TOBAM
Core investments

Diversification Dashboard – 30.09.2013

TOBAM's Diversification Ratio (DR)[1] measures to what extent a portfolio is diversified. The DR^2 (square of the diversification ratio) measures the number of effective degrees of freedom to which a portfolio is exposed. As the table shows, the "broad market" indices leave diversification on the table. In addition to a snapshot of each market's DR^2, the table shows the DR^2 of a well-diversified portfolio, and the fraction of available diversification used by the index.

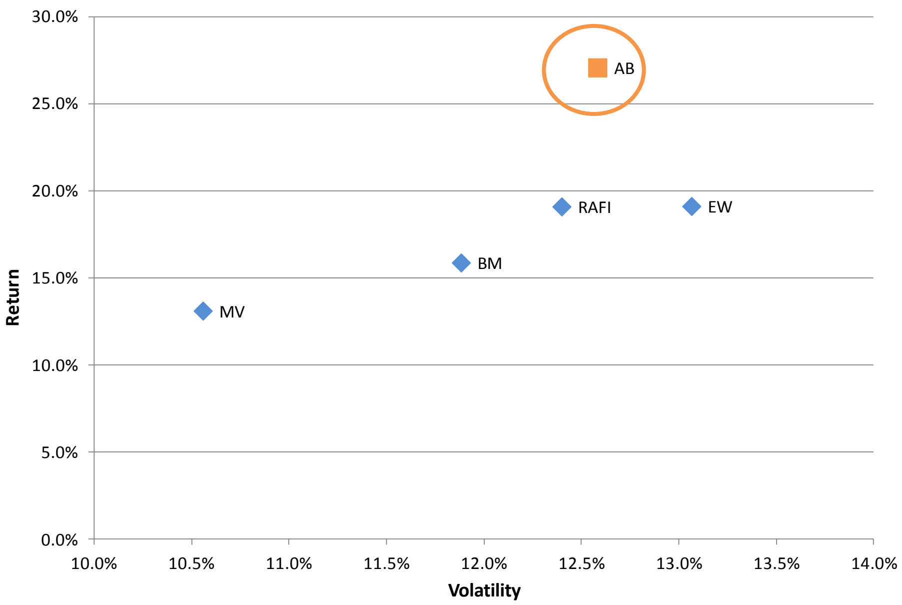
	DR^2 - Index diversification	***DR^2 - Maximum diversification***	***% diversification used by index***
MSCI EMU	2.60	7.93	*32.8%*
MSCI US	3.36	9.73	*34.5%*
MSCI UK	2.73	4.93	*55.4%*
MSCI Japan	2.12	5.39	*39.4%*
MSCI World	4.80	16.88	*28.4%*
MSCI Australia	2.73	5.02	*54.4%*
MSCI Pacific ex-Japan	2.77	6.95	*39.9%*
MSCI Canada	4.42	8.56	*51.6%*
MSCI Emerging	5.11	9.91	*51.6%*
MSCI All Countries	5.24	18.23	*28.7%*

The link between correlations, volatility & performance in US equities

Year to date through September 30, 2013, the US equity market has seen robust performance across all industry sectors, with most sectors registering double digit returns in an environment characterized by lower-than-average volatility. Indeed, for the one year ended September 30, 2013, S&P 500 index volatility of daily returns averaged 11.83%, whereas for the 14-year period between December 31, 1999 and September 30, 2013, S&P 500 index volatility of daily returns averaged 21.35% on an annualized basis. In this context, the Maximum Diversification strategy has selected diversifying stocks that have also enhanced performance compared to the cap-weighted benchmark and also to leading "smart Beta" strategies:

1. "Smart Beta" strategies – Year to date Returns/Volatility

US Equity universe as of September 30, 2013



All strategies have very low volatility compared to their historical[2] averages. The Anti-Benchmark increased its traditionally lower risk profile in 2013, and outperformed all other "Smart Beta" strategies, both on an absolute and risk-adjusted basis (Sharpe Ratio).

Strategies include: Minimum Variance (MV, MSCI USA Minimum Volatility), Fundamental indexation (RAFI, FTSE RAFI US 1000 TR), Anti-Benchmark strategy (AB), Market cap-weighted index (BM, MSCI USA TR), Equal-weighted (EW, MSCI USA Equal Weighted). The Anti-Benchmark strategy includes transaction costs, whereas the other strategies do not reflect transaction costs. Source: TOBAM.

