Index rebalance forecasts

Research Signals

The first stock market index fund was launched by Vanguard in 1976, moving indexes from being just a benchmark in evaluating portfolio performance and risk to investable assets replicated by products such as mutual funds and exchange traded funds (ETFs). While the constituents of many indexes are determined subjectively, Russell US Indexes are a widely followed group of products (tens of trillions of dollars track and benchmark the indexes), that have a rules based construction, for which we provide constituent and weighting estimates leading up to their consequential annual rebalancing period.

- Applying our methodology to the 2017 index rebalance, we correctly forecasted 974 of the 989 Russell 1000 constituents (98.5%) and 1951 of the Russell 2000 constituents (97.6%), with false positives of just 1.3% and 3.1%, respectively.

- Our findings support our hypothesis that going long a basket of stocks forecasted to enter the indices can outperform the benchmarks. From the 2017 rank date to the rebalance date, stocks forecasted to move to the Russell 1000 from the Russell 2000 slightly underperformed the index, while names dropping to the Russell 2000 dipped further, but both groups outperformed in the month after the rebalance date with returns of 4.0% (Russell 1000: 1.3%) and 7.4% (Russell 2000: 1.6%), respectively.

- We also find alpha in going short a basket of stocks forecasted to be deleted from the index, with the strongest results coming from those removed from the Russell 2000, with that basket of stocks underperforming the index by 3.9% for the month following the rebalance date, and 8.6% for the two months, before mean reverting. Stocks moving from the Russell 1000 to the Russell 2000 produced mixed results.

- Names recently forecasted to move into the Russell 1000 and Russell 2000 with the highest confidence levels include Nektar Therapeutics and Rocket Pharmaceuticals, respectively, while Gamestop and Freds are forecasted to move out.

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Introduction

As investor allocation continues to shift to passive funds, indexes and smart beta products, the impact of index rebalances is growing in importance. Accurate predictions for which stocks will enter or exit a major index, thus forecasting a shift in supply and demand for that stock, present attractive opportunities for many traders and hedge funds.

We introduce a process that aims to forecast the membership lists, changes and weight allocations of the major Russell US Indexes: Russell 1000, Russell 2000 and Russell 3000. With $231B assets under management (AUM) tied to these indexes through 84 ETFs as of 12 April 2018, and an estimated total AUM of $8.5T tied to them through mutual funds, index tracking funds and other investment vehicles, the potential flow is substantial for stocks moving in and out of indexes.

Our process aims to replicate the index methodology, using timely updates of corporate actions and market capitalization to forecast the constituents and weights of the index prior to rebalance and announcement. Future releases will extend our forecasting ability to other major index families.

Here we report results from our backtests of the 2016 and 2017 rebalances. In addition, we demonstrate the returns that can be generated by a strategy using the index rebalance forecasts. Finally, we detail a subset of our forecasts for the June 2018 index rebalance (as of 20 April 2018).

Methodology

Russell indexes are completely rebuilt each year, typically on the last Friday in June, unless that falls on the 29th or 30th, in which case rebalancing occurs on the preceding Friday. For 2018, the rebalance schedule is as follows:

Figure 1

Source: FTSE Russell   © 2018 IHS Markit: 1722931
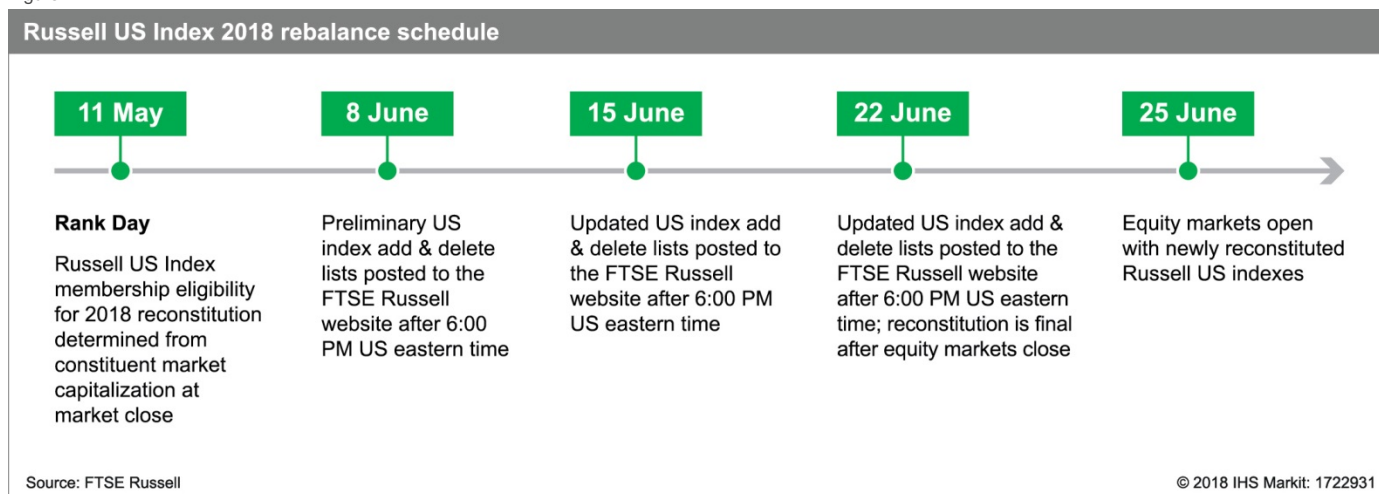
Generally speaking, the constituents included in the indexes are based on a descending list of companies by market capitalization, with the largest 4,000 securities becoming members of the Russell 3000E Index, of which the remaining indexes are a subset. In particular, the Russell 1000 Index includes companies #1–1,000 and the Russell 2000 Index includes companies #1,001–3,000. However, many criteria are also considered in determining the final list of eligible securities, some of which we outline below:

