

US market volatility

A historical perspective

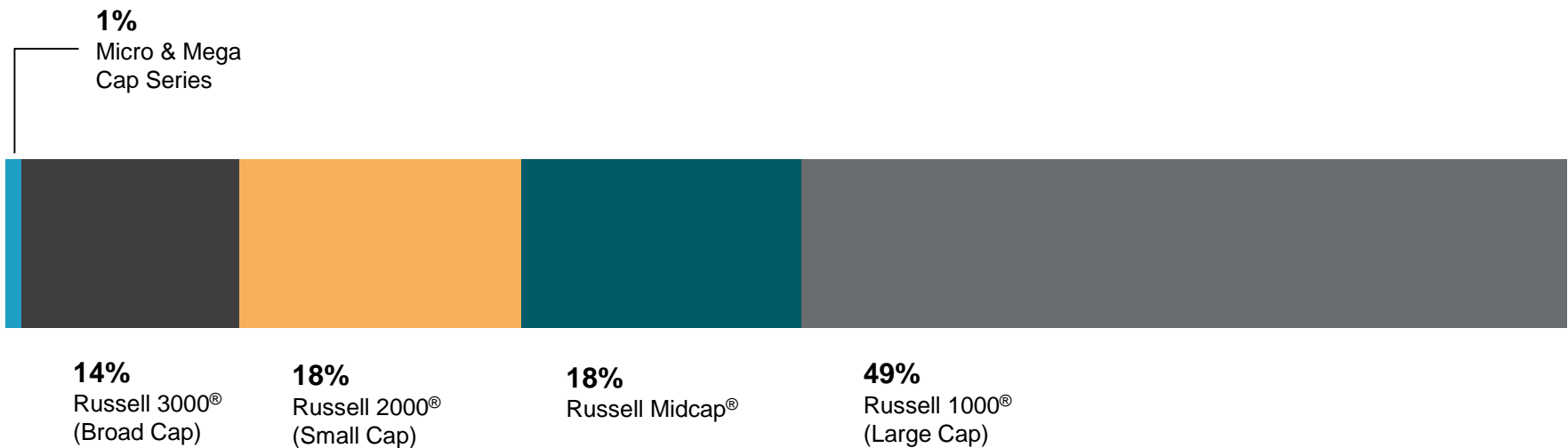
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Assets benchmarked to the Russell US Indexes

~ \$8 trillion in assets benchmarked to Russell US Indexes

- A long history of providing institutional investors with precise, predictable tools to build, manage and measure portfolios
- Tracked by 65% of active US equity institutional funds*
- 14 of the 15 most frequently used US institutional equity benchmarks*



Data as of December 31, 2018 as reported on April 1, 2019 by eVestment for institutional assets, Morningstar for retail mutual funds, insurance products, and ETFs, and additional passive assets directly collected by FTSE Russell. AUM data includes blended benchmarks and excludes futures and options. Passive assets directly collected by FTSE Russell have been removed from third party sources to prevent double counting. No assurances are given by FTSE Russell as to the accuracy of the data.

Russell 1000 large cap series includes the Russell 1000 index; Russell Midcap series includes the Russell Midcap index and the Russell 2500 index; Russell 2000 Small Cap series includes the Russell 2000 index and the Russell Small Cap Completeness index; Russell 3000 Broad Cap series includes the Russell 3000 index and the Russell 3000E index; Russell Mega Cap series includes the Russell Top 200 index and the Russell Top 50 index.

* eVestment, data as of December 31, 2018 as reported on April 1, 2019.

Summary of construction & methodology rules

Russell US Indexes

Inclusions

- Companies classified as US
- Must trade on major US exchange on rank day in May

Exclusions

- Pink sheet, OTC and bulletin board stocks
- Closed-end mutual funds, limited partnerships, royalty trusts
- Blank check/SPAC companies, BDCs
- Foreign Stocks and American Depositary Receipts (ADRs)
- Companies under \$30Million in total market capitalization
- Companies historically passing UBTI to shareholders*
- Stocks trading below \$1.00 (average used for the month of May for existing members)
- Stocks with 5% Floating market cap (or less)

Maintenance

- Stocks removed between reconstitution dates are NOT replaced
- Spin-offs and Initial Public Offerings are the only additions between reconstitution dates

A complete set of rules can be found at <http://www.ftse.com/products/downloads/Russell-US-indexes.pdf>

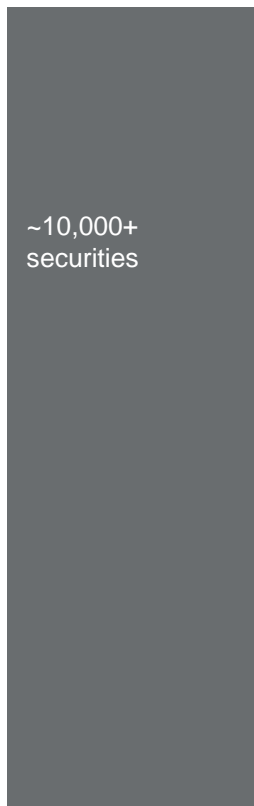
*and not blocking future UBTI to shareholders

