ASU W. P. CAREY SCHOOL of BUSINESS
ARIZONA STATE UNIVERSITY

MBA Student Investment Management Fund

Semi-Annual Presentation

December 2, 2016

Introductions

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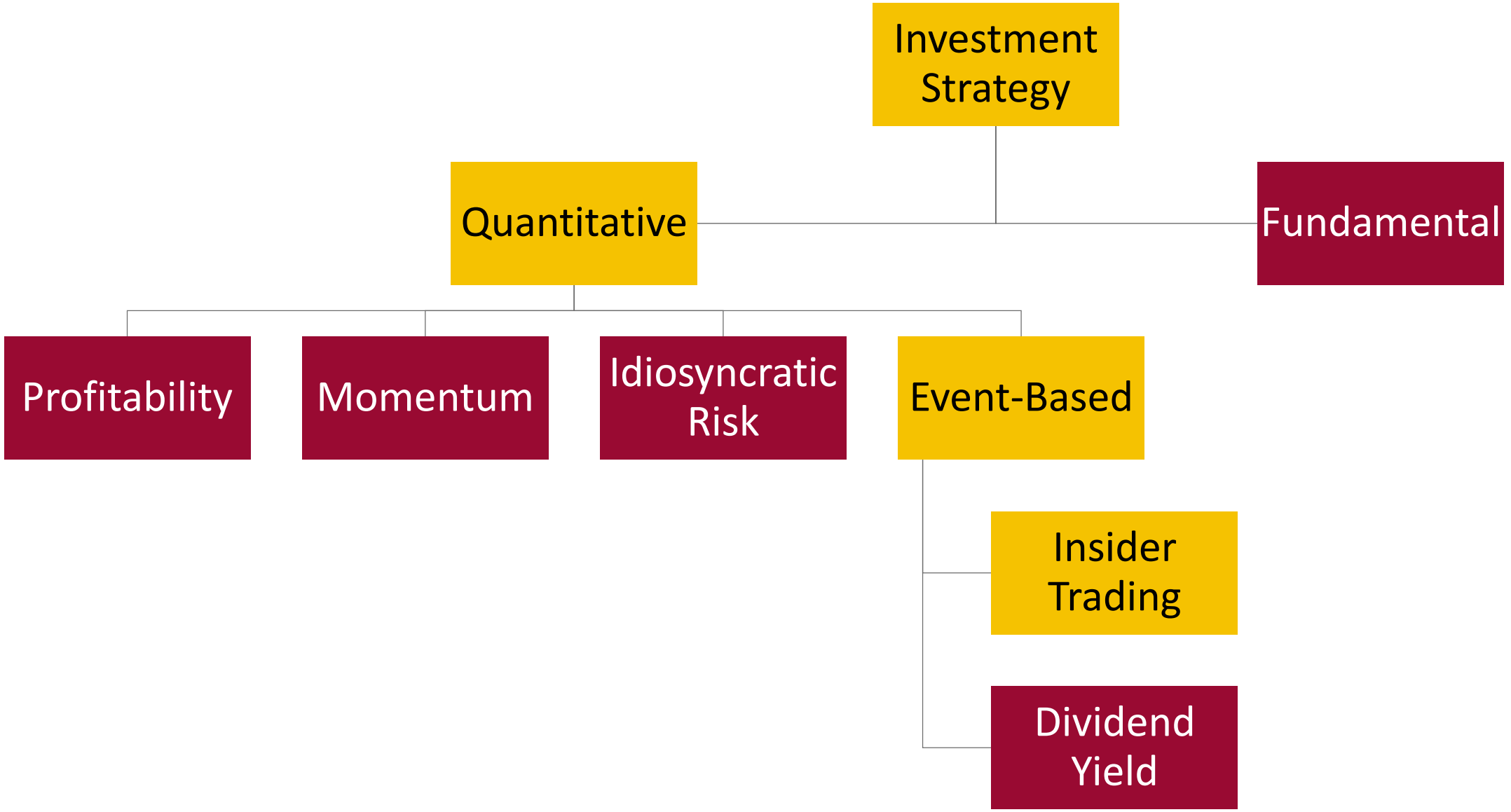
Overview

- Objective
- Strategy
- Implementation
- Portfolio
  - Construction
  - Snapshot
  - Composition
- Next Steps

Objective

- Maximize the learning experience.
- Practical application of academic theories.
- Comprehension of tradeoffs in implementing a quantitative strategy.

