

Part Three

Operational Risk

I. Measurement Methodologies

Operational risk is defined as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events, including legal risk, but excludes strategic and reputational risk.

The methods adopted by banks for calculating operational risk capital charges include: Basic Indicator Approach (BIA), Standardized Approach (SA) or Alternative Standardized Approach (ASA), and Advanced Measurement Approaches (AMA).

A bank will not be allowed to choose to revert to a simpler approach once it has adopted a more advanced approach without the approval of supervisory authority. However, if the supervisory authority determines that a bank using a more advanced approach no longer meets the qualifying criteria for this approach, it may require the bank to revert to a simpler approach for some or all of its operations, until it meets the conditions specified by the supervisor for returning to a more advanced approach.

A. Basic Indicator Approach (BIA)

(A) Calculation method

The Basic Indicator Approach pertains to calculating operational risk capital charge using a single indicator, that is, using the average of positive annual gross income over the previous three years multiplied by a fixed percentage (denoted as α) as the capital charge for operational risk; figures for any year in which annual gross income is negative or zero should be excluded from both the numerator and denominator when calculating the average.

The calculation method under the Basic Indicator Approach is expressed as follows:

$$K_{BIA} = [\sum (GI_{1 \dots n} \times \alpha)]/n$$

K_{BIA} = the capital charge under the Basic Indicator Approach

GI = annual gross income, where positive, over the previous three years

n = number of the previous three years for which gross income is positive

$\alpha = 15\%$

If negative gross income distorts a bank's Pillar 1 capital charge, the supervisory authority may take appropriate supervisory action under Pillar 2.

(B) Calculation of gross income

Gross income is defined as “net interest income” plus “net non-interest income.”

Where, 1. Loss provisions other than loan loss (e.g. guarantee reserve, securities trading loss reserve, and default loss reserve), gain/loss from disposal of fixed assets and bad debt expenses may not be deducted.

2. Operating expenses and fees paid to outsourced service providers may not be deducted, but fees received by banks that provide outsourcing services shall be included.
3. Realized profits/losses from securities held in the banking book are excluded.
4. Extraordinary or irregular items as well as income derived from insurance are excluded (see Annex 1 for details of accounts that should be included).

B. Standardized Approach (SA) or Alternative Standardized Approach

(ASA)

(A) Qualifying criteria

1. Qualifying criteria for Standardized Approach

(1) A bank’s use of the Standardized Approach requires the prior approval of the supervisory authority and the bank meeting the minimum criteria as follows:

- The bank’s board of directors and senior management are actively involved in the oversight of the operational risk management;
- The bank has a risk management system that is conceptually sound and is implemented with integrity; and
- The bank has sufficient resources in the use of the approach in the major business lines as well as the control and audit areas.

(2) A bank must develop specific policies and have documented criteria for mapping gross income for current business lines and activities into the standardized framework. The criteria must be reviewed and adjusted for new or changing business activities and risks as appropriate. The principles for business line mapping are set out in Annex 2.

(3) Before a bank adopts SA for calculating regulatory capital, the supervisory authority may conduct a period of initial monitoring.

(4) The bank must have an operational risk management system with clear responsibilities assigned to an operational risk management function. The operational

risk management function is responsible for developing strategies to identify, assess, monitor and control/mitigate operational risk; codifying firm-level policies and procedures concerning operational risk management and controls; for the design and implementation of the firm's operational risk assessment methodology; for the design and implementation of a risk-reporting system for operational risk.

- (5) As part of the bank's internal operational risk assessment system, the bank must systematically track relevant operational risk data including material losses by business line. Its operational risk assessment system must be closely integrated into the risk management processes of the bank. The outputs of operational risk assessment must be an integral part of the process of monitoring and controlling the bank's operational risk profile. For instance, this information must play a prominent role in risk analysis and management reporting. The bank must have techniques for creating incentives to improve the management of operational risk.
- (6) The bank must have procedures for taking appropriate action according to the information within the management reports, and regularly report operational risk exposures and material operational losses to the board of directors, senior management, and business unit management.
- (7) The bank's operational risk management system must be well documented. The bank must have a routine in place for ensuring compliance with a documented set of internal policies, controls and procedures concerning the operational risk management system, which must include policies for the treatment of non-compliance issues.
- (8) The bank's operational risk management processes and assessment system must be subject to validation and regular independent review. These reviews must include both the activities of the business units and of the operational risk management function.
- (9) The bank's operational risk assessment system (including the internal validation processes) must be subject to regular review by external auditors or the supervisory authority.

