

# **SIM Fund Team A Investment Performance Final Presentation**

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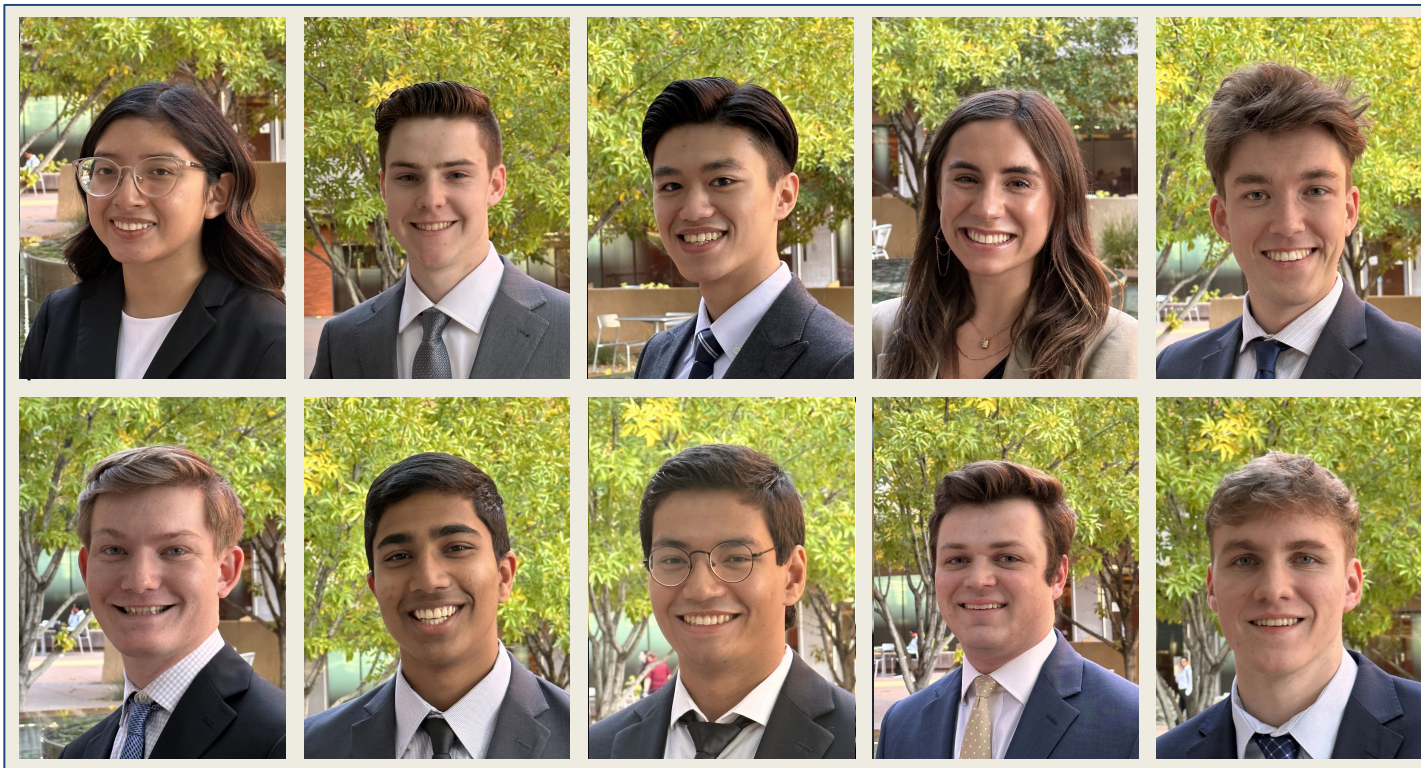
**Prepared by the Undergraduate Student Investment  
Management Fund - Team A  
Presented by Junjie Liu, and Ryan Davitt**

Under the designation of Dr. Wahal  
Friday April 28<sup>th</sup>, 2023



# Team Introduction

## Fund Manager



Alondra Vasquez  
Caden Fricke  
Junjie Liu  
Korey Pettit  
Ethan Kibsey

Peter Andrews  
Rajeev Vemuri  
Ryan Davitt  
Ryan Vanderway  
Skene Black

# Agenda

**Investment Thesis**

**Portfolio Performance**

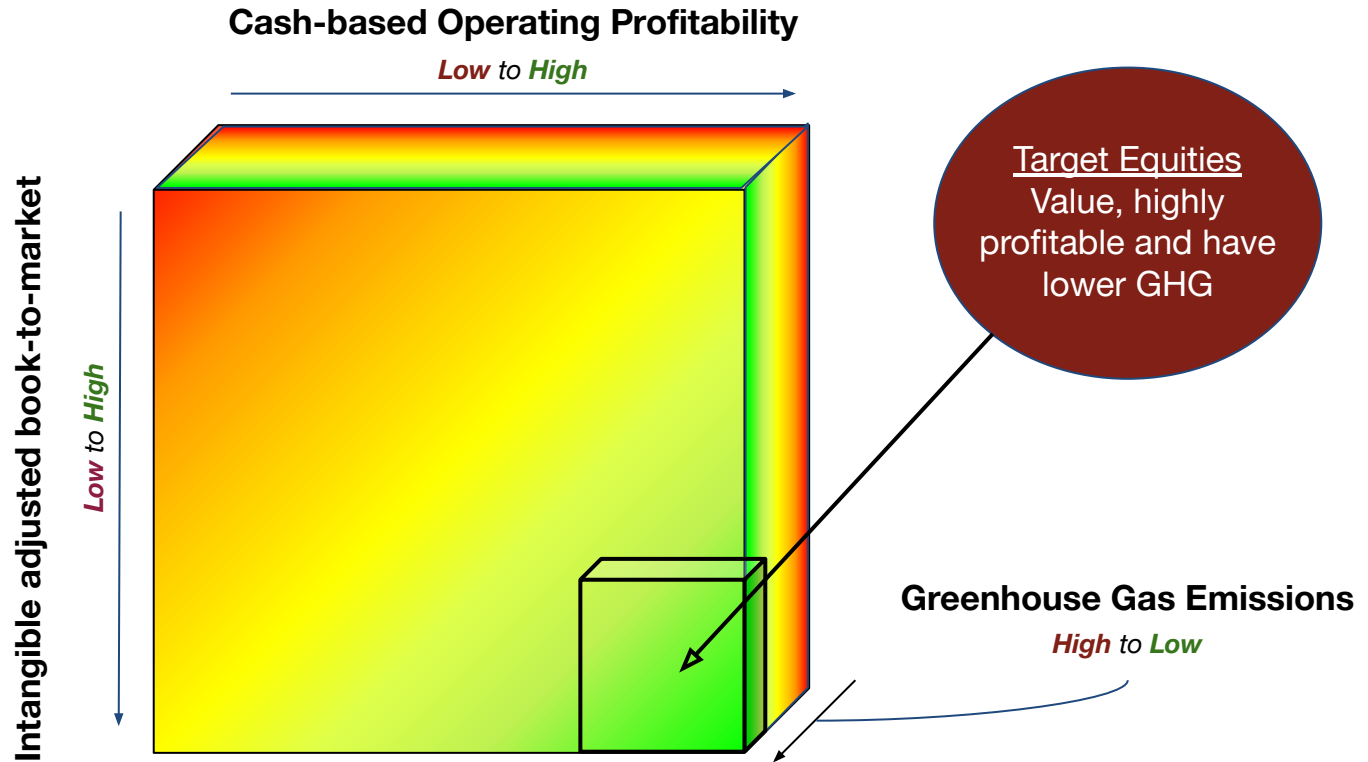
**Lessons Learned**

# Investment Thesis





# 3 Main Components of our Investment Thesis





# Value & Profitability Monotonic Return Patterns

		Profitability			
		Weak	2	3	Robust
Value	Growth	0.44	0.9	0.93	1.04
	2	0.81	0.92	1.1	1.07
	3	0.98	1.07	1.23	1.36
	Value	1.14	1.31	1.37	1.68