Strategy


Investment Strategy
Quantitative
Fundamental
Profitability
Momentum
Idiosyncratic Risk
Event-Based
Insider Trading
Dividend Yield

Strategy - Research

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"Decoding Inside Information" – Journal of Finance 2010
Cohen, Malloy & Pomorski

- Types of inside trades
  - Routine: buying and selling in the same calendar month for past 3 years
  - Opportunistic: buying and selling in no discernable pattern

- Predicative power of opportunistic trades
  - Average monthly returns from a portfolio of opportunistic buys:
    - Value-weighted: 72bp
    - Equal-weighted: 158bp

Strategy – Insider Trading

December 2013

Su	M	T	W	Th	F	Sa
		X				
				Y		

December 2014

Su	M	T	W	Th	F	Sa
				X		

December 2015

Su	M	T	W	Th	F	Sa
			Y			
	X					
				Y		

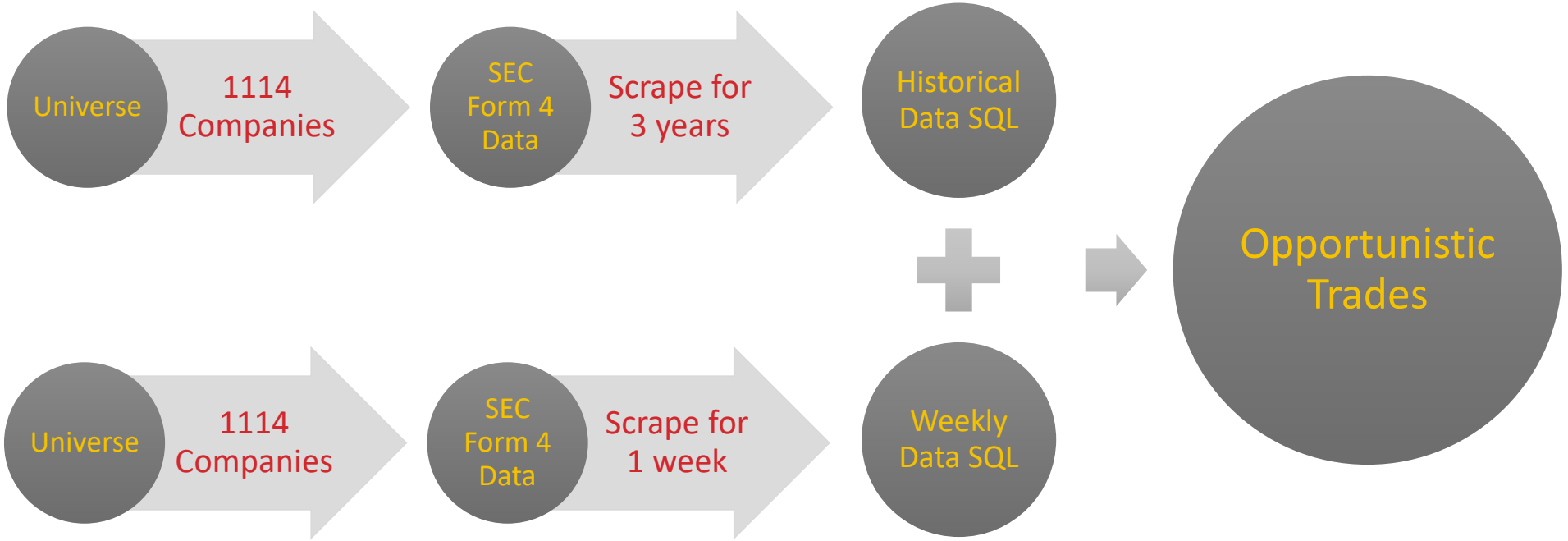
X = Routine Trader

Y = Opportunistic Trader

Implementation - Process

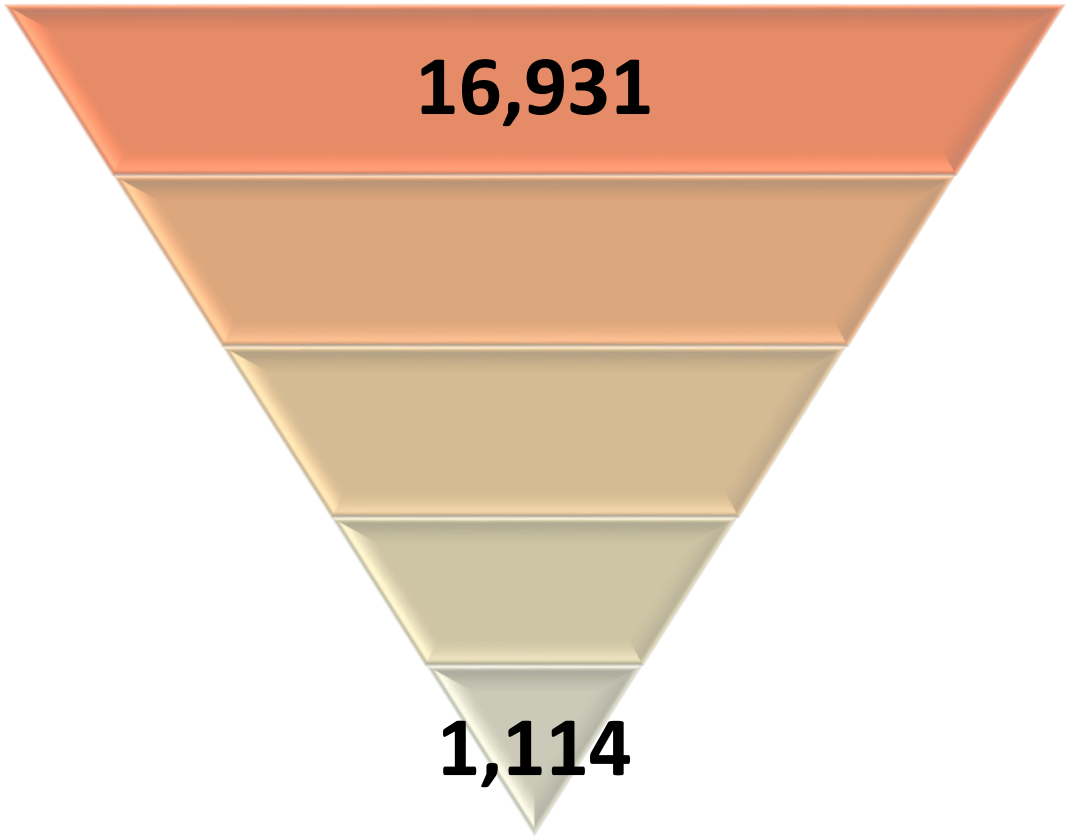
Phase 1:
Establish Routine/Opportunistic Trading Data Set

Phase 2:
Weekly Dataset



Implementation - Universe

Screening Criteria	Number of Securities
Active U.S. Equities	16,931
Common Stock, No ETF's, & No ADR's	
Remove Utilities & S&P 500	
Market cap ≥ $1.2 Billion	
30 Day Average Volume > 50,000	1,114



Implementation - Technical

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Scraper Code

EDGAR Form 4

EDGAR | Company Filings
Free access to more than 21 million filings

Output Excel

Implementation - Technical

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Python Code

```
114  def pullXMLTrade(url_str,StockSpecificTradeList,tickerPulled):
115      FootnoteText = []
116      try:
117          xml_str = urllib.request.urlopen(url_str).read()
118          xmldoc = minidom.parseString(xml_str)
119
120          # Trader
121          obs_values = xmldoc.getElementsByTagName('rptOwnerName')
122          test = obs_values[0].nodeValue
123          # prints report owner name
124          TraderName = obs_values[0].firstChild.nodeValue
125          #print('\n'+"Trader Name: " + str(TraderName))
126          #print("Trader Name: " + str(TraderName))
127
128          # Trader CIK
129          obs_values = xmldoc.getElementsByTagName('rptOwnerCik')
130          test = obs_values[0].nodeValue
131          # prints CIK
132          TraderCIK = obs_values[0].firstChild.nodeValue
133          #print("Trader CIK: " + str(TraderCIK))
```

