THE GENEVA ASSOCIATION

Modernising Insurance Solvency Regimes—Key Features of Selected Markets

A STUDY BY THE GENEVA ASSOCIATION

AUGUST 2016

The Geneva Association

The Geneva Association is the leading international insurance think tank for strategically important insurance and risk management issues.

The Geneva Association identifies fundamental trends and strategic issues where insurance plays a substantial role or which influence the insurance sector. Through the development of research programmes, regular publications and the organisation of international meetings, The Geneva Association serves as a catalyst for progress in the understanding of risk and insurance matters and acts as an information creator and disseminator. It is the leading voice of the largest insurance groups worldwide in the dialogue with international institutions. In parallel, it advances—in economic and cultural terms—the development and application of risk management and the understanding of uncertainty in the modern economy.

The Geneva Association membership comprises a statutory maximum of 90 chief executive officers (CEOs) from the world's top insurance and reinsurance companies. It organises international expert networks and manages discussion platforms for senior insurance executives and specialists as well as policymakers, regulators and multilateral organisations.

Established in 1973, The Geneva Association, officially the 'International Association for the Study of Insurance Economics', has offices in Zurich, Switzerland and is a non-profit organisation funded by its Members.

THE GENEVA ASSOCIATION

Modernising Insurance Solvency Regimes—Key Features of Selected Markets

A STUDY BY THE GENEVA ASSOCIATION

The Geneva Association

The Geneva Association—'International Association for the Study of Insurance Economics'
Zurich | Talstrasse 70, CH-8001 Zurich
Email: secretariat@genevaassociation.org | Tel: +41 44 200 49 00 | Fax: +41 44 200 49 99

August 2016

Modernising Insurance Solvency Regimes—Key Features of Selected Markets. A Study by The Geneva Association.

Published by The Geneva Association—'International Association for the Study of Insurance Economics', Zurich.

Download the electronic version from *www.genevaassociation.org.*

Contents

1. Foreword

The primary goal of any insurance solvency regime is to secure the interests of policyholders. One of the key elements to this end is the requirement for insurers to hold capital in order to be able to honour all future payouts to policyholders, also in case that unexpected claim events occur.

Historically, insurance solvency regimes have been specific to local jurisdictions. However, alongside the internationalisation and integration of economies and financial services, including the insurance industry, the marketplace is becoming increasingly global. This raises the issue of how to effectively regulate and supervise insurance activities at local, regional and global levels.

Also, advances in product development, technology and risk management techniques over the latest decades put pressure on regulators to develop solvency regimes to embrace new risks, new products and even supervisory skills.

The International Association of Insurance Supervisors (IAIS) is currently developing its global Insurance Capital Standard (ICS) as part of Its Common Framework for the Supervision of Internationally Active Insurance Groups (ComFrame). This report aims to shed light on key features of solvency regimes in selected jurisdictions and compares new and emerging regimes with more established ones.

The report also provides an overview of commonalities and differences—based on a structured questionnaire—across regimes and looks, amongst others, at the way assets and liabilities are valued, how regulatory capital requirements are set, whether or not internal models are allowed, and criteria for assessing capital resources, etc.

Our study demonstrates that there is much common ground with regard to the main objectives and key elements of existing and developing solvency regimes. It is, however, clear that these common elements are interpreted and applied in different ways. The IAIS will have to take into account these differences as they strive towards the goal to introduce the ICS.

Anna Maria D'Hulster
Secretary General
The Geneva Association

2. Introduction

Insurance regulatory and supervisory regimes aim at the protection of policyholders and supporting financial stability. The regulatory criteria and requirements set for different markets by the responsible regulatory authorities in pursuit of these objectives are similar in structure—but not identical.

On 1 July 2012, the International Association of Insurance Supervisors (IAIS) presented a comprehensive version of the envisaged common framework (ComFrame). ComFrame is a set of international supervisory requirements focusing on the effective group-wide supervision of internationally active insurance groups (IAIGs). As a component of ComFrame, the IAIS is developing a risk-based global insurance capital standard (ICS), on which a consultation paper was published in October 2013, followed by field testing and additional consultation phases. A second consultation paper was released in July 2016 with a consultation period of three months, i.e. until mid-October.

Confidential reporting of results based on ICS Version 1.0 is scheduled to begin in 2017. The IAIS is targeting the adoption of ComFrame, including ICS Version 2.0, by the end of this decade.

Like other global standard setting bodies, the IAIS does not have legal authority to prescribe or enforce its standards, including the ICS, upon any jurisdiction or firm.

The current discussion on the ICS encouraged The Geneva Association to prepare a comparative study of insurance solvency regimes—most of them recently modernized—along selected element characteristics which are deemed to form essential features of insurance solvency regimes. Based on a questionnaire, The Geneva Association conducted a survey with contributions from eleven insurance groups and eight supervisory bodies with a focus on the following states/unions of states: Australia, Brazil, Canada, China, the European Union, Japan, Mexico, Singapore, South Africa, Switzerland and the United States.

The study does not benchmark the developing ICS against the elements chosen for review of the solvency regimes in the above noted jurisdictions because at this early stage of development of the ICS still too many options are being explored through field testing and consultation. The Geneva Association does not through this study aim to take positions on the preferred approach for the ICS. This said, The Geneva Association is sustaining its engagement in the discussion and consultation on the ICS in order to promote an outcome which will establish comparable results across jurisdictions, will respect the need for a level playing field, will not create unintended consequences for insurance markets and consumers nor place unnecessary burdens on the insurance industry.

