Undergraduate Student Investment Management Fund
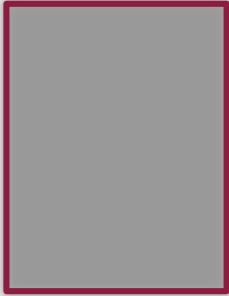## Semi-Annual Presentation

Team A
November 2018

Team Introduction

Fund Manager

Drew Kudlinski

Fund Analysts

Jenna Snittjer

Vishnu Patel

John Michael Hayes

Andrew Fox

Neil Jha

John Remy

ASU W. P. CAREY SCHOOL of BUSINESS
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Table of Contents

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Investment Thesis

Thesis Overview

Event-based portfolio based upon research performed by Hendrik Bessembinder and Feng Zhang

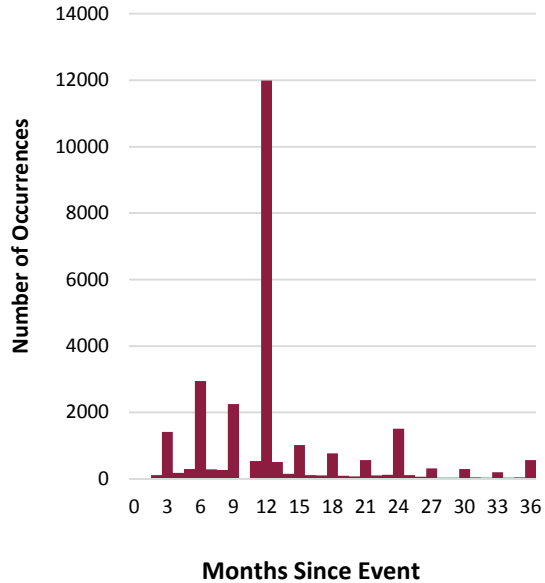Dividend increase at $t - 12 \rightarrow$ Dividend increase likely in t

Special dividends at $t - 12 \rightarrow$ Special dividends likely in t

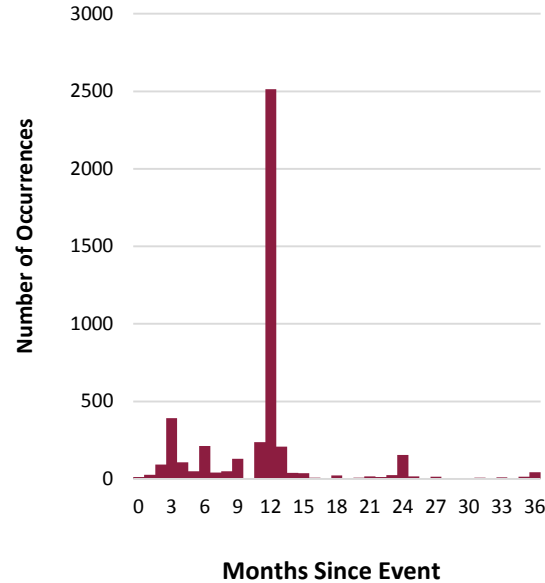Stock dividend at $t - 12 \rightarrow$ Stock dividend likely in t

Bessembinder, Hendrik, and Feng Zhang. "Predictable Corporate Distributions and Stock Returns." *The Review of Financial Studies*, vol. 28, no. 4, 30 Dec. 2014, pp. 1199–1241.

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
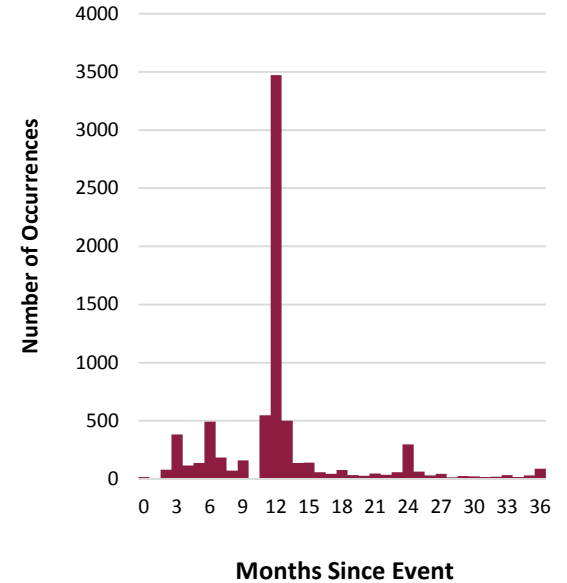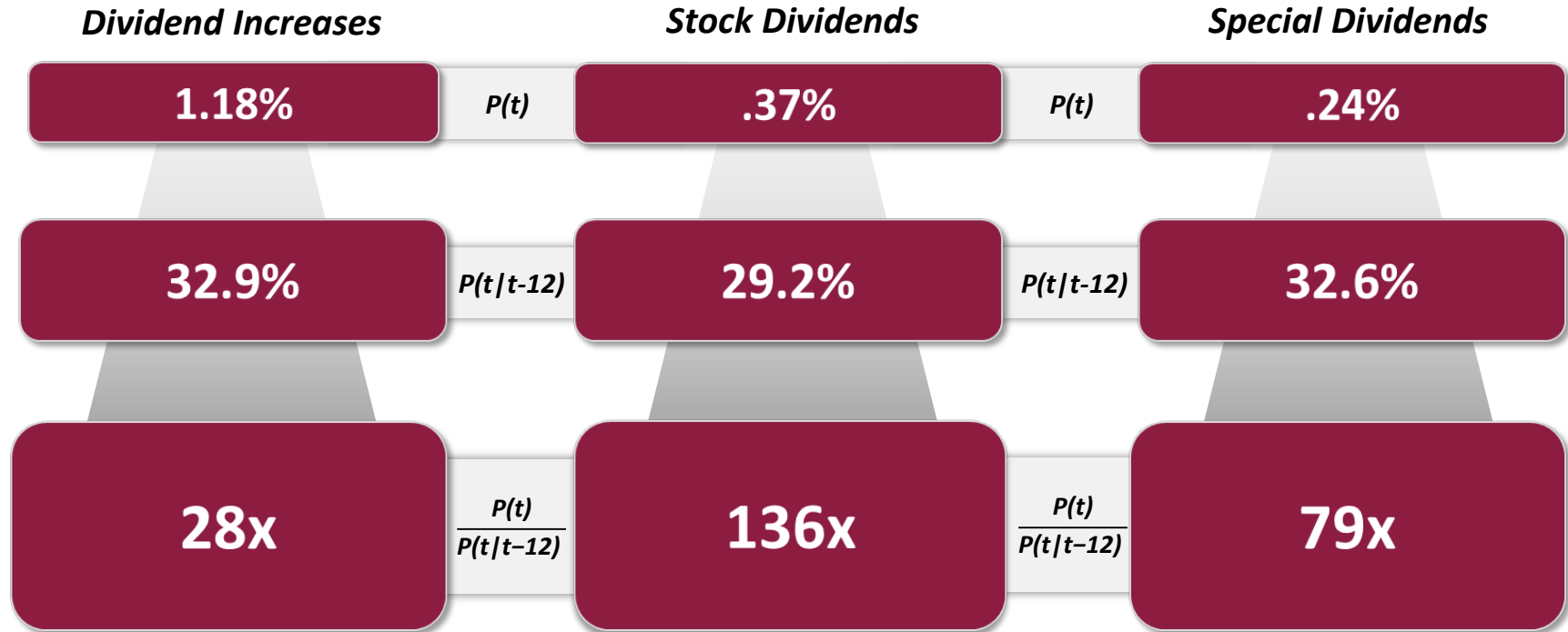
Probabilities of Follow-on Events

Conditional Probabilities					
Bessembinder and 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%

