Similarities of Tech and Emerging Markets

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In a recent article, I discussed some of similarities and differences in the portfolio effects of allocations to technology-focused and foreign-focused funds. In particular, I noted that many foreign funds have the very high Betas and high volatility (as measured by standard deviation in return) that are common in tech funds. The principal ***statistical*** difference between tech funds and foreign funds is that foreign funds tend to have lower values of a statistic called R^2 (R-squared), which is an important measure of diversification value. This article is available here:

http://etfinvestor.com/article/9953

I got a number of interesting responses to my article, including an entire article by Roger Nusbaum aimed at refuting my arguments (***The Foreign Market Rally is No Bubble***):

http://etfinvestor.com/article/10041

Many people believe that the enormous run-up in money flowing into foreign and especially emerging markets makes perfect sense. Perhaps this is true. J.D. Steinhilber has just posted an article reporting that three times as much money flowed into foreign-focused funds than into domestic funds in the first quarter of 2006:

http://etfinvestor.com/article/10051

The consensus "market opinion" supports the idea that foreign funds are more attractive than their domestic counterparts by a considerable margin. Does this really make sense? Are these investors coolly analyzing the numbers and determining that foreign markets make sense for an inordinate flow of their capital? Or is it possible that we are seeing herding behavior that is common when investors simply chase the asset class that has recently out-performed? As Warren Buffett has famously suggested, markets are a voting machine in the short term and a weighing machine in the long term. What we are seeing in foreign investing looks more like voting than weighing.

For those of you who have not read my articles before, I tend to focus on market behavior to analyze stocks and funds. The market behavior of an asset class reflects a great deal about who is investing in it. In other words, we can infer something about the behavior of investors by looking at price histories. If an asset class is highly volatile, for example, this means that there are divergent and rapidly changing opinions as to how other investors will behave and as to the future economic prospects of that asset class.

Volatility tells us a great deal about investor perceptions of risk and potential for return. What does it tell us that emerging markets tend to exhibit very high Betas? ADRE, an emerging market ETF, has a trailing three year Beta of more than 160%. This means that when the S&P500 moves by 1% (up or down), ADRE tends to move 1.6% in the same direction. If ADRE focuses on expansion of emerging markets, why would moves in the S&P500 be amplified through the fund's value? I am sure that there are fundamental reasons why this might be the case, but the bottom line is that high Beta means investors tend to move the S&P500 and ADRE in the same directions by their buying and selling choices. In asset classes with Betas greater than 100%, investor behavior is amplifying the magnitude of their buying and selling tendencies relative to what they do in the broader U.S. market. Investors tend to believe in the greater potential of the emerging markets but also fear the downside more. Market prices track the evolving opinions of investors, with fundamentals being partial drivers to opinion. As behavioral finance has shown again and again, however, the desire to follow the winning asset class is quite capable of overwhelming investors. I am not discussing fundamental valuation here. I am talking about investors' behavioral tendencies.

I am not an expert in fundamental valuation. To the contrary, I look at market behavior in the statistics and let that provide guidance. Our entire capital market system is predicated on the fact that the market balances risk and return effectively in the long term although this may not be the in the short term. **By analyzing short-term market behavior in conjunction with knowledge of how the market tends to balance risk and return in the long-term, you can make intelligent inferences about the future**. We know that foreign markets and tech markets are driven by different fundamentals. But what if speculators move from one hot market to another and their behavior creates similarities in the market dynamics? This is, to some extent, what I believe is happening in emerging markets. The same types of people who drove speculation in Tech in the late 1990's are pumping emerging markets and other foreign markets in the mid 2000's. This is just a thesis, but there is a similar statistical thumbprint in the dynamics of these markets.