Trader Name	Trader CIK	Company Name	Ticker	Company CIK	Transaction Date	Filing Date	Transaction Type	Shares	Price	Buy	Shares	Footnotes
Musslewhite Ro	1390194	ADVISORY BOAI	ABCO	1157377	11/14/2016	11/16/2016	Common Stock	5500	16.6	A	3E+05	This transa
SCAGLIONE DIE	1539527	ABM INDUSTRIE	ABM	771497	11/14/2016	11/15/2016	Common Stock	700	42.5	D	26827	All sales re
Baity Glenn	1487100	ACADIA PHARM	ACAD	1070494	11/10/2016	11/14/2016	Common Stock	10200	1.55	A	73121	The sales r
Murphy Francis	1657233	Acacia Commun	ACIA	1651235	11/15/2016	11/17/2016	Common Stock	1582	69.2	D	53917	Represents

CSV Output

Implementation - Technical

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Database tools

SQL Code

```
27    and footnotes not like '%ESOP%'
28    and footnotes not like '%granted%'
29    and footnotes not like '%Granted%'
30    and footnotes not like '%grant%'
31    and footnotes not like '%incentive%'
32    and footnotes not like '%Incentive%'
33    and footnotes not like '%lieu of%'
34    and footnotes not like '%option%'
35    and footnotes not like '%pension%'
36    and footnotes not like '%Phantom%'
37    and footnotes not like '%phantom%'
38    and footnotes not like '%Stock Purchase Plan%'
39    and footnotes not like '%shares earned%'
40    and footnotes not like '%retainer%'
41    and footnotes not like '%restricted%'
42    and footnotes not like '%transferred%'
43    and footnotes not like '%vest%'
44
45    and price != 0
46    and buy_or_sell like "A"
47    and Primary_key not in
48    (select distinct A.Primary_key
49    from new_table A, new_table B, new_table C, new_table D
50    where year(A.transaction_date) = '2016'
51    and year(B.transaction_date) = '2014'
52    and year(C.transaction_date) = '2015'
53    and year (D.transaction_date) = '2013'
54    and month(A.transaction_date) = '11'
55    and month(B.transaction_date) = '11'
56    and month(C.transaction_date) = '11'
57    and month(D.transaction_date) = '11'
58    and A.trader_CIK=B.trader_CIK
59    and A.trader_CIK=C.trader_CIK
60    and A.trader_CIK=D.trader_CIK)
61    group by transaction_date;
```

Challenges

- Lack of coding experience
- Internet interruptions
- Data quality
- Footnotes
- Compensation based transactions

