TD Asset Management

Year in Review & Look Ahead + 20 Minutes
= New Thinking

TDAM Quantitative Equity Investing
Year in Review & Look Ahead

Two thousand and twenty proved to be a difficult year for systematic investing. Quantitative models that relied on historical data did not fare well over the past year generally, as the novel Coronavirus (COVID-19) pandemic wreaked havoc on both the global economy and financial markets, forcing government authorities and major central banks around the world to come to the rescue of their respective economies. In contrast to most quantitative strategies that seek to find companies with stable earnings and attractive valuations, Low Volatility investing does not rely on traditional valuation metrics directly but rather tries to exploit anomalies in how investors perceive risk. Nonetheless the investment strategy was adversely impacted in both absolute and relative terms during the year.

The behavioural biases that Low Volatility investing strives to exploit, along with increased market concentration in a few stocks, played against the Low Volatility investment philosophy. Some notable examples of greed, as well as herd mentality taking over in markets include, near bankrupt companies doubling in price during extremely short periods of time because investors speculated that an insolvent company had a valuation greater than zero (i.e. Hertz). Speculative buying followed any company believed to be working on a vaccine (i.e. Eastman Kodak), despite the nature of the company's core business. Finally, the number of Initial Public Offerings (IPOs) throughout the year and mushrooming Special Purpose Acquisition Corporations[1] (SPACs) are suggestive of speculative mania that is clearly back in vogue.

Market concentration was observed in all major equity indexes with the FAAMGs (Facebook, Apple, Amazon, Microsoft, Google) dominating in terms of both market capitalization and risk. In Canada, Shopify played a similar role in the S&P/TSX Composite Index. Chinese tech giants Alibaba, Tencent and Taiwan's TSMC completely dominated the emerging market benchmarks. This increasing index concentration combined with stellar performance of technology firms naturally led to the underperformance of most, if not all reasonably diversified portfolios.

Finally, the record plunge in the equity markets at the onset of the pandemic and the subsequent spectacular recovery, thanks to the rescue by governments and central banks was a major headwind for active management which generally aims to steer clients away from wild swings in markets in contrast to passive management that is mandated to simply "ride it out".

[1]A special purpose acquisition company (SPAC) is a company with no commercial operations that is formed strictly to raise capital through an initial public offering.

Many active asset managers were whipsawed by such abrupt turns of events over the past year. Some of TD's competitors and even passive benchmarks, purely due to their mandate to minimize tracking error, were less impacted by the record market swings.

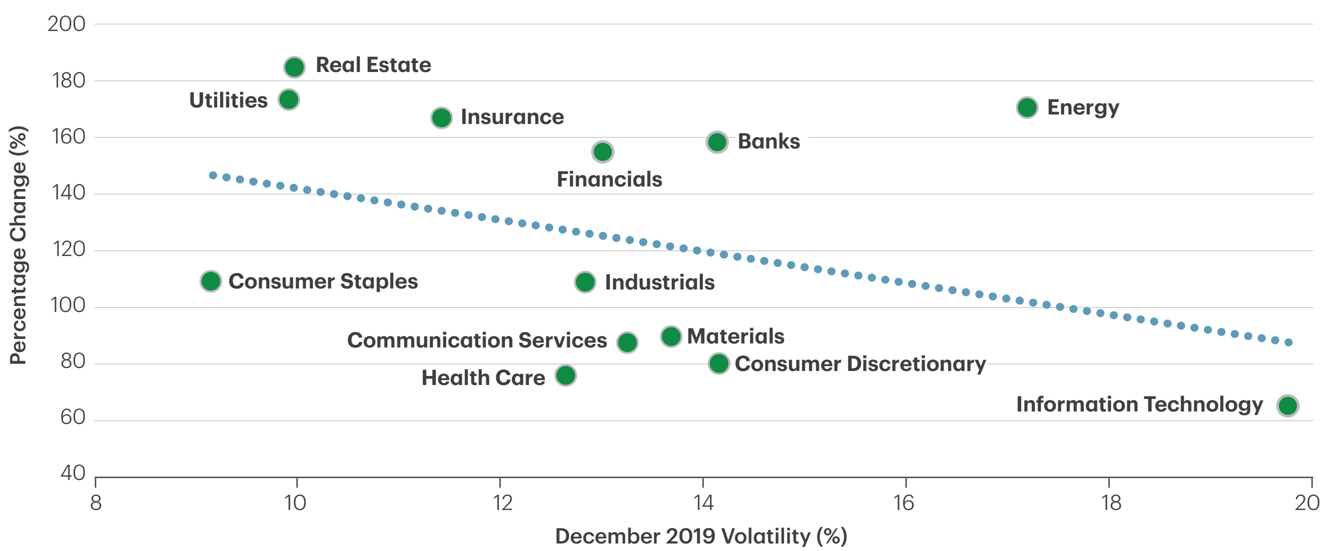
While the recent underperformance of our Low Volatility suite of funds is disappointing, we have also been through an extraordinary period in human history. Within this annual publication, the TDAM Quantitative Equity Team will discuss the key themes of 2020 and why we believe our investment solutions are well positioned for 2021.

Looking back[2]: Changing landscape of risk

The Covid-19 pandemic forced most companies to divert their capital expenditure plans and accelerate their corporate technology spending to meet the new demands of their stakeholders. Firms that previously did not have an online presence were quickly pivoting towards service providers such as Shopify, to reach their clients. Meanwhile many firms required employees to Work-From-Home (WFH), leaving their contracted office space empty and unused. This phenomenon had a determining impact on the performance and therefore riskiness of equities. This shock wasn't distributed evenly across sectors and contrary to what usually occurs during bear markets and major corrections, some of the least volatile and most defensive sectors such as utilities and real estate actually experienced the largest percentage increase in volatility. Interestingly, the spike in volatility for these traditionally defensive sectors happened while global interest rates fell precipitously (normally a tail wind for these sectors).

Low Volatility sectors experienced the highest increase in volatility during the year

Chart 1: Convergence of sector volatility



Source: Bloomberg, TDAM. December 2020.

