TOBAM*
CORE INVESTMENTS

DIVERSIFICATION DASHBOARD

April 2015

Diversification Ratios®

TOBAM's Diversification Ratio® (DR) measures to what extent a portfolio is diversified. The DR² (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 DR2, the table shows the DR2 of a well-diversified portfolio, and the fraction of available diversification used by the index.

Universe	DR^2 Index diversification	DR^2 Maximum diversification®	% diversification used by index
MSCI All Countries World	5.91	24.91	23.7 %
MSCI World	5.09	19.82	25.7 %
MSCI Emerging Markets	7.39	15.53	47.6 %
MSCI Canada	4.66	10.40	44.8 %
MSCI Pacific Ex-Japan	3.19	9.76	32.6 %
MSCI US Equity	3.13	8.10	38.6 %
MSCI Japan	2.33	6.64	35.0 %
MSCI EMU	2.15	5.91	36.4 %
MSCI UK Equity	3.17	5.51	57.5 %
MSCI Australia	2.44	4.34	56.0 %

Source: TOBAM, figures as of March 31, 2015

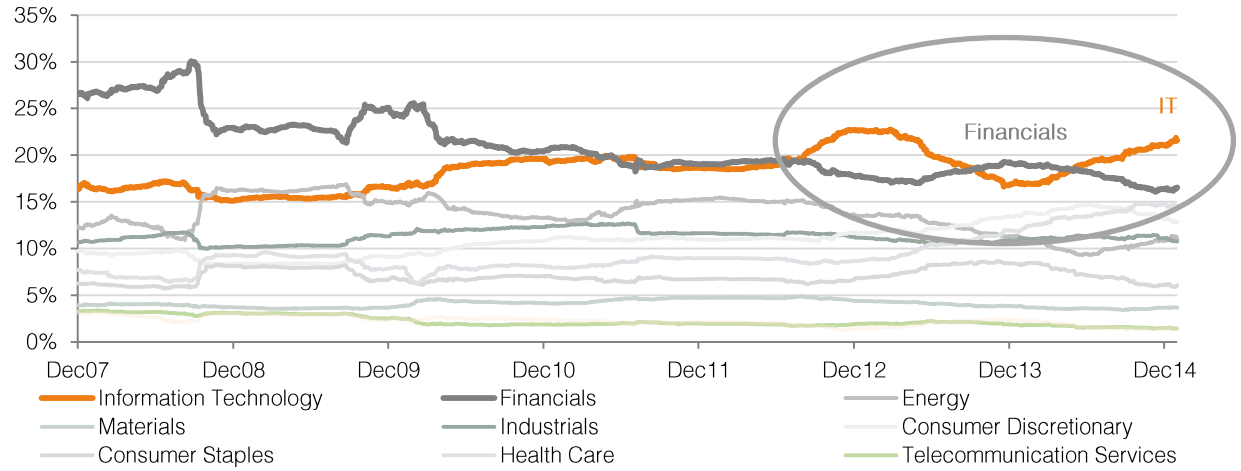
MSCI USA's Dynamic Bets: From Financials to IT?

Market capitalisation indices are a trap to investors seeking to capture the equity risk premium. The more expensive a stock (or a factor) becomes, the larger will be its market cap, and the greater its weight within the cap-weighted portfolio. Thus by construction, a cap-weighted portfolio is vulnerable to market bubbles and trapped in expensive stocks and therefore will destroy a part of the equity risk premium.

With the NASDAQ hitting 5 000 recently, reaching the same peak last seen 15 years ago during the IT bubble, some investors are concerned about this alarming level which could be considered as signs of new market concentrations.

In this note, we analyse how the MSCI USA index has evolved in the current environment. We will focus on the two largest sectors (in terms of weights) of the US equity market: IT and Financials.

Chart 1
MSCI USA's Volatility Contribution by Sector (Dec 2007 – Jan 2015)