2. Qualifying criteria for Alternative Standardized Approach (ASA)

A bank that adopts ASA shall meet the qualifying criteria for SA described above, and in addition, demonstrate to the supervisory authority the material benefit of using ASA, for example, avoiding double counting of risk. A bank that has been approved to adopt ASA may not switch to SA without the approval of the supervisory authority.

(B) Calculation method under the Standardized Approach

In the Standardized Approach, bank's gross income is divided into eight business lines,

where the operational risk capital charge for each business line is calculated by an assigned risk factor (beta, denoted as β). The gross capital charge for bank's operational risk is the sum of capital charge for respective business line. The eight business lines are: Corporate Finance, Trading & Sales, Retail Banking, Commercial Banking, Payment and Settlement, Agency Services, Asset Management, and Retail Brokerage (See Annex 2 for the definition of each business line).

Table 1 Bank's Business Lines and Beta Factors under the Standardized Approach

Business line	Beta factor ($\beta_1 \sim \beta_8$)
Corporate Finance (β_1)	18%
Trading & Sales (β_2)	18%
Retail Banking (β_3)	12%
Commercial Banking(β_4)	15%
Payment and Settlement (β_5)	18%
Agency Services (β_6)	15%
Asset Management (β_7)	12%
Retail Brokerage (β_8)	12%

In the estimation of capital requirement, the indicator is the gross income generated in respective business line and each business line is assigned a beta factor.

Thus the total capital charge is calculated as the three-year average of the simple summation of the regulatory capital charges across each of the business lines in each year.

In any given year, negative capital charges (resulting from negative gross income) in any business line may offset positive capital charges in other business lines without limit.

However, where the aggregate capital charge across all business lines within a given year is negative, then the input for that year will be zero.

The calculation method under the Standardized Approach is expressed as follows:

$$K_{SA} = \{ \sum_{\text{years 1-3}} \max [\sum (GI_{1-8} \times \beta_{1-8}), 0] \} / 3$$

Where

K_{SA} = the capital charge under the Standardized Approach

GI_{1-8} = annual gross income generated for each of the eight business lines (as defined in the Basic Indicator Approach)

β_{1-8} = the beta factor for each business line

The same as the requirement for Basic Indicator Approach, under the Standardized Approach, if negative gross income distorts a bank's Pillar 1 capital charge, the supervisory authority may take appropriate supervisory action under Pillar 2.

(C) Calculation method under the Alternative Standardized Approach (ASA)

The major difference between SA and that ASA is that ASA replaces gross income with a fixed factor “m” (set by the Basel Committee for Banking Supervision in reference to the loan spread set out by ten industrial nations) for calculating the operational risk capital charge for two business lines - retail banking and commercial banking. The β values for these business lines, loans and advances are unchanged from the SA; under the ASA, the other business lines still use gross income as exposure indicators. - multiplied by a fixed factor .m. - replaces gross income as the exposure indicator. The betas for retail and commercial banking are unchanged from the Standardized Approach.

In the example of retail banking, the ASA operational risk capital charge this business line can be expressed as:

$$K_{RB} = \beta_{RB} \times m \times LA_{RB}$$

Where

K_{RB} = capital charge for the retail banking business line

β_{RB} = the beta for the retail banking business line

LA_{RB} = total outstanding retail loans (non-risk weighted and gross of provisions), averaged over the past three years

$m = 0.035$

For the purposes of the ASA, total loans in the retail banking business line consist of: retail, SMEs treated as retail, and purchased retail receivables. For commercial banking,

total loans consist of: corporate, sovereign, bank, specialized lending, SMEs treated as corporate and purchased corporate receivables as well as securities (by book value) held in the banking book.