Daily Stock Returns

Daily Stock Returns Around Event Announcements
Dividend Increases
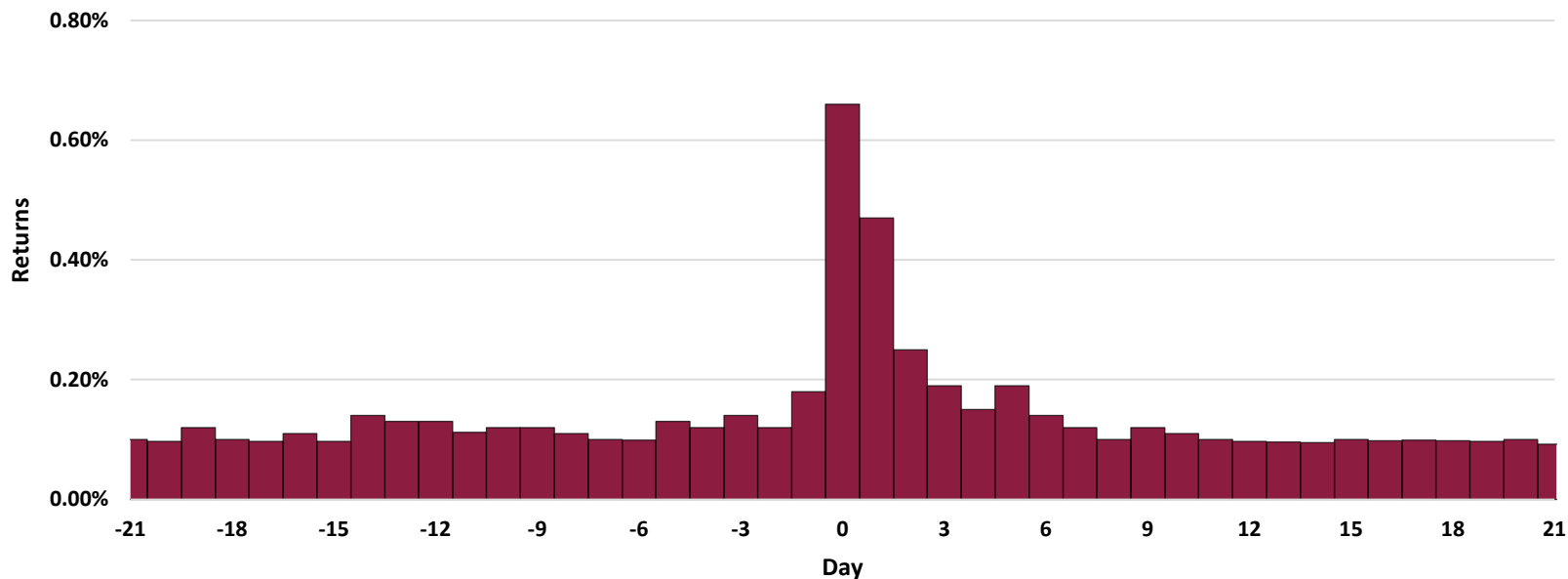
Return Comparison

Return Comparison Around Event Announcement, 1963-2012

Legend: ■ Monthly Stock Returns ■ 5-Day Event Returns

Dividend Increases
- Monthly Stock Returns: 3.42%
- 5-Day Event Returns: 1.18%

Special Dividends
- Monthly Stock Returns: 4.48%
- 5-Day Event Returns: 2.31%

Stock Dividends
- Monthly Stock Returns: 5.71%
- 5-Day Event Returns: 2.37%

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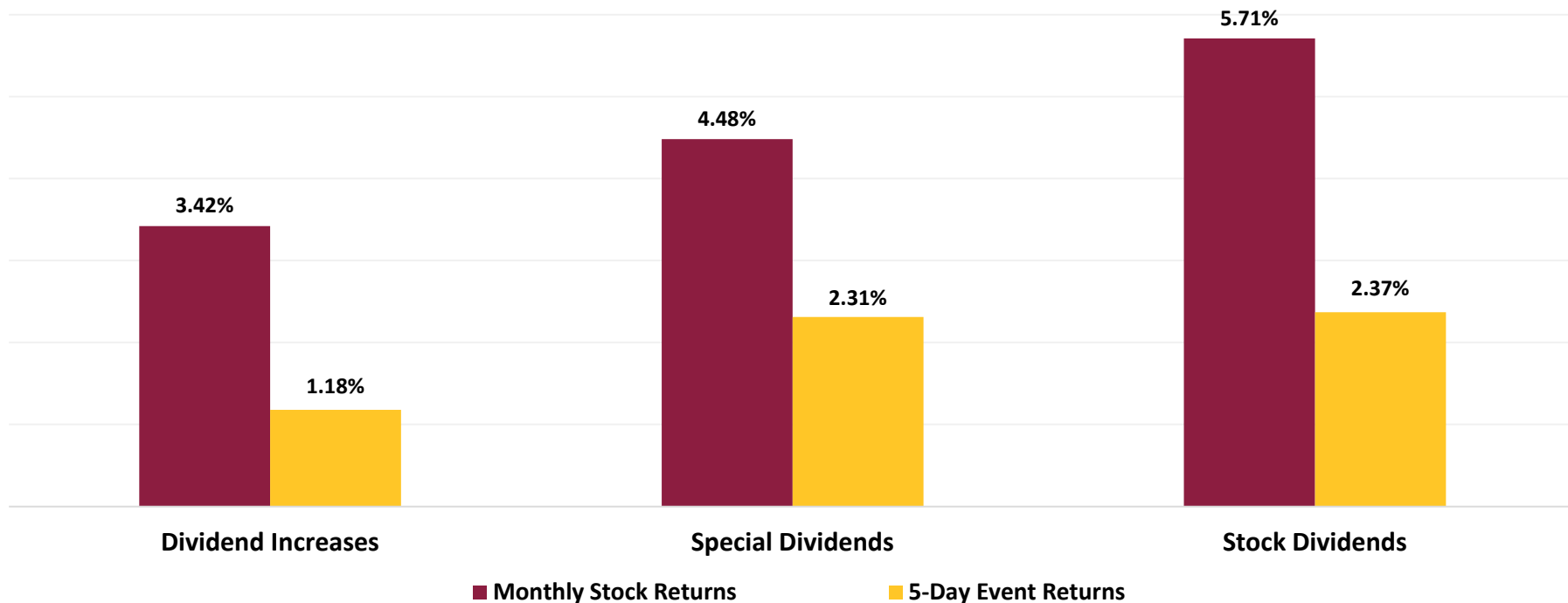
Strategy Implementation

Implementation Process

Russell 3000 → Security Selection → Buy / Sell Timing → Full Schedule Nov – May

Implementation – The *What*

Data Organization

Probability Assignment

Ranking Securities

Security Selection

	2017						2018					
	Jan			Feb			Jan			Feb		
Security	DI	Sp.Div	St.Div	DI	Sp.Div	St.Div	DI	Sp.Div	St.Div	DI	Sp.Div	St.Div
14593	0	0	0	0	0	0	0	0	0	0	0	0
10107												
84788												
90319												
14542												
13407												
22111												
47896												
11850												
55976				1						1		
92611												
59408												
92655												
21936												
38703												

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Implementation – The *What*

Data Organization

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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)**
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Implementation – The *What*

Data Organization

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Ranking Securities

Security Selection

Abnormal Return-Weighted Probability

$$P_i(t)_{Weighted} = \frac{\sum CAR_{[t-2,t+2]_{ij}} * P_{ij}(t)}{\sum CAR_{[t-2,t+2]_{ij}}}$$

Dividend Increases CAR	Stock Dividends CAR	Special Dividends CAR
1.18%	**2.31%**	**2.37%**
Lowest weight	*Middle weight*	*Highest weight*

Implementation – The *What*

Data Organization

Probability Assignment

Ranking Securities

Average Percentile
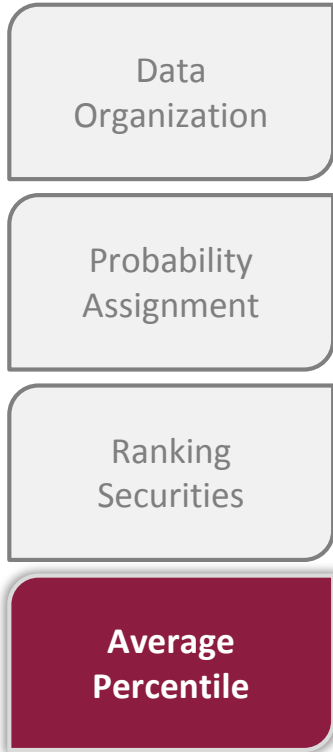
2018-2019				
Nov	*Dec*	*Jan*	*Feb*	*Mar*
$Max\{P(t)\}$	$Max\{P(t)\}$	$Max\{P(t)\}$	$Max\{P(t)\}$	$Max\{P(t)\}$
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
$Min\{P(t)\}$	$Min\{P(t)\}$	$Min\{P(t)\}$	$Min\{P(t)\}$	$Min\{P(t)\}$