Implementation - Seeding

Data Collection Time Period

#Opportunistic Trades by
#Days Preceding Designated Trade Day

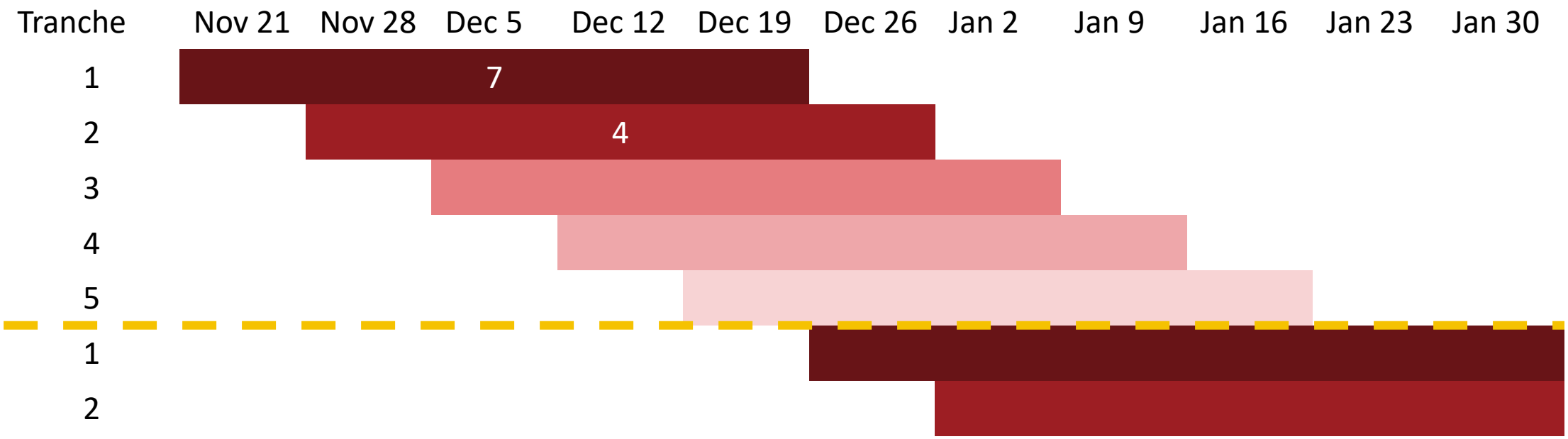
	t-1	t-2	t-3	t-4	t-5
Avg	3	6	9	11	14
Stdev	2	3	5	6	7
Max	9	16	21	27	32
Min	1	2	3	4	5

Day of Week Effect

Day	Average
Monday	19%
Tuesday	13%
Wednesday	22%
Thursday	16%
Friday	27%
Saturday	2%
Sunday	1%

Portfolio Construction

5 Tranches with approximately 2.5% per position



Portfolio Snapshot

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Tranche 1 – November 21		
Company	**Ticker**	**Initial Weight**
Applied Industrial Technologies	AIT	2.5%
Community Bank System, Inc.	CBU	2.5%
Donaldson Company, Inc.	DCI	2.5%
Innospec, Inc.	IOSP	2.5%
Mercury General Corp.	MCY	2.5%
Renasant Corp.	RNST	2.5%
Square Inc.	SQ	2.5%

Tranche 2 – November 28		
Company	**Ticker**	**Initial Weight**
First Hawaiian Inc.	FHB	2.5%
Avon Products Inc.	AVP	2.5%
Canadian Pacific Railway Limited	CP	2.5%
Healthcare Services Group, Inc.	HCSG	2.5%

Portfolio Composition - Sector

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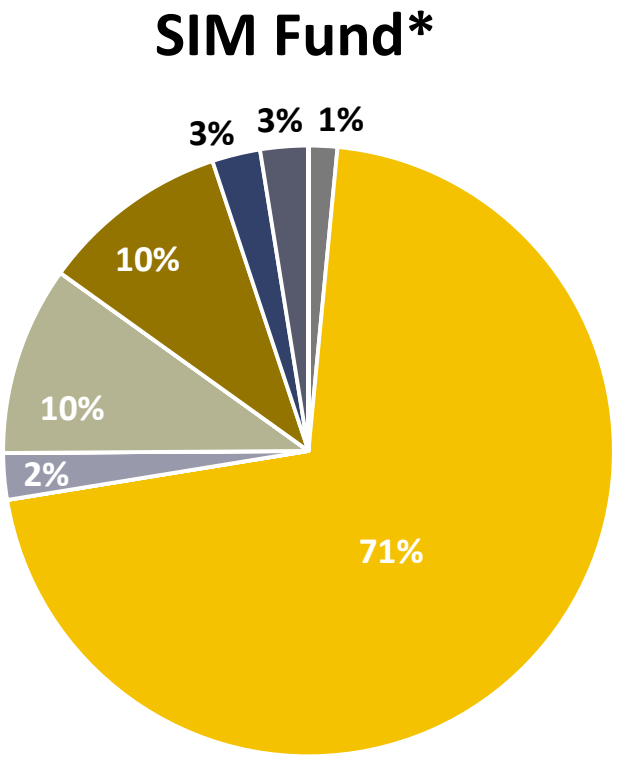

