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
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

Number of Occurrences

Number of Occurrences

Number of Occurrences

Months Since Event

Months Since Event

Months Since Event
Conditional Probabilities

**Dividend Increases**
- 1.18% \( P(t) \)
- 32.9% \( P(t|t-12) \)
- 28x \( \frac{P(t)}{P(t|t-12)} \)

**Stock Dividends**
- .37% \( P(t) \)
- 29.2% \( P(t|t-12) \)
- 136x \( \frac{P(t)}{P(t|t-12)} \)

**Special Dividends**
- .24% \( P(t) \)
- 32.6% \( P(t|t-12) \)
- 79x \( \frac{P(t)}{P(t|t-12)} \)
Daily Stock Returns

Daily Stock Returns Around Event Announcements

*Dividend Increases*
Strategy Implementation
## 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

<table>
<thead>
<tr>
<th>Certainty Bucket</th>
<th>Minimum Occurrences</th>
<th>Holding Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly</td>
<td>--</td>
<td>1 Month</td>
</tr>
<tr>
<td>Weekly</td>
<td>4</td>
<td>9 Weekdays</td>
</tr>
<tr>
<td>Daily</td>
<td>4</td>
<td>5 Weekdays</td>
</tr>
</tbody>
</table>
Holding Period Visualization

- **Daily Buy**
  - Monday: 06
  - Tuesday: 07
  - Wednesday: 08
  - Thursday: 09
  - Friday: 10
  - Saturday: 11

- **Daily Certainty**
  - Wednesday: 08

- **Daily Sell**
  - Thursday: 09

- **Weekly Buy**
  - Monday: 20
  - Tuesday: 21
  - Wednesday: 22
  - Thursday: 23
  - Friday: 24
  - Saturday: 25

- **Weekly Certainty**
  - Monday: 01

- **Weekly Sell**
  - Monday: 01

April 26th, 2019

Student Investment Management Fund - Team A
**Realization Rates**

<table>
<thead>
<tr>
<th>Month</th>
<th>Overall Hit Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>November</td>
<td>81.5%</td>
</tr>
<tr>
<td>December</td>
<td>94.2%</td>
</tr>
<tr>
<td>January</td>
<td>66.0%</td>
</tr>
<tr>
<td>February</td>
<td>89.3%</td>
</tr>
<tr>
<td>March</td>
<td>80.0%</td>
</tr>
<tr>
<td>April</td>
<td>38.3%</td>
</tr>
</tbody>
</table>

### January (Month of January — 66.0% overall hit rate)

<table>
<thead>
<tr>
<th>Confidence</th>
<th>Predicted</th>
<th>Realized</th>
<th>Hit Rate</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>2</td>
<td>2</td>
<td>100%</td>
<td>50%</td>
</tr>
<tr>
<td>Weekly</td>
<td>2</td>
<td>2</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Monthly</td>
<td>23</td>
<td>18</td>
<td>78%</td>
<td>100%</td>
</tr>
</tbody>
</table>

### December (Month of December — 94.2% overall hit rate)

<table>
<thead>
<tr>
<th>Confidence</th>
<th>Predicted</th>
<th>Realized</th>
<th>Hit Rate</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>10</td>
<td>10</td>
<td>100%</td>
<td>70%</td>
</tr>
<tr>
<td>Weekly</td>
<td>14</td>
<td>13</td>
<td>93%</td>
<td>77%</td>
</tr>
<tr>
<td>Monthly</td>
<td>28</td>
<td>26</td>
<td>93%</td>
<td>100%</td>
</tr>
</tbody>
</table>

### February (Month of February — 89.3% overall hit rate)

<table>
<thead>
<tr>
<th>Confidence</th>
<th>Predicted</th>
<th>Realized</th>
<th>Hit Rate</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>15</td>
<td>13</td>
<td>87%</td>
<td>62%</td>
</tr>
<tr>
<td>Weekly</td>
<td>27</td>
<td>26</td>
<td>96%</td>
<td>85%</td>
</tr>
<tr>
<td>Monthly</td>
<td>61</td>
<td>53</td>
<td>87%</td>
<td>100%</td>
</tr>
</tbody>
</table>

### March (Month of March — 80.0% overall hit rate)

<table>
<thead>
<tr>
<th>Confidence</th>
<th>Predicted</th>
<th>Realized</th>
<th>Hit Rate</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>7</td>
<td>6</td>
<td>86%</td>
<td>50%</td>
</tr>
<tr>
<td>Weekly</td>
<td>1</td>
<td>1</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Monthly</td>
<td>17</td>
<td>13</td>
<td>76%</td>
<td>100%</td>
</tr>
</tbody>
</table>