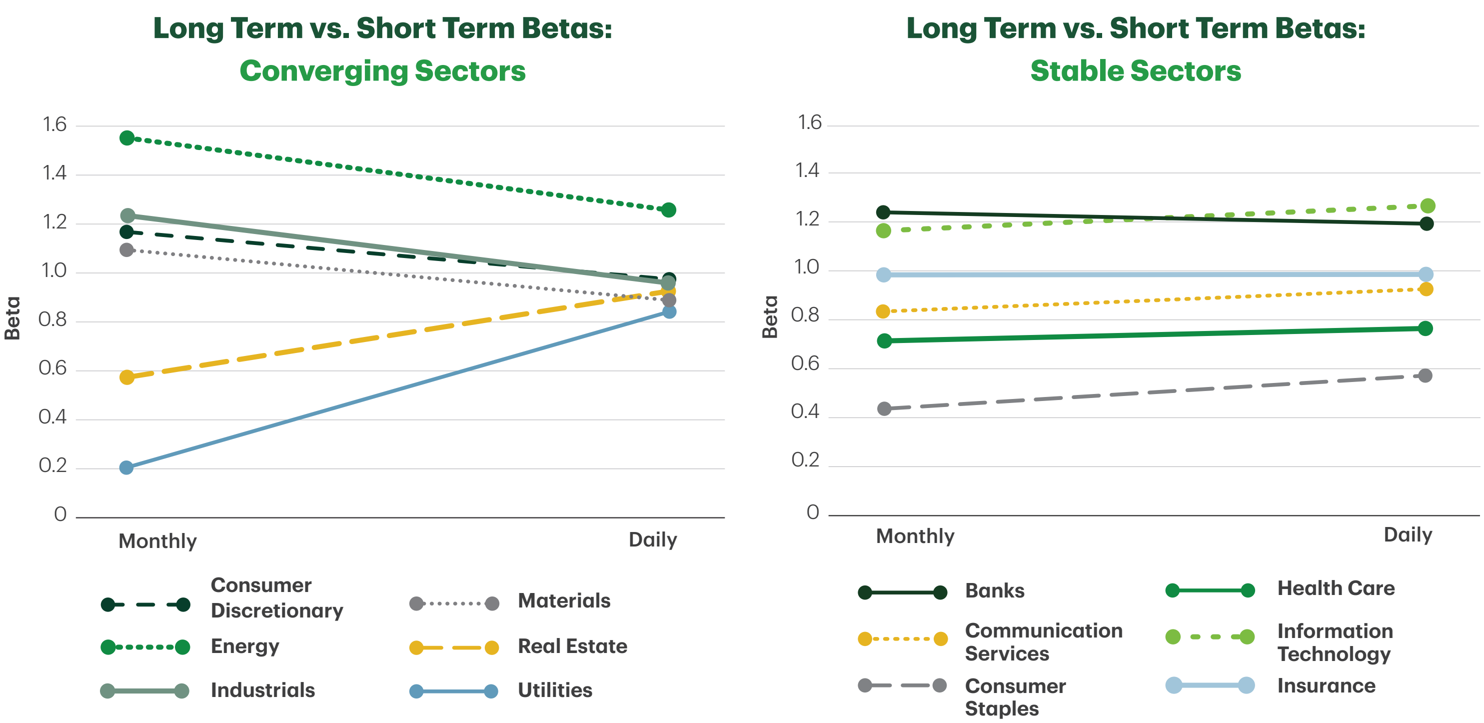
As observed in **Chart 1**, the change in volatility did not occur as expected, and there was also a change in correlations among the sectors. Some high-beta sectors saw their risk, as measured by beta, decrease as a result of their strong relative performances during the crash of late February - March 2020. Many low-beta stocks underperformed during the crash and saw their betas increase (see **Chart 2** below).

[2] For the sake of simplicity, the entire document references our TD *Emerald* Global Developed markets fund and the Developed Markets ex Canada Benchmark.

Did the risk of these sectors and stocks actually change or was it simply a reflection of the environment that we were facing? In behavioural finance, "recency bias" is defined as attributing more weight to recent events than to more distant ones. This phenomena arguably dominated the investor mindset this year driven by the robust performance of specific sectors and the underlying attitude that a once-in-a-hundred-year pandemic will occur every few years. The narrative of permanent WFH and buying everything online, almost exclusively from Amazon, became a mainstream ideology. However, it is more likely that such a pandemic will not happen again for another hundred years.

Information technology beta still amongst the highest

Chart 2: Beta convergence



Source: Bloomberg, TDAM. Data as of December 2020.

Source: Bloomberg, TDAM. Data as of December 2020.

We believe that stock and sector risks did change somewhat, but much less than the short-term data shows. The equity price action during 2020 was characterized as the most violent on record, recording not only the fastest drawdown and the single worst month for returns, but also the best monthly returns and the fastest recovery from a more than 35% decline. Such behaviour saw stocks act in unison and therefore masked volatile stocks as safe havens and defensive stocks were portrayed as particularly risky.

Many of our competitors, whether active Low Volatility managers or passive managers tracking Low Volatility indices have tracking error and turnover constraints, which forces them to ride the upward and downward movements of the market. In 2020, tight Tracking Error turned out to be beneficial to these strategies. The TDAM Quantitative Equity Team actively manages its funds to protect against downside risk, which regrettably hindered their performance during the market rebound beginning in April 2020. Historically, we have provided our clients with exceptional downside capture which largely offsets our lagging performance during market rebounds. Though we are mindful that our clients' investment experience with us in this particular year may have been underwhelming, we remain focused on delivering the best Low Volatility portfolio and continue to research ways to minimize this type of performance in the future.

