



Insurance Core Principles

ICP 17 Capital Adequacy

The supervisor establishes capital adequacy requirements for solvency purposes so that insurers can absorb significant unforeseen losses and to provide for degrees of supervisory intervention.

Introductory Guidance

- 17.0.1 This ICP does not directly apply to non-insurance entities (regulated or unregulated) within an insurance group, but it does apply to insurance legal entities and insurance groups with regard to the risks posed to them by non-insurance entities.

Capital Adequacy in the Context of a Total Balance Sheet Approach

- 17.1 The supervisor requires that a total balance sheet approach is used in the assessment of solvency to recognise the interdependence between assets, liabilities, regulatory capital requirements and capital resources and to require that risks are appropriately recognised.**
- 17.1.1 The overall financial position of an insurer should be based on consistent measurement of assets and liabilities and explicit identification and consistent measurement of risks and their potential impact on all components of the balance sheet. In this context, the IAIS uses the term total balance sheet approach to refer to the recognition of the interdependence between assets, liabilities, regulatory capital requirements and capital resources. A total balance sheet approach should also require that the impacts of relevant material risks on an insurer's overall financial position are appropriately and adequately recognised [1].
- [1] It is noted that the total balance sheet approach is an overall concept rather than implying use of a particular methodology.*
- 17.1.2 The assessment of the financial position of an insurer for supervision purposes addresses the insurer's technical provisions, required capital and available capital resources. These aspects of solvency assessment (namely technical provisions and capital) are intrinsically inter-related and cannot be considered in isolation by a supervisor.

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- 17.1.3 Technical provisions and capital have distinct roles, requiring a clear and consistent definition of both elements. Technical provisions represent the amount that an insurer requires to fulfil its insurance obligations and settle all commitments to policyholders and other beneficiaries arising over the lifetime of the portfolio [2]. In this ICP, the term regulatory capital requirements refers to financial requirements that are set by the supervisor and relates to the determination of amounts of capital that an insurer must have in addition to its technical provisions.

[2] This includes costs of settling all commitments to policyholders and other beneficiaries arising over the lifetime of the portfolio of policies, the expenses of administering the policies, the costs of hedging, reinsurance, and of the capital required to cover the remaining risks.

- 17.1.4 Technical provisions and regulatory capital requirements should be covered by adequate and appropriate assets, having regard to the nature and quality of those assets. To allow for the quality of assets, supervisors may consider applying restrictions or adjustments (such as quantitative limits, asset eligibility criteria or “prudential filters”) where the risks inherent in certain asset classes are not adequately covered by the regulatory capital requirements.
- 17.1.5 Capital resources may be regarded very broadly as the amount of the assets in excess of the amount of the liabilities. Liabilities in this context includes technical provisions and other liabilities (to the extent these other liabilities are not treated as capital resources - for example, liabilities such as subordinated debt may under certain circumstances be given credit for regulatory purposes as capital – see Guidance 17.10.8 - 17.10.11). Assets and liabilities in this context may include contingent assets and contingent liabilities.
- 17.1.6 In considering the quality of capital resources the supervisor should have regard to their characteristics, including the extent to which the capital is available to absorb losses (including considerations of subordination and priority), the extent of the permanent and/or perpetual nature of the capital and the existence of any mandatory servicing costs in relation to the capital. [3]

[3] More detailed guidance on the determination of capital resources is given below.

Additional Guidance for Insurance Groups and Insurance Legal Entities That Are Members of Groups

- 17.1.7 The capital adequacy assessment of an insurance legal entity which is a member of an insurance group needs to consider the value of any holdings the insurance legal entity has in affiliates. Consideration may be given, either at the level of the insurance legal entity or the insurance group, to the risks attached to this value.



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17.1.8 Where the value of holdings in affiliates is included in the capital adequacy assessment and the insurance legal entity is the parent of the group, group-wide capital adequacy assessment and legal entity assessment of the parent may be similar in outcome although the detail of the approach may be different. For example, a group-wide assessment may consolidate the business of the parent and its subsidiaries and assess the capital adequacy for the combined business while a legal entity assessment of the parent may consider its own business and its investments in its subsidiaries.

17.1.9 There are various possible approaches for group-wide supervision. More specifically, undertaking a capital adequacy assessment of an insurance group falls into two broad sets of approaches:

- group level focus and
- legal entity focus.

“Hybrid” or intermediate approaches which combine elements of approaches with a group and a legal entity focus may also be used.

17.1.10 The choice of approach would depend on the preconditions in a jurisdiction, the legal environment which may specify the level at which the group-wide capital requirements are set, the structure of the group and the structure of the supervisory arrangements between the supervisors.

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17.1.11 To further describe and compare the various approaches to group-wide capital adequacy assessment, a two dimensional continuum may be considered; on one axis – the organisational perspective – consideration is given to the extent to which a group is considered as a set of interdependent entities or a single integrated entity; on the other axis – the supervisory perspective – consideration is given to the relative weight of the roles of insurance legal entity supervision and group-wide supervision, without implying that the latter can replace the former in any way. It is recognised that supervisors around the world have adopted approaches corresponding to many points of this continuum. The continuum may be split into four quadrants as shown in Figure 17.1 below.

Figure 17.1

		Legal Entity Focus	Group Level Focus
SUPERVISORY PERSPECTIVE	Large relative weight of group supervision with respect to local supervision	Insurance legal entity capital adequacy assessed for all (relevant) legal entities taking into account group impact. The results are binding and valid for local supervisors as well as for the group supervisor	Insurance legal entity capital adequacy assessed under the assumption that the group behaves as a single integrated entity. Local and group supervisors additionally define how much capital each legal entity has to hold.
	Small relative weight of group supervision with respect to local supervision	Insurance legal entity capital adequacy assessed for all (relevant) legal entities taking into account group impact. These results are not binding; local supervisors apply insurance legal entity capital adequacy requirements.	Insurance legal entity capital adequacy assessed under the assumption that the group behaves as a single integrated entity. These results are not binding; local supervisors apply insurance legal entity capital adequacy requirements.
ORGANISATIONAL PERSPECTIVE			

Additional Guidance for Insurance Groups and Insurance Legal Entities That Are Members of Groups - Group Level Focus

17.1.12 Under a group-wide capital adequacy assessment which takes a group level focus, the insurance group is considered primarily as a single integrated entity for which a separate assessment is made for the group as a whole on a consistent basis, including adjustments to reflect constraints on the fungibility of capital and transferability of assets among group members. Hence under this approach, a total balance sheet approach to solvency assessment is followed which is (implicitly or explicitly) based on the balance sheet of the insurance group as a whole. However, adjustments may be necessary appropriately to take into account risks from non-insurance members of the insurance group, including cross-sector regulated entities and non-regulated entities.

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- 17.1.13 Methods used for approaches with a group level focus may vary in the way in which group capital requirements are calculated. Either the group's consolidated accounts may be used as a basis or an aggregation method may be used. The former is already adjusted for intra-group holdings and further adjustments may then need to be made to reflect the fact that the group may not behave or be allowed to behave as one single entity^[4]. This is particularly the case in stressed conditions. The latter method may sum surpluses or deficits (i.e. the difference between capital resources and capital requirements) for each insurance legal entity in the group with relevant adjustments for intra-group holdings in order to measure an overall surplus or deficit at group level. Alternatively, it may sum the insurance legal entity capital requirements and insurance legal entity capital resources separately in order to measure a group capital requirement and group capital resources. Where an aggregation approach is used for a cross-border insurance group, consideration should be given to consistency of valuation and capital adequacy requirements and of their treatment of intra-group transactions.

[4] Consolidated accounts may be those used for accounting purposes or may differ (e.g. in terms of the entities included in the consolidation).

Additional Guidance for Insurance Groups and Insurance Legal Entities That Are Members of Groups - Legal Entity Focus

- 17.1.14 Under a group-wide capital adequacy assessment which takes a legal entity focus, the insurance group is considered primarily as a set of interdependent legal entities. The focus is on the capital adequacy of each of the parent and the other insurance legal entities in the insurance group, taking into account risks arising from relationships within the group, including those involving non-insurance members of the group. The regulatory capital requirements and resources of the insurance legal entities in the group form a set of connected results but no overall regulatory group capital requirement is used for regulatory purposes. This is still consistent with a total balance sheet approach, but considers the balance sheets of the individual group entities simultaneously rather than amalgamating them to a single balance sheet for the group as a whole. Methods used for approaches with a legal entity focus may vary in the extent to which there is a common basis for the solvency assessment for all group members and the associated communication and co-ordination needed among supervisors.
- 17.1.15 For insurance legal entities that are members of groups and for insurance sub-groups that are part of a wider insurance or other sector group, the additional reasonably foreseeable and relevant material risks arising from being a part of the group should be taken into account in capital adequacy assessment.

Establishing Regulatory Capital Requirements

- 17.2 The supervisor establishes regulatory capital requirements at a sufficient level so that, in adversity, an insurer's obligations to policyholders will continue to be met as they fall due and requires that insurers maintain capital resources to meet the regulatory capital requirements.**



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Purpose and Role of Regulatory Capital Requirements and Resources

- 17.2.1 An insurer's Board and Senior management have the responsibility to ensure that the insurer has adequate and appropriate capital to support the risks it undertakes. Capital serves to reduce the likelihood of failure due to significantly adverse losses incurred by the insurer over a defined period, including decreases in the value of the assets and/or increases in the obligations of the insurer, and to reduce the magnitude of losses to policyholders in the event that the insurer fails.
- 17.2.2 From a regulatory perspective, the purpose of capital is to ensure that, in adversity, an insurer's obligations to policyholders will continue to be met as they fall due. Regulators should establish regulatory capital requirements at the level necessary to support this objective.
- 17.2.3 In the context of its own risk and solvency assessment (ORSA), the insurer would generally be expected to consider its financial position from a going concern perspective (that is, assuming that it will carry on its business as a going concern and continue to take on new business) but may also need to consider a run-off and/or winding-up perspective (e.g. where the insurer is in financial difficulty). The determination of regulatory capital requirements may also have aspects of both a going concern and a run-off [5] or winding-up perspective. In establishing regulatory capital requirements, therefore, supervisors should consider the financial position of insurers under different scenarios of operation.
- [5] In this context, "run-off" refers to insurers that are still solvent but have closed to new business and are expected to remain closed to new business.
- 17.2.4 From a macro-economic perspective, requiring insurers to maintain adequate and appropriate capital enhances the safety and soundness of the insurance sector and the financial system as a whole, while not increasing the cost of insurance to a level that is beyond its economic value to policyholders or unduly inhibiting an insurer's ability to compete in the marketplace. There is a balance to be struck between the level of risk that policyholder obligations will not be paid with the cost to policyholders of increased premiums to cover the costs of servicing additional capital.
- 17.2.5 The level of capital resources that insurers need to maintain for regulatory purposes is determined by the regulatory capital requirements specified by the supervisor. A deficit of capital resources relative to capital requirements determines the additional amount of capital that is required for regulatory purposes.
- 17.2.6 Capital resources protect the interests of policyholders by meeting the following two objectives. They:
- reduce the probability of insolvency by absorbing losses on a going-concern basis or in run-off; and/or
 - reduce the loss to policyholders in the event of insolvency or winding-up.



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- 17.2.7 The extent to which elements of capital achieve the above outcomes will vary depending on their characteristics or “quality”. For example, ordinary share capital may be viewed as achieving both of the above, whereas subordinated debt may be viewed largely as only protecting policyholders in insolvency. Capital which achieves both of the above is sometimes termed “going-concern capital” and capital which only reduces the loss to policyholders in insolvency is sometimes termed “wind-up capital” or “gone concern” capital. It would be expected that the former (i.e. going-concern capital instruments) should form the substantial part of capital resources.
- 17.2.8 For an insurer, the management and allocation of capital resources is a fundamental part of its business planning and strategies. In this context, capital resources typically serve a broader range of objectives than those in Guidance 17.2.6. For example, an insurer may use capital resources over and above the regulatory capital requirements to support future growth or to achieve a targeted credit rating.
- 17.2.9 It is noted that an insurer’s capital management (in relation to regulatory requirements and own capital needs) should be supported and underpinned by establishing and maintaining a sound enterprise risk management framework, including appropriate risk and capital management policies, practices and procedures which are applied consistently across its organisation and are embedded in its processes. Maintaining sufficient capital resources alone is not sufficient protection for policyholders in the absence of disciplined and effective risk management policies and procedures. (See ICP 16 Enterprise risk management for Solvency Purposes.)

Additional Guidance for Insurance Groups and Insurance Legal Entities That Are Members of Groups

- 17.2.10 The supervisor should require insurance groups to maintain capital resources to meet regulatory capital requirements. These requirements should take into account the non-insurance activities of the insurance group. For supervisors that undertake group-wide capital adequacy assessments with a group level focus this means maintaining insurance group capital resources to meet insurance group capital requirements for the group as a whole. For supervisors that undertake group-wide capital adequacy assessments with a legal entity focus this means maintaining capital resources in each insurance legal entity based on a set of connected regulatory capital requirements for the group’s insurance legal entities which fully take the relationships and interactions between these legal entities and other entities in the insurance group into account.
- 17.2.11 It is not the purpose of group-wide capital adequacy assessment to replace assessment of the capital adequacy of the individual insurance legal entities in an insurance group. Its purpose is to require that group risks are appropriately allowed for and the capital adequacy of individual insurers is not overstated, e.g. as a result of multiple gearing and leverage of the quality of capital or as a result of risks emanating from the wider group, and that the overall impact of intra-group transactions is appropriately assessed.

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- 17.2.12 Group-wide capital adequacy assessment considers whether the amount and quality of capital resources relative to required capital is adequate and appropriate in the context of the balance of risks and opportunities that group membership brings to the group as a whole and to insurance legal entities which are members of the group. The assessment should satisfy requirements relating to the structure of group-wide regulatory capital requirements and eligible capital resources and should supplement the individual capital adequacy assessments of insurance legal entities in the group. It should indicate whether there are sufficient capital resources available in the group so that, in adversity, obligations to policyholders will continue to be met as they fall due. If the assessment concludes that capital resources are inadequate or inappropriate then corrective action may be triggered either at a group (e.g. authorised holding or parent company level) or an insurance legal entity level.
- 17.2.13 The quantitative assessment of group-wide capital adequacy is one of a number of tools available to supervisors for group-wide supervision. If the overall financial position of a group weakens it may create stress for its members either directly through financial contagion and/or organisational effects or indirectly through reputational effects. Group-wide capital adequacy assessment should be used together with other supervisory tools, including in particular the capital adequacy assessment of insurance legal entities in the group. A distinction should be drawn between regulated entities (insurance and other sector) and non-regulated entities. It is necessary to understand the financial positions of both types of entities and their implications for the capital adequacy of the insurance group but this does not necessarily imply setting regulatory capital requirements for non-regulated entities. In addition, supervisors should have regard to the complexity of intra-group relationships (between both regulated and non-regulated entities), contingent assets and liabilities and the overall quality of risk management in assessing whether the overall level of safety required by the supervisor is being achieved.
- 17.2.14 For insurance legal entities that are members of groups and for insurance sub-groups that are part of a wider insurance or other sector group, capital requirements and capital resources should take into account all additional reasonably foreseeable and relevant material risks arising from being a part of any of the groups.

Structure of Regulatory Capital Requirements - Solvency Control Levels

- 17.3 The regulatory capital requirements include solvency control levels which trigger different degrees of intervention by the supervisor with an appropriate degree of urgency and requires coherence between the solvency control levels established and the associated corrective action that may be at the disposal of the insurer and/or the supervisor.**

Establishing Solvency Control Levels

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- 17.3.1 The supervisor should establish control levels that trigger intervention by the supervisor in an insurer's affairs when capital resources fall below these control levels. The control level may be supported by a specific framework or by a more general framework providing the supervisor latitude of action. A supervisor's goal in establishing control levels is to safeguard policyholders from loss due to an insurer's inability to meet its obligations when due.
- 17.3.2 The solvency control levels provide triggers for action by the insurer and supervisor. Hence they should be set at a level that allows intervention at a sufficiently early stage in an insurer's difficulties so that there would be a realistic prospect for the situation to be rectified in a timely manner with an appropriate degree of urgency. At the same time, the reasonableness of the control levels should be examined in relation to the nature of the corrective measures. The risk tolerance of the supervisor will influence both the level at which the solvency control levels are set and the intervention actions that are triggered.
- 17.3.3 When establishing solvency control levels it is recognised that views about the level that is acceptable may differ from jurisdiction to jurisdiction and by types of business written and will reflect, amongst other things, the extent to which the pre-conditions for effective supervision exist within the jurisdiction and the risk tolerance of the particular supervisor. The IAIS recognises that jurisdictions will acknowledge that a certain level of insolvencies may be unavoidable and that establishing an acceptable threshold may facilitate a competitive marketplace for insurers and avoid inappropriate barriers to market entry.
- 17.3.4 The criteria used by the supervisor to establish solvency control levels should be transparent. This is particularly important where legal action may be taken in response to an insurer violating a control level. In this case, control levels should generally be simple and readily explainable to a court when seeking enforcement of supervisory action.
- 17.3.5 Supervisors may need to consider different solvency control levels for different modes of operation of the insurer - such as an insurer in run-off or an insurer operating as a going concern. These different scenarios and considerations are discussed in more detail in Guidance 17.6.3 - 17.6.5.
- 17.3.6 In addition, the supervisor should consider the allowance for management discretion and future action in response to changing circumstances or particular events. In allowing for management discretion, supervisors should only recognise actions which are practical and realistic in the circumstances being considered [6].
- [6] The supervisor should carefully consider the appropriateness of allowing for such management discretion in the particular case of the MCR as defined in Standard 17.4.



