Semi-Annual Presentation
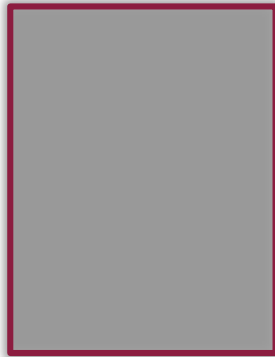
Friday, April 26th, 2019

Team A - Undergraduate Student Investment Management Fund

Team Introduction

Fund
Manager

Drew Kudlinski

Fund
Analysts

Jenna Snittjer

Vishnu Patel

John Michael
Hayes

Andrew Fox

Neil Jha

John Remy

Investment Thesis

Event-based portfolio based upon "Predictable Corporate Distributions and Stock Returns" by Hendrik Bessembinder and Feng Zhang
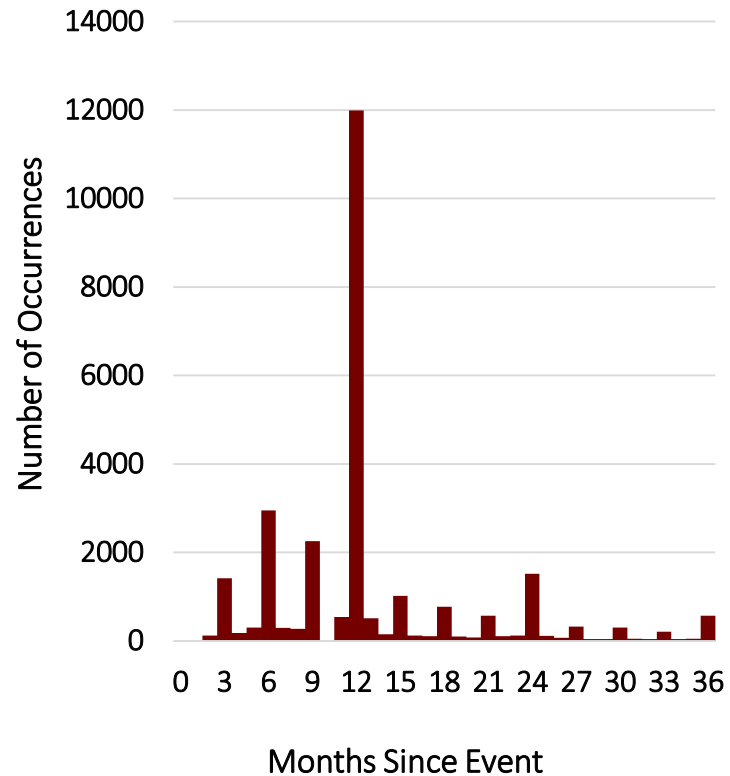*The Review of Financial Studies, 2014*

Dividend increase at $t - 12 \rightarrow$ Dividend increase likely in t
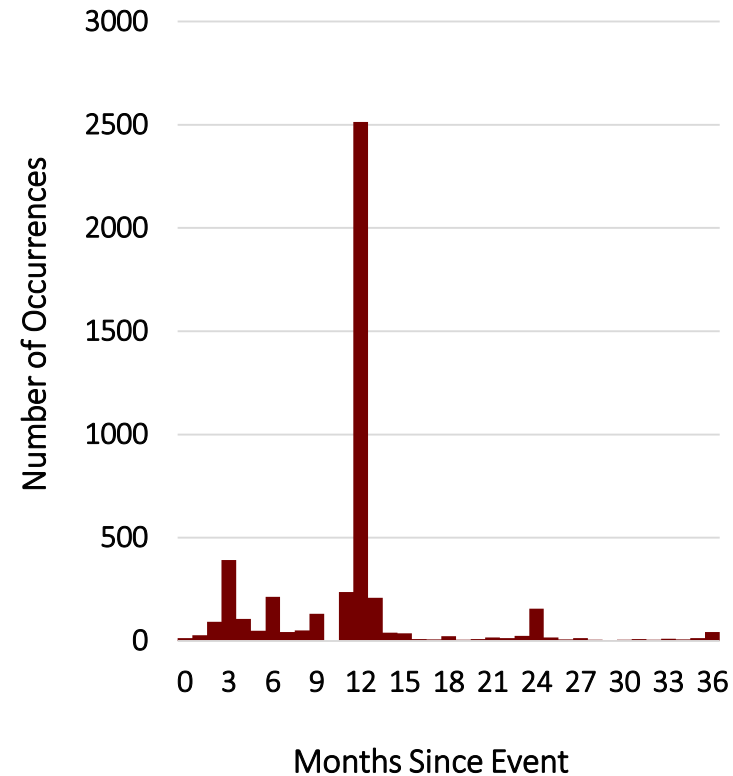Special dividends at $t - 12 \rightarrow$ Special dividends likely in t
Stock dividend at $t - 12 \rightarrow$ Stock dividend likely in t
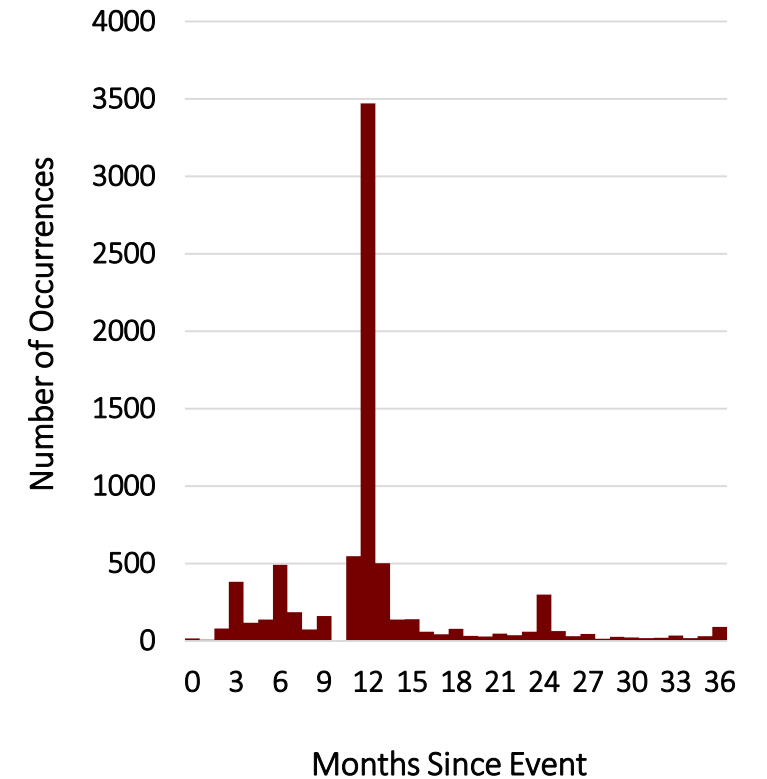
Frequency of Follow-On Events

Dividend Increases

Special Dividends

Stock Dividends

Conditional Probabilities

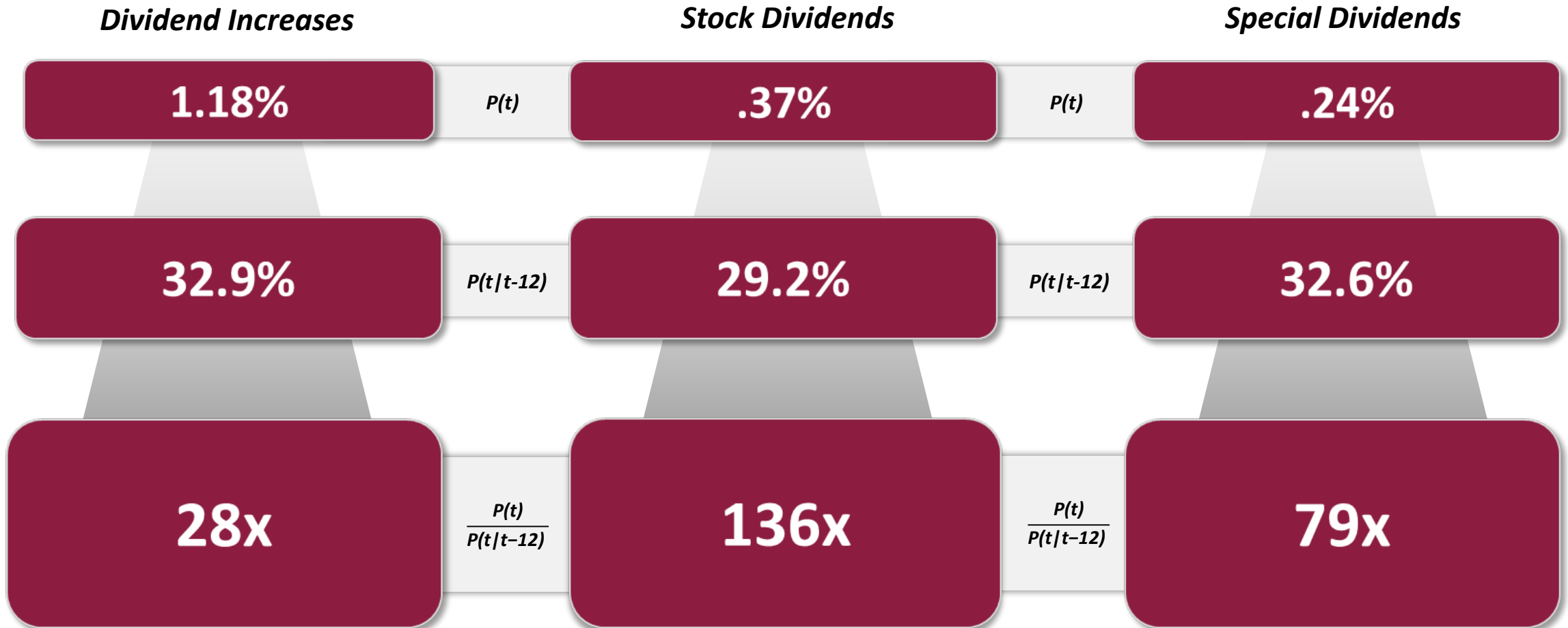| **Dividend Increases**		**Stock Dividends**		**Special Dividends**
1.18%	$P(t)$	.37%	$P(t)$	.24%
32.9%	$P(t\|t\text{-}12)$	29.2%	$P(t\|t\text{-}12)$	32.6%
28x	$\dfrac{P(t)}{P(t\|t-12)}$	136x	$\dfrac{P(t)}{P(t\|t-12)}$	79x

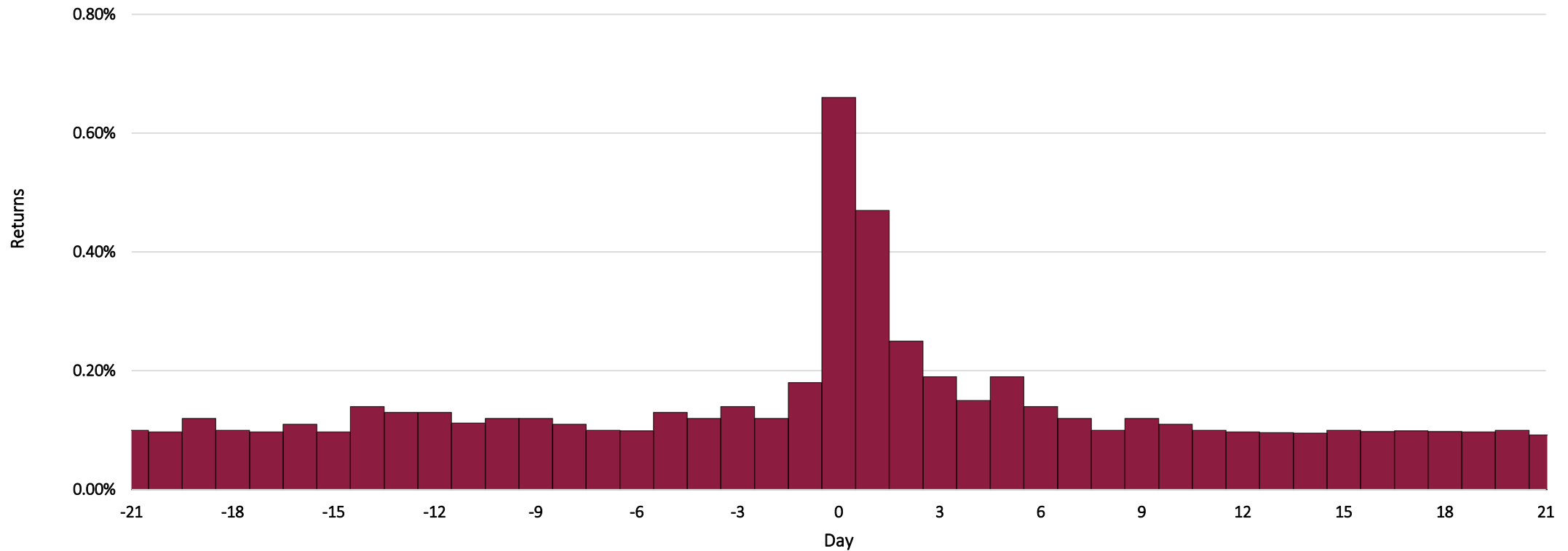# Daily Stock Returns

Daily Stock Returns Around Event Announcements
Dividend Increases

Strategy Implementation

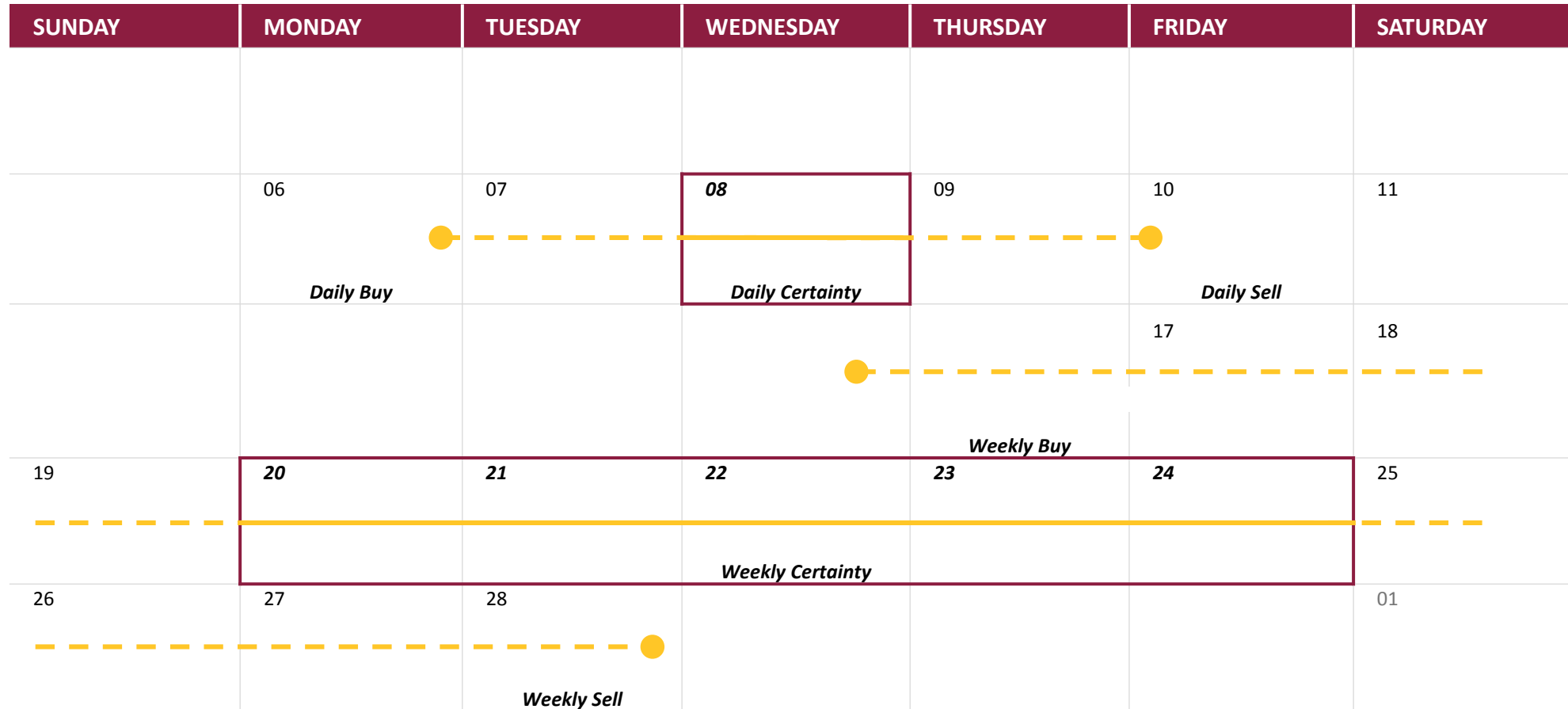# Conditional Probabilities

Conditional Probabilities

Bessembinder / Zhang

Event Types	P(t)	P(t|t-12)	P(t|t-12, t-24)	P(t|t-12, t-24, t-36)	P(t|t-12, t-24, t-36, t-48)
Dividend Increase	1.2%	32.9%	55.3%	62.7%	**66.8%**
Special Dividend	0.2%	32.6%	59.9%	65.0%	**68.1%**
Stock Dividend	0.4%	29.2%	57.6%	64.6%	**68.8%**