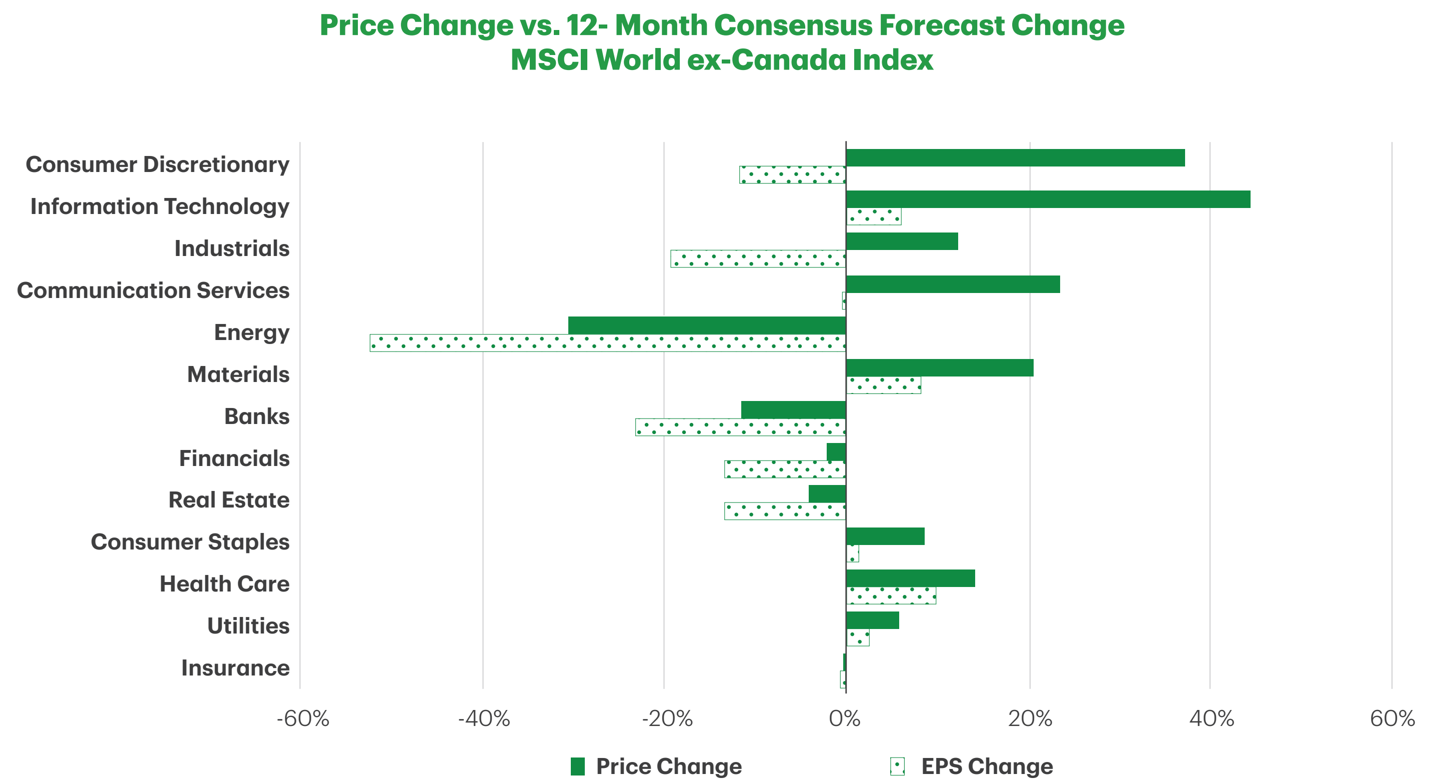
Valuations

In a year where lockdowns across the world wreaked havoc on companies and their earnings, markets finished remarkably strong with double digit gains in the US, single digit gains in Canada and modest single digit losses in Europe. As a consequence, some investors are getting increasingly worried about what seems like excessively stretched valuations. Returns can be decomposed into Price/Earnings (P/E) ratio and earnings per share (EPS) growth plus dividends. When thinking about the big winners from Covid-19 our thoughts immediately steer in the direction of the FAAMGs. While the group indeed delivered exceptionally strong earnings growth during the pandemic, other sectors and industries also posted positive earnings growth. Meanwhile, the utilities sector, generally a top allocation in our funds, was the fourth worst performing sector in the MSCI World Index over the whole year, despite being largely unaffected by the pandemic in terms of EPS growth.

We acknowledge that low interest rates pushed technology valuations higher, because a lower discount factor makes the present value of higher profits in later years more valuable today. However, the same logic does not apply to the other sectors such as Financials or Energy whose P/E ratios increased more than they did for the technology sector. Furthermore, interest rates have been falling for nearly 30 years, why are we only attributing the recent fall in rates to higher valuations and not to the preceding 30 years?

One of the key paradoxes of 2020 was how much people were willing to pay for both the steady earnings growth of the Covid-19 "winners" and for the expected earnings recovery of the "losers". As much as investors were willing to put a high price on the undeterred growth of the FAAMGs, they were equally anticipating a quick recovery of the most negatively impacted sectors. The stocks of oil and gas companies, banks and brick-and-mortar retailers experienced large valuation gains throughout the year as their earnings contracted much faster than their stock prices declined.

Chart 3: When prices outrun earnings

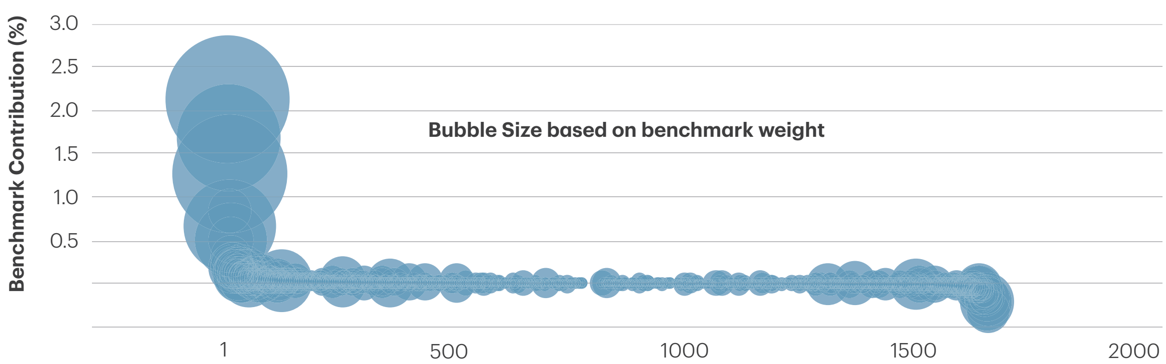


Source: TDAM, Bloomberg. Data as December 2020.

Record concentration

Another phenomenon which dominated 2020 was the increase in market concentration, a topic which we discussed previously.[3] As an illustration of the inefficiencies of market-capitalization indices one needs to look at the recent addition of Tesla to the S&P 500 index. By the end of 2020, irrespective of preferences, Tesla entered the S&P 500 index and was immediately a top 10 weight. All passive investors were forced to buy Tesla at outrageously expensive levels in order to mimic the benchmark. A potential problem with capitalization-weighted indices is that passive investors could be exposed to overextended sectors or to overhyped stocks that rallied recently and could experience a significant correction in the near future.