*1940-2019 Avg Monthly Returns %*

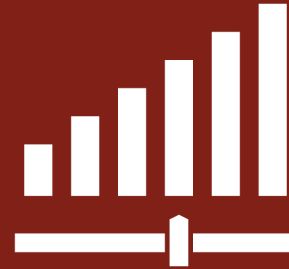


# GHG Emissions - Metrics

We will use **two emission metrics** to rank stocks in our portfolio



**Absolute Emissions**  
**(Scope 1 & 2):**  
Total Emissions Emitted by  
a Company



**Emissions Intensity**  
**(Scope 1 & 2):**  
$$\frac{\text{Absolute Emissions}}{\text{Revenue}}$$



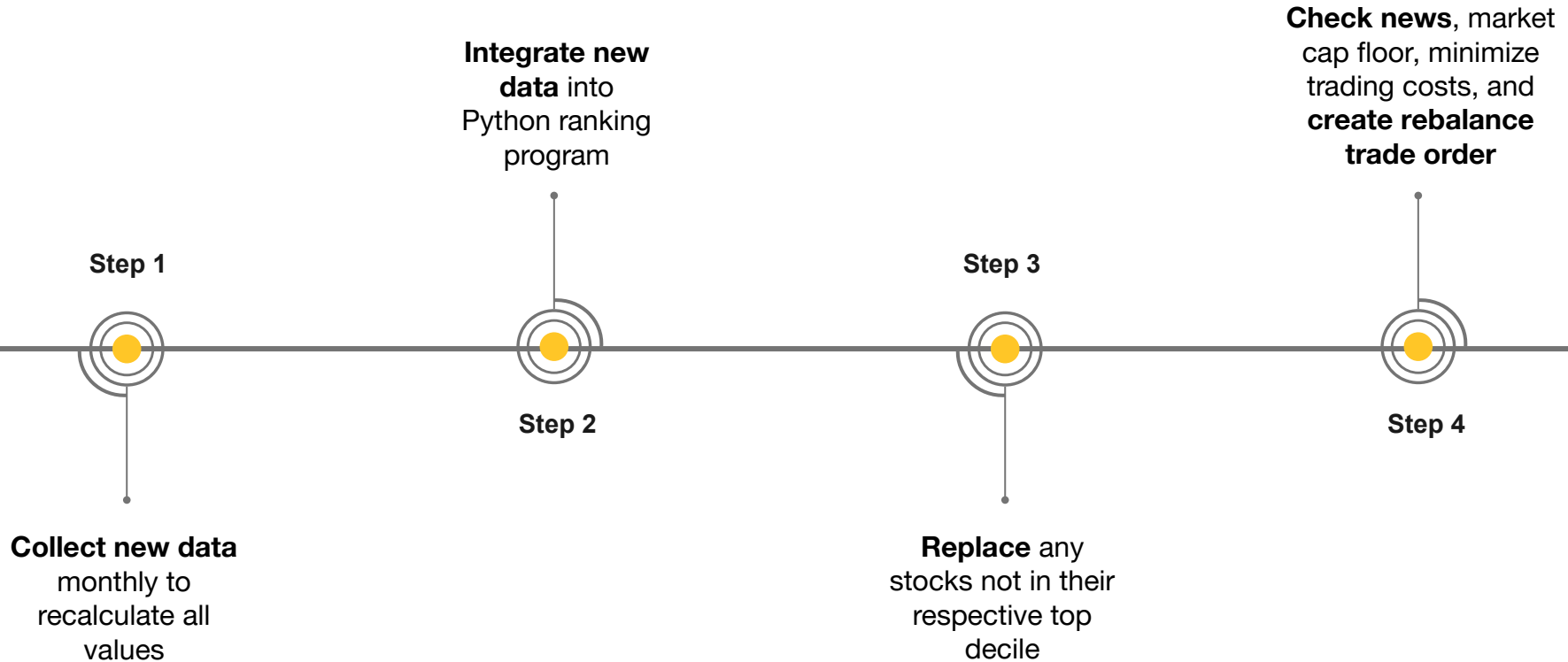
# Ranking Mechanism Example

<b>Stock</b>	<b>Value Percentile (40%)</b>	<b>Profitability Percentile (40%)</b>	<b>Emission Intensity (15%)</b>	<b>Absolute Emissions (5%)</b>	<b>Security Score (100%)</b>
<b>A</b>	90%	90%	50%	50%	82%
<b>B</b>	80%	80%	100%	100%	84%
<b>C</b>	70%	60%	-	-	65%

*This ranking method was performed in each individual Sector*

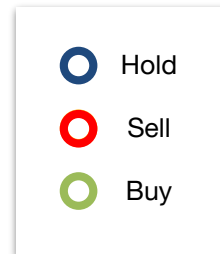
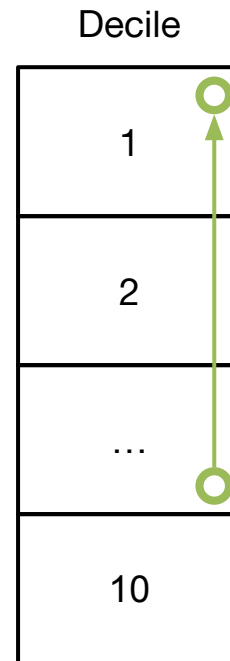
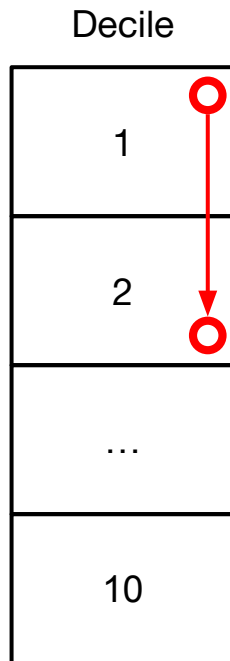
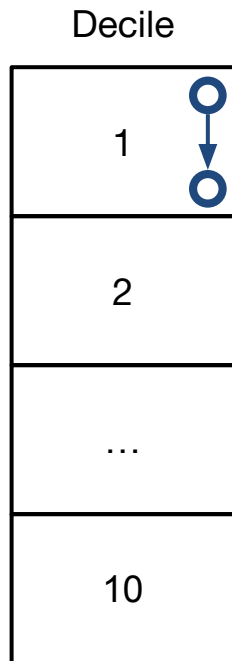


# Portfolio Construction and Rebalance Process





# Decision Criteria During Rebalances







# Portfolio Universe vs Statistics

	iB/M	CbOP/Total Assets (t-1)	Absolute Emissions (M) <sup>2</sup>	Emissions Intensity <sup>3</sup>
<b>Portfolio<sup>1</sup></b>	1.46	0.06	0.42	64.82
<b>Universe<sup>1</sup></b>	0.75	0.01	1.26	187.32

<sup>1</sup>Portfolio and universe metrics are weighted average by portfolio weights

<sup>2</sup>Absolute emissions are measured as millions of metric tons

<sup>3</sup>Emissions intensity is absolute emissions divided by revenues (in millions)

# Portfolio Performance

Market Benchmarks	Value and Profitability Benchmarks	ESG Benchmarks
<p>IWV (iShares Russell 3000 ETF)</p> <p>IWN (iShares Russell 2000 Value ETF)</p>	<p>Shadow Portfolio NSC* (Intangible Value, and Cash-Based Operating Profitability)</p> <p>Shadow Portfolio SC** (Intangible Value, and Cash-Based Operating Profitability)</p> <p>AVUV (Avantis US Small Cap Value ETF)</p>	<p>PABU US (iShares Paris - Aligned Climate MSCI USA ETF): Large-Mid Cap; Low-Carbon</p> <p>AVSU US (Avantis Responsible US Equity ETF): Multi-Cap ESG criteria</p>

\*NSC: Non sector constrain

\*\*SC: Sector constrain



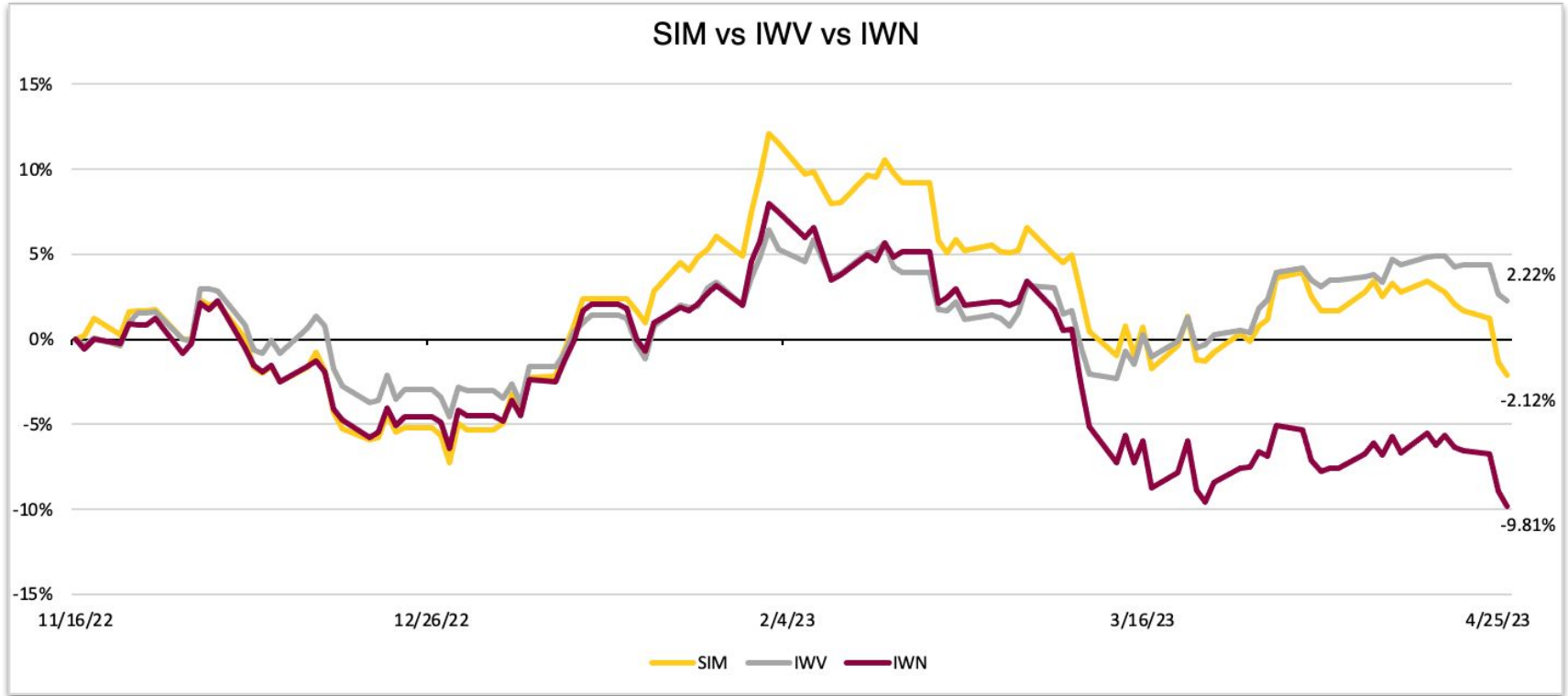
# Portfolio Statistics vs Benchmarks

Benchmark categories

<u>Metric/BM</u>	SIM	Market		Value/Profit			ESG	
		IWV	IWN	AVUV	Shadow SC	Shadow NSC	PABU	AVSU
<b>Mkt. Cap (B)</b>	13.50	42.52	1.70	1.15	2.57	2.38	33.24	26.35
<b># Securities</b>	50	2616	1371	721	50	49	310	1305
<b>P/B</b>	1.7	3.49	1.16	1.27	1.37	1.43	2.79	3.11
<b>P/E</b>	8.97	19.60	24.22	7.33	10.51	12.83	15.17	23.99
<b>Absolute (M)</b>	0.41				1.05	1.46		
<b>Intensity</b>	64.82	144.15	182.09		190.76	313.72	27.83	42.51