Russell US Indexes

Construction summary

1

Start with all US equity securities



2

Remove ineligible securities



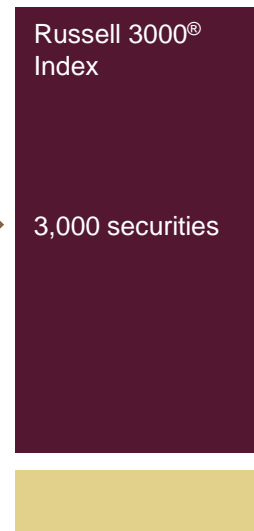
3

Rank and capture top 4,000 securities above \$30M in market capitalization



4

Create the Russell 3000® for US securities



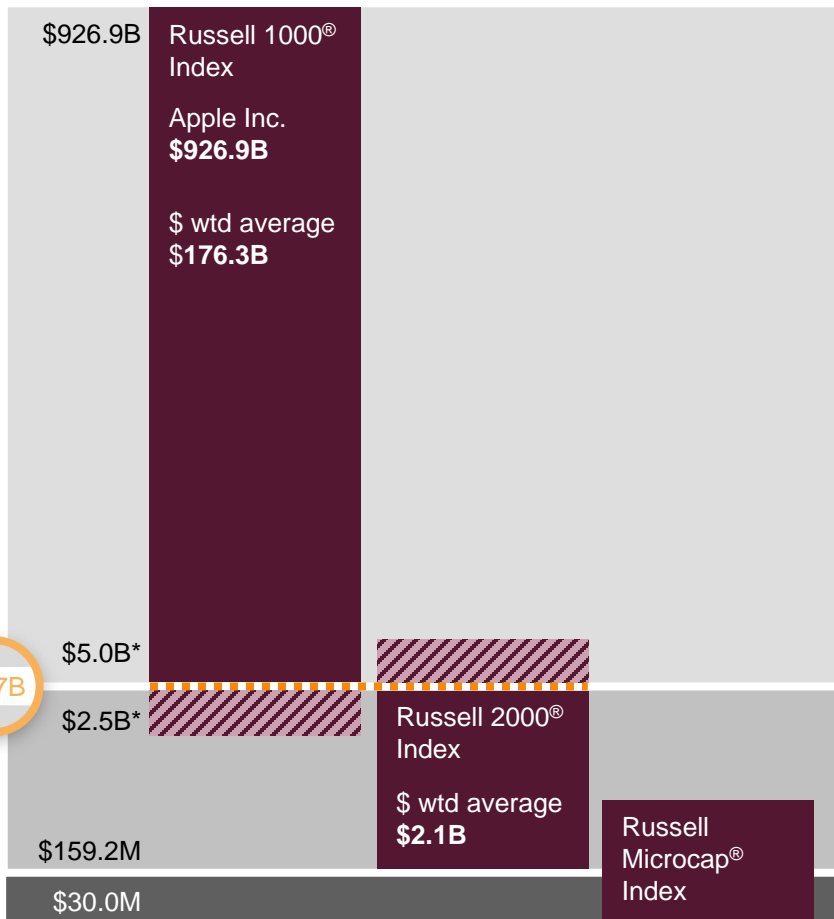
The Russell US Indexes are completely recalibrated each year in June during Russell Reconstitution

This unbiased approach to capturing the US market, which defines the breaks between large, mid and small cap and determines where companies fall along the growth/value spectrum, is one of the most anticipated US market events each year

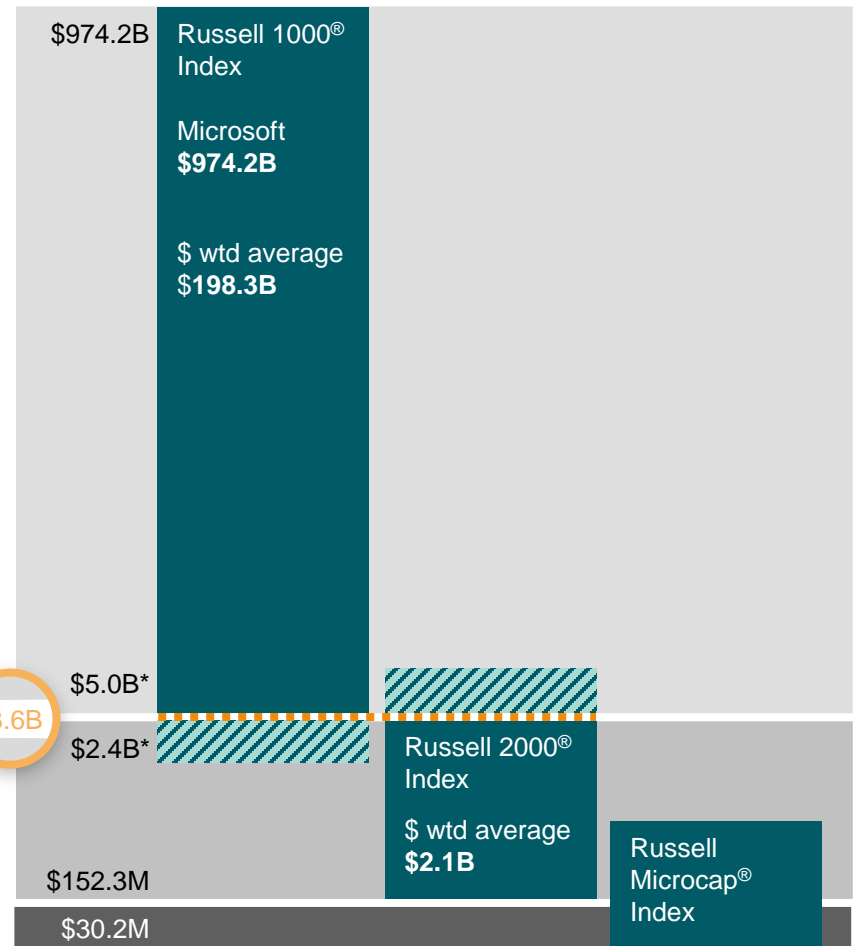
Note: If there are fewer than 4,000 eligible companies above \$30M in size, the R3000E will contain fewer than 4,000 companies.

