



Farm Creek Securities, LLC
Farmcreeksecurities.com
fc@farmcreeksecurities.com
89 Roton Avenue, Rowayton, CT 06853
(203) 838-1025

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**Ed Hynes, CFA
President**

**Should Investors Hold Foreign Stocks to Reduce Their Volatility Risk?
For US Individual Investors the Answer is No!**

Investors need to question the conventional wisdom, take a new hard look at the facts and then decide for themselves. The bottom line is that if an investor is a forced seller of US equities in a bad market, it's bad everywhere. This leaves holders of foreign stocks with little or no diversification benefit at the only time they really need it.

Introduction

In order to discuss this more easily, let's define a model investor and their investment strategy. In a nutshell, we think:

- Long-term individual investors should develop an asset allocation strategy appropriate to their needs. After setting aside an emergency cash reserve, a common asset allocation might be 70% stocks and 30% fixed income.
- The investment strategy should be implemented with low-cost, tax efficient passive index vehicles such as ETFs. After all costs, successful investors should trail their benchmarks by 50 to 75 basis points a year.
- Investors should also follow these best practices:
 1. Rebalance once a year in the most economic way.
 2. Use dollar-cost averaging when buying securities and its counterpart – dollar-income averaging when selling.
 3. Hold a diversified portfolio of stocks and bonds. We believe that a 70% allocation tracking the S&P 1500 and 30% tracking the Lehman Brothers Aggregate meets the criteria.

So the question at hand is would replacing part of the exposure to the S&P 1500 (let's say 20% of the equity allocation) with exposure to foreign stocks as represented by EAFE, reduce the volatility risk of this portfolio?

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Almost everyone says yes and on average, this is probably the right answer as the S&P and EAFE are not perfectly correlated. But when volatility and the risks associated with it are studied more rigorously in the context of our model investor, the diversification arguments break down.

Volatility & Risk and “Volatility Risk”

In another article we discuss volatility and risk in more detail, but we will briefly review the major points here. We believe that it’s unclear to many investors how volatility is risk and how that risk manifests itself. One of the first problems is the language, as risk in the statistical sense is not pejorative; it can be good or bad. As most readers of this paper know, what volatility measures is how much a security’s price varies around its long-term trend. The risk is that the price is not the right price.

For better analysis and understanding, we think it important to break volatility into two pieces and define new terms called Volatility Risk and Volatility Benefit. In this case Risk and Benefit are used in their vernacular sense and therefore Volatility Risk is when an investor can get hurt. How does an investor get hurt? They pay too much for a security or receive too little when they sell it. If volatility is low, it means the investor has less of a chance of paying too much or receiving too little. But as volatility increases, the risk of paying way too much is higher. Volatility Benefit is the mirror image and occurs when an investor buys cheap or sells expensive. This table may help explain these terms.

Volatility Risk and Benefit

<u>Market Level</u>	<u>Buyers</u>	<u>Sellers</u>
Above Trend	Volatility Risk	Volatility Benefit
On Trend	<u>No Volatility Risk or Benefit</u>	
Below Trend	Volatility Benefit	Volatility Risk

In the bubble phase of the late 90s, we now know in hindsight that stock prices were well above trend. Therefore buyers were exposed to Volatility Risk and sellers to Volatility Benefits during this period.

What should an investor do to control the risk? In the best practices outlined above, Dollar Cost Averaging and Dollar Income Averaging are designed to mitigate an investor’s exposure to Volatility Risk. If an investor purchases securities over a period of years, they are less likely to have an average purchase price near the high end of the range and their Volatility Risk that they overpay has been reduced. Unfortunately, it also

reduces their exposure to Volatility Benefits as it's also unlikely they will pay too little. Selling works the opposite way. If an investor sells over time they are more likely to get the average rather than the top or bottom.

Long-term investors who follow these practices remove some of their Volatility Risk (and Benefits). But emergencies happen and sometimes investors do not have the luxury of time when selling and cannot average out. They have to sell tomorrow and become what are called forced sellers. There is no way to remove this risk, but the "best practice" of holding a diversified portfolio will help lower it.

If the stock market is on trend or up, the forced seller just sells stocks and has dodged the bullet of Volatility Risk and may have even experienced a Volatility Benefit. But if the stock market is down, the forced seller's first line of defense is their cash reserve which has little volatility. If more money is needed, the second line of defense comes from their bond holdings which are more volatile than cash, but historically are less volatile than stocks and generally are not very correlated with stocks. Only after an investor burns through their bonds, do they have to sell stocks.

This is the critical point where we have to examine if holding foreign stocks would be helpful. Our conjecture is that under these circumstances, foreign stocks do not offer diversification benefits because when the US market goes south, so do the international markets and correlations increase.