Hence, the main purpose of this study is to provide an overview of current practices, approaches and methods, focusing on selected elements such as valuation principles, risk sensitivity, risk-based capital and internal models. This study, limited to the selected countries and elements, gives insights and information on the regulatory regime in several countries that have already adopted a risk-based solvency capital approach or are in the process of doing so. It helps to better understand the issues at stake in the current ICS discussion at the IAIS, and thus contributes to its development as well as to the relevant debate.

3. Key Findings

Regulatory capital requirements in the countries concerned are risk-based or developing into being more risk-based over time. Being risk-based means that the solvency regimes aim to reflect all risks with the potential to affect the balance sheet of the insurer. Specific risks such as strategic and reputational risks are generally not accounted for in the capital calculation. As a general conclusion, the regimes examined are characterised by a strengthening over time of the degree of risk sensitivity in regulatory capital requirements.

Other findings are summarised as follows:

- ***Assets*** are valued in many regimes according to principles which are compatible with International Financial Reporting Standards (IFRS)/Generally Accepted Accounting Principles (GAAP) or according to local statutory accounting rules so prescribed.[1] Particular adjustments for intangible assets, goodwill and deferred tax for solvency capital calculation purposes are required in some countries.

- ***Liability valuation*** is heterogeneous across jurisdictions with regards to, for example, underlying assumptions, applied rules and adequacy tests as well as whether valuation reflects the degree of illiquidity of the liabilities. Valuation in many jurisdictions is based on cash flow projections, discounted by a risk-free rate, with or without an adjustment for credit spread/liability illiquidity. Further, a margin over current estimate is, in many cases, added to the current estimate, whilst explicit countercyclical elements that reflect the degree of illiquidity of the liabilities are rarely considered. Other jurisdictions prescribe conservatism over and above expected obligations and subject companies to annual reserve adequacy assessments.

- ***Capital requirements*** are in most cases, but not always, set at a predetermined confidence level. It is not common to take account of future management actions in determining the solvency requirements. Capital requirements are specified at 'solo entity level', i.e. for individual insurance companies. Capital requirements at group level (for all entities belonging to a group) do not exist in all the countries examined.

- In general, insurance solvency regimes contain provisions for a ***'ladder of intervention' approach*** that provides the relevant supervisor with the requisite supervisory tools to intervene in different degrees of intensity connected to the solvency situation of the supervised company/entity and remediate deficiencies as necessary. In some instances, intervention triggers may also be part of the regime. Should intervention be necessary the supervisor can adapt the tools to align with the degree of the severity of the problem. This allows the company to anticipate supervisory actions and can contribute to an orderly means to address the issues raised by the supervisor.

- The use of ***internal models*** as part of the regulatory capital requirement calculation is subject to specific regulatory criteria and can be applied only upon supervisory approval. The actual use of and reliance on full or partial internal models is high for certain businesses, as in the case of reinsurance, or for certain jurisdictions, as in the case of Switzerland, but on average it is more limited.

- The quality of ***capital resources*** is assessed based upon specific criteria, applying a subdivision into two or three tiers. The capital classification is generally based on loss absorbency, where Tier 1 is the most and Tier 3 the least loss-absorbent.

- ***Qualitative requirements*** are imposed in all regimes, mostly regarding governance (especially risk management and internal control).

- ***An Own Risk and Solvency Assessment*** (ORSA) is imposed in a large number of the countries examined. Where it is not required yet, the introduction of an ORSA-type requirement is planned.

1 The U.S. uses statutory accounting principles (SAP).

4. Choice of Jurisdictions and Methodology

This study represents an analysis of selected elements of solvency regimes from countries representing various geographical areas. The countries were chosen to obtain a broad, geographically repesentative sampling of countries that have already adopted a risk-based solvency capital approach or are in the process of doing so. They include Australia, Brazil, Canada, China, the European Union, Japan, Mexico, Singapore, South Africa, Switzerland and the United States.[2] The elements were chosen based on the advice of industry and regulatory experts with the aim of supporting the study's main focus, that is, to look at key issues of solvency regimes which are being modernised in a number of emerging markets.

The Geneva Association developed a questionnaire (***see Annex 2: Survey Questionnaire***) addressed to one company representative and one supervisory representative in each jurisdiction covered by the study. The questionnaire addressed the following areas: valuation principles, risk sensitivity, calibration, qualitative requirements, group issues, internal models, multi-layer supervisory systems and qualifying capital. The questions asked are relatively broad, aimed at making meaningful, general comparisons possible. Hence, this study does not aim to cover all details of these selected elements, and the comparisons made must be seen in this light.

Unless explicitly stated, the findings in this study are based solely on the replies obtained to the questionnaire developed by The Geneva Association, in certain cases further adapted on the basis of contacts taken with the respondents to clarify some details. This approach does limit the range of possible analysis and comparisons. As a consequence, the conclusions drawn are in line with the overall objective of the study, which is to spur high-level discussions on the development of the ICS.

2 A reply to the questionnaire was not obtained from the Chinese market. Hence, the information provided on the Chinese market in this study has been obtained from other sources.

5. Background Information on the Solvency Regimes Included in the Study

The following general information on the subject of jurisdictions gives a short overview of the existing regimes and planned changes.