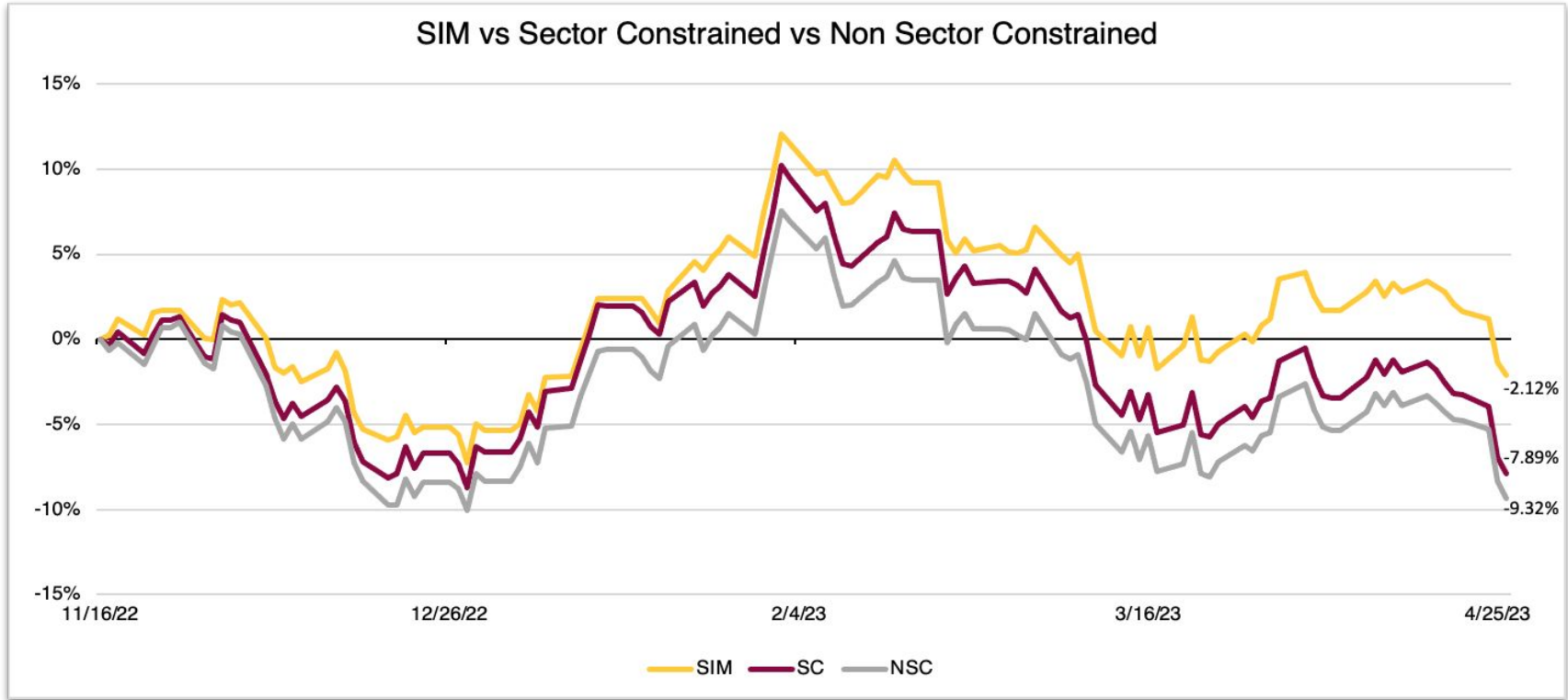


# Performance since inception vs benchmarks (**Market**)





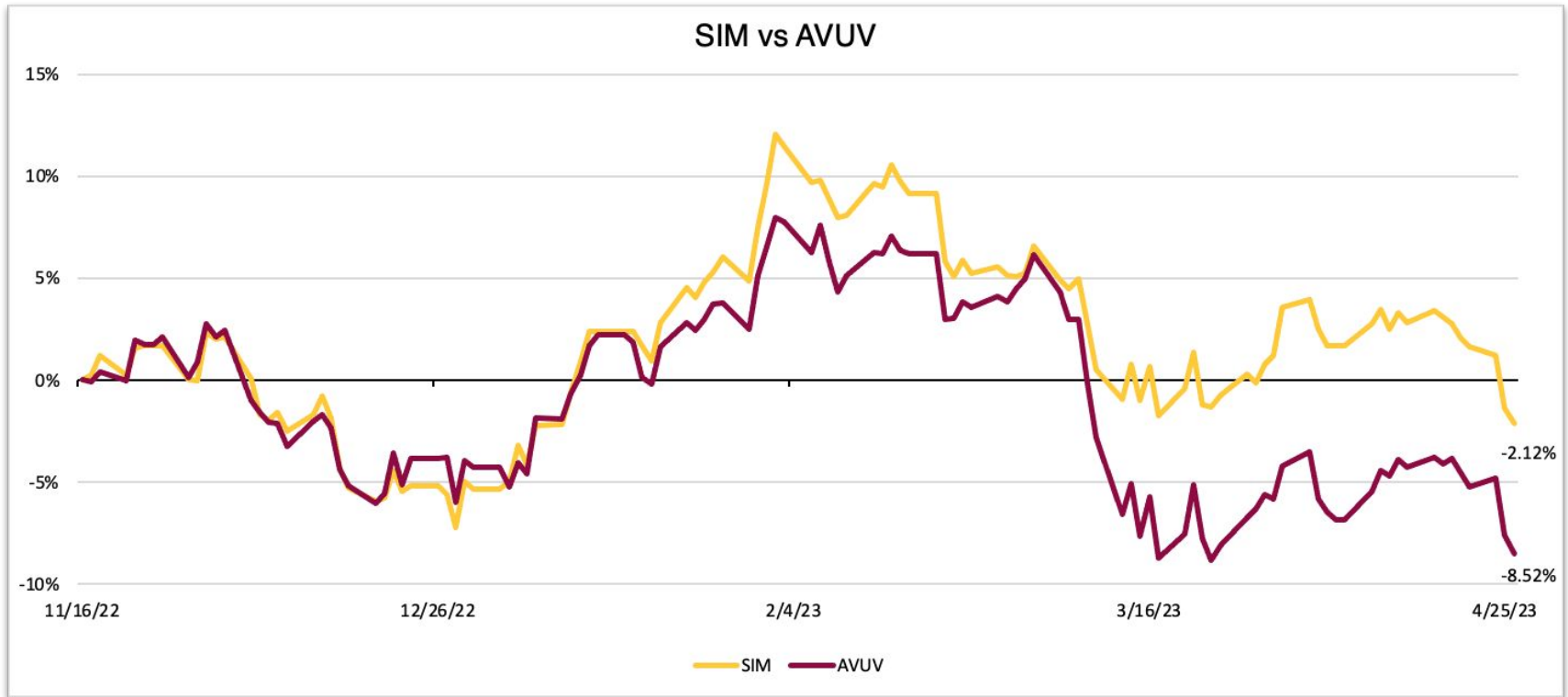
# Performance since inception vs benchmarks (Shadow Portfolios)





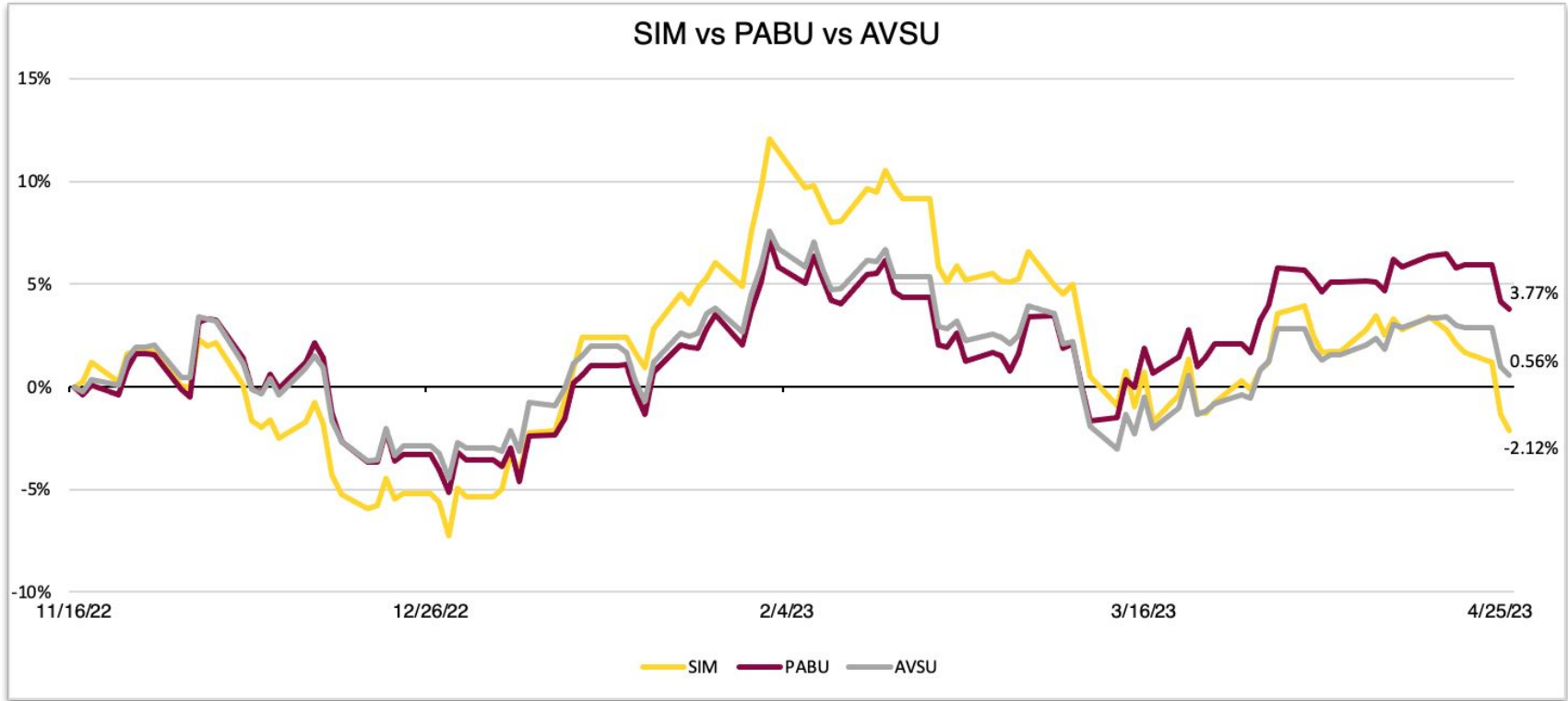


# Performance since inception vs benchmarks (**Value & Profitability**)





# Performance since inception vs benchmarks (ESG)





# Attribution Summary vs IWV

## Attribution Summary (Grid)

	Avg % Wgt			Total Return (%)	Contribution to Return (%)	Allocation Effect (%)	Selection Effect (%)	Tot Attr
	Port	Bench	+/-	Port	Port			
SIM PORTFOLIO	100.00	100.00	0.00	-2.12	-2.12	-0.66	-3.68	-4.34
Information Technology	19.32	22.60	-3.29	3.90	0.63	-0.24	-1.92	-2.16
Financials	15.67	14.40	1.27	-0.07	-0.19	-0.03	0.85	0.81
Industrials	14.41	10.05	4.36	3.07	0.46	-0.21	0.73	0.53
Health Care	13.74	14.67	-0.92	-26.51	-4.28	-0.03	-4.32	-4.35
Consumer Discretionary	11.98	10.05	1.93	11.18	1.15	-0.01	0.92	0.91
Real Estate	5.90	3.25	2.65	-13.99	-1.06	-0.25	-0.74	-0.99
Materials	5.54	3.01	2.53	16.75	0.94	-0.11	1.05	0.94
Communication Services	4.75	7.17	-2.42	6.87	0.32	-0.22	-0.14	-0.37
Consumer Staples	4.61	6.69	-2.08	7.91	0.36	0.00	0.17	0.17
Not Classified	2.05	0.25	1.80	0.00	0.00	0.01	0.00	0.01
Energy	2.03	4.98	-2.96	-20.24	-0.45	0.37	-0.28	0.10
Utilities		2.87	-2.87			0.05	0.00	0.05