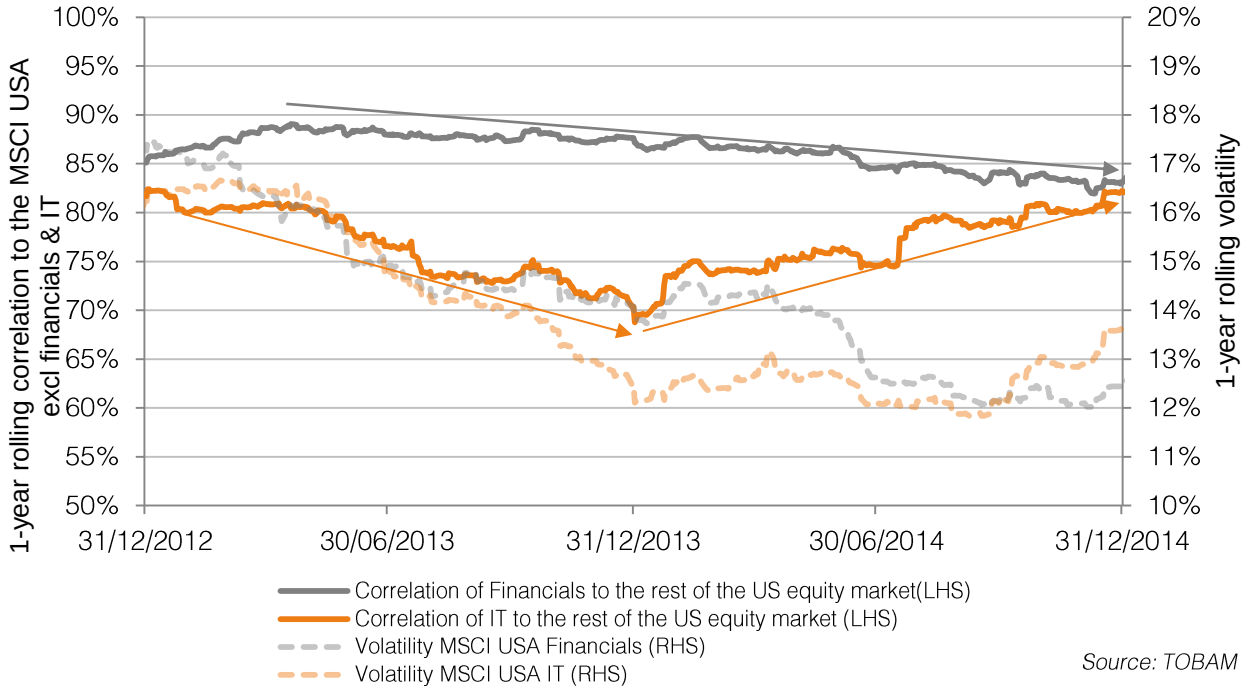
Source: TOBAM

As illustrated in Chart 1, since the peak of the financial crisis in September 2008, the contribution of the Financial sector to the MSCI USA's volatility has been decreasing, reaching its lowest levels in 2015; it was cut in half over the period.

On the other hand, IT stocks whose representation in the index grew in the aftermath of the Financial Crisis saw their contribution to the volatility of the index gradually increase, surpassing the contribution of Financials as the greatest source of volatility in the index in late 2012 and since mid-2014.

In order to better understand these changes, we look at Chart 2 which presents: the 1-year rolling correlation of both sectors to the rest of the US Equity market *(MSCI USA excluding IT and Financials - LHS)* as well as the 1-year rolling volatility of each sector *(LHS – Dashed lines)*.

Chart 2: IT & Financials: Correlation to the MSCI USA excluding IT & Financials and Volatilities of IT and Financials (Focus from December 2012 to December 2014)



Source: TOBAM

I. **Correlations**

Looking at correlations of both sectors to the *MSCI USA excluding IT and Financials (LHS)*, we observe that:

a. The rest of the US equity market remained more correlated to Financials than to IT over the whole period
b. Financials' correlation to the rest of the market has been gradually decreasing since the beginning of 2013
c. The correlation of the rest of the US equity market to IT reached its lowest point in December 2013, and since then the market has been experiencing an increased correlation to IT stocks.
d. Currently, absolute correlations of IT and Financials to the rest of the market are very close.

II. **Volatilities** (RHS – dashed lines)

a. Both sectors experienced a decrease in volatility since December 2012.
b. The gap between the IT and Financials volatilities reached its highest level back in December 2013, with IT being 14% less volatile than Financials.
c. The IT Sector became more volatile than the Financials sector since Q4 2014.

➔ Looking at Chart 2, we can conclude that during this 2 year period, the IT sector lost a significant part of its diversifying benefits compared to Financials, while the **MSCI USA increased its allocations to IT, leading to significant concentrations of risks in the cap-weighted benchmark.**