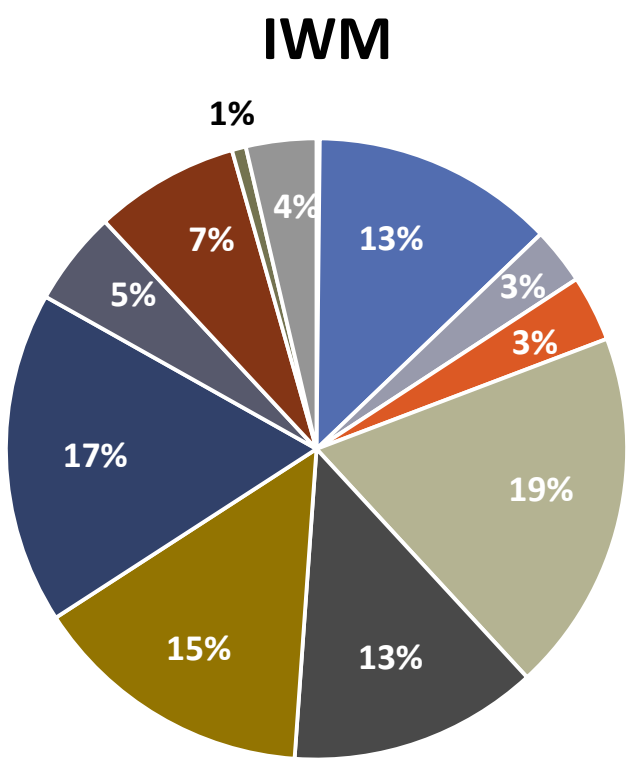

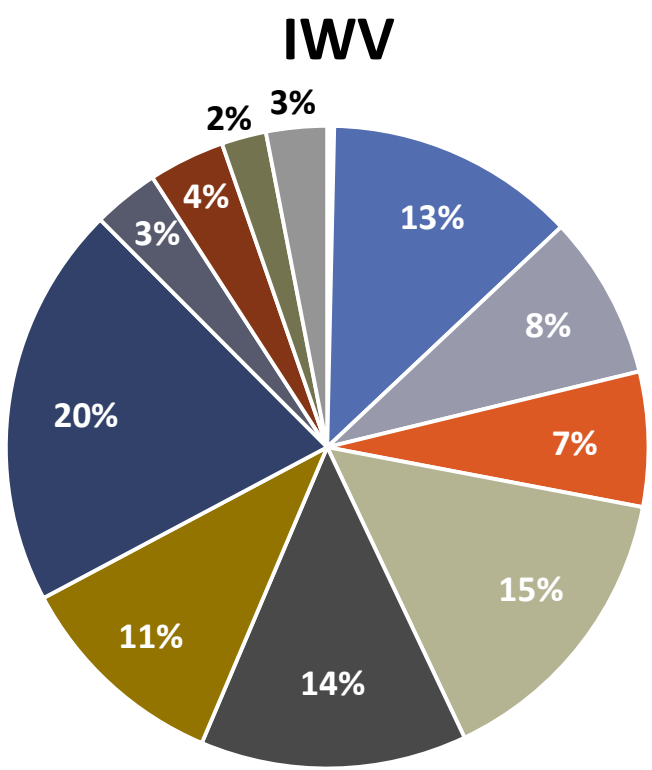

- Cash
- IWV
- Consumer Discretionary
- Consumer Staples
- Energy
- Financials
- Health Care
- Industrials
- Information Technology
- Materials
- Real Estate
- Telecommunications
- Utilities

*As of 28nd November

Next Steps

1. Continue to seed portfolio
2. Rebalancing the portfolio
3. Holding & attribution analysis
4. Refine and improve trade signal