# Problems and Lessons



## Learning Opportunities:

- Late Rebalance
- Bloomberg Mistakes
- Day to Day Decisions
- Rule Implementation
- Trading Costs
- High Turnover
- Accounting for Emissions
- Data
- Stale Pricing
- Banking Industry

**“If you’re not making mistakes,  
then you’re not doing anything”  
- John Wooden**



# Do We Really Care About Emissions?

	<b>Weighted Average Absolute Emissions (mCO2t)</b>	<b>Weighted Average Emissions Intensity</b>
<b>Average</b>	0.4	64.8
<b>February Portfolio</b>	1.1	129.3

**Solution:** Invest in Materials and Energy if Absolute and Intensity are at least top 50% percentile





## **It is all about the data!**

- Know your sources
- Keep it organized
- Understand what you are looking at



# Stale Pricing

Keep your prices updated!  
... or you might end up on margin.

Custody Overview			
ASUF14 - ASUF - LTIP UNDERGRAD SIM 2			
24 FEB 2023	24 FEB 2023	24 FEB 2023	24 FEB 2023
Total Value	Unrealized Gain/Loss	Cash Balance	Funds
1,220,336.04	32,406.12	-4,943.34	0.00

Change in Value for Investment Securities

Cover Ratio

	AFS: Change in Value	HTM: Change in Value	Cash to Interest Bearing Liabilities	Cash to Total Liabilities
Banking Industry Avg	-10.47%	-9.93%	2.58%	1.67%
TCBI	-12.84%	-12.68%	1.51%	0.92%
TCBI Percentile in Banking Industry	25.14%	37.41%	35.56%	28.26%

# Questions?

# Appendix Table of Contents

Appendix 1: V&P Return Patterns

Appendix 2: Intangible Book to Market Ratio

Appendix 3: Cash-based Operating Profitability

Appendix 4: OP and CbOP Returns

Appendix 5: OP and CbOP Regression

Appendix 6: Value and Profitability Framework

Appendix 7: TCBI Investment Securities

Appendix 8: Portfolio Statistics vs Benchmarks

Appendix 9: Attribution Summary (vs IWW)

Appendix 10: GHG 3 Scope of Emissions

Appendix 11: Sector Allocation Mechanism

Appendix 12: Portfolio Turnover and Trading Cost



# Value & Profitability Monotonic Return Patterns

		Profitability			
		Weak	2	3	Robust
Value	Growth	0.44	0.9	0.93	1.04
	2	0.81	0.92	1.1	1.07
	3	0.98	1.07	1.23	1.36
	Value	1.14	1.31	1.37	1.68

*1940-2019 Avg Monthly Returns %*





# Intangible Value - Adjusted B/M

Equation 1: Initialization at T-1

$$INT_{i0} = SGA_{i1} / (g + \delta)$$



Equation 2: Depreciate Starting at T = 0

$$INT_{it} = (1 - \delta)INT_{it-1} + SGA_{it}$$

Equation 3: New Book to Equity<sub>INT</sub>

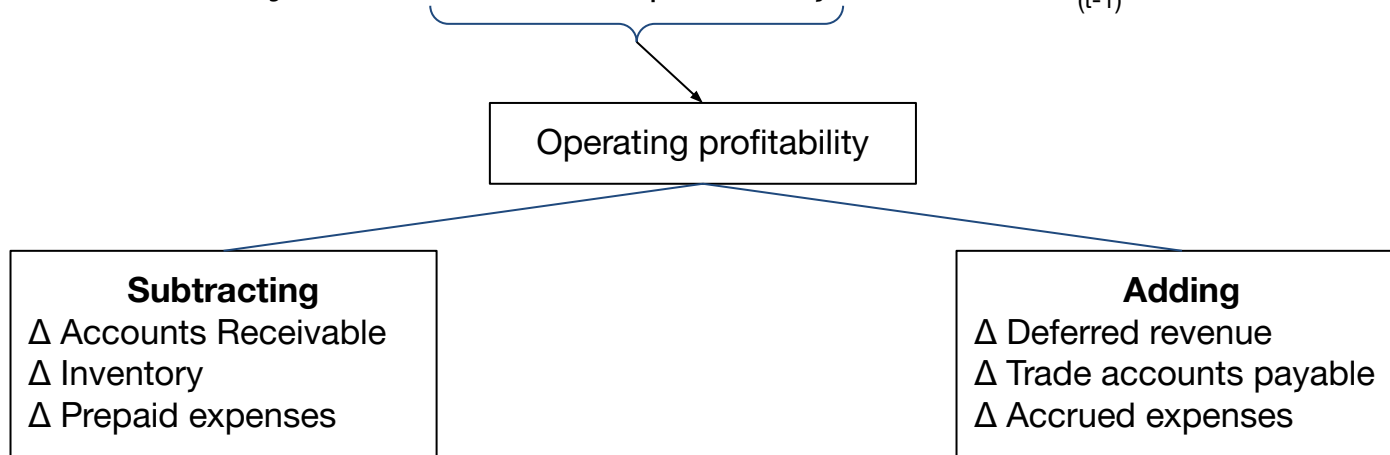
$$B_{it}^{INT} = B_{it} - GDWL_{it} + INT_{it}$$

*\*Noted SGA is the sum of SG&A (organization capital)  
and R&D Expenses (knowledge capital)*



# Cash-based Operating Profitability

$$\text{Profitability Ratio} = \text{Cash-based profitability} \div \text{Total Assets}_{(t-1)}$$



*Equation 4: Breakdown of the profitability ratio*



# Cash-based Operating Profitability

Panel A: All stocks

Portfolio	Operating profitability			Accruals			Cash-based operating profitability		
	Excess return	$\alpha$		Excess return	$\alpha$		Excess return	$\alpha$	
		CAPM	FF3		CAPM	FF3		CAPM	FF3
Monthly excess returns and alphas									
1 (low)	0.29	-0.35	-0.45	0.68	0.11	0.19	0.16	-0.50	-0.55
2	0.42	-0.09	-0.21	0.61	0.12	0.13	0.36	-0.19	-0.30
3	0.52	0.04	-0.13	0.53	0.06	0.10	0.46	-0.02	-0.11
4	0.49	0.03	-0.10	0.55	0.07	0.06	0.52	0.02	-0.09
5	0.51	0.03	-0.01	0.61	0.15	0.12	0.59	0.11	0.02
6	0.58	0.11	0.05	0.57	0.11	0.11	0.44	-0.02	-0.08
7	0.54	0.05	-0.02	0.58	0.11	0.15	0.61	0.14	0.09
8	0.67	0.16	0.16	0.45	-0.05	-0.03	0.61	0.12	0.12
9	0.53	0.04	0.08	0.46	-0.11	-0.02	0.62	0.11	0.17
10 (high)	0.58	0.07	0.29	0.32	-0.32	-0.20	0.64	0.14	0.35
10 - 1	0.29	0.42	0.74	-0.35	-0.43	-0.39	0.47	0.65	0.89



# Profitability Spanning Regressions

*Panel A: All-but-microcaps*

Explanatory variable	Regression						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Operating profitability	2.99 (8.86)	2.55 (7.04)		2.55 (7.09)			0.80 (1.56)
Accruals			-1.41 (-3.90)	-1.58 (-4.45)		0.15 (0.34)	
Cash-based operating profitability					2.60 (9.69)	2.54 (7.40)	1.91 (5.27)
log(BE/ME)	0.42 (5.80)	0.36 (5.08)	0.21 (3.28)	0.33 (4.66)	0.33 (4.76)	0.32 (4.53)	0.33 (4.73)
log(ME)	-0.08 (-2.07)	-0.09 (-2.35)	-0.09 (-2.24)	-0.10 (-2.66)	-0.10 (-2.59)	-0.10 (-2.69)	-0.10 (-2.59)
$r_{1,1}$	-3.03 (-6.97)	-3.23 (-7.49)	-3.34 (-7.76)	-3.30 (-7.72)	-3.27 (-7.58)	-3.32 (-7.78)	-3.28 (-7.66)
$r_{12,2}$	1.03 (5.69)	0.95 (5.30)	0.86 (4.81)	0.91 (5.12)	0.92 (5.11)	0.91 (5.08)	0.92 (5.15)
Adjusted $R^2$	5.6%	5.5%	5.2%	5.7%	5.4%	5.6%	5.6%



# Value and Profitability Framework

- Miller-Modigliani (1961): Market value ( $M_t$ ) is the present value of expected future cash flows
- With clean-surplus accounting, future cash flows equals to future earnings ( $Y_{t+\tau}$ ) minus future expected investment ( $dB_{t+\tau}$ )

$$\text{Value} \left( \frac{M_t}{B_t} \right) \equiv \sum_{\tau=0}^{\infty} \frac{\mathbb{E}_t \left( Y_{t+\tau}/B_t - dB_{t+\tau}/B_t \right)}{(1+r)^\tau} \text{Expected Profitability}$$