Chart 4: MSCI World ex-Canada Index single stock contribution for 2020



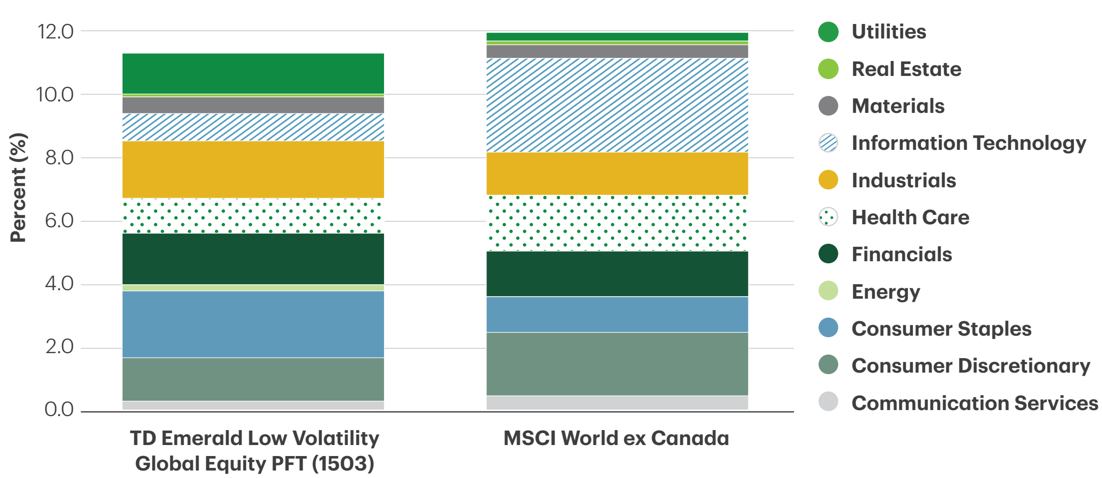
Source: TDAM, Factset. Data as of December 2020.

Low Volatility funds have trouble participating in rallies driven by record concentration because they tend to be well diversified and invest primarily in companies with stable revenues and earnings. The concentration that we have witnessed this past year is astounding, with the top 10 names in the MSCI World Ex Canada Index contributing to 65% of total returns in 2020. The technology sector alone accounts for 60% of MSCI World Ex Canada Index returns in 2020.

Remarkably, when we look back at the past 11 years[4], while our funds had a persistent underweight exposure to Information Technology names, the best performing sector in the benchmark, they still posted nearly identical returns to their benchmarks (See **Chart 5**). This suggests that the investment universe is filled with solid, high quality companies that keep delivering competitive earnings growth and therefore can match even strong market returns, despite exhibiting much less volatility.

After 11 years, similar results with different paths taken

Chart 5: 11-year performance attribution

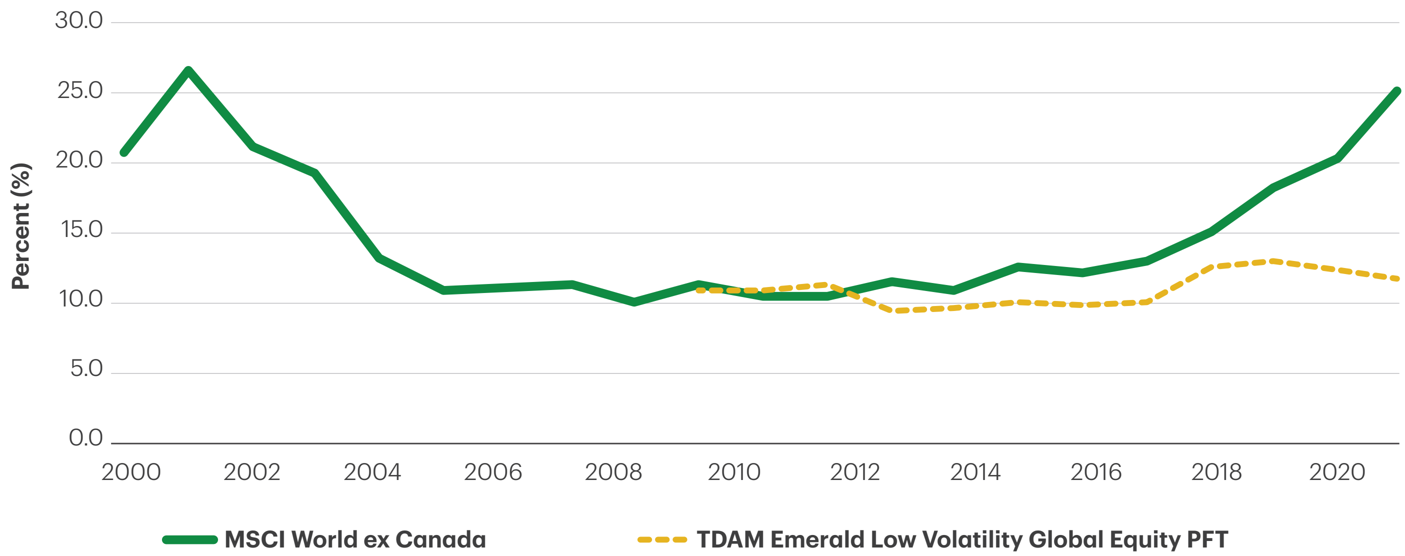


Source: TDAM, Factset. Data as of December 2020.

[3] Our paper, The Risk of Index Concentration in Today's Markets, provides our insights on this market phenomenon.