Under the ASA, banks may aggregate retail and commercial banking using a beta of 15%. Similarly, banks that are unable to disaggregate their gross income into the other six business lines can aggregate the total gross income for these six business lines using a beta of 18%. In any given year, negative capital charges (resulting from negative gross income) in any business line may offset positive capital charges in other business lines without limit. However, where the aggregate capital charge across all business lines within a given year is negative, then the input into the numerator for that year will be zero. As under the Standardized Approach, the total capital charge for the ASA is calculated as the simple summation of the regulatory capital charges across each of the eight business lines.

C. Advanced Measurement Approach

If a bank meets the criteria, it may adopt the Advanced Measurement Approach (AMA) for calculating the regulatory capital requirement based on its internal operational risk measurement system. Banks adopting the AMA will be required to calculate their capital requirement using this approach as well as the existing method for a year prior to adopting the AMA.

(A) Capital floor requirements in the initial period of implementation

Banks that adopt AMA for measuring operational risk must meet the capital floor requirements in the initial period of implementation:

1. Capital floor is adjusting factor multiplied by the result of the following calculations:
 - a. 8% of total risk-weighted assets calculated according to the applicable rules for the calculation of capital adequacy ratio prior to the adoption of AMA;
 - b. Add deductions from Tier 1 capital and Tier 2 capital; and
 - c. Deduct operating reserve and loan loss provision that are eligible for inclusion in Tier 2 capital pursuant to the *Regulations Governing the Capital Adequacy Ratio of Banks*.
2. The adjusting factor for each year is as follows:

90% in the first year of implementation; 80% in the second year of implementation.
3. If the capital floor is higher than the result of following calculations, the difference thereof shall be multiplied by 12.5 and the result shall be included in the

risk-weighted assets:

- a. 8% of total risk-weighted assets calculated according to the applicable rules for the calculation of capital adequacy ratio after the adoption of IRB approach;
- b. Add deductions from Tier 1 capital and Tier 2 capital; and
- c. Deduct operating reserve and loan loss provision that are eligible for inclusion in Tier 2 capital pursuant to the Regulations Governing the Capital Adequacy Ratio of Banks.

(B) Basic requirements for management framework

A bank's use of the Standardized Approach requires the prior approval of the supervisory authority and the bank meeting the minimum criteria as follows:

1. The bank's board of directors and senior management are actively involved in the oversight of the operational risk management;
2. The bank has a risk management system that is conceptually sound and is implemented with integrity; and
3. The bank has sufficient resources in the use of the approach in the major business lines as well as the control and audit areas.

A bank's AMA will be subject to a period of initial monitoring by the supervisory authority before it can be used for calculating regulatory capital, including whether the approach is credible and appropriate, whether the bank's internal measurement system reasonably estimates unexpected losses based on the combined use of internal and relevant external loss data, scenario analysis and bank-specific business environment and internal control factors. The bank's measurement system must also be capable of supporting an allocation of economic capital for operational risk across business lines in a manner that creates incentives to improve business line operational risk management.

(C) Qualitative standards

A bank that adopts the AMA for operational risk capital must meet the following qualitative standards:

1. The bank must have an independent operational risk management function that is responsible for the design and implementation of the bank's operational risk management framework. The function is responsible for codifying firm-level policies and procedures concerning operational risk management and controls; for the design and implementation of the firm's operational risk measurement methodology; for the

design and implementation of a risk-reporting system for operational risk; and for developing strategies to identify, measure, monitor and control/mitigate operational risk.

2. The bank's internal operational risk measurement system must be closely integrated into the day-to-day risk management processes of the bank. Its output must be an integral part of the process of monitoring and controlling the bank's operational risk profile. For instance, this information must play a prominent role in risk reporting, management reporting, internal capital allocation, and risk analysis, and based on which, the bank creates incentives to improve the management of operational risk.
3. There must be regular reporting of operational risk exposures and loss experience to the board of directors, senior management and business unit management. The bank must have procedures for taking appropriate action according to the information within the management reports.
4. The bank's risk management system must be well documented. The bank must documented set of internal policies, controls and procedures concerning the operational risk management system for compliance of routine operation and the treatment of non-compliance.
5. Internal and/or external auditors must perform regular reviews of the operational risk management processes and measurement systems. This review must include both the activities of the business units and of the independent operational risk management function.
6. The validation of the operational risk measurement system by external auditors and/or supervisory authority must include the following:
 - (1) Verifying that the internal validation processes are operating in a satisfactory manner; and
 - (2) Making sure that data flows and processes associated with the risk measurement system are transparent and accessible. When auditors and supervisory authority undertake system audit, they should have easy access, to the system's specifications and parameters.