Certainty Buckets

Certainty Bucket	Minimum Occurrences	Holding Period
Monthly	--	*1 Month*
Weekly	*4*	*9 Weekdays*
Daily	*4*	*5 Weekdays*

Holding Period Visualization

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	06	07	08	09	10	11
	Daily Buy		Daily Certainty		Daily Sell	
					17	18
				Weekly Buy		
19	20	21	22	23	24	25
			Weekly Certainty			
26	27	28				01
		Weekly Sell				

Realization Rates

Month of November – *81.5% overall hit rate*

January				
Confidence	Predicted	Realized	Hit Rate	Confidence
Daily	2	2	**100%**	50%
Weekly	2	2	**100%**	100%
Monthly	23	18	**78%**	100%

Month of December – *94.2% overall hit rate*

December				
Confidence	Predicted	Realized	Hit Rate	Confidence
Daily	10	10	**100%**	70%
Weekly	14	13	**93%**	77%
Monthly	28	26	**93%**	100%

Month of January – *66.0% overall hit rate*

January				
Confidence	Predicted	Realized	Hit Rate	Confidence
Daily	8	7	**88%**	57%
Weekly	6	4	**67%**	100%
Monthly	39	24	**62%**	100%

Month of February – *89.3% overall hit rate*

February				
Confidence	Predicted	Realized	Hit Rate	Confidence
Daily	15	13	**87%**	62%
Weekly	27	26	**96%**	85%
Monthly	61	53	**87%**	100%

Month of March – *80.0% overall hit rate*

March				
Confidence	Predicted	Realized	Hit Rate	Confidence
Daily	7	6	**86%**	50%
Weekly	1	1	**100%**	100%
Monthly	17	13	**76%**	100%

Month of April – *38.3% overall hit rate **

April				
Confidence	Predicted	Realized	Hit Rate	Confidence
Daily	13	6	**46%**	50%
Weekly	7	3	**43%**	67%
Monthly	27	9	**33%**	100%

as of April 24th 2019

Total Portfolio Returns: Gross vs. Russell 3000

November 19th, 2018 - April 23rd, 2019

Δ =+1.88%

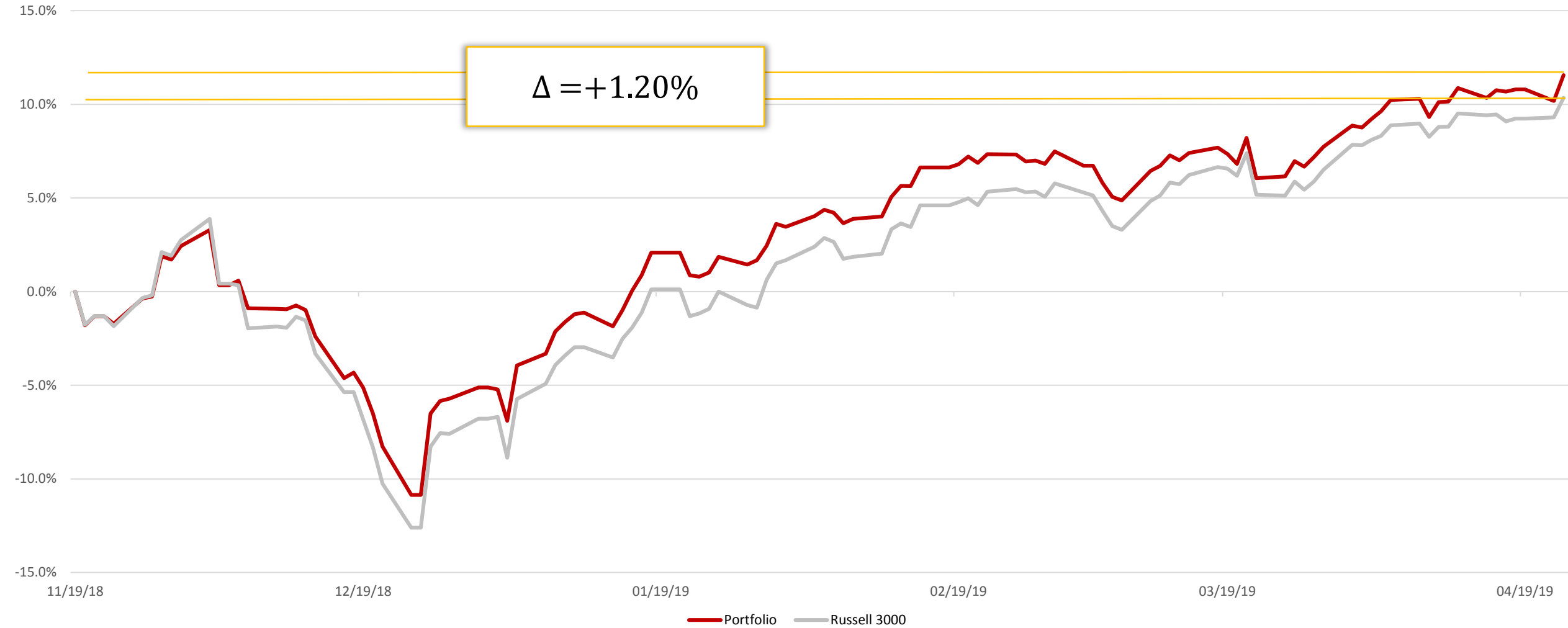Portfolio   Russell 3000
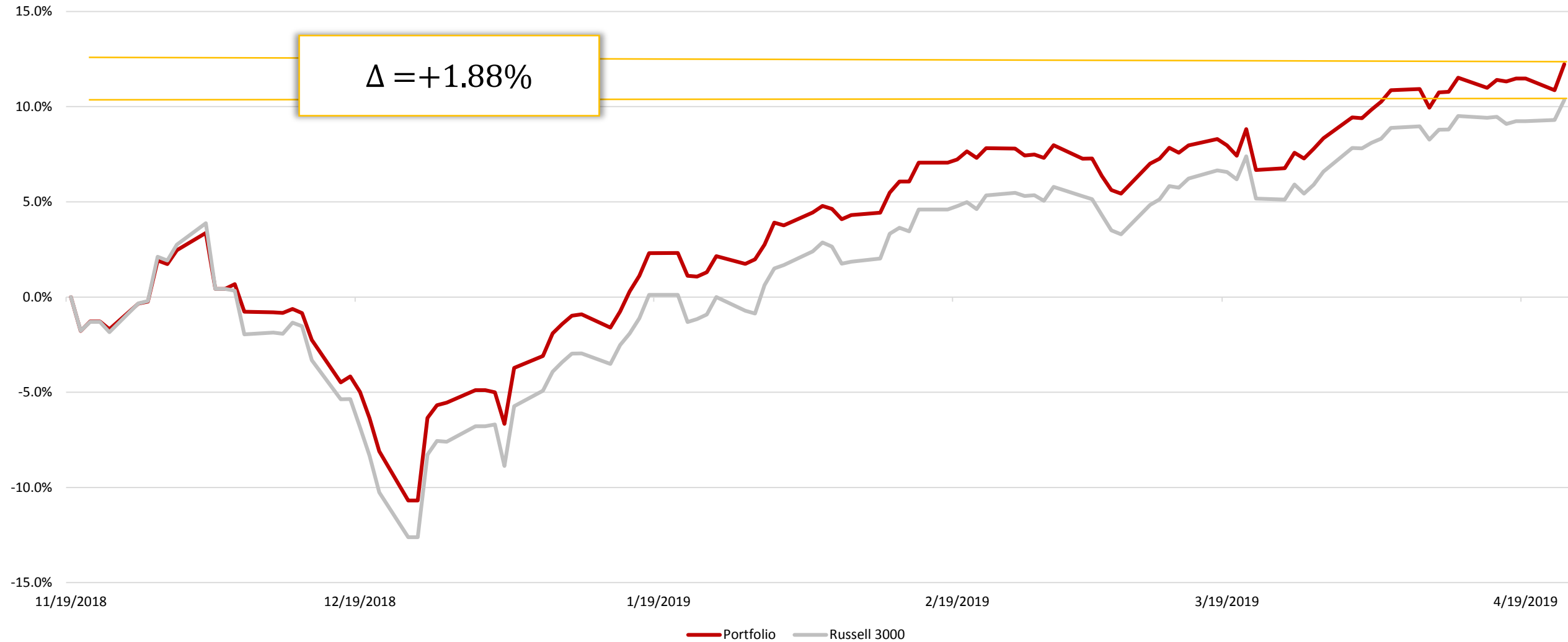
Turnover By Month

Month	Quantity of Trades	Turnover	Contribution to Turnover by Russell
November	$971,479.58	129.53%	34.68%
December	$1,603,733.05	213.83%	29.57%
January	$484,258.23	64.57%	32.31%
February	$742,745.71	99.03%	22.57%
March	$1,301,997.02	173.60%	21.34%
April	$1,309,662.99	174.62%	17.99%
Total	**$6,413,876.58**	**855.18%**	**219.81%**

Total Portfolio Returns: Net of Trading Costs

November 19th, 2018 - April 23rd, 2019

Δ =+1.20%

Portfolio   Russell 3000
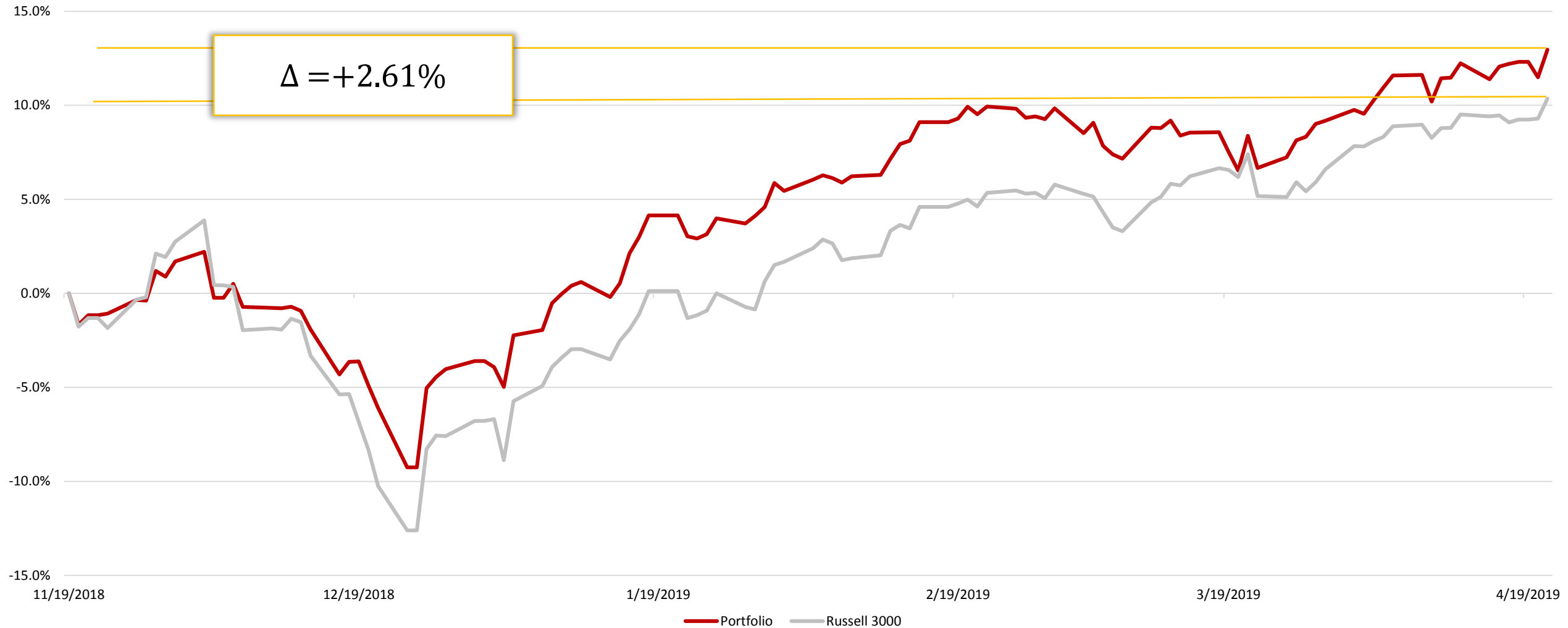
Active Portfolio Returns: Gross Active Returns vs. Russell 3000

November 19th, 2018 - April 23rd, 2019

Δ =+3.19%

Active Portfolio   Russell 3000
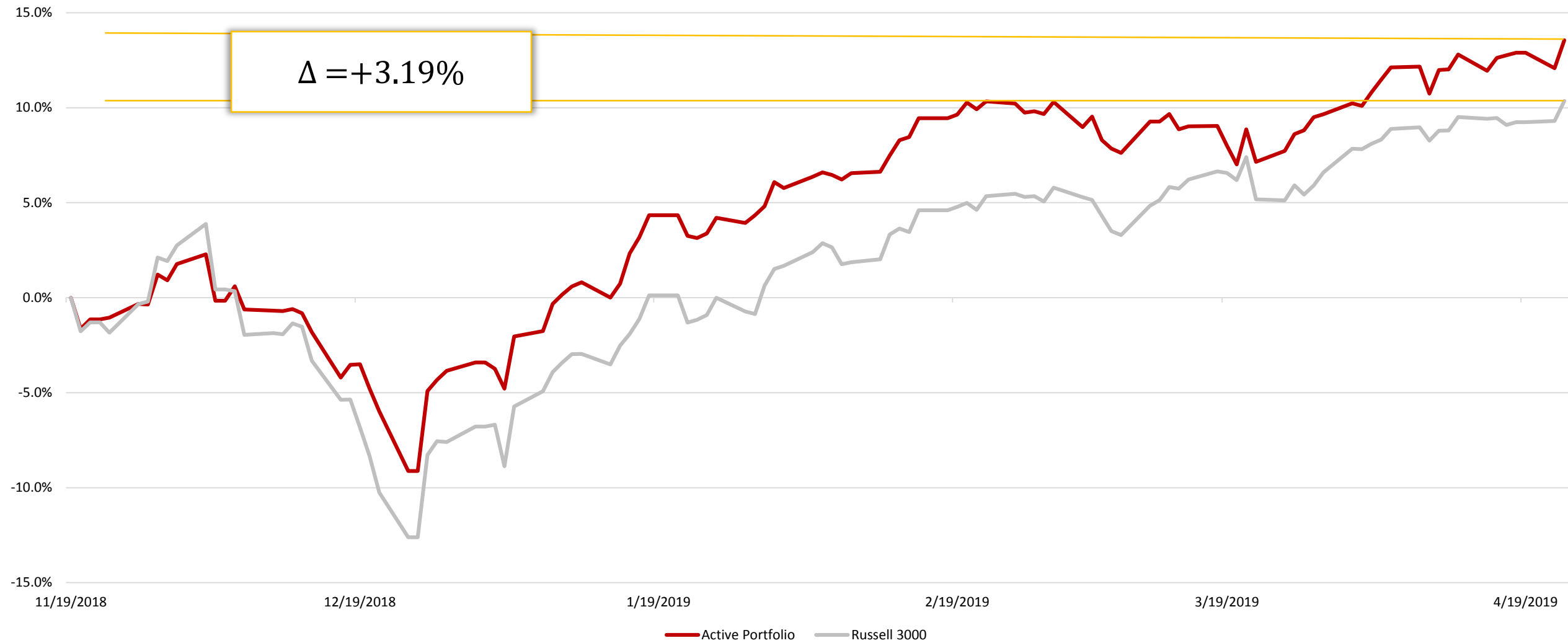
Active Portfolio Returns: Net Active Returns vs. Russell 3000

November 19th, 2018 - April 23rd, 2019

Δ =+2.61%

Portfolio ——— Russell 3000

Shadow Portfolio Benchmarking

Shadow Portfolios: Monthly Rebalance (EW)

Bessembinder and Zhang Portfolio Construction

| Prior Corporate Event Announcements | Portfolios of All Securities in a Given Month | Monthly Holding Periods |

SIM Fund Strategy Implementation Using "Certainty Buckets"

Certainty Bucket	Minimum Occurrences	Holding Period
Monthly	--	*1 Month*
Weekly	*4*	*9 Weekdays*
Daily	*4*	*5 Weekdays*

Shadow Portfolios: Gross Active Only vs. Monthly Rebalance (EW)


November 19th, 2018 - April 23rd, 2019

Δ =+1.42%

Legend: Active Portfolio — Monthly Rebalance (EW)

Shadow Portfolios: Perfect Foresight (EW)

Conditional Probabilities				
Bessembinder / Zhang				
Event Types	P(t)	P(t|t-12)	P(t|t-12, t-24)	P(t|t-12, t-24, t-36)	P(t|t-12, t-24, t-36, t-48)
Dividend Increase	1.2%	32.9%	55.3%	62.7%	**66.8%**
Special Dividend	0.2%	32.6%	59.9%	65.0%	**68.1%**
Stock Dividend	0.4%	29.2%	57.6%	64.6%	**68.8%**

But what if prediction accuracy was 100%?