• A stock must trade on NYSE, NYSE American, NASDAQ, ARCA, BATS or IEX

• A stock must have a closing price at or above $1

 May 2018

- A stock must have a total market capitalization above $30 million

- A stock must have at least 94.5% of its shares available in the marketplace

- Share types that are not eligible for market cap calculation include preferred and convertible preferred stock, redeemable shares, participating preferred stock, warrants, rights, installment receipts and trust receipts

- Companies structured as royalty trusts, US limited liability companies, closed-end investment companies, Business Development Companies, blank-check companies, special-purpose acquisition companies (SPACs) or limited partnerships are excluded

- ETFs and mutual funds are excluded

- Real Estate Investment Trusts (REITs) and Publicly Traded Partnerships (PTPs) are excluded if they generate or historically generated unrelated business taxable income (UBTI) and have not taken steps to block UBTI to equity holders

- Only companies determined to be part of the US equity market are included as determined by country of incorporation, country of headquarters and country of the most liquid exchange as defined by two-year average daily dollar trading volume (ADDTV) from all exchanges within a country, with country assignment involving analysis of assets/revenue by location

Finally, after the initial market cap breakpoints are determined by the ranges of eligible companies, existing members are reviewed to determine if they fall within a cumulative 5% market cap range around the new market cap breakpoints, as companies that fall on the edge of market cap breakpoints are often still within a manager's opportunity set since they have not significantly grown or declined in market cap.

Using the steps outlined above, we then forecast the membership lists prior to the official announcement dates. Confidence scores are also computed describing how confident we are in our forecast of whether the stock will be in or out of an index. Confidence scores are a function of three things:

- Probability of stock price movement out of the current index range, accounting for idiosyncratic volatility

- Time – as we move closer to the index rank date, the likelihood of a major stock price movement is reduced

- Corporate actions – mergers, spin-offs, and relocations can change how the index provider classifies a company, so corporate actions decrease the confidence of our projections

The calculation of the confidence score *k* is as follows:

$$k = \frac{CutoffLevel}{StockPrice \; x \; RealizedVolatility \; x \; \sqrt{\frac{DaysToRankDate}{365}}}$$

where

CutoffLevel = the nearest index market cap cutoff applicable to the stock

StockPrice = closing price as of forecast date

RealizedVolatility = annualized realized volatility for the past 60 months

DaysToRankDate = number of days from the forecast date to the next rank date

Confidence scores span 5 categories:

Table 1

Confidence scores	
Score	**Description**
Very High	Required price change is more than 5 standard deviations
High	Required price change is between 4 and 5 standard deviations
Moderate	Required price change is between 3 and 4 standard deviations
Low	Required price change is between 2 and 3 standard deviations
Very Low	Required price change is within 1 standard deviation

Source: IHS Markit © 2018 IHS Markit

Accuracy results

Based on the steps described above, we apply our methodology to the 2016 and 2017 index rebalances. We report the more recent 2017 Russell 1000 and Russell 2000 accuracy results below (Table 2) and include 2016 results in the Appendix (see Table A1). The cells shaded green indicate consistent scenarios between forecasts and actual results. Conversely, cells shaded red indicate differing scenarios between forecasts and actual results.