(D) Quantitative standards

Banks that adopt AMA must meet the following quantitative standards:

1. AMA soundness standards

With respect to the specific approach and distributional assumptions used to generate the operational risk measure and calculating regulatory capital, a bank must be able to

demonstrate that its approach captures potentially severe “tail” loss events. Whatever approach is used, a bank must demonstrate that its operational risk measure meets a soundness standard comparable to that of the IRB for credit risk, (ex.: to measure risk more accurately, the bank shall observe the potential loss of assets comparable to a one year holding period and a 99.9 percent confidence interval).

The AMA soundness standard provides significant flexibility to banks in the development of an operational risk measurement and management system. However, in the development of these systems, banks must have and maintain rigorous procedures for operational risk model development and independent model validation.

2. Detailed criteria

The following quantitative standards are applicable to calculating the regulatory minimum capital charge for operational risk:

- (1) Any internal operational risk measurement system must be consistent with the definition of operational risks and the definition of loss event types (see Annex 3).
- (2) A bank shall calculate its regulatory capital requirement as the sum of expected loss (EL) and unexpected loss (UL), unless the bank can demonstrate that it is adequately capturing EL in its internal business practices. That is, to base the minimum regulatory capital requirement on UL alone, the bank must be able to demonstrate to the satisfaction of the supervisory authority that it has measured and accounted for its EL exposure.
- (3) A bank’s risk measurement system must be sufficiently complete to capture the major drivers of operational risk affecting the shape of the tail of the loss estimates.
- (4) When calculating the regulatory minimum capital requirements, regulatory capital estimates for different operational risks must be added. However, the bank may be permitted to use internally determined correlations in operational risk losses across individual operational risk estimates, provided it can demonstrate to the satisfaction of supervisory authority that its systems for determining correlations are sound, implemented with integrity, and take into account the uncertainty surrounding any such correlation estimates (particularly when stress events occur). The bank must validate its correlation assumptions using appropriate quantitative and qualitative techniques.
- (5) Any operational risk measurement system must have certain key features to meet the soundness standard set out by the supervisory authority. These elements must include the use of internal data, relevant external data, scenario analysis and factors reflecting the business environment and internal control systems.
- (6) A bank needs to have a credible, transparent, well-documented and verifiable approach for weighting these fundamental elements in its overall operational risk measurement. The approach should be internally consistent and avoid the double counting of qualitative assessments or risk mitigants. For example, there may be cases where estimates of the

99.9th percentile confidence interval based primarily on internal and external loss event data would be unreliable for business lines with a heavy-tailed loss distribution and a small number of observed losses. In such cases, scenario analysis, and business environment and control factors, may play a more dominant role in the risk measurement system. Conversely, operational loss event data may play a more dominant role in the risk measurement system for business lines where estimates of the 99.9th percentile confidence interval based primarily on such data are deemed reliable.

(E) Loss data

1. Internal data

Regardless whether the internal loss data are used directly to build the loss measure or for validation purpose, internally generated operational risk measures used for estimating regulatory capital must be based on a minimum five-year observation period of internal loss data. A bank must have documented procedures for assessing the on-going relevance of historical loss data. When the bank first moves to the AMA, the availability of three-year historical data is acceptable. To qualify for regulatory capital purposes, a bank's internal loss collection processes must meet the following standards:

- (1) To assist in validation by the supervisory authority, a bank must be able to map its historical internal loss data into level 1 based on the business lines and types of loss event set out by the supervisory authority, and to provide these data to supervisors upon request. It must have documented, objective criteria for allocating losses to the specified business lines and event types.
- (2) A bank's internal loss data must capture all material activities and exposures from all appropriate sub-systems and geographic locations. A bank must be able to justify that any excluded activities or exposures, both individually and in combination, would not have a material impact on the overall risk estimates. A bank must have an appropriate minimum gross loss threshold for internal loss data collection. Such threshold should be broadly consistent with those used by peer banks.
- (3) The collected data should include: gross loss amounts, date of loss event, any recoveries of gross loss amounts, and some descriptive information about the drivers or causes of the loss event. The level of detail of any descriptive information should be comparable to the size of the gross loss amount. Necessary loss data associated with operational risk to be collected include:
 - a. Event name and description.
 - b. The business unit in which the event occurs (reporting and account generation).
 - c. The business unit responsible for the event.
 - d. Geographic area in which the event occurs.
 - e. Type of event (seven types).