EUROPE

- In the ***European Union (EU)***, the Solvency II (SII) regime, based on a three-pillar supervisory structure, entered into force on 1 January 2016 for insurance companies in all EU (and European Economic Area) member countries. Insurance companies affected by Solvency II have, however, been preparing for the new regime for many years; hence, the actual introduction of the principles is a process which has been long under way. Whilst the requirements set by the Solvency II Framework Directive had to be transposed into national law, the implementing measures came directly into force. The technical standards prepared by the European Insurance and Occupational Pensions Authority (EIOPA) come into force after their approval by the European Commission. Additional guidelines that are binding on a 'comply or explain' basis for national competent authorities without further approval are issued by EIOPA. Although such guidelines are addressed to national competent authorities, they do, in effect, set requirements for insurance companies to follow.

- Solvency II comprises quantitative requirements regarding risk-based capital (Pillar 1), supplemented by qualitative requirements concerning governance and the supervisory review process (Pillar 2) and requirements concerning public disclosure and supervisory reporting (Pillar 3). .

- ***Switzerland's*** Financial Market Supervisory Authority (FINMA) is mandated to supervise banks, insurance companies, exchanges, securities dealers, collective investment schemes and their asset managers, and fund management companies. FINMA uses a principles-based, risk-oriented approach to its supervision of insurance companies. The intensity of supervision is proportionate to the risk potential of an insurance company. The Swiss Solvency Test (SST) has been developed since 2003, and the legislation entered into force in 2006 with a transitional period of five years. The SST is a risk-based system relying on a market-consistent total balance sheet. Since 2007/2008, insurance companies and groups need to submit a comprehensive SST report to FINMA. Since 2011, SST can be used by FINMA directly to enforce supervisory action based on a ladder of intervention. In 2015, the legal basis for the SST was strengthened and revised. The European Union (Parliament, Commission and Council) have classified SST as fully equivalent to Solvency II. The SST is the only regulatory system that has been granted equivalency from the beginning of Solvency II.

NORTH AMERICA (United States and Canada)

- In the ***United States (U.S.)***, the National Association of Insurance Commissioners (NAIC) is the national standard-setting organisation created and governed by the chief insurance regulators from the 50 states, the District of Columbia, and five U.S. territories. It coordinates the work of the state insurance regulators that are responsible for insurance supervision, provides regulatory support to state insurance departments, and coordinates changes to insurance regulatory requirements. Over the past years, the NAIC has, as part of the Solvency Modernization Initiative (SMI) introduced reforms related to group supervision, corporate governance, enterprise risk management, liability valuation for life and annuity products (principle-based reserving) and reinsurance. In addition, as a result of the Dodd–Frank Act, the Federal Reserve has obtained supervisory powers concerning insurers that have been designated as systemically important.

- ***Canada's*** Office of the Superintendent of Financial Institutions (OSFI) develops the solvency requirements for federally registered Canadian insurance companies. In recent years, the guideline on risk management was updated, requiring an enterprise-wide framework and introducing an ORSA requirement in 2014.

LATIN AMERICA (Brazil, Mexico)[3]

- SUSEP (Superintendência de Seguros Privados—National Regulatory Agency for Private Insurance) is responsible for the supervision of all insurance and reinsurance undertakings in ***Brazil*** (excluding health insurance)[4] and is working on the development of a risk-based solvency regime to be fully implemented by the end of 2017.

- In ***Mexico***, a new regulatory framework has been developed by the Mexican regulator, Comisión Nacional

3 For an overview, see Ernst & Young (2014).

4 The ANS (Agência Nacional de Saúde Suplementar) is responsible for health insurance.

de Seguros y Fianzas (CNSF) in cooperation with the Mexican association of insurance companies, aiming at a more sophisticated risk-based capital approach than is currently the case. Approved by the Mexican Congress in April 2013, the regulation with certain quantitative and disclosure requirements will become effective in 2016.

ASIA-PACIFIC (Australia, China, Japan, Singapore)

- In ***Australia***, the Australian Prudential Regulation Authority (APRA) is the supervisory authority in charge of prudential regulation of financial institutions. In January 2013, APRA updated its capital adequacy requirements and implemented the Life and General Insurance Capital Standards (LAGIC), a risk-based solvency capital regime following a three-pillar approach.[5]

- In 2012, The ***China*** Insurance Regulatory Commission (CIRC) began an initiative to modernise its solvency requirements and built the so-called China Risk Oriented Solvency System (C-ROSS). C-ROSS is a risk-based solvency regime following a three-pillar approach.[6]

- The regulator in ***Japan***, the Financial Services Agency (FSA), announced an updated financial monitoring policy for financial institutions in 2014. The policy comprises requirements for improving risk management, policyholder protection, claims payment and governance in insurance companies. Further developments of the regulatory framework focus on supervision, capital adequacy and the introduction of an economic value-based solvency regime.

- In ***Singapore***, the RBC framework for insurers was introduced in 2004 by the supervisor, the Monetary Authority of Singapore (MAS). Supported by an industry consultation process in 2012, MAS reviewed the framework and, in 2014, issued details of the new risk based capital regulatory calculations called RBC 2. The final industry consultation is expected for Q2 2016 with potential implementation in 2019.

AFRICA (South Africa)

The South African Reserve Bank (SARB) has the responsibility for the prudential regulation of banks and the Financial Services Board (FSB) for the prudential regulation of insurers. In future, post the enactment of the Financial Sector Regulation Bill , the Prudential Authority, under the auspices of the SARB, will be responsible for the prudential regulation of both banks and insurers.

For the insurance industry, the major change in regulation comes with the implementation of the Solvency Assessment and Management (SAM) framework as of 2017. SAM is a risk-based solvency regime that follows a three-pillar approach. It will be legally introduced through enactment of the Insurance Bill, expected to take effect in 2017.

5 http://www.apra.gov.au/Policy/Documents/Regulation-Impact-Statement-LAGIC.pdf.