Our 2017 forecasts are as of the rank day 12 May. Of the 989 Russell 1000 constituents in the 2017 rebalance on 23 June, we correctly forecasted 974 names, a hit rate of 98.5%. Furthermore, we only identified 13 false positives, or 1.3%, and missed just 15 names, or 1.5%. Russell 2000 forecasting accuracy was similarly robust. Of the 2000 constituents upon rebalance, we correctly predicted 1951 (97.6% hit rate), with just 62 false positives (3.1%), and 49 misses (2.5%).

While the rebalance logic for 2016 varied slightly, we worked off of the 2017 logic and applied it to 2016 forecasts; however, results were, in fact, somewhat stronger. For the Russell 1000 rebalance, we correctly identified 992 of 1000 names (hit rate 99.2%) as of the 27 May rank day, with just 9 false positives (0.9%) and 8 misses (0.8%). Of the 1988 Russell 2000 constituents, we correctly predicted 1960 (hit rate 98.6%), with 39 false positive (2.0%) and 28 misses (1.4%).

Table 2

Russell index forecast accuracy, 2017				
	Forecast			
	In R1000 / stay in R1000	In R1000 / move to R2000	In R1000 / move out of Russell	**Total**
In R1000 / stay in R1000	945	4	0	949
In R1000 / move to R2000	1	41	0	42
In R1000 / move out of Russell	5	0	1	6
Total	951	45	1	997
	In R2000 / move to R1000	In R2000 / stay in R2000	In R2000 / move out of Russell	
In R2000 / move to R1000	24	7	0	31
In R2000 / stay in R2000	3	1768	10	1781
In R2000 / move out of Russell	1	22	89	112
Total	28	1797	99	1924
	Not in Russell / move to R1000	Not in Russell / move to R2000	Not in Russell / stay out of Russell	
Not in Russell / move to R1000	5	0	4	9
Not in Russell / move to R2000	0	142	35	177
Not in Russell / stay out of Russell	3	29	2848	2880
Total	8	171	2887	3066

(Row label, left side: **Actual result**)

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Return results

Next, we examine returns around the time of the 2017 rebalance for stocks that we forecasted to enter the indexes (Table 3). Our hypothesis is simple – we expect the flow from ETFs, index tracking funds and other funds benchmarked to the Russell indexes to cause prices for stocks entering the indexes to increase and those leaving the indexes to decrease relative to the benchmark. Expected price changes for stocks moving between the Russell 1000 and 2000 is a little more complex, but in general we expect a more favorable reaction for stocks moving into the Russell 1000 than those moving out of the Russell 1000 to the Russell 2000.

In the table, we include returns for the four most common types of index changes. For comparison, we also include returns of the actual newly assigned index constituents both after the rank date and prior to it, though the earlier results would require perfect foresight. Returns for 2016 are included in the Appendix (see Table A2).

Table 3

Returns, 2017									
			Russell 1000 from Russell 2000		Russell 2000 from Russell 1000		New to Russell 2000		Removed from Russell 2000	
Time frame	Russell 1000	Russell 2000	Forecasted	Actual	Forecasted	Actual	Forecasted	Actual	Forecasted	Actual
1 month before rank date	1.9%	1.7%	6.8%	6.1%	-6.4%	-6.5%	4.3%	3.9%	-9.0%	-7.7%
2 weeks before rank date	0.2%	-1.3%	2.6%	2.2%	-5.3%	-5.2%	3.0%	2.3%	-8.3%	-7.5%
Rank date to rebalance date	2.0%	2.3%	1.5%	2.1%	-2.6%	-1.2%	-1.4%	-0.1%	3.7%	4.0%
1 month after rebalance date	1.3%	1.6%	4.0%	3.8%	7.4%	7.6%	5.0%	3.4%	-2.3%	-1.8%
2 months after rebalance date	0.1%	-3.2%	1.3%	1.4%	-2.2%	-2.1%	-1.3%	-3.8%	-11.8%	-10.4%
3 months after rebalance date	2.4%	2.6%	6.0%	5.3%	9.3%	9.6%	7.6%	5.9%	4.2%	2.7%
# of stocks			45	42	28	31	171	177	99	112

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From the rank date to the the rebalance date, stocks forecasted to move into the Russell 1000 from the Russell 2000 (1.5%) slightly underperformed the index (2.0%). However, one month after the rebalance, the return improved to 4.0% compared with 1.3% for the Russell 1000 and 3.8% for the names that actually moved into the index.