High

Low

2nd percentile on average per month

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Implementation – The *When*

Data Organization

Certainty Buckets

Holding Period Visualization

Weekly

Year	2018					
Month	November					
Week #	**1**	**1**	**1**	**2**	**2**	**2**
	DI	*Sp.D*	*St.D*	*DI*	*Sp.D*	*St.D*
22752	**0**					
57665						
39642						
44644	**3**					
22103						
52038						
32870						
84381						
89155						

Daily

Month	Nov					
Week	Week 1					
Weekday	**Th**	**Th**	**Th**	**F**	**F**	**F**
	DI	*Sp.D*	*St.D*	*DI*	*Sp.D*	*St.D*
22752	**0**			**0**		
57665						
39642						
44644	**2**			**1**		
22103						
52038						
32870						
84381						
89155						

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Implementation – The *When*

Data Organization

Certainty Buckets

Holding Period Visualization

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

Bessembinder / Zhang

[t-2,t+2]
CARs

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Implementation – The *When*

Data Organization

Certainty Buckets

Holding Period Visualization

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	06	07	*08*	09	10	11
	Daily Buy		*Daily Certainty*		*Daily Sell*	
				16	17	18
				Weekly Buy		
19	*20*	*21*	*22*	*23*	*24*	25
			Weekly Certainty			
26	27	28				
		Weekly Sell				

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Timeline of Trades

Buy / Sell Schedule Example

	11/29/2018	12/4/2018	12/9/2018	12/14/2018	12/19/2018	12/24/2018	12/29/2018

PFE — Monthly Hold
MA — Weekly Hold
BA — Daily Hold
ABT — Monthly Hold
AMGN — Monthly Hold
LLY — Weekly Hold
AVGO — Weekly Hold
BMY — Monthly Hold
AMT — Weekly Hold
CME — Monthly Hold
SYK — Daily Hold

Monthly Hold   Weekly Hold   Daily Hold

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Portfolio Allocation: Strategy vs. Russell 3000

% of Portfolio Allocated to Strategy
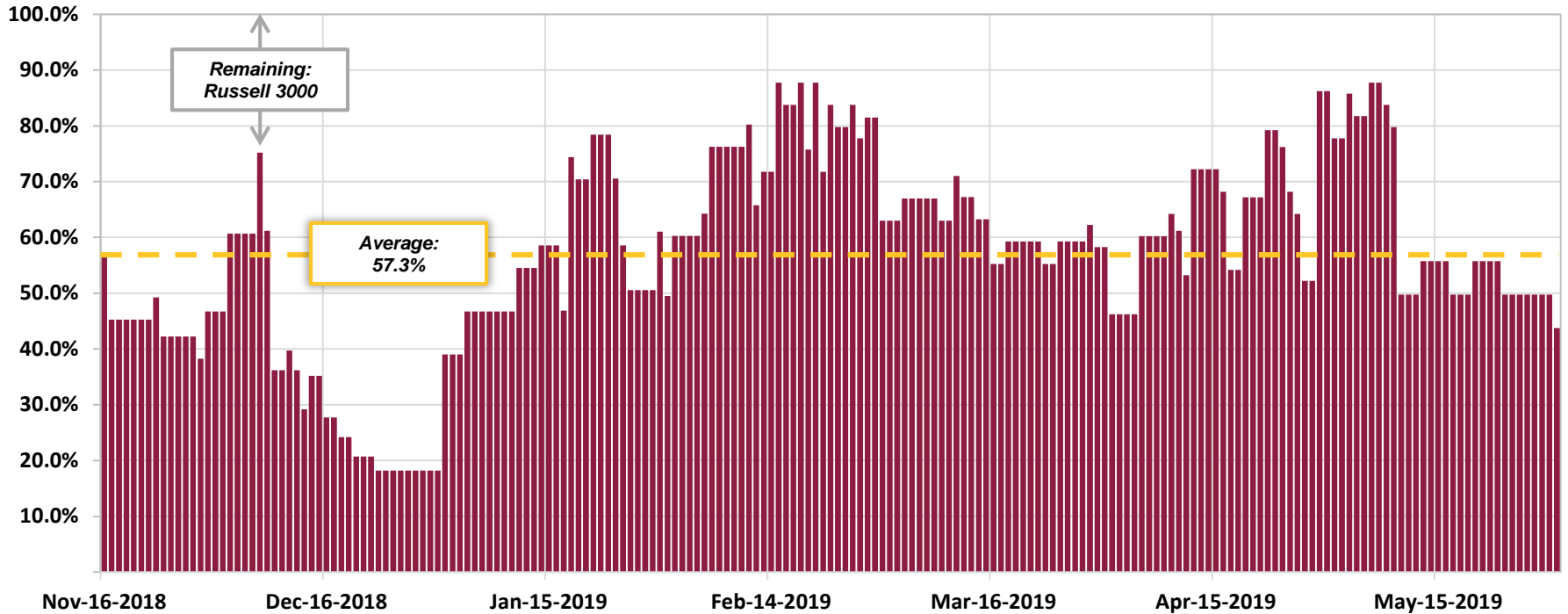
Tentative Returns

Portfolio Returns

Active Strategy vs. Russell 3000 (11/19 – 11/28)

$\Delta = -18 bps$

Legend: SIM Portfolio — Russell 3000
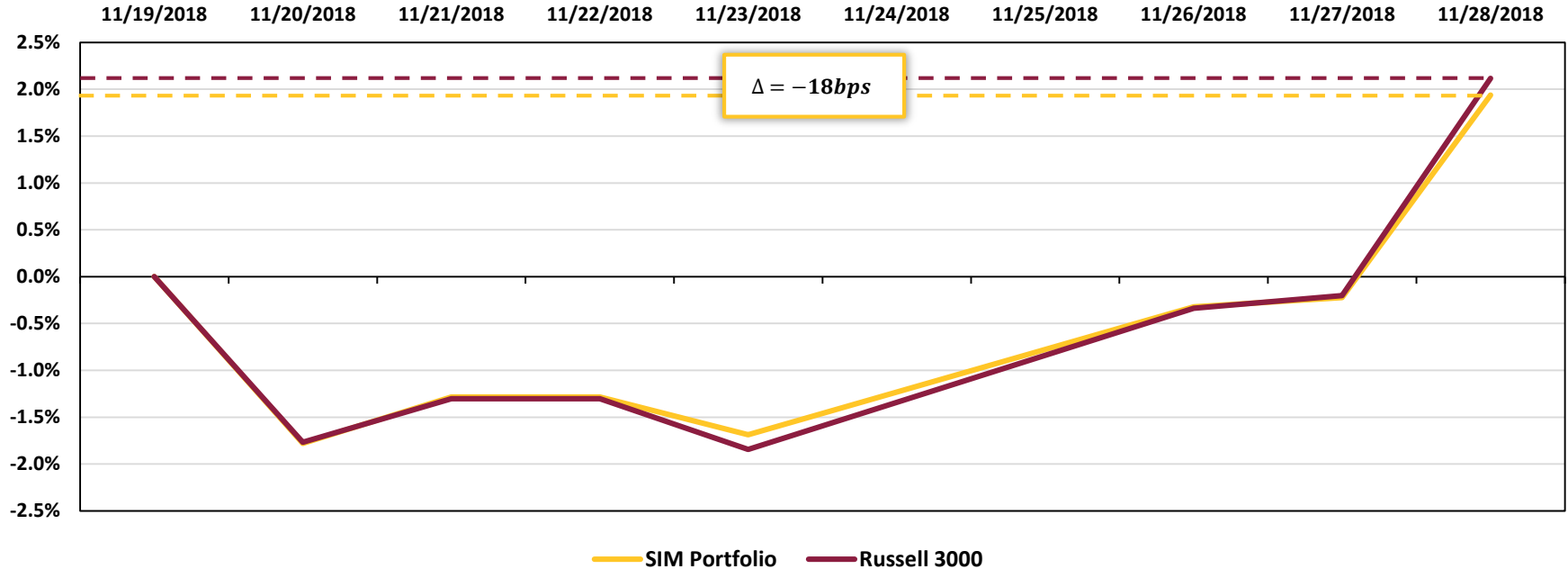
Q&A