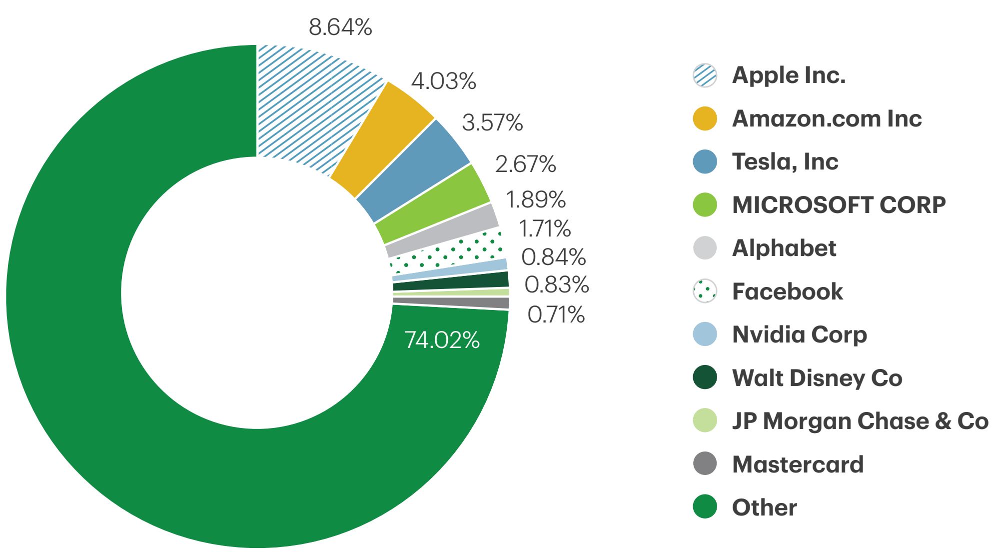
[4] Our paper, A Decade of Achievement: Celebrating the 10-year Anniversary of TDAM Low Volatility Strategies, details the historical performance of our Low Volatility Funds.

Chart 6: Risk comparison:
Top 10 contributors to risk of the Fund vs the Benchmark



Source: TDAM Internal. Data as of December 2020.

Chart 7: 10 companies represent more than 25% of the risk of the benchmark



Source: TDAM Internal. Data as of December 2020.

Summary of 2020

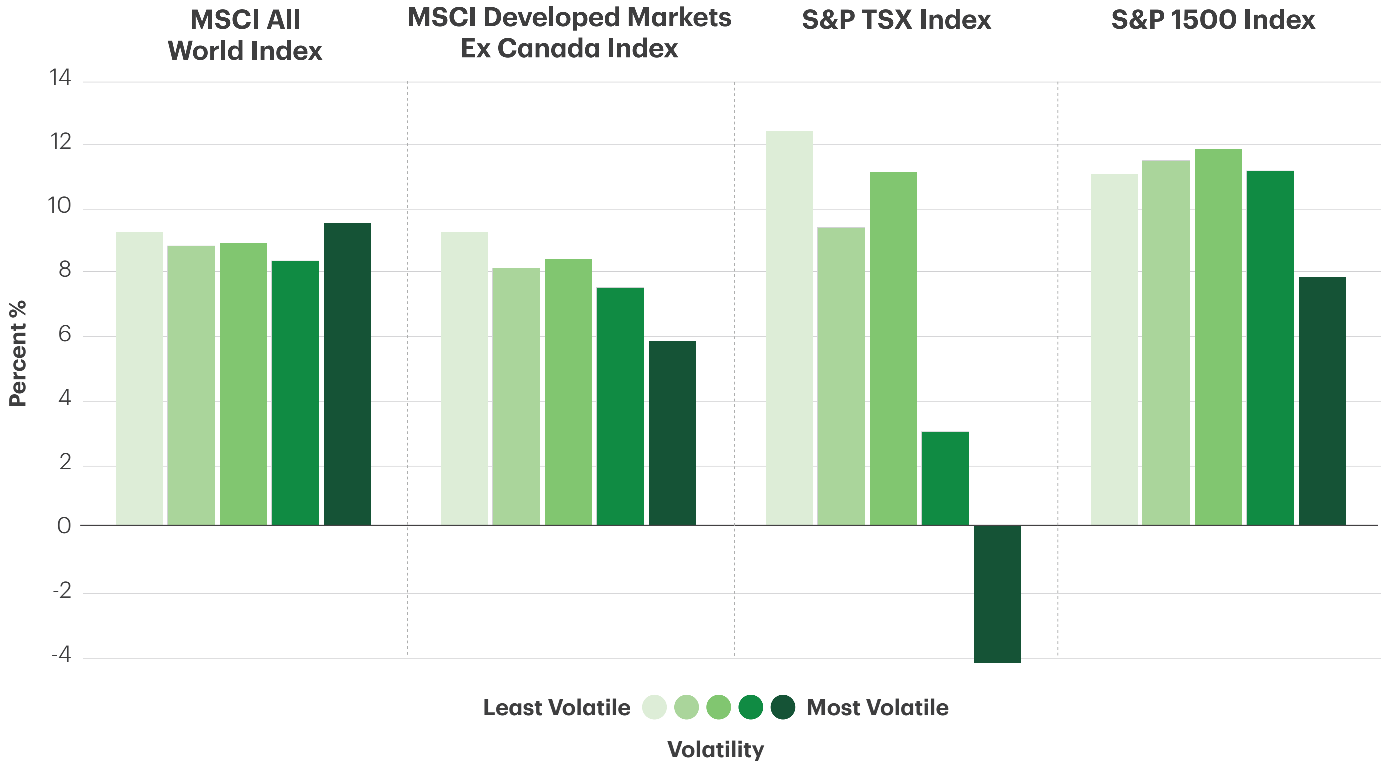
Our underperformance in both absolute and relative terms was very disappointing. No one saw the Covid-19 crisis coming, yet some active managers who were overweight growth sectors were lucky to benefit from the pandemic despite being similarly caught off guard by it. Some passive managers who rode the wave of drawdowns and runups also ended up benefiting versus active managers who tried to protect their clients from this turbulence by trading the portfolios. Luck, good or bad, played a large role in what transpired in 2020, but we firmly believe that we are on the proper footing for 2021. Going forward one should ask to what extent central banks can continue to bail out investors by managing market turbulence and how much fiscal stimulus will be available without putting public finances under unbearable stress.

Looking forward: favorable backdrop for Low Volatility investing

Back to Basics: Theory vs. History

The Low Volatility investment philosophy has proved to be a winning strategy across time, markets and even asset classes. As elegant as the theory behind the Capital Asset Pricing Model (CAPM) can be, volatile/high beta stocks or high yield bonds have generally underperformed their less risky counterparts over long time periods as illustrated below in the equity space.

Chart 8: Universe volatility quintiles



Source: TDAM Internal. Data since January 2000 to December 2020.