6 The information on China provided in the study was obtained from other sources than via the questionnaire.

6. Solvency Regimes: an Analysis of Selected Elements

6.1. REGIME OVERVIEW

The overview in ***Table 1*** of the regimes covered by this study shows that there are quite a number of similarities between the jurisdictions treated regarding the applied framework, valuation principles and accounting standards, risk-based capital requirements, possible use of internal models, and qualitative requirements such as an ORSA process.

Despite such similarities, however, when applying and interpreting principles, differences in detail appear, as the analysis and comparison of specific elements in the following sections show.

Table 1: Overview of solvency regimes covered by this study

	AUSTRALIA	BRAZIL	CANADA	CHINA	EUROPEAN UNION
SUPERVISOR	APRA/ASIC	SUSEP/ANS	OSFI	CIRC	NCA[7]
REGULATION	LAGIC	Insurance regulatory framework	Insurance regulatory framework	C-ROSS	Solvency II
STRUCTURE	3 pillars	3 pillars	3 pillars	3 pillars	3 pillars
YEAR OF MAJOR CHANGES TO REGULATION	2013[8]	2016[9]	2014	2016	2016
REGULATORY CAPITAL REQUIREMENT	Risk-based	Risk-based	Risk-based	Risk-based	Risk-based
ASSET VALUATION	IFRS-based	IFRS-based	IFRS-based	IFRS-based	IFRS-based
LIABILITY VALUATION	DCF[10]	DCF (LAT test)	DCF	DCF	Market consistent value[11]
CONFIDENCE LEVEL / PERIOD	99.5% / 1 year	Varies (always above 95%) / 1 year	99% / 1 year (TailVaR)	99.5% / 1 year	99.5% / 1 year
RISK METRIC	VaR	VaR	TailVaR[12]	VaR	VaR
INTERNAL MODELS	Allowed	Allowed	Partially allowed	n/a	Allowed
# OF CAPITAL TIERS	2	Limitations similar to Solvency II tiers	2	2	3
QUALITATIVE REQUIREMENTS	Pillar 2	Pillar 2	Yes	Pillar 2	Pillar 2
OWN RISK AND SOLVENCY ASSESSMENT	ICAAP	Planned	ORSA	SARMRA	ORSA

7 National competent authorities are responsible for insurance supervision, whilst EIOPA has a coordinating role, drafting technical standards for adoption by the EU Commission and developing guidelines which apply on a comply or explain basis.

8 New standards CPS 220 'Risk Management' and CPS 510 'Governance' became effective on 1 January 2015.

9 SUSEP started implementing the Insurance Regulatory Framework step by step from late 2008. In 2015, the Brazilian regime obtained equivalence to Solvency II, with regard to the solvency assessment.

10 Discounted cash flow.

11 In the EU—under Solvency II—the discounting of liabilities involves a number of explicit measures to address excessive short-term volatility and pro-cyclical behaviour as part of the market-consistent framework.

12 Tail value-at-risk (TailVaR or TVaR) is a statistical measure which provides the average of a specified 'tail' of the distribution, i.e. the portion of a distribution that lies beyond a certain confidence level. For instance, 95 per cent TVaR is the average of the tail of the distribution that lies beyond the 95th percentile. In comparison to value-at-risk measures, which provide the percentile value of a distribution (i.e. the value of a single point in the distribution), TVaR provides information about the shape of the tail of a distribution beyond the specified percentile. TVaR is also known as conditional tail expectation (CTE) and conditional tail value at risk in certain regimes. Hereafter, we will use the term TVaR for consistency when referring to tail value-at-risk measures in this paper, regardless of the official term used within a given regime.

JAPAN	MEXICO	SINGAPORE	SOUTH AFRICA	SWITZERLAND	UNITED STATES
FSA	CNSF	MAS	FSB/SARB	FINMA	Insurance Commissioners / Federal Reserve[13]
Insurance Business Act	Insurance regulatory framework	RBC 2	Insurance Bill and Standards to be made thereunder[14]	Insurance Supervision Act	Insurance regulatory framework
Chapters	3 pillars	RBC 2 Standards	3 pillars	SST plus Pillar 2 and 3 requirements	7 core principles
2014	2016	2019[15]	2017	2006	2016
Risk-based	Risk-based	Risk-based	Risk-based	Risk-based	Risk-based
Japanese GAAP	IFRS-compatible	IFRS-based	IFRS-based	Market (consistent) value	U.S. SAP[16]
DCF (planned)	DCF	DCF	DCF	Market consistent value	U.S. SAP
% depends on risk category / 1 year	99.5% / 1 year	99.5% / 1 year	99.5% / 1 year	99% / 1 years (TailVaR)	n/a
VaR	VaR	VaR	VaR	TailVar	Various metrics exist
Partially allowed	Allowed	Allowed	Allowed	Allowed	Partially allowed
No tiers—core solvency margin	3	3	3	2	n/a
No	Pillar 2	Pillar 2	Pillar 2	Yes	Yes
ORSA	ARSI	ORSA	ORSA	ORSA	ORSA

13 The Federal Reserve is the consolidated supervisor of those insurance entities subject to its supervision (based on provisions under the Dodd–Frank Act). The brief responses in this table reflect responses describing the national system of state insurance supervision.
14 Still to be promulgated. Currently serving before Parliament.
15 Expected implementation date based on comments made by MAS.
16 SAP: statutory accounting principles

6.2. REGULATORY CAPITAL REQUIREMENT

EUROPE

- The ***European Union's*** Solvency II framework is designed to be risk-sensitive and is based on a prospective (forward-looking) calculation to ensure accurate and timely intervention by supervisory authorities—the Solvency Capital Requirement (SCR) below which the amount of financial resources *should* not fall—and a minimum level of security—the minimum capital requirement (MCR) below which the amount of financial resources *must* not fall. Breaching the MCR ultimately results in withdrawal of the authorisation.

