Quantitative Indicators of Risk

IIA Dallas Chapter
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Agenda

• Development of data-driven key risk indicators
• Risk re-defined
• Risk Assessment - Strategic Objectives:

1. Corporate Risk
   • Drilldown to determine which areas of the organization are contributing to the corporate risk

2. Project or Activity Risk
   • Relative risk rating of organizational activities - on different risk categories
Overview

Problem with traditional risk assessments:

- Risk assessment relies primarily on qualitative and subjective measures
- Corporate risk profile is time consuming to prepare and is typically only updated once a year
- Corporate risk profile is an aggregate (top-down) view of risk
- Corporate risk profile does not allow you to examine organizational entity / activity impact on risk
- Corporate risk profile does not allow you to examine the different risk categories (e.g. financial, HR, operational, strategic, legal, technological, etc.)
Emerging View of Analytics

Using data analysis as a strategic planning tool

Quantifying risks by measuring consequence and monitoring likelihood

Determining response

Profiling where functions/risks reside in your organization

Monitor key control effectiveness/improvements to business
Stakeholders

Audit
- Ongoing assessment of risks and controls
- Identification of specific audits; drilldown into risks; refine audit objectives
- Annual risk-based audit planning

Finance
- Financial monitoring and control testing
- Assessment of new opportunities
- Statement of assurance

Corporate Risk Officer
- Support for corporate risk profile
- Assessment of mitigation efforts
- Ongoing assessment of current and emerging risks
Benefits of Ongoing Risk Assessment

- Auditors can be more proactive in assessing corporate risks and emerging areas of risk.
- Predictive business performance measures will help drive productivity by 20 percent by 2017.
- Managers that persist in using historical measures miss the opportunity to capitalize on opportunities that would increase profit or fail to intervene to prevent an unforeseen event, resulting in a decrease in profit.
- ERM is more reliable and effective when ERM frameworks are shown to produce credible and useful risk-adjusted performance measures on an ongoing basis.
Quantitative Risk Indicators (QRIs)

Pre-requisites for Effective QRIs

• By-product of production systems
• Easily updated and reduce reporting burden
• Free from bias
• React to changes in risk levels
• Support the assessment risk at any organizational level - drill down to transactional level data
• Support annual and ongoing risk assessment process
Quantitative Risk Indicators

Subjective/qualitative assessment

Quantitative/data-driven assessment

Risk → Probability and Impact

Risk → Variability, Complexity and Volume
Ongoing Assessment of Risks

Objective:

The development and assessment of data-driven key risk indicators for ongoing assessments:

• For each corporate risk
  – Assessments of each organizational entity to determine impact on corporate risk and to develop an overall risk ranking (Low, Medium, High).

• For each risk category
  – Assessments of each organizational entity to determine impact on each risk category and to develop an of overall risk ranking (Low, Medium, High).
Development of KRI

Steps:

1. Ensure that your Audit Universe is aligned to Strategic Initiatives that are tied to Corporate Objectives
2. Develop KRI for each corporate risk and for all corporate risk categories
3. Perform ongoing assessment of corporate risks and risk categories by audit entity or any slice of the organization
4. Select activities/entities to audit which have highest corporate or risk category ratings.
Quantitative Key Risk Indicators

Corporate Risks - example:

1. Risk the management or loss of Intellectual Property will damage ability to drive future revenue

2. Risk ......

X . Risk .....
## Developing Data-Driven Risk Indicators for Corporate Risk – Intellectual Property

<table>
<thead>
<tr>
<th>Risk Sub-category</th>
<th>Risk Result / Impact</th>
<th>Risk Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>R&amp;D</strong> – failure to manage research and development projects.</td>
<td>• Project failure</td>
<td>• Success rate</td>
</tr>
<tr>
<td></td>
<td>• Escalation in costs</td>
<td>• Expenditures / budget</td>
</tr>
<tr>
<td></td>
<td>• Project delays</td>
<td>• Project status / Plan</td>
</tr>
<tr>
<td><strong>Safeguarding of IP</strong> – failure to implement safeguards to prevent theft of IP by employees.</td>
<td>• Loss of IP</td>
<td>• Percentage turnover</td>
</tr>
<tr>
<td></td>
<td>• ?</td>
<td>• Number of grievances</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Percentage use of outside / non fulltime employee</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Geographic location of facilities</td>
</tr>
<tr>
<td><strong>IT Controls</strong> – failure to implement IT controls to protect IP.</td>
<td>• Loss of data</td>
<td>• Email attachments</td>
</tr>
<tr>
<td></td>
<td>• System unavailable or unreliable</td>
<td>• # of unauthorized access attempts</td>
</tr>
<tr>
<td></td>
<td>• Control weaknesses</td>
<td>• System availability / downtime</td>
</tr>
</tbody>
</table>
Overall Corporate Risk Rating

Combined assessment of risk across all corporate risks for each organizational entity.