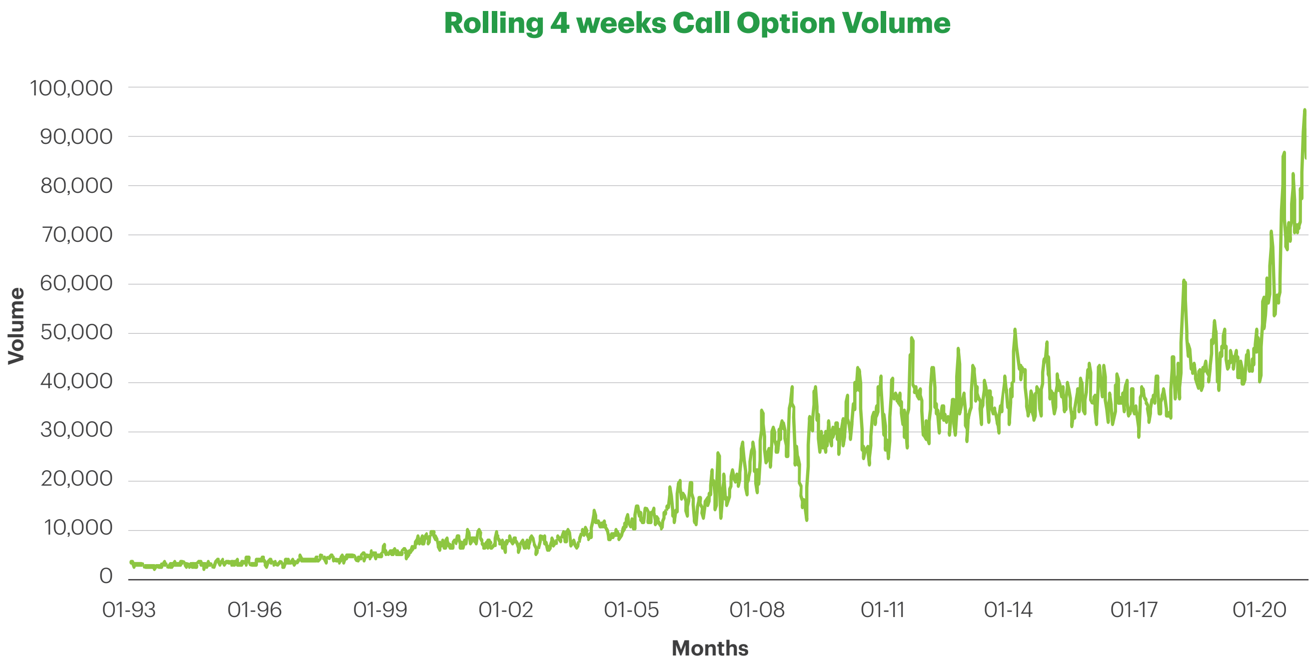
Ever since Black, Jensen and Scholes (1972) showed the capital market line to be too flat relative to what the CAPM theory suggests, illustrating that investors are not compensated appropriately for investing in risky assets, researchers have been looking for explanations as to why this could actually be the case. One potential explanation is the so-called lottery effect, whereby investors buy recent winners or bid up stocks/bonds with high potential returns, which can lead the same stocks to become expensive and underperform their lower volatility counterparts over the long run.

Volatility

Looking at 2020, there are clear signs that market participants are pushing markets higher on very little information other than euphoric expectations that prices will just keep going up. Not surprisingly, those expectations are tied to other evidence of general market optimism including historical highs in the total trading volume of US call options (**Chart 9a**) and all-time high for the price of Bitcoin in U.S. dollars (**Chart 9b**).

These examples appear to be clear signs of the lottery effect at play.

Chart 9a: Call option volume: betting on the upside at an unprecedented pace



Source TDAM, Bloomberg. Data as of December 2020.

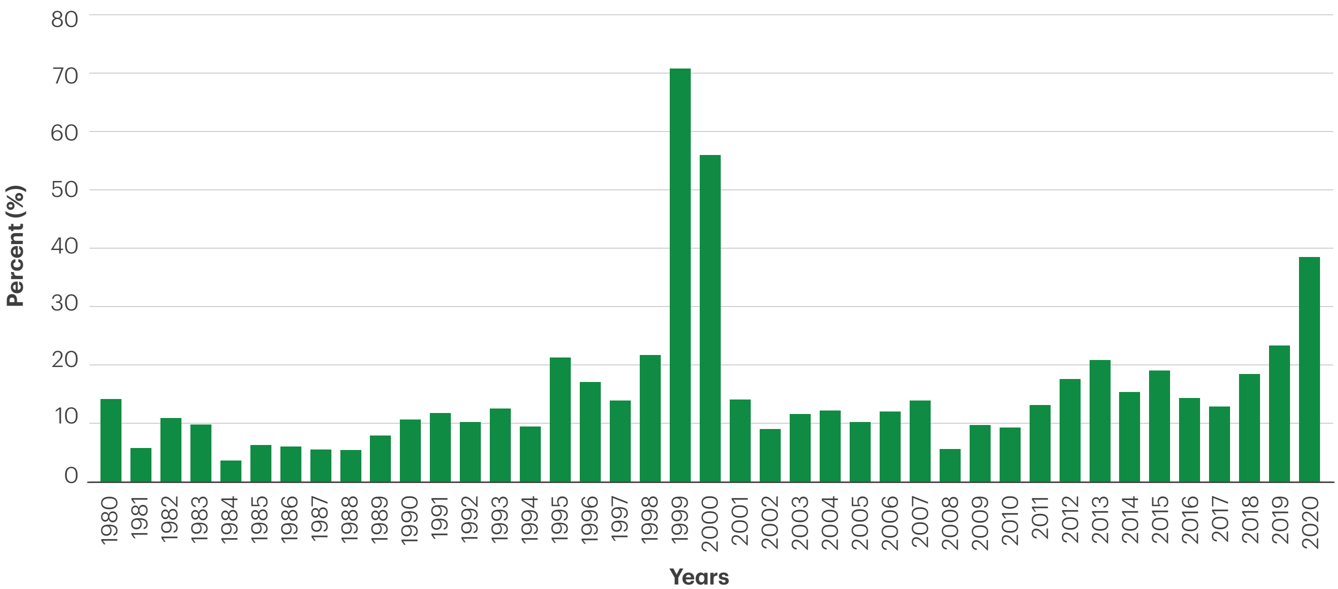
Chart 9b: Bitcoin/USD exchange rate

Source: TDAM, Bloomberg. Data as of December 2020.