- f. Business lines affected by the event.
 - g. The date the event occurred.
 - h. The date the event was discovered.
 - i. The date the event ended.
 - j. Subsequent action plans.
 - k. Loss amount.
 - l. Loss items (e.g. litigation fees).
 - m. Recovered amount.
 - n. Manner of recovery (e.g. insurance).
 - o. Insurance coverage.
- (4) A bank must develop specific criteria for assigning loss data arising from an event in a centralized function (e.g., an information technology department) or an activity that spans more than one business line, as well as from related events over time.
 - (5) Operational risk losses that are related to credit risk and have historically been included in banks' credit risk databases (e.g. collateral management failures) will continue to be treated as credit risk for the purposes of calculating minimum regulatory capital without being subject to the operational risk capital charge. Nevertheless, for the purposes of internal operational risk management, banks must identify all material operational risk losses, including those related to credit risk. Such material operational risk-related credit risk losses should be noted separately within a bank's internal operational risk database. The materiality of these losses may vary between banks, and within a bank across business lines and/or event types. However, materiality thresholds should be broadly consistent with those used by peer banks.
 - (6) Operational risk losses that are related to market risk shall be treated as operational risk for the purposes of calculating minimum regulatory capital.

2. External data

A bank's operational risk measurement system must use relevant external data (either public data and/or pooled industry data), especially when there is reason to believe that the bank is exposed to infrequent, yet potentially severe, losses. These external data should include data on actual loss amounts, information on the scale of business operations where the event occurred, information on the causes and circumstances of the loss events or other information that would help in assessing the relevance of the loss event for other banks. A bank must have a systematic process for determining the situations for which external data must be used and the methodologies used to incorporate the data (e.g., scaling, qualitative adjustments, or informing the development of improved scenario analysis). The conditions and practices for external data use must be regularly reviewed, documented and subject to periodic independent review.

(F) Business environment and internal control factors

In addition to using loss data, whether actual or scenario-based, a bank's firm-wide risk assessment methodology must capture key business environment and internal control factors that can change its operational risk profile. These factors will make a bank's risk assessments more forward-looking, more directly reflect the quality of the bank's control and operating environments, help align capital assessments with risk management objectives, and recognize both improvements and deterioration in operational risk profiles in a more immediate fashion. To qualify for regulatory capital purposes, the use of these factors in a bank's risk measurement framework must meet the following standards:

- (1) The adjustment of the factors into meaningful drivers of risk should be based on experience and involving the expert judgment of the affected business areas. Whenever possible, the factors should be translatable into quantitative measures for verification.
- (2) The sensitivity of a bank's risk estimates to changes in the factors and the relative weighting of the various factors must be reasonable. In addition to reflecting changes in risk due to improvements in risk controls, the framework must also reflect potential increases in risk due to greater complexity of activities or increased business volume.
- (3) The framework and each instance of its application, including the rationale for any adjustments to empirical estimates, must be documented and subject to independent review within the bank and by the supervisory authority.
- (4) The process and the outcomes of measurement need to be validated through comparison to actual internal loss experience, relevant external data, and appropriate adjustments made.

(G) Scenario analysis

A bank must use scenario analysis of expert opinion in conjunction with external data to evaluate its exposure to high severity events. When carrying reasonable assessment of plausible losses, the bank should draw on the knowledge of experienced business managers. For instance, these expert assessments could be expressed as parameters of an assumed statistical loss distribution. In addition, scenario analysis should be used to assess the impact of deviations from the correlation assumptions embedded in the bank's operational risk measurement framework, in particular, to evaluate potential losses arising from multiple simultaneous operational risk loss events. Such assessments need to be validated and re-assessed on an ongoing basis through comparison to actual loss experience to ensure their reasonableness.