Equation 5: Value and Profitability

# TCBI Investment Securities

## (3) Investment Securities

The following is a summary of the Company's investment securities:

<i>(in thousands)</i>	Amortized Cost(1)	Gross Unrealized Gains	Gross Unrealized Losses	Estimated Fair Value
<b>December 31, 2022</b>				
<b>Available-for-sale debt securities:</b>				
U.S. Treasury securities	\$ 698,769	\$ —	\$ (28,187)	\$ 670,582
U.S. government agency securities	125,000	—	(22,846)	102,154
Residential mortgage-backed securities	2,162,364	3	(331,320)	1,831,047
Tax-exempt asset-backed securities	—	—	—	—
CRT securities	14,713	—	(2,852)	11,861
Total available-for-sale debt securities	3,000,846	3	(385,205)	2,615,644
<b>Held-to-maturity debt securities:</b>				
Residential mortgage-backed securities	935,514	—	(118,600)	816,914
Total held-to-maturity debt securities	935,514	—	(118,600)	816,914
<b>Equity securities</b>				33,956
<b>Total investment securities(2)</b>				\$ 3,585,114
<b>December 31, 2021</b>				
<b>Available-for-sale debt securities:</b>				
U.S. government agency securities	\$ 125,000	\$ —	\$ (4,056)	\$ 120,944
Residential mortgage-backed securities	3,288,261	156	(63,039)	3,225,378
Tax-exempt asset-backed securities	170,626	9,407	—	180,033
CRT securities	14,713	—	(2,867)	11,846
Total available-for-sale debt securities	3,598,600	9,563	(69,962)	3,538,201
<b>Equity securities</b>				45,607
<b>Total investment securities(2)</b>				\$ 3,583,808



# Portfolio Statistics vs Benchmarks

Benchmark categories

<u>Metric/BM</u>	SIM	Market		Value/Profit			ESG	
		IWV	IWN	AVUV	Shadow SC	Shadow NSC	PABU	AVSU
<b>Mkt. Cap (B)</b>	15.50	42.52	1.70	1.15	2.57	2.38	33.24	26.35
<b># Securities</b>	50	2616	1371	721	50	49	310	1305
<b>P/B</b>	1.7	3.49	1.16	1.27	1.37	1.43	2.79	3.11
<b>P/E</b>	8.97	19.60	24.22	7.33	10.51	12.83	15.17	23.99
<b>Absolute (M)</b>	0.10				0.25	0.46		
<b>Intensity</b>	18.86	144.15	182.09		190.76	313.72	27.83	42.51

# Attribution Summary (vs IWW)

## Attribution Summary (Grid)

	Avg % Wgt			Total Return (%)	Contribution to Return (%)	Allocation Effect (%)	Selection Effect (%)	Tot Attr
	Port	Bench	+/-	Port	Port			
SIM PORTFOLIO	100.00	100.00	0.00	-2.12	-2.12	-0.66	-3.68	-4.34
Information Technology	19.32	22.60	-3.29	3.90	0.63	-0.24	-1.92	-2.16
Financials	15.67	14.40	1.27	-0.07	-0.19	-0.03	0.85	0.81
Industrials	14.41	10.05	4.36	3.07	0.46	-0.21	0.73	0.53
Health Care	13.74	14.67	-0.92	-26.51	-4.28	-0.03	-4.32	-4.35
Consumer Discretionary	11.98	10.05	1.93	11.18	1.15	-0.01	0.92	0.91
Real Estate	5.90	3.25	2.65	-13.99	-1.06	-0.25	-0.74	-0.99
Materials	5.54	3.01	2.53	16.75	0.94	-0.11	1.05	0.94
Communication Services	4.75	7.17	-2.42	6.87	0.32	-0.22	-0.14	-0.37
Consumer Staples	4.61	6.69	-2.08	7.91	0.36	0.00	0.17	0.17
Not Classified	2.05	0.25	1.80	0.00	0.00	0.01	0.00	0.01
Energy	2.03	4.98	-2.96	-20.24	-0.45	0.37	-0.28	0.10
Utilities		2.87	-2.87			0.05	0.00	0.05



# 3 Scope of Emissions

## Scope 1: Direct GHG emissions

Direct GHG emissions occur from sources that are owned or controlled by the company, for example, emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.; emissions from chemical production in owned or controlled process equipment.

## Scope 2: Electricity indirect GHG emissions

Scope 2 accounts for GHG emissions from the generation of purchased electricity consumed by the company. Purchased electricity is defined as electricity that is purchased or otherwise brought into the organizational boundary of the company. Scope 2 emissions physically occur at the facility where electricity is generated.

## Scope 3: Other indirect GHG emissions

Scope 3 is an optional reporting category that allows for the treatment of all other indirect emissions. Scope 3 emissions are a consequence of the activities of the company, but occur from sources not owned or controlled by the company. Some examples of scope 3 activities are extraction and production of purchased materials; transportation of purchased fuels; and use of sold products and services.



## Ideal Sector Allocation Equation

$$\text{Sector Weight} = \frac{\text{Sector Score}}{\text{Sum of Sector Scores}}$$

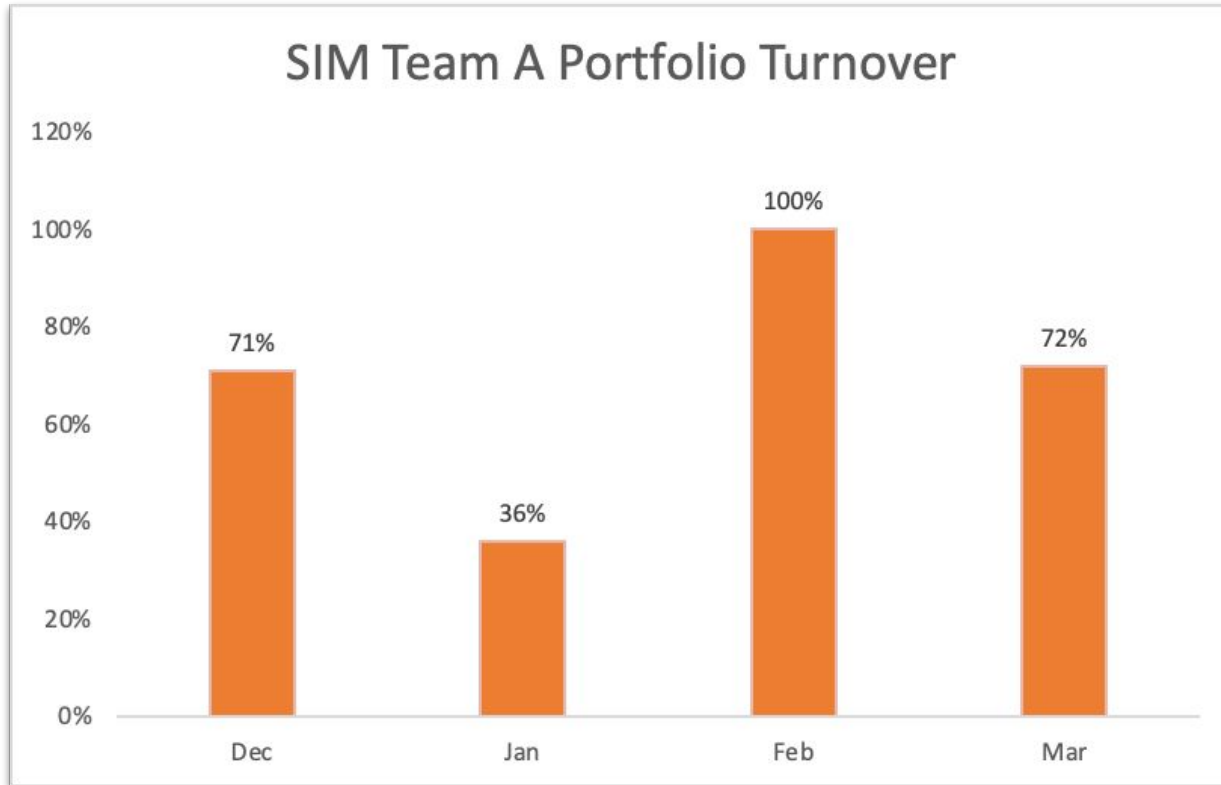
Take the **top decile** of security scores in a sector and sum them up

Take the sum of all sector scores

Equation 7: Breakdown of the sector weight

Sectors must stay in compliance to a **±7.5% requirement** (threshold of ±5.5%) compared to the Russell 3000 sector allocation.