Research

Our research starts with a null hypothesis that is easily stated: After a steep decline in the US market over a short period of time, the correlation between the US and EAFE is not higher than normal. The alternative hypothesis holds that when the US falls correlations increase significantly. If the alternative is true, we believe the diversification benefit argument of owning foreign stocks is oversold.

The hard part comes with putting strict empirical definitions on steep decline, short period of time, the time frame of the correlation and the underlying time period. Here is our common sense approach. We started with the daily closing levels of the price indexes of MSCI's European, Australasia and the Far East Index (EAFE) and MSCI's US Index from 12-31-79 through 8-31-04 measured in US Dollars. When we discuss market returns at the end of the paper, we use monthly data from 12-31-69 through 8-31-04 on a net dividend basis measured in USD. On the US price index we made one change to MSCI's methodology regarding emergency market closures. When a market is closed for any reason, MSCI uses the last available closing price to fill in the daily prices until the market reopens. Generally this makes sense and is the only way to publish an index on a daily basis. But in the case of 9-11 where data is needed for September 11, 12, 13 & 14th we suggest that the closing level on the first day the US reopened (9-17-01) is a better approximation of the market's level than the close on 9-10-01 and so we made that change. We would also recommend Hong Kong's Index be treated in the same way

when it closed for three days after the October 1987 crash, however given our data-set this change is more difficult and probably of little effect.

Next we need to define a “sharp fall” in a “short period of time.” For a “sharp fall” we used a fall of two standard deviations or more. And for a “short period of time” we used two weeks or 10 business days which seemed reasonable given the problem we are exploring. To get the standard deviations we looked at the preceding year and calculated 26 non-overlapping 10-day percent changes and used the standard deviation of this rolling data set.

We then tested the data’s 6,173 10-day periods and found 149 10-day percentage declines of 2 standard deviations or more as shown in the next table. But many of these declines were connected and/or continuous with each other and we felt it was fairer to identify unique events. When the connected and/or continuous market moves were truncated, we were left with 44 events. Also, as an interesting aside, the 9-11-01 period was included in the analysis not due to market changes on or after 9-11, but as a result of the US market being down 8% over the 10-day period ending the previous Friday, September 7.

Table of 10-day Percent Changes in US Index
January 1981 to August 2004

	<u>All Periods</u>	<u>149 Total Events</u>	<u>44 Unique Events</u>
Mean	0.4%	-7.7%	-6.1%
Median	0.4%	-6.6%	-6.1%
High	15.0%	-3.3%	-3.4%
Low	-29.2%	-29.2%	-12.9%
SD	3.0%	4.3%	2.0%
Number	6,173	149	44

How to analyze the next part is much more difficult. Remember we are trying to understand the risks and dynamics of an investor who needs to raise funds in an emergency when the US market has fallen sharply. Should we measure the investor’s risk in terms of correlations, price change or something else? Also, what are the appropriate time periods to analyze? How much if any smoothing of the data is appropriate? We decided to use a two-week window (ten trading days) after the US fell to see how the markets behaved. We also looked at both correlation and price changes.

For the correlation data we used a rolling 10-day average of the 10-day correlations between the US and EAFE. Our thinking is that if an investor needs emergency cash and the market falls sharply, they will either panic out of the market within a few weeks or they won’t. And what we are trying to understand is the usefulness of foreign stocks for the investor that panics and sells relatively quickly after the market has fallen.

Our specific test observed the rolling 10-day correlation coefficients 10 days after a two standard deviation fall in the US market for all 44 events. We then compared the mean correlation of these 44 events with the mean of the entire sample. To repeat, our null hypothesis is that correlations for this group of events should not be different from the whole population. The alternative hypothesis is that correlations will be higher.

Since correlation coefficients are not normally distributed, we used Fisher's transformation to rescale the data so that standard statistical tests could be used. And as with the return data for the standard deviation tests above, we eliminated overlapping periods so as not to understate the standard error of the population.

The correlation between EAFE and US indexes did in fact increase as predicted. And the increase was large enough to allow us to reject the null hypothesis with a very high degree of confidence ($z = 4.14$). The table below summarizes the correlation data in the form of R-Squares.

R-Square Values Between EAFE and US Price Indexes
Rolling 10-day Average of 10-day R-Squares
 January 1981 to August 2004

	<u>All</u> <u>Periods</u>	<u>After 2-SD</u> <u>Fall in US</u>	<u>Diff. (pts)</u> <u>2SD - All</u>
Mean	29.6%	42.3%	12.7
Median	30.0%	45.1%	15.1
High	95.3%	90.7%	-4.6
Low	-77.3%	-21.9%	55.4
Number	6,173	44	

The bottom line is that correlations increase after the US falls. And maybe even more important, in terms of price changes, the US and EAFE fell about the same amount as shown in the next table.