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- 17.3.7 Other considerations in establishing solvency control levels include:
- the way in which the quality of capital resources is addressed by the supervisor;
 - the coverage of risks in the determination of technical provisions and regulatory capital requirements and the extent of the sensitivity or stress analysis underpinning those requirements;
 - the relation between different levels (for example the extent to which a minimum is set at a conservative level);
 - the powers of the supervisor to set and adjust solvency control levels within the regulatory framework;
 - the accounting and actuarial framework that applies in the jurisdiction (in terms of the valuation basis and assumptions that may be used and their impact on the values of assets and liabilities that underpin the determination of regulatory capital requirements);
 - the comprehensiveness and transparency of disclosure frameworks in the jurisdiction and the ability for markets to exercise sufficient scrutiny and impose market discipline;
 - policyholder priority and status under the legal framework relative to other creditors in the jurisdiction;
 - overall level of capitalisation in the insurance sector in the jurisdiction;
 - overall quality of risk management and governance frameworks in the insurance sector in the jurisdiction;
 - the development of capital markets in the jurisdiction and its impact on the ability of insurers to raise capital; and
 - the balance to be struck between protecting policyholders and the impact on the effective operation of the insurance sector and considerations around unduly onerous levels and costs of regulatory capital requirements.

Additional Guidance for Insurance Groups and Insurance Legal Entities That Are Members of Groups

- 17.3.8 While the general considerations in Guidance 17.3.1 to 17.3.7 above on the establishment of solvency control levels apply in a group-wide context as well as a legal entity context, the supervisory actions triggered at group level will be likely to differ from those at legal entity level. As a group is not a legal entity the scope for direct supervisory action in relation to the group as a whole is more limited and action may need to be taken through co-ordinated action at insurance legal entity level.

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- 17.3.9 Nevertheless, group solvency control levels are a useful tool for identifying a weakening of the financial position of a group as a whole or of particular parts of a group, which may, for example, increase contagion risk or impact reputation which may not otherwise be readily identified or assessed by supervisors of individual group entities. The resulting timely identification and mitigation of a weakening of the financial position of a group may thus address a threat to the stability of the group or its component insurance legal entities.
- 17.3.10 Group-wide solvency control levels may trigger a process of coordination and cooperation between different supervisors of group entities which will facilitate mitigation and resolution of the impact of group-wide stresses on insurance legal entities within a group. Group-wide control levels may also provide a trigger for supervisory dialogue with the group's management.

Structure of Regulatory Capital Requirements - Triggers for Supervisory Intervention in the Context of Legal Entity Capital Adequacy Assessment

17.4 In the context of insurance legal entity capital adequacy assessment, the regulatory capital requirements establish:

- a solvency control level above which the supervisor does not intervene on capital adequacy grounds. This is referred to as the Prescribed Capital Requirement (PCR). The PCR is defined such that assets will exceed technical provisions and other liabilities with a specified level of safety over a defined time horizon.
 - a solvency control level at which, if breached, the supervisor would invoke its strongest actions, in the absence of appropriate corrective action by the insurance legal entity. This is referred to as the Minimum capital requirement (MCR). The MCR is subject to a minimum bound below which no insurer is regarded to be viable to operate effectively.
- 17.4.1 A range of different intervention actions should be taken by a supervisor depending on the event or concern that triggers the intervention. Some of these triggers will be linked to the level of an insurer's capital resources relative to the level at which regulatory capital requirements are set.
- 17.4.2 In broad terms, the highest regulatory capital requirement, the Prescribed Capital Requirement (PCR), will be set at the level at which the supervisor would not require action to increase the capital resources held or reduce the risks undertaken by the insurer^[7]. However if the insurer's capital resources were to fall below the level at which the PCR is set, the supervisor would require some action by the insurer to either restore capital resources to at least the PCR level or reduce the level of risk undertaken (and hence the required capital level).

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[7] Note that this does not preclude the supervisor from intervention or requiring action by the insurer for other reasons, such as weaknesses in the risk management or governance of the insurer. Nor does it preclude the supervisor from intervention when the insurer's capital resources are currently above the PCR but are expected to fall below that level in the short term. To illustrate, the supervisor may establish a trend test (a time series analysis). A sufficiently adverse trend would require some supervisory action. The trend test would support the objective of early regulatory intervention by considering the speed at which capital deterioration is developing.

- 17.4.3 The regulatory objective to require that, in adversity, an insurer's obligations to policyholders will continue to be met as they fall due will be achieved without intervention if technical provisions and other liabilities [8] are expected to remain covered by assets over a defined period, to a specified level of safety. As such, the PCR should be determined at a level such that the insurer is able to absorb the losses from adverse events that may occur over that defined period and the technical provisions remain covered at the end of the period.

[8] To the extent these liabilities are not treated as capital resources.

- 17.4.4 The Minimum capital requirement (MCR) represents the supervisory intervention point at which the supervisor would invoke its strongest actions, if further capital is not made available [9]. Therefore, the main aim of the MCR is to provide the ultimate safety net for the protection of the interests of policyholders.

[9] Note that this does not preclude such actions being taken by the supervisor for other reasons, and even if the MCR is met or exceeded.

- 17.4.5 These actions could include stopping the activities of the insurer, withdrawal of the insurer's licence, requiring the insurer to close to new business and run-off the portfolio, transfer its portfolio to another insurer, arrange additional reinsurance, or other specified actions. This position is different from the accounting concept of insolvency as the MCR would be set at a level in excess of that at which the assets of the insurer were still expected to be sufficient to meet the insurer's obligations to existing policyholders as they fall due. The PCR cannot be less than the MCR, and therefore the MCR may also provide the basis of a lower bound for the PCR, which may be especially appropriate in cases where the PCR is determined on the basis of an insurer's internal model [10] approved for use in determining regulatory capital requirements by the supervisor.

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[10] The term “internal model” refers to “a risk measurement system developed by an insurer to analyse its overall risk position, to quantify risks and to determine the economic capital required to meet those risks”. Internal models may also include partial models which capture a subset of the risks borne by the insurer using an internally developed measurement system which is used in determining the insurer’s economic capital. The IAIS is aware that insurers use a variety of terms to describe their risk and capital assessment processes, such as “economic capital model”, “risk-based capital model”, or “business model”. The IAIS considers that such terms could be used interchangeably to describe the processes adopted by insurers in the management of risk and capital within their business on an economic basis. For the purposes of consistency, the term “internal model” is used throughout.

- 17.4.6 In establishing a minimum bound on the MCR below which no insurer is regarded to be viable to operate effectively, the supervisor may, for example, apply a market-wide nominal floor^[11] to the regulatory capital requirements, based on the need for an insurer to operate with a certain minimal critical mass and consideration of what may be required to meet minimum standards of governance and risk management. Such a nominal floor might vary between lines of business or type of insurer and is particularly relevant in the context of a new insurer or line of business.

[11] In this context, a market-wide nominal floor may, for example, be an absolute monetary minimum amount of capital required to be held by an insurer in a jurisdiction.

- 17.4.7 Regulatory capital requirements may include additional solvency control levels between the level at which the supervisor takes no intervention action from a capital perspective and the strongest intervention point (that is, between the PCR and MCR levels). These control levels may be set at levels that correspond to a range of different intervention actions that may be taken by the supervisor itself or actions which the supervisor would require of the insurer according to the severity or level of concern regarding adequacy of the capital held by the insurer. These additional control levels may be formally established by the supervisor with explicit intervention actions linked to particular control levels. Alternatively, these additional control levels may be structured less formally, with a range of possible intervention actions available to the supervisor depending on the particular circumstances. In either case the possible triggers and range of intervention actions should be appropriately disclosed by the supervisor.

- 17.4.8 Possible intervention actions include:

- measures that are intended to enable the supervisor to better assess and/or control the situation, either formally or informally, such as increased supervision activity or reporting, or requiring auditors or actuaries to undertake an independent review or extend the scope of their examinations;
- measures to address capital levels such as requesting capital and business plans for restoration of capital resources to required levels, limitations on redemption or repurchase of equity or other instruments and/or dividend payments;

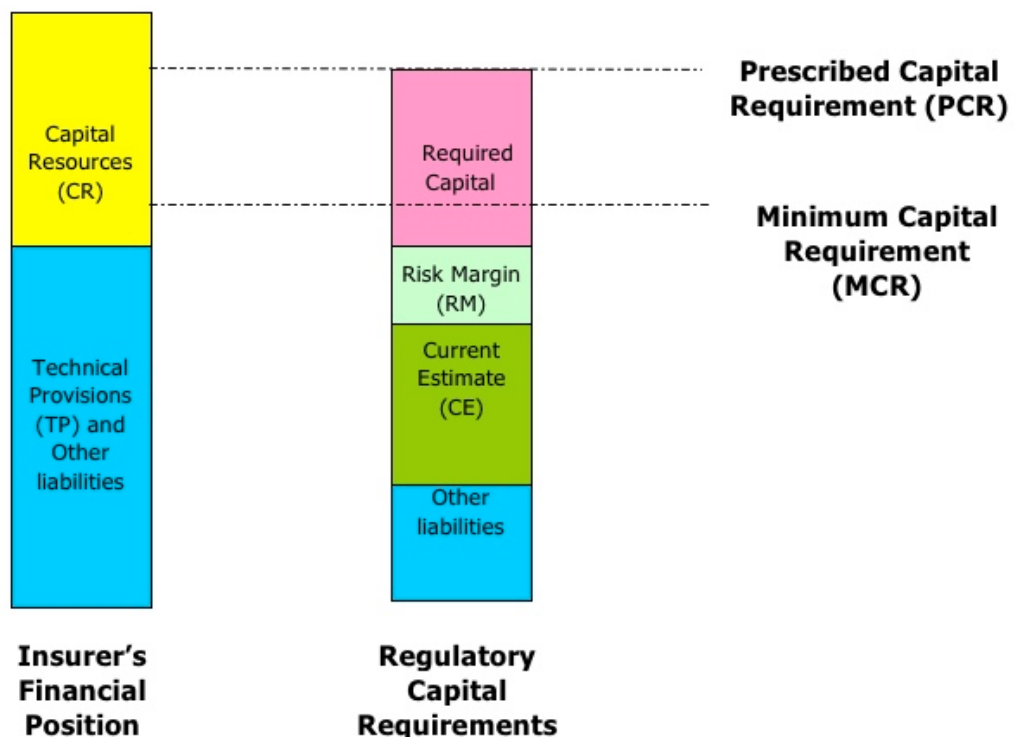
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- measures intended to protect policyholders pending strengthening of the insurer’s capital position, such as restrictions on licences, premium volumes, investments, types of business, acquisitions, reinsurance arrangements;
- measures that strengthen or replace the insurer’s management and/or risk management framework and overall governance processes;
- measures that reduce or mitigate risks (and hence required capital) such as requesting reinsurance, hedging and other mechanisms; and/or
- refusing, or imposing conditions on, applications submitted for regulatory approval such as acquisitions or growth in business.

17.4.9 In establishing the respective control levels, consideration should be had for these possibilities and the scope for an insurer with capital at this level to be able to increase its capital resources or to be able to access appropriate risk mitigation tools from the market.

Figure 17.2: Solvency control levels and regulatory capital requirements

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Structure of Regulatory Capital Requirements - Triggers for Supervisory Intervention in the Context of Group-wide Capital Adequacy Assessment

17.5 In the context of group-wide capital adequacy assessment, the regulatory capital requirements establish solvency control levels that are appropriate in the context of the approach to group-wide capital adequacy that is applied.

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- 17.5.1 The supervisor should establish solvency control levels that are appropriate in the context of the approach that is adopted for group-wide capital adequacy assessment. The supervisor should also define the relationship between these solvency control levels and those at legal entity level for insurers that are members of the group. The design of solvency control levels depends on a number of factors. These include the supervisory perspective, i.e. the relative weight placed on group-wide supervision and legal entity supervision, and the organisational perspective, i.e. the extent to which a group is considered as a set of interdependent entities or a single integrated entity. The solvency control levels are likely to vary according to the particular group and the supervisors involved. (See Figure 17.1.) The establishment of group-wide solvency control levels should be such as to enhance the overall supervision of the insurers in the group.
- 17.5.2 Having group-wide solvency control levels does not necessarily mean establishing a single regulatory capital requirement at group level. For example, under a legal entity approach consideration of the set of capital requirements for individual entities (and interrelationships between them) may enable appropriate decisions to be taken about supervisory intervention on a group-wide basis. However, this requires the approach to be sufficiently well developed for group risks to be taken into account on a complete and consistent basis in the capital adequacy assessment of insurance legal entities in a group. To achieve consistency for insurance legal entity assessments, it may be necessary to adjust the capital requirements used for insurance legal entities so they are suitable for group-wide assessment.
- 17.5.3 One approach may be to establish a single group-wide PCR or a consistent set of PCRs for insurance legal entities that are members of the group which, if met, would mean that no supervisory intervention at group level for capital reasons would be deemed necessary or appropriate. Such an approach may assist, for example, in achieving consistency of approach towards similar organisations with a branch structure and different group structures e.g. following a change in structure of a group. Where a single group-wide PCR is determined, it may differ from the sum of insurance legal entity PCRs because of group factors including group diversification effects, group risk concentrations and intra-group transactions. Similarly, where group-wide capital adequacy assessment involves the determination of a set of PCRs for the insurance legal entities in an insurance group, these may differ from the insurance legal entity PCRs if group factors are reflected differently in the group capital assessment process. Differences in the level of safety established by different jurisdictions in which the group operates should be considered when establishing group-wide PCR(s).
- 17.5.4 The establishment of a single group-wide MCR might also be considered and may, for example, trigger supervisory intervention to restructure the control and/or capital of the group. A possible advantage of this approach is that it may encourage a group solution where an individual insurer is in financial difficulty and capital is sufficiently fungible and assets are transferable around the group. Alternatively, the protection provided by the supervisory power to intervene at individual entity level on breach of an insurance legal entity MCR may be regarded as sufficient.

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- 17.5.5 The solvency control levels adopted in the context of group-wide capital adequacy assessment should be designed so that together with the solvency control levels at insurance legal entity level they represent a consistent ladder of supervisory intervention. For example, a group-wide PCR should trigger supervisory intervention before a group-wide MCR because the latter may invoke the supervisor's strongest actions. Also, if a single group-wide PCR is used it may be appropriate for it to have a floor equal to the sum of the legal entity MCRs of the individual entities in the insurance group. Otherwise, no supervisory intervention into the operation of the group would be required even though at least one of its member insurers had breached its MCR.
- 17.5.6 Supervisory intervention triggered by group-wide solvency control levels should take the form of coordinated action by relevant group supervisors. This may, for example, involve increasing capital at holding company level or strategically reducing the risk profile or increasing capital in insurance legal entities within the group. Such supervisory action may be exercised via the insurance legal entities within a group and, where insurance holding companies are authorised, via those holding companies. Supervisory action in response to breaches of group-wide solvency control levels should not alter the existing division of statutory responsibilities of the supervisors responsible for authorising and supervising each individual insurance legal entity.

Structure of Regulatory Capital Requirements - Approaches to Determining Regulatory Capital Requirements

- 17.6 The regulatory capital requirements are established in an open and transparent process, and the objectives of the regulatory capital requirements and the bases on which they are determined are explicit. In determining regulatory capital requirements, the supervisor allows a set of standardised and, if appropriate, other approved more tailored approaches such as the use of (partial or full) internal models.**
- 17.6.1 Transparency as to the regulatory capital requirements that apply is required to facilitate effective solvency assessment and supports its enhancement, comparability and convergence internationally.
- 17.6.2 The supervisor may develop separate approaches for the determination of different regulatory capital requirements, in particular for the determination of the MCR and the PCR. For example, the PCR and MCR may be determined by two separate methods, or the same methods and approaches may be used but with two different levels of safety specified. In the latter case, for example, the MCR may be defined as a simple proportion of the PCR, or the MCR may be determined on different specified target criteria to those specified for the PCR.
- 17.6.3 The PCR would generally be determined on a going concern basis, i.e. in the context of the insurer continuing its operations. On a going concern basis, an insurer would be expected to continue to take on new risks during the established time horizon. Therefore, in establishing the regulatory capital level to provide an acceptable level of solvency, the potential growth in an insurer's portfolio should be considered.