US capitalization rank comparison

2018 market cap range

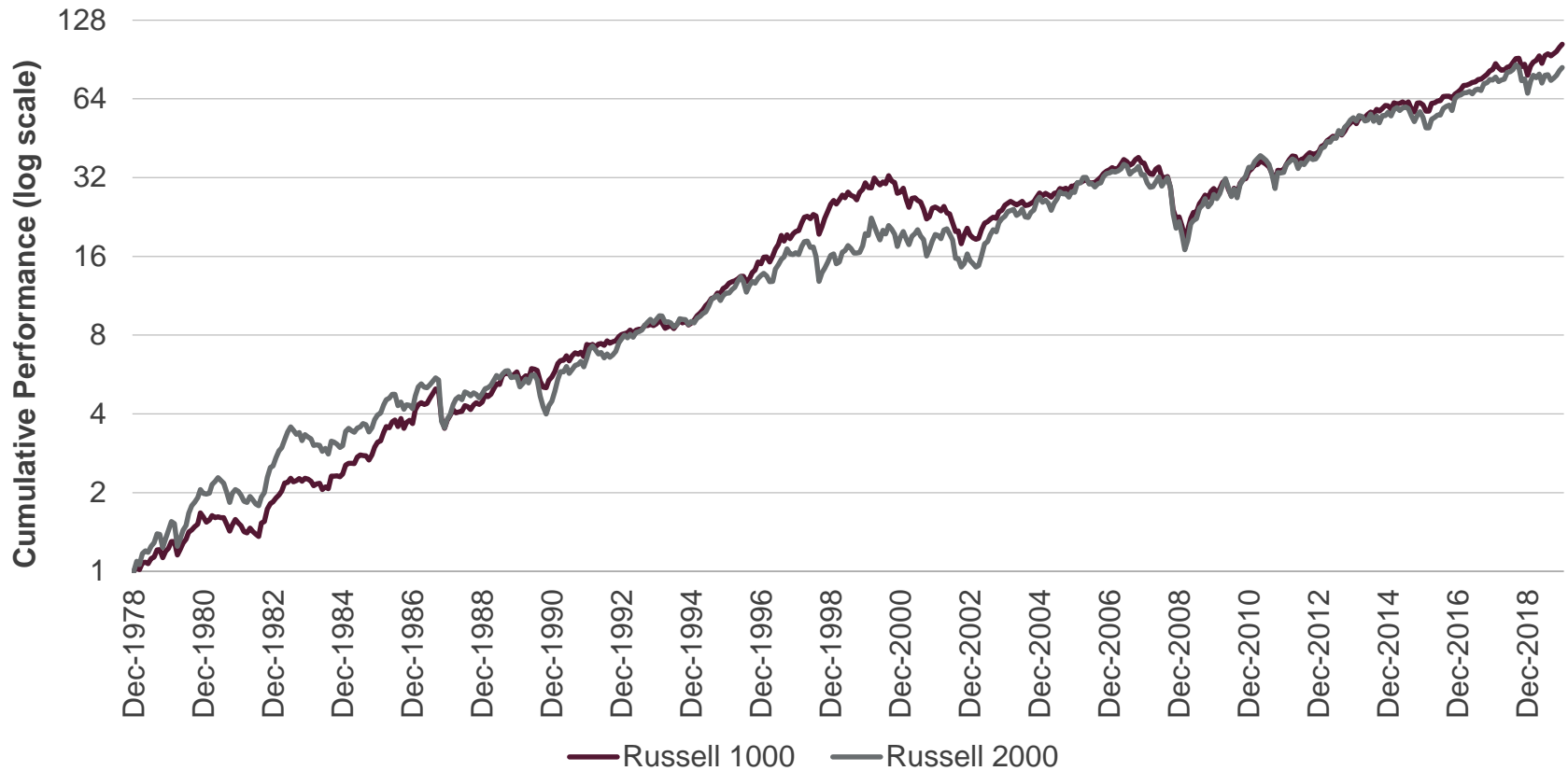


2019 market cap range



* Reflects banding. Data as of May 11, 2018 and May 10, 2019 respectively.