Let's now jump back to the end of 1999 and looking at market dynamics for a very popular tech-focused fund of the dot-com age, Janus Mercury Fund (JAMRX). To examine how the world looked back then, we are using Quantext Portfolio Planner (QPP), and we are specifying the historical data to be drawn from the three year period from January 1, 1997 to 12/31/1999 (this is a user input to the software). At the end of 1999, JAMRX was trading at $44 and it had generated amazing gains to get to this point. In fact, over this three year period, JAMRX yielded an average annual return of 45% (see ***Historical Data*** below).

			Portfolio Stats	
Fund Name	Percentage of Funds	Average Annual Return	Average Annual Return	Standard Deviation(Annual)
JAMRX	100.0%	14.44%	14.37%	23.52%
-	0.0%	-		
-	0.0%	-		
-	0.0%	-	**Historical Data**	
-	0.0%	-	Start: 1/1/1997	End: 12/31/1999
-	0.0%	-		
-	0.0%	-	Average Annual Return	Standard Deviation (Annual)
-	0.0%	-		
-	0.0%	-	45.12%	26.14%
-	0.0%	-		

Historical and projected future performance (from QPP) at the end of 1999 for JAMRX

JAMRX continued to go up for a while after the start of 2000, and then started its enormous decline (see the chart at http://finance.yahoo.com/q/bc?s=JAMRX&t=my). JAMRX dropped to $21 by the start of 2002 and was trading as low as $14 a share in the 2002-2003 period. At the end of 1999, though, JAMRX was still going to the moon and plenty of investors wanted to go along.

What did a statistical analysis of the three years through 1999 suggest (see chart above)? First, while the average return was 45% per year, the *Standard Deviation* in annual return

was 26% per year—pretty major volatility. At the end of 1999, JAMRX had a Beta of 123% and a value of R^2 equal to 63%.

We initialized our portfolio management model, Quantext Portfolio Planner (QPP) with an assumption of a long-term average rate of return for the S&P500 of 10.3% per year --- a common assumption back then --- and with a long-term standard deviation in annual return of 15.07%, the historical average. QPP projected that JAMRX would generate an average annual return of 14.37% per year with a standard deviation of 23.5% per year (see above). The QPP Monte Carlo engine adjusts projected future returns to reflect the assumption that asset classes will generate a risk-return balance that is consistent with long-term behavior of the capital markets. While JAMRX had dramatically out-performed on a risk-adjusted basis over the three year period, the Monte Carlo model projects that the long-term return will revert to a more balanced value. The Monte Carlo consistently discounts estimated future returns on asset classes that have been recent out-performers and this is a good example. Still, the Monte Carlo is projecting that JAMRX will, on average, beat the S&P500 by 4% per year (14.37% vs. 10.3% for the S&P500). Now, the Monte Carlo model estimates future outcomes at a range of probabilities and if we use the Monte Carlo to predict outcomes a two-year horizon (from the end of 1999) for a portfolio of 1,000 shares, the Monte Carlo model yields the following:

Percentile	Portfolio Value	Gain / Loss	Return
1%	$24,094	-$19,906	-45%
5%	$32,090	-$11,910	-27%
10%	$37,321	-$6,679	-15%
15%	$41,055	-$2,945	-7%
20%	$44,183	$183	0%
25%	$46,301	$2,301	5%
30%	$48,780	$4,780	11%
35%	$51,209	$7,209	16%
40%	$52,970	$8,970	20%
45%	$54,889	$10,889	25%
50%	**$56,757**	**$12,757**	**29%**
55%	$58,624	$14,624	33%
60%	$60,268	$16,268	37%
65%	$62,088	$18,088	41%
70%	$64,249	$20,249	46%
75%	$66,198	$22,198	50%
80%	$68,465	$24,465	56%
85%	$71,171	$27,171	62%
90%	$74,447	$30,447	69%
95%	$80,926	$36,926	84%
99%	$90,325	$46,325	105%
Average	**$56,471**	**$12,471**	**28%**

JAMRX Two year Monte Carlo projection from the end of 1999 (using QPP)