Shadow Portfolios: Perfect Foresight (EW) vs. Russell 3000
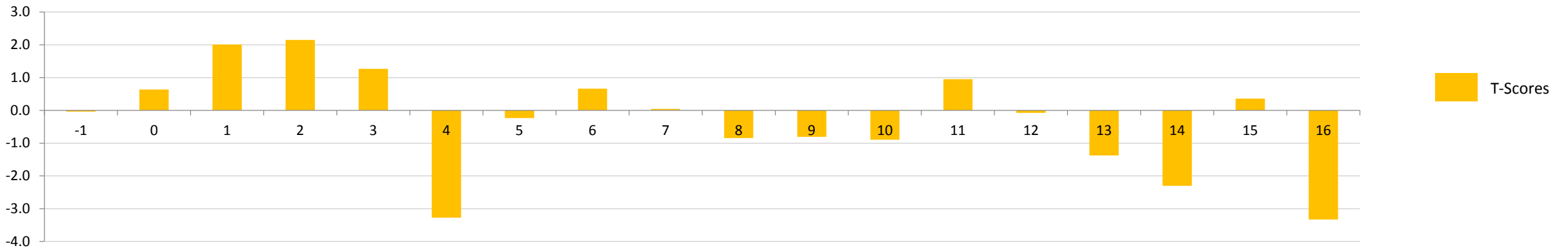
November 19th, 2018 - April 23rd, 2019

Δ = +5.35%

Legend: Perfect Foresight (EW) — Russell 3000
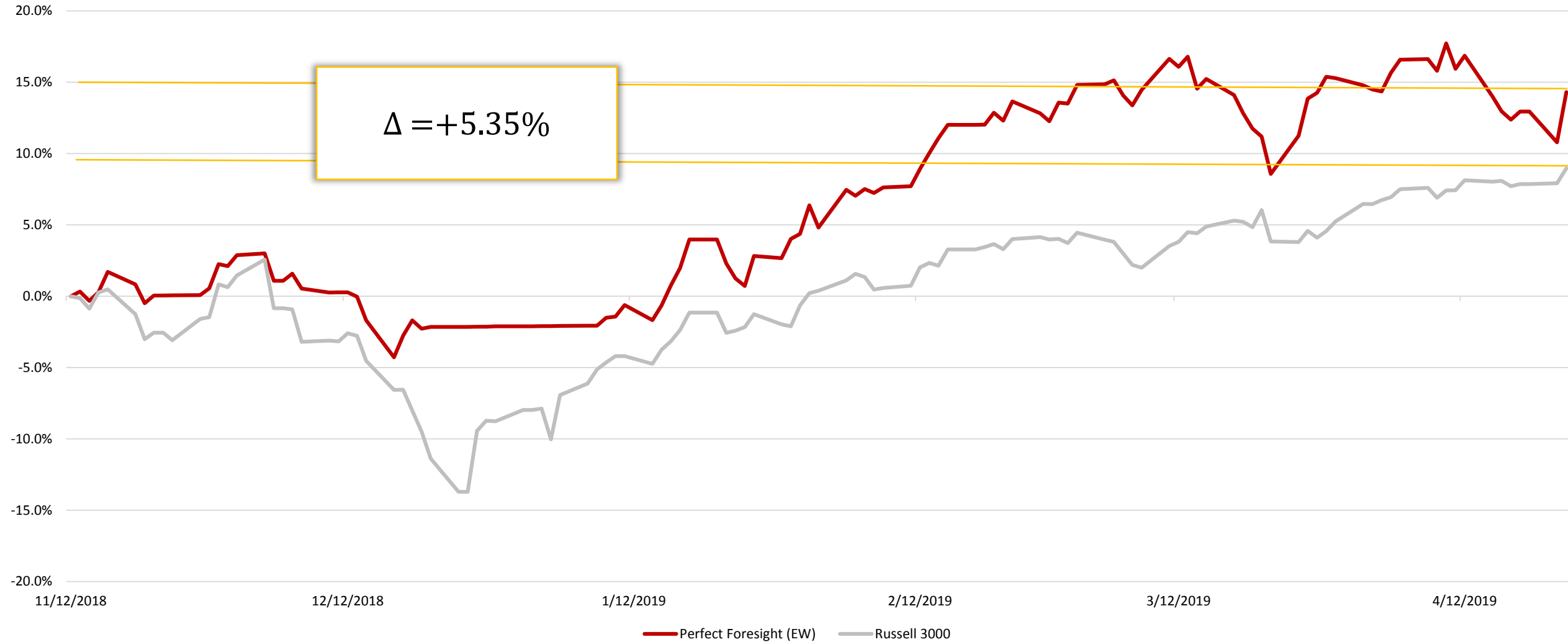
Event Time Returns – Equal Weighted (bps)

Equal-Weighted Excess Returns with Security Count

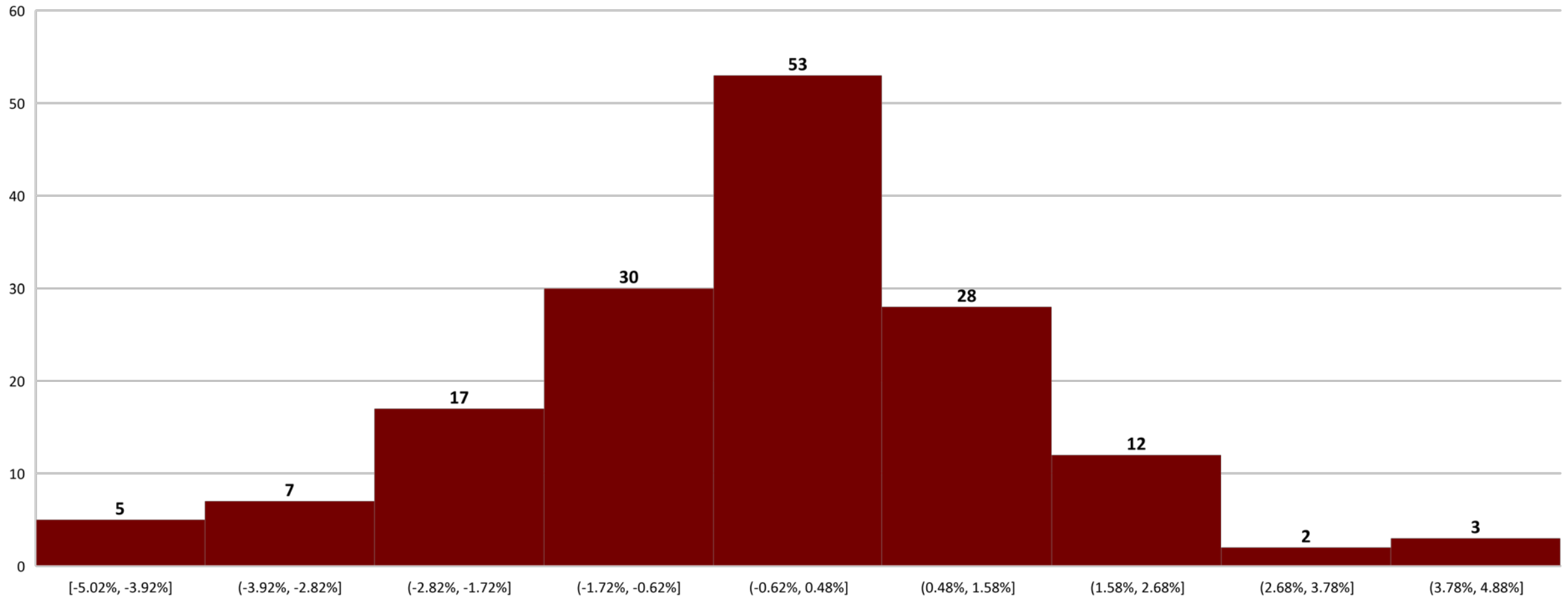Security Count: 192, 192, 192, 189, 173, 157, 153, 141, 116, 83, 82, 71, 62, 44, 32, 32, 24, 15
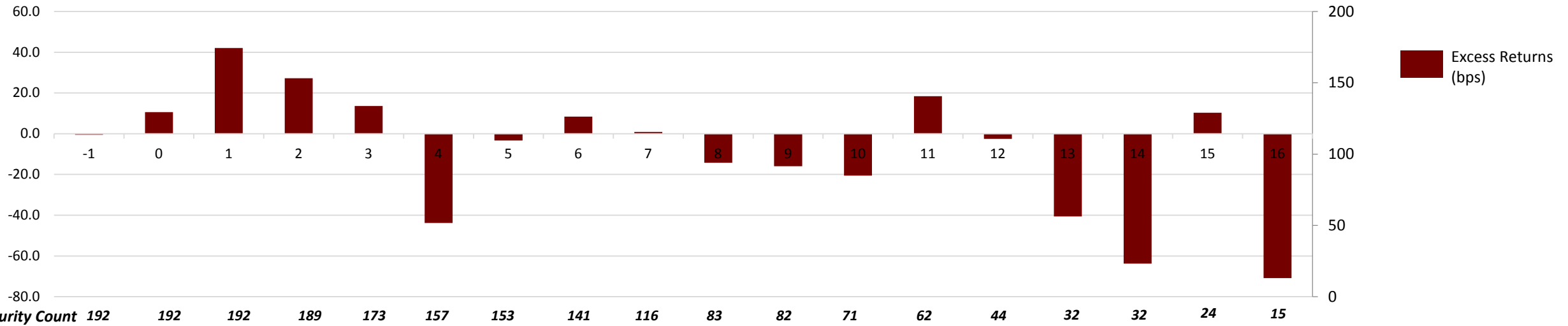
Equal Weighted T-Scores by Day
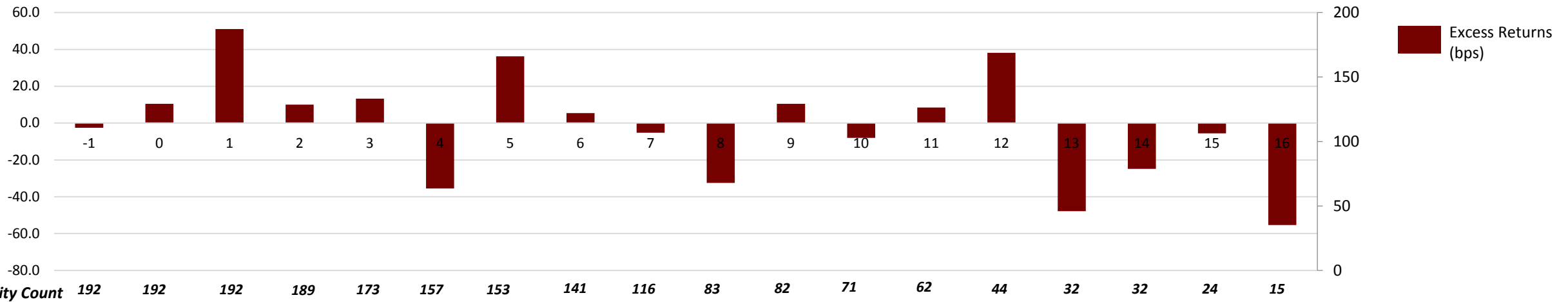
Day 4 Equal Weighted Returns

Event Time Returns – Value Weighted (bps)
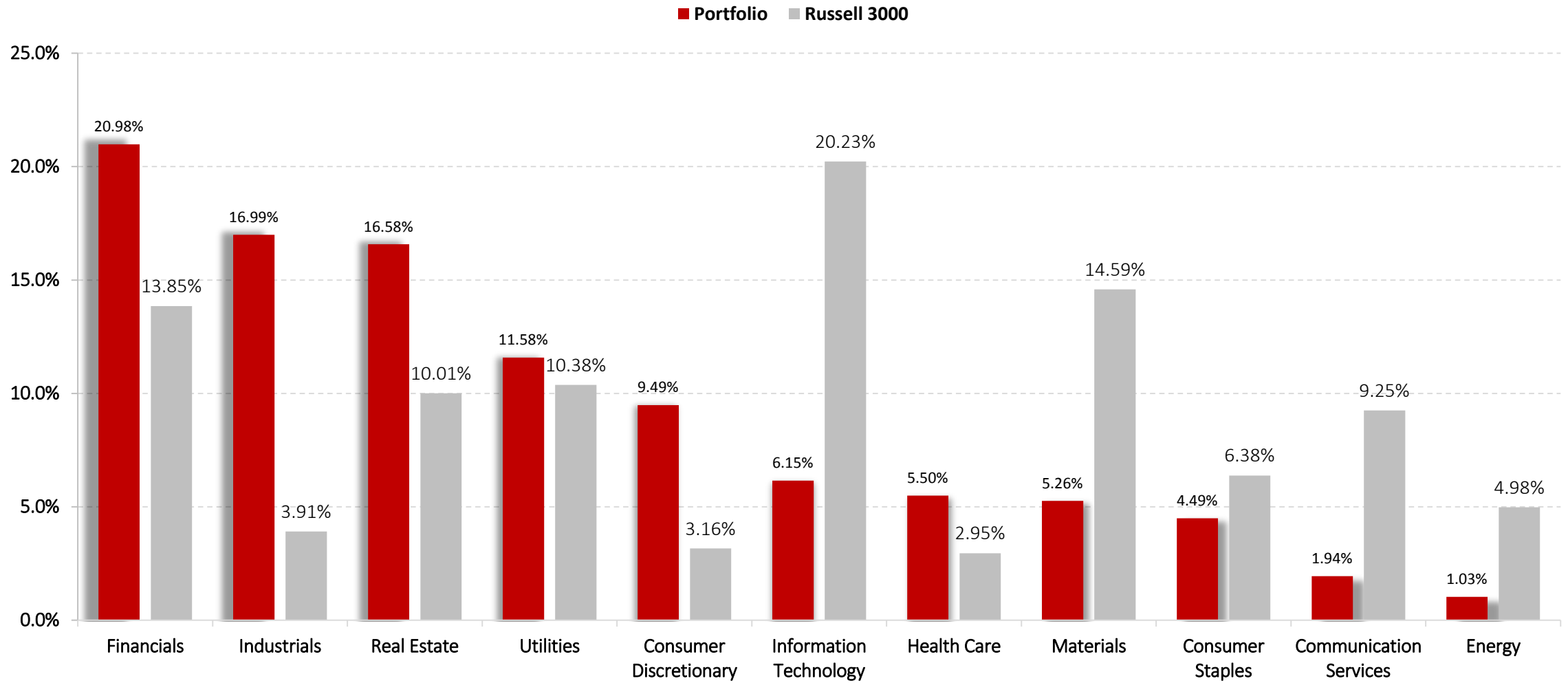

