Agenda

1. Introduction
2. Methodology
3. Performance
4. Conclusions
5. Demo
1 Introduction
Speakers

Moderator

Irina Baron
Director
Customer Success Management

Presenter

Maria Buitrago
Associate Director
RiskCalc Research

Presenter

Gustavo Jimenez
Assistant Director
RiskCalc Product Management

Presenter

Uliana Makarov
Director
RiskCalc Research
The Use Case

RiskCalc™ generates accurate and forward-looking EDF™ (Expected Default Frequency) measures for private companies based on financial statement information.

Some business cases require users to translate RiskCalc EDF measures to a rating comparable to an agency rating.

The new Excel Add-in template combines RiskCalc EDF values with company size and sovereign rating to estimate ratings for large private companies, that are currently not rated by a rating agency.

Sovereign & Size-Adjusted EDF-implied ratings are within two notches of the agency ratings approximately 70% of the time.
Extending RiskCalc to Estimate Ratings

RiskCalc EDF

- Measures absolute level of risk
- Standalone quantitative risk assessment
- Lower weight on Size
- Calculated for any company with financials

Agency Ratings

- Measure relative risk
- Incorporate qualitative factors, external support and country-related risks
- Higher weight on Size
- Calculated for large companies that want access to capital markets
The Current EDF-Implied Ratings in RiskCalc

Derived from long history of default rates for rated firms

We will continue to offer the EDF-implied ratings based on historical default rates, for clients interested on measuring the absolute level of default risk
Sovereign & Size-Adjusted EDF-implied Rating

Mimics agency rating methodology in spirit

*(does not directly replicate it)*

Sovereign & Size-Adjusted EDF-Implied Rating
Case Study: Match Group Inc

» US internet company that owns and operates several online dating websites
» Total Assets are ~ $2B
» Went public on Nov. 19, 2015, rated Ba3 by Moody’s Investors Service
Methodology
Data Description

- Global Corporate and Not-for-Profit data
- Each observation was assigned to a RiskCalc model depending on the location & industry.

<table>
<thead>
<tr>
<th>Financial Statements</th>
<th>Vended and Moody’s Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rating Data</td>
<td>Moody’s Senior Unsecured Rating</td>
</tr>
<tr>
<td>Period</td>
<td>1986-2017</td>
</tr>
<tr>
<td>Number of Statements</td>
<td>36,000+</td>
</tr>
<tr>
<td>Number of companies</td>
<td>3,900+</td>
</tr>
</tbody>
</table>
Distribution of Statements by year
Distribution of Statements by size

- <500M: 0%
- 500M-1B: 5%
- 1B-2B: 10%
- 2B-5B: 15%
- 5B-10B: 20%
- >10B: 35%
Agency ratings seem to become more conservative through time.
Functional Form

Linear Model:

\[
\text{Rating} = \text{EDF} + \text{Sovereign Rating} + \text{Size}
\]

- **Rating**: All the ratings are rating numbers from 1 to 19 corresponding to Aaa to Caa3. The model also includes dummies corresponding to each RiskCalc model used.

- **EDF**: Normal Inverse of RiskCalc FSO EDF

- **Sovereign Rating**: MIS Sovereign Rating of the Country the Company is Located

- **Size**: Log of Total Assets in Thousand USD
3 Performance
More than 70% of the estimated ratings are within 2 notches of the Agency Rating between 2015 and 2017

<table>
<thead>
<tr>
<th>Sovereign &amp; Size Adjusted EDF-Implied Rating</th>
<th>Within 0 notches</th>
<th>Within 1 notch</th>
<th>Within 2 notches</th>
<th>Within 3 notches</th>
<th>Within 4 notches</th>
<th>Within 5 notches</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDF-Implied Rating (static)</td>
<td>8.6%</td>
<td>25.7%</td>
<td>42.4%</td>
<td>57.1%</td>
<td>69.3%</td>
<td>79.4%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sovereign &amp; Size Adjusted EDF-Implied Rating</th>
<th>Within 0 notches</th>
<th>Within 1 notch</th>
<th>Within 2 notches</th>
<th>Within 3 notches</th>
<th>Within 4 notches</th>
<th>Within 5 notches</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDF-Implied Rating (static)</td>
<td>19.6%</td>
<td>52.2%</td>
<td>73.8%</td>
<td>87.4%</td>
<td>94.5%</td>
<td>97.6%</td>
</tr>
</tbody>
</table>
The performance is consistent across locations

