The Sea Change of Data Science and Apartment Research

2020 NMHC Research Forum Webinar Series
March 31, 2020
Webinar Host
Mark Obrinsky
SVP, Research and Chief Economist
NMHC
Webinar Information

- To ensure good sound quality, all attendees will be muted during the webinar.
- To ask a question: type your question in to the Question Box on your control panel. NMHC staff will review and present your question to the speakers at the end of the presentation as time allows.
- Today’s webinar is being recorded and will be made available on the NMHC website.
- This webinar is closed to media and intended for information purposes only.
The mission of NMHC is to create opportunities for the industry’s best and brightest to come together to leverage smart decision making and collaborative action to shape a positive future for their business, the multifamily housing industry and the communities they help build.
AGENDA

• Welcome and Overview
• **Economics and Forecasting: Algorithms, Machine Learning, and Data Science**
  • James Chung, President, Reach Advisors
• Applying Data Science in Multifamily
  • Quinn Eddins, Managing Director, Research and Analytic Services, Greystar
  • Mark Franceski, Vice President, Research The Bozzuto Group
• Questions
• Closing Remarks
ECONOMICS AND FORECASTING: ALGORITHMS, MACHINE LEARNING, AND DATA SCIENCE

James Chung
President
Reach Advisors
2020 NMHC Research Forum:
The Sea Change of Data Science and Apartment Research

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james@reachadvisors.com
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APPLYING DATA SCIENCE IN MULTIFAMILY

Quinn Eddins
Managing Director, Research and Analytics
Greystar

Mark Franceski
Vice President, Research
The Bozzuto Group
Bozzuto Footprint

<table>
<thead>
<tr>
<th>Metro Area</th>
<th>#Projects</th>
<th>#Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC Metro</td>
<td>121</td>
<td>34,000</td>
</tr>
<tr>
<td>NY-NJ-CT</td>
<td>49</td>
<td>13,700</td>
</tr>
<tr>
<td>Baltimore Metro</td>
<td>30</td>
<td>7,300</td>
</tr>
<tr>
<td>Boston</td>
<td>23</td>
<td>6,600</td>
</tr>
<tr>
<td>Chicago</td>
<td>17</td>
<td>6,500</td>
</tr>
<tr>
<td>Philadelphia</td>
<td>15</td>
<td>3,900</td>
</tr>
<tr>
<td>Florida</td>
<td>10</td>
<td>3,900</td>
</tr>
<tr>
<td>Pittsburgh</td>
<td>1</td>
<td>400</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>265</strong></td>
<td><strong>76,200</strong></td>
</tr>
</tbody>
</table>

Mid-Atlantic & Northeast

Southeast FL
LEAD FEARLESSLY IN THE TECHNOLOGY REVOLUTION

Learn to leverage technology in every aspect of business
Architecture Diagram

Application Roles
- Data Developer
- Analysis Service Developer
- Power BI Developer
- Production Support
- Solution Architect
Talking Points

• Yardi Orion and the importance of data modeling

• The spectrum between “What do you want to know?” and “What do you have?” or “If this is so advanced, you tell me what I need to know.”

• Data quality

• Skills, skills, skills, skills
  • SQL, Python, database design and administration, etc.

• Infrastructure intimidation
GREYSTAR AT A GLANCE

Founded in 1993, Greystar™ is the global leader in rental housing offering expertise in investment management, development and construction, and property management worldwide.

<table>
<thead>
<tr>
<th>197</th>
<th>13</th>
<th>15,000+</th>
<th>Charleston, SC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Markets</td>
<td>Countries</td>
<td>Team Members</td>
<td>Global Headquarters</td>
</tr>
</tbody>
</table>

**PROPERTY MANAGEMENT**

<table>
<thead>
<tr>
<th>525K+</th>
<th>82K</th>
<th>1,800+</th>
<th>$160B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units Under Management (including student beds)</td>
<td>Student Beds Under Management</td>
<td>Communities (in 42 US States, DC, and 5 Countries)</td>
<td>Value of Managed and Operated Portfolio (Estimated)</td>
</tr>
</tbody>
</table>

**GLOBAL INVESTMENT MANAGEMENT**

<table>
<thead>
<tr>
<th>$36.1B</th>
<th>$19.8B+</th>
<th>167K+</th>
<th>113</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assets Under Management (AUM)</td>
<td>Equity Under Management</td>
<td>Units and Student Beds Owned</td>
<td>Markets (Assets Owned)</td>
</tr>
</tbody>
</table>

**DEVELOPMENT AND CONSTRUCTION SERVICES**

<table>
<thead>
<tr>
<th>$14.2B</th>
<th>$8.0B</th>
<th>$7.9B</th>
<th>176</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Developments Underway (Also included in AUM)</td>
<td>Global Development Pipeline*</td>
<td>US General Contractor Capitalization (Since 2009)</td>
<td>US Multifamily Projects Sponsored (Since 2009)</td>
</tr>
</tbody>
</table>

Numbers are as of September 30, 2019 *The Global Development Pipeline, which represents a volume of projects that are currently being evaluated, is subject to change without notice and is provided as an example of the volume being pursued. There is no guarantee that any deals in the Pipeline will ultimately be included in Greystar’s investment portfolio. Past performance of projects in the pipeline are not indicative of future results.
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NMHC RESEARCH FORUM WEBINAR SERIES

State of the Apartment Industry - Market Trends and Outlook Webinar
April 2 | 2:00 - 3:00 PM EDT

The Role of "Filtering" in Housing Affordability
April 16 | 2:00 – 3:00 PM EDT

New Apartment Construction: The Impact on Existing Apartments Webinar
May 12 | 2:00 – 3:00 PM EDT