### April (Month of April — 38.3% overall hit rate)

<table>
<thead>
<tr>
<th>Confidence</th>
<th>Predicted</th>
<th>Realized</th>
<th>Hit Rate</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>13</td>
<td>6</td>
<td>46%</td>
<td>50%</td>
</tr>
<tr>
<td>Weekly</td>
<td>7</td>
<td>3</td>
<td>43%</td>
<td>67%</td>
</tr>
<tr>
<td>Monthly</td>
<td>27</td>
<td>9</td>
<td>33%</td>
<td>100%</td>
</tr>
</tbody>
</table>

*as of April 24th 2019*
Overview of Results
Total Portfolio Returns: Gross vs. Russell 3000

November 19th, 2018 - April 23rd, 2019

Δ = +1.88%
### Turnover By Month

<table>
<thead>
<tr>
<th>Month</th>
<th>Quantity of Trades</th>
<th>Turnover</th>
<th>Contribution to Turnover by Russell</th>
</tr>
</thead>
<tbody>
<tr>
<td>November</td>
<td>$971,479.58</td>
<td>129.53%</td>
<td>34.68%</td>
</tr>
<tr>
<td>December</td>
<td>$1,603,733.05</td>
<td>213.83%</td>
<td>29.57%</td>
</tr>
<tr>
<td>January</td>
<td>$484,258.23</td>
<td>64.57%</td>
<td>32.31%</td>
</tr>
<tr>
<td>February</td>
<td>$742,745.71</td>
<td>99.03%</td>
<td>22.57%</td>
</tr>
<tr>
<td>March</td>
<td>$1,301,997.02</td>
<td>173.60%</td>
<td>21.34%</td>
</tr>
<tr>
<td>April</td>
<td>$1,309,662.99</td>
<td>174.62%</td>
<td>17.99%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$6,413,876.58</strong></td>
<td><strong>855.18%</strong></td>
<td><strong>219.81%</strong></td>
</tr>
</tbody>
</table>
Total Portfolio Returns: Net of Trading Costs

November 19th, 2018 - April 23rd, 2019

\[ \Delta = +1.20\% \]
Active Portfolio Returns: Gross Active Returns vs. Russell 3000

November 19th, 2018 - April 23rd, 2019

\[ \Delta = +3.19\% \]
Active Portfolio Returns: Net Active Returns vs. Russell 3000

November 19th, 2018 - April 23rd, 2019

Δ = +2.61%
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”

<table>
<thead>
<tr>
<th>Certainty Bucket</th>
<th>Minimum Occurrences</th>
<th>Holding Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly</td>
<td>1</td>
<td>1 Month</td>
</tr>
<tr>
<td>Weekly</td>
<td>4</td>
<td>9 Weekdays</td>
</tr>
<tr>
<td>Daily</td>
<td>4</td>
<td>5 Weekdays</td>
</tr>
</tbody>
</table>
Shadow Portfolios: Gross Active Only vs. Monthly Rebalance (EW)

November 19th, 2018 - April 23rd, 2019

Δ = +1.42%
## Conditional Probabilities

| 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

$\Delta = +5.35\%$
Event Time Returns – Equal Weighted (bps)

Equal-Weighted Excess Returns with Security Count

Equal Weighted T-Scores by Day
Event Time Returns – Day 4

Day 4 Equal Weighted Returns

- [-5.02%, -3.92%]: 5
- [-3.92%, -2.82%]: 7
- [-2.82%, -1.72%]: 17
- [-1.72%, -0.62%]: 30
- [-0.62%, 0.48%]: 53
- [0.48%, 1.58%]: 28
- [1.58%, 2.68%]: 12
- [2.68%, 3.78%]: 2
- [3.78%, 4.88%]: 3
Event Time Returns – Value Weighted (bps)

Value-Weighted Excess Returns with Security Count

Value Weighted T-Score By Day
Appendix
Average Sector Exposures

- **Financials**: 20.98%
- **Industrials**: 13.85%
- **Real Estate**: 16.99%
- **Utilities**: 10.01%
- **Consumer Discretionary**: 10.38%
- **Information Technology**: 9.49%
- **Health Care**: 20.23%
- **Materials**: 11.58%
- **Consumer Staples**: 16.58%
- **Communication Services**: 6.15%
- **Energy**: 5.50%
- **Energy**: 5.26%
- **Real Estate**: 4.49%
- **Consumer Staples**: 1.94%
- **Energy**: 1.03%

**Legend**
- **Portfolio**
- **Russell 3000**
Sector Return Attribution

April 26th, 2019

Student Investment Management Fund - Team A

Financials

Industrials

Real Estate

Utilities

Communication Services

Energy

Financials

Health Care

Materials

Consumer Staples

Information Technology

Consumer Discretionary

Energy

(1.4)%

3.0%

2.8%

(0.3)%

6.5%

6.7%

19.0%

9.1%

11.6%

22.8%

15.2%

11.8%

11.6%

19.0%

22.8%

15.2%

11.8%

11.6%

19.0%

22.8%

15.2%

11.8%

11.6%

19.0%

22.8%

15.2%

11.8%
Sector Return Contribution

30 April 26th, 2019
Student Investment Management Fund - Team A