‘Operational Risk in the Basel framework’

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Operational risk in the Basel framework

• Definition of operational risk and overview

Quantitative and qualitative elements of Operational risk in the Basel framework

• Calculation of minimum capital requirements methodologies (quantitative elements)
• Sound Principles (qualitative elements)

Basel Committee’s review of the operational risk framework (2009-2014)

• Key observations (Sound Principles)
• Key observations (Calculation of minimum capital requirements)

Basel Committee’s proposed revisions of the operational risk framework (2016)

• Basel’s new operational risk framework
• The ‘Business Indicator’ (BI)
• The ‘BI Component’ (BIC)
• The ‘Internal Loss Multiplier’ (ILM) and ‘Loss Component’ (LC)
• The SMA Capital Requirement
• Timeline for finalization of revisions

Further resources
**Definition:** “Operational risk is defined as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. This definition includes legal risk, but excludes strategic and reputational risk”

**Quantitative** elements used to determine the calculation of operational risk capital requirements:
- (i) the Basic Indicator Approach (BIA),
- (ii) the Standardised Approach (SA or TSA),
- (iii) the Alternative Standardised Approach (ASA), and
- (iv) the Advanced Measurement Approach (AMA)

**Qualitative** measures which complement to the calculation of operational risk capital requirements:
- The “Principles for the Sound Management of Operational Risk” cover governance, risk management and disclosure, and are complementary to the calculation of operational risk capital requirements
Quantitative and qualitative elements of Operational risk in the Basel framework
Pillar I quantitative elements (Capital methodology)

- **Basic Indicator Approach** (BIA) – Capital = Avg. of 3yr Gross Income x 15%.

- **Standardised Approach** (TSA) – Capital = Avg. 3yr Gross Income x business line factor for 8 business lines: corporate finance, trading & sales, retail banking, commercial banking, payment & settlement, agency services, asset management, and retail brokerage.

- **Alternative Standardised Approach** (ASA) – Capital = Avg. 3yr Gross Income x business line factor for 6 business lines. Retail and commercial business lines are multiplied by factor of 3.5%.

- **Advanced Measurement Approach** (AMA) – Under AMA the banks develop their own empirical model to quantify required capital for operational.
Three lines of defense

- the first line of defence – functions that own and manage risk
- the second line of defence – functions that oversee or specialise in risk management, compliance
- the third line of defence – functions that provide independent assurance, above all internal audit.

Fundamental principles of operational risk management

- The board of directors should take the lead in establishing a strong risk management culture (Principle 1)
- Banks should develop, implement and maintain a Framework that is fully integrated into the bank’s overall risk management processes (Principle 2)

Governance

- The board of directors should establish, approve and periodically review the Framework (Principle 3)
- The board of directors should approve and review a risk appetite and tolerance statement (Principle 4)
Pillar II qualitative elements (Principles 5-8)

**Senior management**
- Senior management should develop for approval by the board of directors a clear, effective and robust governance structure with well defined, transparent and consistent lines of responsibility (Principle 5)

**Risk management environment – identification and assessment**
- Senior management should ensure the identification and assessment of the operational risk inherent in all material products, activities, processes and systems to make sure the inherent risks and incentives are well understood (Principle 6)
- Senior management should ensure that there is an approval process for all new products, activities, processes and systems that fully assesses operational risk (Principle 7)

**Risk management environment – monitoring & reporting**
- Senior management should implement a process to regularly monitor operational risk profiles and material exposures to losses (Principle 8)
Pillar II qualitative elements (Principles 9-11)

Risk management environment – control & mitigation
• Banks should have a strong control environment that utilizes policies, processes and systems; appropriate internal controls, and appropriate risk mitigation and/or transfer strategies (Principle 9)

Business resiliency and continuity
• Banks should have business resiliency and continuity plans in place to ensure an ability to operate on an ongoing basis and limit losses in the event of severe business disruption (Principle 10)

Role of disclosure
• A bank’s public disclosures should allow stakeholders to assess its approach to operational risk management (Principle 11)
Basel Committee’s review of the operational risk framework (2009-2014)
Key observations in the application of ‘Sound Principles’

- Insufficient progress in implementing the Principles originally introduced in 2003 and revised in 2011 with many banks still in the process of implementing various principles overall.