In the following IPO charts, we show one-day returns of IPOs (**Chart 10a**) and the percent of IPOs with negative earnings. (**Chart 10b**) It is surprising to what extent investors assume they know about the private market when valuing these firms. The YTD average IPO returns are around 40% with extremes being north of 100%. We don't believe that pre-IPO shareholders are willingly leaving money on the table when taking these firms public, but rather that the public market is herding into the next hot tech stocks, irrespective of valuations.

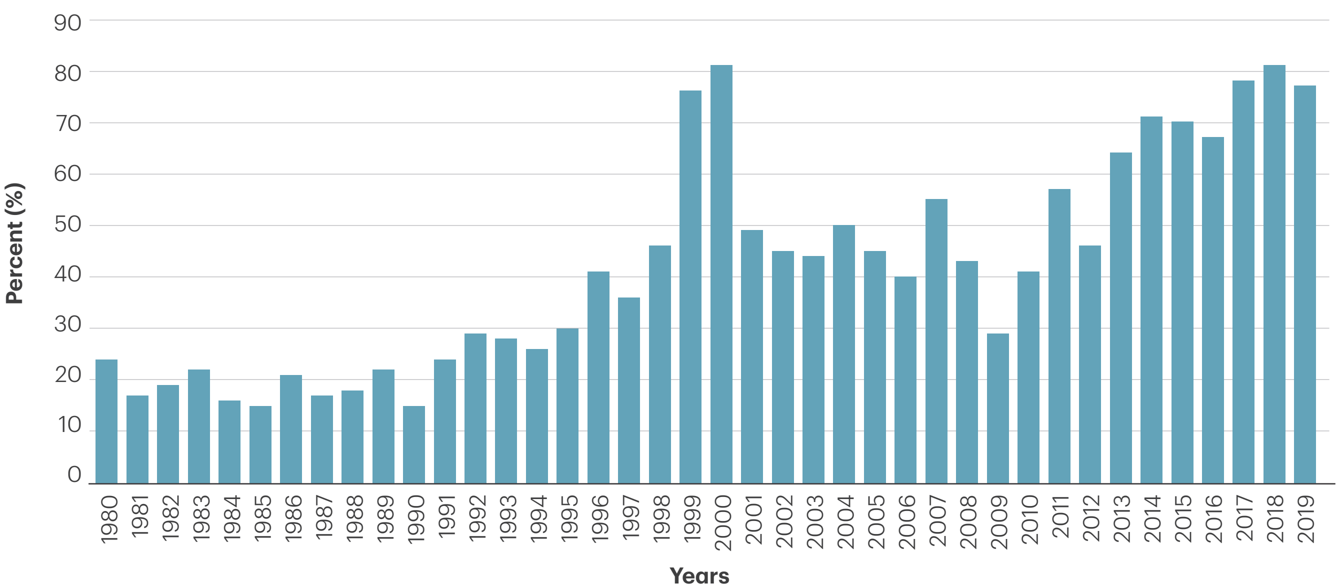
IPO mania is back, during a recession

Chart 10a: Mean first day return of IPOs



Source: TDAM, University of Florida. Data as of December 2020.

Chart 10b: Percentage of IPOs with negative EPS



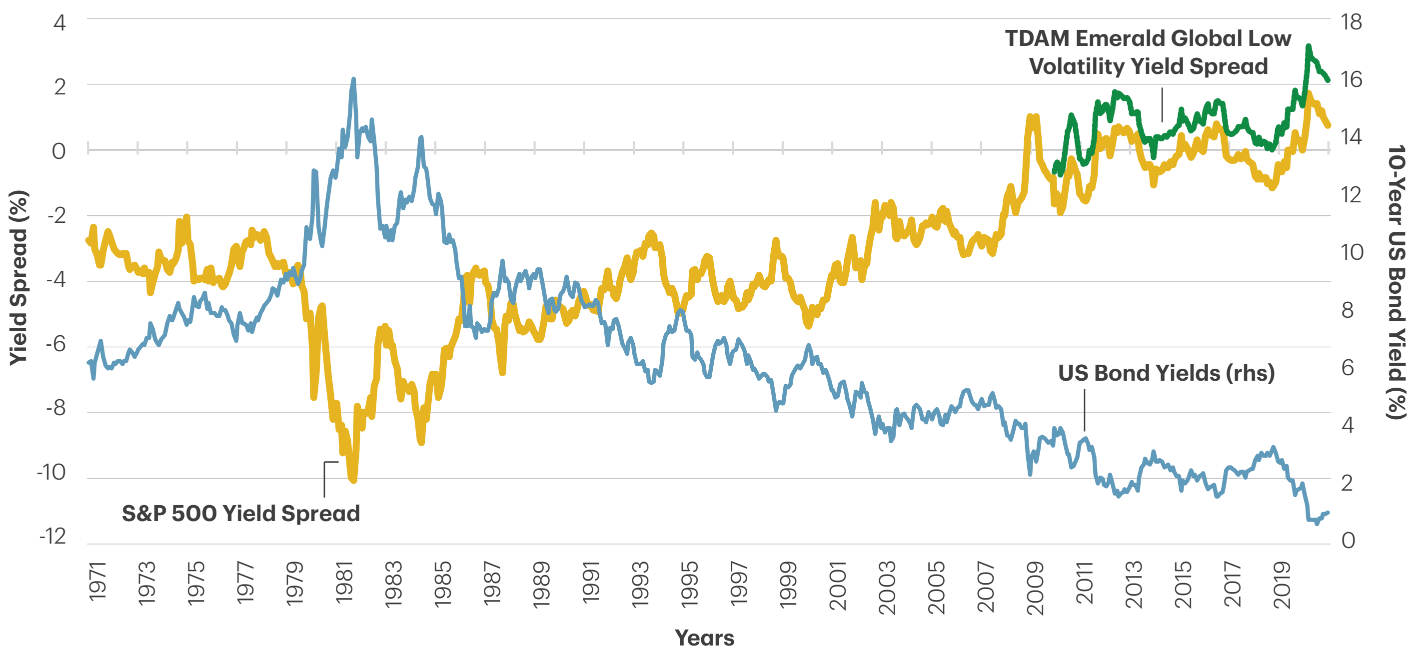
Source: TDAM, University of Florida. Data as of December 2019.