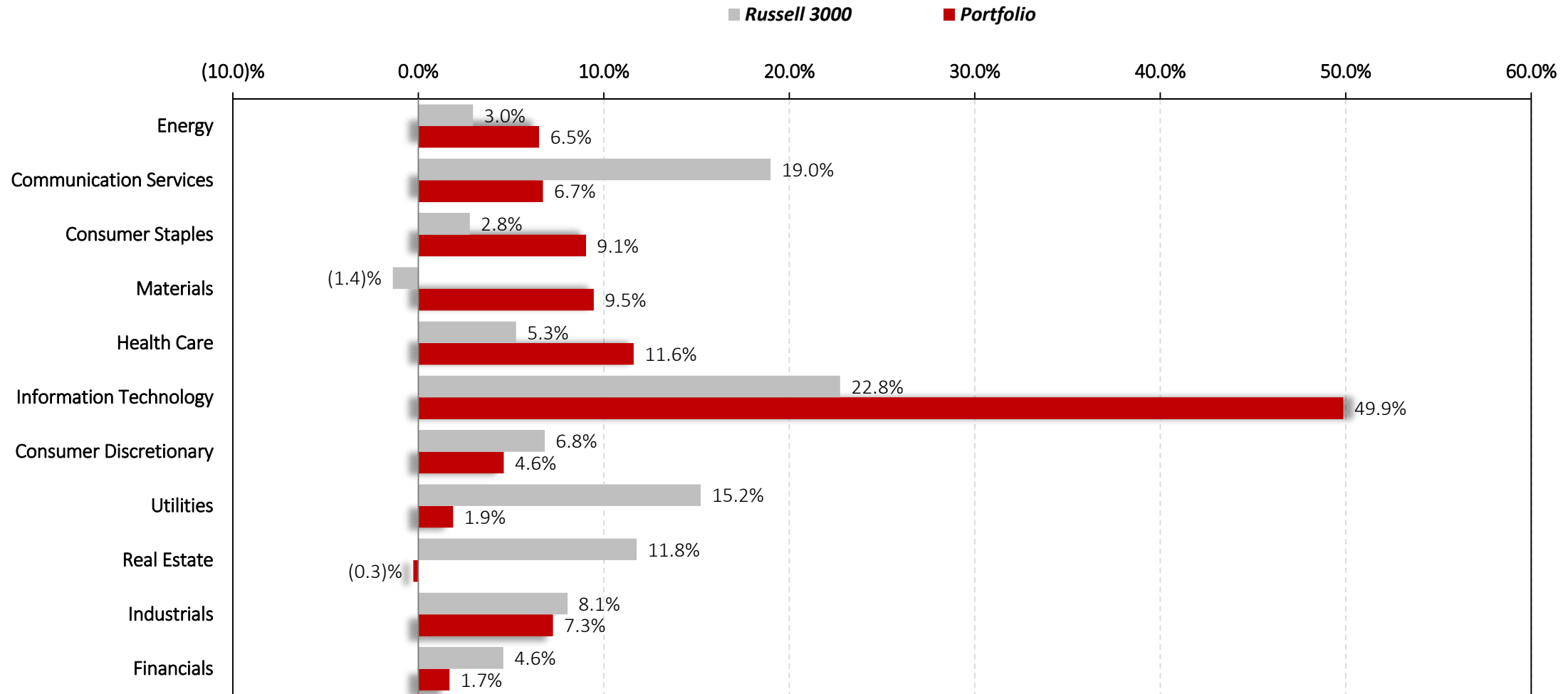
Value-Weighted Excess Returns with Security Count

| Security Count | 192 | 192 | 192 | 189 | 173 | 157 | 153 | 141 | 116 | 83 | 82 | 71 | 62 | 44 | 32 | 32 | 24 | 15 |

Value Weighted T-Score By Day
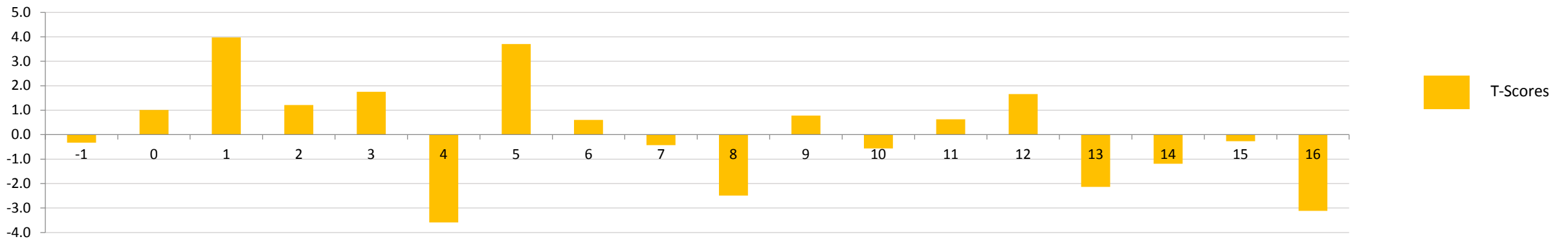
Appendix

Average Sector Exposures

Sector Return Attribution

Legend: ■ Russell 3000 ■ Portfolio

Sector	Russell 3000	Portfolio
Energy	3.0%	6.5%
Communication Services	19.0%	6.7%
Consumer Staples	2.8%	9.1%
Materials	(1.4)%	9.5%
Health Care	5.3%	11.6%
Information Technology	22.8%	49.9%
Consumer Discretionary	6.8%	4.6%
Utilities	15.2%	1.9%
Real Estate	11.8%	(0.3)%
Industrials	8.1%	7.3%
Financials	4.6%	1.7%

Sector Return Contribution

Legend: ■ Russell 3000   ■ Portfolio

Sector	Russell 3000	Portfolio
Energy	0.0%	0.2%
Communication Services	1.8%	0.2%
Consumer Staples	0.1%	0.3%
Materials	(0.1)%	(0.2)%
Health Care	0.1%	0.6%
Information Technology	4.4%	1.5%
Consumer Discretionary	0.2%	0.7%
Utilities	1.6%	0.8%
Real Estate	1.1%	1.0%
Industrials	0.3%	0.2%
Financials	0.9%	1.4%
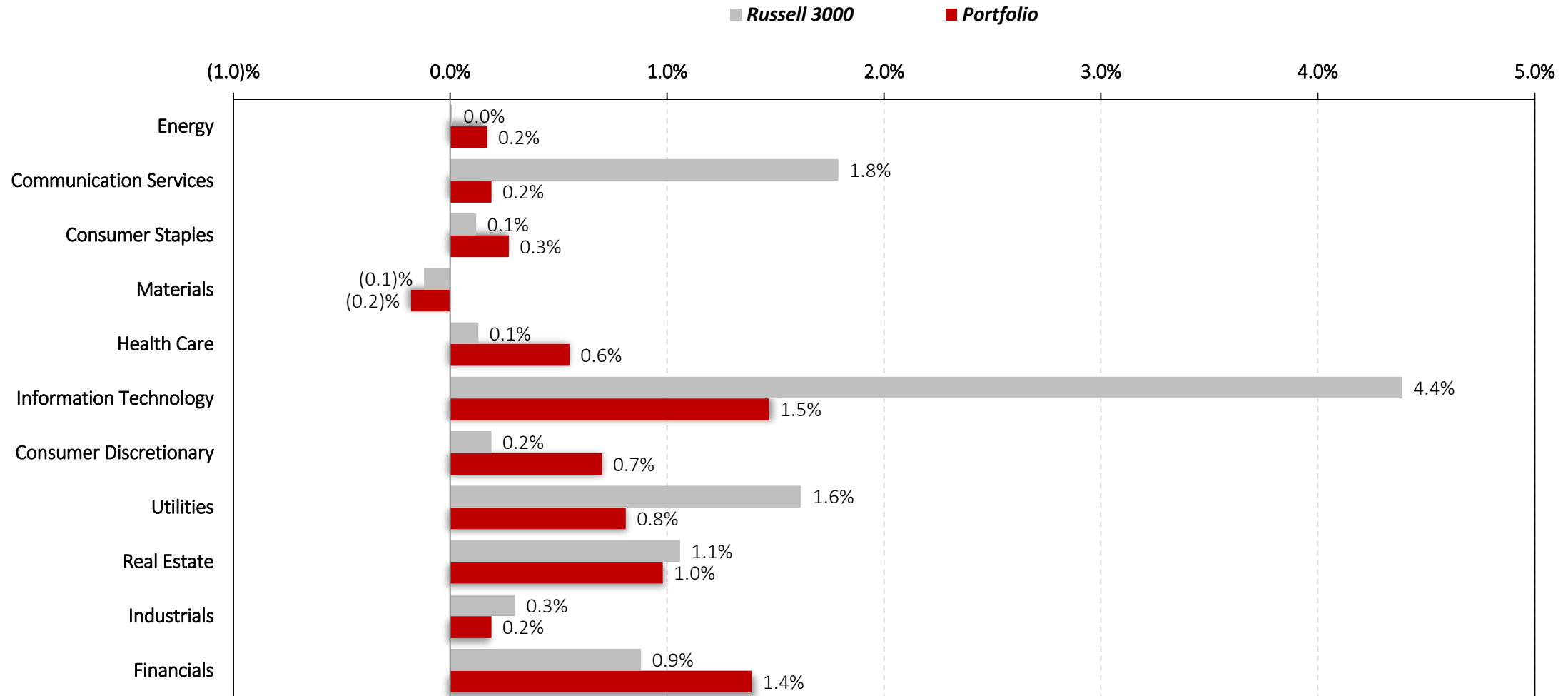
Undergraduate
Student Investment Management Fund

Spring 2019 Presentation
Friday, April 26

Team Overview

Fund Manager

Jerry Zhang

Fund Analysts

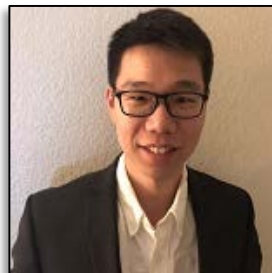Michael Calabro   Nicholas DeSantangilo   Yanni Dong   Abbas Haider
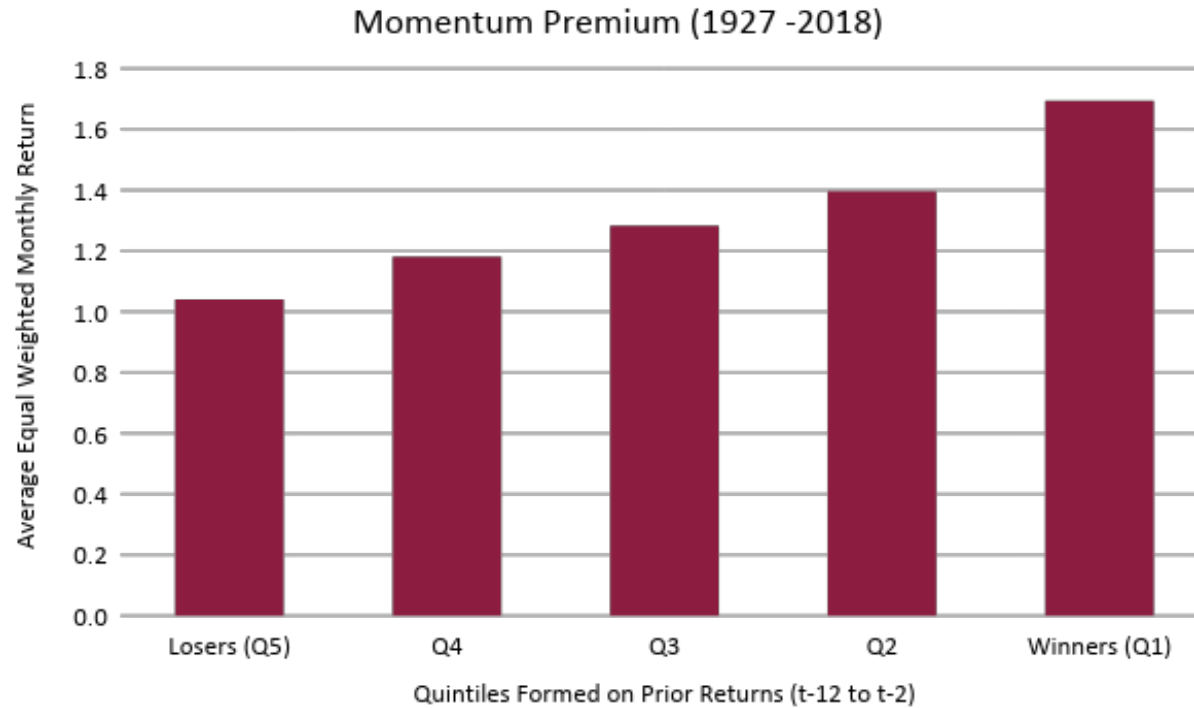
Lukas Stogsdill   Li Yang   Isaac Zolot
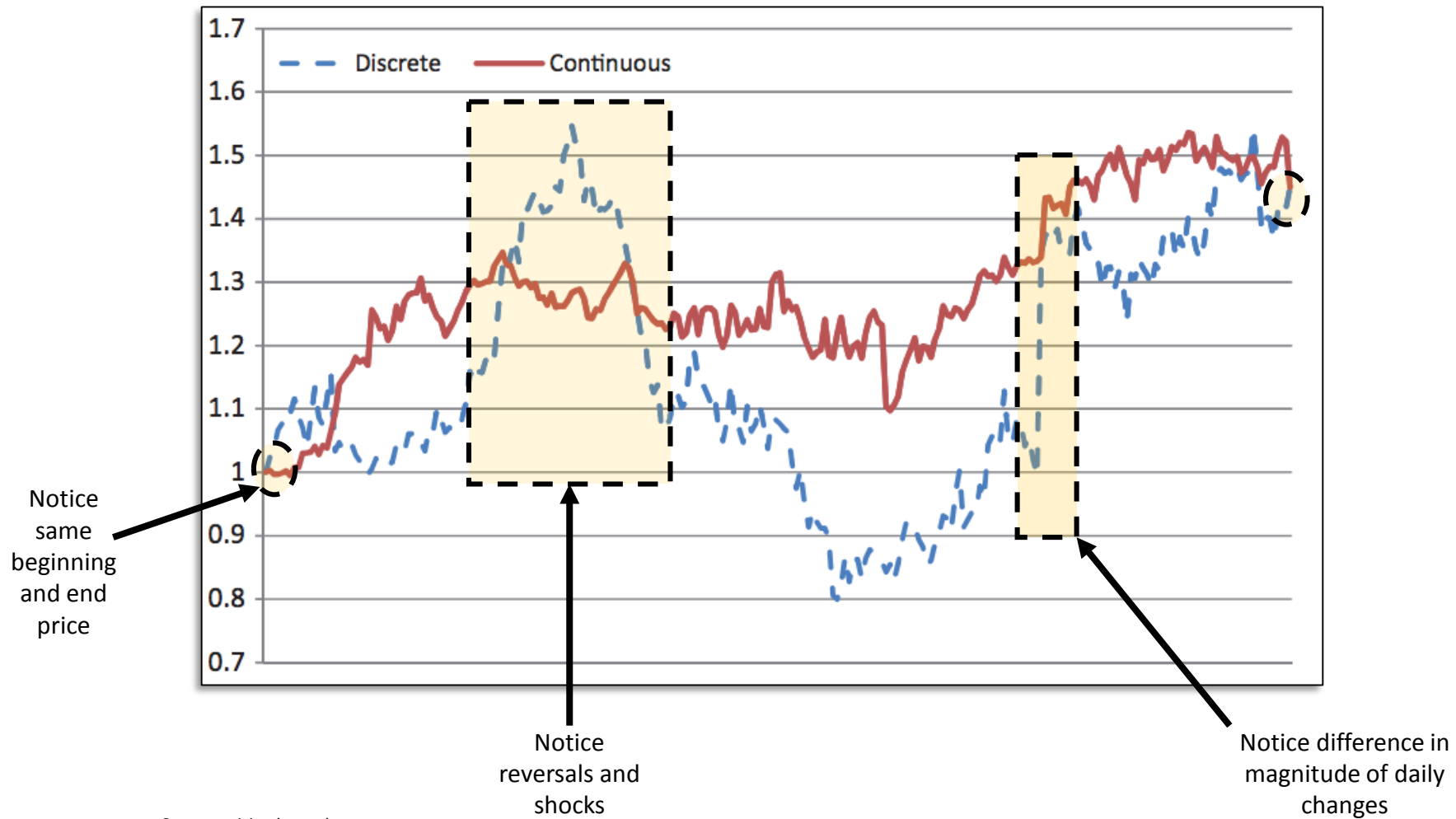
Investment Thesis & Implementation

Momentum Returns

Momentum theory posits that past winners will continue to win while past losers will continue to lose.