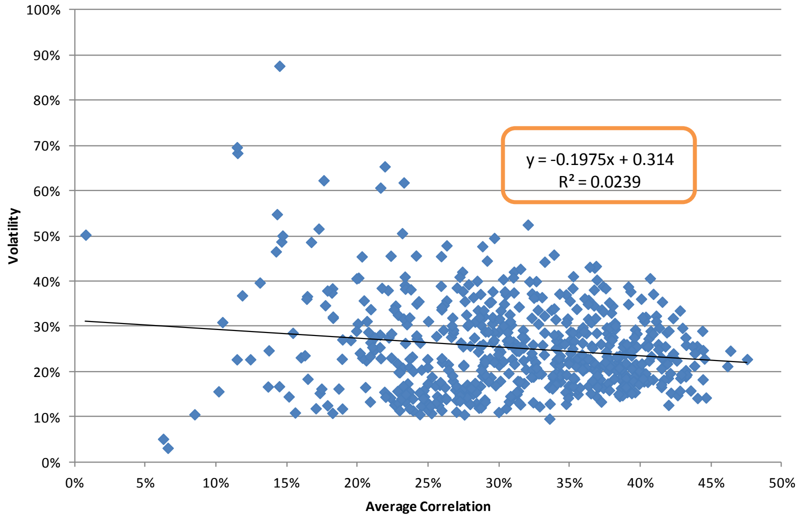
[1] TOBAM's Diversification Ratio measures a portfolio's or index's diversification. It is supported by original research and is based on a mathematical definition of diversification. TOBAM's "Anti-Benchmark" Most Diversified Portfolio® maximizes this Diversification Ratio. Maximizing diversification within a universe of securities provides a result closer to the true market risk premium from that universe. "Maximum Diversification®" and "MaxDiv®" are registered trademarks of TOBAM.

[2] From the period between September 30, 2009 – September 30, 2013, the strategies referenced in the graph had the following average volatilities for the five year period: market cap-weighted (MSCI USA TR) 24.96%, equal-weighted (MSCI USA Equal Weighted): 27.89%, minimum variance (MSCI USA Minimum Volatility): 20.04%, RAFI (FTSE RAFI US 1000 TR): 27.27%, Anti-Benchmark US (AB US): 20.68%.

2. Structural shift in the relationship between correlation and volatility

The Anti-Benchmark aims to achieve maximum diversification by investing in as many stocks (minimizing the effective concentration of the portfolio) that are as different as possible, as measured by their correlations. Stocks with low correlations to each other are of special interest for the AB strategy. In 2012, the least correlated issues were not necessarily the most volatile, and the inverse relationship between correlation and volatility was not statistically significant:

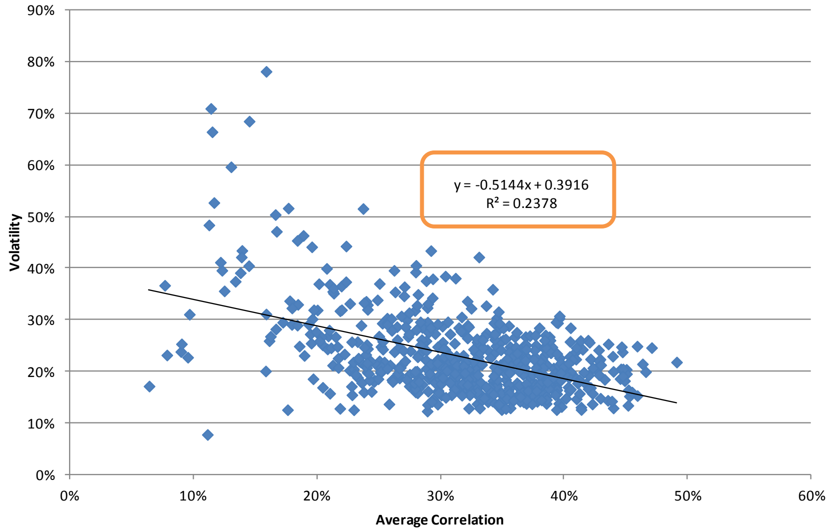
Correlation/Volatility Scatter plot: MSCI USA – 2012 *(full year)*



Source: TOBAM

The above relationship strengthened tenfold in 2013, as seen by the statistically significant R^2 of 24%: stocks that were good diversifier candidates were on average more volatile. A stock with an average correlation of 10% to the rest of the group had a volatility higher by 10% on average, compared to a 50%-correlation stock.

