SAS GLOBAL FORUM 2019

USERS PROGRAM

APRIL 28 - MAY 1, 2019 | DALLAS, TX
Mr. Galinson has 20 years of experience in risk management (Credit and Market Risk) for Leumi and for the Central Bank of Israel.

Boaz speaks frequently at professional risk conferences and lectures in the Executive MBA programs (including Kellogg) in Tel-Aviv University.

He holds MBA degree in Finance and B.Sc degree in Mathematics.
Outline
Model Risk Management and Corporate Governance of Models with SAS®

- MRM -Four Lines of Defense.
- Corporate Governance of Models - Our Story!
- What’s next in Leumi MRM?
- MRM Project Architecture with SAS®
- Wrap up and Q&A
Disclaimer

This presentation presents the point of view of its author, which may differ from Leumi’s. It supports an oral presentation and is incomplete without it. The information is supplied in summary form and is therefore not necessarily complete.
Stake Holders & Four Lines of MRM Defense

Business Operations
- Model Development
- Formalized Control
- Model Implementation
- Model Use

Risk Management Functions
- On-going Monitoring
- Model Review & Validation
- Model Risk Remediation & Mitigation

Independent Governance & Assurance
- Audit Committee
- Internal Audit
- External Audit

Board Level Strategy & Policy
- Model Risk Appetite & Framework
- Model Risk Escalation & Reporting

First line
- Model Development
- Formalized Control
- Model Implementation
- Model Use

Second line
- On-going Monitoring
- Model Review & Validation
- Model Risk Remediation & Mitigation

Third line
- Audit Committee
- Internal Audit
- External Audit

Courtesy: Chartis Research Ltd 2014.
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The MRM Committee is headed by the CRO.

Responsibilities:

- To periodically review the group model quality.
- To approve and monitor the **model group work plan** including setting handling priority and resources allocation.
- To grant approval for transferring significant models for production.
- To receive reporting for transferring non significant models for production.
- To discuss and make decisions when there is disagreement between the developer and the validator.
- To act when models deteriorate.
- To report to the BoD on significant models.
- To examine relevant changes of regulations.

The MRM Committee is held every two months.
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What’s Next?

1. Improving the SLA of building a model, validating and documenting.
What’s Next?

2. Real Time Data and Real Time Model Decision Making.

Change in behavior that would affect rating

When rating is affected

Time Window with Wrong Risk Assessment and Pricing

1 Month

2 Months
What’s Next?

3. MRM for all types of models.
How to validate ML/AI models?

“Machine learning gives computers the ability to learn without being explicitly programmed.”

Arthur Samuel

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<thead>
<tr>
<th>Traditional:</th>
<th>ML/AI:</th>
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<tbody>
<tr>
<td>DATA</td>
<td>DATA</td>
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<tr>
<td>Algorithm/program  -&gt;output</td>
<td>Output  -&gt;Algorithm/program</td>
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Mitigating the Model Risk with SAS

**MRM/Dashboard for Models**
- Model Monitoring
- Dynamic ABT

**SAS Detail Data Store**
- Credit data mart

**Enhanced Model Monitoring**
- Automated validation

**SAS VA**

**Enhancing Corporate governance**
- Quick Model Deployment
- Automated documentation

**Flexibility in model development**
- Revealing new relationships

**Single Version of the Truth**
- Synchronized, Consistent, Competence

**Users Program**
Wrap up

• The use of models will increase (Digital Banks, Big Data, IOT).
• Decisions can be made by models without human intervention.
• Risk has been shifted to models. The cost of error may be huge.
• Strong corporate governance of models is crucial.
• Advance tools for models (Dynamic ABT, Model Monitoring & Manager, RTDM, MRM, SAS VA, SAS in Memory) are essential to develop, validate, monitor, deploy and reduce model risk.
• What’s Next?
  - Real time scoring & Better SLA in the model life cycle.
Thank you!

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Kay Bailey Hutchison Convention Center