<table>
<thead>
<tr>
<th>Location</th>
<th>Within 0 notches</th>
<th>Within 1 notch</th>
<th>Within 2 notches</th>
<th>Within 3 notches</th>
<th>Within 4 notches</th>
<th>Within 5 notches</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>21.9%</td>
<td>50.7%</td>
<td>72.6%</td>
<td>90.4%</td>
<td>98.6%</td>
<td>98.6%</td>
</tr>
<tr>
<td>Emerging Markets</td>
<td>20.0%</td>
<td>58.9%</td>
<td>75.1%</td>
<td>87.4%</td>
<td>93.1%</td>
<td>96.1%</td>
</tr>
<tr>
<td>Japan</td>
<td>11.9%</td>
<td>45.9%</td>
<td>78.9%</td>
<td>87.2%</td>
<td>87.2%</td>
<td>89.9%</td>
</tr>
<tr>
<td>Europe</td>
<td>21.0%</td>
<td>52.3%</td>
<td>74.0%</td>
<td>88.0%</td>
<td>94.6%</td>
<td>97.1%</td>
</tr>
<tr>
<td>North America</td>
<td>18.8%</td>
<td>49.2%</td>
<td>70.7%</td>
<td>85.9%</td>
<td>94.2%</td>
<td>97.7%</td>
</tr>
<tr>
<td>US Not-For-Profit</td>
<td>20.7%</td>
<td>56.5%</td>
<td>78.3%</td>
<td>89.7%</td>
<td>95.9%</td>
<td>98.6%</td>
</tr>
<tr>
<td>US Real Estate Operators</td>
<td>17.2%</td>
<td>50.7%</td>
<td>77.0%</td>
<td>87.1%</td>
<td>94.3%</td>
<td>98.6%</td>
</tr>
</tbody>
</table>
The performance is consistent across size

<table>
<thead>
<tr>
<th>Size Range</th>
<th>Within 0 notches</th>
<th>Within 1 notch</th>
<th>Within 2 notches</th>
<th>Within 3 notches</th>
<th>Within 4 notches</th>
<th>Within 5 notches</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;500M</td>
<td>19.28%</td>
<td>49.63%</td>
<td>70.10%</td>
<td>85.50%</td>
<td>94.02%</td>
<td>97.91%</td>
</tr>
<tr>
<td>500M-1B</td>
<td>26.03%</td>
<td>64.77%</td>
<td>82.78%</td>
<td>92.56%</td>
<td>98.04%</td>
<td>99.41%</td>
</tr>
<tr>
<td>1B-2B</td>
<td>20.34%</td>
<td>56.27%</td>
<td>78.07%</td>
<td>92.07%</td>
<td>96.83%</td>
<td>98.55%</td>
</tr>
<tr>
<td>2B-5B</td>
<td>16.54%</td>
<td>45.82%</td>
<td>71.46%</td>
<td>86.27%</td>
<td>94.87%</td>
<td>98.18%</td>
</tr>
<tr>
<td>5B-10B</td>
<td>17.95%</td>
<td>47.65%</td>
<td>69.55%</td>
<td>82.59%</td>
<td>92.09%</td>
<td>96.69%</td>
</tr>
<tr>
<td>&gt;10B</td>
<td>20.31%</td>
<td>54.33%</td>
<td>74.49%</td>
<td>87.92%</td>
<td>93.82%</td>
<td>96.59%</td>
</tr>
</tbody>
</table>
The performance is consistent across time
Conclusions
Conclusions

RiskCalc EDF measures a company’s standalone credit risk based on financial statement information, while an agency rating considers additional factors such as external support and country-related risks.

The Sovereign and Size-Adjusted EDF-Implied Rating Template combines RiskCalc EDF values with company size and sovereign rating to estimate ratings comparable to agency ratings.

Estimated ratings are within two notches of agency ratings approximately 70% of the time.
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