Correlation/Volatility Scatter plot: MSCI USA – 2013 *(year to date through September 30)*



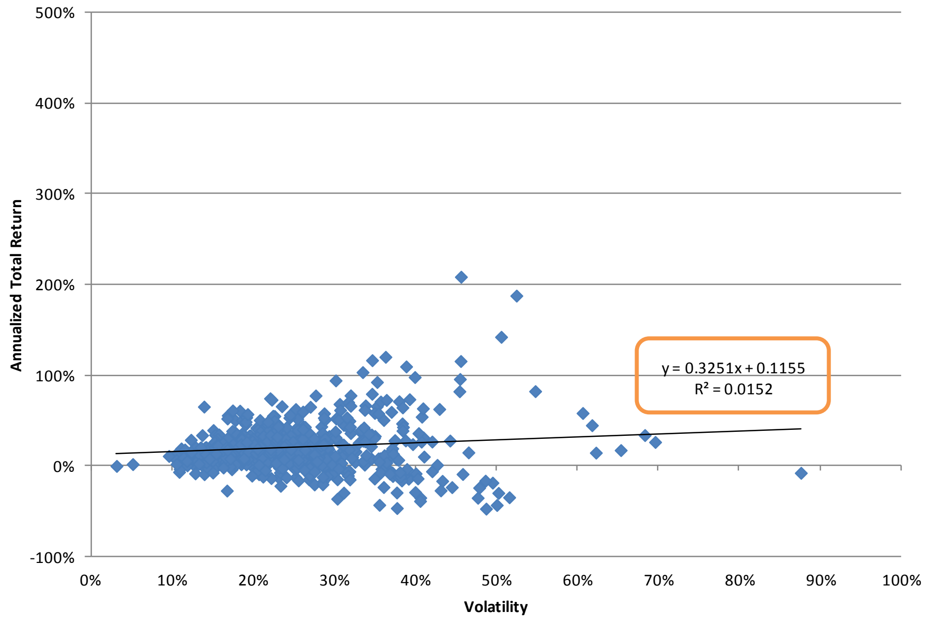
Source: TOBAM

The bottom line: in 2013, a well-diversified portfolio was more likely to hold stocks characterized by a relatively higher volatility when compared to 2012.

3. Risk was rewarded in 2013

In 2012, the more volatile issues were not necessarily the best performing on average, and the relationship between returns and volatility is not statistically significant:

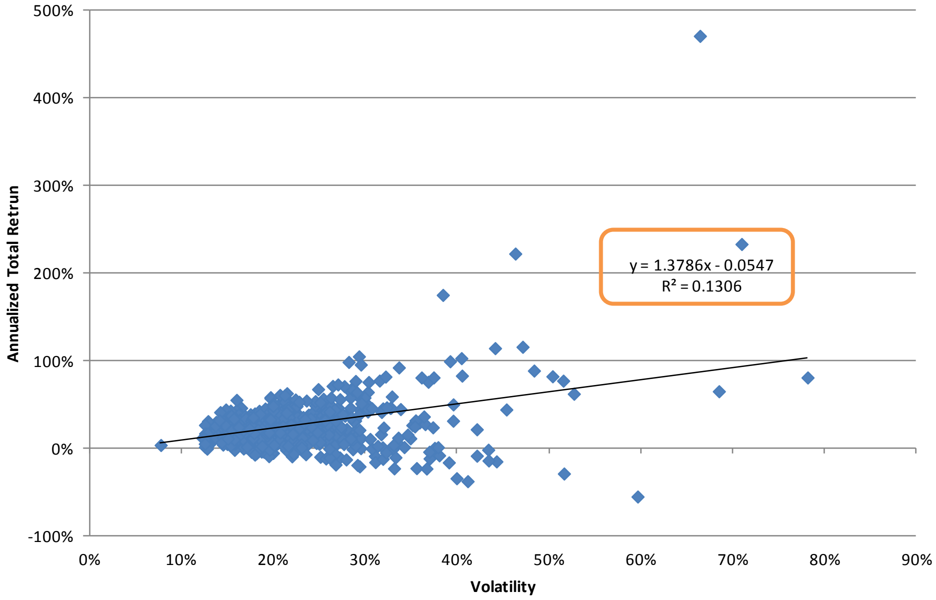
Return/Volatility Scatter plot: MSCI USA – 2012 *(full year)*