10-Day Percent Changes of EAFE and US Price Indexes

January 1981 to August 2004

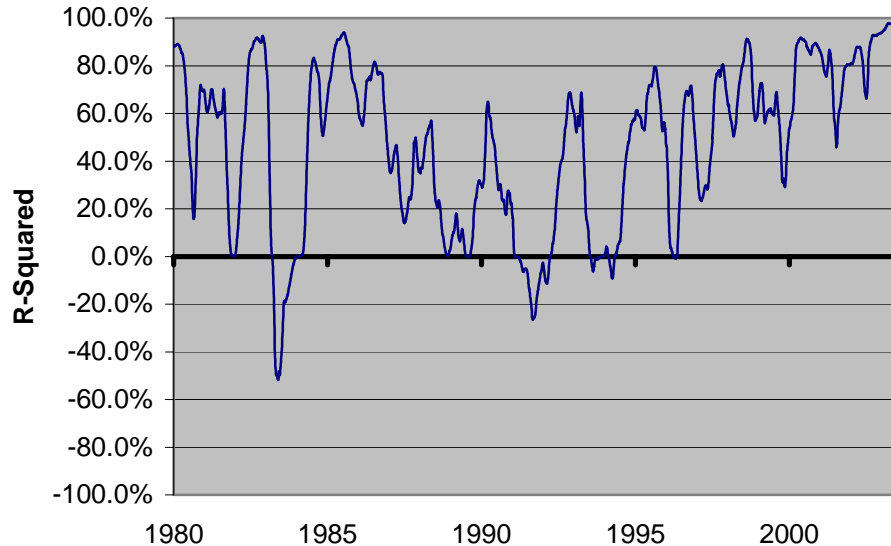
	<u>All Periods</u>		<u>After 2-SD Fall in US</u>		
	<u>EAFE</u>	<u>US</u>	<u>EAFE</u>	<u>US</u>	<u>Diff. (pts)</u> <u>US - EAFE</u>
Mean	0.3%	0.4%	-0.2%	0.2%	0.4
Median	0.4%	0.4%	0.6%	0.2%	-0.4
High	14.9%	15.0%	9.2%	11.6%	2.4
Low	-19.2%	-29.2%	-18.5%	-21.3%	-2.8
SD	3.1%	3.0%	4.4%	5.0%	0.6
Number	6,173	6,173	44	44	

As you can see, after falls of two standard deviations or more in the US the performance of EAFE and the US are fairly even with the US slightly, but not significantly ahead. This result is not completely unexpected since the US market's fall was the independent event and as it is the last market to close each day, the EAFE markets needed time to catch up with the US fall.

The bottom line is that it is very difficult to see any risk reduction benefit from holding foreign stocks. When investors need the diversification benefits, they simply are not there.

Are there any reasons an investor should add EAFE to their portfolios from a correlation perspective? To be fair, based on this data, EAFE and the US are not highly correlated all the time. But their correlation is unstable and appears to be increasing as shown in the following chart.

Rolling One-Year R-Squared - EAFE & US Daily Data



Just eyeballing the data an investor holding an EAFE allocation could theoretically benefit through periodic rebalancing if they got lucky on timing. But the actual returns of EAFE and the US have varied so much it is important not to overstate the potential benefits from rebalancing.

Owning Foreign Stocks

Based on returns, should US investors own EAFE (or any other developed market index)? This topic is somewhat tangential to our subject, but our feeling is no. Let's briefly look at some of the reasons US investors have traditionally sought exposure to the foreign developed markets.

1. Access to the growth in the global market.
2. Foreign currency exposure.
3. Less efficient markets.
4. Diversification.
5. It was new and cool – market's opened up and opportunities arose.
6. Better performance.

Reviewing these in order, we agree that accessing the global market is important. But owning US companies give an investor plenty of international exposure. If you put together all the companies in the S&P 1500 index, about 35% of their revenues comes

from outside the US. How much exposure do you want? For reference, the US makes up around 55% of the developed world's stock market capitalization. Point number 2 gets a similar response.

The third point probably does not hold water any longer in developed markets. In emerging markets this might be true, but we view emerging market investing as too risky for most individual investors.

Number 4, diversification, is no longer a justification for investing in the international developed markets for US long-term investors.

Many of these points overlap, especially number 5 & 6. One of the reasons the EAFE index was started by Capital International, the fund company, in the late 1960s was due to the growing interest in global markets and the need for benchmarks. But markets such as Japan were still somewhat closed and there was very little foreign investment. As various countries opened up and allowed their currencies to appreciate, EAFE did very well. This in turn made international investing very cool and attracted more investors.

In the next table we have outlined the performance of EAFE and the US during various time periods. Since the end of 1969 EAFE's performance has been slightly better. But when you look at shorter time frames you see more volatility as EAFE outperformed dramatically during the first 20 years, cumulating with the Japanese bubble top in 1989. Since that time the US has outperformed with its own bubble top ending in 2000.