(H) Risk mitigation

1. Under the AMA, a bank will be allowed to recognize the risk mitigating effect of insurance in the measures of operational risk used for regulatory minimum capital requirements. The recognition of insurance mitigation will be limited to 20% of the total operational risk capital charge.

2. A bank shall comply the following criteria in order to take advantage of the risk mitigation effect of insurance:

- (1) The insurance provider has a minimum claims paying ability rating of A;
- (2) The insurance policy must have an initial term of no less than one year. For policies with a residual term of less than one year, the bank must make appropriate haircuts reflecting the declining residual term of the policy. No mitigating effect will be recognized for policies with a residual term of 90 days or less;
- (3) The insurance policy has a minimum notice period for cancellation and non-renewal of the contract;
- (4) The insurance policy has no exclusions or limitations triggered by supervisory actions or, if the policy precludes any penalty or punitive damages resulting from supervisory action, the preclusion shall not keep the bank, receiver or liquidator from recovering for damages in respect of events occurring after the initiation of receivership or liquidation proceedings.
- (5) The risk mitigation calculations must reflect the bank's insurance coverage in a manner that is transparent in its relationship to, and consistent with, the actual likelihood and impact of loss used in the bank's calculation of operational risk capital.
- (6) The insurance is provided by a third-party entity. If not, the exposure has to be transferred to an independent third-party entity, for example through re-insurance, to meet the eligibility criteria.
- (7) The framework for recognizing the risk mitigation of insurance must be well reasoned and documented.
- (8) The bank must disclose a description of its use of insurance for the purpose of mitigating operational risk.

3. A bank's recognition of insurance under the AMA also needs to capture the following elements to adjust the mitigating effect of insurance:

- (1) The treatment of policy with a residual term of less than one year.
- (2) Is the notification period in the policy's cancellation terms less than one year?
- (3) The uncertainty of payment as well as mismatches in coverage of insurance policies.

(I) Principles for selecting (combining) measurement methodologies

1. A bank will be permitted to use an AMA for some parts of its operations and the Basic Indicator Approach or Standardized Approach for the balance (partial use), provided that the following conditions are met:

- (1) All operational risks of the bank are captured;
- (2) All of the bank's operations that are covered by the AMA meet the qualitative criteria for using AMA, while those parts of its operations that are using one of the simpler approaches meet the qualifying criteria for that approach;

- (3) On the date of implementation of an AMA, a significant part of the bank's operational risks are captured by the AMA; and
 - (4) The bank provides the supervisory authority with a plan specifying the timetable to which it intends to roll out the AMA across all business lines (except for a few immaterial businesses). The plan should be driven by the practicality and feasibility of moving to the AMA over time, and not for other reasons.
- 2. Subject to the approval of the supervisory authority, a bank opting for partial use may determine which parts of its operations will use an AMA on the basis of business line, legal structure, geography, or other internally determined basis.
 - 3. Subject to the approval of its supervisor, where a bank intends to implement an approach other than the AMA on a global, consolidated basis, the bank may, under special circumstances:
 - (1) Implement an AMA on a permanent partial basis; or
 - (2) Include in its global, consolidated operational risk capital requirements the results of an AMA calculation at a subsidiary where the AMA has been approved by the relevant host supervisor and is acceptable to the bank's home supervisor.
 - 4. Exceptional approvals of special circumstances should generally be limited to circumstances where a bank is prevented from meeting these conditions due to implementation decisions of supervisory authority of the bank's subsidiary operations in foreign jurisdictions.

II. Annexes

Annex 1 Calculation of Gross Income

Definition of gross income	GI notation ¹	Account	Remark
Net interest income	+	Interest income	
	—	Interest expense	
Net non-interest income	+	Net fee income	
	+	Gain/loss on financial assets and liabilities at fair value through profit or loss	
	+	Gain/loss on investment carried on equity basis	Gain/loss on disposal of investment excluded
	+	Translation gain/loss	
	+	Other net non-interest gain/loss	
		Realized gain/loss from disposal of financial assets in available-for-sale on banking book	Excluded
		Realized gain/loss from disposal of financial assets in held-to-maturity	Excluded

Notes: Gross income is defined as “net interest income” plus “net non-interest income”,

Where, 1. Loss provisions other than loan loss (e.g. guarantee reserve, securities trading loss reserve, and default loss reserve), gain/loss from disposal of fixed assets and bad debt expenses may not be deducted.

