Undergraduate Student Investment Management Fund

Fall 2017 Presentation
Fund Managers

Ernest Dela Cruz

Fund Analysts

Kevin Bergauer
Jeremy Liu
Joshua Harter
Thomas Henning
Brian Stewart
Kyle McCall
Gage Schrantz
Andrew Kudlinski

Student Investment Management Fund
Background
Momentum

Momentum Premium

Average Monthly Returns

Deciles

1927 - 2014
Premia By Size

- Momentum: High Returns – Low Returns
- Profitability: Profitable - Unprofitable
- Value: Value - Growth

Momentum Excess Returns

- 1965 - 1989

Profitability Excess Returns

- 1963 - 2014

Value Excess Returns

- 1926 - 2014
Construction
Background

- Russell 3000

Construction

- Under $1 Billion Market Cap
- Average Daily Shares Traded Under 50k
- Over $10 Billion Market Cap
- Regulated Utilities

Implementation

- Small - Mid Cap Universe
Above Median in Profitability
Above Median in Value
Above Median in Momentum

Small - Mid Cap Universe
Target Universe
Student Investment Management Fund

Background

Construction

Implementation

Normalized Profitability

Normalized Value

Normalized Momentum

Normalized Profitability

Normalized Value

Normalized Momentum

Target Universe

Profitability

Value

Momentum

\[ z = \frac{x - \min(x)}{\max(x) - \min(x)} \]
Profitability

Value

Momentum

Distance Formula

\( \sqrt{(1-x)^2 + (1-y)^2 + (1-z)^2} \)
Student Investment Management Fund

Background

Construction

Implementation

Portfolio

Distance

Tier: 1 2 3
Securities: 10 15 25
Portfolio Weight: 33% 33% 33%

Cash - 1%
Implementation
Factor Tilts

Value

<table>
<thead>
<tr>
<th>Premium Measure</th>
<th>Russell 3000</th>
<th>Portfolio</th>
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<tbody>
<tr>
<td>-20%</td>
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Profitability

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Momentum

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<tr>
<td>180%</td>
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</tbody>
</table>
Average Exposure By Tier

Average Value

Average Profitability

Average Momentum
Portfolio By Sector

![Bar chart showing portfolio by sector.](chart.png)

- **Sectors**: Consumer Staples, Energy, Financials, Health Care, Industrials, Information Technology, Materials, Real Estate, Telecommunication, Utilities
- **Portfolio Weight**
  - Consumer Staples: 0.00%
  - Energy: 5.00%
  - Financials: 10.00%
  - Health Care: 15.00%
  - Industrials: 20.00%
  - Information Technology: 25.00%
  - Materials: 30.00%
- **Russell 3000 Weight**
  - Consumer Staples: 0.00%
  - Energy: 5.00%
  - Financials: 10.00%
  - Health Care: 15.00%
  - Industrials: 20.00%
  - Information Technology: 25.00%
  - Materials: 30.00%

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**Background**

**Implementation**

**Construction**
Returns

Our Portfolio: 1.56%
Russell 3000: 1.77%
Thank you. We will now welcome questions.
Appendix
Value

Calculation used for premium measure:

\[
\frac{\text{Book Equity}}{\text{Market Capitalization}}
\]

Paper used:

*Fact, Fiction, and Value Investing*

Asness, Frazzini, Israel and Moskowitz (2015)
Profitability

Calculation used for premium measure: \[
\frac{\text{Cash Flow From Operations} - \text{Net Income} + \text{Operating Income}}{\text{Total Assets}}
\]

Paper used: \textit{Accruals, Cash Flows, and Operating Profitability in the Cross Section of Stock Returns}\nBall, Gerakos, Linnainmaa and Nikolaev (2015)
Momentum

Calculation used for premium measure: \[
\frac{\text{Current Value}}{\text{Prior 6 Months Value}} - 1
\]

Paper used: Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency
Jegadeesh and Titman (1993)
Undergraduate Student Investment Management Fund