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- 17.6.4 Capital should also be capable of protecting policyholders if the insurer were to close to new business. Generally, the determination of capital on a going concern basis would not be expected to be less than would be required if it is assumed that the insurer were to close to new business. However, this may not be true in all cases, since some assets may lose some or all of their value in the event of a winding-up or run-off, for example, because of a forced sale. Similarly, some liabilities may actually have an increased value if the business does not continue (e.g. claims handling expenses).
- 17.6.5 Usually the MCR would be constructed taking into consideration the possibility of closure to new business. It is, however, relevant to also consider the going concern scenario in the context of establishing the level of the MCR, as an insurer may continue to take on new risks up until the point at which MCR intervention is ultimately triggered. The supervisor should consider the appropriate relationship between the PCR and MCR, establishing a sufficient buffer between these two levels (including consideration of the basis on which the MCR is generated) within an appropriate continuum of solvency control levels, having regard for the different situations of business operation and other relevant considerations.
- 17.6.6 It should be emphasised that meeting the regulatory capital requirements should not be taken to imply that further financial injections will not be necessary under any circumstances in future.
- 17.6.7 Regulatory capital requirements may be determined using a range of approaches, such as standard formulae, or other approaches, more tailored to the individual insurer (such as partial or full internal models), which are subject to approval by the relevant supervisors.^[12] Regardless of the approach used, the principles and concepts that underpin the objectives for regulatory capital requirements described in this ICP apply and should be applied consistently by the supervisor to the various approaches. The approach adopted for determining regulatory capital requirements should take account of the nature and materiality of the risks insurers face generally and, to the extent practicable, should also reflect the nature, scale and complexity of the risks of the particular insurer.
- [12] A more tailored approach which is not an internal model might include, for example, approved variations in factors contained in a standard formula or prescribed scenario tests which are appropriate for a particular insurer or group of insurers.
- 17.6.8 Standardised approaches, in particular, should be designed to deliver capital requirements which reasonably reflect the overall risk to which insurers are exposed, while not being unduly complex. Standardised approaches may differ in level of complexity depending on the risks covered and the extent to which they are mitigated or may differ in application based on classes of business (e.g. life and non-life). Standardised approaches should be appropriate to the nature,

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scale and complexity of the risks that insurers face and should include approaches that are feasible in practice for insurers of all types including small and medium sized insurers and captives taking into account the technical capacity that insurers need to manage their businesses effectively.

- 17.6.9 By its very nature a standardised approach may not be able to fully and appropriately reflect the risk profile of each individual insurer. Therefore, where appropriate, a supervisor should allow the use of more tailored approaches subject to approval. In particular, where an insurer has an internal model (or partial internal model) that appropriately reflects its risks and is integrated into its risk management and reporting, the supervisor should allow the use of such a model to determine more tailored regulatory capital requirements, where appropriate [13]. The use of the internal model for this purpose would be subject to prior approval by the supervisor based on a transparent set of criteria and would need to be evaluated at regular intervals. In particular, the supervisor would need to be satisfied that the insurer's internal model is, and remains, appropriately calibrated relative to the target criteria established by the supervisor (see Guidance 17.12.1 to 17.12.18).

[13] It is noted that the capacity for a supervisor to allow the use of internal models will need to take account of the sufficiency of resources available to the supervisor.

- 17.6.10 The supervisor should also be clear on whether an internal model may be used for the determination of the MCR. In this regard, the supervisor should take into account the main objective of the MCR (i.e. to provide the ultimate safety net for the protection of policyholders) and the ability of the MCR to be defined in a sufficiently objective and appropriate manner to be enforceable (refer to Guidance 17.3.4).

- 17.7 The supervisor addresses all relevant and material categories of risk in insurers and is explicit as to where risks are addressed, whether solely in technical provisions, solely in regulatory capital requirements or if addressed in both, as to the extent to which the risks are addressed in each. The supervisor is also explicit as to how risks and their aggregation are reflected in regulatory capital requirements.**

Types of Risks to be Addressed

- 17.7.1 The supervisor should address all relevant and material categories of risk - including as a minimum underwriting risk, credit risk, market risk, operational risk and liquidity risk. This should include any significant risk concentrations, for example, to economic risk factors, market sectors or individual counterparties, taking into account both direct and indirect exposures and the potential for exposures in related areas to become more correlated under stressed circumstances.

Dependencies and Interrelations Between Risks

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17.7.2 The assessment of the overall risk that an insurer is exposed to should address the dependencies and interrelationships between risk categories (for example, between underwriting risk and market risk) as well as within a risk category (for example, between equity risk and interest rate risk). This should include an assessment of potential reinforcing effects between different risk types as well as potential “second order effects”, i.e. indirect effects to an insurer’s exposure caused by an adverse event or a change in economic or financial market conditions.^[14] It should also consider that dependencies between different risks may vary as general market conditions change and may significantly increase during periods of stress or when extreme events occur. “Wrong way risk”, which is defined as the risk that occurs when exposure to counterparties, such as financial guarantors, is adversely correlated to the credit quality of those counterparties, should also be considered as a potential source of significant loss e.g. in connection with derivative transactions. Where the determination of an overall capital requirement takes into account diversification effects between different risk types, the insurer should be able to explain the allowance for these effects and ensure that it considers how dependencies may increase under stressed circumstances.

[14] For example, a change in the market level of interest rates could trigger an increase of lapse rates on insurance policies.

Allowance for Risk Mitigation

17.7.3 Any allowance for reinsurance in determining regulatory capital requirements should consider the possibility of breakdown in the effectiveness of the risk transfer and the security of the reinsurance counterparty and any measures used to reduce the reinsurance counterparty exposure. Similar considerations would also apply for other risk mitigants, for example derivatives.

Transparency of Recognition of Risks in Regulatory Requirements

17.7.4 The supervisor should be explicit as to where risks are addressed, whether solely in technical provisions, solely in regulatory capital requirements or if addressed in both, as to the extent to which the risks are addressed in each. The solvency requirements should also clearly articulate how risks are reflected in regulatory capital requirements, specifying and publishing the level of safety to be applied in determining regulatory capital requirements, including the established target criteria (refer to Standard 17.8).

Treatment of Risks Which Are Difficult to Quantify

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- 17.7.5 The IAIS recognises that some risks, such as strategic risk, reputational risk, liquidity risk and operational risk, are less readily quantifiable than the other main categories of risks. Operational risk, for example, is diverse in its composition and depends on the quality of systems and controls in place. The measurement of operational risk, in particular, may suffer from a lack of sufficiently uniform and robust data and well developed valuation methods. Jurisdictions may choose to base regulatory capital requirements for these less readily quantifiable risks on some simple proxies for risk exposure and/or stress and scenario testing. For particular risks (such as liquidity risk), holding additional capital may not be the most appropriate risk mitigant and it may be more appropriate for the supervisor to require the insurer to control these risks via exposure limits and/or qualitative requirements such as additional systems and controls.
- 17.7.6 However, the IAIS envisages that the ability to quantify some risks (such as operational risk) will improve over time as more data become available or improved valuation methods and modelling approaches are developed. Further, although it may be difficult to quantify risks, it is important that an insurer nevertheless addresses all material risks in its own risk and solvency assessment.
- 17.8 The supervisor sets appropriate target criteria for the calculation of regulatory capital requirements, which underlie the calibration of a standardised approach. Where the supervisor allows the use of approved more tailored approaches such as internal models for the purpose of determining regulatory capital requirements, the target criteria underlying the calibration of the standardised approach are also used by those approaches for that purpose to require broad consistency among all insurers within the jurisdiction.**
- 17.8.1 The level at which regulatory capital requirements are set will reflect the risk tolerance of the supervisor. Reflecting the IAIS's principles-based approach, this ICP does not prescribe any specific methods for determining regulatory capital requirements. However, the IAIS's view is that it is important that individual jurisdictions set appropriate target criteria (such as risk measures, confidence levels or time horizons) for their regulatory capital requirements. Further, each jurisdiction should outline clear principles for the key concepts for determining regulatory capital requirements, considering the factors that a supervisor should take into account in determining the relevant parameters as outlined in this ICP.
- 17.8.2 Where a supervisor allows the use of other more tailored approaches to determine regulatory capital requirements, the target criteria established should be applied consistently to those approaches. In particular, where a supervisor allows the use of internal models for the determination of regulatory capital requirements, the supervisor should apply the target criteria in approving the use of an internal model by an insurer for that purpose. This should achieve broad consistency among all insurers and a similar level of protection for all policyholders, within the jurisdiction.

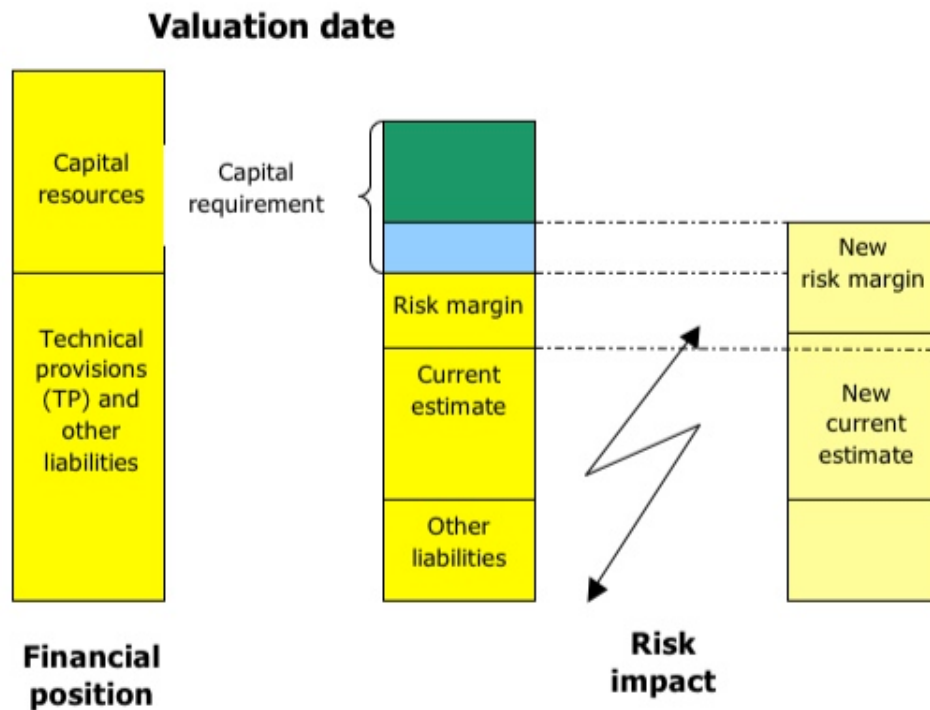
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- 17.8.3 With regards to the choice of the risk measure and confidence level to which regulatory capital requirements are calibrated, the IAIS notes that some supervisors have set a confidence level for regulatory purposes which is comparable with a minimum investment grade level. Some examples have included a 99.5% VaR calibrated confidence level over a one year timeframe [15], 99% TVaR over one year and 95% TVaR over the term of the policy obligations.
- [15] This is the level expected in Australia for those insurers that seek approval to use an internal model to determine their MCR. It is also the level used for the calculation of the risk-based Solvency Capital Requirement under the European Solvency II regime.
- 17.8.4 In regards to the choice of an appropriate time horizon, the determination and calibration of the regulatory capital requirements needs to be based on a more precise analysis, distinguishing between:
- the period over which a shock is applied to a risk – the “shock period”; and
 - the period over which the shock that is applied to a risk will impact the insurer – the “effect horizon”.
- 17.8.5 For example, a one-off shift in the interest rate term structure during a shock period of one year has consequences for the discounting of the cash flows over the full term of the policy obligations (the effect horizon). A judicial opinion (e.g. on an appropriate level of compensation) in one year (the shock period) may have permanent consequences for the value of claims and hence will change the projected cash flows to be considered over the full term of the policy obligations (the effect horizon).
- 17.8.6 The impact on cash flows of each stress that is assumed to occur during the shock period will need to be calculated over the period for which the shock will affect the relevant cash flows (the effect horizon). In many cases this will be the full term of the insurance obligations. In some cases, realistic allowance for offsetting reductions in discretionary benefits to policyholders or other offsetting management actions may be considered, where they could and would be made and would be effective in reducing policy obligations or in reducing risks in the circumstances of the stress. In essence, at the end of the shock period, capital has to be sufficient so that assets cover the technical provisions (and other liabilities) re-determined at the end of the shock period. The re-determination of the technical provisions would allow for the impact of the shock on the technical provisions over the full time horizon of the policy obligations.

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- 17.8.7 Figure 17.3 summarises key aspects relevant to the determination of regulatory capital requirements:

Figure 17.3: Illustration of determination of regulatory capital requirements



- 17.8.8 For the determination of the technical provisions, an insurer is expected to consider the uncertainty attached to the policy obligations, that is, the likely (or expected) variation of future experience from what is assumed in determining the current estimate, over the full period of the policy obligations. As indicated above, regulatory capital requirements should be calibrated such that assets exceed the technical provisions (and other liabilities) over a defined shock period with an appropriately high degree of safety. That is, the regulatory capital requirements should be set such that the insurer's capital resources can withstand a range of predefined shocks or stress scenarios that are assumed to occur during that shock period (and which lead to significant unexpected losses over and above the expected losses that are captured in the technical provisions).

Calibration and Measurement Error

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- 17.8.9 The risk of measurement error inherent in any approach used to determine capital requirements should be considered. This is especially important where there is a lack of sufficient statistical data or market information to assess the tail of the underlying risk distribution. To mitigate model error, quantitative risk calculations should be blended with qualitative assessments, and, where practicable, multiple risk measurement tools should be used. To help assess the economic appropriateness of risk-based capital requirements, information should be sought on the nature, degree and sources of the uncertainty surrounding the determination of capital requirements in relation to the established target criteria.
- 17.8.10 The degree of measurement error inherent, in particular, in a standardised approach depends on the degree of sophistication and granularity of the methodology used. A more sophisticated standardised approach has the potential to be aligned more closely to the true distribution of risks across insurers. However, increasing the sophistication of the standardised approach is likely to imply higher compliance costs for insurers and more intensive use of supervisory resources (for example, in validating the calculations). The calibration of the standardised approach therefore needs to balance the trade-off between risk-sensitivity and implementation costs.

Procyclicality

- 17.8.11 When applying risk-based regulatory capital requirements, there is a risk that an economic downturn will trigger supervisory interventions that exacerbate the economic crises, thus leading to an adverse “procyclical” effect. For example, a severe downturn in share markets may result in a depletion of the capital resources of a major proportion of insurers. This in turn may force insurers to sell shares and to invest in less risky assets in order to decrease their regulatory capital requirements. A simultaneous massive selling of shares by insurers could, however, put further pressure on the share markets, thus leading to a further drop in share prices and to a worsening of the economic crises.
- 17.8.12 However, the system of solvency control levels required enables supervisors to introduce a more principles-based choice of supervisory interventions in cases where there may be a violation of the PCR control level and this can assist in avoiding exacerbation of procyclicality effects: supervisory intervention is able to be targeted and more flexible in the context of an overall economic downturn so as to avoid measures that may have adverse macroeconomic effects.
- 17.8.13 It could be contemplated whether further explicit procyclicality-dampening measures would be needed. This may include allowing a longer period for corrective measures or allowance for the calibration of the regulatory capital requirements to reflect procyclicality dampening measures. Overall, when such dampening measures are applied, an appropriate balance needs to be achieved to preserve the risk sensitivity of the regulatory capital requirements.

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- 17.8.14 In considering the impacts of procyclicality, the influence of external factors (for example, the influence of credit rating agencies) should be given due regard. The impacts of procyclicality also heighten the need for supervisory cooperation and communication.

Additional Guidance for Insurance Groups and Insurance Legal Entities That Are Members of Groups

- 17.8.15 Approaches to determining group-wide regulatory capital requirements will depend on the overall approach taken to group-wide capital adequacy assessment. Where a group level approach is used, either the group's consolidated accounts may be taken as a basis for calculating group-wide capital requirements or the requirements of each insurance legal entity may be aggregated or a mixture of these methods may be used. For example, if a different treatment is required for a particular entity (for example, an entity located in a different jurisdiction) it might be disaggregated from the consolidated accounts and then included in an appropriate way using a deduction and aggregation approach.
- 17.8.16 Where consolidated accounts are used, the requirements of the jurisdiction in which the ultimate parent of the group is located would normally be applied, consideration should also be given to the scope of the consolidated accounts used for accounting purposes as compared to the consolidated balance sheet used as a basis for group-wide capital adequacy assessment to require, for example, identification and appropriate treatment of non-insurance group entities.
- 17.8.17 Where the aggregation method is used (as described in Guidance 17.1.13), or where a legal entity focus is adopted (as described in Guidance 17.1.14), consideration should be given as to whether local capital requirements can be used for insurance legal entities within the group which are located in other jurisdictions or whether capital requirements should be recalculated according to the requirements of the jurisdiction in which the ultimate parent of the group is located.

Group-specific Risks

- 17.8.18 There are a number of group-specific factors which should be taken into account in determining group-wide capital requirements including diversification of risk across group entities, intra-group transactions, risks arising from non-insurance group entities, treatment of group entities located in other jurisdictions and treatment of partially-owned entities and minority interests. Particular concerns may arise from a continuous sequence of internal financing within the group, or closed loops in the financing scheme of the group.
- 17.8.19 Group specific risks posed by each group entity to insurance members of the group and to the group as a whole are a key factor in an overall assessment of group-wide capital adequacy. Such risks are typically difficult to measure and mitigate and include notably contagion risk (financial, reputational, legal), concentration risk, complexity risk and operational/organisational risks. As groups can differ significantly it may not be possible to address these risks

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groups can differ significantly it may not be possible to address these risks adequately using a standardised approach for capital requirements. It may therefore be necessary to address group specific risks through the use of more tailored approaches to capital requirements including the use of (partial or full) internal models. Alternatively, supervisors may vary the standardised regulatory capital requirement so that group-specific risks are adequately provided for in the insurance legal entity and/or group capital adequacy assessment. [16]

[16] See Standard 17.9.