Impact of these changes on the Anti-Benchmark US and MSCI USA portfolios

Chart 3: Sector Allocation
MSCI USA vs. Anti-Benchmark US
As of Dec 31, 2013

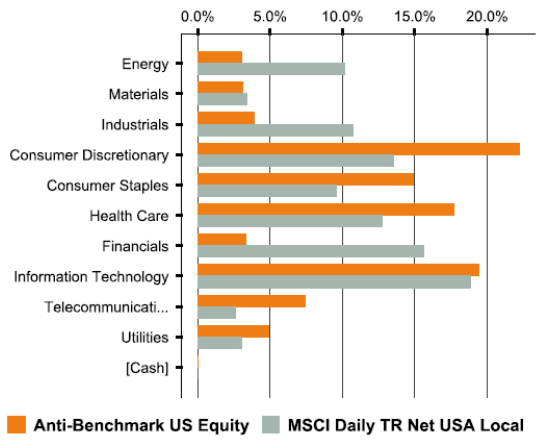
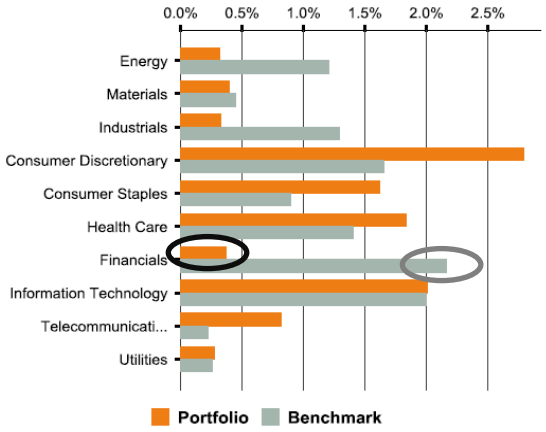


Chart 4: Sources of Volatility (Ex ante)
MSCI USA vs. Anti-Benchmark US
As of Dec 31, 2013



As of Dec 31, 2013 when Financials were less attractive, compared to IT from a diversification perspective:

- The MSCI USA had its highest risk exposure to Financials (cf.Chart 4). This significant concentration in a highly correlated and highly volatile sector is a good illustration of the unmanaged risk allocation put in place by the market cap-weighted benchmark.
- In the meantime, The AB portfolio had a low allocation to Financials (consistent with the low contribution of Financials to the ex-ante volatility of the AB portfolio – cf. Chart 4) and had a considerably higher allocation to the more diversifying IT sector.

Chart 5: Sector Allocation
MSCI USA vs. Anti-Benchmark US
As of Dec 31, 2014

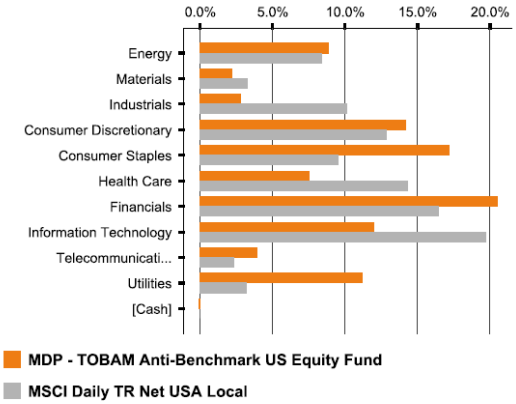
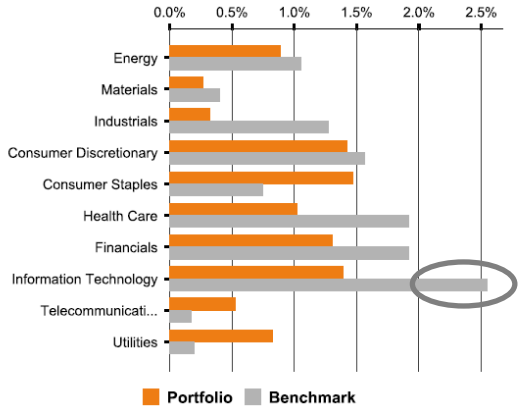
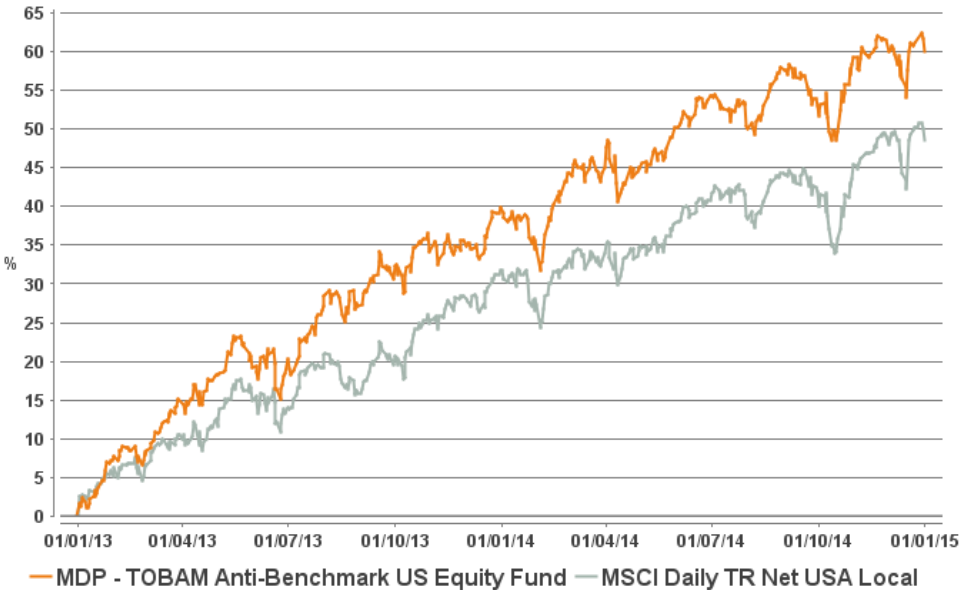