Momentum Premium (1927 -2018)

Source: Kenneth R. French Data Library

Continuous vs. Discrete Returns

Notice same beginning and end price

Notice reversals and shocks

Notice difference in magnitude of daily changes

Source: Da, Gurun, & Warachka (2014)

Calculating Information Discreteness

Our fund's investment thesis is derived from Da, Gurun, & Warachka's (2014) analysis on momentum investing conditioned on information discreteness.

To calculate information discreteness:

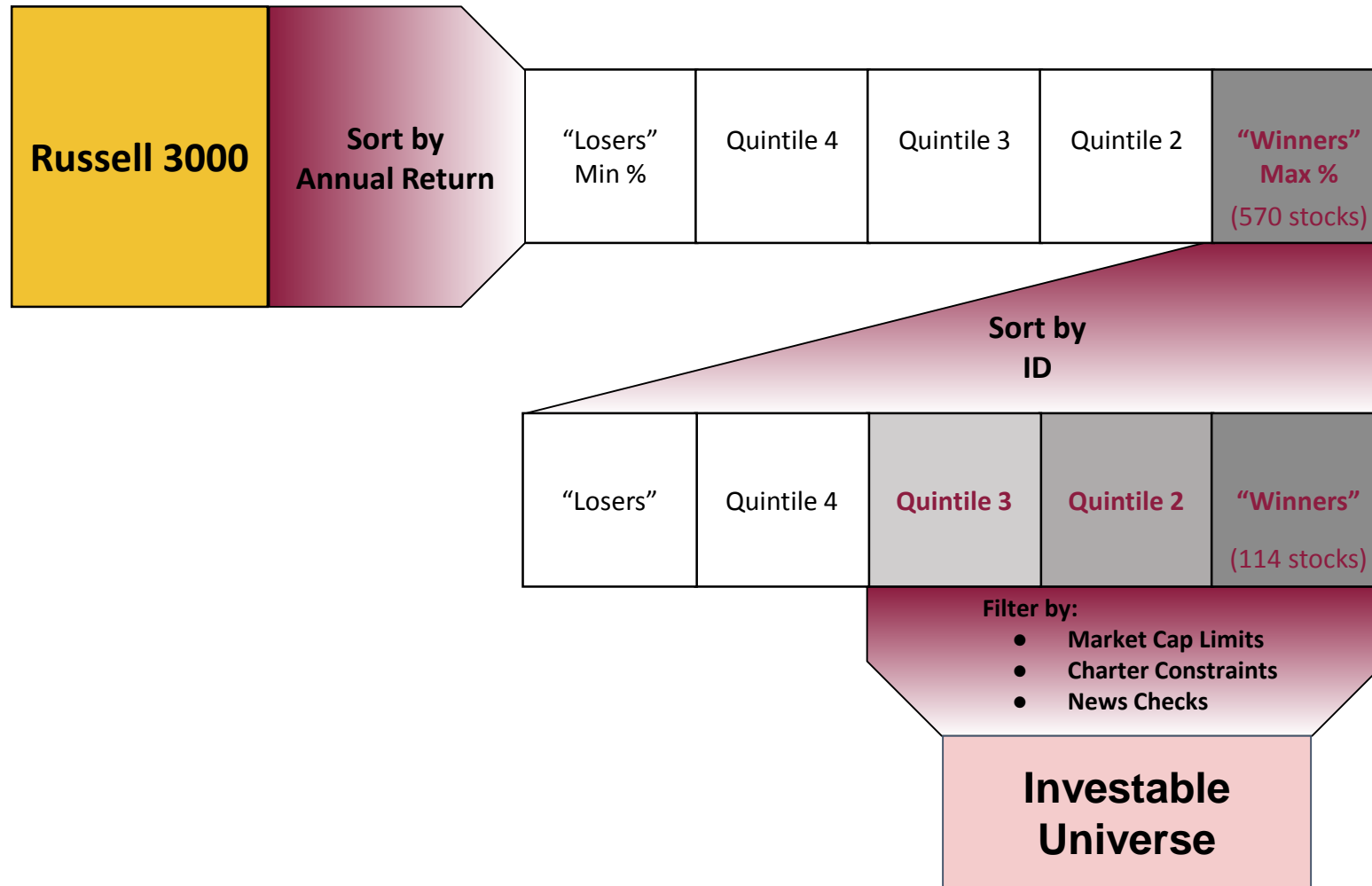$$ID = sign(Annual\ Return) \times [\%neg\text{-}\%pos]$$

Information Discreteness

Sign of the cumulative return over t-12 to t-2

Percentage of days during formation period with negative returns minus positive returns
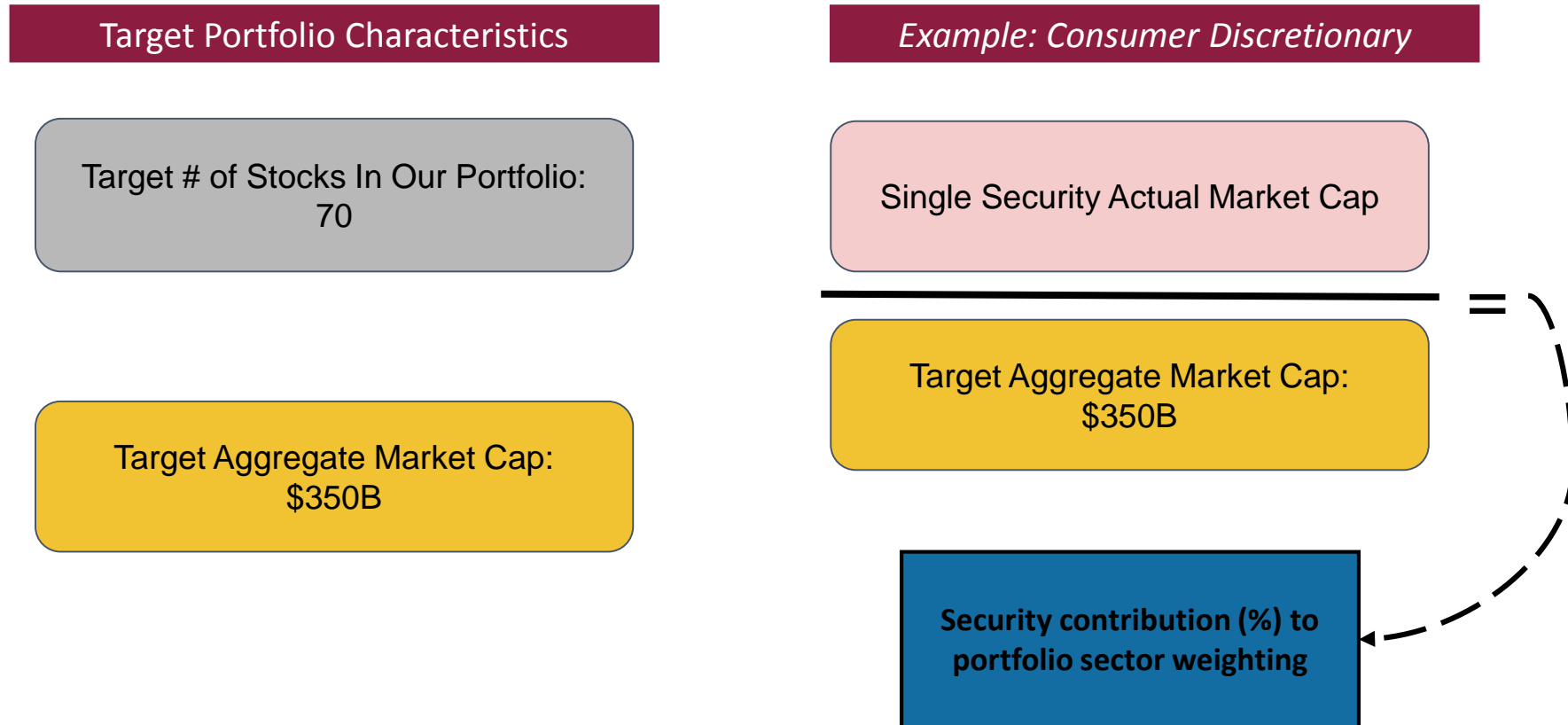
Source: Da, Gurun, & Warachka (2014)
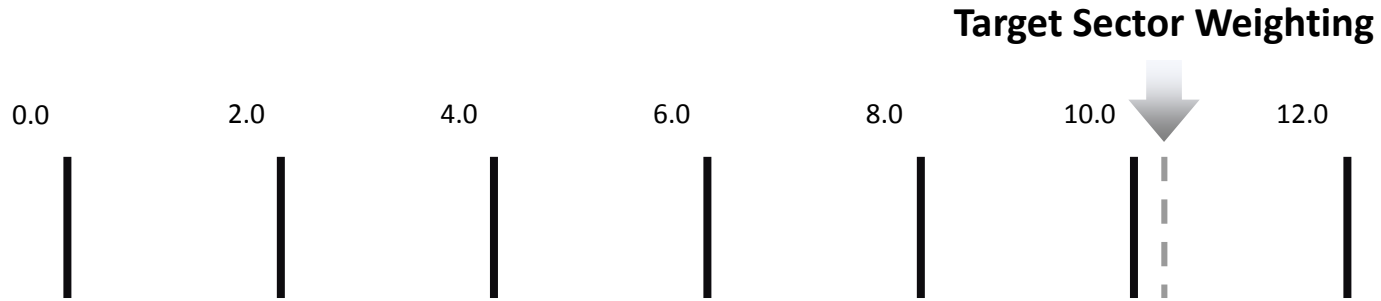
Discussion on Investment Quintiles

| Russell 3000 | Sort by Annual Return | "Losers" Min % | Quintile 4 | Quintile 3 | Quintile 2 | "Winners" Max % (570 stocks) |

Sort by ID

| "Losers" | Quintile 4 | Quintile 3 | Quintile 2 | "Winners" (114 stocks) |

Filter by:
- Market Cap Limits
- Charter Constraints
- News Checks

Investable Universe

Portfolio Construction Process

Cumulative market cap with respect to target portfolio: Consumer Discretionary

Target Portfolio Characteristics
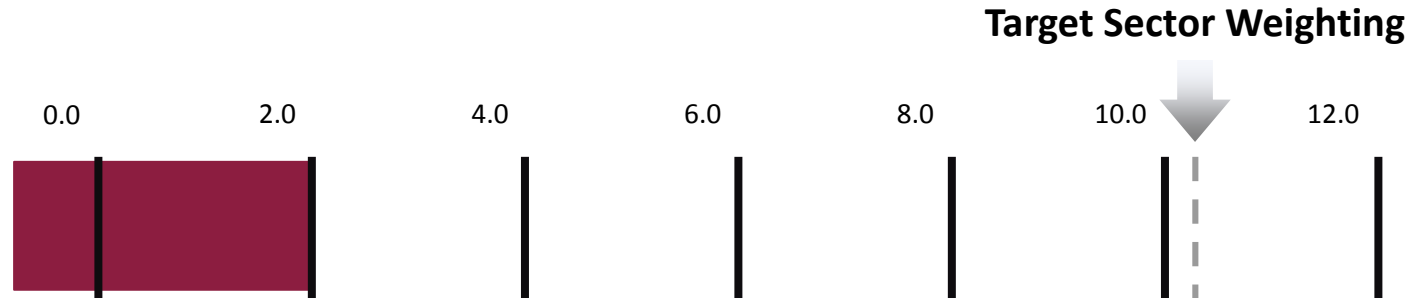
Target # of Stocks In Our Portfolio: 70

Target Aggregate Market Cap: $350B

Example: Consumer Discretionary

Single Security Actual Market Cap

Target Aggregate Market Cap: $350B

Security contribution (%) to portfolio sector weighting

Portfolio Construction Process

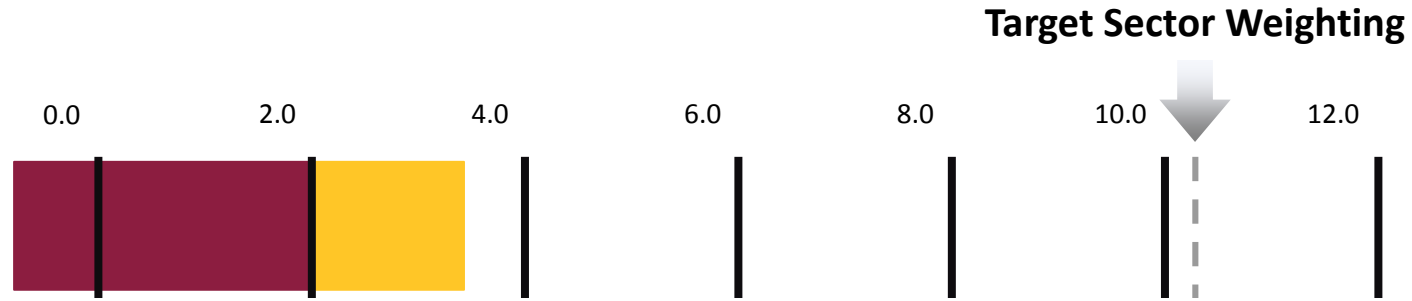Cumulative market cap with respect to target portfolio: Consumer Discretionary

Target Sector Weighting

| 0.0 | 2.0 | 4.0 | 6.0 | 8.0 | 10.0 | 12.0 |

Security	Market Cap ($B)	Market Cap Weighting	ID Rank
A	6.84	2.00%	1
B	5.59	1.60%	2
C	9.64	2.75%	3
D	13.26	3.79%	4

Portfolio Construction Process

Cumulative market cap with respect to target portfolio: Consumer Discretionary

Target Sector Weighting

Security	Market Cap ($B)	Market Cap Weighting	ID Rank
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Portfolio Construction Process

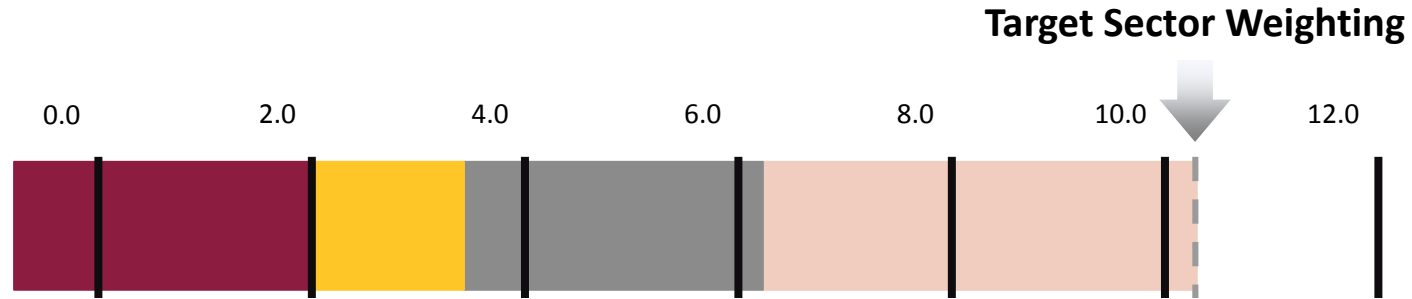Cumulative market cap with respect to target portfolio: Consumer Discretionary