- 17.8.20 Group specific risks should be addressed from both an insurance legal entity perspective and group-wide perspective ensuring that adequate allowance is made. Consideration should be given to the potential for duplication or gaps between insurance legal entity and group-wide approaches.

Diversification of Risks Between Group Entities

- 17.8.21 In the context of a group-wide solvency assessment, there should also be consideration of dependencies and interrelations of risks across different members in the group. However, it does not follow that where diversification effects exist these should be recognised automatically in an assessment of group-wide capital adequacy. It may, for example, be appropriate to limit the extent to which group diversification effects are taken into account for the following reasons:

- Diversification may be difficult to measure at any time and in particular in times of stress. Appropriate aggregation of risks is critical to the proper evaluation of such benefits for solvency purposes.
- There may be constraints on the transfer of diversification benefits across group entities and jurisdictions because of a lack of fungibility of capital or transferability of assets.
- Diversification may be offset by concentration/aggregation effects (if this is not separately addressed in the assessment of group capital).

- 17.8.22 An assessment of group diversification benefits is necessary under whichever approach used to assess group-wide capital adequacy. Under a legal entity approach, recognition of diversification benefits will require consideration of the diversification between the business of an insurance legal entity and other entities within the group in which it participates and of intra-group transactions. Under an approach with a consolidation focus which uses the consolidated accounts method, some diversification benefits will be recognised automatically at the level of the consolidated group. In this case, supervisors will need to consider whether it is prudent to recognise such benefits or whether an adjustment should be made in respect of potential restrictions on the transferability or sustainability under stress of surplus resources created by group diversification benefits.

Intra-group Transactions



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- 17.8.23 Intra-group transactions may result in complex and/or opaque intra-group relationships which give rise to increased risks at both insurance legal entity and group level. In a group-wide context, credit for risk mitigation should only be recognised in group capital requirements to the extent that risk is transferred outside the group. For example, the transfer of risk to a captive reinsurer or to an intra-group insurance special purpose vehicle should not result in a reduction of overall group capital requirements.

Non-insurance Group Entities

- 17.8.24 In addition to insurance legal entities, an insurance group may include a range of different types of non-insurance entity, either subject to no financial regulation (non-regulated entities) or regulated under other financial sector regulation. The impact of all such entities should be taken into account in the overall assessment of group-wide solvency but the extent to which they can be captured in a group-wide capital adequacy measure as such will vary according to the type of non-insurance entity, the degree of control/influence on that entity and the approach taken to group-wide supervision.
- 17.8.25 Risks from non-regulated entities are typically difficult to measure and mitigate. Insurance supervisors may not have direct access to information on such entities but it is important that supervisors are able to assess the risks they pose in order to apply appropriate mitigation measures. Measures taken to address risks from non-regulated entities do not imply active supervision of such entities.
- 17.8.26 There are different approaches to addressing risks stemming from non-regulated entities such as capital measures, non-capital measures or a combination thereof.
- 17.8.27 One approach may be to increase capital requirements in order that the group holds sufficient capital. If the activities of the non-regulated entities have similar risk characteristics to insurance activities (e.g. certain credit enhancement mechanisms as compared to traditional bond insurance) it may be possible to calculate an equivalent capital charge. Another approach might be to deduct the value of holdings in non-regulated entities from the capital resources of the insurance legal entities in the group, but this on its own may not be sufficient to cover the risks involved.
- 17.8.28 Non-capital measures may include, for example, limits on exposures and requirements on risk management and governance applied to insurance legal entities with respect to non-regulated entities within the group.

Cross-jurisdictional Entities

- 17.8.29 Group-wide capital adequacy assessments should, to the extent possible, be based on consistent application of ICPs across jurisdictions. In addition, consideration should be given to the capital adequacy and transferability of assets in entities located in different jurisdictions.

Partial Ownership and Minority Interests

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- 17.8.30 An assessment of group-wide capital adequacy should include an appropriate treatment of partially-owned or controlled group entities and minority interests. Such treatment should take into account the nature of the relationships of the partially-owned entities within the group and the risks and opportunities they bring to the group. The accounting treatment may provide a starting point. Consideration should be given to the availability of any minority interest's share in the net equity in excess of regulatory capital requirements of a partially-owned entity.

Variation of Regulatory Capital Requirements

- 17.9 Any variations to the regulatory capital requirement imposed by the supervisor are made within a transparent framework, are appropriate to the nature, scale and complexity according to the target criteria and are only expected to be required in limited circumstances.**
- 17.9.1 As has already been noted, a standardised approach, by its very nature, may not be able to fully and appropriately reflect the risk profile of each individual insurer. In cases where the standardised approach established for determining regulatory capital requirements is materially inappropriate for the risk profile of the insurer, the supervisor should have the flexibility to increase the regulatory capital requirement calculated by the standard approach. For example, some insurers using the standard formula may warrant a higher PCR and/or group-wide regulatory capital requirement if they are undertaking higher risks, such as new products where credible experience is not available to establish technical provisions, or if they are undertaking significant risks that are not specifically covered by the regulatory capital requirements.
- 17.9.2 Similarly, in some circumstances when an approved more tailored approach is used for regulatory capital purposes, it may be appropriate for the supervisor to have some flexibility to increase the capital requirement calculated using that approach. In particular, where an internal model or partial internal model is used for regulatory capital purposes, the supervisor may increase the capital requirement where it considers the internal model does not adequately capture certain risks, until the identified weaknesses have been addressed. This may arise, for example, even though the model has been approved where there has been a change in the business of the insurer and there has been insufficient time to fully reflect this change in the model and for a new model to be approved by the supervisor.
- 17.9.3 In addition, supervisory requirements may be designed to allow the supervisor to decrease the regulatory capital requirement for an individual insurer where the standardised requirement materially overestimates the capital required according to the target criteria. However, such an approach may require a more intensive use of supervisory resources due to requests from insurers for consideration of a decrease in their regulatory capital requirement. Therefore, the IAIS appreciates that not all jurisdictions may wish to include such an option for their supervisor. Further, this reinforces the need for such variations in regulatory capital requirements to only be expected to be made in limited circumstances.

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- 17.9.4 Any variations made by the supervisor to the regulatory capital requirement calculated by the insurer should be made in a transparent framework and be appropriate to the nature, scale and complexity in terms of the target criteria. The supervisor may, for example, develop criteria to be applied in determining such variations and appropriate discussions between the supervisor and the insurer may occur. Variations in regulatory capital requirements following supervisory review from those calculated using standardised approaches or approved more tailored approaches should be expected to be made only in limited circumstances.
- 17.9.5 In undertaking its ORSA, the insurer considers the extent to which the regulatory capital requirements (in particular, any standardised formula) adequately reflect its particular risk profile. In this regard, the ORSA undertaken by an insurer can be a useful source of information to the supervisor in reviewing the adequacy of the regulatory capital requirements of the insurer and in assessing the need for variation in those requirements.

Identification of Capital Resources Potentially Available for Solvency Purposes

17.10 The supervisor defines the approach to determining the capital resources eligible to meet regulatory capital requirements and their value, consistent with a total balance sheet approach for solvency assessment and having regard to the quality and suitability of capital elements.

- 17.10.1 The following outlines a number of approaches a supervisor could use for the determination of capital resources in line with this requirement. The determination of capital resources would generally require the following steps:
- the amount of capital resources potentially available for solvency purposes is identified (see Guidance 17.10.3 - 17.10.21);
 - an assessment of the quality and suitability of the capital instruments comprising the total amount of capital resources identified is then carried out (see Guidance 17.11.1 - 17.11.29); and
 - on the basis of this assessment, the final capital resources eligible to meet regulatory capital requirements and their value are determined (see Guidance 17.11.30 - 17.11.44).
- 17.10.2 In addition, the insurer is required to carry out its own assessment of its capital resources to meet regulatory capital requirements and any additional capital needs (see Standard 16.14).

Capital Resources Under Total Balance Sheet Approach

- 17.10.3 The IAIS supports the use of a total balance sheet approach in the assessment of solvency to recognise the interdependence between assets, liabilities, regulatory capital requirements and capital resources so that risks are appropriately recognised.

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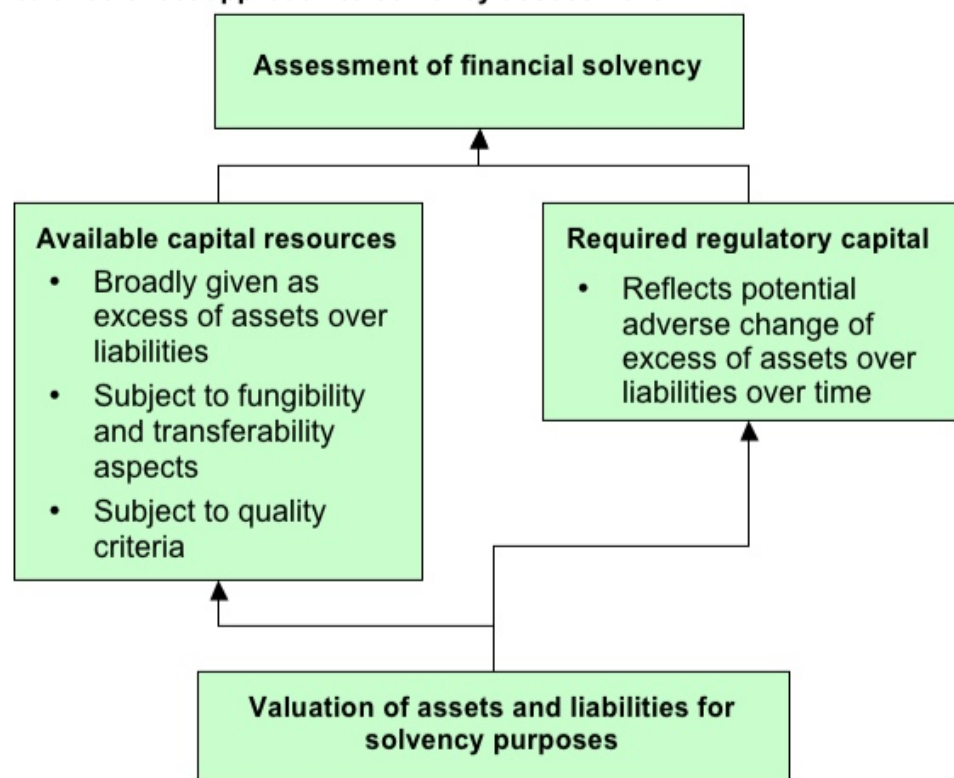
17.10.4 Such an approach requires that the determination of available and required capital is based on consistent assumptions for the recognition and valuation of assets and liabilities for solvency purposes.

17.10.5 From a regulatory perspective, the purpose of regulatory capital requirements is to require that, in adversity, an insurer's obligations to policyholders will continue to be met as they fall due. This aim will be achieved if technical provisions and other liabilities are expected to remain covered by assets over a defined period, to a specified level of safety [17].

[17] Refer to Guidance 17.3.1 - 17.9.5.

17.10.6 To achieve consistency with this economic approach to setting capital requirements in the context of a total balance sheet approach, capital resources should broadly be regarded as the difference between assets and liabilities on the basis of their recognition and valuation for solvency purposes.

Total balance sheet approach to solvency assessment



17.10.7 When regarding available capital resources as the difference between assets and liabilities, the following issues should be considered:

- the extent to which certain liabilities other than technical provisions may be treated as capital for solvency purposes (Guidance 17.10.8 - 17.10.10);
- whether contingent assets could be included (Guidance 17.10.11) ;
- the treatment of assets which may not be fully realisable in the

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normal course of business or under a wind-up scenario (Guidance 17.10.12 - 17.10.19); and

- reconciliation of such a “top down” approach to determining capital resources with a “bottom up” approach which sums up individual items of capital to derive the overall amount of capital resources (Guidance 17.10.20).

Treatment of Liabilities

- 17.10.8 Liabilities include technical provisions and other liabilities. Certain items such as other liabilities in the balance sheet may be treated as capital resources for solvency purposes.
- 17.10.9 For example, perpetual subordinated debt, although usually classified as a liability under the relevant accounting standards, could be classified as a capital resource for solvency purposes. [18] This is because of its availability to act as a buffer to reduce the loss to policyholders and senior creditors through subordination in the event of insolvency. More generally, subordinated debt instruments (whether perpetual or not) may be treated as capital resources for solvency purposes if they satisfy the criteria established by the supervisor. Other liabilities that are not subordinated would not be considered as part of the capital resources; examples include liabilities such as deferred tax liabilities and pension liabilities.
- [18] However, adequate recognition should be given to contractual features of the debt such as embedded options which may change its loss absorbency.
- 17.10.10 It may, therefore, be appropriate to exclude some elements of funding from liabilities and so include them in capital to the extent appropriate. This would be appropriate if these elements have characteristics which protect policyholders by meeting one or both of the objectives set out in Guidance 17.2.6 above.

Treatment of Contingent Assets

- 17.10.11 It may be appropriate to include contingent elements which are not considered as assets under the relevant accounting standards, where the likelihood of payment if needed is sufficiently high according to criteria specified by the supervisor. Such contingent capital may include, for example, letters of credit, members’ calls by a mutual insurer or the unpaid element of partly paid capital and may be subject to prior approval by the supervisor.

Treatment of Assets Which May Not be Fully Realisable on a Going-concern or Wind-up Basis

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17.10.12 Supervisors should consider that, for certain assets in the balance sheet, the realisable value under a wind-up scenario may become significantly lower than the economic value which is attributable under going-concern conditions. Similarly, even under normal business conditions, some assets may not be realisable at full economic value, or at any value, at the time they are needed. This may render such assets unsuitable for inclusion at their full economic value for the purpose of meeting required capital. [19]

[19] In particular, supervisors should consider the value of contingent assets for solvency purposes taking into account the criteria set out in Guidance 17.11.21.

17.10.13 Examples of such assets include:

- own shares directly held by the insurer: the insurer has bought and is holding its own shares thereby reducing the amount of capital available to absorb losses under going concern or in a wind-up scenario;
- intangible assets: their realisable value may be uncertain even during normal business conditions and may have no significant marketable value in run-off or winding-up; Goodwill is a common example;
- future income tax credits: such credits may only be realisable if there are future taxable profits, which is improbable in the event of insolvency or winding-up;
- implicit accounting assets: under some accounting models, certain items regarding future income are included, implicitly or explicitly, as asset values. In the event of run-off or winding-up, such future income may be reduced;
- investments^[20] in other insurers or financial institutions: such investments may have uncertain realisable value because of contagion risk between entities; also there is the risk of “double gearing” where such investments lead to a recognition of the same amount of available capital resources in several financial entities; and
- company-related assets: certain assets carried in the accounting statements of the insurer could lose some of their value in the event of run-off or winding-up, for example physical assets used by the insurer in conducting its business which may reduce in value if there is a need for the forced sale of such assets. Also, certain assets may not be fully accessible to the insurer e.g. surplus in a corporate pension arrangement.

[20] These investments include investment in the equity of, loans granted to, deposits with and bonds issued by the related parties.

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17.10.14 The treatment of such assets for capital adequacy purposes may need to reflect an adjustment to its economic value. Generally, such an adjustment may be effected either:

- directly, by not admitting a portion of the economic value of the asset for solvency purposes (deduction approach); or
- indirectly, through an addition to regulatory capital requirements (capital charge approach).

Deduction Approach

17.10.15 Under the deduction approach, the economic value of the asset is reduced for solvency purposes. This results in capital resources being reduced by the same amount. The partial (or full) exclusion of such an asset may occur for a variety of reasons, for example, to reflect an expectation that it would have only limited value in the event of insolvency or winding-up to absorb losses. No further adjustment would normally be needed in the determination of regulatory capital requirements for the risk of holding such assets.

Capital Charge Approach

17.10.16 Under the capital charge approach, an economic value is placed on the asset for the purpose of determining available capital resources. The risk associated with the asset – i.e. a potential deterioration of the economic value of the asset due to an adverse event which may occur during the defined solvency time horizon - would then need to be reflected in the determination of regulatory capital requirements. This should take into account the estimation uncertainty [21] inherent in the determination of the economic value.

[21] This refers to the degree of inaccuracy and imprecision in the determination of the economic value where observable values are not available, and estimation methodologies need to be applied. Sources for this estimation uncertainty are for example the possibility that the assumptions and parameters used in the valuation are incorrect, or that the valuation methodology itself is deficient.

Choice and Combination of Approaches

17.10.17 As outlined above, an application of the deduction approach would lead to a reduction in the amount of available capital resources, whereas an application of the capital charge approach would result in an increase in regulatory capital requirements. Provided the two approaches are based on a consistent economic assessment of the risk associated with the relevant assets, they would be expected to produce broadly similar results regarding the overall assessment of the solvency position of the insurer.

17.10.18 For some asset classes, it may be difficult to determine a sufficiently reliable economic value or to assess the associated risks. Such difficulties may also arise where there is a high concentration of exposure to a particular asset or type of assets or to a particular counterparty or group of counterparties.