Low Vol taking back its place as a better bond alternative?

A developing consensus for 2021 is that equities will be pushed higher by accommodative central bank policies and government deficits while bond yields will remain anchored thanks to aggressive monetary easing policies by the major central banks around the world. This outlook raises the question of which equity sectors and styles will be best supported by such a macroeconomic environment. After a year of massive valuation-fueled rallies in growth stocks, followed by a rebound in deep value cyclical stocks driven by optimistic economic recovery expectations, we believe that 2021 will see a shift in focus towards Low Volatility names – the so-called, equity alternatives to bonds.

The spread between the S&P 500 dividend yield and the US 10-year Treasury bond yield is near its 50-year high while our Low Volatility funds add an additional 140bps in dividend yield spread over the S&P 500 (See **Chart 11**).

Chart 11: Bond Yields and Yield Spread



Source: TDAM, Bloomberg. Data as of December 2020.

The income component will once again become a core part of a portfolio. However, as many investors experienced in 2020, income doesn't translate to safety. Energy companies and retail REITs paying high dividend yields ended up being extremely risky bets.[5]

Our funds have clear preferences for higher yielding stocks that also combine more stable sales and earnings growth and solid profit margins, as illustrated in **Chart 12**. Furthermore, 2020 left Low Volatility stocks at historically low valuations relative to the market, and most specifically to the growth and cyclical segments of the market. Additionally, the highly concentrated state of the cap-weighted indices creates attractive risk reduction opportunities for those who build a diversified portfolio.

[5] Real estate was a lesson learned in our Low Volatility funds.

Chart 12: Style analytics

Source: Style Analytics. December 2020.

Better macroeconomic backdrop for small cap stocks

Another notable development of 2020 has been a significant underperformance of small cap stocks relative to their larger peers in general, and to mega caps in particular. Given that our Low Volatility strategy tends to be much less concentrated than its cap-weighted benchmark, it naturally tends to have a small-cap bias (**Chart 12**). Unfortunately, the size factor did not perform well during the past year, indirectly hurting the performance of the Low Volatility strategy.

However, recent macroeconomic developments indicate that the worst for small caps could be behind us.

The unprecedent amount of monetary and fiscal stimulus has lifted economic growth prospects for the next year allowing inflation expectations to recover as well from the depths of the Covid-19 recession (**Chart 13**). This is a good sign for small cap relative performance because historically, the higher growth accompanied with inflationary pressures is a better environment for small caps relative to their large cap counterparts given their higher debt levels.

Chart 13: Inflation expectation and Small Cap relative performance

Source: TDAM, Bloomberg. Data as of December 2020.

Small Cap: from headwind to tailwind

Closing remarks

Our journey in Low Volatility equities started with a careful empirical analysis of historical equity returns. Despite widely held beliefs that investors are generally averse to risk and a large body of theories that predict that riskier equities should have higher expected returns than their less risky peers, the empirical evidence suggests that average historical annualized returns of more volatile equities are not statistically greater than those of less volatile equities. Less volatile equities deliver better risk-adjusted returns over the long run. The logical conclusion from this analysis is that a long-term investor who is averse to risk should invest in less volatile equities. This was the genesis for our suite of Low Volatility equity funds designed to take on as little risk as necessary to achieve benchmark-like returns in long-only equity portfolios. We believe in the empirical evidence that extra risk is not compensated over the long run and we make no attempt to control tracking error risk. The end results are portfolios that are very different from the capitalization-weighted indices we are benchmarked against. These very different equity portfolios served our clients well during the decade that followed the launch of our first Low Volatility equity funds.

What about the short run? The typical market crashes and rallies are led by more volatile equities. The performance of the stock market in 2020 was far from typical as we have shown in this review. Investors in TD Low Volatility Equity funds have not experienced the downside market protection they had come to expect. They have so far not participated as much in the narrowly based yet strong market rally witnessed since the end of March 2020. The greater the under performance, the more holders of our funds must question their investment decisions. While our funds hold many equities that are currently out of favour, we believe that now is not the time to sell them and invest in recent winners, many of which now trade at very high multiples of forecasted earnings.

What about 2021 and beyond? As of year-end 2020, yields on 10-year U.S. Treasury bonds or Government of Canada bonds around 1%. These yields are historically very low, especially when compared with the 2% inflation targets of the U.S. Federal Reserve and the Bank of Canada. Extremely low interest rates are bound to lead many investors to review their strategic asset allocations in favour of equities. As investors increase their exposures to equities, many will discover that less volatile equities trade at reasonable multiples of forecasted earnings and pay dividend yields far in excess of government bond yields. We thus expect 2021 to be favorable to Low Volatility equities. ■

Appendix: Trailing Performance

Returns as at Dec 31, 2020	1 yr	3 yrs	5 yrs	10 Yrs	10 Years	
					Volatility	Sharpe Ratio
TD *Emerald* Low Volatility Canadian Equity Pooled Fund Trust	-1.38%	4.67%	7.84%	9.44%	8.80%	0.96
S&P/TSX Composite TRI	5.60%	5.74%	9.33%	5.76%	11.80%	0.41
Difference	-6.98%	-1.07%	-1.48%	3.69%	-3.00%	0.55

Returns as at Dec 31, 2020	1 yr	3 yrs	5 yrs	10 Yrs	10 Years	
					Volatility	Sharpe Ratio
TD *Emerald* Low Volatility Global Equity Pooled Fund Trust	-8.67%	3.30%	5.91%	11.82%	8.70%	1.25
MSCI World Ex Canada ND - C$	14.23%	11.41%	10.35%	12.98%	10.70%	1.13
Difference	-22.90%	-8.11%	-4.44%	-1.16%	-2.00%	0.12

Returns as at Dec 31, 2020	1 yr	3 yrs	5 yrs	Since Inception		
				Return	Volatility	Sharpe Ratio
TD *Emerald* Low Volatility All World Equity Pooled Fund Trust	-11.32%	1.06%	4.47%	10.14%	8.40%	1.09
MSCI All Country World Index ND (C$)	14.22%	10.67%	10.33%	11.97%	10.60%	1.04
Difference	-25.54%	-9.62%	-5.86%	-1.83%	-2.20%	0.05

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