  Furthermore, the SCR is risk-based, requiring an amount of solvency capital that reflects all quantifiable risks an insurer is exposed to. It can be calculated using a standard formula, or a full or partial internal model developed by the company and approved by the supervisory authority. Basically, a scenario approach is applied to capture the underlying risks and the links between assets, liabilities and risk mitigation. In some cases and subject to approval by the supervisory authority, the scenarios can be approximated by applying a factor-based approach, however, without reducing the confidence (calibration) level. In addition, not directly quantifiable risks such as reputational, strategic and liquidity risk are covered through a more qualitative assessment under Pillar 2. The SCR is calibrated to a 99.5 per cent confidence level, using a VaR measure over a one-year horizon. Solvency II fully supports reinsurance as a risk mitigation instrument. However, there are currently some practical limitations under the standard formula, due to some design insufficiencies.

- In ***Switzerland***, FINMA uses the Swiss Solvency Test (SST) as a supervisory tool, which adopts a risk-based approach using a total—no off-balance sheet items—and market-consistent balance sheet. The SST is designed to capture all material risk to this market-consistent balance sheet of the insurance company or group. It defines available capital resources and sets the required capital benchmark needed to pursue the business planned for the next 12 months. The required capital benchmark is the 1 per cent TailVaR of the change of capital resources over a one-year horizon at a 99 per cent confidence level.

  As the SST is based on market-consistent values for all assets and liabilities, the impact of changes in business or investment decisions by insurance companies is quantified at prevailing market conditions. The SST thus fosters conscious investment behaviour over the business and investment cycle by creating transparency on real market prices at any time, which in a market-consistent regime, is understood to disincentivise pro-cyclical (investment) behaviour.

  Where necessary, the supervisor has the full, unrestricted set of intervention measures available by being able to induce any transaction at prevailing market conditions.

- Insurance companies need to calculate their required capital benchmark appropriately. If needed, they must use an internal model, especially where the FINMA developed standard models (which are generally stochastic models, not formulas) do not sufficiently capture their risk situation.

  Residual operational risk is not required to be quantified in the SST capital requirement; instead, operational risks are required to be mitigated. Despite this, for companies that calculate both, the SST ratio could sometimes be lower than the Solvency II ratio.

  As part of the technical provisions, the SST provides for a cost of capital margin over the current estimate (MOCE), i.e. the cost to compensate investors for providing appropriate levels of capital resources during the entire run-off of the insurance liabilities.

NORTH AMERICA

- The ***United States***' solvency regime uses a risk-based capital (RBC) approach, which is intended to be the basis for determining the point at which regulatory intervention is legally permissible and/or required rather than for internal company risk or capital management.[17]

- The U.S. RBC formula is primarily factor-based and considers all risks that are quantifiable and material for the industry, i.e. the ***United States*** framework typically covers all risks to some degree even if they are not explicitly reflected within the calculation of required capital. RBC is a laddered intervention framework that is designed to identify weakly capitalised companies and provide for increasing degree of supervisory intervention based on the company's RBC level.

17 For details, we refer the reader to the EU-U.S. Dialogue Project (2012, 2014).

- Strategic risk, reputational risk and currency risk, for instance, are not explicitly accounted for in the RBC. The factors of the formula are derived from historical industry-wide data, whilst internal models are used for interest rate and market risk only. In particular, the RBC requirements for variable annuities are based on TailVaR measures calculated using stochastic models (RBC C-3 Phase 2). Currently, the NAIC is developing a model-based catastrophe component for P&C insurance and a factor-based method for more explicitly reflecting operational risk in the RBC formula.

- The U.S. RBC requirement is not calibrated to an overarching confidence level or time horizon, i.e. the formula was not designed to produce a minimum level of aggregate RBC at an explicit level representing a certain statistical outcome. However, the components and factors of RBC, such as asset risk or the catastrophe risk charge, do have a statistical calibration base.

- The Dodd–Frank Act required the United States Federal Reserve Board (FRB) to apply consolidated supervision to firms designated as systemically important by the Financial Stability Oversight Council (FSOC) as well as those holding company systems with a bank or thrift included within their structure. The FRB has initiated the development of its capital regime for these firms.

- In January 2016, the National Association of Insurance Supervisors (NAIC) initiated a work stream to develop a group-wide capital calculation. The NAIC plans to complete this exercise by year end 2016.

- The RBC requirements in ***Canada*** reflect the quantifiable key risks an insurance company is exposed to. The calculation of RBC is performed via a scenario-based approach for insurance and interest rate risk, and a factor-based approach for credit, market and operational risks. The regulatory framework does not directly account for the following risks: credit spread risk, liquidity risk, legal risk, strategic risk and reputational risk.

  Canadian RBC is calibrated over a one-year horizon, using TailVaR as a risk measure at a confidence level of 99 per cent.