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- 17.10.19 A supervisor should choose the approach which is best suited to the organisation and sophistication of the insurance sector and the nature of the asset class and asset exposure considered. It may also combine different approaches for different classes of assets. Whatever approach is chosen, it should be transparent and consistently applied. It is also important that any material double counting or omission of risks under the calculations for determining the amounts of required and available regulatory capital is avoided.

Reconciliation of Approaches

- 17.10.20 The approach to determining available capital resources as broadly the amount of assets over liabilities (with the potential adjustments as discussed above) may be described as a “top-down” approach - i.e. starting with the high level capital as reported in the balance sheet and adjusting it in the context of the relevant solvency control level. An alternative approach which is also applied in practice is to sum up the amounts of particular items of capital which are specified as being acceptable. Such a “bottom-up” approach should be reconcilable to the “top-down” approach on the basis that the allowable capital items under the “bottom-up approach” should ordinarily include all items which contribute to the excess of assets over liabilities in the balance sheet, with the addition or exclusion of items as per the discussion in Guidance 17.10.8 - 17.10.19.

Other Considerations

- 17.10.21 A number of factors may be considered by the supervisor in identifying what may be regarded as capital resources for solvency purposes, including the following:
- the way in which the quality of capital resources is addressed by the supervisor, including whether or not quantitative requirements are applied to the composition of capital resources and/or whether or not a categorisation or continuum- based approach is used;
 - the coverage of risks in the determination of technical provisions and regulatory capital requirements;
 - the assumptions in the valuation of assets and liabilities (including technical provisions) and the determination of regulatory capital requirements, e.g. going-concern basis or wind-up basis, before tax or after tax, etc;
 - policyholder priority and status under the legal framework relative to other creditors in the jurisdiction;
 - overall quality of risk management and governance frameworks in the insurance sector in the jurisdiction;
 - the comprehensiveness and transparency of disclosure frameworks in the jurisdiction and the ability for markets to exercise sufficient scrutiny and impose market discipline;
 - the development of the capital market in the jurisdiction and its impact on the ability of insurers to raise capital;

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- the balance to be struck between protecting policyholders and the impact on the effective operation of the insurance sector and considerations around unduly onerous levels and costs of regulatory capital requirements;
- the relationship between risks faced by insurers and those faced by other financial services entities, including banks.

Additional Guidance for Insurance Groups and Insurance Legal Entities That Are Members of Groups

- 17.10.22 The considerations set out in Guidance 17.10.3 - 17.10.21 above apply equally to insurance legal entity and group-wide supervision. The practical application of these considerations will differ according to whether a legal entity focus or a group level focus is taken to group-wide supervision. Whichever approach is taken, key group-wide factors to be addressed in the determination of group-wide capital resources include multiple gearing, intra-group creation of capital and reciprocal financing, leverage of the quality of capital and fungibility of capital and free transferability of assets across group entities. There may be particular concerns where such factors involve less transparent transactions e.g. because they involve both regulated and non-regulated entities or where there is a continuous sequence of internal financing within the group, or closed loops in the financing of the group.

Criteria for the Assessment of the Quality and Suitability of Capital Resources

17.11 The supervisor establishes criteria for assessing the quality and suitability of capital resources, having regard to their ability to absorb losses on both a going-concern and wind-up basis.

- 17.11.1 In view of the two objectives of capital resources set out in Guidance 17.2.6, the following questions need to be considered when establishing criteria to determine the suitability of capital resources for regulatory purposes:
- To what extent can the capital element be used to absorb losses on a going-concern basis or in run-off?
 - To what extent can the capital element be used to reduce the loss to policyholders in the event of insolvency or winding-up?
- 17.11.2 Some capital elements are available to absorb losses in all circumstances i.e. on a going concern basis, in run-off, in winding-up and insolvency. For example, common shareholders' funds (ordinary shares and reserves) allow an insurer to absorb losses on an ongoing basis, are permanently available and rank as the most subordinate instruments in a winding-up. Further, this element of capital best allows insurers to conserve resources when they are under stress because it provides an insurer with full discretion as to the amount and timing of distributions. Consequently, common shareholders' funds are a core element of capital resources for the purpose of solvency assessment.

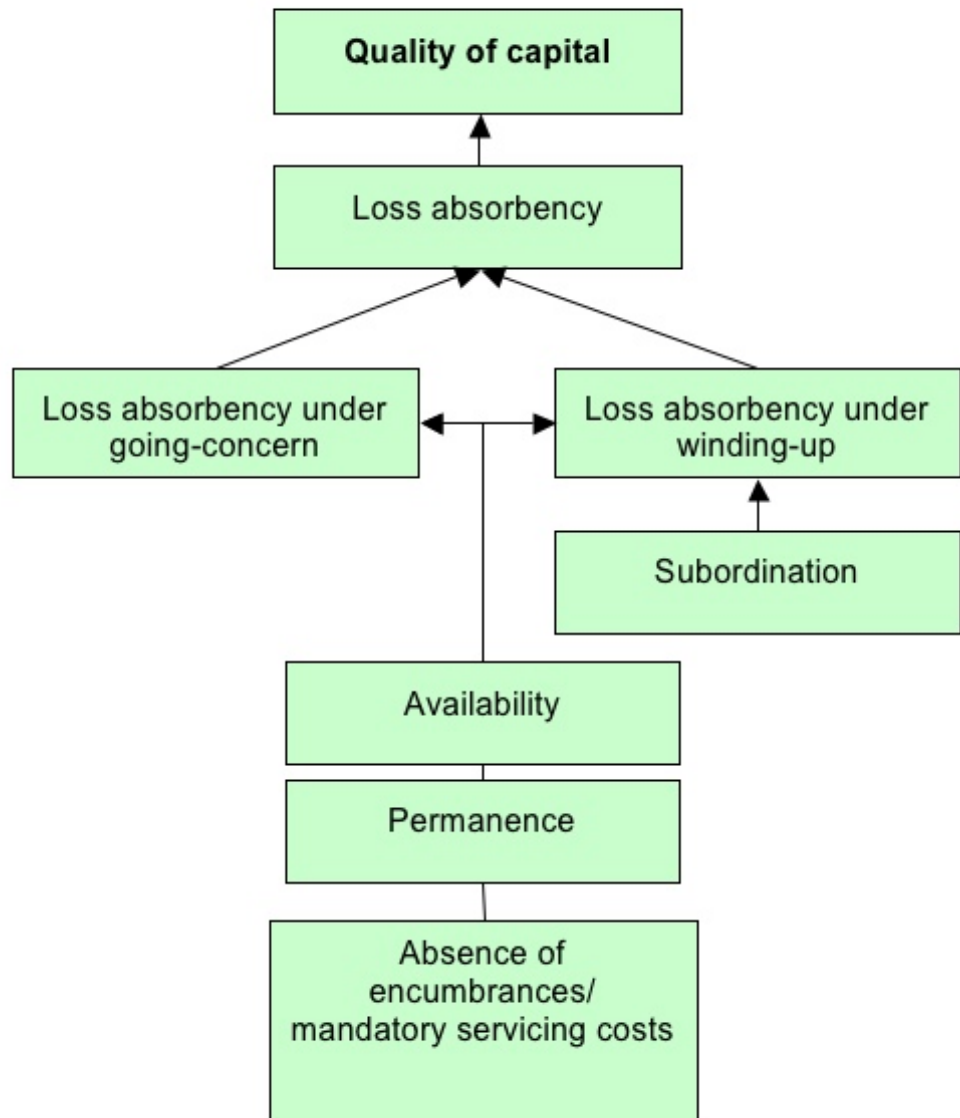
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- 17.11.3 The extent of loss absorbency of other capital elements can vary considerably. Hence, a supervisor should take a holistic approach to evaluating the extent of loss absorbency overall and should establish criteria that should be applied to evaluate capital elements in this regard, taking into account empirical evidence that capital elements have absorbed losses in practice, where available.
- 17.11.4 To complement the structure of regulatory capital requirements, the supervisor may choose to vary the criteria for capital resources suitable for covering the different solvency control levels established by the supervisor. Where such an approach is chosen, the criteria relating to capital resources suitable for covering an individual control level should have regard to the supervisory intervention that may arise if the level is breached and the objective of policyholder protection.
- 17.11.5 For example, considering that the main aim of the MCR is to provide the ultimate safety net for the protection of the interests of policyholders, the supervisor may decide to establish more stringent quality criteria for capital resources suitable to cover the MCR (regarding such resources as a “last line of defence” for the insurer both during normal times and in wind-up) than for capital resources to cover the PCR.
- 17.11.6 Alternatively, a common set of regulatory criteria for capital resources could be applied at all solvency control levels, with regulatory capital requirements reflecting the different nature of the various solvency control levels.
- 17.11.7 In assessing the ability of elements of capital to absorb losses, the following characteristics are usually considered:
- the extent to which and in what circumstances the capital element is subordinated to the rights of policyholders in an insolvency or winding-up (subordination);
 - The extent to which the capital element is fully paid and available to absorb losses (availability);
 - the period for which the capital element is available (permanence); and
 - the extent to which the capital element is free from mandatory payments or encumbrances (absence of encumbrances and mandatory servicing costs).
- 17.11.8 In the first bullet of Guidance 17.11.7 above, this characteristic is inherently linked to the ability of the capital item to absorb losses in the event of insolvency or winding-up. The characteristics of permanence and availability are relevant for loss absorbency under both going-concern and winding-up; taken together, they could be described as being able to absorb losses when needed. The fourth characteristic is related to the degree to which the capital is conserved until needed, and in the case of absence of mandatory serving costs is primarily relevant for ensuring loss absorbency on a going-concern basis.

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17.11.9 The relationship between these characteristics is illustrated below:

Figure 17.5



17.11.10 In the following Guidance, we examine how the characteristics of capital resources described above may be used to establish criteria for an assessment of the quality of capital elements for regulatory purposes. It is recognised that views about the specific characteristics that are acceptable may differ from jurisdiction to jurisdiction and will reflect, amongst other things, the extent to which the pre-conditions for effective supervision exist within the jurisdiction and the risk tolerance of the particular supervisor.

Subordination

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- 17.11.11 To require that a capital element is available to protect policyholders, it must be legally subordinated to the rights of policyholders and senior creditors of the insurer in an insolvency or winding-up. This means that the holder of a capital instrument is not entitled to repayment, dividends or interest once insolvency or winding-up proceedings have been started until all obligations to the insurer's policyholders have been satisfied.
- 17.11.12 In addition, there should be no encumbrances that undermine the subordination or render it ineffective. One example of this would be applying rights of offset where creditors are able to set off amounts they owe the insurer against the subordinated capital instrument [22]. Further, the instrument should not be guaranteed by either the insurer or another related entity unless it is clear that the guarantee is available subject to the policyholder priority. In some jurisdictions subordination to other creditors may also need to be taken into account.
- [22] Rights of offset will vary according to the legal environment in a jurisdiction.
- 17.11.13 Each jurisdiction is governed by its own laws regarding insolvency and winding-up. Common equity shareholders normally have the lowest priority in any liquidating distribution of assets, immediately following preferred shareholders. In some jurisdictions, insurers can issue subordinated debt that provides protection to policyholders and creditors in insolvency. While policyholders are often given a legal priority above other creditors such as bondholders, this is not always the case; some jurisdictions treat policyholders and other creditors equally. Some jurisdictions rank obligations to the government (e.g. taxes) and obligations to employees, ahead of policyholders and other creditors. Where creditors have secured claims, they may rank before policyholders. The determination of suitable capital elements for solvency purposes is critically dependent upon the legal environment of the relevant jurisdiction.
- 17.11.14 The supervisor should evaluate each potential capital element in the context that its value and suitability, and hence an insurer's solvency position may change significantly in a wind-up or insolvency scenario. In most jurisdictions the payment priority in a wind-up situation is clearly stated in law.

Availability

- 17.11.15 In order to satisfy the primary requirement that capital resources are available to absorb unforeseen losses, it is important that capital elements are fully paid.
- 17.11.16 However, in some circumstances, a capital element may be paid for "in kind" i.e. issued for non-cash. The supervisor should define the extent to which payment other than cash is acceptable for a capital element to be treated as fully paid without prior approval by the supervisor and the circumstances where payment for non-cash consideration may be considered as suitable subject to approval by the supervisor. There may, for example, be issues about the valuation of the non-cash components or the interests of parties other than the insurer.

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- 17.11.17 It may also be appropriate to treat certain contingent elements of capital as available capital resources in cases where the probability of payment is expected to be sufficiently high (for example, the unpaid part of partly paid capital, contributions from members of a mutual insurer or letters of credit, see Guidance 17.10.11).
- 17.11.18 Where a supervisor allows contingent elements of capital to be included in the determination of capital resources, such inclusion would be expected to be subject to meeting specific supervisory requirements or prior supervisory approval. When assessing the appropriateness of inclusion of a contingent element of capital, regard should be had to:
- the ability and willingness of the counterparty concerned to pay the relevant amount;
 - the recoverability of the funds, taking into account any conditions which would prevent the item from being successfully paid in or called up; and
 - any information on the outcome of past calls which have been made in comparable circumstances by other insurers, which may be used as an indication of future availability.
- 17.11.19 The availability of capital instruments may also be impaired when capital is not fully fungible within an insurer to cover losses arising from the insurer's business. Whereas the fungibility of capital and transferability of assets is primarily an issue in the context of group solvency assessment, it may also be relevant for the supervision of an insurer as a legal entity.
- 17.11.20 For example, this is the case where – as applies to certain forms of with-profit business in life insurance – part of the assets or surplus of the insurer is segregated from the rest of its operations in a ring-fenced fund. In such cases, assets in the fund may only be able to be used to meet obligations to policyholders with respect to which the fund has been established. In these circumstances, the insurer's available capital resources relating to the ring-fenced fund can only be used to cover losses stemming from risks associated with the fund (until transferred out of that fund) and cannot be transferred to meet the insurer's other obligations.

Permanence

- 17.11.21 To provide suitable protection for policyholders for solvency purposes, a capital element must be available to protect against losses for a sufficiently long period to ensure that it is available to the insurer when needed. Supervisors may want to determine a minimum period that capital should be outstanding to be regarded as capital resources for solvency purposes.

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17.11.22 When assessing the extent of permanence of a capital element, regard should be had to:

- the duration of the insurer's obligations to policyholders;^[23]
- contractual features of the capital instrument which have an effect on the period for which the capital is available, e.g. lock-in clauses, step-up options or call options;
- any supervisory powers to restrict the redemption of capital resources; and
- the time it might take to replace the capital element on suitable terms as it approaches maturity.

[23] The duration of the insurer's obligations to policyholders should be assessed on an economic basis rather than strict contractual basis.

17.11.23 Similarly, if a capital element has no fixed maturity date, the notice required for repayment should be assessed against the same criteria.

17.11.24 It is important to take into account incentives to redeem a capital element prior to its maturity date which may exist in a capital element and may effectively reduce the period for which the capital is available. For example, a capital instrument which features a coupon rate which increases from its initial level at a specified date after issue, may give rise to an expectation that the instrument will be paid back at that future specified date.

Absence From Mandatory Servicing Requirements or Encumbrances

17.11.25 The extent to which capital elements require servicing in the form of interest payments, shareholder dividend payments and principal repayments should be considered, as it will affect the insurer's ability to absorb losses on a going-concern basis.

17.11.26 Capital elements that have a fixed maturity date may have fixed servicing costs that cannot be waived or deferred before maturity. The presence of such features also affects the insurer's ability to absorb losses on a going-concern basis and may accelerate insolvency if the payment of a servicing cost results in the insurer breaching its regulatory capital requirements.

17.11.27 A further consideration is the extent to which payments to capital providers or redemption of capital elements should be restricted or subject to supervisory approval. For example, the supervisor may have the ability to restrict the payment of dividends or interest and any redemption of capital resources where considered appropriate to preserve the solvency position of the insurer. Insurers may also issue capital instruments for which payments and redemptions are fully discretionary or subject to supervisory approval according to the contractual terms.

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- 17.11.28 Some capital instruments are structured so as to restrict the payment of dividends or interest and any redemption of capital resources where an insurer is breaching or near to breaching its regulatory capital requirements and/or is incurring loss. The payment of dividends or interest may also be subordinated to policyholder interests in case of winding-up or insolvency. Such features will contribute to the ability of the capital instrument to absorb losses on a wind-up basis provided that any claims to unpaid dividends or interest are similarly subordinated.
- 17.11.29 It should also be considered whether the capital elements contain encumbrances which may restrict their ability to absorb losses, such as guarantees of payment to the capital provider or other third parties, hypothecation or any other restrictions or charges which may prevent the insurer from using the capital resource when needed. Where the capital element includes guarantees of payment to the capital provider or other third parties, the priority of that guarantee in relation to policyholders' rights should be assessed. Encumbrances may also undermine other characteristics such as permanence or availability of capital.