Long-term Performance



Source: FTSE Russell. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

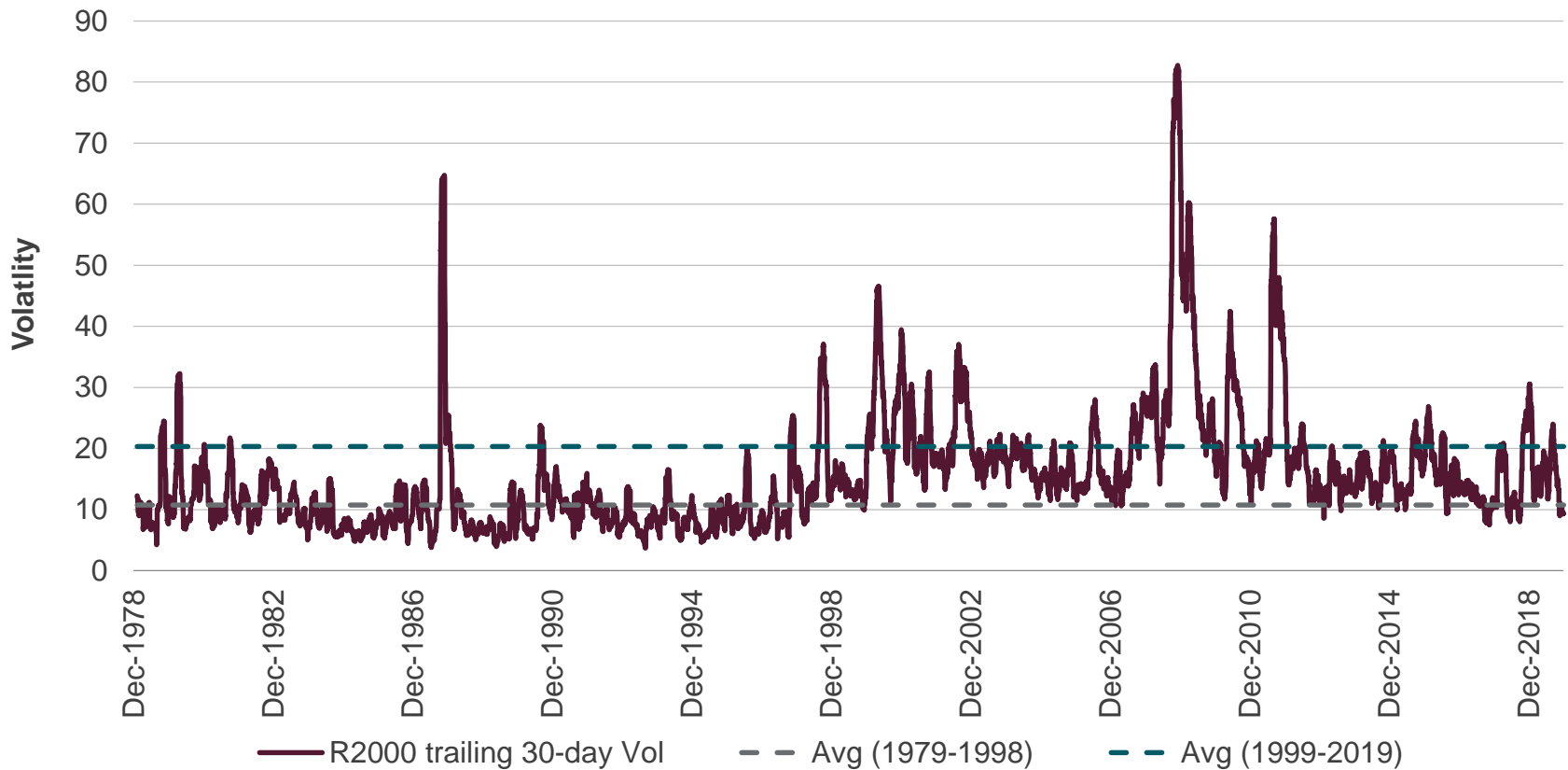
Recent small cap cycles are not as pronounced

Rolling 3- and 5-Year Excess Returns (Russell 2000 - Russell 1000)



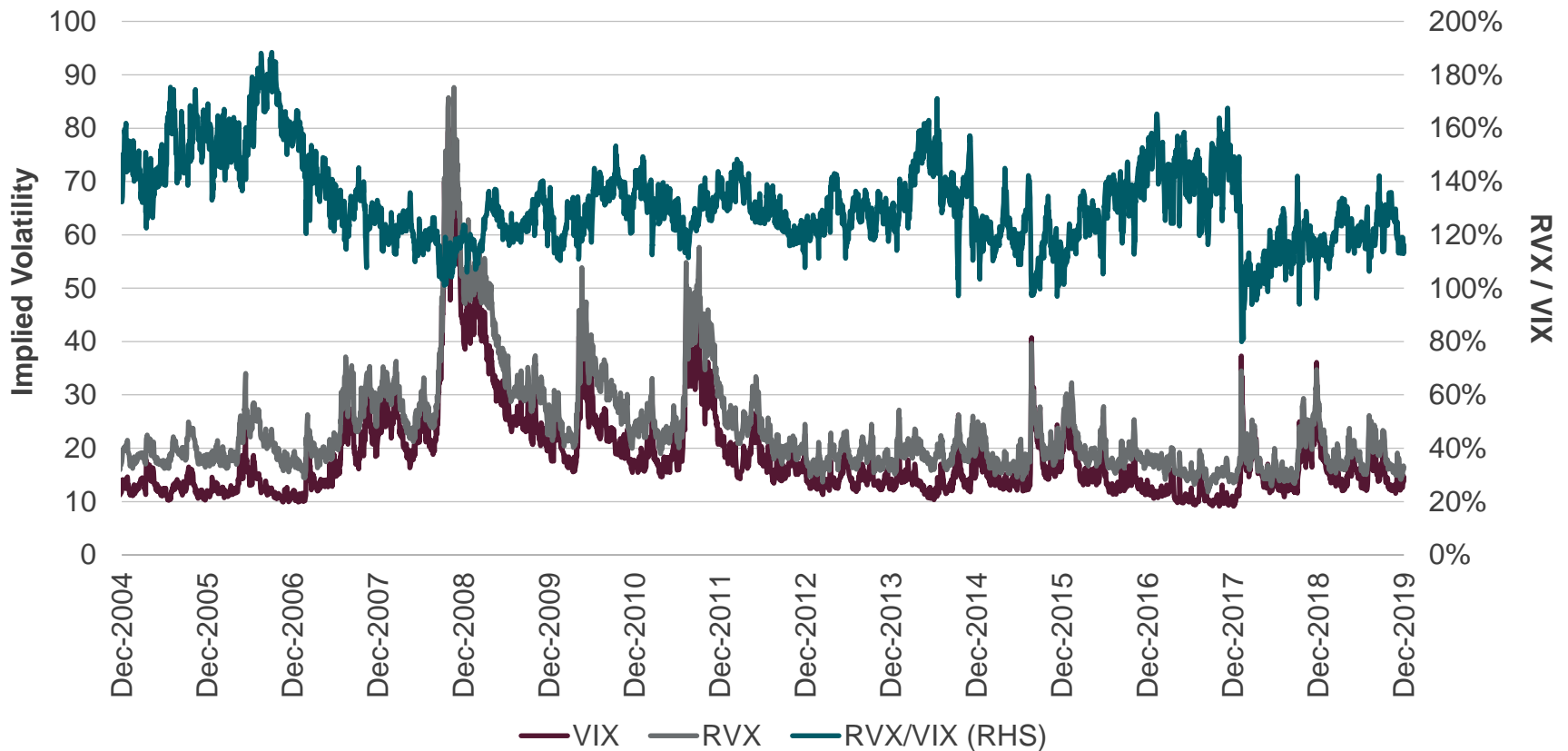
Source: FTSE Russell. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