Names forecasted to drop from the Russell 1000 to the Russell 2000 initially lagged (-2.6%) relative to the index (2.3%) from the rank date to the rebalance date. Losses were quickly recovered, though, in the month after rebalance with a return of 7.4% compared with 1.6% for the Russell 2000, similarly tracking names that actually moved. Results for new additions to the Russell 2000 were similar with a return of -1.4% followed by 5.0% post rebalance. As expected, the weakest group was those names forecasted to drop out of the Russell 2000, with a return of 3.7% between the rank date and rebalance date (coming off of a -9.0% return in the month prior), followed by significant underperformance (-11.8%) in the two months post rebalance, before mean reverting after three months. Returns for the 1-month and 2-weeks prior to the rank date are also reported, revealing profitable strategies of going long the index additions and short the index deletions prior to the rank date. We note that our forecast accuracy increases closer to the rank date.

Some differences are seen in 2016 results. Stocks forecasted to move into the Russell 1000 from the Russell 2000 (6.1%) performed fairly on par with the Russell 1000 (6.4%) for the first month after the rebalance, after strong outperformance was recorded in the month leading up to the rank date (6.3% versus 0.1%). Likewise, in the two weeks prior to the rank date, stocks forecasted to drop to the Russell 2000 from the Russell 1000 (3.3%) closely tracked the index (4.4%) but lost more ground in the month following the rebalance (4.4% versus 7.3%). Stocks new to the Russell 2000 (7.8%) outperformed the Russell 2000 (7.3%) over the next month before tracking the benchmark more closely after. Interestingly, stocks forecasted to be removed from the Russell 2000 (1.2%) underperformed for the first month post rebalance before rallying and outperforming over the next month (10.9% versus 9.7%). Again, we find strategies trading leading into the rank date are also robust and consistent with our hypothesis.

Figures 1 and 2 visually demonstrate the returns of our forecasted portfolios for the Russell 1000 and Russell 2000, respectively. In this case we display cumulative returns indexed from the rank date, two weeks prior through one month after the rebalance date. Forecasts reported in Table 1 along with additional forecast groups include names new to the Russell 1000, for which we report a return of 0.7% in the weeks leading up to the rank date with continued outperformance one month out of 5.8%, compared with 3.3% for the index. It should be noted that the Forecasted New to Russell 1000 bucket underperforms the actual New to Russell 1000 bucket, but is driven by our false positive forecast of