Appendix A

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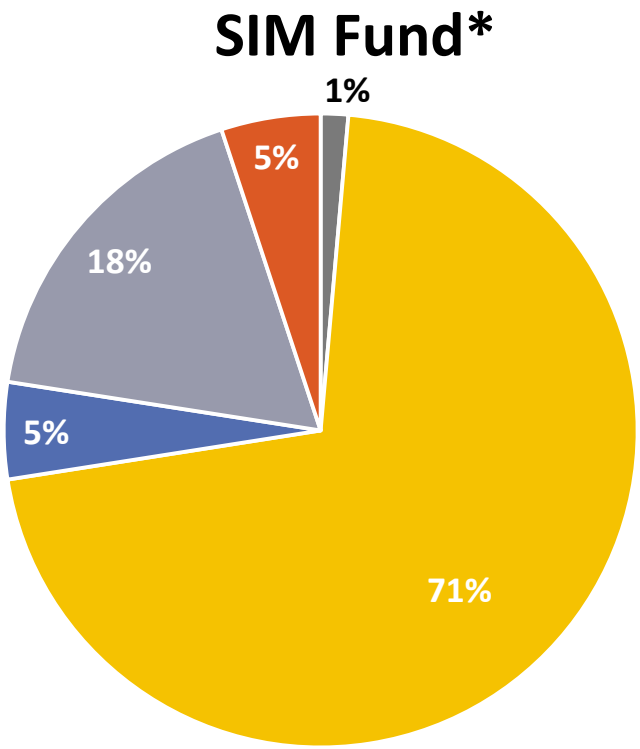
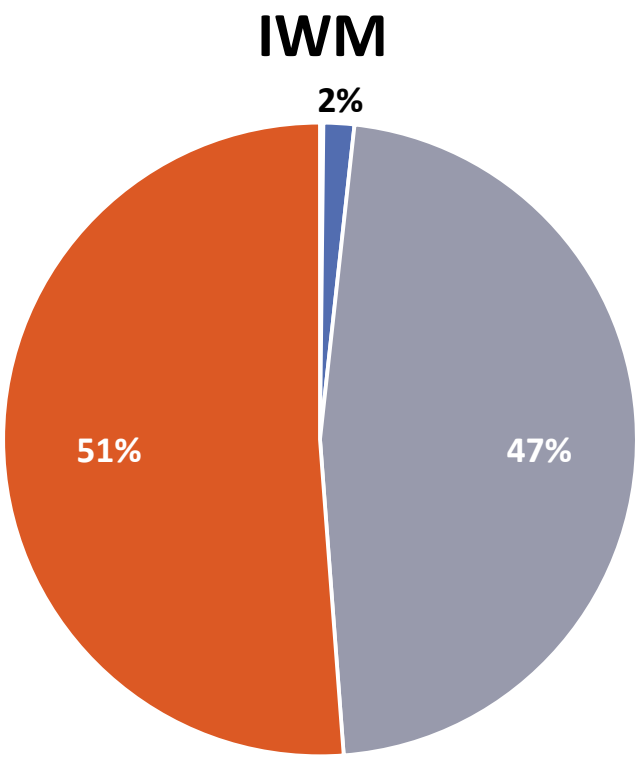
Table IV: Portfolio Returns to Routine and Opportunistic Trades