# Turnover and Trading Cost



**Trading Costs:**  
The trading costs are either .015 cents per share or a flat \$9 if it less than 600 shares

**April 28th, 2023**

# **Spring 2023 Undergraduate SIM Fund Presentation**

**Under the designation of Dr. Sunil Wahal &  
Jacob Nance**

# Team Introduction

## Analysts

### Fund Manager



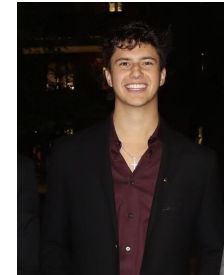
Jacob Nance



Ian Cashen



Samantha Ferraro



Cal Frank



Will Harmon



Connor O'Loughlin



Paul Schmelzeis



Hunter Shulman



Connor Voightmann

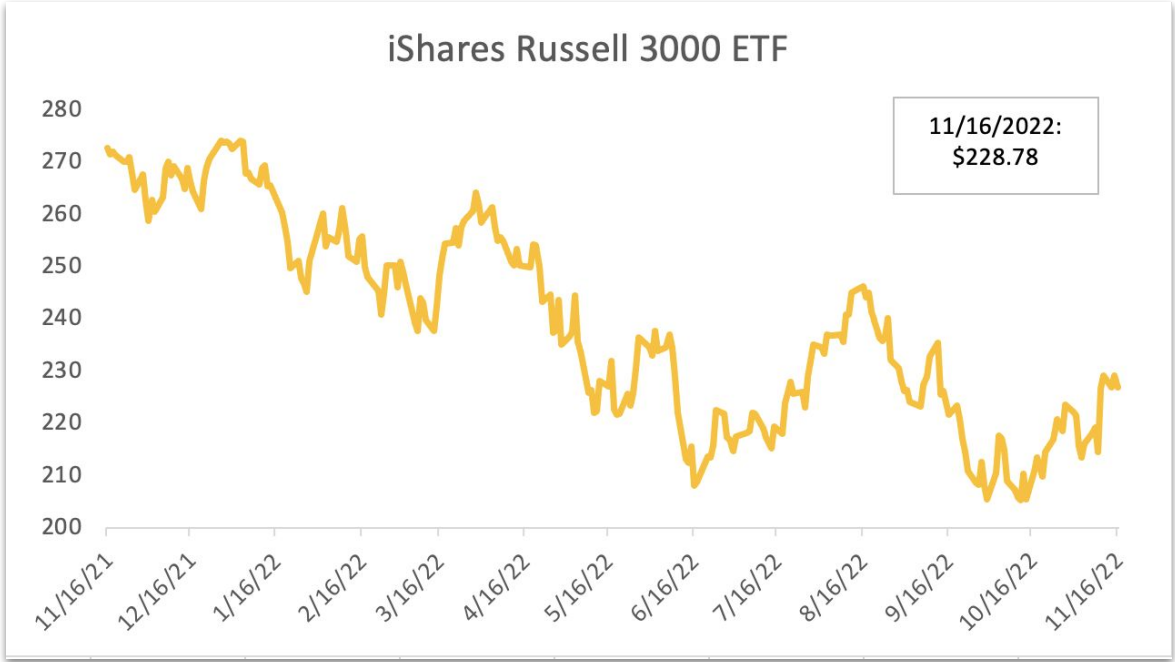
# Table of Contents

- I. Investment Thesis**
- II. Performance**
- III. SBNY Case Study**
- IV. Lessons Learned**
- V. Appendix**

A blurred background image of a university campus. In the foreground, a person is walking on a paved path. The background shows green trees and a white car. A yellow rectangular box is overlaid on the image, containing the text "Strategy Overview".

# Strategy Overview

# Investment Thesis: Downside Risk





# Calculation of Downside Beta

$r_i$  = security excess returns

$r_m$  = market excess returns

$\mu_m$  = average market excess return



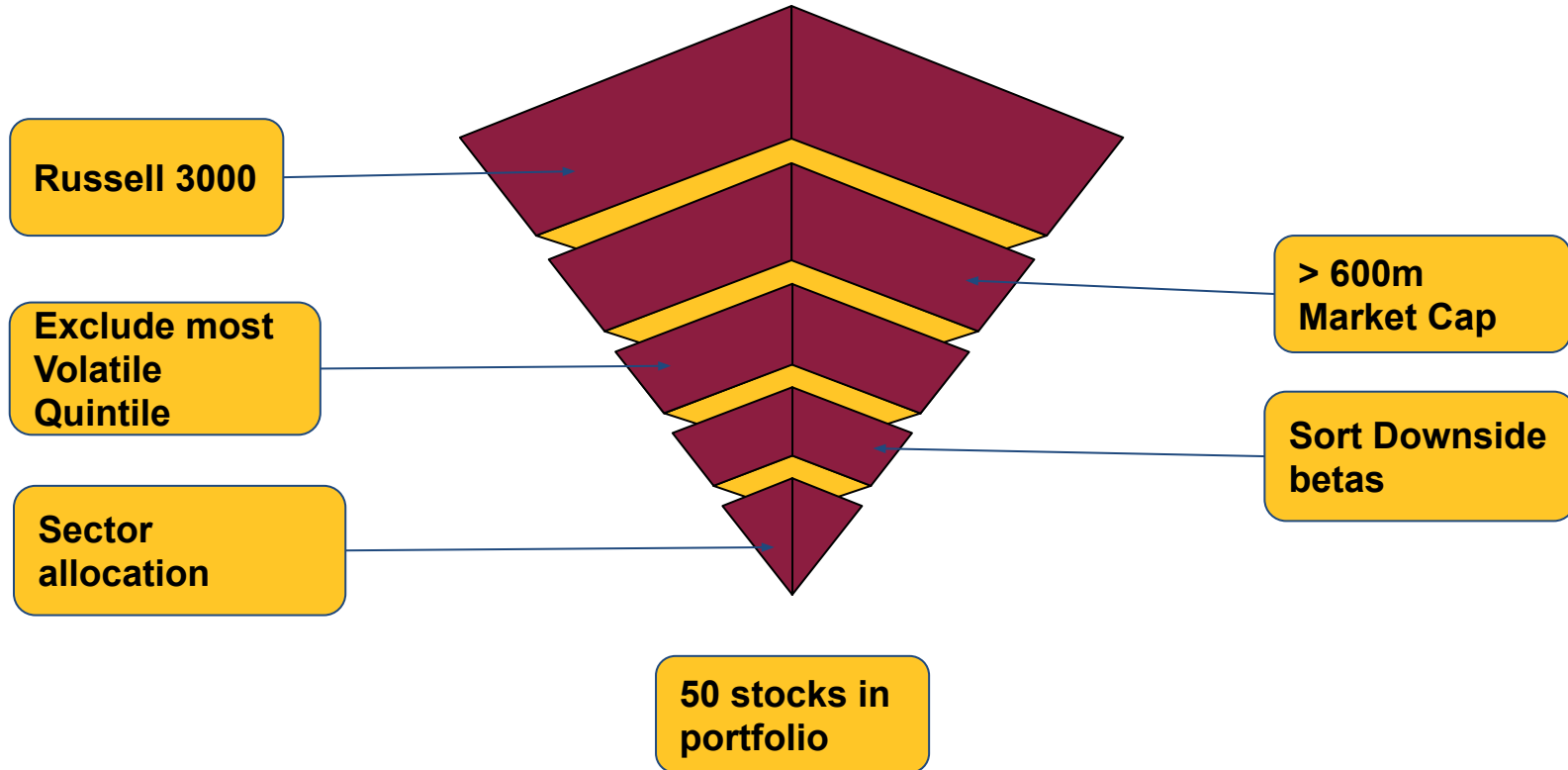
$$\beta^- = \frac{\text{COV}(r_i, r_m | r_m < \mu_m)}{\text{var}(r_m | r_m < \mu_m)}$$

Because they are loss averse, investors demand additional compensation for holding stocks with high downside risk.

Ang, Chen, and Xing show that if the most volatile stocks are excluded, stocks with high downside risk earn higher average returns than those with low downside risk, measured by  $\beta^-$ .

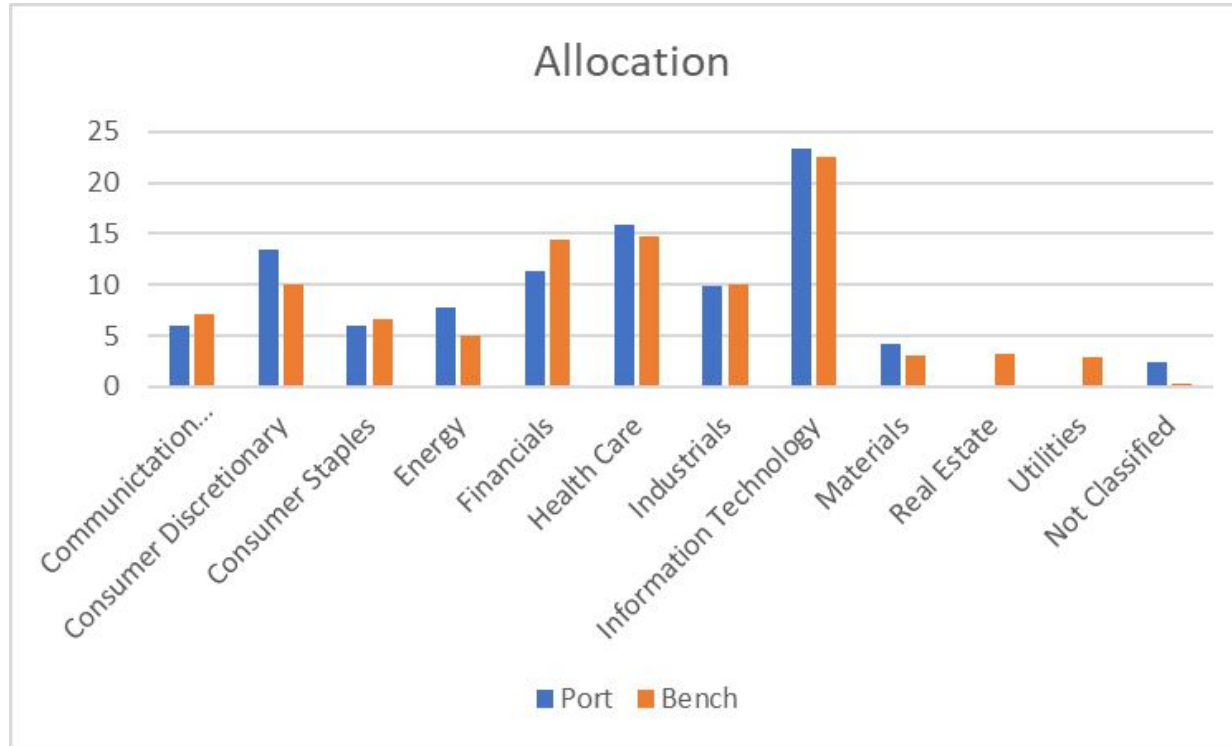


# Selection



# Allocation & Market Weights

\*Weights are based on the Russell 3000



A blurred background image of a park or outdoor setting. In the foreground, there is a curved concrete ledge with several rectangular blocks. In the background, a person is walking on a path, and there are trees and other people, all out of focus. A yellow rectangular box is overlaid on the left side of the image, containing the word "Performance" in bold black text.