Daily small cap volatility higher now than historically



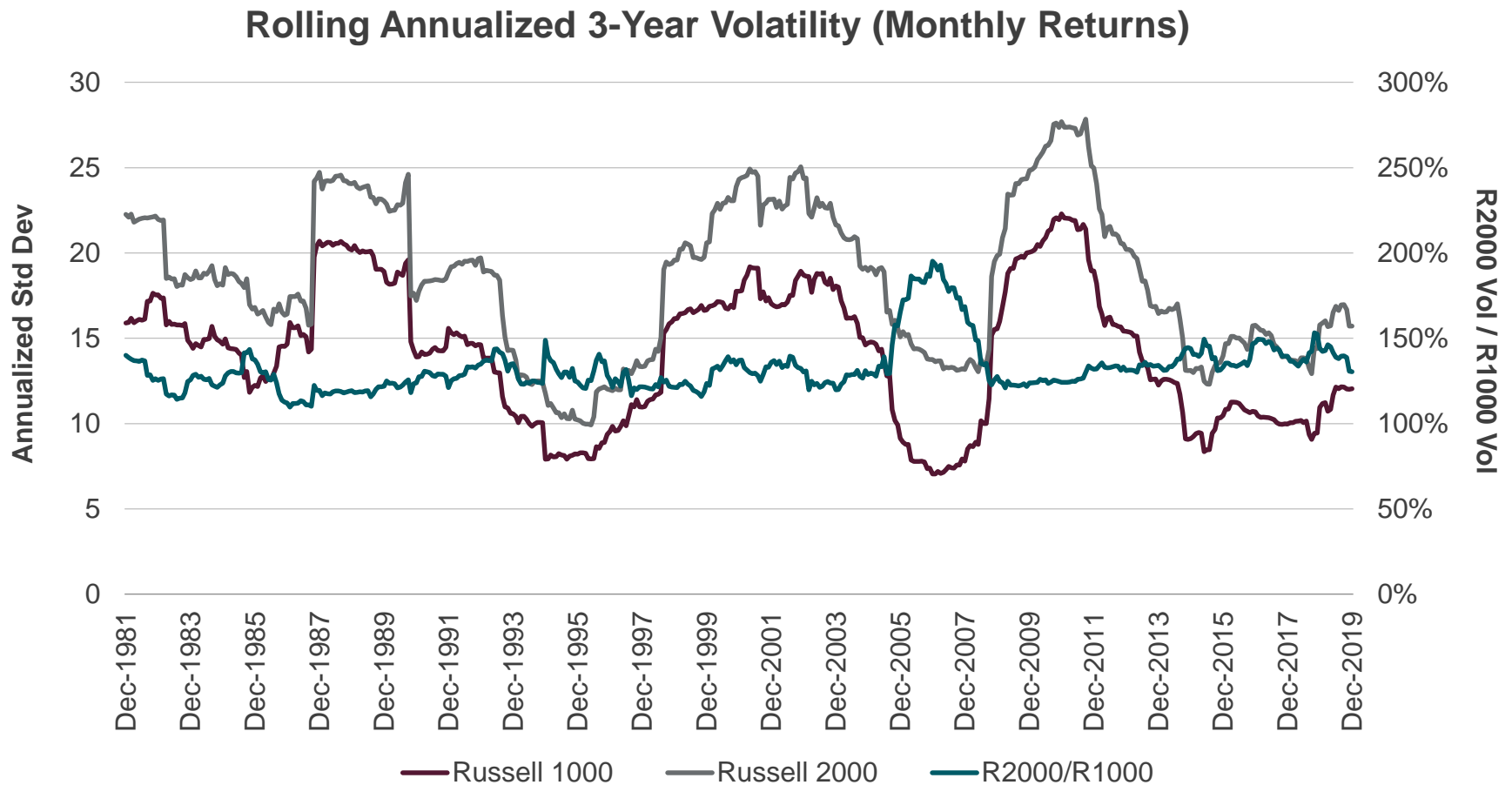
Source: FTSE Russell. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