Appendix

Daily Strategy Sector Exposure
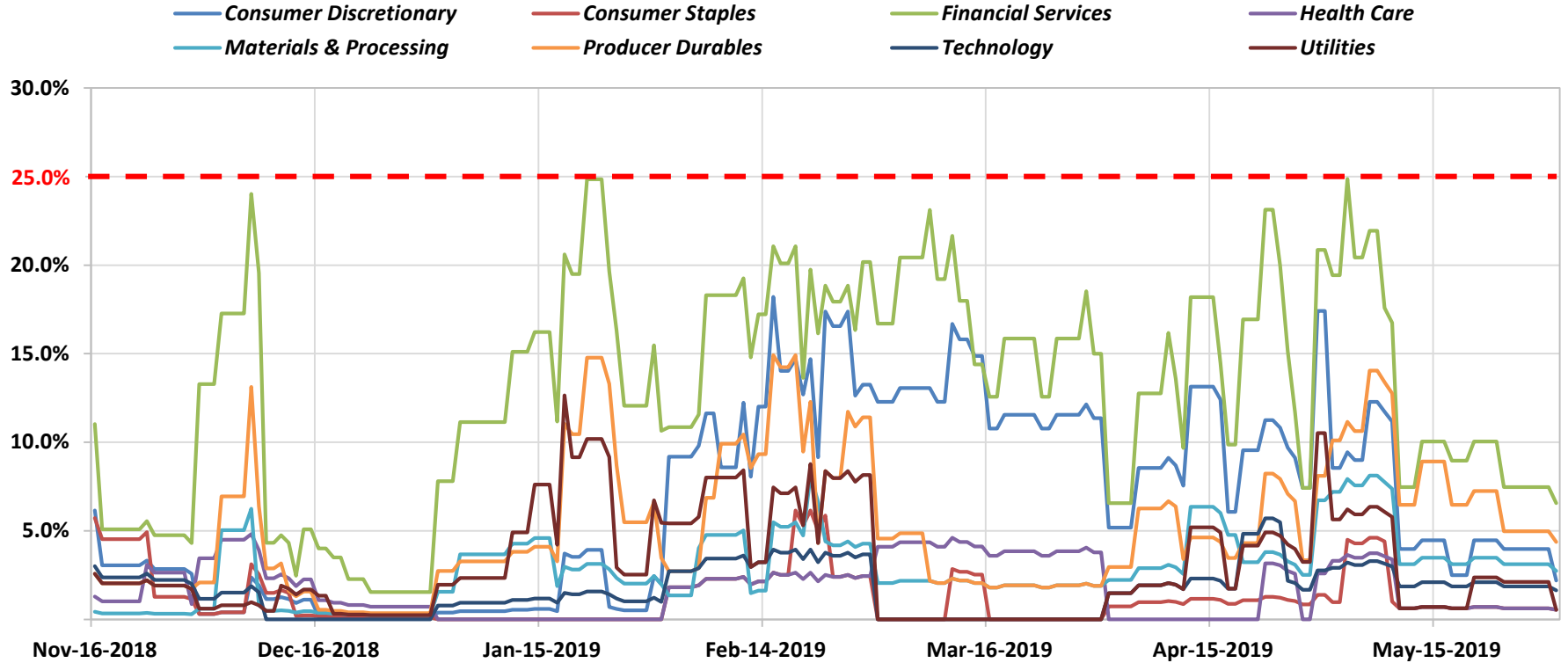
Security Weighting by Month

1

November		
Bucket	**Count**	**Weighting**
Daily	5	4.00%
Weekly	7	3.50%
Unknown	51	0.75%

2

December		
Bucket	**Count**	**Weighting**
Daily	10	3.50%
Weekly	14	2.50%
Unknown	28	0.65%

3

January		
Bucket	**Count**	**Weighting**
Daily	8	4.00%
Weekly	6	3.85%
Unknown	39	1.00%

4

Februrary		
Bucket	**Count**	**Weighting**
Daily	15	4.00%
Weekly	27	1.50%
Unknown	61	0.75%

5

March		
Bucket	**Count**	**Weighting**
Daily	7	4.00%
Weekly	1	3.75%
Unknown	17	3.25%

6

April		
Bucket	**Count**	**Weighting**
Daily	13	4.00%
Weekly	7	3.00%
Unknown	27	1.60%

7

May		
Bucket	**Count**	**Weighting**
Daily	3	4.00%
Weekly	16	3.00%
Unknown	35	1.25%

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Undergraduate Student Investment Management Fund

2018 Fall Presentation
Friday, November 30

Team Overview

Fund Manager

Jerry Zhang

Fund Analysts

Michael Calabro

Nicholas DeSantangilo

Yanni Dong

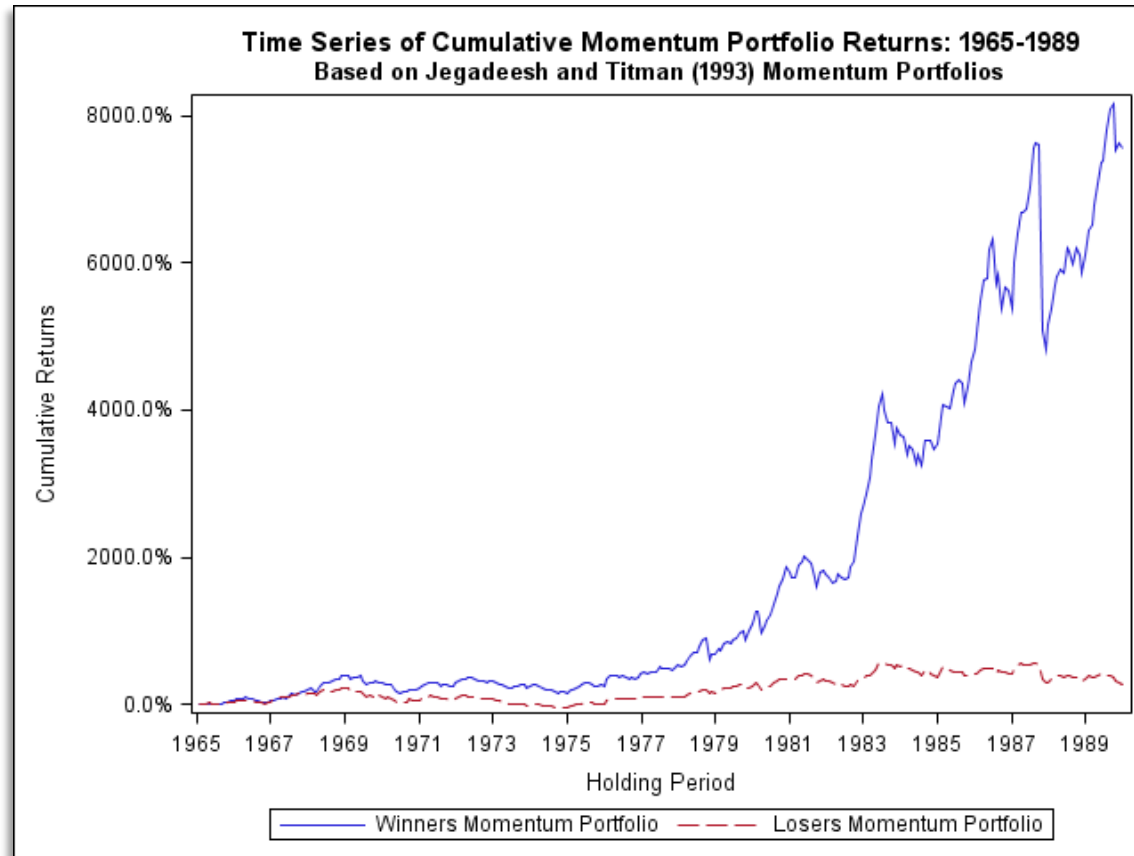

Abbas Haider

Lukas Stogsdill
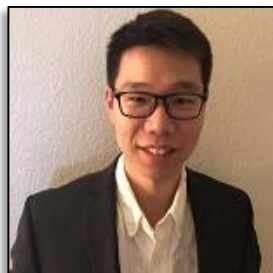

Li Yang

Isaac Zolot

Investment Thesis

Introduction to Momentum

Jegadeesh & Titman (1993) find that trading strategies that buy past winners (stocks that perform well) and sell past losers (stock that perform poorly) experience abnormal returns.