Determination of Capital Resources to Meet Regulatory Capital Requirements

- 17.11.30 Based on the assessment of the quality of the capital elements comprising the total capital resources potentially available to the insurer, the final capital resources suitable to meet the regulatory capital requirements can be determined.
- 17.11.31 Capital elements that are fully loss absorbent under both a going-concern and a wind-up perspective would generally be allowed to cover any of the different levels of regulatory capital requirements. However, the supervisor may choose to restrict the extent to which the stronger solvency control levels (i.e. control levels which trigger more severe supervisory interventions) may be covered by lower quality capital resources or to establish minimum levels for the extent to which these stronger requirements should be covered by the highest quality capital resources. In particular, this applies to amounts of capital resources which are intended to cover the MCR.
- 17.11.32 To determine the amount of an insurer's capital resources, supervisors may choose a variety of approaches:
- approaches which categorise capital resources into different quality classes ("tiers") and apply certain limits/restrictions with respect to these tiers (tiering approaches);
 - approaches which rank capital elements on the basis of the identified quality characteristics (continuum-based approaches); or
 - approaches which do not attempt to categorise or rank capital elements, but apply individual restrictions or charges where necessary.

To accommodate the quality of assets and quality of capital elements,

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combinations of the above approaches have been widely used in various jurisdictions for solvency purposes for insurance and other financial sectors.

Determination of Capital Resources to Meet Regulatory Capital Requirements - tiering approach

- 17.11.33 To take into account the quality of capital instruments, a tiering approach is commonly used in many jurisdictions and in other financial sectors. Under a tiering approach, the composition of capital resources is based on the categorisation of elements of capital according to the quality criteria set by the supervisor.
- 17.11.34 In many jurisdictions, capital elements are categorised into two or three distinct levels of quality when considering criteria for, and limits on, those capital elements for solvency purposes. For example, one broad categorisation may be as follows; [24]
- Highest quality capital - permanent capital that is fully available to cover losses of the insurer at all times on a going-concern and a wind-up basis;
 - Medium quality capital - capital that lacks some of the characteristics of highest quality capital, but which provides a degree of loss absorbency during ongoing operations and is subordinated to the rights (and reasonable expectations) of policyholders; and
 - Lowest quality capital - capital that provides loss absorbency in insolvency/ winding-up only.

[24] Capital elements categorised as being of highest quality are often referred to as core capital and lower levels as supplementary capital, or similar.

- 17.11.35 Under a tiering approach, the supervisor would set minimum or upper levels for the extent to which required capital should comprise the various categories or tiers (for example, high, medium, low) of capital elements. Where established, the level may be expressed as a percentage of required capital [25] (for example, a minimum level of 50% [26] of required capital for high quality capital elements and/or an upper limit for lowest quality capital might be 25% of required regulatory capital). There may also be limits set on the extent to which required capital may be comprised of certain specific types of capital elements (for example, perpetual subordinated loan capital and perpetual cumulative preference share capital may be limited to 50% of required capital.)

[25] Alternative approaches may also be used in practice, for example, where the levels are expressed as a percentage of available capital.

[26] *The percentages used may vary for supervisors in different jurisdictions*



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- 17.11.36 What constitutes an adequate minimum or upper level may depend on the nature of the insurance business and how the requirement interacts with the various solvency control levels. A separation into tiers as set out above assumes that all elements of capital can clearly be identified as belonging to one of the specified tiers and that elements falling into an individual tier will all be of the same quality. In reality, such distinctions between elements of capital may not be clear cut and different elements of capital will exhibit the above quality characteristics in varying degrees.
- 17.11.37 There are two potential policy responses to this fact. One is to set minimum quality thresholds on the characteristics the capital must have to be included in the relevant tier - as long as these thresholds are met for a given element then it can be included in the relevant tier of capital without limit. The other approach is to set minimum quality thresholds for limited inclusion in the relevant tier, but to set additional higher quality thresholds for elements to be permitted to be included in that tier without limit. This approach effectively sub-divides the tiers. It permits greater recognition within a given tier for elements of capital which are more likely to fulfil the quality targets specified for that tier.
- 17.11.38 Where a tiering approach is applied, this should ideally follow the distinction between going-concern capital and wind-up capital. Dividing capital into these tiers is an approach that is also used in the context of regulatory capital requirements for the banking sector.

Determination of Capital Resources to Meet Regulatory Capital Requirements – Continuum-based Approach

- 17.11.39 In other jurisdictions a continuum-based approach may be used in recognising the differential quality of capital elements. Under this approach, elements of capital are not categorised, but rather ranked, relative to other elements of capital on the basis of identified quality characteristics set by the supervisor. The supervisor also defines the minimum acceptable level of quality of capital for solvency purposes and perhaps for different solvency control levels. In this way the capital elements are classified from highest to lowest quality on a continuous basis; only capital elements sitting above this defined minimum level on the continuum, would be accepted as capital resources for solvency purposes. Due consideration should again be given to the quality of capital elements to ensure that there is an appropriate balance of going-concern and wind-up capital.

Determination of Capital Resources to Meet Regulatory Capital Requirements – Other Approaches on Determination of Capital Resources

- 17.11.40 The supervisor may also apply approaches that are not based on an explicit categorisation of capital instruments, but more on an assessment of the quality of individual capital instruments and their specific features. For example, the terms of a hybrid capital instrument may not provide enough certainty that coupon payments will be deferred in times of stress. In such a case, the supervisor's approach may limit (possibly taking into account further quality criteria) the ability of that instrument to cover the regulatory capital requirements.

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Determination of Capital Resources to Meet Regulatory Capital Requirements – Choice and Combination of Approaches

- 17.11.41 Each approach has advantages and disadvantages. Jurisdictions should consider the organisation and sophistication of the insurance sector and choose the best approach appropriate to the circumstances. Whatever approach is used overall, it should be transparent and be consistently applied so that capital resources are of sufficient quality on a going-concern and a wind-up basis.
- 17.11.42 It is recognised that in some markets, only a limited range of instruments (for example, pure equity) may meet the quality criteria set out above. Accordingly, supervisors in such markets may wish to restrict the range of instruments that may be included in capital resources for solvency purposes or to apply procedures for prior approval as appropriate.
- 17.11.43 It is also important that the approach to the determination of capital resources for solvency purposes is consistent with the framework and principles underlying the determination of regulatory capital requirements. This includes not only the implemented range of solvency control levels but is also relevant with regard to the target criteria underlying the regulatory capital requirements. In particular, the target criteria for regulatory capital requirements and hence the approach to determining capital resources should be consistent with the way in which the supervisor addresses the two broad aims of capital from a regulatory perspective as described in Guidance 17.2.6.
- 17.11.44 To illustrate this, suppose that in setting regulatory capital requirements the supervisor would consider the maximum probability over a specified time period with which they are willing to let unforeseen losses cause the insolvency of an insurer. In such a case, insurers would need to maintain sufficient capital resources to absorb losses before insolvency or winding-up occurs. Hence the determination of capital resources would need to lay sufficient emphasis on the first objective stated in Guidance 17.2.6 (loss absorbency under going concern), and could not entirely rely on the second objective (loss absorbency solely under insolvency or winding-up).

Additional Guidance for Insurance Groups and Insurance Legal Entities That Are Members of Groups

- 17.11.45 The considerations set out in Guidance 17.11.1 - 17.11.44 above apply equally to insurance legal entity and group-wide supervision. See Guidance 17.10.22 for additional guidance on the criteria for the assessment of the quality and suitability of capital resources for insurance groups and insurance legal entities that are members of groups.

Multiple Gearing and Intra-group Creation of Capital

- 17.11.46 Double gearing may occur if an insurer invests in a capital instrument that counts as regulatory capital of its subsidiary, its parent or another group entity. Multiple gearing may occur if a series of such transactions exist.

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- 17.11.47 Intra-group creation of capital may arise from reciprocal financing between members of a group. Reciprocal financing may occur if an insurance legal entity holds shares in or makes loans to another legal entity (either an insurance legal entity or otherwise) which, directly or indirectly, holds a capital instrument that counts as regulatory capital of the first insurance legal entity.
- 17.11.48 For group-wide capital adequacy assessment with a group level focus, a consolidated accounts method would normally eliminate intra-group transactions and consequently multiple gearing and other intra-group creation of capital whereas, without appropriate adjustment, a legal entity focus may not. Whatever approach is used, multiple gearing and other intra-group creation of capital should be identified and treated in a manner deemed appropriate by the supervisor to largely prevent the duplicative use of capital.

Leverage

- 17.11.49 Leverage arises where a parent, either a regulated company or an unregulated holding company, issues debt or other instruments which are ineligible as regulatory capital or the eligibility of which is restricted and down-streams the proceeds as regulatory capital to a subsidiary. Depending on the degree of leverage, this may give rise to the risk that undue stress is placed on a regulated entity as a result of the obligation on the parent to service its debt.

Fungibility and Transferability

- 17.11.50 In the context of a group-wide solvency assessment, excess capital in an insurance legal entity above the level needed to cover its own capital requirements may not always be available to cover losses or capital requirements in other insurance legal entities in the group. Free transfer of assets and capital may be restricted by either operational or legal limitations. Some examples of such legal restrictions are exchange controls in some jurisdictions, surpluses in with-profits funds of life insurers which are earmarked for the benefit of policyholders and rights that holders of certain instruments may have over the assets of the legal entity. In normal conditions, surplus capital at the top of a group can be down-streamed to cover losses in group entities lower down the chain. However, in times of stress such parental support may not always be forthcoming or permitted.
- 17.11.51 The group-wide capital adequacy assessment should identify and appropriately address restrictions on the fungibility of capital and transferability of assets within the group in both “normal” and “stress” conditions. A legal entity approach which identifies the location of capital and takes into account legally enforceable intra-group risk and capital transfer instruments may facilitate the accurate identification of, and provision for, restricted availability of funds. Conversely an approach with a consolidation focus using a consolidated accounts method which starts by assuming that capital and assets are readily fungible/transferable around the group will need to be adjusted to provide for the restricted availability of funds.

General Provisions on the Use of an Internal Model to Determine Regulatory Capital Requirements

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17.12 Where a supervisor allows the use of internal models to determine regulatory capital requirements, the supervisor:

- establishes appropriate modelling criteria to be used for the determination of regulatory capital requirements, which require broad consistency among all insurers within the jurisdiction; and
- identifies the different levels of regulatory capital requirements for which the use of internal models is allowed.

17.12.1 Internal models can be considered in the dual contexts of:

- a method by which an insurer determines its own economic capital^[27] needs; and
- a means to determine an insurer's regulatory capital resources and requirements, where appropriate.

In either case, the quality of the insurer's risk management and governance is vital to the effective use of internal models. If the insurer has supervisory approval, internal models can be used to determine the amount of the insurer's regulatory capital requirements. However, an insurer should not need supervisory approval, initial or ongoing, for the use of its internal model in determining its own economic capital needs or management.

^[27] Economic capital refers to the capital which results from an economic assessment of the insurer's risks given the insurer's risk tolerance and business plans.

17.12.2 One of the main purposes of an internal model is to better integrate the processes of risk and capital management within the insurer. Among other uses, internal models can be used to determine the economic capital needed by the insurer and, if an insurer has supervisory approval, to determine the amount of the insurer's regulatory capital requirements. As a basic principle, an internal model that is to be used for regulatory capital purposes should already be in established use for determining economic capital. The methodologies and assumptions used for the two purposes should be consistent, any differences being explainable in terms of the difference in purposes.

17.12.3 Where the supervisor allows a range of standardised and more tailored approaches for regulatory capital purposes, including internal models, an insurer should have a choice as to which approach it adopts, ^[28] subject to satisfying certain conditions established by the supervisor on the use of internal models for regulatory capital purposes.

^[28] There are a number of considerations that the insurer would also have to make before deciding to invest in constructing an internal model, one of which is cost. The IAIS is not advocating that all insurers must have an internal model (although their use is encouraged where appropriate).

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17.12.4 Where there is a choice of approach allowed by a supervisor, it is inappropriate for an insurer to be able to adopt a process of “cherry-picking” between those approaches^[29] – for example, by choosing to use its model for regulatory capital purposes only when the model results in a lower capital requirement than a standardised approach. The IAIS supports the use of internal models where appropriate as they can be a more realistic, risk-responsive method of calculating capital requirements, but discourages any “cherry-picking” practices by insurers.

[29] Refer to Guidance 17.12.14 in relation to “cherry-picking” in the particular context of partial internal models.

17.12.5 In particular, where the risk profile of an insurer which is using a standardised approach for calculating its regulatory capital requirements is such that the assumptions underlying this approach are inappropriate, the supervisor may use its powers to increase the insurer's capital requirement, or to require the insurer to reduce the risks it bears. However, in such circumstances the supervisor should also consider encouraging the insurer to develop a full or partial internal model which might enable its risk profile to be better reflected in its regulatory capital requirements.

17.12.6 Where the supervisor is aware that an insurer has an existing internal model but has not sought approval to use it to calculate the regulatory capital requirement, the supervisor should discuss this decision with the insurer.

17.12.7 Effective use of internal models by an insurer for regulatory capital purposes should lead to a better alignment of risk and capital management by providing incentives for insurers to adopt better risk management procedures which can:

- produce regulatory capital requirements that are more risk sensitive and better reflect the supervisor's target criteria; and
- assist the integration of the internal model fully into the insurer's strategic, operational and governance processes, systems and controls.

Criteria for the Use of an Internal Model to Determine an Insurer's Regulatory Capital Requirements

17.12.8 Where a supervisor allows the use of internal models to determine regulatory capital requirements, the supervisor should determine modelling criteria, based upon the level of safety required by the supervisor, to be used by an insurer adopting an internal model for that purpose. These criteria should require broad consistency between all insurers within the jurisdiction being based on the same broad level of safety requirements applied to the overall design and calibration of the standardised approach to determining regulatory capital requirements. Discussions with the insurance industry in a jurisdiction may also assist in achieving consistency. The supervisor should set out for which of the different levels of regulatory capital requirements the use of internal models is allowed and determine the modelling criteria for each level.

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- 17.12.9 In particular, when considering whether an internal model may be used in determining the MCR, the supervisor should take into account the main objective of the MCR (i.e. to provide the ultimate safety net for the protection of policyholders) and the ability of the MCR to be defined in a sufficiently objective and appropriate manner to be enforceable. If internal models are allowed for determining the MCR, particular care should be taken so that the strongest supervisory action that may be necessary if the MCR is breached can be enforced, for example if the internal model is challenged in a court of law.
- 17.12.10 The IAIS does not prescribe specific solvency requirements which are compulsory to all IAIS members. Notwithstanding this, the supervisor will need to establish the appropriate modelling criteria to be used by insurers to meet its regulatory capital requirements, and the insurer's internal models will need to be calibrated accordingly if used for that purpose. The IAIS notes that some supervisors who allow the use of internal models to determine regulatory capital requirements have set a confidence level for regulatory purposes, which is comparable with a minimum investment grade level. Some examples of modelling criteria include a 99.5% VaR [30] calibrated confidence level over a one year timeframe,[31] a 99% TVaR[32] over one year[33] and a 95% TVaR over the term of the policy obligations. Different criteria apply for PCR and MCR.
- [30] VaR – Value at risk – an estimate of the worst expected loss over a certain period of time at a given confidence level.
- [31] *This is the level expected in Australia for those insurers that seek approval to use an internal model to determine their MCR. It is also the level used for the calculation of the risk-based Solvency Capital Requirement under the European Solvency II regime.*
- [32] *TVaR – Tail value at risk – the VaR plus the average exceedence over the VaR if such exceedence occurs*
- [33] *These are the modelling criteria of the Swiss Solvency test.*
- 17.12.11 If an internal model is used for regulatory capital purposes, the insurer should ensure that its regulatory capital requirements determined by the model are calculated in a way that is consistent with the objectives, principles and criteria used by the supervisor. For example, the insurer may be able to apply the confidence level specified in the supervisors' modelling criteria directly to the probability distribution forecasts used in its internal model. Alternatively, depending on the insurer's own modelling criteria for its economic capital, an insurer may have to recalibrate its internal model to the modelling criteria required by the supervisor in order to use it for regulatory capital purposes. This will allow internal models to have a degree of comparability to enable supervisors to make a meaningful assessment of an insurer's capital adequacy, without sacrificing the flexibility needed to make it a useful internal capital model in the operation of the insurer's business. Further elaboration is provided in Guidance 17.15.1 - 17.15.2.

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- 17.12.12 It is noted that, due to the insurer-specific nature of each internal model, internal models can be very different from each other. Supervisors, in allowing the use of an internal model for regulatory capital purposes, should preserve broad consistency of capital requirements between insurers with broadly similar risks.