LATIN AMERICA

- The solvency capital regime in ***Brazil*** stipulates specific capital requirements for underwriting, credit and operational risk. Market risk will be included by the end of 2016. The capital requirements for insurers are calculated by standard models established by the supervisor, applying a factor-based formula that is calibrated at a confidence level of above 95 per cent (one-year horizon). The supervisor monitors and re-performs the capital requirement calculation for every company on a monthly basis by using an internal system that accesses a set of information provided on a monthly basis by the insurers.[18]

- In ***Mexico***, the Insurance and Surety Institutions Law (LISF) introduced a new risk-based solvency regulatory capital framework that is being implemented step by step from 2015. In the following two years, the risk-based capital for an insurer is determined according to the standard formula software provided by the supervisor. Internal models can be applied after the transition period. Liquidity, reputational and strategic risks are not quantified in the standard formula .

  VaR is the risk measure for calibrating the Mexican RBC at a confidence level of 99.5 per cent over a one-year horizon.

ASIA-PACIFIC

- In ***Australia***, insurers are obliged to hold capital according to the Prudential Capital Requirement (PCR). The PCR comprises a set of capital amounts plus any supervisory adjustments for the individual insurer made by APRA. The regulatory capital requirement is obtained by using APRA's 'standard method' or, alternatively, by an approved internal model. The standard method for calculating the capital requirement uses scenario- and factor-based approaches and takes the following risks into account: insurance, insurance concentration, asset risk (including market and credit risk), asset concentration and operational risk.

  The regulatory capital requirement is based on a '1-in-200-year event' (corresponding to a one-year 99.5 per cent VaR).

- ***China's*** C-ROSS includes insurance, market and credit risk as the major underlying risks faced by insurers in its quantitative capital requirements. Risks such as operational, reputational and strategic risks are included in Pillar 2. For determining the regulatory capital requirement under Pillar 1, a prescribed standard method is in use, supported by a solvency stress test. For life insurers, a scenario approach is under discussion, whilst for

18 The set of information is called the FIP (Formulário de Informações Periódicas—'Periodic Information Form').

non-life insurers, the standard method will be factor-based. The conceptual framework adopted a VaR approach for the calculation of the quantitative capital requirements.[19] The confidence level will be set based on China's current circumstances, with reference to an industry quantitative impact study (e.g. 99.5 per cent).

- ***Japan*** has implemented a risk-based solvency regime. The amount of required risk-based capital is calculated at individual and at group level, using a factor-based approach and a one-year VaR. The requirements are set to specific confidence levels for each risk category: A 95 per cent VaR is applied for general underwriting and investment related risks, 99 per cent for other underwriting risks such as general personal insurance (health, accident), 99.5 per cent for natural catastrophe risk from earthquakes and 98.7 per cent for natural catastrophe risk from flood and storm.

- ***Singapore*** links its capital requirements to insurance, market, credit and asset concentration risk taking into account asset and liability mismatching. New explicit risk charges for operational risk, credit spread risk and insurance catastrophe risk will be introduced under the revised framework, RBC 2. Currently, a factor-based approach to determine the total capital requirements which correspond to a VaR with a 99.5 per cent confidence level over a one-year period as well as usage of internal models in the future is being discussed. The MAS also requires insurers to perform a series of prescribed stress tests on an annual basis to determine the robustness of their capital positions.

AFRICA (South Africa)

- The new South African regime[20] will capture a number of quantifiable risks including market, life underwriting, non-life underwriting, credit and operational risks, whilst liquidity, reputational and strategic risks may not be considered in the calculations. These latter risks, and any other risk that the insurer believes is relevant, should be taken into consideration as part of the ORSA.

  The standard formula to calculate the regulatory capital requirement is based on a modular, primarily scenario-based approach, even though a factor-based approach applies for some risks such as operational risk. The scenario calculations are particularly relevant for those risks where the interaction between assets and liabilities is important, such as all market risks apart from concentration risk, all life underwriting risks and non-life lapse risk. Calibration is done at a 99.5 per cent confidence level over one year, applying a VaR of the basic own funds over a one-year time horizon.

19 Van Hulle (2014).

20 which is not law yet but will become law once the Insurance Bill has been promulgated.

6.3. VALUATION

EUROPE

- Solvency II prescribes a solvency assessment in the ***European Union*** according to market-adjusted values and a so-called economic balance sheet. Assets and liabilities are to be reflected at the amount at which they could be exchanged between knowledgeable, willing parties in an arm's length transaction. The Solvency II implementing measures prescribe a hierarchy of valuation methodologies as follows: quoted market prices in active markets for the same assets or liabilities should be used when obtainable or, if no direct prices are available, quoted market prices in active markets for similar assets and liabilities with adjustments to reflect differences. Otherwise, insurers should use a mark-to-model valuation. In general, intangible assets and goodwill are mostly written off in the economic balance sheet on the asset side.

- Technical provisions should correspond to the amount an insurance or reinsurance undertaking would have to pay if it transferred its contractual rights and obligations immediately to another undertaking (transfer value). Technical provisions are valued on a market-consistent basis, comprising the sum of the best estimate and a margin over current estimate. Updated assumptions must be used. The best estimate represents the probability-weighted average of future cash flows discounted using a risk-free rate term structure.[21] Furthermore, a matching adjustment or volatility adjustment may, under specific conditions, be added to the discount rate. These so-called countercyclical elements are intended to alleviate problems of excessive short-term volatility under the market-consistent valuation approach.

- In ***Switzerland*** the SST requires a total balance sheet with market-consistent values for all assets and liabilities without adjustments such as for matching assets or liquidity features of liabilities. To avoid deviations from market consistency, the balance sheet for SST purposes is separate from statutory, local or other GAAP

21 EU–U.S. Dialogue Project (2012, 2014).

or IFRS accounting principles. The valuation principles are the same for life and non-life liabilities; up-to-date assumptions are required to determine contingent cash flows. The cash flows are valued by optimally risk reducing replication, giving rise to a best estimate, and by adding a cost of capital MOCE that covers the cost of holding capital for the residual risk during its entire run-off. Where payouts do not depend on market variables, the value of the replicating portfolio is the risk-free discounted expected cash flow. Therefore the valuation approach seamlessly extends risk-free discounting.