Time Series of Cumulative Momentum Portfolio Returns: 1965-1989
Based on Jegadeesh and Titman (1993) Momentum Portfolios

Momentum Returns

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

Momentum Premium (1927 -2018)
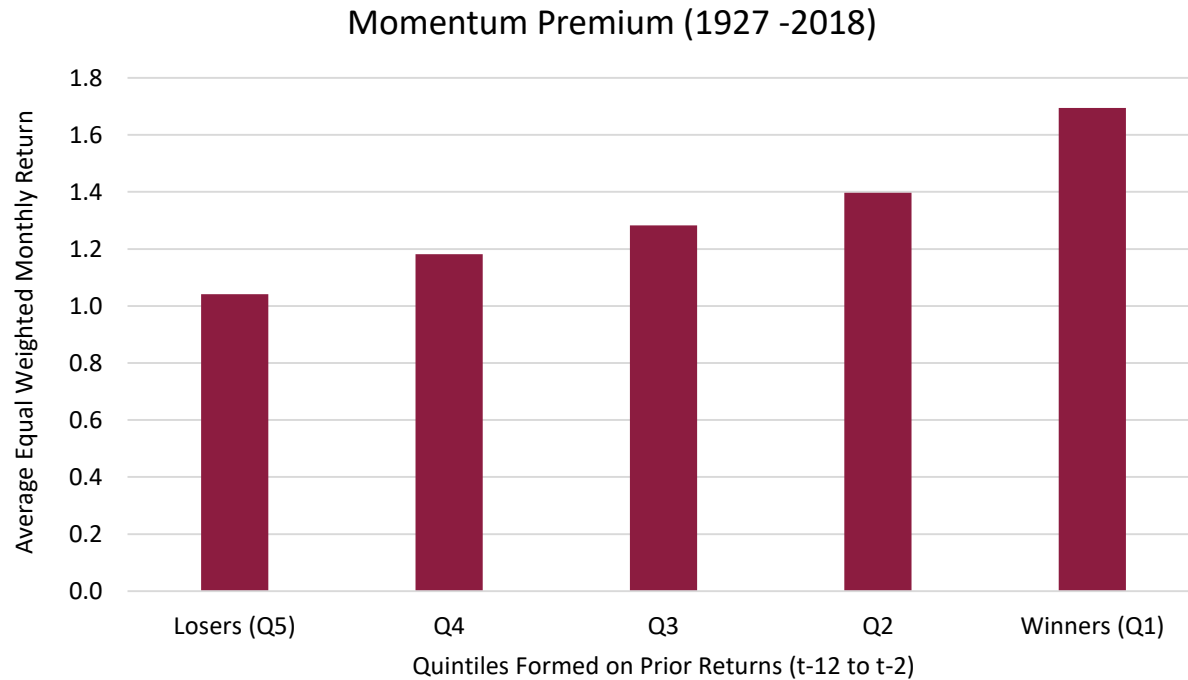
Source: Kenneth R. French Data Library

Explanations of Momentum Phenomenon

Bearing Undiversifiable Risk: this theory posits that momentum investors experience outsized average returns as compensation for bearing undiversifiable risk.

Underreaction: this theory posits that information slowly leaks into prices due to slow reactions to news.

Frog in the Pan Theory

Our fund's investment thesis is derived from Da, Gurun, & Warachka's (2014) analysis on momentum investing conditioned on information discreteness.
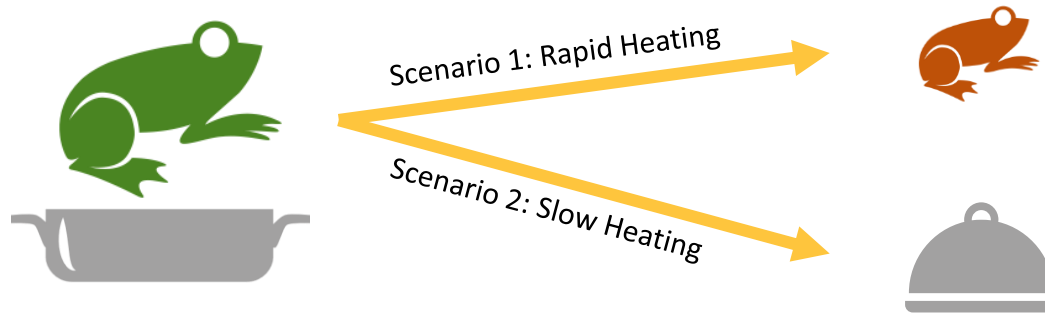
Implication: Investors are less attentive to information arriving continuously in small amounts than to information that arrives in large amounts at discrete time points.

Continuous vs. Discrete Returns

Notice same beginning and end price

Notice reversals and shocks

Notice difference in magnitude of daily changes
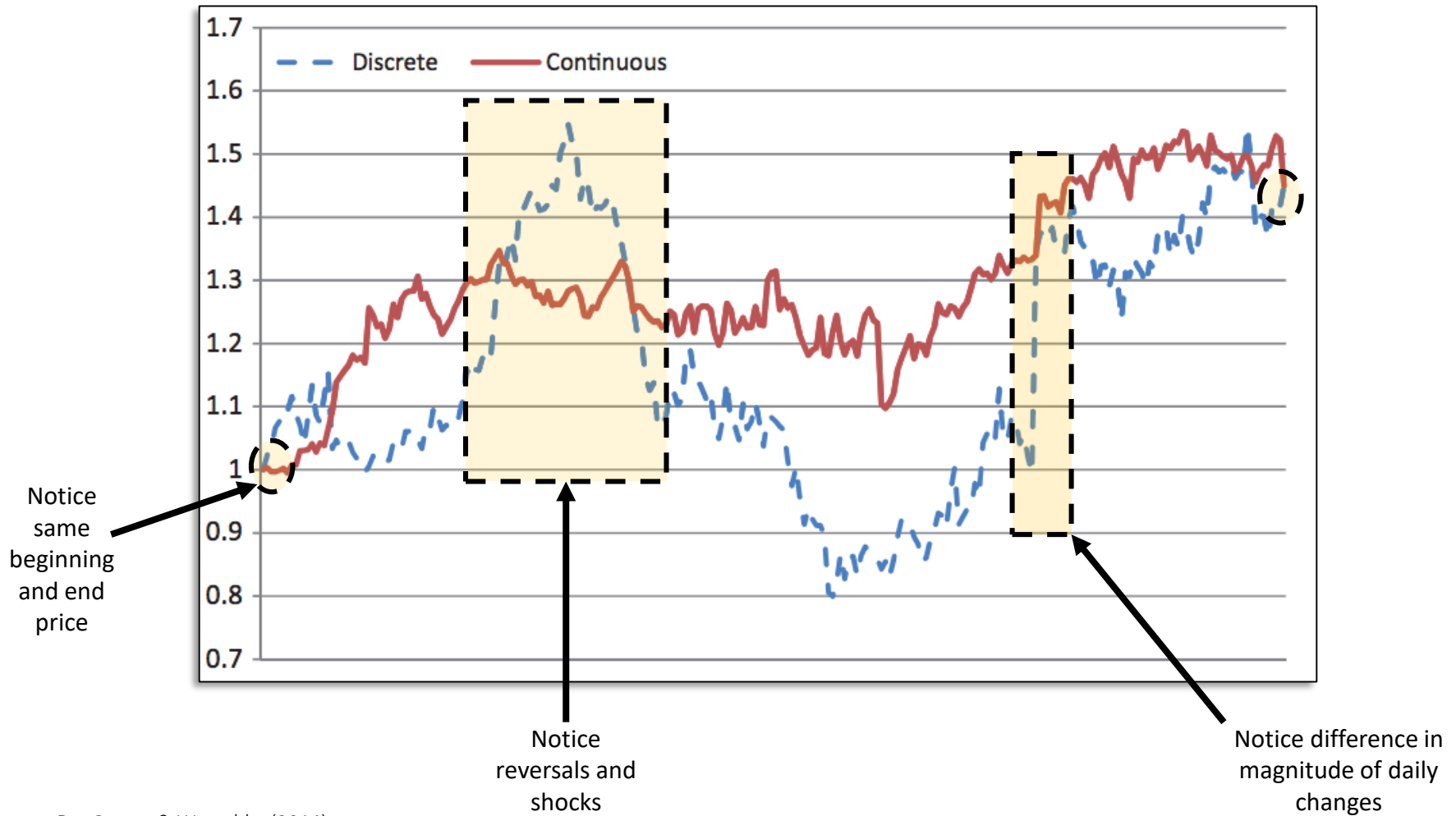
Source: Da, Gurun, & Warachka (2014)