Partial Internal Models

- 17.12.13 The IAIS supports the use of partial internal models for regulatory capital purposes, where appropriate. A partial internal model typically involves the use of internal modelling to substitute parts of a standardised approach for the determination of regulatory capital requirements. For example, an insurer could decide to categorise its insurance contracts along business lines for modelling purposes. If the regulatory capital requirements for some of these categories are determined by modelling techniques, while the capital requirements for other categories are determined using a standardised approach, then this would constitute the insurer using a partial internal model to calculate regulatory capital.
- 17.12.14 Partial internal models are often used to smooth an insurer's transition to full use of an internal model or to deal with instances such as the merger of two insurers, one of which uses an internal model, and the other which uses a standardised approach. Given the potential complexity of a full internal model, use of a partial internal model could be a satisfactory approach provided its scope is properly defined (and approved by the supervisor). Provided the reduced scope of the internal model is soundly justified, the use of a partial internal model could be allowed as a permanent solution. However, as discussed above, there could be a tendency for an insurer to adopt a “cherry-picking” approach in the use of internal models. This particularly applies where partial modelling is allowed. The supervisor should place the onus on the insurer to justify why it has chosen to only use internal models for certain risks or business lines. Where this justification is not sound enough, the supervisor should take appropriate action e.g. refuse or withdraw approval of the model or impose a capital add-on until the model has developed to a sufficient degree.
- 17.12.15 This ICP should be applied to both partial and full internal models. Partial models should therefore be subject, as appropriate, to the full range of tests: the “statistical quality test”, “calibration test” and “use test” (see Guidance 17.13.1 - 17.17.8). In particular, an insurer should assess how the partial internal model achieves consistency with the modelling criteria specified by the supervisor for regulatory purposes. As part of the approval process for regulatory capital use, an insurer should be required to justify the limited scope of the model and why it considers that using partial internal modelling for determining regulatory capital requirements is more consistent with the risk profile of the business than the standardised approach or why it sufficiently matches regulatory capital requirements. The insurer should clearly document the reasons behind its decision to use partial internal models. If, for example, this is to ease transition towards full internal models, the insurer should outline a transitional plan, considering the implications for risk and capital management of the transition. Such plans and use of partial

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risk and capital management of the transition. Such plans and use of partial internal models should be reviewed by the supervisor, who may decide to impose certain restrictions on the partial model's use for calculating regulatory capital (for example, introducing a capital add-on during the transitional period).

Additional Guidance for Group-wide Internal Models

- 17.12.16 Where a supervisor allows the use of group-wide internal models^[34] to determine regulatory capital requirements, the supervisor should determine modelling criteria for such models, based upon the level of safety required by the supervisor applicable to an insurance group or an insurance legal entity adopting an internal model for that purpose.
- [34] A group-wide internal model is a risk measurement system a group uses for its internal purposes to analyse and quantify risks to the group as a whole as well as risks to the various parts of the group, to determine the capital resources needed to cover those risks and to allocate capital resources across the group. Group-wide internal models include partial models which capture a subset of the risks to the group and/or all the risks of a subset of the group. Group-wide internal models also include combinations of models in respect of different parts of the group. An insurer's internal model may be part of a broader group-wide model rather than a standalone model.
- 17.12.17 The modelling criteria for internal models for regulatory capital purposes and the process for internal model approval that a supervisor establishes should require broad consistency between group-wide regulatory capital requirements and regulatory capital requirements of individual insurance legal entities.
- 17.12.18 Group-wide internal models can vary greatly depending on their group-specific nature. In allowing the use of group-wide internal models for regulatory capital purposes, supervisors should preserve broad consistency between insurance groups and insurers with broadly similar risks e.g. insurance legal entities and insurance groups operating through a branch structure in a jurisdiction. The supervisor should design modelling criteria and the process for model approval so as to maintain broad consistency between the regulatory capital requirements determined using internal models and standardised approaches.
- 17.12.19 The IAIS recognises that modelling criteria may differ among supervisors. For Insurance groups operating in multiple jurisdictions, the degree of consistency in regulatory capital requirements across group members may vary.
- 17.12.20 Each supervisor should set out for which group-wide regulatory capital requirements, corresponding to the solvency control level or levels which apply to an insurance group, the use of group-wide internal models is allowed.

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- 17.12.21 In particular, when the supervisor considers allowing the use of internal models for the purpose of determining group-wide regulatory capital requirements at the MCR level, the issues relating to possible legal challenges may differ from those encountered in respect of individual insurance legal entities. For example, supervisors may need to work together to establish and co-ordinate grounds for legal action in respect of the different insurance legal entities within a group.

Initial Validation and Supervisory Approval of Internal Models

17.13 Where a supervisor allows the use of internal models to determine regulatory capital requirements, the supervisor requires:

- prior supervisory approval for the insurer's use of an internal model for the purpose of calculating regulatory capital requirements;
- the insurer to adopt risk modelling techniques and approaches appropriate to the nature, scale and complexity of its current risks and those incorporated within its risk strategy and business objectives in constructing its internal model for regulatory capital purposes;
- the insurer to validate an internal model to be used for regulatory capital purposes by subjecting it, as a minimum, to three tests: "statistical quality test", "calibration test" and "use test"; and
- the insurer to demonstrate that the model is appropriate for regulatory capital purposes and to demonstrate the results of each of the three tests.

Approval of the Use of an Internal Model for Determination of Regulatory Capital Requirements

- 17.13.1 Where insurers may be permitted to use internal models for calculating regulatory capital requirements, the models used for that purpose should be subject to prior supervisory approval. The onus should be placed on the insurer to validate a model that is to be used for regulatory capital purposes and provide evidence that the model is appropriate for those purposes. The IAIS considers that an insurer should not need supervisory approval for the use of internal models in determining its own economic capital needs.
- 17.13.2 The supervisor may prescribe requirements which will allow it to assess different models fairly and facilitate comparison between insurers within its jurisdiction. However, overly prescriptive rules on internal model construction may be counter-productive in creating models which are risk-sensitive and useful for insurers. Therefore, although a certain level of comparability can be achieved by the calibration requirements, full and effective comparison across jurisdictions to align best practice may be best achieved by dialogue between supervisors and industry.

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- 17.13.3 The supervisor should require that in granting approval for the use of an internal model to calculate regulatory capital requirements, it has sufficient confidence that the results being produced by the model provide adequate and appropriate measures of risk and capital. Although the supervisor may encourage insurers to develop internal models that better reflect their risks as soon as possible, this should not lead to models being approved until there is confidence that they are calibrated correctly. The supervisor may therefore feel it necessary to evaluate an internal model over a specified period of time, for example a few years, prior to approval. For supervisors, approval of an internal model could require considerable expertise (depending on the sophistication of the model) which may need to be developed. In addition, it may be necessary to introduce different supervisory powers to allow the approval of internal models.
- 17.13.4 The supervisor should use, at a minimum, the “statistical quality test”, “calibration test” and “use test”, as the basis of its approval process. While a broad range of internal model approaches may be suitable for internal economic capital assessment purposes, and this should not be subject to supervisory approval, supervisors may want to place requirements on the internal model approaches that would be regarded as acceptable for regulatory capital purposes. In approving the use of an internal model for calculating regulatory capital requirements, the supervisor should consider the primary role of the model as part of the insurer’s risk management procedures. Any requirements imposed by the supervisor on the approval of a model for use in determining regulatory capital requirements should not prevent the model from being sufficiently flexible to be a useful strategic decision making tool which reflects the insurer’s unique risk profile. Consistent standards for the approval of an insurer’s internal model should be applied by the supervisor, regardless of whether the model is developed in-house by the insurer or by an external party.
- 17.13.5 The “statistical quality test” and the “use test” are envisaged to be more insurer-specific measures which should allow the supervisor to gain an understanding of how a particular insurer has embedded its internal model within its business. The “calibration test” would be used by the supervisor to assess the results from the internal model in comparison to the insurer’s regulatory capital requirements and to those of other insurers.
- 17.13.6 In addition, the insurer should review its own internal model and validate it so as to satisfy itself of the appropriateness of the model for use as part of its risk and capital management processes. [35] As well as internal review, the insurer may wish to consider a regular independent, external review of its internal model by appropriate specialists.
- [35] Validation should be carried out by a different department or personnel to those that created the internal model to facilitate independence.

Additional Guidance for Group-wide Internal Models

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- 17.13.7 Each supervisor who permits the use of internal models for regulatory capital purposes at legal entity and/or group level should require prior supervisory approval for that purpose.
If an insurance group wishes to use its group-wide internal model for regulatory capital purposes in more than one jurisdiction in which it operates, the group may be subject to requirements that differ in a number of ways. Examples of some areas of possible variation may include:
- modelling criteria (risk measure, time horizon, level of safety);
 - valuation bases for regulatory capital purposes;
 - the risks that have to be modelled;
 - treatment of intra-group transactions;
 - approach to group-wide capital adequacy (e.g. group level or legal entity focus); and
 - recognition of diversification across the group.
- A group-wide internal model therefore needs to be sufficiently flexible to meet the differing requirements of each jurisdiction in which it is to be used for regulatory capital purposes.
- 17.13.8 The supervisors of an insurance group that conducts insurance business in more than one jurisdiction may consider their joint and common interests for the joint approval of the use of a group-wide internal model for regulatory capital purposes. If so, it may improve the efficiency and effectiveness of the approval process if the supervisors agree on common requirements for the process e.g. standardised language or languages for the application process.
- 17.13.9 Alternatively, the supervisors may independently approve the use of a group-wide internal model. Therefore, an insurance group seeking approval for a group-wide internal model may receive permission from one supervisor to use the model in that jurisdiction, while not receiving approval in another jurisdiction.
- 17.13.10 Similarly, where an insurance legal entity operates in other jurisdictions through a branch structure, the supervisors in those branch jurisdictions will have an interest in the solvency of the insurance legal entity. If local branch supervisors in these jurisdictions are not satisfied with the capital requirements of the home supervisor, possibly because they are determined using internal models, the local branch supervisors may impose limitations on the branch operations. The home supervisor, however, does not need to have the approval of the local branch supervisors in order to approve the use of the insurance legal entity's internal model for its own purposes.
- 17.13.11 The degree of involvement of different supervisors in the approval process depends on a number of factors as illustrated in Guidance 17.13.12 - 17.13.16.

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- 17.13.12 In the simplest case, an insurance group operates in one jurisdiction only. Clearly only the supervisor in that jurisdiction needs to be involved in the group-wide internal model approval process. Where there is more than one supervisor in a jurisdiction, e.g. where different insurance activities of a group are supervised separately, then both may need to be involved depending on the scope of the model. Nevertheless, some liaison with supervisors in other jurisdictions may be mutually beneficial to facilitate convergence and comparability across jurisdictions in respect of internal model standards and practice.
- 17.13.13 In the case of an insurance group that operates in more than one jurisdiction but only applies to use its group-wide internal model for regulatory capital purposes in one jurisdiction, e.g. the parent's jurisdiction, the group does not need group-wide internal model approval of other jurisdictions provided that it is using other approaches to meet the capital requirements of those other jurisdictions. However, the supervisor considering approval of the group-wide internal model may wish to consult the other supervisors about the relevant insurance markets, the group's operations in those markets and the standard of modelling.
- 17.13.14 In the case of an insurance group that wishes to use its group-wide internal model in more than one jurisdiction (e.g. to calculate insurance legal entity PCR_s), the supervisor of each of those jurisdictions should consider approval of the specific application of the group-wide internal model in its jurisdiction, having regard to the considerations in Guidance 17.13.15 - 17.13.18 below.
- 17.13.15 When considering approval of the use of a group-wide internal model for group-wide regulatory capital purposes, each supervisor should consider:
- its group-wide regulatory capital requirements;
 - whether and the extent to which its jurisdiction allows the use of internal models for regulatory capital purposes (e.g. PCR or both PCR and MCR);
 - how its jurisdiction interacts with the other jurisdictions potentially involved when supervisory intervention is being considered; and
 - the arrangements for collaboration between the supervisors of the entities within the insurance group.
- 17.13.16 A supervisor may delegate the approval process to another supervisor or agree to be bound by its decision while retaining supervisory responsibility. Alternatively, a group-wide supervisor may have ultimate decision-making authority over some or all of the supervisors involved. If more than one jurisdiction is concerned, making such authority legally binding may require a treaty between these jurisdictions. To be effective, each arrangement requires a high level of collaboration between supervisors. To require the model appropriately addresses all categories of risk, the supervisor making the decision needs sufficient knowledge of the local circumstances in which the group operates.

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- 17.13.17 Supervisors should require that the approval process for the use of a group-wide internal model for regulatory capital purposes is sufficiently flexible to achieve an approach appropriate to the nature, scale and complexity at each organisational level in an insurance group (group/sub-group/individual insurance legal entity). Risks which may have a large impact at insurance legal entity level may have much smaller significance at insurance group level. Conversely, risks that may have a small impact at insurance legal entity level may aggregate to have a larger impact on risk at the group level. The nature and complexity of risks may also vary at different levels in the insurance group.
- 17.13.18 Whether the group-wide internal model is appropriate for regulatory purposes given the nature, scale and complexity of the risks depends on the regulatory capital requirements of a jurisdiction. While the risk coverage by an internal model may look reasonable from a group-wide perspective, it may not be reasonable from the point of view of each member of the insurance group. For example, in a group of many non-life insurers and one small life insurer it may be appropriate from an overall perspective to place less emphasis on the modelling of the life insurance risks. However this may not be appropriate from the life insurer's or supervisor's perspective. In such circumstances, it may be necessary for the group to upgrade its model to include an adequate life insurance risk component or to set up a self-contained internal model for the life insurer in order to gain approval.

Statistical Quality Test for Internal Models

17.14 Where a supervisor allows the use of internal models to determine regulatory capital requirements, the supervisor requires:

- the insurer to conduct a “statistical quality test” which assesses the base quantitative methodology of the internal model, to demonstrate the appropriateness of this methodology, including the choice of model inputs and parameters, and to justify the assumptions underlying the model; and
- that the determination of the regulatory capital requirement using an internal model addresses the overall risk position of the insurer and that the underlying data used in the model is accurate and complete.

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- 17.14.1 Given the importance of an embedded internal model to an insurer's risk management policy and operations, an internal model would generally be constructed to deliver a probability distribution of the required risk capital rather than a "point estimate". A range of approaches could constitute an effective internal model for risk and capital management purposes, and supervisors should encourage the use of a range of different approaches appropriate to the nature, scale and complexity of different insurers and different risk exposures. There are several different techniques to quantify risk which could be used by an insurer to construct its internal model. In broad terms, these could range from basic deterministic scenarios to complex stochastic models. Deterministic scenarios would typically involve the use of stress and scenario testing reflecting an event, or a change in conditions, with a set probability to model the effect of certain events (such as a drop in equity prices) on the insurer's capital position, in which the underlying assumptions would be fixed. In contrast, stochastic modelling often involves simulating very large numbers of scenarios in order to reflect the likely distributions of the capital required by, and the different risk exposures of, the insurer.
- 17.14.2 The IAIS recognises that there are numerous methodologies which an insurer could use as part of its stress and scenario testing. For example, an insurer may decide to model the effect of various economic scenarios, such as a fall in equity prices or a change in interest rates, on its assets and liabilities. Alternatively, an insurer could consider a run-off approach, where the effect of various scenarios on a specific portfolio of business as it is run-off is examined. The insurer should use scenarios which it regards as most appropriate for its business. Where the internal model is used for regulatory capital purposes, the onus is on the insurer to demonstrate to the supervisor that the chosen methodology is appropriate to capture the relevant risks for its business. This includes testing of the model to require that it can replicate its results on request and that its response to variation in input data is adequate such as that corresponding to changes in base or stress scenarios. Overall capital requirements derived from an internal model can be highly sensitive to assumptions on the effect of diversification across risks. Supervisors and insurers should therefore give particular consideration to aggregation issues. Conducting stress and scenario testing to determine the effect of shocks may be a suitable tool to validate statistical assumptions.
- 17.14.3 Where an internal model is established to assess risks at a modular level, i.e. on a risk-by-risk basis, in order to conduct an overall risk assessment, the insurer should aggregate the results for each of these risks both within and across business lines. Several methods exist to aggregate the separate results allowing for diversification effects. The IAIS considers that an insurer would generally be expected to decide how best to aggregate and account for the risks to the whole of its business. The determination of overall regulatory capital requirements by the internal model should consider dependencies within, as well as across, risk categories. Where the internal model allows for diversification effects, the insurer should be able to justify its allowance for diversification effects and demonstrate that it has considered how dependencies may increase under stressed circumstances.



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- 17.14.4 Internal models need high quality data in order to produce sufficiently reliable results. The data used for an internal model should be current and sufficiently credible, accurate, complete and appropriate. Hence, a “statistical quality test” should examine the appropriateness of the underlying data used in the construction of the internal model. A “statistical quality test” would include the examination of the aggregation of data, the modelling assumptions and the statistical measures used to construct the internal model. This could include an annual (or more frequent) review of the various items that are being measured (claims, lapses, etc.) updated for the additional data available together with a scrutiny of data from previous periods to determine whether this data continues to be relevant. Older data may no longer be relevant possibly due to changes in risks covered, secular trends or policy conditions and guarantees attaching. Similarly, new data may not be of substantive use when modelling items that require a long-term view of experience (such as testing the predictions of cash flows for catastrophic events).
- 17.14.5 An insurer may not always have sufficient reliable data in-house. In instances where an insurer lacks fully credible data it may rely on industry or other sufficiently credible data sources to supplement its own data. For example, a new company may lack its own historical data and so could use market data sources in constructing its internal model. Some supervisors have published jurisdictional data which may be of some use.
- 17.14.6 Another possible source of data may be from reinsurers - whose data pool is typically larger and covers a wider spectrum of the market. It is, however, important to consider that such industry data may not be entirely appropriate for all insurers. Reinsurers often only receive data in aggregated form and sometimes are only informed of larger claims or from smaller insurers whose market may not be applicable for all or many insurers. Therefore, any data not specific to the insurer would need to be carefully considered before deciding it was appropriate for use as the basis for an insurer's “statistical quality test”. Even where deemed appropriate, it may still be necessary to adjust the data to allow for differences in features between the data source and the insurer.
- 17.14.7 In assessing suitability of data and of other inputs, e.g. assumptions, to the internal model, expert judgment should be applied and supported by proper justification, documentation and validation.
- 17.14.8 As part of the “statistical quality test”, the insurer should be able to demonstrate that the base quantitative methodology used to construct its internal model is sound and sufficiently reliable to support the model's use, both as a strategic and capital management tool, and to calculate the insurer's regulatory capital requirements, if appropriate. The methodology should also be consistent with the methods used to calculate technical provisions.