The SST in general only allows risk-free discounting without 'spread adjustment'. As the only exception to this, FINMA has the option to allow for risk-prone discounting for the existing book of business during a phase of exceptionally low interest rates; new business always needs to be discounted risk free. No risk-prone discounting is currently allowed (even though the Swiss franc yield curve is currently negative up to 24 years).

NORTH AMERICA

- In the ***United States***, regulatory reporting is based on statutory accounting principles (SAP) as defined within the NAICs *Accounting Practices and Procedures Manual*, and to a lesser extent, state law. The NAICs *Accounting Practices and Procedures Manual* represents a comprehensive basis of accounting, which utilises a maintenance process that requires the NAIC to adopt, reject or adopt with modification every U.S. GAAP standard as it is completed.

- The largest asset on most U.S. insurer's balance sheets is its investment in bonds and other fixed-income investments. SAP utilises a valuation of such investments that consider the business model of the insurer. For non-life insurers, investment grade bonds are carried at amortised cost whilst non-investment grade bonds are carried at the lower of amortised cost and fair value. However, all bonds are subject to impairment requirements. For life insurers, only bonds of the lowest quality are carried at the lower of amortised cost and fair value. However, in addition to being subject to impairment requirements, life insurers are also required to establish an asset valuation reserve liability designed to serve as a cushion for potential credit losses.

- Life and health insurance liabilities are valued with significant prudence, according to SAP, The discount rate in SAP formula reserves is intended to represent a prudent estimate of the investment earnings of a typical insurer's investment portfolio over a long time horizon. Statutory reserves for variable annuities are based on TailVaR measures calculated using stochastic models (Actuarial Guideline XLIII). In addition, life insurance reserves are subject to annual asset adequacy testing requirements, which are typically performed through cash-flow testing of assets and liabilities over the life of the insurance liabilities and may result in the establishment of additional actuarial reserves. Most non-life (property/casualty) liabilities are valued according to best estimates of liabilities and are largely consistent with U.S. GAAP. (For life and health liabilities, statutory reserves differ from U.S. GAAP reserves, and both generally differ from company best estimates.) For non-life insurance, discounting is not used, except for qualifying claims in certain defined lines of business (e.g. workers' compensation and certain long-term disability policies).

- ***Canadian*** GAAP is compatible with IFRS and, therefore, applies the related accounting rules for asset valuation. The Canadian Asset Liability Method (CALM) is used to define actuarial reserves. For calculating the required capital, the liability cash flows are based on best-estimate assumptions without additional margins and discounted by regulatory prescribed rates for interest rate and insurance risk.[22]

LATIN AMERICA

- In ***Brazil***, the recognition and measurement of financial assets and liabilities generally follows the local GAAP standards, prepared in accordance with IAS 39 ('Financial Instruments'). The valuation of other types of assets follows local GAAP standards that are in compliance with IFRS. On the liabilities side, companies have to perform the liability adequacy test (LAT), which is based on the concept of best estimate, considering market values, for the technical provisions. The LAT considers realistic assumptions and an interest rates curve released by the regulator, without adding a margin over current estimate or accounting for countercyclical elements.

- The ***Mexican*** solvency requirements are based on an economic valuation of the whole balance sheet. In particular, the new 2015 LISF introduces a requirement to use market values for asset valuation purposes. Institutions must classify their investments in the following three categories that are compatible with IFRS: securities to finance the operation, to be held to maturity or available for sale.

22 See OSFI (2015).

For liability valuation, the value of the technical provisions must correspond to its market value, i.e. to the amount another insurer would pay if all contractual rights and obligations of the insurance portfolio were transferred. In order to comply with this requirement, institutions must value technical provisions by using best estimate of liabilities methodologies (BEL), plus a margin over current estimate. The BEL must reflect the probability-weighted average of the expected present value of future cash flows, using the relevant risk-free interest rate term structure. Countercyclical elements are considered in the valuation approach.

ASIA-PACIFIC

- In ***Australia***, valuation is based on the Australian Accounting Standard AASB1038, adjusted according to the Australian Prudential Rules. On the asset side, intangible assets and goodwill as well as assets in excess of specified asset concentration limits are written off. Further, deferred tax assets are written off unless there are offsetting deferred tax liabilities that could be realised in a close-down scenario.

  Liabilities are calculated by discounting the best estimate with the risk-free yield curve that is based on government bonds. Margins for future adverse experiences are explicitly allowed. As an element to counter cyclicality, real interest rate shocks are specified in terms of a relative percentage shock to the risk-free yield curve, and equity shocks are specified in terms of an absolute shock to dividend yields.

- The valuation principles are specified in the section technical principles for Pillar 1 in the conceptual framework of ***China's*** C-ROSS: The principles utilise a consistent measurement for assets and liabilities of non-life and life insurance undertakings, minimising the mismatch between assets and liabilities. The actual risk profiles of assets and liabilities should be fully reflected and be based on accounting information.[23]

- In ***Japan***, assets and liabilities are measured according to the Japanese GAAP principles with some adjustments for the solvency assessment. For most of the assets, a fair value measurement applies, whilst liabilities for life business are measured based on locked-in assumptions combined with a future cash-flow analysis in order to verify whether accumulating additional reserves in addition to existing technical provisions is required. Liabilities for non-life business are not discounted, except for long-term business. Generally, a current estimate for liability valuation is not used, and the discount rate, where applicable, is a statutory-defined, assumed interest rate based on Japanese government bond yields and a safety factor coefficient.