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)

Continuous Momentum Alpha

Momentum profit conditioned on continuous information persists for ten months; discrete profits ends after five months. Continuous information also lacks a long-term return reversal.
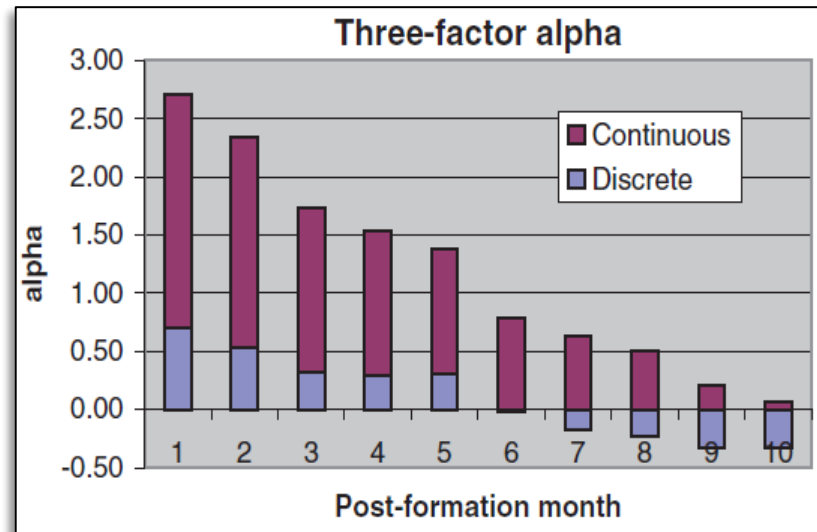
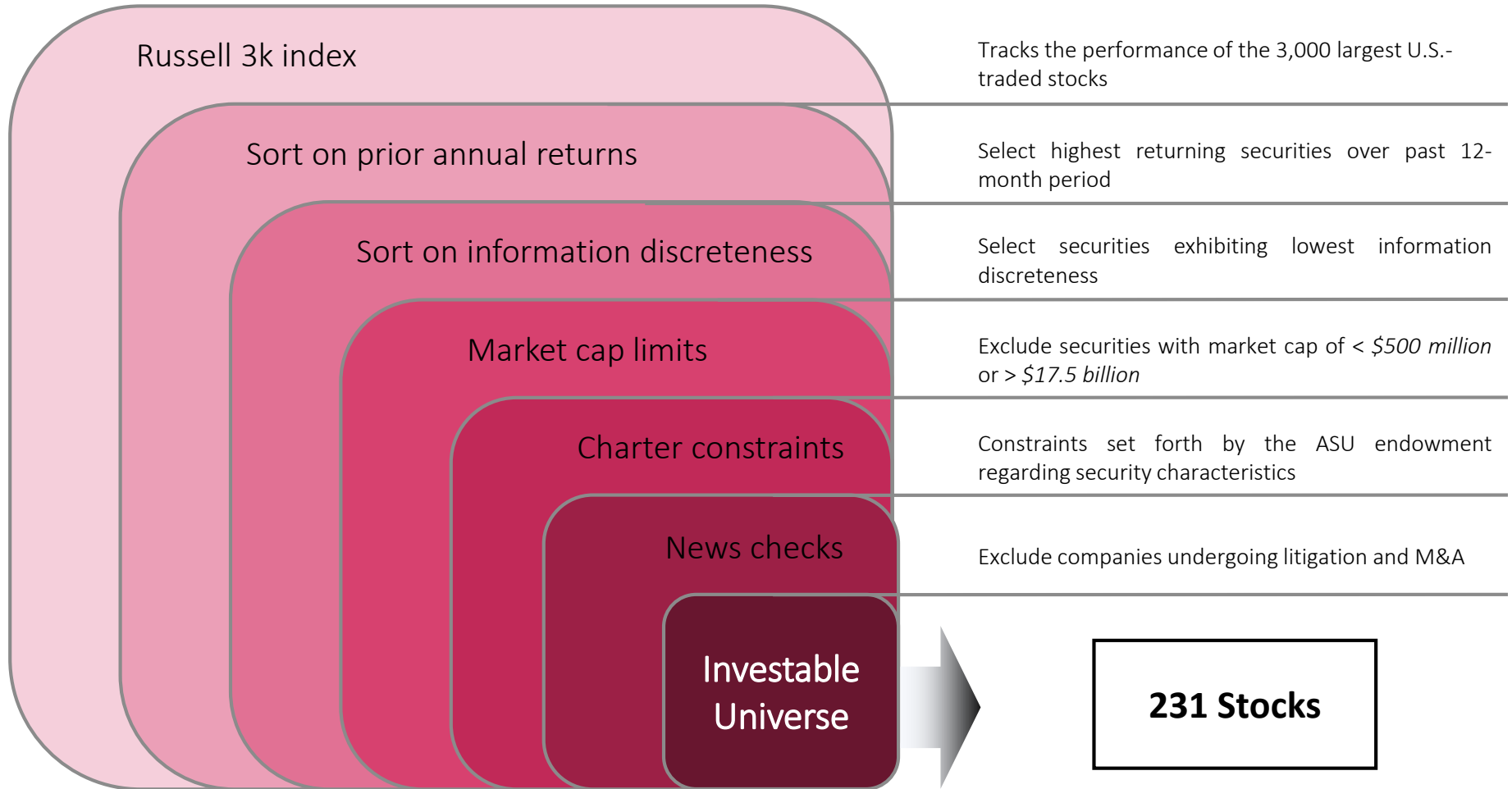Source: Da, Gurun, & Warachka (2014)

Portfolio Implementation

Discussion on Investment Quintiles

	Losers Min: -95%	-18% - -3%	-3% - 11%	11% - 33%	Winners Max: 1648%

Russell 3k

Quintiles sorted on annual returns

Quintile 5	Quintile 4	Quintile 3	Quintile 2	Quintile 1 (570 stocks)