2. Operating expenses and fees paid to outsourced service providers may not be deducted, but fees received by banks that provide outsourcing services shall be included.

3. Realized profits/losses from disposal of securities held in the banking book are excluded.

4. Extraordinary or irregular items as well as income derived from insurance are excluded.

¹ GI notation: 「+」 means a plus item to GROSS INCOME; 「—」 means a minus item to GROSS INCOME.

Annex 2 Definitions of Business Lines under the Standardized Approach

Business Unit	Business		Activities
	Level 1	Level 2	
Investment Finance	Corporate Finance	Corporate Finance	Mergers and acquisitions, underwriting, privatization, securitization, research, debt (government, high yield), equity, syndication, IPO, secondary private placements
		Government Finance	
		Merchant Banking	
		Advisory Services	
	Trading & Sales	Sales	Fixed income, equity, foreign exchanges, commodities, credit derivatives, funding, own position securities, lending and repos, brokerage, debt, prime brokerage
		Market Making	
		Proprietary Position	
		Treasury	
General Finance	Retail Banking	Retail Banking	Retail lending, banking services, trust and estates
		Private Banking	Private consumer lending, banking services, trust and estates, investment advice
		Card Services	Merchant/commercial/corporate cards, private labels and retail
	Commercial Banking	Commercial Banking	Project finance, real estate, export finance, trade finance, factoring, leasing, lending, guarantees, bills of exchange
	Payment and Settlement	External Client Services	Payments and collections, funds transfer, clearing and settlement
	Agency Services	Custody	Escrow, depository receipts, custody of lent securities, subsidiary business of custodian bank
		Corporate Agency	Issuer and paying agents
		Corporate Trust	
Others	Asset Management	Discretionary Fund Management	Pooled, segregated, retail, charity, closed, open, private equity
		Non-Discretionary Fund Management	Pooled, segregated, retail, charity, closed, open
	Retail Brokerage	Retail Brokerage	Execution and full service

Principles for business line mapping:

- (A) All activities must be mapped into the eight level 1 business lines.
- (B) Any banking or non-banking activity which cannot be readily mapped into the business line framework, but which represents an ancillary function to an activity included in the framework, must be allocated to the business line it is ancillary to and supports.
- (C) When mapping gross income, if an activity cannot be mapped into a particular business line, then the business line yielding the highest charge based on the risk factor must be used.

- (D) Banks may use internal pricing methods to allocate gross income between business lines provided that total gross income for the bank as would be recorded under the Basic Indicator Approach still equals the sum of gross income for the eight business lines.
- (E) The mapping of activities into business lines for operational risk capital purposes must be consistent with the definitions of business lines used for regulatory capital calculations in market risk and credit risk categories.
- (F) The mapping process used must be clearly documented and properly kept to allow third parties to replicate and verify the business line mapping.
- (G) Processes must be in place to define the mapping of any new activities or products.
- (H) Senior management is responsible for the formulation and implementation of mapping policy approved by the board of directors).
- (I) The mapping process to business lines must be subject to independent review.

Examples of business line mapping:

1. Gross income mapped to retail banking includes:
 - (1) Net interest income on loans to retail customers and SMEs treated as retail 【(interest income)-(weighted average cost of funding of retail finance activities)】 ;
 - (2) Fees income from retail finance activities;
 - (3) Net income from swaps and derivatives held to hedge the retail banking book; and
 - (4) Income on purchased retail receivables.
2. Gross income mapped to commercial banking includes:
 - (1) Net interest income on loans to corporate, interbank, sovereign customers, and SMEs treated as corporate 【(interest income)-(weighted average cost of funding of commercial finance activities)】 .
 - (2) Income on purchased commercial receivables;
 - (3) Fees income from commercial finance activities, such as commitments, guarantees and bills of exchange;
 - (4) Net income (e.g. from coupons and dividends) on securities held in the banking book (e.g. from coupons and dividends); and
 - (5) Profits/losses on swaps and derivatives held to hedge the commercial banking book.