Target Sector Weighting

| 0.0 | 2.0 | 4.0 | 6.0 | 8.0 | 10.0 | 12.0 |

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Portfolio Construction Process

Cumulative market cap with respect to target portfolio: Consumer Discretionary

Target Sector Weighting

Security	Market Cap ($B)	Market Cap Weighting	ID Rank
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Portfolio Construction Process

Cumulative market cap with respect to target portfolio: Consumer Discretionary

Target Sector Weighting

0.0 2.0 4.0 6.0 8.0 10.0 12.0

Security	Market Cap ($B)	Market Cap Weighting	ID Rank
A	6.84	2.00%	1
B	5.59	1.60%	2
C	9.64	2.75%	3
D	13.26	3.79%	4

Rebalancing
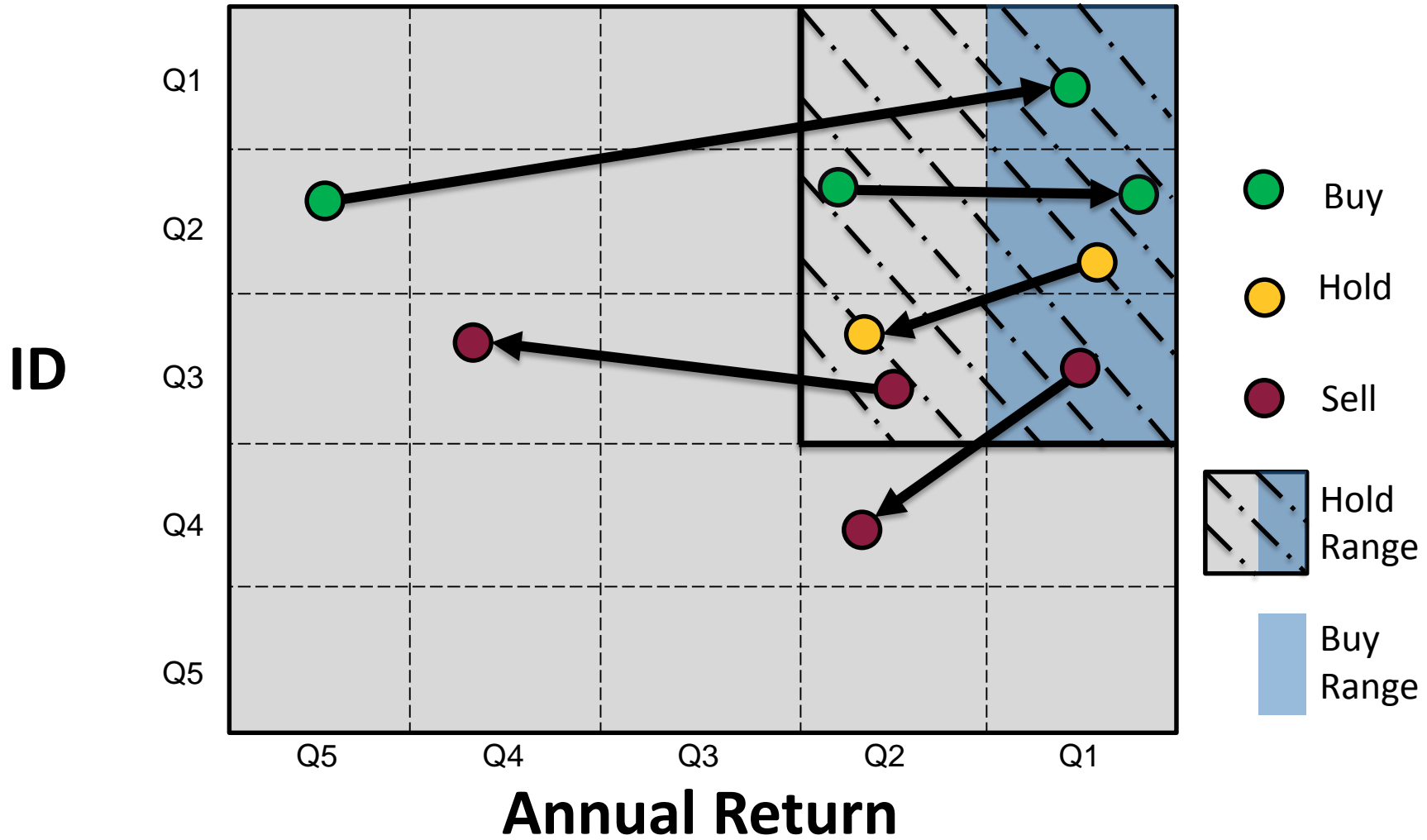
Returns and Attribution

Market Cap Tilt

159.2 M **Russell 3000** 1.012 T

500.0 M 24.4 B **Our Portfolio**

159.2 M 5.0 B **Russell 2000**

Portfolio Returns

Legend: ■ Porfolio ■ R2 ■ R3

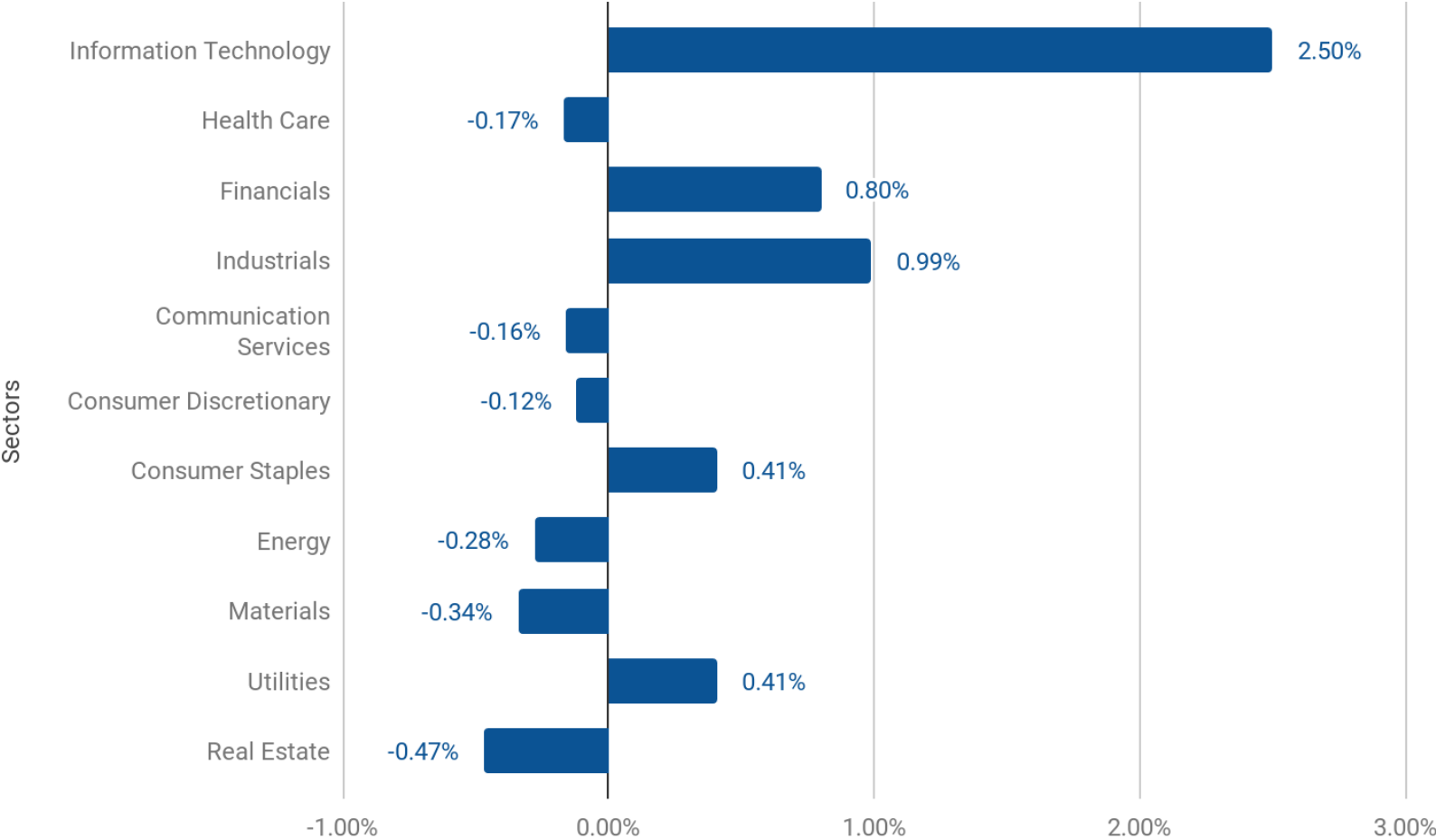| Our Portfolio	10.87%
Russell 3000	10.36%
Russell 2000	6.53%
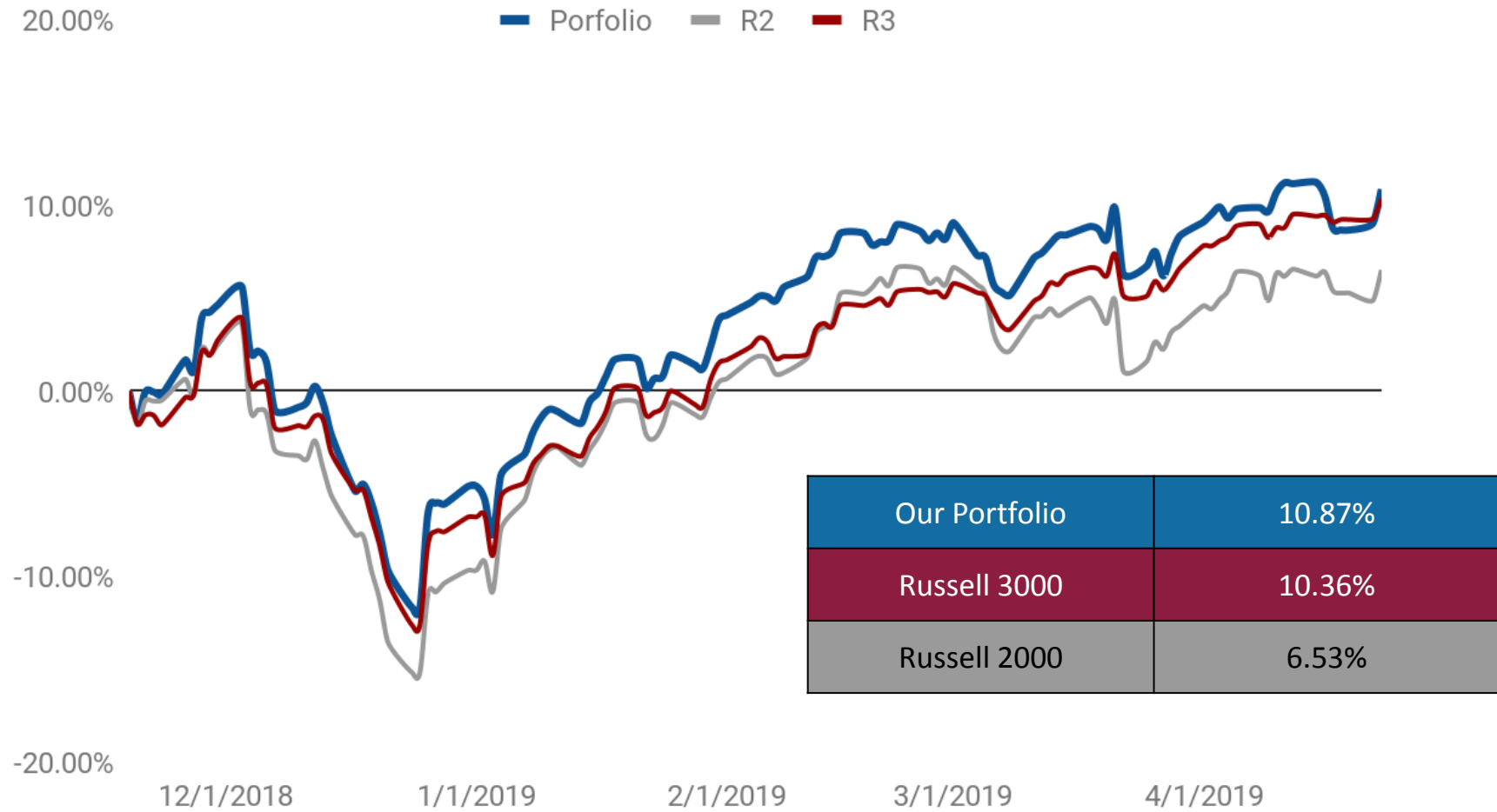
Sector Contribution

Selection

Information Technology Sector Attribution
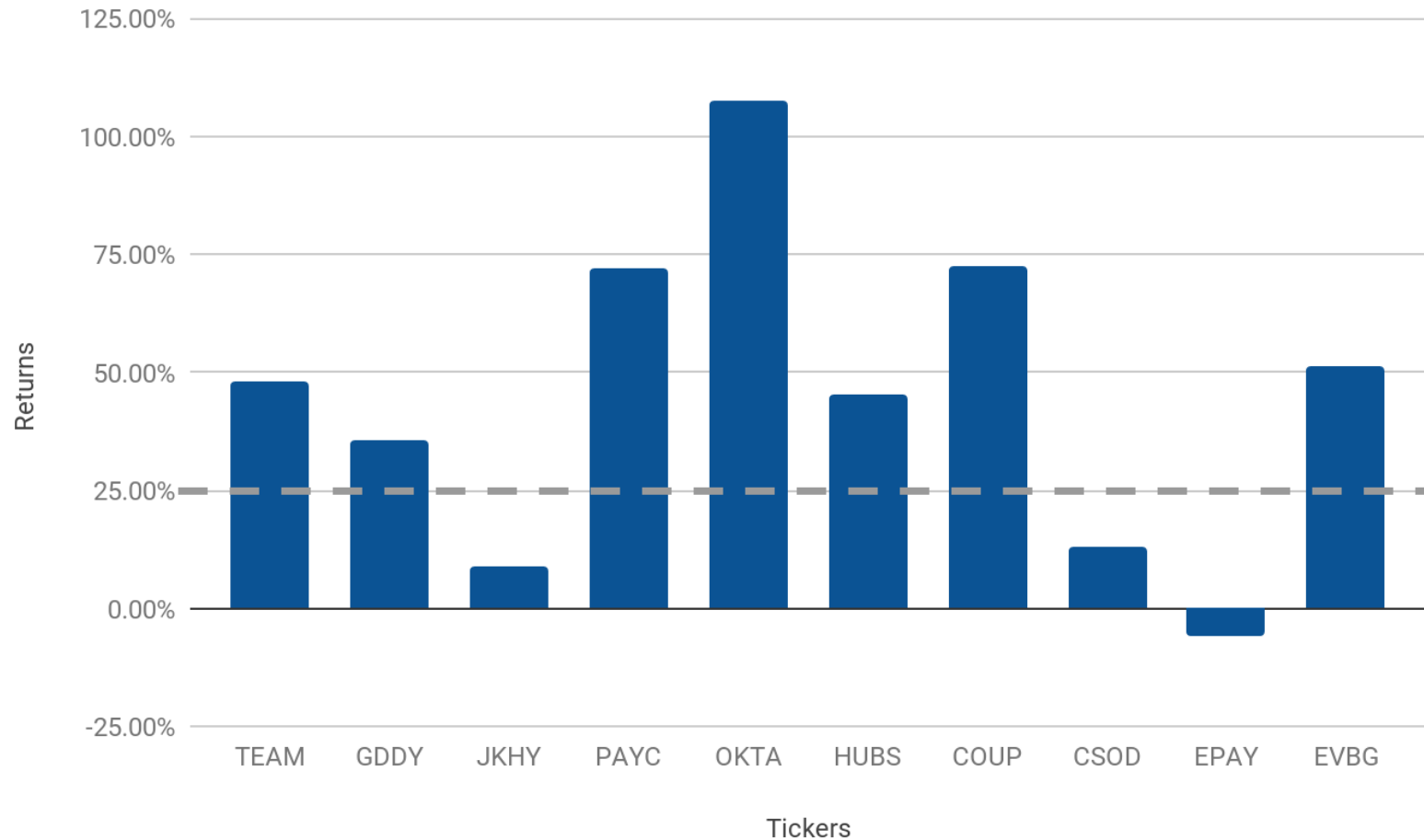
Shadow Portfolios