Quintile 1

Quintiles sorted on ID

Quintile 1 (114 stocks)	Quintile 2	Quintile 3	Quintile 4	Quintile 5
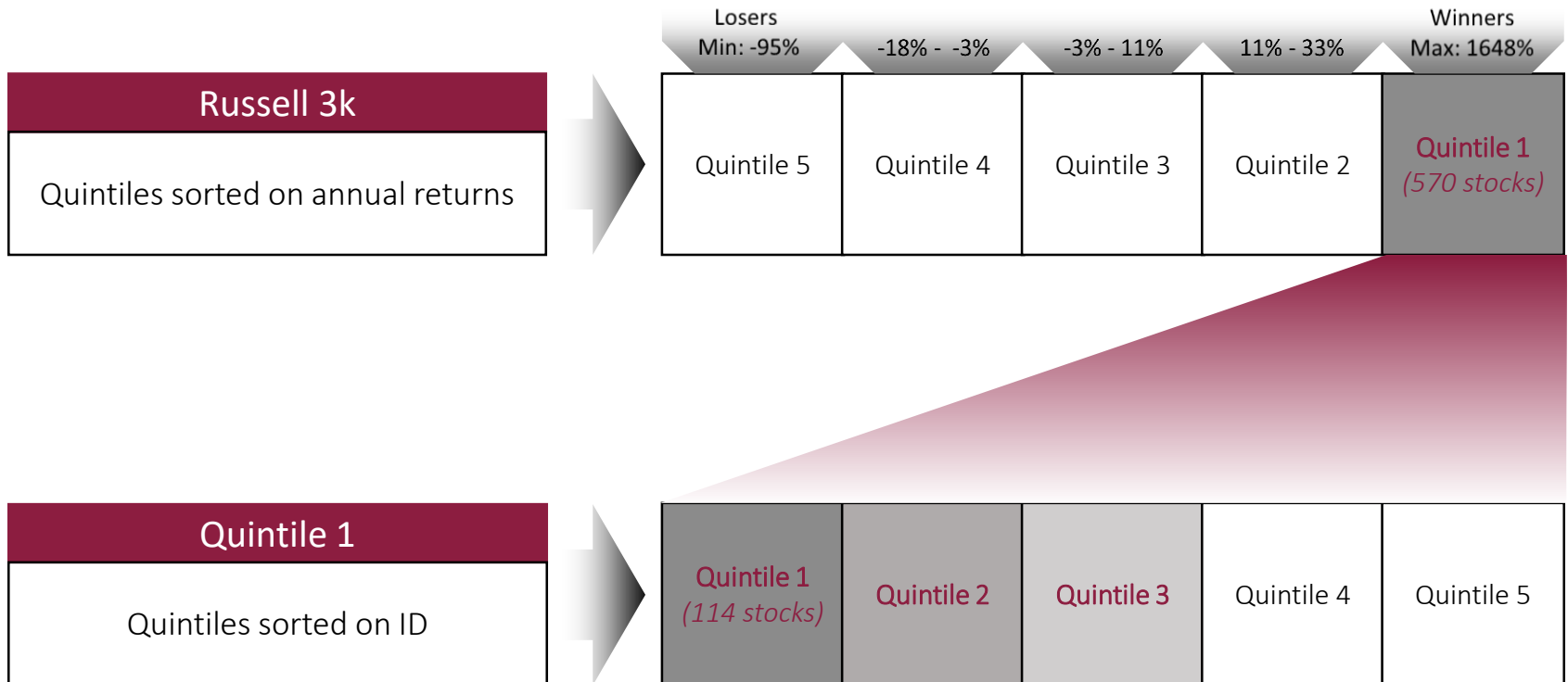
$$ID = sign(Annual\ Return) \times [\%neg - \%pos]$$

Security Selection

Funnel Stage	Description
Russell 3k index	Tracks the performance of the 3,000 largest U.S.-traded stocks
Sort on prior annual returns	Select highest returning securities over past 12-month period
Sort on information discreteness	Select securities exhibiting lowest information discreteness
Market cap limits	Exclude securities with market cap of < *$500 million* or > *$17.5 billion*
Charter constraints	Constraints set forth by the ASU endowment regarding security characteristics
News checks	Exclude companies undergoing litigation and M&A
Investable Universe	→ **231 Stocks**

Portfolio Construction Process

Cumulative market cap with respect to target portfolio: Consumer Discretionary.

Target Portfolio Characteristics

# of securities: 70   Average Market Cap: $5B

Total Mkt. Cap $350B

4% 3% 2% 10% 19% 10% 12% 14% 14% 5% 7%

X # of Securities

Example: Consumer Discretionary
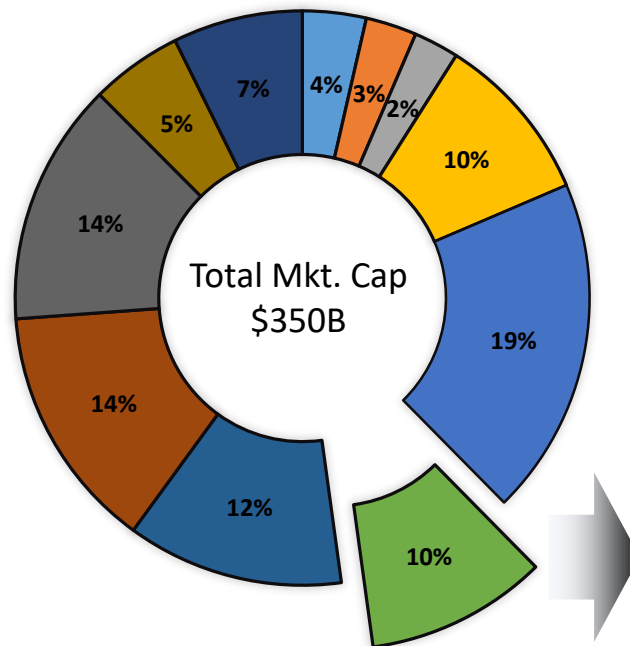
Single Security Market Cap
―――――――――
Target Portfolio Market Cap

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

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

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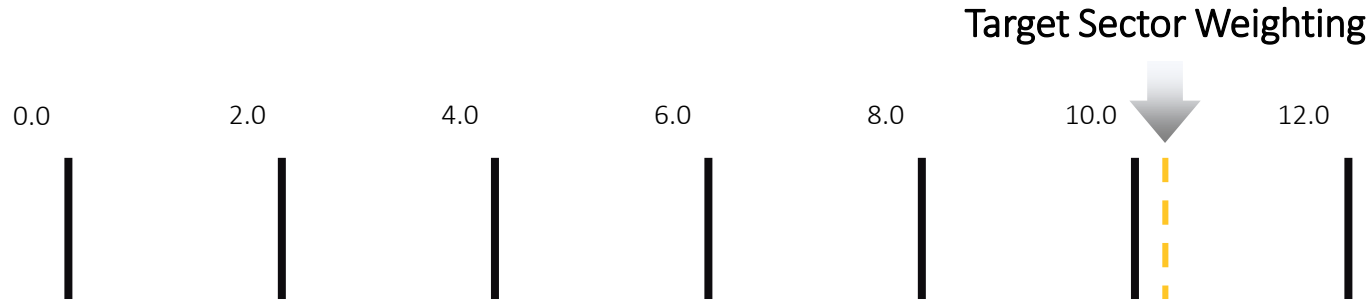
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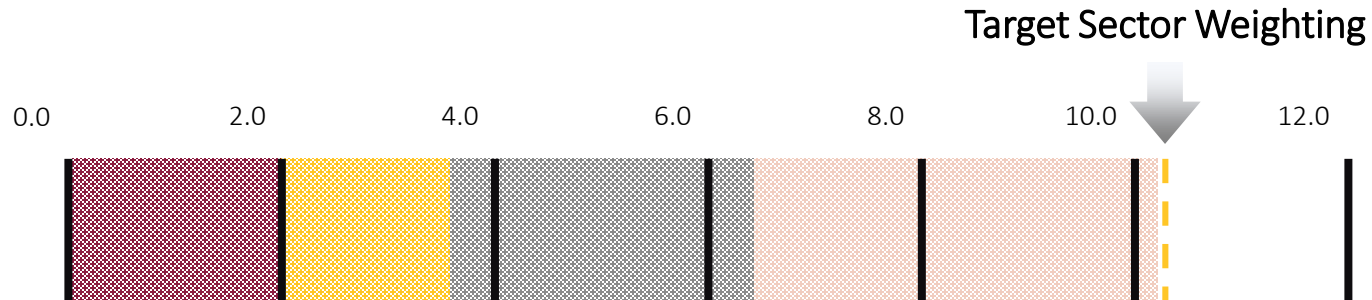
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Asset Allocation