The calculation of net interest income is based on interest earned on loans to corporate, interbank and sovereign customers less the weighted average cost of

funding for these loans.

3. Gross income mapped to trading and sales includes: net income from instruments held for trading purpose (net income - average cost of funding) and fees from wholesale broking.
4. For the other business lines (corporate finance, agency services, and retail brokerage), gross income consists of net fees or commissions earned in each of these businesses.
5. Gross income mapped to payment and settlement consists of fees generated from payment or settlement activities associated with other commercial entities.
6. Asset management activity means management of assets on behalf of customers.

Annex 3 Classification of Operational Loss Event Types

Event-type Category (Level 1)	Definition	Category (Level 2)	Operating Activities (Level 3)
Internal fraud	Losses due to acts of at least one internal party intending to defraud, misappropriate property or circumvent regulations, the law or company policy (excluding diversity/discrimination events)	Unauthorized activity	Transactions not reported (intentional), transaction type unauthorized with monetary loss, mismarking of position (intentional)
		Theft and fraud	Fraud/credit fraud/untruthful deposit, theft / extortion / embezzlement / robbery, misappropriation of assets, malicious destruction of assets, forgery, check kiting, smuggling, account take-over / impersonation, tax non-compliance / evasion (willful), bribes / kickbacks, insider trading (not on firms' account)
External fraud	Losses due to acts of a third party intending to defraud, misappropriate property or circumvent the law	Theft and fraud	Theft/robbery, forgery, check kiting
		System security	Hacking damage, theft of information with monetary loss
Employment practices and workplace safety	Losses arising from acts inconsistent with employment, health or safety laws or agreements, from payment of personal injury claims, or from diversity/discrimination events	Employee relations	Compensation, benefit, termination of employment, organized labor activity
		Safe environment	General liability, employee health & safety rules, worker compensation
		Discrimination	All discriminative acts.

Event-type Category (Level 1)	Definition	Category (Level 2)	Operating Activities (Level 3)
Clients, products and business practices	Losses arising from an unintentional or negligent failure to meet a professional obligation to specific clients (including fiduciary and suitability requirements), or from the nature or design of a product	Suitability, disclosure & fiduciary	Fiduciary breaches / guideline violations, suitability / disclosure issues, retail finance disclosure violations, breach of privacy, aggressive sales, account churning, misuse of confidential information, lender liability
		Improper business or market practices	Antitrust, improper trade / market practices, market manipulation, insider trading on firm's account, unlicensed activity, money laundering
		Product flaws	Product defects, model errors
		Selection, sponsorship and exposure	Failure to investigate client credit, exceeding client exposure limits
		Advisory services	Disputes over performance of advisory activities
Personnel or asset damages	Losses arising from natural disaster or other events	Disasters and other events	Natural disaster losses, losses from external forces (terrorism, vandalism)
Business disruption and system failures	Losses arising from disruption of business or system failures	Information systems	Hardware, software, telecommunications, utility or gas supply disruption

Event-type Category (Level 1)	Definition	Category (Level 2)	Operating Activities (Level 3)
Execution, delivery and process management	Losses due to failed transaction processing or process management from relations with trade counterparties and vendors	Transaction record, execution and maintenance	Miscommunication, data entry, maintenance or loading error, missed deadline, model / system misoperation, accounting error / entity attribution error, other task misperformance, delivery failure, collateral management failure, reference data maintenance
		Monitoring and reporting	Failed mandatory reporting obligation, inaccurate external report with loss incurred
		Customer intake and documentation	Client permissions / disclaimers missing, legal documents missing or incomplete
		Customer / client account management	Unapproved access given to accounts, incorrect client records with loss incurred, negligent loss or damage of client assets
		Trade counterparties	Non-client counterparty misperformance, non-client counterparty disputes
		Vendors and suppliers	Outsourcing, vendor dispute

Notes:

1. Losses arising from natural disaster or other events: Natural disasters (earthquake, typhoon, tornado, storm, flood, etc.) that occur within seventy-two hour period will be treated as an individual event in the classification of loss, unless the disasters occur at different locations or different time.
2. Business disruption and system failures: A single event or a continuous event will be treated as an

individual event in the classification of loss if it is originated from the same cause (e.g. mechanical failure at the same location, or specific program error).