- Banks applying the more advanced approaches do not always have more advanced operational risk management frameworks.

- Varying degrees of implementation of change management programmes, processes and effective monitoring. A large number of Globally Systemic Important Banks (G-SIBs), have yet to implement all of the Principles and do not deploy the full range of operational risk management tools at their disposal.

- Inconsistent implementation of the three-lines of defence, especially by refining the assignment of roles and responsibilities; and

- Insufficient board and senior management oversight; articulation of operational risk appetite and tolerance statements; and risk disclosures.
Key observations in the calculation of minimum capital requirements

- Operational risk capital calculated under the Basel II (standardised and modelled) approaches decreased or remained stable in spite of substantial operational risk related loss events during and after the financial crisis.

- The complexity of the AMA and the lack of comparability arising from a wide range of internal modelling practices exacerbated variability in risk-weighted asset calculations.

- Simplicity and comparability of the standardised approaches could be maintained by providing a single non-model-based method.

- The incorporation of individual bank loss experience in a simple and standardised manner significantly enhances the risk sensitivity of the operational risk capital framework.
Basel Committee’s proposed revisions of the operational risk framework (2016)
Earlier this year, the Committee introduced the Standardized Measurement Approach (SMA) a single non-model-based method for the estimation of operational risk capital that replaces all existing approaches.

The SMA, which builds on the simplicity and comparability offered by a standardised approach, also incorporates the risk sensitivity of an advanced approach by incorporating its internal loss experience.

Under the SMA, capital increases and decreases are driven by operational losses. Improved risk management practices, controls, or other qualitative risk management progress translate into capital reductions.

The emphasis of the SMA is on long term performance rather than on models and data inputs to influence regulatory capital.

All banks must comply with the ‘Sound Principles’ under Pillar I with special emphasis on proper identification, collection and treatment of internal loss event data.
• The SMA combines in standardized fashion financial statement information and banks’ internal loss experience

• Core components of the SMA are as follows:
  
  • Business Indicator (BI): a refined financial statement based proxy that replace the gross income measure

  • Loss component: The introduction of loss experience into the SMA is the most effective way to increase its risk sensitivity. Loss component of the SMA is highly relevant for predicting future operational risk loss exposure.

• To calculate operational risk capital charges under the SMA the Loss component is combined with the BI component through a function (described ahead)
The Business Indicator (BI)

The Business Indicator is composed of almost the same P&L items as those found in Gross Income (GI). The main difference resides in how items are combined.

<table>
<thead>
<tr>
<th>Component</th>
<th>Gross Income</th>
<th>Business Indicator</th>
<th>Specific treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest</td>
<td>Interest income - Interest Expense</td>
<td>Absolute value (income - expense)</td>
<td>For high margin banks: A linear normalization ratio for high margins banks, defined as those with NIM larger than 3.5%, is adopted. Under this approach, the BI’s interest component is adjusted by the ratio of the NIM cap – set to 3.5% – to the actual NIM.</td>
</tr>
<tr>
<td>Services</td>
<td>Fee-income + Fee expense + Other operating income</td>
<td>Max (Fee Income; Fee Expense) + Max (Other Operating Income; Other Operating Expense)</td>
<td>For high fee banks: the BI structure for high fee banks (i.e., banks with the share of fees greater than 50% of the BI) is modified by accounting for only 10% of fees in excess of 50% of the BI (with the absolute value of net fee income as a floor to avoid unintended capital reductions).</td>
</tr>
<tr>
<td>Other</td>
<td>Dividend income</td>
<td>Dividend income</td>
<td></td>
</tr>
</tbody>
</table>
The Business Indicator (BI) cont’d

• To compute the BI for year t, a bank must determine the three-year average of the BI, as the sum of the three-year average of its components:

\[ BI = ILDC_{Avg} + SC_{Avg} + FC_{Avg} \]