The Monte Carlo projection goes out two years, starting at 12/31/1999. With 1000 shares trading at $44 per share at the start of the period, the model projects that the median expected portfolio value is $56,800 after two years, for a total gain of 29% (see above). But, we know that the market is a risky place, so what did the projected downside look like? The Monte Carlo results projected a 1% chance that the share price of JAMRX would drop to $24 per share or below (the 1% percentile level above) two years into the future. You can think about the 1% percentile level as the worst 1-in-100 case, the perfect storm. And it happened. Two years after the end of the historical data used at the start of this analysis, JAMRX had dropped to $21 per share—actually worse than our 1% estimated worst case. It is very interesting that even when the market had only three years of market history during which JAMRX had seen phenomenal gains, the Monte Carlo model was flashing a warning that the risk/return profile of this fund had the potential for a harsh drop.

As an interesting aside, I have calculated the average annual return and standard deviation for JAMRX over the entire period that it has existed, from May16, 1994 until May 4, 2006 (the date at which this is written). The average annual return for JAMRX over its life is 13.45%, with a standard deviation of 21.41%. This is very close to what the Monte Carlo model predicted for the long-term average and standard deviation in annual return using only three years of data up to the end of 1999. In an earlier chart I showed the projected values (Portfolio Stats) using this three year period of data: average annual return equal to 14.37%, with a standard deviation of 23.5%. Note: users of QPP can easily verify this result.

Now, let's flash forward to the present day and emerging market funds. We have taken ADRE and specified three years of trailing data up until the end of 2005 and specified a future average return for the S&P500 of 8.3% per year and a standard deviation in return of 15.07% per year. The average return for the S&P500 is assumed to be lower than the value used for JAMRX because this is the current economic best-guess. ADRE yields a value of Beta equal to 159% and SD equal to 24% for the three years to the end of 2005. The R^2 for ADRE over this period is 56%, which means that there is a correlation between ADRE and the S&P500 of more than 70%. These basic statistics are quite similar to JAMRX in the three years through 1999.

			Portfolio Stats	
Fund Name	Percentage of Funds	Average Annual Return	Average Annual Return	Standard Deviation(Annual)
ADRE	100.0%	12.72%	12.69%	24.08%
-	0.0%	-		
-	0.0%	-		
-	0.0%	-	**Historical Data**	
-	0.0%	-	Start: 1/1/2003	End: 12/31/2005
-	0.0%	-		
-	0.0%	-	Average Annual Return	Standard Deviation (Annual)
-	0.0%	-		
-	0.0%	-	35.37%	19.15%
-	0.0%	-		

ADRE historical performance and projection at the end of 2005

The projected future performance (***Portfolio Stats*** above) for ADRE is an annual average return of 12.7% per year, with a standard deviation in annual return of 24.08% per year. This projection is generated by Quantext Portfolio Planner.

The historical performance of ADRE over the three years to the end of 2005 is impressive, with an annual average return of 35.37% per year and a standard deviation in annual return of 19.15%. The standard deviation of return is a measure of volatility or risk, and the observed value for the last three years is more than twice that of the S&P500. The annual average return of 35% is 1.8 times the standard deviation. ***The ratio of average return to standard deviation is a basic measure of risk adjusted return. The S&P500 has yielded a value of 0.5 to 0.7 over long periods of time. A value of 1.8 as we see for ADRE is simply not sustainable by any measure.*** Actually, as total risk and return goes up, this ratio tends to decline. There is no way that you can generate this much average return on this level of risk in the long term. So, either risk must go up or average return must come down and the Monte Carlo model is predicting some of both.

The ratio of average return to standard deviation in return for JAMRX at the end of 1999 was 1.72 (45.1% / 26.1%). This is remarkably close to the value of 1.8 that we have seen over the past three years for ADRE. It is on the basis of this kind of risk-adjusted return that I say that emerging markets look like a bubble. No market anywhere can sustain average returns this high compared to risk unless the entire capital market has massively malfunctioned on an asset class. In the short term, it is possible to see this kind of effect but it is never seen on longer time horizons. Now, maybe there are special and unique effects at work in emerging markets due to globalization, etc. I hear these arguments and some are compelling—as were some arguments for why traditional valuation measures were irrelevant in the 'new economy.' I put more weight on the long-term statistics and capital market dynamics of risk and return, however, and on this basis we would expect to see some sort of major correction in emerging markets to bring their long-term risk / return balance into some sort of reasonable accord with the long-term experience in financial markets and with other asset classes.