# Performance

# Portfolio Performance

SIM NOV: SIM NOV POR vs ISHARES RUSSE by GICS Sectors in USD Time Maxim 11/16/22 - 04/26/23

Version MAC Unit Percentage Freq Daily

Total Return % Value

SIM NOV -2.3268  
ISHARES RUSSELL 3000 ETF 2.2204



# Low Volatility Strategy

- **Defensive strategies**
- **Low Volatility vs. Downside Risk**
  - Construction
  - Measurement
  - Security selection
- **Performance**

# Portfolio vs. Low Vol Strategy

\*MSCI Min Vol USA Index







# Attribution

# Attribution: % to Total Return

Name	Avg % Wgt			Tot Rtn		
	Port	Bmrk	+/-	Port	Bmrk	+/-
<b>P</b> SIM NOV	100.00	100.00	0.00	-2.33	2.22	-4.55
▶ Information Technology	23.36	22.60	0.76	4.63	12.20	-7.57
▶ Materials	4.14	3.01	1.13	25.25	-0.89	26.14
▶ Consumer Staples	5.98	6.69	-0.72	9.42	3.77	5.65
▶ Consumer Discretionary	13.48	10.05	3.43	1.57	2.02	-0.45
▶ Not Classified	2.33	0.25	2.07	0.00	0.07	-0.07
▶ Health Care	15.83	14.67	1.16	0.00	0.33	-0.33
▶ Industrials	9.90	10.05	-0.15	-3.12	-1.57	-1.54
▶ Communication Services	5.95	7.17	-1.22	-10.63	10.89	-21.52
▶ Energy	7.68	4.98	2.70	-17.55	-9.31	-8.24
▶ Financials	11.36	14.40	-3.04	-23.42	-6.48	-16.95
▶ Real Estate		3.25	-3.25		-3.01	3.01
▶ Utilities		2.87	-2.87		0.73	-0.73

# Attribution: Effects

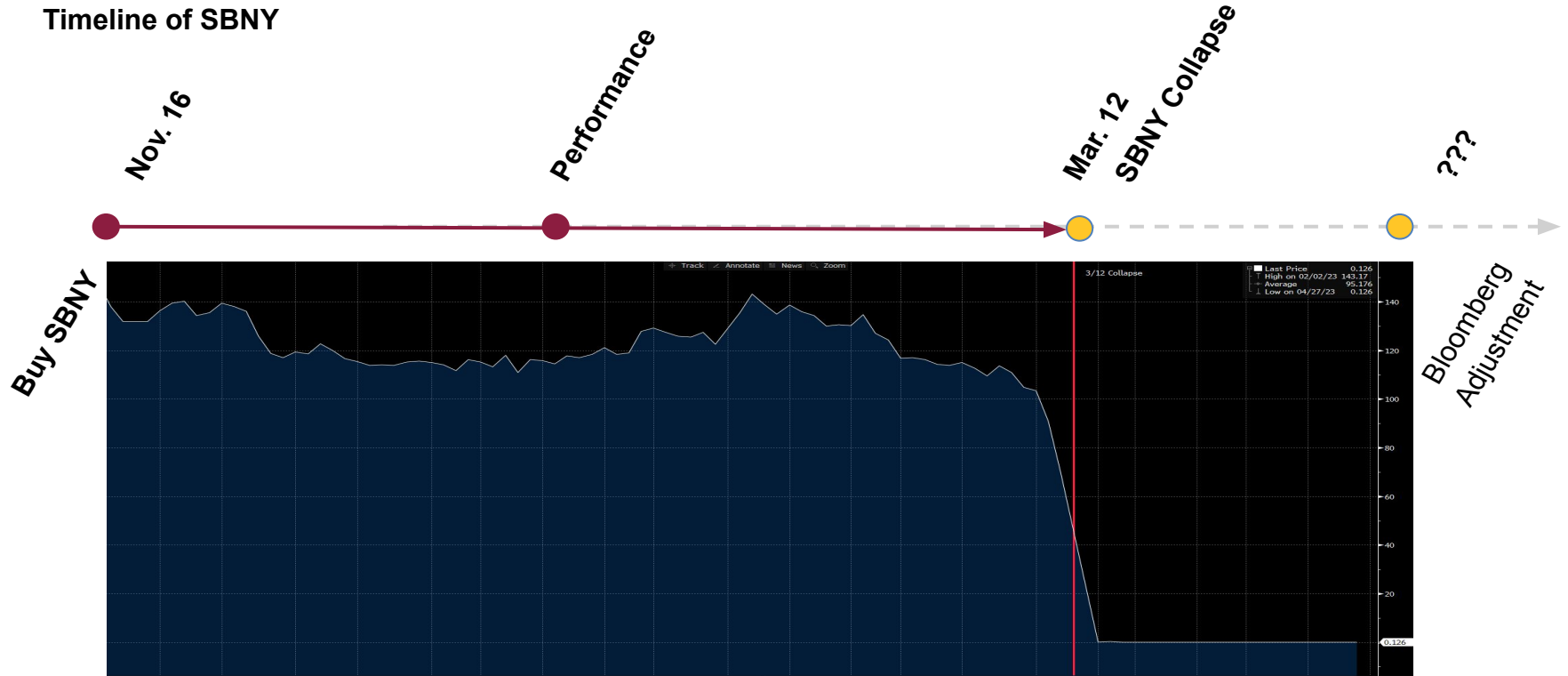
Name	Alloc	Selec	Curr	Tot Attr
<b>P</b> SIM NOV	0.29	-4.84	0.00	-4.55
▶ Information Technology	0.18	-1.67	0.00	-1.50
▶ Materials	-0.04	1.03	0.00	0.99
▶ Consumer Staples	-0.01	0.32	0.00	0.31
▶ Consumer Discretionary	0.04	-0.07	0.00	-0.03
▶ Not Classified	-0.07	0.00	0.00	-0.07
▶ Health Care	0.06	-0.09	0.00	-0.02
▶ Industrials	0.01	-0.13	0.00	-0.12
▶ Communication Services	-0.05	-1.33	0.00	-1.39
▶ Energy	-0.32	-0.70	0.00	-1.02
▶ Financials	0.29	-2.20	0.00	-1.91
▶ Real Estate	0.16	0.00	0.00	0.16
▶ Utilities	0.04	0.00	0.00	0.04



# **SBNY Case Study**

# SBNY Case Study

## Timeline of SBNY





# Lessons Learned

## Verify Calculations

Bloomberg downside risk

## Trading Timeliness

An important part of portfolio management

## Returns Are Noisy

Short trading period

## Document Processes

Monthly rebalance, meeting notes, and due diligence

# Questions & Comments

**Thank you!**



# Appendix

## Turnover

Turnover due to	December	January	February	March
Volatility	2	10	0	3
$\beta^-$	11	1	14	9
Total	13 (26%)	11 (22%)	14 (28%)	12 (24%)

# Appendix

## $\beta$ – each month

R3000	$\beta$ by sector	Nov	Dec	Jan	Feb	Mar
6%	Energy	1.15	1.06	1.01	1.08	1.08
3%	Materials	0.97	0.96	0.98	1.01	1.00
10%	Industrials	0.98	0.98	0.98	1.00	0.98
10%	Consumer Discretionary	1.19	1.17	1.18	1.20	1.14
6%	Consumer Staples	0.63	0.64	0.66	0.68	0.70
16%	Health Care	0.85	0.87	0.85	0.86	0.89
12%	Financials	0.75	0.76	0.75	0.78	0.77
24%	Information Technology	1.10	1.09	1.08	1.08	1.10
6%	Communications	0.86	0.88	0.87	0.90	0.91
3%	Utilities	0.48	0.47	0.48	0.48	0.53
4%	Real Estate	0.86	0.88	0.86	0.91	0.93

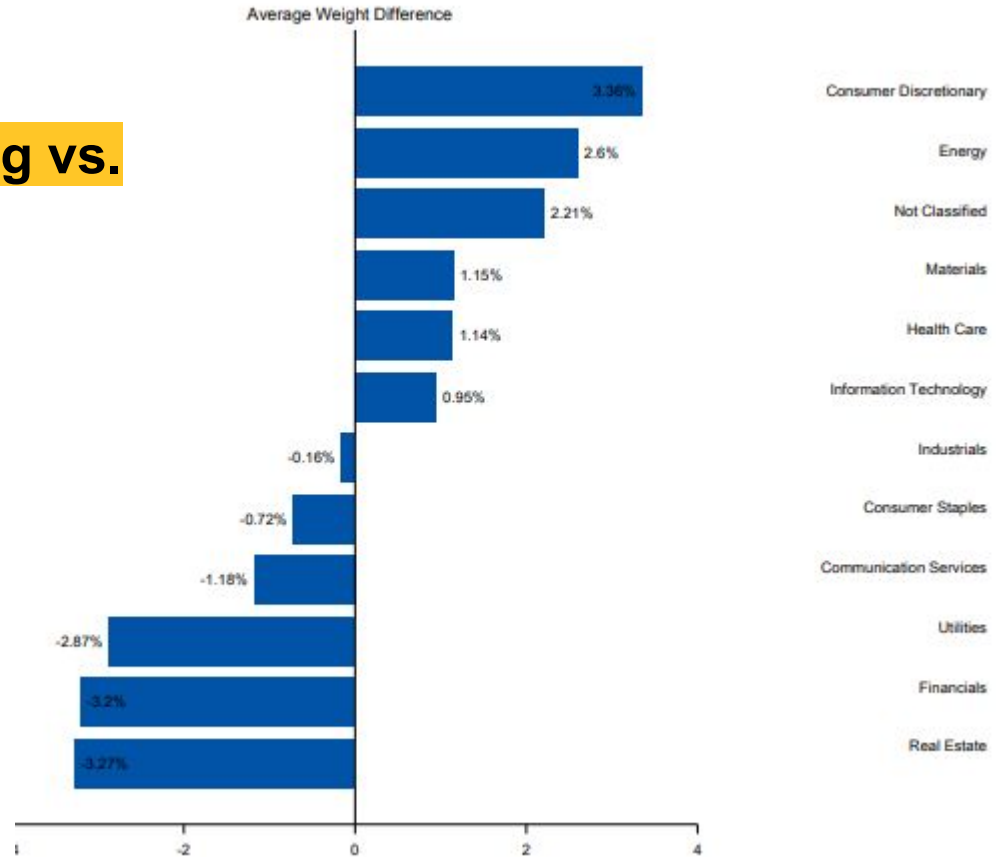
# Appendix

## Low Volatility vs. Downside Risk

- The Low Volatility isolates the lowest volatility stocks which carry low expected return. This is where downside risk differs. The goal of low vol is taking a defensive position against the volatility of stocks in down markets and accept the lower return; downside risk has the goal of attaining greater future gains while mitigating severe losses during down markets
- The strategies are similar in that they can be utilized in the same type of market environment
- Downside risk strategy allows investors to capitalize on the **greater expected future returns** that we identify
  - Strategy goes against the common financial behavior to avoid risk

