Invesco’s differentiated Proxy Voting Approach

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September 2017

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Proxy Voting - Benefits, Challenges and Solutions/Opportunities through big data analytics

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<th>Benefits</th>
<th>Challenges</th>
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<td>▪ Great medium to make investor’s voices heard on key issues such as ‘Say-on-Pay’, Climate Change, Gender Diversity, Shareholder Activism etc.</td>
<td>▪ High volumes during the proxy season. For example - An institutional investor might hold stakes in more than 10,000 companies</td>
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<td>▪ Active Investor’s opportunity to engage with companies and dialogue the change</td>
<td>▪ Market driven impediments to proxy voting such as Share-blocking, Power of Attorney, Share Re-registration etc.</td>
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<td>▪ Voting at the annual general meeting (AGM) can represent the most transparent manifestation of an institution’s commitment to active responsible investing</td>
<td>▪ Incorporating the Portfolio Manager’s expert insight into the proxy voting decision-making process efficiently</td>
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Solutions/Opportunities

| ▪ Powerful decision making by integrating the input of the proxy advisers | ▪ Incorporating modern technologies such as algorithmic learning, predictive and big data analytics to address crucial proxy voting data questions and analyzing the proxy voting patterns based on the historical data. |
| ▪ Accessibility to the market information                             | ▪ Using advanced analytics (i.e., mix of cross-functional, internal and external data) to develop forward-looking proxy voting insights |
| ▪ Technology-based voting consolidation, processing by way of a streamlined process |                                                                   |

Proxy Voting Software
Invesco’s proprietary tool – The Fund Manager Portal: the hallmark of active ownership

The Invesco fund manager portal differentiates our firm by putting the proxy voting decision in the hands of fund managers which ultimately leads to informed, timely, and robust proxy voting outcomes for our clients.

The Fund Manager (FM) Portal is a state-of-the-art, proprietary proxy voting system which is developed in-house in 2013 and is currently pending patent in US and India

- User-friendly, one-stop, simple and easy front-end interface build as a Windows application using Microsoft .NET technology which is linked to in-house proxy database
- Allow fund managers to enter voting rationale, recommendations and complete voting quickly which can be viewed by other FM’s enabling collaboration and discussions globally
- Builds institutional knowledge base across the Invesco complex with respect to individual companies and proxy issues through storage of historical proxy data
- Provides a flexibility to the Fund managers to independently view the big historical data which includes research material (both internal and third party), voting trends etc. with a click of button
- FM Portal is integrated with Power BI (Business Intelligence) analytics tool which creates personalized dashboards and drive real time analytics for Fund Managers on key topics like Climate Change, Say-on-Pay etc. from historical proxy voting data resulting in efficient decision making.
- Tool, currently, provides access to analysis of business data, research and historical proxy voting data (since 2012) on more than 7000 corporate issuers. This sums up close to analyzing 1 Tera Byte (TB) of big data in-house.

Invesco’s Investment professionals are supported with around the clock coverage from the governance and administration teams in US and India.

*All the data and statistics in the slides are as of 21 Sep 2017.*
Invesco’s Echo Voting process and future of proxy voting using Big Data Analytics

Invesco’s Echo Voting Process – Active Passive Investing

- At Invesco, we leverage active equity expertise to drive our voting decisions across our index and quantitative strategies, also referred to as echo-voting.
- Echo Voting process helps in leveraging proxy votes of Invesco’s Rank 1 holder of a security to the index and quantitative strategies funds. This is done by scanning through a big data of security holdings and upcoming meetings to calculate the rank 1 holder and echoing their votes.

Invesco’s Vision - Future of Proxy Voting using Big Data Analytics

- Integrating advanced analytics technology to the universe of big proxy voting and corporate issuers data with new techniques like Machine Learning (MI) and Artificial Intelligence (AI) to make efficient proxy voting decisions.
- Using Predictive and Prescriptive analytics method to identify patterns which helps in answering questions like “What will happen next?” (Predictive) to “What shall we do?” (Prescriptive)

*Simplify data analytics flow Big data Analytics

Multiple stages
Storage decoupled from processing

Ingest Store Analyze Visualize

Data Answers

Time

*All the data and statistics in the slides are as of 21 Sep 2017. Figure source - http://blog.sysfore.com/hadoop-and-big-data-analytics/
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