<table>
<thead>
<tr>
<th>Org Entity</th>
<th>Corp Risk 1</th>
<th>Corp Risk 2</th>
<th>......</th>
<th>Corp Risk n</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entity 1</td>
<td>3.5</td>
<td>3.7</td>
<td></td>
<td>2.3</td>
<td>Low</td>
</tr>
<tr>
<td>Entity 2</td>
<td>3.5</td>
<td>4.5</td>
<td></td>
<td>4.6</td>
<td>High</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entity X</td>
<td>4.8</td>
<td>2.8</td>
<td></td>
<td>4.4</td>
<td>Medium</td>
</tr>
</tbody>
</table>
Risk Categories - example

- External environment
- Legal and regulatory
- Strategy
- Governance
- Operational

- Information
- Human resources
- Technology
- Financial and administrative
Developing Data-Driven Risk Indicators for HR Risk Category

<table>
<thead>
<tr>
<th>Risk Sub-category</th>
<th>Risk Result / Impact</th>
<th>Risk Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recruiting</strong></td>
<td>• Lack of resources</td>
<td>• Vacancies</td>
</tr>
<tr>
<td></td>
<td>• Lack of skills</td>
<td>• Acting appointments</td>
</tr>
<tr>
<td></td>
<td>• ?</td>
<td>• ?</td>
</tr>
<tr>
<td><strong>Resource Allocation</strong></td>
<td>• Inappropriate resources for tasks</td>
<td>• Type of employee</td>
</tr>
<tr>
<td></td>
<td>• ?</td>
<td>• Employee classifications</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Status of employee</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Unions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ?</td>
</tr>
<tr>
<td><strong>Retention</strong></td>
<td>• Demographics</td>
<td>• Years of pensionable service</td>
</tr>
<tr>
<td></td>
<td>• Low experience levels</td>
<td>• Average age</td>
</tr>
<tr>
<td></td>
<td>• Turnover</td>
<td>• Average years in position</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ?</td>
</tr>
<tr>
<td><strong>Work environment</strong></td>
<td>• Unhappy workforce</td>
<td>• Average sick leave/vacations</td>
</tr>
<tr>
<td></td>
<td>• High sick leave</td>
<td>• Percentage departures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ?</td>
</tr>
</tbody>
</table>
HR Risk Category Data-Driven Indicators

Volume / Size
- # of employees
- Payroll dollars

Variability/Change
- Avg age; avg age of senior managers
- Avg years of pensionable service; % who can retire < 2 years
- Experience – years in dept / position / classification
- % Fulltime employees; % affected by org change
- % acting ; % new hires
- Leave: total leave taken; avg sick; avg vacation; avg unpaid

Complexity
- # types of employee; # classifications; # locations; # unions
- % employee with non-std hours

Other
- % Sex (M/F); % FOL (Eng/Fr)
**Objective:** to support the assessment of HR risk category for each audit entity.

<table>
<thead>
<tr>
<th>Audit Entity</th>
<th>Volume</th>
<th>Variability/Change</th>
<th>Complexity</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entity 1</td>
<td>304</td>
<td>5 6 12% 1</td>
<td>12 4 28%</td>
<td>Medium</td>
</tr>
<tr>
<td>Entity 2</td>
<td>281</td>
<td>13 2 13% 2</td>
<td>16 6 32%</td>
<td>High</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entity X</td>
<td>463</td>
<td>28 6 21% 4</td>
<td>9 8 14%</td>
<td>Low</td>
</tr>
</tbody>
</table>
## Developing Data-Driven Risk Indicators for Finance Risk Category

<table>
<thead>
<tr>
<th>Risk Sub-category</th>
<th>Risk Results / Impact</th>
<th>Risk Indicator</th>
</tr>
</thead>
</table>
| • Failure to establish a proper financial framework    | • Errors and corrections  
   • Losses  
   • Suspense transactions                                                                  |                |
| • Failure to establish budgeting and forecasting processes | • Over expenditures  
   • Late expenditure decisions  
   • Poor commitment accounting  
   • ?                                                                                      |                |
| • Failure to manage financial structure                 | • Complex financial structure  
   • Inadequate financial structure                                                          |                |
|                                                        | • Discretionary expenses                                                             |                |
## Developing Data-Driven Risk Indicators for Finance Risk Category