Where:

• \( Avg = \) Average of the items at the years: t, t-1 and t-2
• \( ILDC_{Avg} = Min[Abs(II_{Avg} − IE_{Avg}); 0.035 * IEA_{Avg}] + Abs(ILI_{Avg} − LE_{Avg}) + DI_{Avg} \)
• \( SC_{Avg} = Max(0OI_{Avg}; 0OE_{Avg}) + Max\{Abs(FI_{Avg} − FE_{Avg}); Min\{Max(FI_{Avg}; FE_{Avg}); 0.5 * uBI + 0.1 * (Max(FI_{Avg}; FE_{Avg}) − \)

List of abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Abs</td>
<td>Absolute Value of the items within the bracket</td>
</tr>
<tr>
<td>BB</td>
<td>Banking Book</td>
</tr>
<tr>
<td>BI</td>
<td>Business Indicator</td>
</tr>
<tr>
<td>DI</td>
<td>Dividend Income</td>
</tr>
<tr>
<td>FC</td>
<td>Financial Component</td>
</tr>
<tr>
<td>FE</td>
<td>Fee Expense</td>
</tr>
<tr>
<td>FI</td>
<td>Fee Income</td>
</tr>
<tr>
<td>IEA</td>
<td>Interest Earning Assets</td>
</tr>
<tr>
<td>IE</td>
<td>Interest Expenses (except for financial and operating leases)</td>
</tr>
<tr>
<td>II</td>
<td>Interest Income (except for financial and operating leases)</td>
</tr>
<tr>
<td>ILDC</td>
<td>Interest, Lease and Dividend Component</td>
</tr>
<tr>
<td>OLE</td>
<td>Operating Lease Expenses</td>
</tr>
<tr>
<td>OLI</td>
<td>Operating Lease Income</td>
</tr>
<tr>
<td>Max</td>
<td>Maximum Value of the items in the bracket</td>
</tr>
<tr>
<td>Min</td>
<td>Minimum Value of the items in the bracket</td>
</tr>
<tr>
<td>P&amp;L</td>
<td>Profit &amp; Loss</td>
</tr>
<tr>
<td>SC</td>
<td>Service Component</td>
</tr>
</tbody>
</table>
SMA capital requirements are anchored by the bank’s BI Component, which is an increasing function of the BI. It is applied in a bucket structure with coefficients based on business volume (or size of BI).

This progressive increase of the marginal impact of BI is motivated by analysis which showed that operational loss exposure increases more than proportionally with the BI. The BI buckets and the formula for the BI Component are as follows:

<table>
<thead>
<tr>
<th>Bucket</th>
<th>BI Range</th>
<th>BI Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>€0 to €1Bln</td>
<td>0.11*BI</td>
</tr>
<tr>
<td>2</td>
<td>€1Bln to €3Bln</td>
<td>€110Mln + 0.15(BI – €1Bln)</td>
</tr>
<tr>
<td>3</td>
<td>€3Bln to €10Bln</td>
<td>€410Mln + 0.19(BI – €3Bln)</td>
</tr>
<tr>
<td>4</td>
<td>€10Bln to €30Bln</td>
<td>€1.74Bln + 0.23(BI – €10Bln)</td>
</tr>
<tr>
<td>5</td>
<td>€30Bln to +∞</td>
<td>€6.34Bln + 0.29(BI – €30Bln)</td>
</tr>
</tbody>
</table>

The BI component increases linearly within buckets, but the marginal effect of the BI on the BI Component is higher for higher buckets than for lower buckets.
• The Loss Component reflects the operational loss exposure of a bank that can be inferred from its internal loss experience. It distinguishes between loss events above €10Mln and €100Mln and smaller loss events to differentiate between banks with different loss distribution tails, but similar average loss totals.