Now, if you are willing to go with my assumption that capital markets will ultimately balance risk and return in the ways that they have in the past and in a consistent way across asset classes, what does the QPP Monte Carlo simulation project for ADRE? At the end of 2005, ADRE was trading at $115 and I used QPP to project two years into the future for 1000 shares (below).

Percentile	Portfolio Value	Gain / Loss	Return
1%	$57,158	-$57,842	-50%
5%	$78,554	-$36,446	-32%
10%	$92,553	-$22,447	-20%
15%	$102,545	-$12,455	-11%
20%	$110,914	-$4,086	-4%
25%	$116,583	$1,583	1%
30%	$123,214	$8,214	7%
35%	$129,716	$14,716	13%
40%	$134,427	$19,427	17%
45%	$139,564	$24,564	21%
50%	**$144,562**	**$29,562**	**26%**
55%	$149,558	$34,558	30%
60%	$153,955	$38,955	34%
65%	$158,826	$43,826	38%
70%	$164,608	$49,608	43%
75%	$169,823	$54,823	48%
80%	$175,890	$60,890	53%
85%	$183,132	$68,132	59%
90%	$191,897	$76,897	67%
95%	$209,234	$94,234	82%
99%	$234,385	$119,385	104%
Average	**$143,794**	**$28,794**	**25%**

Two year Monte Carlo projection for ADRE from the end of 2005

In two years, the Monte Carlo simulation suggests that ADRE could decline by 50% or more—but this would occur with a probability of only 1%. The similarity between the projected values generated automatically for ADRE and those projected for JAMRX are striking. Does this mean that I am saying that ADRE will do this? Nope. The median projected outcome for ADRE will see a gain of about 26% in the next two years, far below recent experience but not too shabby. The Monte Carlo model is not predicting a massive crash—just the potential for it.

If the median projected return on ADRE from the Monte Carlo model is around 12.7% per year, why do I talk about bubble-like characteristics of emerging markets? I believe that the Monte Carlo projections for the long-term risk-return balance for emerging markets and funds like ADRE are probably a good estimate—a ratio of average return to standard deviation of around 50-60%. For this to be the case, however, we will need to see substantially lower sustained returns for ADRE and related funds to bring long-term risk/return statistics back into line. This is exactly what we saw for JAMRX, for example. I believe that the current rally is a deviation and that the emerging markets will eventually re-equilibrate into the risk/return balance appropriate for a high return / high risk asset class. There will be people who agree and people who don't and it is this dynamic tension between buyers and sellers that establishes a market's price point. Over extended periods of time, our capital market system has proven remarkably good at consistently balancing risk and return across asset classes and I, for one, am betting that this will continue to be the case. Perhaps the out-performance of emerging and other foreign markets will continue into the future for some period in time, but they will ultimately fall back into line in terms of the continuum of risk and return established by our (reasonably) efficient capital markets.

The great value of Monte Carlo portfolio simulations is the ability to project future performance in a probabilistic framework so that investors can see the relative impacts of risk and average return. QPP, for example, consistently discounts the future performance of asset classes that have been out-performing in recent history. This discounting reflects the fact that capital markets have established certain baseline relationships between risk and return over long periods of time. QPP's Monte Carlo projections show you what the future will look like on a probabilistic basis if these relationships are maintained into the future. When we test QPP in an historical analysis and we obtain consistent results as we have seen here for JAMRX, a strong case can be made for the value of this type of simulation.

More information on Quantext Portfolio Planner and instructions for obtaining a trial copy can be obtained at Quantext.com.