<table>
<thead>
<tr>
<th>Risk Sub-category</th>
<th>Risk Results / Impact</th>
<th>Risk Indicator</th>
</tr>
</thead>
</table>
| • Failure to establish a proper financial framework | • Errors and corrections  
• Losses  
• Suspense transactions | • % JV and reversals  
• % Losses  
• % Suspense account |
| • Failure to establish budgeting and forecasting processes | • Over expenditures  
• Late expenditure decisions  
• Poor commitment accounting  
• ? | • Actual > Planned  
• % expenditures period 12+  
• % not referencing a commitment or PO  
• ? |
| • Failure to manage financial structure | • Complex financial structure  
• Inadequate financial structure  
• Discretionary expenses | • # of funds / fund centres  
• Use of Internal orders / WBS  
• # of currencies  
• % discretionary expenses |
Finance Risk - Data-Driven Indicators

Volume
- Total Expenses, Revenue, and Assets

Variability/Change
- Percentage of discretionary spending
- Percentage of expenditures in Period 12, 13+
- Total and number of JVs / Suspense account transactions
- Total and number of Reversal documents / Loss transactions

Complexity
- Number of Funds / Fund centres / Cost centres
- Number of Economic object categories / GLs
- Number of Currencies / Document types
- Use of Internal Orders / Purchase orders / Fund reservations
- Use of Materiel and Asset numbers / Real estate blocks / WBS
- Number of employees
- Number of P-Cards
### Risk Factor Weighting

By default, all risk factors are weighted equally. Enter the desired risk factor weight.

#### Volume
- Total Expenses: 1.0
- Total Revenue: 1.0
- Total Assets: 1.0
- Number of Invoices: 0.7
- Number of PRLs: 1.0
- Number of acquisition cards: 1.0

#### Complexity
- Number of object categories: 1.0
- Number of funds: 1.0
- Number of Cost Centres: 1.3
- Number of GLs: 1.0
- Number of currencies: 1.0
- Number of document types: 1.0
- Number of Internal Orders: 1.0
- Number of POs and FRs: 1.0
- Number of material documents: 1.0
- Number of Assets: 1.0
- Number of real estate blocks: 1.0
- Number of WBS documents: 1.0
- Pct Overtime to Salary: 1.0
- Pct Invoice Date Errors: 1.2

---

**OK**  **Cancel**
Financial Risk Category Rating

Financial risk rating:
• Overall rating;
• By volume;
• By variability; and
• By complexity

Not only can you assess which entity has the highest overall risk, but you can also determine whether it is because of volume, variability or complexity.
Quantitative Indicators of Risk

ACL Demo
Other Risk Categories - examples

Legal and Regulatory
- Number of new regulations
- Number of modified regulations
- Regulatory fines within the industry
- Frequency and extent of onsite visits by regulators
- Frequency of media coverage of issues affecting regulations

Cyber Security
- Number of firewall attacks and breaches
- Number of applications operating in the cloud
- Amount of IT traffic
- Assessment of the organization’s cyber security maturity
- Frequency of alerts from cyber security vendors

Source: 2014 Emerging Risks Teleconference and Panelist Discussion, Corporate Executive Board
Other Risks - examples

Retail
- Number of products
- Number of regions
- Sales / sq ft
- ???

Manufacturing
- Number of production lines
- Number of special runs
- Percentage defects
- Percentage downtime
- ???
**Overall Risk Category Rating**

Combined assessment of risk across all risk categories for each organizational entity.

<table>
<thead>
<tr>
<th>Org Entity</th>
<th>Financial</th>
<th>HR</th>
<th>......</th>
<th>Operational</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entity 1</td>
<td>3.2</td>
<td>3.2</td>
<td>4.3</td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Entity 2</td>
<td>6.5</td>
<td>5.5</td>
<td>3.6</td>
<td></td>
<td>High</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entity X</td>
<td>4.3</td>
<td>1.8</td>
<td>4.4</td>
<td></td>
<td>Medium</td>
</tr>
</tbody>
</table>
Overall Risk Rating
Corporate Risk – rating by indicator
Overall Risk Rating by Audit Entity

Projects A - K
Audit Entity - rating by risk category
HR Risk Rating – by Region by Indicator
HR Risk Rating - Complexity by Entity

High-level of HR Risk
Conclusions

Data-driven risk indicators:

• Use operational system information
• Quantitative (data-driven) and can easily be updated (e.g. monthly/quarterly)
• Provide relative risk ranking for each org entity
• Support the risk identification and assessment process
• Support ongoing assessment of risk management and mitigation activities
• Support the ongoing update of the risk profile
• Support the ongoing assessment of risks for new initiatives
Additional Reference Materials
Questions?