SNAP, which returned -19.7% from the rank date to one month out.   Results for 2016 are again included in the Appendix (see Figures A1 and A2, respectively).
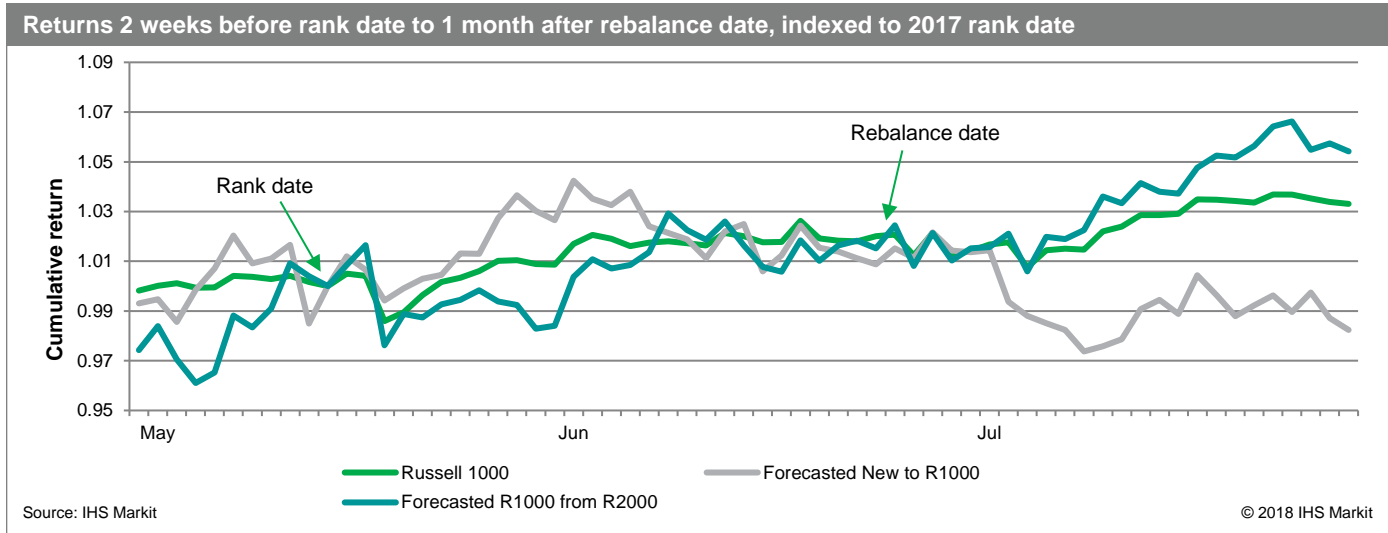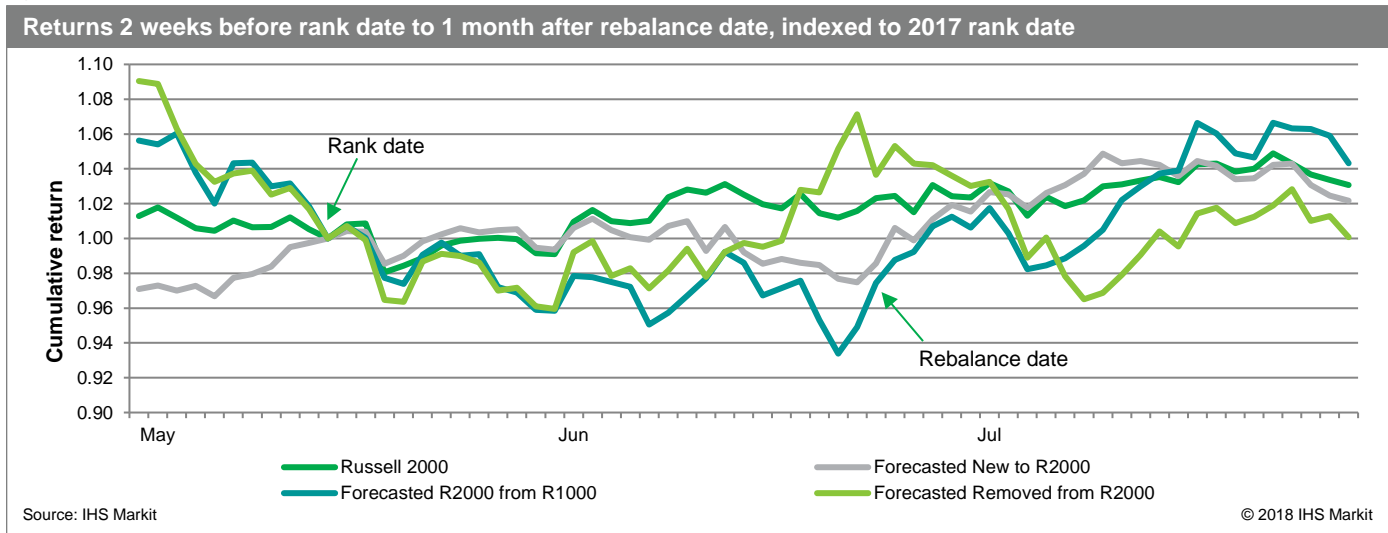
Figure 1

Returns 2 weeks before rank date to 1 month after rebalance date, indexed to 2017 rank date

Source: IHS Markit

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Figure 2

Returns 2 weeks before rank date to 1 month after rebalance date, indexed to 2017 rank date

Source: IHS Markit

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Figures 3 and 4 provide visualization of the Russell 1000 and 2000 cumulative returns (again indexed to the rank date) ranging from two months prior to the rank date through four months after the rebalance date. Here we highlight the long term trend of stocks that move from Russell 1000 to Russell 2000 and continue to outperform the Russell 1000 months after the rebalance. Interestingly, the Russell 2000 additions tended to track the Russell 2000 index quite closely following the rebalance date, albeit with increased volatility compared to the index as a whole. In 2016 (see Figures A3 and A4 in the Appendix), the long term cumulative returns show that stocks added to the Russell 1000 from the Russell 2000 tended to outperform for the first couple months before reverting back to the mean over the longer horizon. With Russell 2000 additions, we again observe that index additions tend to track the benchmark quite closely after the rebalance date.

Returning to our hypothesis, our results suggest benefits, overall, to several approaches including buying ahead of the official rank day, and holding up to one month after the rebalance, those names that are forecasted new to the Russell 1000 and those moving up from the Russell 2000, along with names new to the Russell 2000. In addition, those stocks deleted from the Russell 2000 strongly underperform the index for a period of time. However, we note that our forecast accuracy will improve the closer to the rank date we get, so we suggest focusing on stocks for which our forecast confidence is high

prior to the rank date. Our results suggest that taking action prior to the rank date and holding for one month post rebalance date produces the results most consistent with our hypothesis, while three months or further past the rebalance date we observe mean reversion tendencies.