Implied volatility pre/post GFC



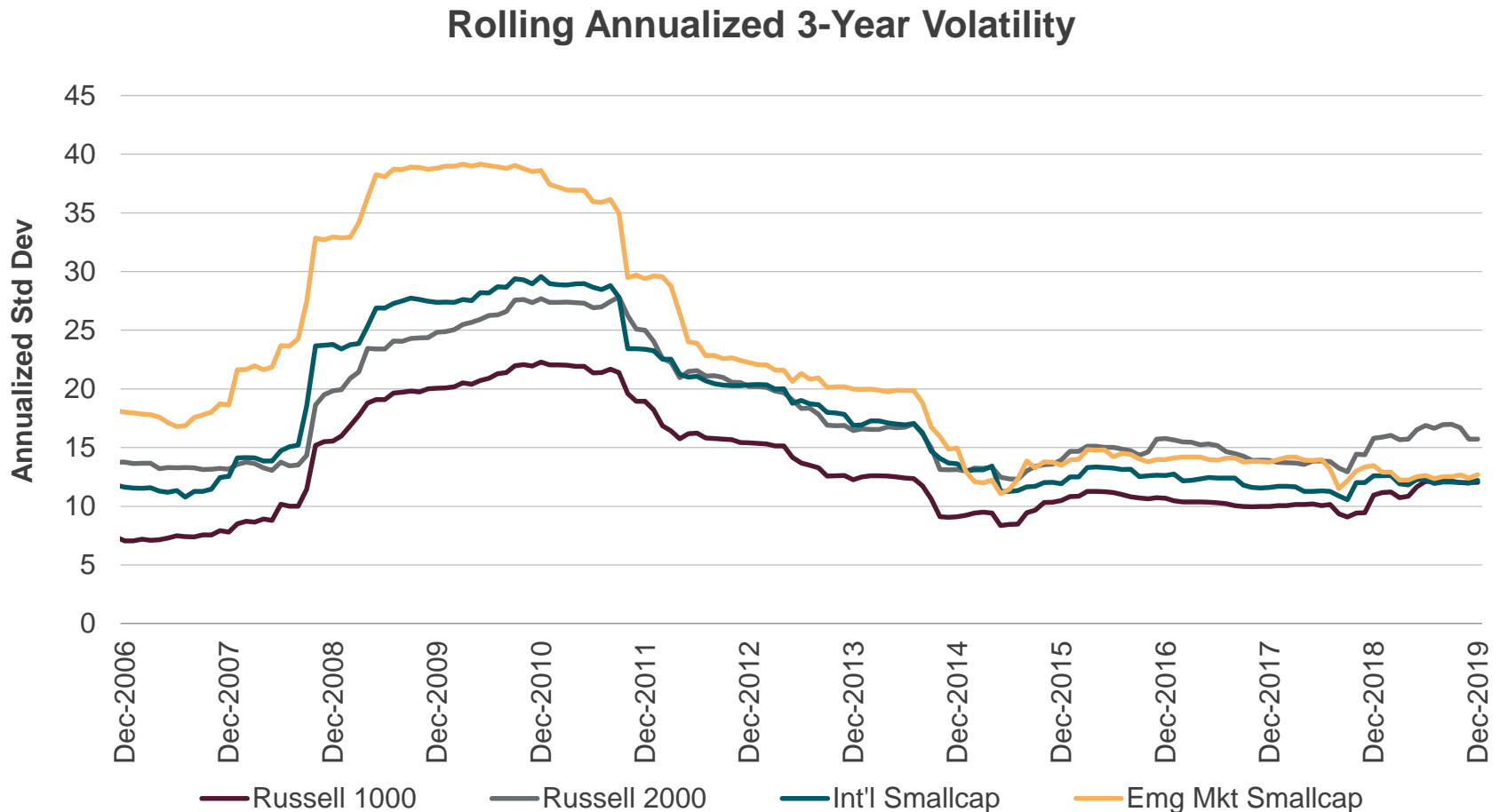
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Small cap volatility consistently higher than large cap