2017 Fall Presentation
Friday, December 1st
Team Overview

Fund Manager
Paige Weisman

Fund Analysts
Michael Barger
Peter Hurtado
Chris Nuccio
Elena Pham
Drezden Plotkin
Caleb Skogen
Steven Urry
Jerry Zhang
Paige Weisman

Systematic Drivers of Expected Returns

Equities

- **Value**
  - Value vs Growth Companies

- **Profitability**
  - Profitable vs Less-Profitable Companies

- **Momentum**
  - Appreciating vs Non-Appreciating Companies

- **Volatility**
  - Low Volatility vs High Volatility Companies

- **Size**
  - Small vs Large Companies (by market capitalization)

- **Investment**
  - Low Investment vs High Investment Companies
Monthly Historical Returns

Market (1963-2016) Return: 43 Bps

Profitability (1963-2010) Return: 62 Bps

Value (1963-2010) Return: 80 Bps

Implementation
Charter Constraints

- Investable Universe
- Minimum Average Trade Volume of 50K
- Greater than $1B Market Cap
- U.S. Domiciled Securities
Measuring Profitability

Revenue

Cost of Sales

Gross Profit

Selling, General & Administrative

Operating Income

Add

Minus

Operating Income

Net Change in Accruals and other Non-Cash Activities

Cash Operating Income
Monthly Returns Historical Profitability

Cash Operating Profitability (1963-2014)
Return: 64 Bps

Operating Profitability (1963-2014)
Return: 54 Bps
Composite Value Score

\[ Value \ Score = \left( \frac{1}{3} \right) \left( \frac{\text{Book Equity}}{\text{Market Cap}} \right) + \left( \frac{1}{3} \right) \left( \frac{\text{Earnings}}{\text{Price}} \right) + \left( \frac{1}{3} \right) \left( \frac{\text{Cash Flow}}{\text{Price}} \right) \]
Security Selection Matrix

- Highest Profit
- Breakpoint

The Intersection: Our Target Universe

- Highest Value
- Breakpoint

Profitability vs. Value
Russell 3000 Financials Distributions

Financials Value Distribution

Financials Profitability Distribution

Mean
Median
Portfolio Construction
Sector Weighting

Russell 3000

- Consumer Discretionary: 12%
- Consumer Staples: 8%
- Energy: 5%
- Financials: 5%
- Health Care: 15%
- Industrials: 10%
- Information Technology: 3%
- Materials: 4%
- Real Estate: 2%
- Telecom Services: 1%
- Utilities: 3%

Target Portfolio
Sector Weighting

Russell 3000

Target Portfolio

15% Financials
Sector Weighting

Russell 3000

Target Portfolio

Financials

15%
## Security Selection Example: Financials

<table>
<thead>
<tr>
<th>Security</th>
<th>Market Cap (B)</th>
<th>Profitability Measure</th>
<th>Value Measure</th>
<th>Value Rank</th>
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<tbody>
<tr>
<td>A</td>
<td>24.60</td>
<td>0.132</td>
<td>0.469</td>
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<tr>
<td>B</td>
<td>17.27</td>
<td>0.138</td>
<td>0.450</td>
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<td>C</td>
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<td>0.808</td>
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**Cumulative Market Cap (B)**

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## Security Selection Example: Financials

### Cumulative Market Cap (B)

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<td>11.27</td>
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<td>0.442</td>
<td>4</td>
</tr>
</tbody>
</table>
Portfolio Characteristics

- 54 Securities
- $424B Market Cap
- 0.99% Cash
- 0.5% Floor
- 5.0% Ceiling

- Consumer Discretionary: 6%
- Consumer Staples: 2%
- Energy: 13%
- Financials: 5%
- Health Care: 11%
- Industrials: 15%
- Information Technology: 26%
- Materials: 3%
- Real Estate: 8%
- Telecomm Services: 9%
- Utilities: 1%
Sector Weight Comparison

Russell 3000

- Consumer Discretionary: 12%
- Consumer Staples: 2%
- Energy: 8%
- Financials: 5%
- Health Care: 3%
- Industrials: 10%
- Materials: 3%
- Real Estate: 15%
- Information Technology: 25%