Figure 3

Returns 2 months before rank date to 4 months after rebalance date, indexed to 2017 rank date

Source: IHS Markit
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Figure 4

Returns 2 months before rank date to 4 months after rebalance date, indexed to 2017 rank date

Source: IHS Markit
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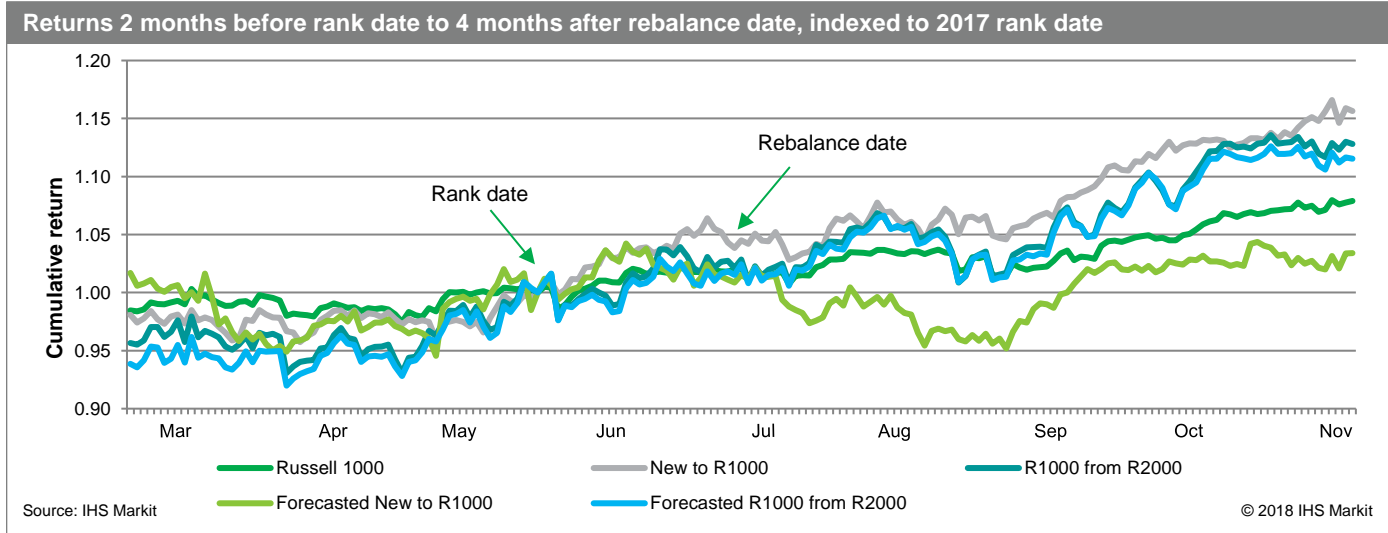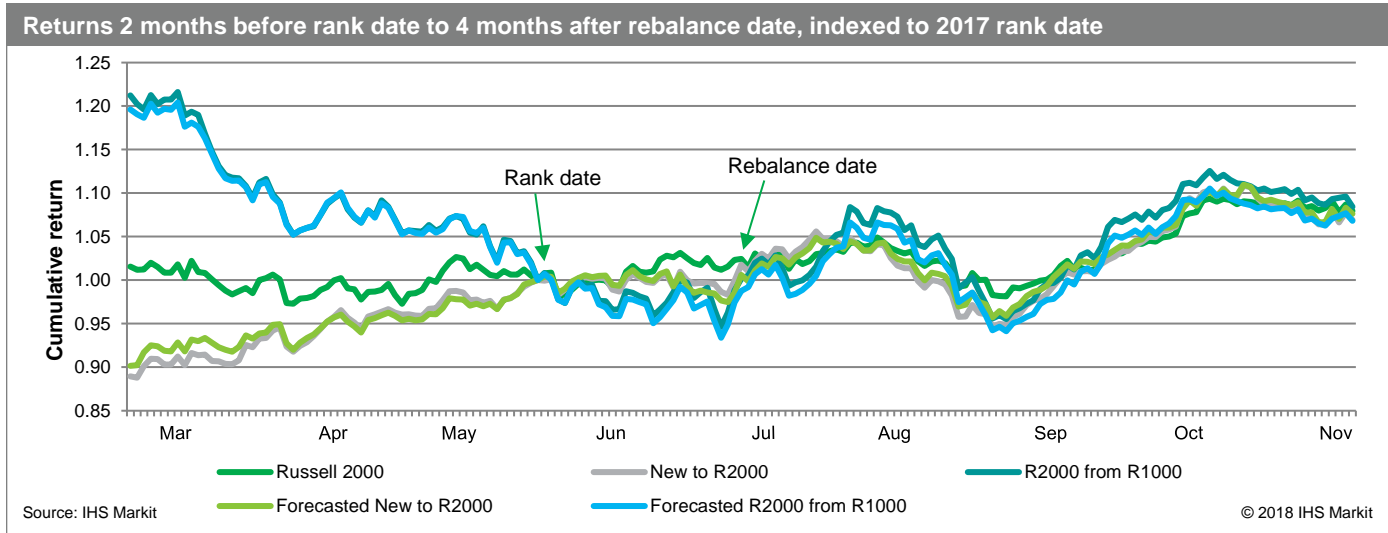
Current forecasts