Source: FTSE Russell. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

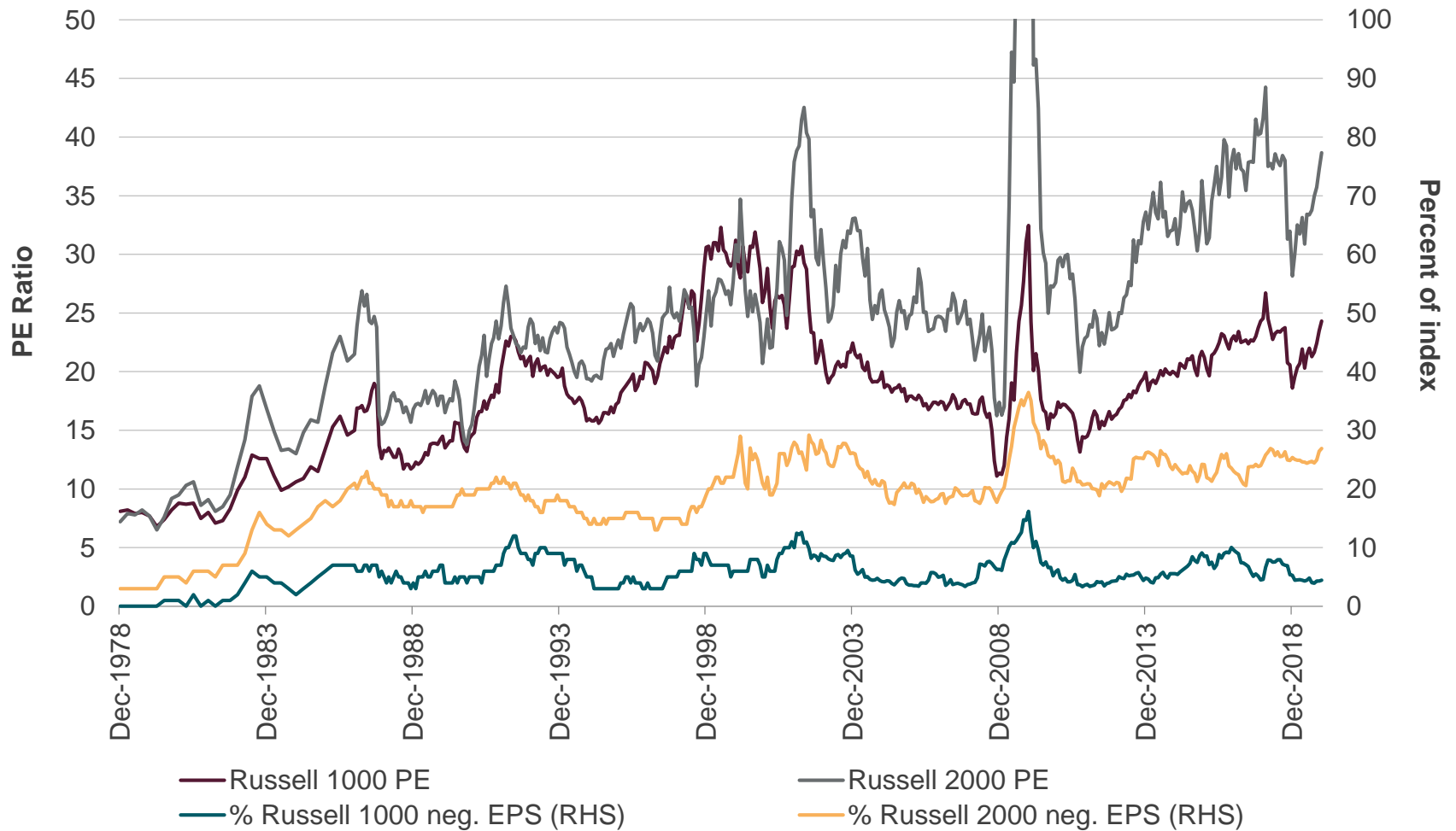
US small cap currently more volatile than non-US small cap