• Internal loss experience is introduced to the SMA through the Internal Loss Multiplier. The formula of the Internal Loss Multiplier is presented below:

\[
\text{Internal Loss Multiplier} = \ln \left( \exp(1) - 1 + \frac{\text{Loss Component}}{\text{BI Component}} \right)
\]

Where:

\[
\text{Loss Component} = 7 \times \text{Average Total Annual Loss below €10 million} \\
+ 7 \times \text{Average Total Annual Loss only including loss events above €10 million} \\
+ 5 \times \text{Average Total Annual Loss only including loss events above €100 million}
\]

• The Internal Loss Multiplier is bounded below by \( \ln(\exp(1)-1) \approx 0.541 \) and has no upper bound. Nevertheless, the logarithmic function used to calculate the Internal Loss Multiplier means that it increases at a decreasing rate with the Loss Component, ensuring the stability of SMA capital.
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$$\text{Internal Loss Multiplier} = \ln \left( \exp(1) - 1 + \frac{\text{Loss Component}}{\text{BI Component}} \right)$$

Where:

Loss Component = 7 * Average Total Annual Loss below €10 million
+ 7 * Average Total Annual Loss only including loss events above €10 million
+ 5 * Average Total Annual Loss only including loss events above €100 million

• The Internal Loss Multiplier is bounded below by $\ln(\exp(1) - 1) \approx 0.541$ and has no upper bound. Nevertheless, the logarithmic function used to calculate the Internal Loss Multiplier means that it increases at a decreasing rate with the Loss Component, ensuring the stability of SMA capital.
The operational risk capital requirement is determined as follows:

$$SMA \text{ Capital} = \begin{cases} 
\text{BI Component, if Bucket 1} \\
110\text{Mln} + (\text{BI Component} - 110\text{Mln}) \cdot \ln\left(\exp(1) - 1 + \frac{\text{Loss Component}}{\text{BI Component}}\right), \text{if Buckets 2} - 5
\end{cases}$$

Where:

$$\text{BI Component} = \begin{cases} 
0.11 \cdot \text{BI, if Bucket 1} \\
110\text{Mln} + 0.15(\text{BI} - 1\text{Bln}), \text{if Bucket 2} \\
410\text{Mln} + 0.19(\text{BI} - 3\text{Bln}), \text{if Bucket 3} \\
1.74\text{Bln} + 0.23(\text{BI} - 10\text{Bln}), \text{if Bucket 4} \\
6.34\text{Bln} + 0.29(\text{BI} - 30\text{Bln}), \text{if Bucket 5}
\end{cases}$$

And:

$$\text{Loss Component} = 7^*\text{Average Total Annual Loss}$$

$$+ 7^*\text{Average Total Annual Loss only including loss events above 10Mln}$$

$$+ 5^*\text{Average Total Annual Loss only including loss events above 100Mln}$$

Capital for banks in bucket 1 corresponds solely to the BI component. For banks in buckets 2 through 5, capital results from multiplying the BI Component by the Internal Loss Multiplier.
Timeline for the finalisation of revisions

- The Committee intends to finalise its revisions to the operational risk framework by the end of this year.

- The final calibration of the approach and its methodology will be assessed upon the analysis of the data being collected for the Basel III monitoring exercise.

Consultative paper: http://www.bis.org/bcbs/publ/d355.pdf
Further resources

Basel II: Revised international capital framework
June 2004: [http://www.bis.org/publ/bcbsca.htm](http://www.bis.org/publ/bcbsca.htm)

Principles for the Sound Management of Operational Risk
June 2011: [http://www.bis.org/publ/bcbs195.htm](http://www.bis.org/publ/bcbs195.htm)

Revisions to the simpler approaches for operational risk - consultative document (1)
October 2014: [http://www.bis.org/publ/bcbs291.htm](http://www.bis.org/publ/bcbs291.htm)

Review of the Principles for the Sound Management of Operational Risk
October 2014: [http://www.bis.org/publ/bcbs292.htm](http://www.bis.org/publ/bcbs292.htm)

Standardised Measurement Approach for operational risk - consultative document (2)
March 2016: [http://www.bis.org/bcbs/publ/d355.htm](http://www.bis.org/bcbs/publ/d355.htm)