We round out the report with a brief review of the stocks we are forecasting for each move as of 20 April 2018. We currently forecast 4 names to be added to the Russell 1000 with an additional 36 names to move up from the Russell 2000 and no deletions. For the Russell 2000, we forecast 146 new additions, 36 from the Russell 1000 and 85 deletions.

Table 4

Russell index rebalance forecast counts, 20 Apr 2018	
Forecast type	Count
New to Russell 1000	4
Russell 1000 from Russell 2000	36
Removed from Russell 1000	0
New to Russell 2000	146
Russell 2000 from Russell 1000	36
Removed from Russell 2000	85

Source: IHS Markit © 2018 IHS Markit

Lastly, we present a sampling of firms that we recently forecasted to enter or leave the Russell 1000 and 2000 indexes along with their confidence levels (Table 5). Nektar Therapeutics (NKTR) and Sage Therapeutics (SAGE) are forecasted to move to the Russell 1000 from the Russell 2000, while Simply Good Foods (SMPL) and Rocket Pharmaceuticals (RCKT) are forecasted to be newly added to the Russell 2000, all with very high confidence levels.

Conversely, Gamestop (GME) and Pandora Media (P) are forecasted to move down to the Russell 2000 with very high confidence levels. Zynerba Pharmaceuticals (ZYNE) and Freds (FRED) are forecasted to drop out of the Russell 2000, again with very high confidence levels.

Table 5

Russell index rebalance forecasts, 13 Apr 2018				
Name	Ticker	Current index status	Forecasted index status	Confidence level
Russell 1000 additions				
Nektar Therapeutics	NKTR	Russell 2000 member	Added to Russell 1000 from Russell 2000	Very High
Sage Therapeutics Inc	SAGE	Russell 2000 member	Added to Russell 1000 from Russell 2000	Very High
Dropbox Inc	DBX	Not in Russell indexes	Added to Russell 1000	Very High
Russell 1000 deletions				
Gamestop Corp New	GME	Russell 1000 member	Deleted from Russell 1000, moves to Russell 2000	Very High
Pandora Media Inc	P	Russell 1000 member	Deleted from Russell 1000, moves to Russell 2000	Very High
Sally Beauty Hldgs Inc	SBH	Russell 1000 member	Deleted from Russell 1000, moves to Russell 2000	Very High
Russell 2000 additions				
Simply Good Foods Co	SMPL	Not in Russell indexes	Added to Russell 2000	Very High
Rocket Pharmaceuticals Inc	RCKT	Not in Russell indexes	Added to Russell 2000	Very High
Ashford Inc	AINC	Not in Russell indexes	Added to Russell 2000	Moderate
Russell 2000 deletions				
Freds Inc	FRED	Russell 2000 member	Deleted from Russell 2000	Very High
Zynerba Pharmaceuticals Inc	ZYNE	Russell 2000 member	Deleted from Russell 2000	High
Delta Apparel Inc	DLA	Russell 2000 member	Deleted from Russell 2000	High

Source: IHS Markit © 2018 IHS Markit

Conclusion

We introduce a new Research Signals process to forecast the membership lists, changes and weight allocations of the Russell 1000, 2000 and 3000 Indexes leading up to the official index rebalance in late June of each year. Given the large potential flows from products tracking the indexes, the impact of rebalances on the supply and demand for stocks moving in and out of the indexes presents attractive opportunities for investors.

Applying our methodology to the 2017 rebalance, we correctly forecasted 974 of the 989 Russell 1000 constituents (hit rate of 98.5%) with only 13 false positives (1.3%). For the Russell 2000, we correctly forecasted 1951 of the 2000 constituents (97.6% hit rate), with just 62 false positives (3.1%).