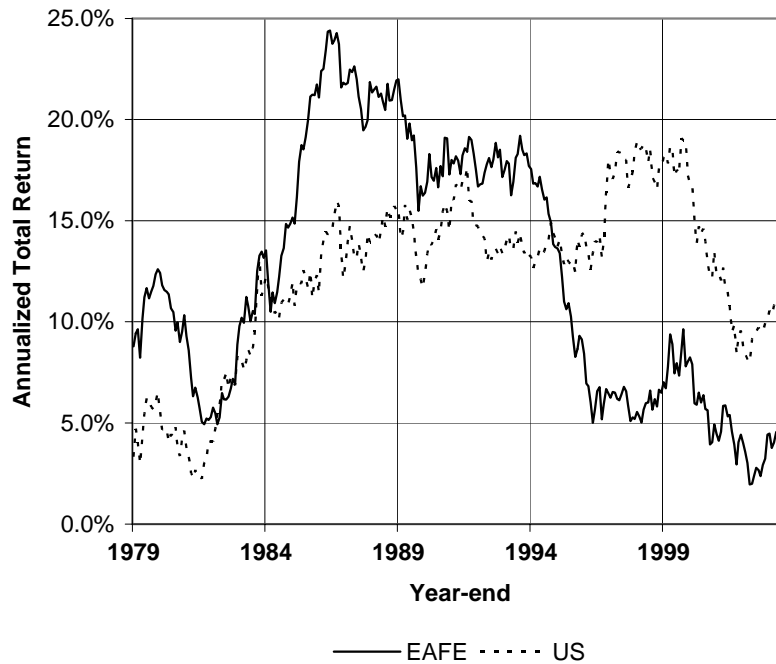
Annualized Total Return of EAFE & US

December 31, 1969 to August 31, 2004

	<u>EAFE</u>	<u>US</u>	Diff (pts) <u>US - EAFE</u>
1970s (ending 12-31-79)	8.8%	3.3%	-5.5
1980s	22.0%	15.6%	-6.4
1990s	7.0%	18.1%	11.1
2000s (ending 8-31-04)	-0.4%	-0.5%	-0.1
 Total	 9.9%	 9.5%	 -0.4

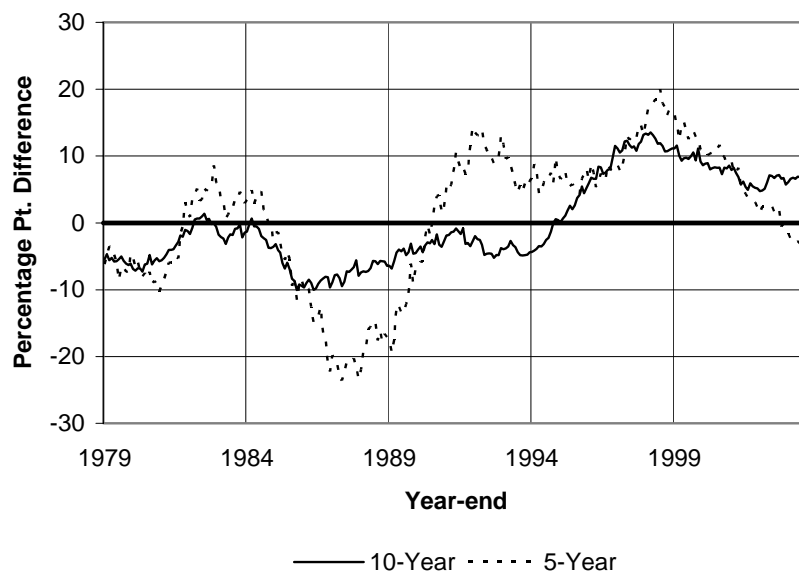
The next chart contains similar information showing the rolling 10-year annualized performance of both EAFE and the US.

EAFE & US Rolling 10-year Annualized Returns



This next chart shows the differences between EAFE and US performance as rolling 5 and 10-year annualized returns.

Difference of US - EAFE Annualized Returns Rolling 5 and 10 years



Many readers will recognize that Japan's performance had a significant effect on EAFE during this period. When Japan peaked on the last day of the 1980s its weight in the EAFE Index was around 65%. Today it is in the low 20s.

Conclusion

To wrap up, this discussion indicates that for long term investors who follow best practices, holding foreign shares does not necessarily reduce volatility risk. This is due to the fact that these investors have already eliminated most of their volatility risk and when their residual risk rears its ugly head, foreign stocks cannot be counted on to bail them out.

We also conclude that over long time periods the performance of the US and EAFE vary greatly. Therefore, we believe the question of whether or not to own foreign stocks should be an "active" investment decision. And since most investors play the active game poorly, we recommend against them holding a dedicated foreign stock investment.