Portfolio

- Consumer Discretionary: 26%
- Consumer Staples: 1%
- Energy: 6%
- Financials: 2%
- Health Care: 13%
- Industrials: 11%
- Materials: 3%
- Real Estate: 15%
- Information Technology: 9%
- Telecomm Services: 8%
- Utilities: 3%
Market Capitalization Comparison

Russell 3000

Portfolio

- <$2B
- $2-10B
- >$10B

83%
13%
4%
5%
67%
28%
Performance at Market Close 11/29/2017

<table>
<thead>
<tr>
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<th>Returns</th>
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<tr>
<td>Our Portfolio</td>
<td>2.84%</td>
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<tr>
<td>Russell 3000</td>
<td>1.78%</td>
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</table>

Portfolio & Russell 3000 Index Total Return

- Portfolio Total Return
- Russell 3000 Return
Thank you, we now welcome questions!
APPENDIX
Alaska Air Group Inc.

**ALK Stock Price**

- **ALK Portfolio Weight**
  - Seeding Weight: 1.70%
  - Portfolio Weight: 1.72%

**Returns**
- **ALK**: 3.96%
- **Our Portfolio**: 2.84%
- **Russell 3000**: 1.78%
## Break Points

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<th>Sector</th>
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<td>Telecommunication Services</td>
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<td>Utilities</td>
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Distributions - Breakpoint & Sector Averages

Value Measure Comparison

- Portfolio
- Average
- Median

Categories: Consumer Discretionary, Consumer Staples, Energy, Financials, Health Care, Industrials, Information Technology, Materials, Real Estate, Telecommunication Services, Utilities
Distributions - Breakpoint & Sector Averages

Normalized Profitability Measure Comparison

- Portfolio
- Average
- Median

[Chart showing normalized profitability measure comparison for various sectors]
### Value Sharpe Ratios (1951-2014)

<table>
<thead>
<tr>
<th>Period</th>
<th>B/M</th>
<th>E/P</th>
<th>CF/P</th>
<th>D/P</th>
<th>5-year return</th>
<th>Composite</th>
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<td>1971-1980</td>
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<td>1981-1990</td>
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<td>0.45</td>
<td>0.30</td>
<td>0.29</td>
<td>0.45</td>
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Highest | Lowest
Rebalancing

Profitability Rank vs. Value Rank

- Mean
- Median

- Sell
- Buy
- Hold
R3000 Consumer Discretionary Distributions

Mean

Median

Factor Captured (Portfolio Weighting)

**Consumer Discretionary Value Distribution**

**Consumer Discretionary Profitability Distribution**
R30000 Consumer Staples Distributions

Consumer Staples Value Distribution

Consumer Staples Profitability Distribution

Mean

Median

Factor Captured (Portfolio Weighting)
R3000 Energy Distributions

**Energy Value Distribution**

- Mean
- Median

**Energy Profitability Distribution**

- Factor Captured (Portfolio Weighting)
R3000 Financials Distributions

Mean

Median

Factor Captured (Portfolio Weighting)
R3000 Health Care Distributions

- Mean
- Median
- Factor Captured (Portfolio Weighting)
R3000 Industrials Distributions

**Mean**

**Median**

**Factor Captured (Portfolio Weighting)**

**Industrials Value Distribution**

**Industrials Profitability Distribution**
R3000 Information Technology Distributions

Mean

Median

Factor Captured (Portfolio Weighting)
R3000 Materials Distributions

Materials Value Distribution

Materials Profitability Distribution

Mean

Median

Factor Captured (Portfolio Weighting)
R3000 Real Estate Distributions

Real Estate Value Distribution

Real Estate Profitability Distribution

Mean
Median
Factor Captured (Portfolio Weighting)
R3000 Telecommunication Distributions

Telecommunication Services Value Distribution

Telecommunication Services Profitability Distribution

Mean

Median

Factor Captured (Portfolio Weighting)
R3000 Utilities Distributions

Utilities Value Distribution

Utilities Profitability Distribution

Mean
Median
Factor Captured (Portfolio Weighting)