We also report the returns of our forecasted portfolios. In 2017, stocks we forecasted to move into the Russell 1000 from the Russell 2000 slightly underperformed the Russell 1000 from the rank date to the rebalance date, but outperformed the index (4.0% versus 1.3%) in the month after the rebalance. Similarly, stocks forecasted to enter the Russell 2000 underperformed leading into the rebalance but outperformed post rebalance. Stocks that we forecasted to be eliminated from the Russell 2000 beat the index prior to the rebalance date, but underperformed significantly over the next two months post rebalance (-11.8% versus -3.2%) before mean-reverting after three months.

2016 results were not consistent with 2017. We observed stocks moving into the Russell 1000 from the Russell 2000 performed fairly on par with the Russell 1000 for the first month after the rebalance. Stocks new to the Russell 2000 outperformed the Russell 2000 over the next month before tracking more closely after. Interestingly, stocks forecasted to be removed from the Russell 2000 underperformed for the first month post rebalance before rallying and outperforming over the next month.

Forecasts for the June 2018 index rebalance (as of 20 April 2018) include Nektar Therapeutics into the Russell 1000 and Gamestop's removal with very high confidence levels. For the Russell 2000, Rocket Pharmaceuticals (RCKT) and Freds are forecasted to be respective additions and deletions, again with very high confidence levels.

Appendix

Table A1

Russell index forecast accuracy, 2016				

		Forecast			
		In R1000 / stay in R1000	In R1000 / move to R2000	In R1000 / move out of Russell	Total
	In R1000 / stay in R1000	960	3	0	963
	In R1000 / move to R2000	0	52	0	52
	In R1000 / move out of Russell	5	0	0	5
	Total	965	55	0	1020
		In R2000 / move to R1000	In R2000 / stay in R2000	In R2000 / move out of Russell	
	In R2000 / move to R1000	31	4	0	35
Actual result	In R2000 / stay in R2000	2	1762	6	1770
	In R2000 / move out of Russell	2	12	104	118
	Total	35	1778	110	1923
		Not in Russell / move to R1000	Not in Russell / move to R2000	Not in Russell / stay out of Russell	
	Not in Russell / move to R1000	1	0	1	2
	Not in Russell / move to R2000	0	146	20	166
	Not in Russell / stay out of Russell	0	20	2608	2628
	Total	1	166	2629	2796

Source: IHS Markit

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Table A2

			Russell 1000 from Russell 2000		Russell 2000 from Russell 1000		New to Russell 2000		Removed from Russell 2000	
Returns, 2016										
Time frame	Russell 1000	Russell 2000	Forecasted	Actual	Forecasted	Actual	Forecasted	Actual	Forecasted	Actual
1 month before rank date	0.1%	-0.3%	6.3%	4.8%	-8.5%	-9.3%	4.3%	4.9%	-14.5%	-11.9%
2 weeks before rank date	2.6%	4.4%	6.2%	5.0%	3.3%	3.4%	5.0%	5.1%	5.0%	5.5%
Rank date to rebalance date	-2.9%	-2.0%	-0.6%	-0.5%	-2.4%	-2.6%	-4.9%	-4.1%	3.6%	2.6%
1 month after rebalance date	6.4%	7.3%	6.1%	6.8%	4.4%	4.1%	7.8%	7.9%	1.2%	1.3%
2 months after rebalance date	6.8%	9.7%	6.6%	7.3%	10.4%	10.2%	8.8%	8.9%	10.9%	11.0%
3 months after rebalance date	5.6%	10.1%	6.2%	6.7%	12.4%	12.0%	9.8%	10.2%	13.6%	13.6%
# of stocks			55	52	35	35	166	166	110	118

Source: IHS Markit   © 2018 IHS Markit

Figure A1

Returns 2 weeks before rank date to 1 month after rebalance date, indexed to 2016 rank date

Source: IHS Markit   © 2018 IHS Markit

Figure A2

Returns 2 weeks before rank date to 1 month after rebalance date, indexed to 2016 rank date

Source: IHS Markit

— Russell 2000
— Forecasted R2000 from R1000
— Forecasted New to R2000
— Forecasted Removed from R2000

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Figure A3

Returns 2 months before rank date to 4 months after rebalance date, indexed to 2016 rank date

Source: IHS Markit

— Russell 1000
— R1000 from R2000
— New to R1000
— Forecasted R1000 from R2000

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Figure A4

Returns 2 months before rank date to 4 months after rebalance date, indexed to 2016 rank date

Source: IHS Markit

— Russell 2000
— Forecasted New to R2000
— New to R2000
— Forecasted R2000 from R1000
— R2000 from R1000

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