Shadow Portfolios

00 Our Portfolio
- Sort by Annual Return
- Sort by ID
- Sector Neutral

01 Pure Momentum
- Sort by Annual Return
- Purchase Top 60 Securities

02 Sector Agnostic
- Sort by Annual Return
- Sort by ID
- Sector Agnostic

03 News Count Momentum
- Sort by Annual Return
- Sort by Count of Press Mentions
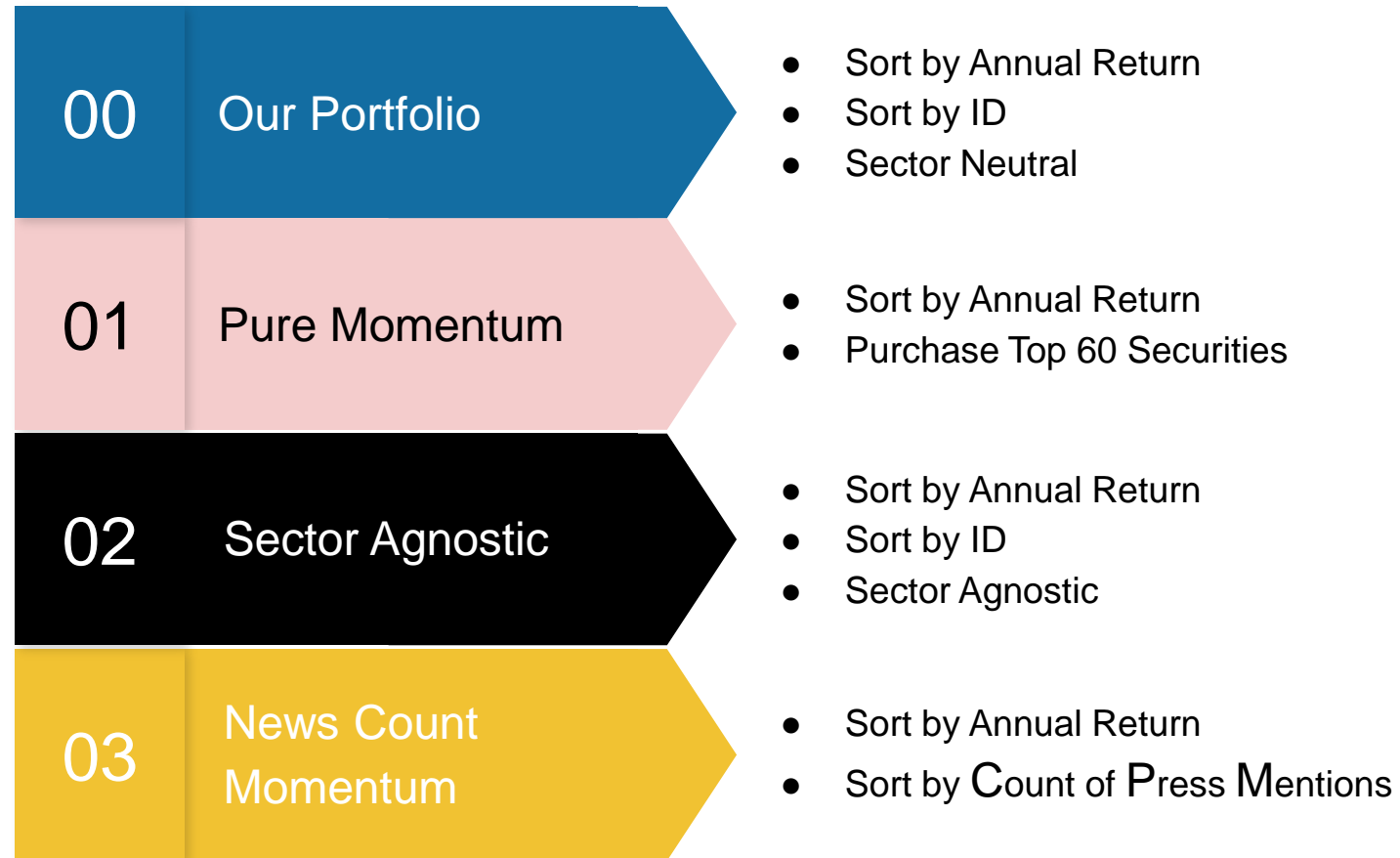
Shadow Portfolio Returns

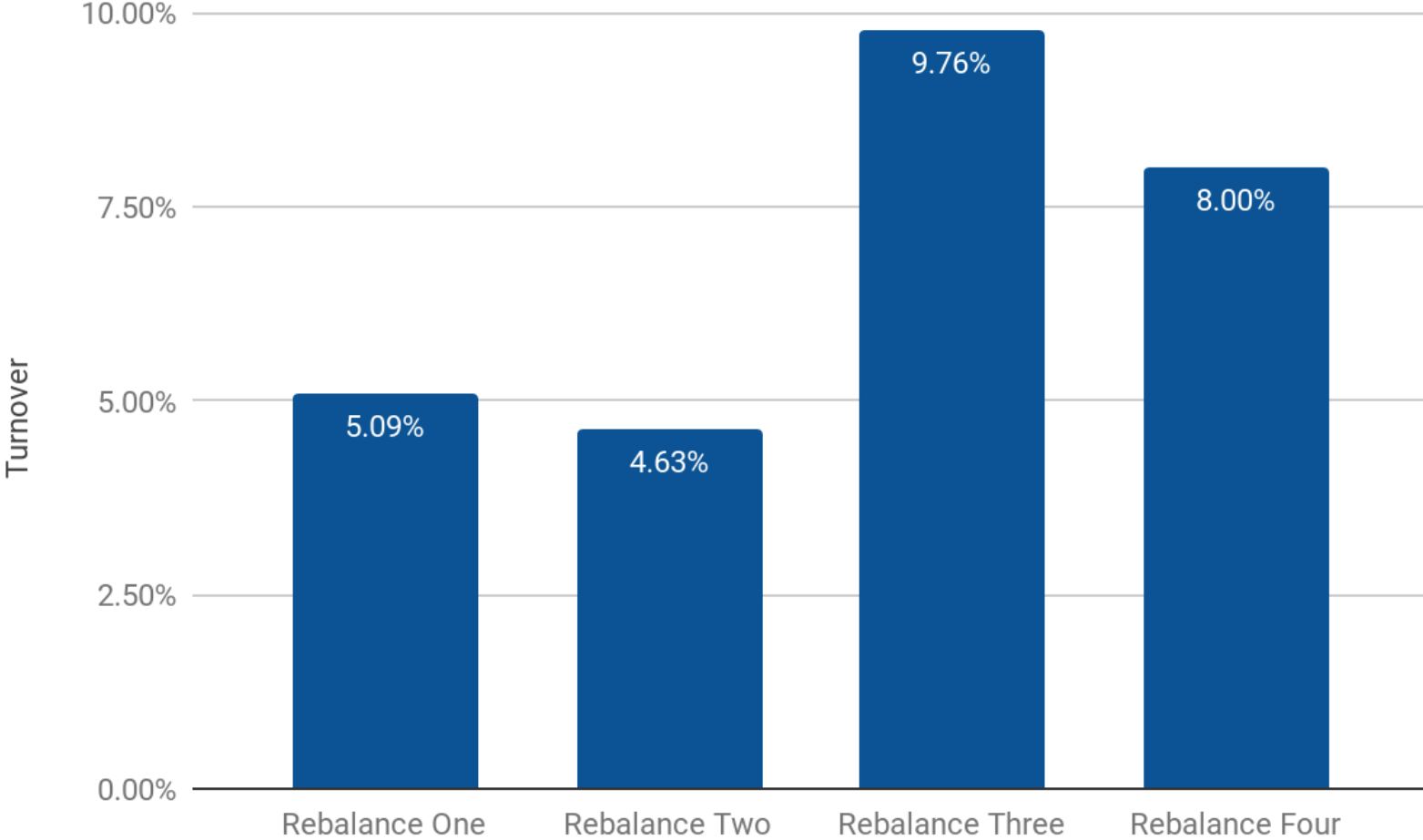|		
Sector Agnostic	14.38%	6.62 σ^2
News Count Momentum	12.65%	6.29 σ^2
Pure Momentum	13.00%	7.53 σ^2
Our Portfolio	10.87%	5.64 σ^2
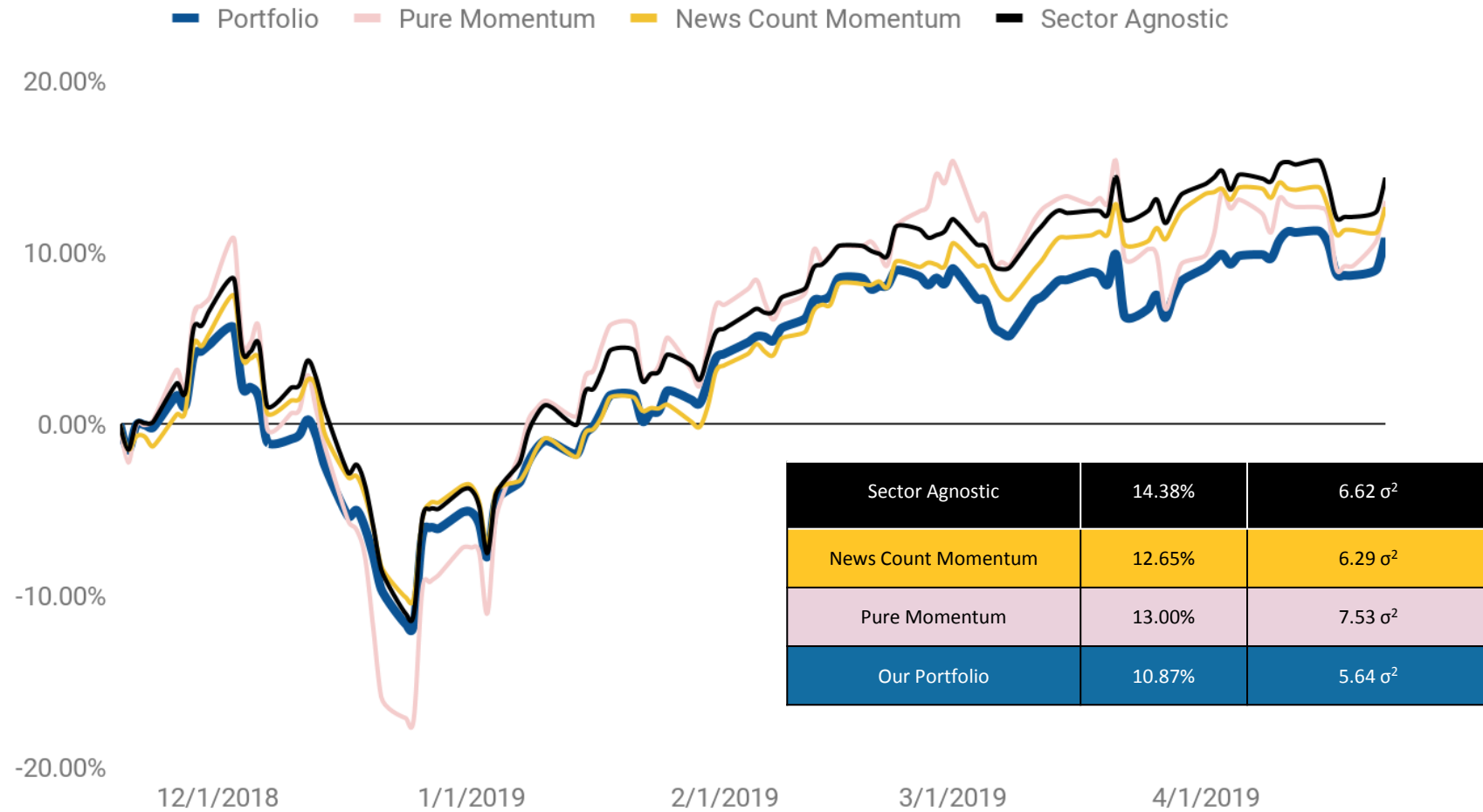
Thank you. Any questions?