Chart 6: Sources of Volatity (Ex ante)
MSCI USA vs. Anti-Benchmark US
As of Dec 31, 2014



- While the weights of Financials and IT in the MSCI USA did not considerably change from 2013 to 2014, the risk exposure of the cap-weighted benchmark to IT significantly increased as a result of the decreasing diversification benefits of the sector. Once again, **the benchmark suffered from unmanaged risk concentrations.**
- As Financials and IT reached almost identical correlation to the rest of the US market in late 2014, the Anti-Benchmark strategy displayed roughly equal ex-ante risk contribution for both sectors (cf.Chart 6 as of Dec 31, 2014). In order to achieve this diversified risk exposure, the Anti-Benchmark reduced in late 2014 its weight to IT (cf.Chart 5) as the sector had higher levels of volatility compared to Financials.

Recap on performance for the period (Dec 2012 – Dec 2014)



MDP AB US:	
Return:	59.85% (31/12/14)
Annualized return:	26.43%
Sharpe ratio:	2.20

MSCI Daily TR Net USA Local:	
Return:	48.52% (31/12/14)
Annualized return:	21.87%
Sharpe ratio:	1.93

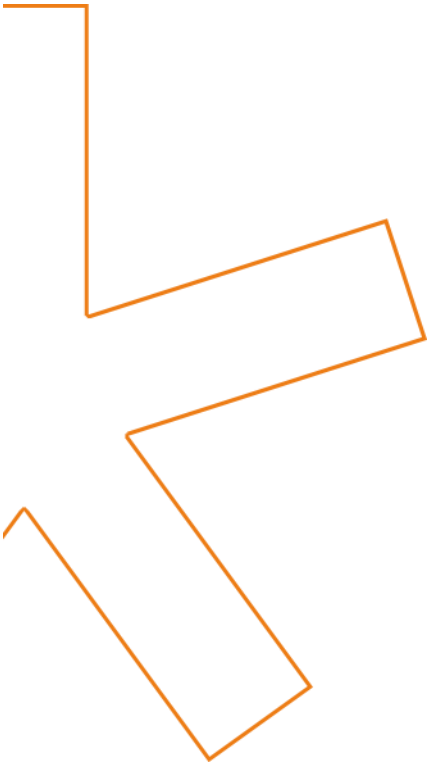
Excess return:	11.34%	
Excess annual. return:	4.57%	
Tracking error:	6.11%	
Info ratio:	0.75	
Beta:	0.89	r^2 74.95%
Correlation:	86.40%	
Jensen's alpha:	16.75%	
Treynor ratio:	0.30	

Source TOBAM. Past Performance is not indicative of future results. Returns are stated in USD and are Gross of management fees.

Over the period in which the market cap-weighted benchmark dynamically changed its bets from Financials to IT and suffered from unmanaged risk concentrations, the most diversified portfolio (the Anti-Benchmark US equity), outperformed the cap-weighted benchmark by +11.34% (+4.57% annualized) in a bull market (MSCI USA+48.52% vs. AB US +59.85%). This is a good illustration of how market cap-weighted benchmarks, by construction, implement bets which lead to destroy part of the equity risk premium.

Conclusion

The Anti-Benchmark® portfolio manages its exposure in taking into account the changes in the market environment, notably volatilities and correlations in order to remain the most diversified portfolio for its investment universe (US equities). In the meantime, the MSCI USA cap-weighted index by construction underwent market movements and speculative trends and remained concentrated in the least diversifying sectors altering its bets from Financials to IT and as such exposing itself to unmanaged risk concentrations.



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 exposure in equity and fixed-income markets. The company manages $8.8 billion (March 2015) via its Anti-Benchmark strategies for clients worldwide. Its team includes 35 financial professionals.

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