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- 17.14.9 A “statistical quality test” should also include a review of the internal model to determine whether the assets and products as represented in the model truly reflect the insurer's actual assets and products. This should include an analysis of whether all reasonably foreseeable and relevant material risks have been incorporated, including any financial guarantees and embedded options. Insurers should also consider whether the algorithms used are able to take into account the action of management and the reasonable expectation of policyholders. Testing should include future projections within the model and to the extent practicable “back-testing” (the process of comparing the predictions from the model with actual experience).

Additional Guidance for Group-wide Internal Models

- 17.14.10 For use in determining the regulatory capital requirements of an insurance legal entity, a group-wide internal model should meet the same standards as applicable to a stand-alone internal model of that insurer.
- 17.10.11 For use for group-wide regulatory capital requirements, group members should be sufficiently engaged with a group-wide internal model and its application to their businesses (through their input to the model, local Board involvement, capital allocation, performance measurement etc.), even if the insurance group does not use the model to determine the regulatory capital requirements of individual group members.

Calibration Test for Internal Models

- 17.15 Where a supervisor allows the use of internal models to determine regulatory capital requirements, the supervisor requires the insurer to conduct a “calibration test” to demonstrate that the regulatory capital requirement determined by the internal model satisfies the specified modelling criteria.**

- 17.15.1 As part of a “calibration test”, where an internal model is used for determining regulatory capital, the insurer should assess the extent to which the output produced by its internal model is consistent with the modelling criteria defined for regulatory capital purposes, and hence, confirm the validity of using its internal model for that purpose.
- 17.15.2 The “calibration test” should be used by the insurer to demonstrate that the internal model is calibrated appropriately to allow a fair, unbiased estimate of the capital required for the particular level of confidence specified by the supervisor. Where an insurer uses different modelling criteria than those specified by the supervisor for regulatory capital purposes, it may need to recalibrate its model to the supervisor’s modelling criteria to achieve this.

Additional Guidance for Group-wide Internal Models

- 17.15.3 See Guidance 17.14.10 and 17.14.11 for additional guidance for group-wide internal models.

Use Test and Governance for Internal Models

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17.16 Where a supervisor allows the use of internal models to determine regulatory capital requirements, the supervisor requires:

- the insurer to fully embed the internal model, its methodologies and results, into the insurer's risk strategy and operational processes (the "use test");
- the insurer's Board and Senior management to have overall control of and responsibility for the construction and use of the internal model for risk management purposes, and ensure sufficient understanding of the model's construction at appropriate levels within the insurer's organisational structure. In particular, the supervisor requires the insurer's Board and Senior management to understand the consequences of the internal model's outputs and limitations for risk and capital management decisions; and
- the insurer to have adequate governance and internal controls in place with respect to the internal model.

- 17.16.1 In considering the use of an internal model for regulatory capital purposes by an insurer, the supervisor should not merely focus on its use for that narrow purpose, but should consider the wider use of the internal model by the insurer for its own risk and capital management.
- 17.16.2 The "use test" is the process by which the internal model is assessed in terms of its application within the insurer's risk management and governance processes. In order for the insurer's internal model to be most effective it should be genuinely relevant for use within its business for risk and capital management purposes.
- 17.16.3 Where an insurer decides to adopt a higher confidence level than the level required for regulatory capital purposes for its own purposes, for example, in order to maintain a certain investment grade rating, then "calibration" testing should also be conducted by the insurer to allow the insurer to determine the level of capital needed at this higher level. The insurer should then assess whether holding this amount of capital is consistent with the insurer's overall business strategy.
- 17.16.4 The insurer should have the flexibility to develop its internal model as an important tool in strategic decision making. An insurer should therefore have the flexibility to use the most appropriate risk measure and modelling techniques in its internal models. It may be beneficial if the insurer is able to demonstrate why it has chosen a particular risk measure, and it should include in its internal model an appropriate recalibration or reconciliation, if necessary, between the modelling criteria used in the model for its own risk and capital management purposes and those set by the supervisor for regulatory capital purposes. Differences between the economic capital and the regulatory capital requirements should be explicit and capable of being explained by the insurer to its Board and the supervisor.



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- 17.16.5 The “use test” is a key method by which the insurer can demonstrate that its internal model is integrated within its risk and capital management and system of governance processes and procedures. As part of the “use test”, an insurer should examine how the internal model is used for operational management purposes, how the results are used to influence the risk management strategy and business plan of the insurer, and how senior management are involved in applying the internal model in running the business. An insurer should demonstrate to the supervisor that an internal model used for regulatory capital purposes remains useful and is applied consistently over time and that it has the full support of and ownership by the Board and Senior management.
- 17.16.6 The insurer's Senior management should take responsibility for the design and implementation of the internal model, in order to ensure full embedding of the model within the insurers' risk and capital management processes and operational procedures. The methodology used in building the model should be compatible with the overall enterprise risk management framework agreed to by the Board and Senior management. Although the Board and Senior management may not be able to de-construct the internal model in detail, it is important that the Board has overall oversight of the model's operation on an ongoing basis and the level of understanding necessary to achieve this. The Board and Senior management should also ensure that processes are in place to update the internal model to take into account changes in the insurer's risk strategy or other business changes.
- 17.16.7 Various business units within the insurer may be involved in the construction and operation of the internal model, such as risk management, capital management, finance and actuarial departments, depending on the size of the insurer. The experience and technical ability of staff involved in the construction and operation of the internal model should be an important consideration for the insurer. For a model to pass the “use test” it would be expected that an insurer would have a framework for the model's application across business units. This framework should define lines of responsibility for the production and use of information derived from the model. It should also define the purpose and type of management information available from the model, the decisions to be taken using that information, and the responsibilities for taking those decisions. The “use test” should also ensure the adequacy of systems and controls in place for the maintenance, data feeds and results of the model. The IAIS notes that internal models may require significant IT resources and costs, which should be a consideration for the insurer in developing its models.
- 17.16.8 The IAIS considers that governance processes and communication in respect of an internal model are as important as its construction. An internal model should be subject to appropriate review and challenge so that it is relevant and reliable when used by the insurer. The key elements and results from the internal model should be understood by the key personnel within the insurer, including the Board, and not only by those who have constructed it. This understanding should ensure that the internal model remains a useful decision-making tool. If the internal model is not widely understood, it will not be achieving its purpose and adding value to the business. The “use test” is key in ensuring the relevance of the internal model to the insurer's business.

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Additional Guidance for Group-wide Internal Models

- 17.16.9 See Guidance 17.14.10 and 17.14.11 for additional guidance for group-wide internal models.

Documentation for Internal Models

17.17 Where a supervisor allows the use of internal models to determine regulatory capital requirements, the supervisor requires the insurer to document the design, construction and governance of the internal model, including an outline of the rationale and assumptions underlying its methodology. The supervisor requires the documentation to be sufficient to demonstrate compliance with the regulatory validation requirements for internal models, including the statistical quality test, calibration test and use test outlined above.

- 17.17.1 The insurer should document the design and construction of the internal model sufficient for a knowledgeable professional in the field to be able to understand its design and construction. This documentation should include justifications for and details of the underlying methodology, assumptions and quantitative and financial bases, as well as information on the modelling criteria used to assess the level of capital needed.
- 17.17.2 The insurer should also document, on an ongoing basis, the development of the model and any major changes, as well as instances where the model is shown to not perform effectively. Where there is reliance on an external vendor/supplier, the reliance should be documented along with an explanation of the appropriateness of the use of the external vendor/supplier.
- 17.17.3 The insurer should document the results of the “statistical quality test”, “calibration test” and “use test” conducted to enable the supervisor to assess the appropriateness of its internal model for regulatory capital purposes.

Additional Guidance for Group-wide Internal Models

- 17.17.4 In view of the potential complexity of a group-wide internal model, the flexibility required and the potential need for multiple supervisory approvals, it is essential that the group fully document all aspects of the group-wide internal model clearly and unambiguously. This enables supervisors to identify what is approved and what is not approved. Supervisors should require the insurance group to provide thorough documentation of the scope of an internal model, clarifying what falls within and outside of the model boundaries and what parts of the group universe are modelled. Supervisory authorities should know the boundary to the internal model.
- 17.17.5 As a minimum, the documentation of the group-wide internal model should include:
- a full description of the risk profile of the insurance group and how the group models those risks, including the underlying central assumptions and methods;
 - the parts, entities and geographical locations of the insurance

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group and which are included or excluded from the scope of the model submitted for approval;

- specification of which risks are modelled, with particular focus on group-wide risks;
- intra-group transactions such as (subordinated) loans and other hybrid instruments together with their different level of triggers, guarantees, reinsurance, capital and risk transfer instruments, contingent assets and liabilities; off-balance sheet items and special purpose vehicles;
- the effect of these instruments, either on individual insurance legal entities or on the insurance group considered as one single economic entity or on both, depending on supervisory requirements and how these effects are modelled;
- justifications for specific decisions taken in terms of assumptions, scope, simplifications;
- the flexibility of the model architecture to cope with central assumptions ceasing to be valid;
- more generally the insurance group's processes for validating, maintaining and updating the model including the use of stress testing and scenario analysis and the results of those tests and analyses;
- how the model allows for and models fungibility of capital, transferability of assets and liquidity issues, the assumptions made especially regarding the treatment of intra-group transactions and the free flow of assets and of liabilities across different jurisdictions, and how the group uses the model for an analysis or a qualitative assessment of liquidity issues; and
- the allocation of capital to insurance legal entities implied by the group-wide model and how this would change in times of stress for insurance groups established in more than one jurisdiction. Such allocation is required by supervisors, even if an insurance group uses a different allocation, e.g. by region or business line, for management purposes.

17.17.6 If elements are omitted from the group-wide internal model, the supervisors should require an explanation within the required documentation, for example if and why a standardised approach is used for some insurance legal entities, lines of business or risks.

17.17.7 The supervisors should require the insurance group to provide documentation describing whether and how the modelling is consistent over different jurisdictions or insurance legal entities regarding, for example, modelling criteria, risks, lines of business, intra-group transactions or capital and risk transfer instruments (CRTIs) with suitable explanations for any differences in approach.



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17.17.8 Diversification/concentration of risks means that some risks or positions are offset or increased by other risks or positions. The supervisors should require, within the framework of the required internal model documentation, a description of how the insurance group:

- incorporates diversification/concentration effects at the relevant different levels within the group-wide internal model;
- measures such effects in normal and in adverse conditions;
- confirms those measurements for reasonableness, and
- allocates diversification effects across the group according to supervisory requirements.

Credit for diversification effects should only be allowed where appropriate having regard to risk correlations in adverse financial conditions.

Ongoing Validation and Supervisory Approval of the Internal Model

17.18 Where a supervisor allows the use of internal models to determine regulatory capital requirements, the supervisor requires:

- **the insurer to monitor the performance of its internal model and regularly review and validate the ongoing appropriateness of the model's specifications. The supervisor requires the insurer to demonstrate that the model remains fit for regulatory capital purposes in changing circumstances against the criteria of the statistical quality test, calibration test and use test;**
- **the insurer to notify the supervisor of material changes to the internal model made by it for review and continued approval of the use of the model for regulatory capital purposes;**
- **the insurer to properly document internal model changes; and**
- **the insurer to report information necessary for supervisory review and ongoing approval of the internal model on a regular basis, as determined appropriate by the supervisor. The information includes details of how the model is embedded within the insurer's governance and operational processes and risk management strategy, as well as information on the risks assessed by the model and the capital assessment derived from its operation.**

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- 17.18.1 Over time an insurer's business may alter considerably, as a result of internal factors or events (such as a change in insurer strategy) and external factors or events (such as a change in interest rates), so that the internal model may no longer fully capture the risks to which the insurer is exposed unless adapted. The supervisor should reassess an insurer's internal model and the results that it produces on a regular basis against the criteria of the statistical quality test, calibration test and use tests so that it remains valid for use, both as a strategic decision-making tool in the context of the insurer's own risk and capital management, and as a means of calculating regulatory capital requirements where appropriate. In general only material changes to the model (such as changing the underlying model structure or the risk measure used) or to the risks faced by the insurer should require the model to be reassessed by the supervisor. A "model change policy" could be agreed between the supervisor and the insurer regarding the degree and timing of changes made to the internal model. This would enable the insurer to enact minor changes to its internal model without seeking prior supervisory approval (provided the changes are in accordance with the agreed policy), thereby allowing the model to be updated in a quicker and more flexible way.
- 17.18.2 The insurer should be required to notify the supervisor of material changes to the internal model and to properly document changes to enable the supervisor to assess, for continued approval, the ongoing validity of the model for use in determining regulatory capital requirements. Following any material changes to an internal model, the supervisor may give the insurer a reasonable amount of time so that the updated model is embedded in its risk strategies and operational processes.
- 17.18.3 The insurer should demonstrate that the data used in the internal model remains appropriate, complete and accurate for this purpose.
- 17.18.4 The supervisor should take care that its ongoing validation requirements do not unduly restrict the use of the internal model by the insurer for its own risk and capital management purposes and thereby reduce its ability to comply with the use test.

Additional Guidance for Group-wide Internal Models

- 17.18.5 The insurance group should adjust the model for material changes in group composition and operations, including mergers, acquisitions and other structural changes of affiliated entities or jurisdictional changes.
- 17.18.6 The supervisor should require the insurance group to provide documentation of material changes in group operations and the reasons why continued use of the group-wide internal model would remain appropriate following the change. If such reasons cannot be given or are not sufficient the supervisor should require the group to propose appropriate model changes as a result of the material change for re-assessment of approval by the supervisor.

Supervisory Responsibilities



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- 17.18.7 The IAIS considers that it is essential that supervisors are able to understand fully the insurers' internal models and be able to appraise their quality. To this end, the supervisor should have access to experienced personnel with appropriate technical ability, as well as sufficient resources. It is likely to take time for supervisors to acquire the necessary experience to appraise an insurer's internal model. Without the experience and resources, the supervisor may be unable to reliably approve the use of an insurer's internal model for regulatory purposes. The supervisor may wish to use external specialists that are considered to have the appropriate experience, such as actuarial consultants, accountancy firms and ratings agencies, to assist it in reviewing an insurer's internal models. In such instances, the supervisor should retain the final responsibility for review and approval of the use of the internal model for regulatory purposes.
- 17.18.8 It may be appropriate for a supervisor to consider transitional measures when permitting insurers to use internal models for regulatory capital purposes for their first time. Such measures will permit the necessary time for both insurers and the supervisor to become familiar with the internal models and their uses. For example, during a transition period, the supervisor could include the use of partial internal modelling, to allow the insurer to move gradually to full use of internal models or the supervisor could require parallel reporting of regulatory capital determined by both the internal model and standardised approach. The supervisor may also consider applying a minimum capital level during the transition period.
- 17.18.9 The supervisor may need to impose additional capital requirements (capital add-ons) or take other supervisory action to address any identified weaknesses in an internal model, either prior to approving the use of the model, as a condition on the use of the model or in the context of a review of the ongoing validity of an internal model for regulatory capital purposes. It may be necessary to introduce additional supervisory powers, to allow such supervisory actions and measures, when internal models are allowed for regulatory capital purposes by a supervisor.
- 17.18.10 Where an insurer which is a subsidiary of an insurance group seeks approval for the use of an internal model which itself is part of a broader "group model", the supervisor of this subsidiary should conduct the approval process in close co-operation with the group-wide supervisor. In particular, the supervisor of the subsidiary should check the status of the "group model" and seek information from the group-wide supervisor about its own approval process.

Supervisory Reporting



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17.18.11 For supervisory approval purposes, supervisors should require the insurer to submit sufficient information for them to be able to approve the use of the internal model for regulatory capital purposes and to give confidence to the supervisor that the insurer is appropriately carrying out its responsibility to manage its risks and protect the interests of policyholders. This should include the results of analysis conducted under the “statistical quality test”, “calibration test” and “use test”. While supervisors should have the power to determine the exact nature and scope of the information they require, supervisory reporting should be appropriate to the nature, scale and complexity of an insurer's business.

17.18.12 The level of information on internal models necessary to allow meaningful assessment by supervisors would be expected to include appropriate information regarding the insurer's risk and capital management strategy – for example, how the model is embedded into the insurer's governance procedures, overall business strategy, operational procedures and risk processes. An insurer should report details of the risks assessed by the model, including how these are identified and measured, as well as information on the results of the internal model analysis, the economic capital derived from these results and how the results of the internal model compare to those derived from the supervisory standardised approach. [36]

[36] Supervisors may consider that the comparison between the capital requirements from an internal model and a supervisory standardised approach should only be required during a transition period.