Appendix
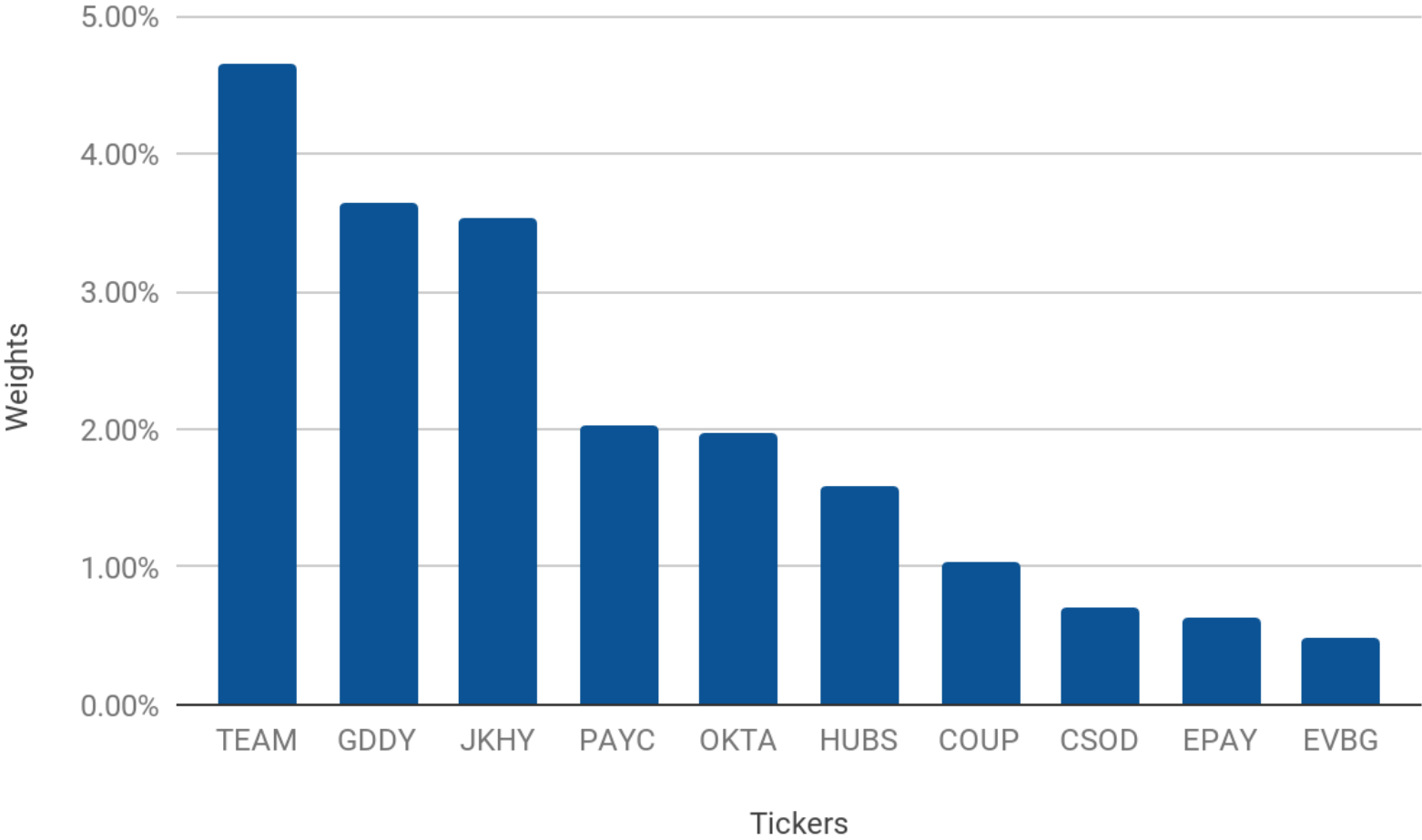
Turnover

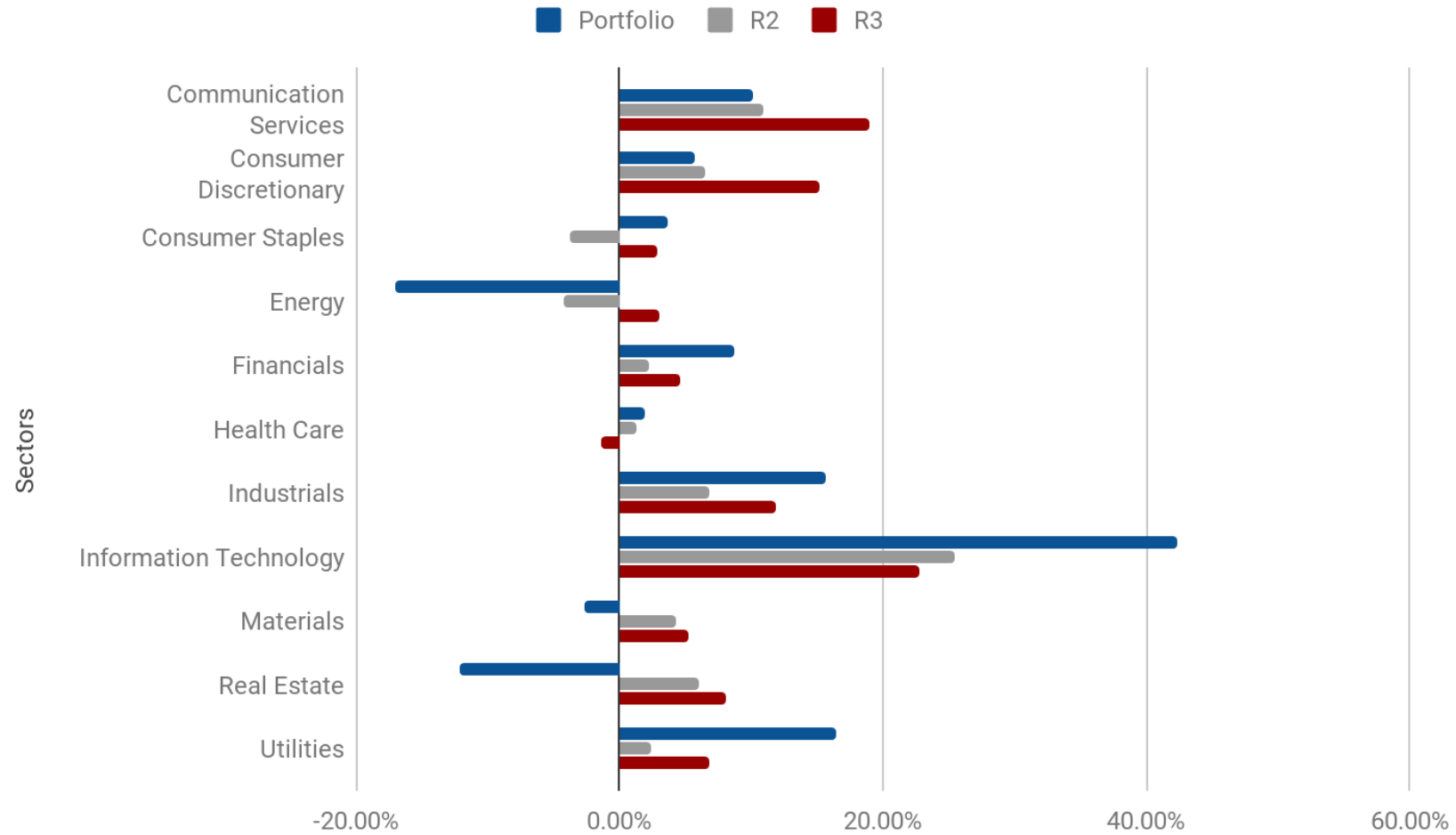# Outperformance

Arizona State University
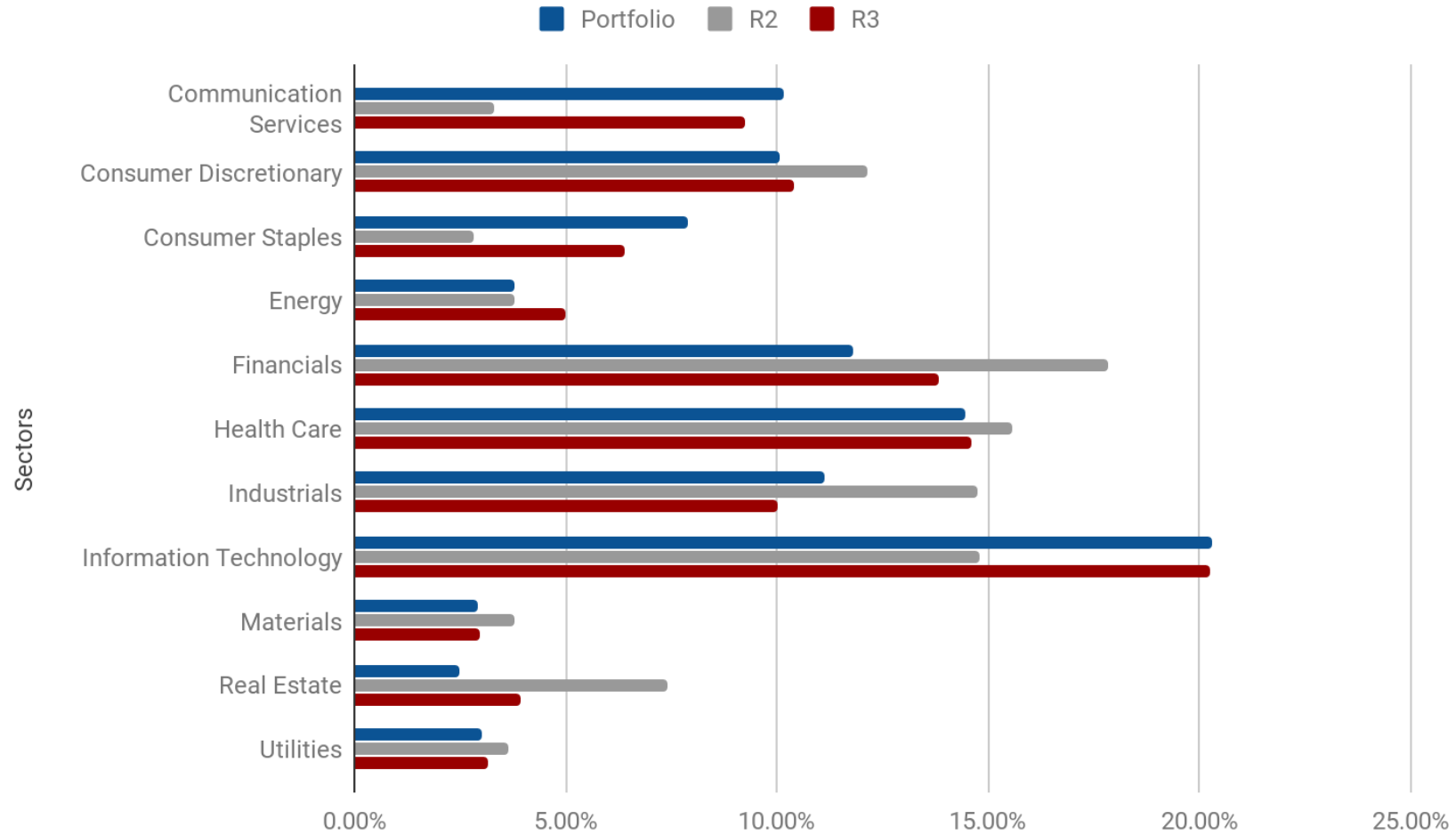Student Investment Management Fund
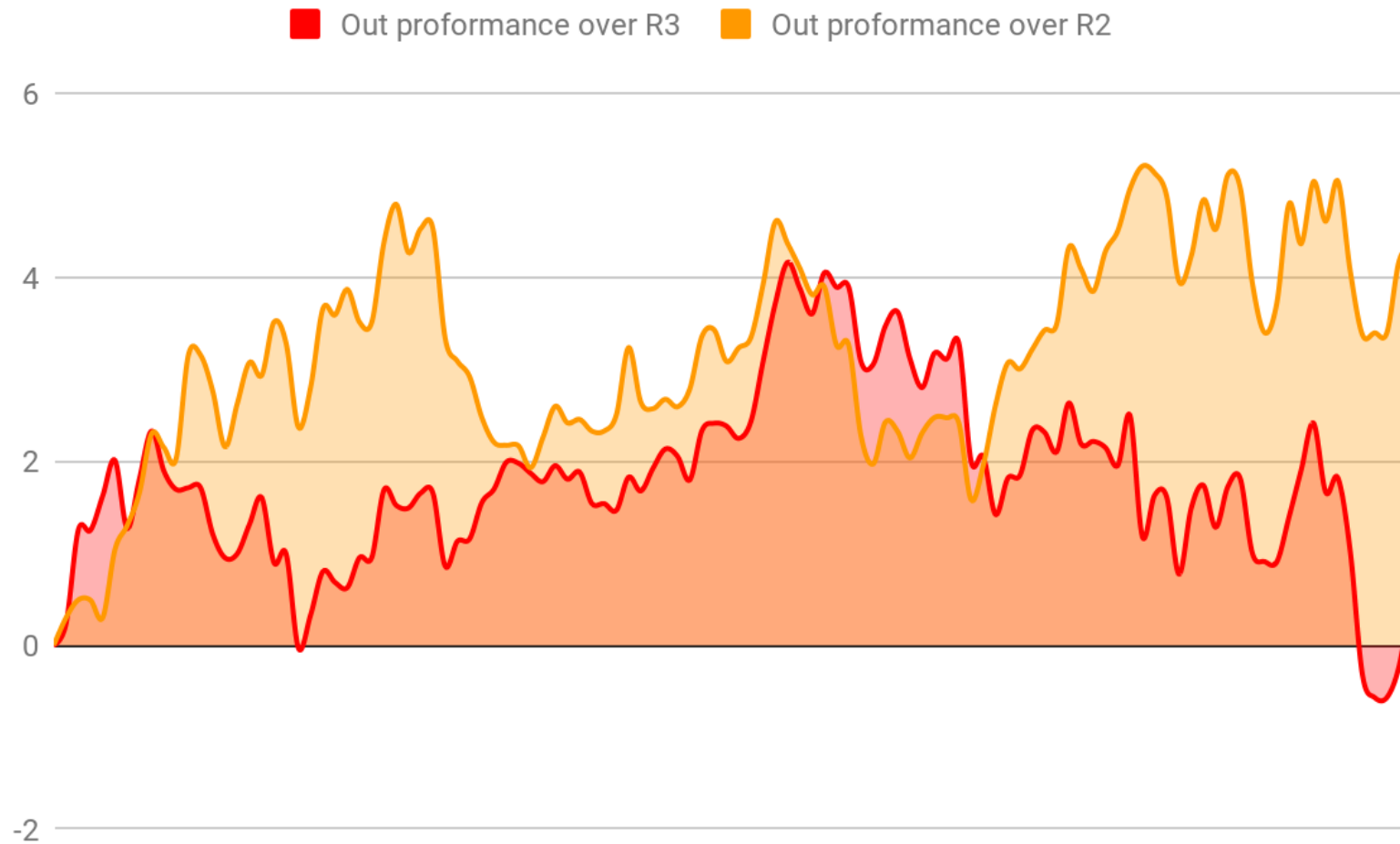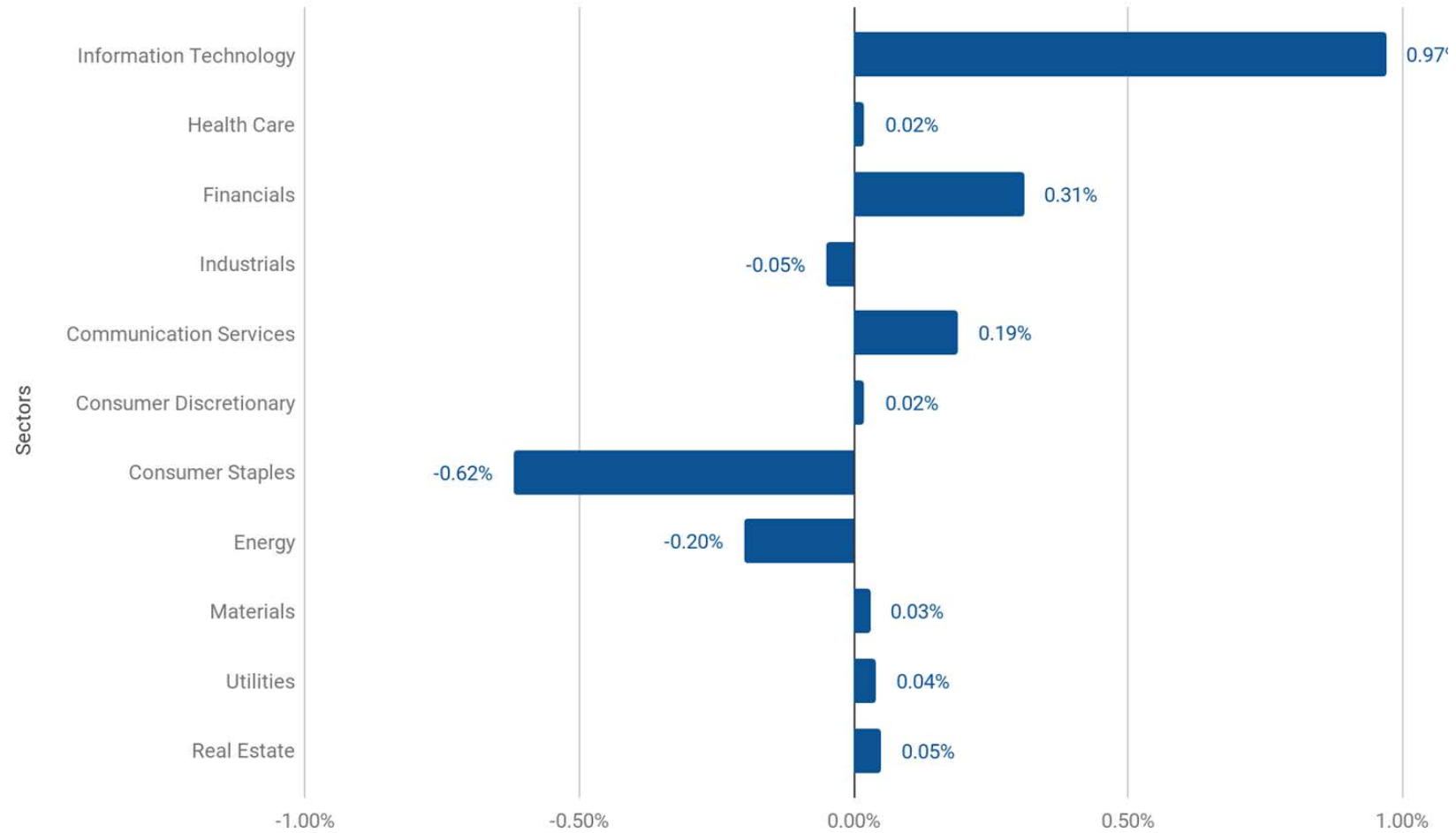
Information Technology Portfolio Weights

Sector Returns

Sector Weights

Allocation

Discussion on Investment Quintiles

| Russell 3000 | Sort by Annual Return | "Losers" Min: -95% | Quintile 4 -18% to -3% | Quintile 3 -3% to 11% | Quintile 2 11% to 33% | "Winners" Max: 1648% (570 stocks) |

Sort by ID

| "Losers" | Quintile 4 | Quintile 3 | Quintile 2 | "Winners" (114 stocks) |

Filter by:
- Market Cap Limits
- Charter Constraints
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Investable Universe