Source: FTSE Russell. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

Historical P/E

December 31, 1978 – December 31, 2019



Source: FTSE Russell

Portfolio characteristics

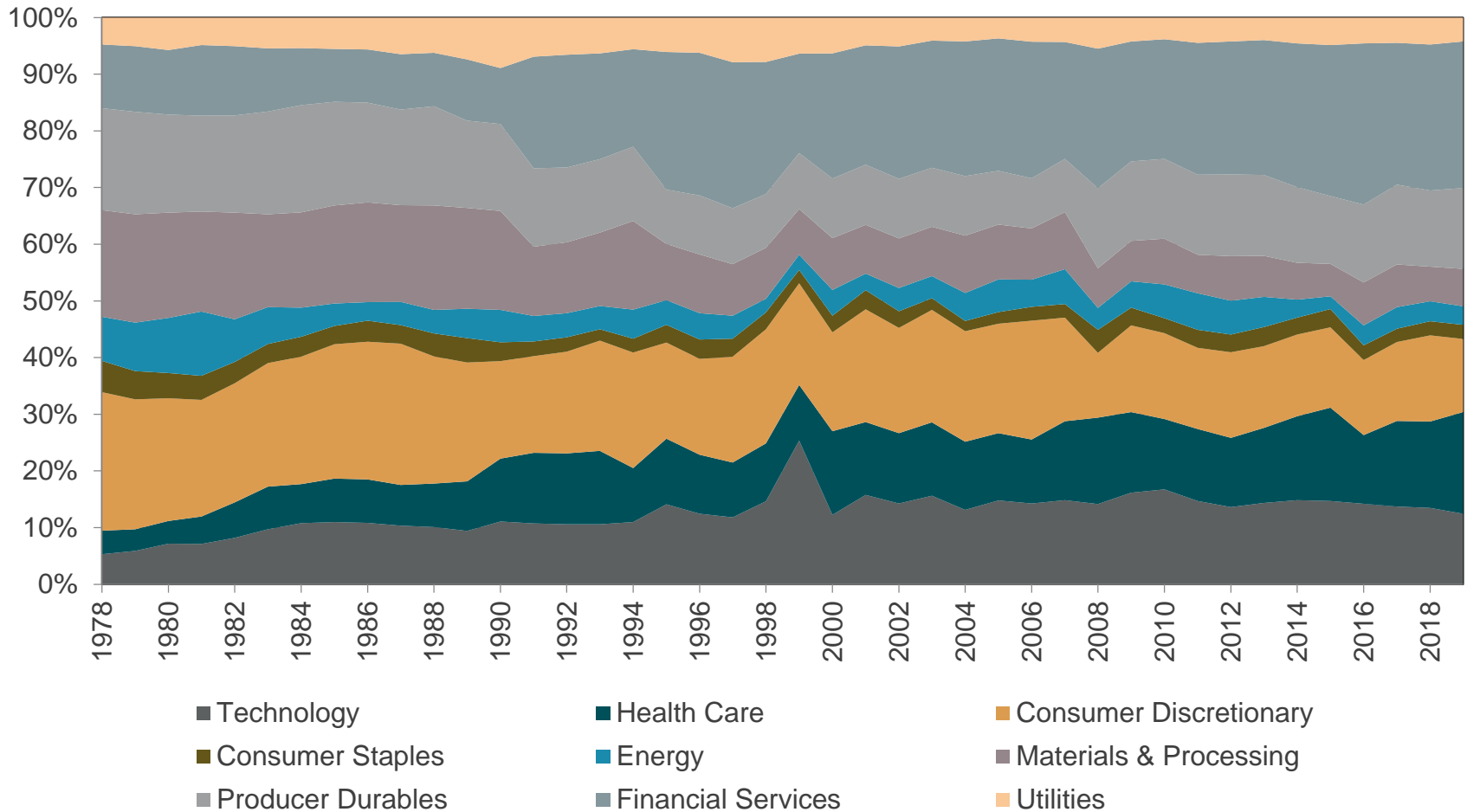
as of December 31, 2019

	Russell 2000	Russell 1000
Avg Market Capitalization (\$billion)	2.5	226.2
Dividend Yield	1.4	1.8
Price/Earnings	38.7	24.3
Price/Earnings excluding negative EPS	20.5	22.2
P/E using FY1 Est	17.3	20.1
Price/Book	2.0	3.3
Price/Sales	1.1	2.3
Non-US Revenue %	28.1	44.4

Source: FTSE Russell, Factset

Russell 2000 historical sector weights

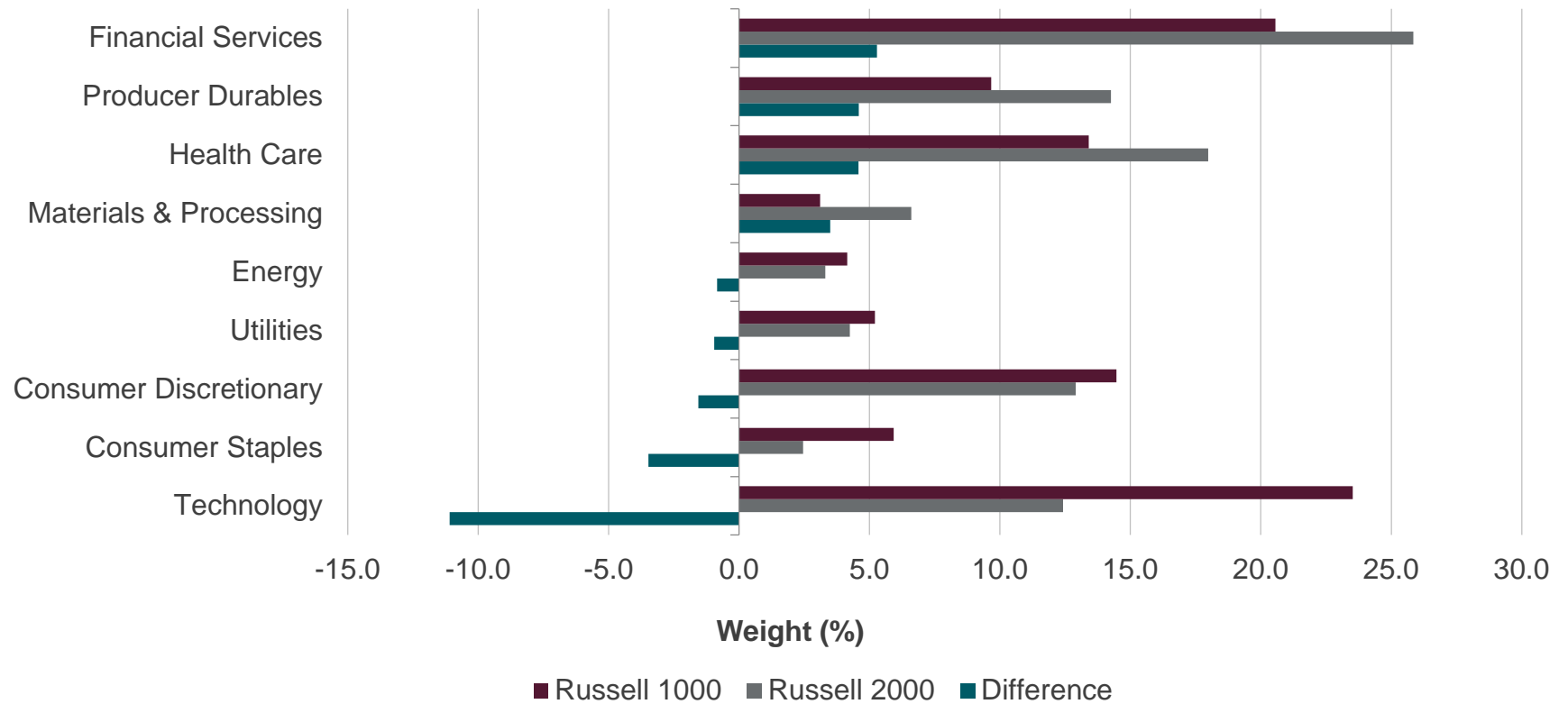
December 31, 1978 – December 31, 2019



Source: FTSE Russell

Relative sector weights

December 31, 2019



Source: FTSE Russell

Key conclusions

1 The “small cap premium” has not been realized over the last 40 years.

2 The large/small volatility relationship has been fairly constant over time.

3 Daily volatility is higher since the TMT bubble, but we are currently in a low volatility regime as measured by lower frequency data.

4 US Small cap is currently more volatile than both Developed and Emerging Int'l markets.

5 US Small cap is currently undervalued relative to US Large cap.

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