Source: TOBAM

On the contrary, in 2013, a significant positive and statistically significant relationship between performance and volatility was apparent, even using a basic analysis:

Return/Volatility Scatter plot: MSCI USA – 2013 *(year to date through 30/09)*



Source: TOBAM

4. Anti-Benchmark outperformance explanation

Structural changes in the US equity market from 2012 to 2013 can help to explain the Anti-Benchmark US portfolio's outperformance. Low correlation stocks, naturally diversifying candidates, were also characterized by higher volatility year to date through September 30, on average. In turn, higher volatility stocks have rewarded investors in proportion to the extra risk they offer, on average.

This structural change is a key reason why the Anti-Benchmark portfolio had volatility comparable to that of the benchmark in 2013, though it tends to be less volatile over time given its high level of diversification. In the relatively low-volatility environment that has characterized 2013 to date, the AB portfolio offered overall volatility similar to that of the benchmark while still holding stocks that were on average significantly more volatile when compared to the benchmark. This was made possible by the portfolio's high level of diversification. Furthermore, as its member stocks' individual risks were well-rewarded over the period, the Anti-Benchmark outperformed the broad market.

Performance Attribution
Anti-Benchmark US Equity strategy
Year to date through September 30, 2013

Sector	*Contrib. To Relative Perf.*	*AB Vol Contrib*	*Bench Vol Contrib*	*AB Wtd Avg Volatility*	*Bench Wtd Avg Volatility*
Consumer Discretionary	3.87%	2.89%	1.54%	18.22%	12.99%
Information Technology	3.75%	1.13%	1.99%	22.13%	13.20%
Consumer Staples	3.63%	2.00%	1.00%	16.50%	11.87%
Health Care	3.18%	2.00%	1.30%	20.77%	12.46%
Energy	0.72%	0.13%	1.31%	28.04%	14.55%
Telecommunication Services	0.61%	0.83%	0.26%	18.54%	14.35%
Industrials	0.26%	0.93%	1.25%	16.14%	13.55%
Utilities	-0.79%	0.85%	0.30%	15.83%	13.24%
Materials	-1.66%	0.49%	0.45%	41.42%	15.36%
Financials	-2.21%	1.02%	2.14%	27.28%	14.77%
Total Anti-Benchmark US	***11.39%***	***12.26%***	***11.54%***	***12.34%***	***11.60%***

Source: TOBAM

The above performance attribution by industry sectors for the Anti-Benchmark US equity strategy confirms the above explanation, showing that for most sectors, the Anti-Benchmark's stock selection resulted in more diversified and better-performing combination of stocks – while diversification allowed the overall portfolio to maintain an overall volatility in line with that of the benchmark.

For more information

TOBAM is an asset management company offering innovative investment capabilities whose aim is to maximize diversification. TOBAM's flagship Anti-Benchmark® strategies, supported by original research and a mathematical definition of diversification, provide clients with diversified core equity exposure, both globally and in domestic markets. FTSE also publishes the FTSE TOBAM Maximum Diversification Index Series based on the Anti-Benchmark equity portfolio construction methodology. The company manages over $4.9 billion via its Anti-Benchmark strategies for institutional clients worldwide. Its team includes 20 financial professionals.

Contacts:

Head of Business Development
Christophe Roehri
+33 1 53 23 41 6

Business Development
Laura Vu Thien
+33 1 53 23 41 65
Laura.VuThien@tobam.fr

Client Service
+33 1 53 23 41 56
ClientService@tobam.fr

TOBAM Marketing Partners

Global Distribution - Amundi
Jan Vormoor
+33 1 76 37 11 09
jan.vormoor@amundi.com

Nordics - Paxstone Capital LLP
Kasper Kemp Hansen
+45 36 95 97 00
kasper.hansen@paxstone.com

Canada - Investeam
Nancy Nightingale
+1 416 860 9490
nancy.nightingale@investeam.ca

Australia & NZ - Phoenix Capital Advisory Ltd.
Mark Jackson mark.jackson@phoenixcap.com.au
Matt Wormald matt.wormald@phoenixcap.com.au
+61287055474

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