Russell 3k Weights

Portfolio Weights

66 Stocks
Total Mkt. Cap $337B
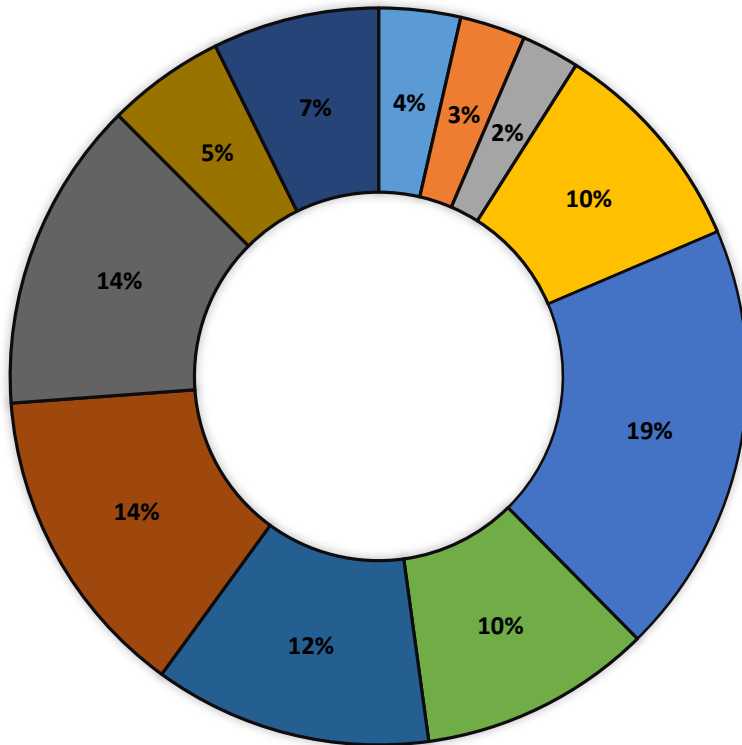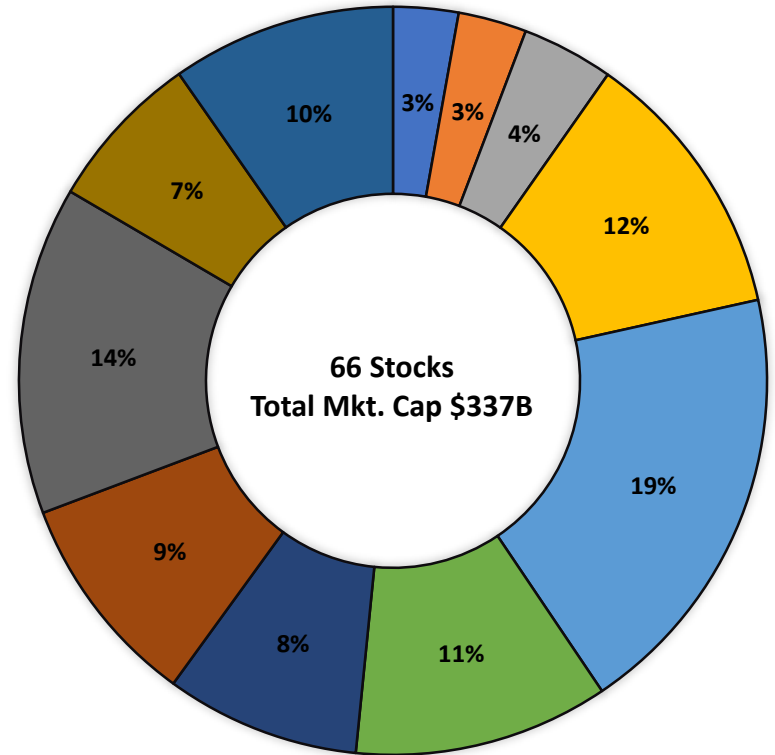
Legend:
- Real Estate
- Utilities
- Materials
- Industrials
- Information Technology
- Consumer Discretionary
- Communication Services
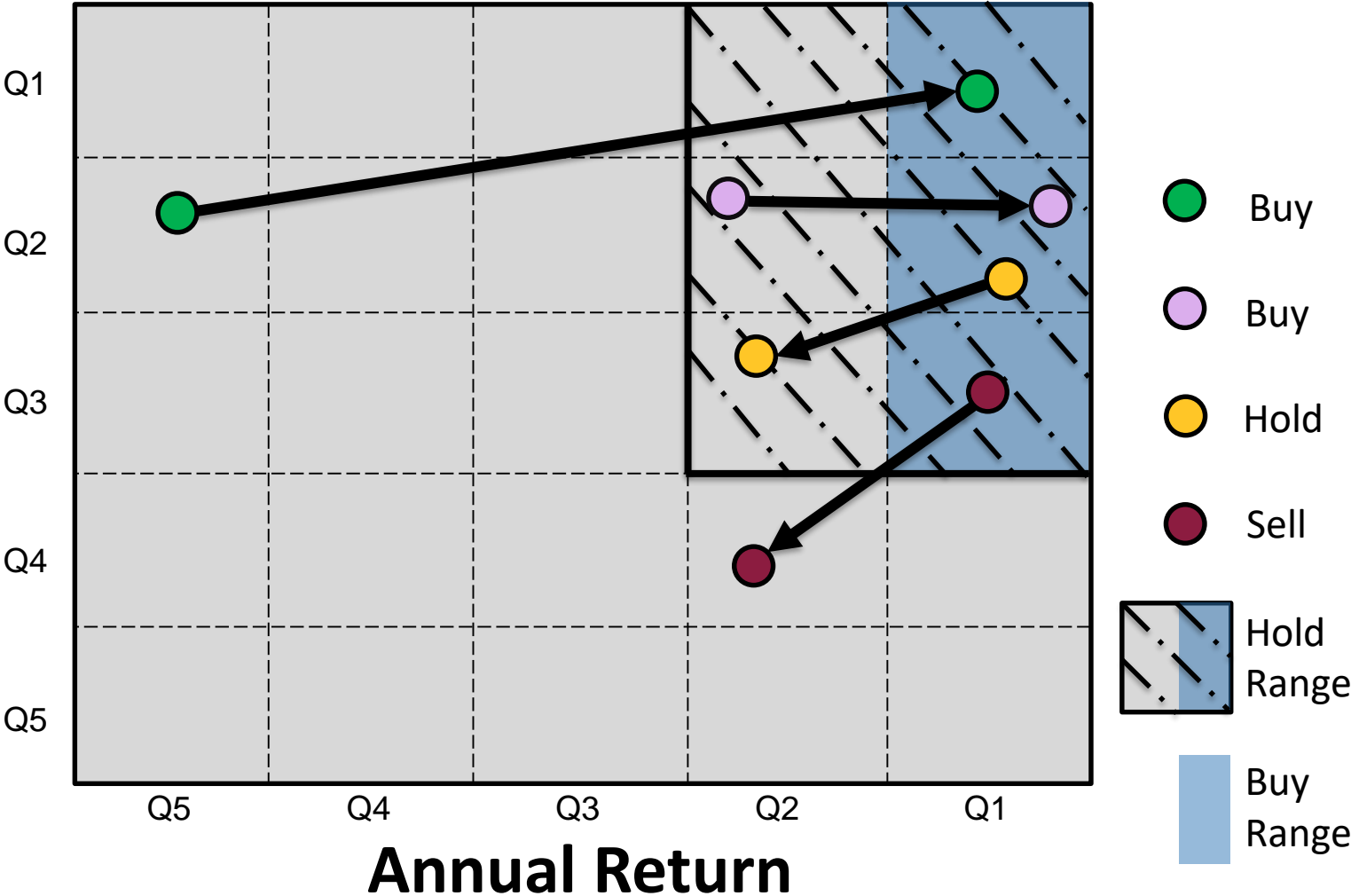- Financials
- Health Care
- Energy
- Consumer Staples

Returns

Arizona State University
Student Investment Management Fund

Investment Thesis   Implementation

Rebalancing

ID

Annual Return

Buy

Buy

Hold

Sell

Hold Range

Buy Range

Thank you. Questions?