	151%	27%
EWY	iShares MSCI South Korea Index	192%	43%
EWD	iShares MSCI Sweden Index	165%	32%
EWP	iShares MSCI Spain Index	130%	25%
EPP	iShares MSCI Pacific ex-Japan	84%	20%
EWA	iShares MSCI Australia Index	97%	23%
IXC	iShares S&P Global Energy Sector	72%	29%
EWK	iShares MSCI Belgium Index	145%	29%
IYE	iShares Dow Jones US Energy	64%	31%
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ADRE	BLDRS Emerging Markets 50 ADR Index	159%	32%
EWV	iShares MSCI Mexico (Free) Index	154%	32%
EWO	iShares MSCI Austria Index	110%	28%
ILF			
EWZ	iShares MSCI Brazil (Free) Index	184%	47%

### **Beta and Projected Standard Deviation in Annual Return for ETF's and indices**

The international indices are, in general, showing far lower values of Beta and far lower values of projected standard deviation than the international ETF's. This is a very interesting and telling result. We have experimented with a range of time horizons, limited by the fact that very few of these ETF's have been around much longer than three years, and the results are consistent. The international ETF's tend to have Betas, historical volatilities and projected future volatilities that are notably higher than the international indices. As a counterpoint, historical Beta for the Dow Jones Utility Index (DJU) is quite close to historical Beta for the iShares ETF that is supposed to track this index, IYE (see the table above). For the past three years, standard deviation of returns on IYE is considerably higher than the standard deviation of returns for the DJU Index, something the projected values of volatility preserve.

What do these results tell us? From our analysis, we conclude that many international ETF's are not broadly representative of their market-wide indices. This is not, in and of itself, surprising. Any ETF that is made up of Spanish or Belgian stocks may or may not replicate the diversification effects of the FTSE 100, for example. The fact that many of these international ETF's, when included in a portfolio that is largely comprised of stocks

listed in U.S. markets, will actually increase the sensitivity of the portfolio to fluctuations in the U.S. markets will surprise many people.

### ***Conclusions***

A prime strategic reason that most investors want international investments is to diversify risk associated with the U.S. markets, but many international ETF's will not serve this purpose at all. To the contrary, based on historical volatility and Betas, many of these foreign ETF's look more like aggressive growth investments rather than as vehicles for managing portfolio risk. This fact does help in trying to reconcile the extremely high returns that we have seen from these ETF's and similar portfolios in the past several years. The high Betas and high historical and projected volatilities also serve as a warning that a portfolio with substantial concentrations of these ETF's along with other high-Beta investments such as Tech stocks may yield a final portfolio that is over-sensitive to the U.S. market and also carries levels of volatility well beyond an investor's comfort level.

One of the substantial benefits of running a portfolio through a Monte Carlo portfolio management model is to be able to look at the combined risk-return effects of the assets in the portfolio, taking diversification into account. In this case, the raw analysis for the individual assets can show the portfolio manager that these international ETF's may not have the impact on portfolio risk and return profiles that he or she is looking for. These results will not show up with all Monte Carlo tools, however. Many Monte Carlo simulation engines do not calculate the statistical parameters for each investment directly, but simply assign each portfolio component to a 'class' or style of investment. After assigning each investment to a class (U.S. Small Cap, International/Emerging markets, Intermediate Term Bonds, etc.), the Monte Carlo engine runs a simulation for the small number of classes and estimates portfolio risk and return. The analysis by class can tend to miss the degree to which an investment's properties may be different from the broader class. Quantext's Monte Carlo tools calculate historical and projected risk and return parameters for every portfolio component and it is through this analysis that we have seen

that many of the available international ETF's tend to increase a portfolio's exposure to fluctuations in the U.S. market.

The issues shown here for international ETF's also hold for many mutual funds. I first became really aware of this issue when I was analyzing a portfolio using the Quantext Monte Carlo tool (portfolio planner) that included a heavy concentration in the T. Rowe Price New Asia Fund (PRASX). It was immediately clear that the high level of Beta (around 120-130%) and the high standard deviation in annual return (25%) meant that the portfolio impact of this fund was to increase exposure to the U.S. market rather than to diminish it. The person to whom this portfolio belonged thought that he was limiting risk with his allocation to PRASX, when in fact he was increasing total risk and sensitivity to the U.S. market.

This analysis is not an argument to ignore international investments, but rather to examine their portfolio effects with some care. The best choices for international investing will tend to be companies which are fairly decoupled from U.S. market fluctuations, which will be reflected by low Beta. If you choose to take positions to exploit the very high returns we have seen from these international ETF's, it is wise to be aware that many of them can have portfolio impacts that are not dissimilar from tech stocks and funds.

A range of articles on Quantext's Monte Carlo portfolio analysis tools and about Monte Carlo analysis in general, as well as access to a free trial version, are available at:

[www.quantext.com/gpage3.html](http://www.quantext.com/gpage3.html).