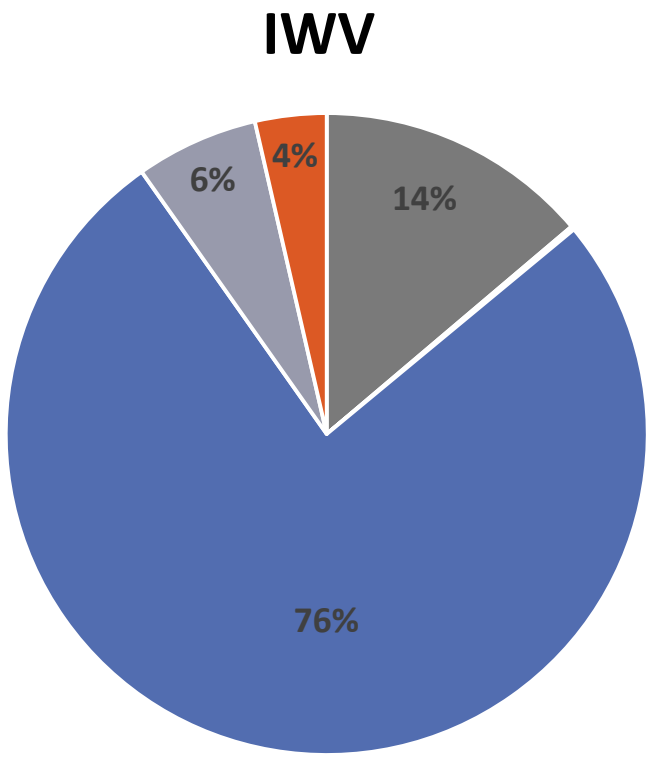
	Opportunistic Buys	Routine Buys	L/S Buys	Opportunistic Sells	Routine Sells	L/S Sells	Opportunistic (Buys–Sells)	Routine (Buys–Sells)
Panel A: Equal-Weighted								
Average returns	2.33	1.65	0.68	0.77	1.41	−0.63	1.55	0.25
Standard dev.	4.95	4.06	3.03	5.97	6.01	2.64	4.91	4.67
CAPM alpha	1.51***	0.92***	0.59***	−0.30	0.32	−0.61***	1.81***	0.60**
	(5.89)	(4.34)	(2.98)	(−1.31)	(1.44)	(−3.47)	(5.86)	(2.25)
Fama-French alpha	1.20***	0.64***	0.56***	−0.21	0.43***	−0.65***	1.41***	0.20
	(5.49)	(3.78)	(2.74)	(−1.34)	(2.72)	(−3.60)	(5.04)	(0.87)
Carhart alpha	1.45***	0.82***	0.63***	−0.19	0.38**	−0.57***	1.64***	0.44*
	(6.82)	(4.92)	(3.03)	(−1.18)	(2.32)	(−3.11)	(5.86)	(1.89)
DGTW Char Adj	1.24***	0.40**	0.83***	−0.27**	0.42***	−0.69***	1.51***	−0.02
	(4.99)	(2.00)	(3.39)	(−2.09)	(2.75)	(−4.52)	(4.98)	(−0.06)
5-Factor alpha	1.58***	0.87***	0.70***	−0.23	0.45***	−0.67***	1.80***	0.43*
	(7.03)	(5.00)	(3.18)	(−1.30)	(2.59)	(−3.48)	(6.07)	(1.73)
Panel B: Value-Weighted								
Average returns	1.79	1.27	0.52	0.72	1.00	−0.29	1.08	0.27
Standard dev.	5.96	5.02	5.27	5.70	6.16	2.92	5.88	5.97
CAPM alpha	0.87***	0.45*	0.42	−0.34*	−0.09	−0.25	1.22***	0.55
	(2.88)	(1.73)	(1.20)	(−1.73)	(−0.39)	(−1.29)	(3.14)	(1.44)
Fama-French alpha	0.64**	0.18	0.46	−0.08	0.28	−0.36	0.72**	−0.09
	(2.16)	(0.75)	(1.27)	(−0.46)	(1.35)	(−1.83)	(2.06)	(−0.29)
Carhart alpha	0.52*	0.09	0.43	−0.09	0.17	−0.26	0.62*	−0.07
	(1.73)	(0.37)	(1.16)	(−0.50)	(0.80)	(−1.29)	(1.71)	(−0.22)
DGTW Char Adj	0.57**	0.26	0.31	−0.18	0.06	−0.24	0.75**	0.21
	(2.35)	(1.26)	(1.04)	(−1.29)	(0.31)	(−1.46)	(2.48)	(0.72)
5-Factor alpha	0.72**	0.09	0.63	−0.10	0.29	−0.39*	0.82**	−0.20
	(2.27)	(0.34)	(1.61)	(−0.49)	(1.32)	(−1.84)	(2.15)	(−0.57)

*Source: Decoding Inside Information

Appendix B: Portfolio Composition - Weight







Cash IWV Large Mid Cap Small Cap

*As of 28nd November