# Appendix

## Portfolio Sector Weighting vs. Russell 3000



# Appendix: Unconstrained Downside Performance



# Appendix

## Tracking Error

SIM NOV: SIM NOV POR vs ISHARES RUSSE by GICS Sectors in USD As of 11/16/22

Model MAC2 Integrated Mu Unit % Scaling 1 Year

Name	% Wgt			Gross Active Weight	Total Risk	Contribution (%)	Beta (ex-ante)
	Port	Bmrk	+/-				
SIM NOV	100.00	100.00	0.00	190.62	13.91	100.00	1.34
▶ Communication Services	5.86	6.93	-1.06	12.80	1.67	2.49	1.20
▶ Consumer Discretionary	13.36	10.12	3.23	19.37	2.87	15.50	1.52
▶ Consumer Staples	5.84	6.73	-0.89	12.51	1.33	5.32	0.83
▶ Energy	7.61	5.44	2.17	12.44	2.01	9.86	1.48
▶ Financials	11.26	14.75	-3.48	25.91	2.07	9.94	1.45
▶ Health Care	15.47	14.68	0.79	29.57	3.56	17.62	1.19
▶ Industrials	9.57	10.09	-0.51	19.57	2.03	9.24	1.36
▶ Information Technology	22.48	21.96	0.51	41.24	4.47	26.14	1.58
▶ Materials	3.90	3.00	0.90	6.41	1.66	7.74	1.75
▶ Real Estate		3.24	-3.24	3.25	0.82	-2.96	
▶ Utilities		2.86	-2.86	2.87	0.60	-0.86	
▶ Not Classified	4.65	0.22	4.43	4.67	0.01	-0.02	0.00

# Appendix

## Coskewness

Equally-weighted portfolios emphasize the differences between downside risk and coskewness.

Results of Fama-MacBeth (1973) regressions of 12-month excess returns on firm characteristics and realized-risk characteristics (Ang Downside Risk)

**Table 2**  
**Fama-MacBeth Regressions**

Model	I	II	III	IV	V	VI	Mean (Std Dev)
Intercept	0.300 [9.35]	0.044 [3.39]	0.054 [1.66]	0.046 [1.42]	0.246 [7.62]	0.257 [7.79]	
$\beta$	0.177 [8.19]						0.828 (0.550)
$\beta^-$		0.069 [7.17]	0.064 [7.44]	0.028 [2.68]	0.062 [6.00]	0.056 [5.25]	0.882 (0.739)
$\beta^+$		-0.029 [4.85]	-0.025 [4.15]	0.003 [0.22]	0.020 [2.33]	0.017 [1.91]	0.722 (0.842)
Log-size	-0.039 [8.82]		-0.007 [1.47]	-0.013 [3.03]	-0.034 [7.77]	-0.034 [7.39]	5.614 (1.523)
Bk-Mkt	0.017 [3.87]		0.024 [5.17]	0.023 [5.03]	0.017 [3.67]	0.018 [3.76]	0.768 (0.700)
Past Ret	0.017 [1.91]		0.063 [6.32]	0.053 [5.40]	0.020 [2.12]	0.015 [1.50]	0.085 (0.370)
Std Dev	-8.433 [10.7]				-5.781 [6.41]	-6.459 [7.04]	0.355 (0.174)
<b>Coskewness</b>	-0.229 [10.7]			-0.181 [4.31]	-0.196 [5.07]	-0.188 [4.59]	-0.179 (0.188)
Cokurtosis	0.015 [1.57]				0.045 [4.40]	0.047 [4.52]	2.240 (1.353)
$\beta_L$						-0.008 [0.93]	-0.166 (0.456)

# Appendix

## Asset Detail: First 25

Description	Super Category Cod	S
UNITED STS STL CORP NEW COM	5	E
GLOBALFOUNDRIES INC	5	E
B RILEY FINL INC COM	5	E
FORTINET INC COM	5	E
AMAZON COM INC COM	5	E
PENN ENTERTAINMENT INC	5	E
BRINKER INTL INC COM	5	E
DANA INC COM	5	E
NVIDIA CORP COM	5	E
XPO LOGISTICS INC COM	5	E
DEVON ENERGY CORP NEW COM	5	E
CARLYLE GROUP INC COM	5	E
JACKSON FINANCIAL INC CL A COM	5	E
OCCIDENTAL PETROLEUM CORP	5	E
E L F BEAUTY INC COM	5	E
APA CORP COM	5	E
UNIVERSAL DISPLAY CORP COM	5	E
CHINOOK THERAPEUTICS INC COM USD0.0001	5	E
AMERICAN AIRLINES INC COM USD1	5	E
LIBERTY ENERGY INC COM USD0.01 CL A	5	E
LATTICE SEMICONDUCTOR CORP COM	5	E
GOGO INC COM	5	E
ADVANCED MICRO DEVICES INC COM	5	E
SIGNATURE BK NY N Y COM	5	E

Name	\$ Allocation
UNITED STS STL CORP NEW COM	\$22,549.89
GLOBALFOUNDRIES INC	\$21,853.25
B RILEY FINL INC COM	\$21,644.47
FORTINET INC COM	\$22,442.44
AMAZON COM INC COM	\$22,594.81
PENN ENTERTAINMENT INC	\$22,734.80
BRINKER INTL INC COM	\$22,208.44
DANA INC COM	\$22,028.97
NVIDIA CORP COM	\$22,083.66
XPO LOGISTICS INC COM	\$21,890.04
DEVON ENERGY CORP NEW COM	\$22,043.75
CARLYLE GROUP INC COM	\$22,481.51
JACKSON FINANCIAL INC CL A COM	\$22,125.04
OCCIDENTAL PETROLEUM CORP	\$22,136.50
E L F BEAUTY INC COM	\$23,333.97
APA CORP COM	\$22,247.45
UNIVERSAL DISPLAY CORP COM	\$22,028.60
CHINOOK THERAPEUTICS INC COM USD0.0001	\$22,802.70
AMERICAN AIRLINES INC COM USD1	\$22,129.89
LIBERTY ENERGY INC COM USD0.01 CL A	\$22,060.41
LATTICE SEMICONDUCTOR CORP COM	\$21,792.22
GOGO INC COM	\$22,532.56
ADVANCED MICRO DEVICES INC COM	\$21,681.46
SIGNATURE BK NY N Y COM	\$21,350.32
WINGSTOP INC COM	\$22,483.97

et	As of Date - Accrued Market Va
	0.02100000
	0.01910000
	0.01920000
	0.01840000
	0.01890000
	0.01770000
	0.02010000
	0.01860000
	0.01890000
	0.01840000
	0.01800000
	0.01960000
	0.01960000
	0.01830000
	0.02130000
	0.01830000
	0.01890000
	0.01880000
	0.01890000
	0.01840000
	0.01930000
	0.01970000
	0.01910000
	0.01800000



# Appendix

## Asset Detail: Second 25

Description	Super Category Cod	Super Ca
WINGSTOP INC COM	5	Equities
COTY INC COM CL A COM CL A	5	Equities
ZIPRECRUITER INC CL A CL A	5	Equities
CYTEK BIOSCIENCES INC COM	5	Equities
AVID TECHNOLOGY INC COM	5	Equities
H & E EQUIP SVCS INC COM	5	Equities
INSPIRE MED SYS INC COM	5	Equities
BLUEPRINT MEDICINES CORP COM	5	Equities
MAXLINEAR INC COMMON STOCK	5	Equities
LIBERTY LATIN AMERICA LTD COM USD0.01 CLASS C	5	Equities
CLEVELAND CLIFFS USD0.125	5	Equities
BUILDERS FIRSTSOURCE INC COM STK	5	Equities
MONOLITHIC PWR SYS INC COM	5	Equities
ARES MANAGEMENT LP COM SHS REPSTG LTD PARTNER	5	Equities
SYNAPTICS INC COM	5	Equities
SAGE THERAPEUTICS INC COM	5	Equities
ALIGN TECHNOLOGY INC COM	5	Equities
ROCKET COS INC CL A CL A	5	Equities
INTUITIVE SURGICAL INC COM NEW STK	5	Equities
MARVELL TECHNOLOGY INC COM	5	Equities
SIX FLAGS ENTMT CORP NEW COM	5	Equities
AIRBNB INC CL A COM USD0.0001 CL A	5	Equities
DARLING INGREDIENTS INC COMSTK	5	Equities
ON SEMICONDUCTOR CORP COM	5	Equities
AXONICS INC COM	5	Equities
VERITIV CORP COM	5	Equities
MFC ISHARES TRUST RUSSELL 3000 ETF	5	Equities
United States dollar	30	Cash and

Name	\$ Allocation
COTY INC COM CL A COM CL A	\$22,647.96
ZIPRECRUITER INC CL A CL A	\$22,718.08
CYTEK BIOSCIENCES INC COM	\$22,582.73
AVID TECHNOLOGY INC COM	\$22,734.84
H & E EQUIP SVCS INC COM	\$22,664.32
INSPIRE MED SYS INC COM	\$22,820.40
BLUEPRINT MEDICINES CORP COM	\$22,342.93
MAXLINEAR INC COMMON STOCK	\$21,671.28
LIBERTY LATIN AMERICA LTD COM USD0.01 CLASS C	\$23,585.65
CLEVELAND CLIFFS USD0.125	\$22,486.39
BUILDERS FIRSTSOURCE INC COM STK	\$22,453.65
MONOLITHIC PWR SYS INC COM	\$21,236.87
ARES MANAGEMENT LP COM SHS REPSTG LTD PARTNER	\$22,387.64
SYNAPTICS INC COM	\$21,522.33
SAGE THERAPEUTICS INC COM	\$23,059.53
ALIGN TECHNOLOGY INC COM	\$21,833.93
ROCKET COS INC CL A CL A	\$21,144.73
INTUITIVE SURGICAL INC COM NEW STK	\$22,551.27
MARVELL TECHNOLOGY INC COM	\$21,496.50
SIX FLAGS ENTMT CORP NEW COM	\$22,102.20
AIRBNB INC CL A COM USD0.0001 CL A	\$22,372.82
DARLING INGREDIENTS INC COMSTK	\$22,034.66
ON SEMICONDUCTOR CORP COM	\$21,830.69
AXONICS INC COM	\$22,379.13
VERITIV CORP COM	\$22,810.09

Accrued Market Va