- ***Singapore's*** valuation rules for assets such as debt securities, equity securities, land and buildings, loans, outstanding premium and agents' balances, reinsurance deposits and reinsurance recoverables are set out in the Insurance (Valuation and Capital) Regulations 2004. The valuation of other types of assets follows local GAAP standards that are in compliance with IFRS.

  The liabilities for both life and non-life businesses are calculated based on the expected cash flows of the underlying policies, with appropriate provision for adverse deviation added to the expected current estimate. Discounting of cash-flow projections is used for life insurance (risk-free rate), whilst for general insurance, no discounting is employed.

  As part of the RBC 2 review, it is intended to introduce a matching adjustment concept to reflect the illiquid nature of life liabilities. Such adjustment will be added to the risk-free rates for certain life businesses that meet the eligibility criteria.

AFRICA (South Africa)

Market consistency is the overriding principle used for the valuation of assets and liabilities. IFRS builds the accounting basis, explicitly set out in the SAM framework, and is mainly applied to assets and liabilities other than technical provisions.

Liability measurement is performed on a current estimate plus margin over current estimate approach:

- The current estimate is a probability-weighted discounted cash-flow calculation of all cash flows that are expected for the insurance contract, based on the best estimates of the insurer as at the valuation date.

- The margin over current estimate is a cost of capital calculation, based on the present value of the cost of capital that an insurer may need to hold for its non-hedgeable risks.

The applied risk-free discount rate is related to the South African Government Bond discount rate, which is computed

23 The information was obtained at http://www.circ.gov.cn/web/site0/tab4566/info3905736.htm.

by the prudential regulator (FSB) on a monthly basis and published on the FSB website.

6.4. INTERNAL MODELS

The possibility for companies to make use of a full or partial internal model is an important element of a jurisdiction's solvency framework.

In the ***European Union***, the SCR needs to be calculated appropriately as the VaR of the basic own funds over a one-year time horizon. The EU has developed a standard model that aims to yield appropriate result for the SCR for most insurance companies and conservative results for all other insurance companies. Where the standard model is inappropriate (especially if SCR values are much too high), the SCR must be computed by an internal model. An internal model is developed to overcome the shortcomings of the standard formula. The use of an internal model can be requested by the supervisor and by the insurer. The regulatory use of internal models requires supervisory approval. The approval process for an internal model comprises six tests and standards: use test, documentation standard, profit and loss attribution standard, calibration standard, statistical quality standard and validation standard. Particularly, internal models must fulfil specific and demanding requirements, including documentation and integration of the model in risk management and decision-making processes.

The solvency regimes in ***Brazil, Mexico, China, Singapore, South Africa*** and ***Switzerland*** follow a similar approach, allowing for the use of full or partial internal models, provided the models are approved by the supervisor. Within this analysis, it is not possible to compare the respective approval requirements in the various jurisdictions in detail. This might be an area of future research. In general, internal models are most relevant for large insurance companies, since the costs of developing, monitoring and getting internal models approved are substantial.

In certain cases where the underlying risks are not well captured by the standard model, the regulator may require the use of internal modelling.

Australia also allows the use of an internal model upon the approval of the supervisor.

In ***Switzerland***, currently, a large segment of the market both in terms of the number of companies and the required capital benchmark uses internal models. FINMA aims to reduce the use of internal models going forward.

In the ***European Union***, a few insurance companies—mainly all material reinsurers and most of the bigger insurance groups—currently have an approved full internal model.

In the ***United States***, an 'internal model' is typically understood to be a quantitative requirement that employs a company-specific actuarial cash-flow projection and is contrasted with 'formula reserves' and factor-based capital charges, which are uniform for all companies. Thus, internal model application, using prescribed parameters and time horizons, is limited to specific products in the life RBC formula and will be utilised in the catastrophe risk module currently under development for P/C insurers.

For the (limited) cases where partial internal models are allowed for life insurance, these models do not require supervisory approval as regulatory minimum/floor scenarios persist.[24] However, the regulators review internal models as part of the ongoing solvency surveillance process. The model-based catastrophe component, on the other hand, would have to come from vendors approved by the supervisor.

Following a similar approach, ***Canada's*** supervisor only recognises internal models for variable annuities and segregated fund guarantees, whilst in ***Japan***, the use of an internal model is allowed only for catastrophe and minimum guarantee risks under specific requirements set by the supervisor.

6.5. QUALITATIVE REQUIREMENTS

EUROPE

- Pillar 2 of the ***European*** Solvency II framework sets qualitative requirements:
    - for the system of governance including risk management, the prudent person principle, fit and proper requirements, identification of key people and key functions,
    - for outsourcing activities,
    - for the ORSA as well as for the supervisory review process.

  Solvency II requires every insurance company to conduct an ORSA. To this end, the insurer must set up processes which enable it to properly identify and assess the risks in the short and long term.

24 EU–U.S. Dialogue Project (2012, 2014).

- In ***Switzerland*** there are specific corporate governance and risk management requirements as well as public disclosure requirements, and ORSA is in force. The requirements are similar to Solvency II.

NORTH AMERICA

- In the ***United States***, the NAIC adopted the Corporate Governance Annual Disclosure Model Act in 2014, requiring insurers to disclose their corporate governance framework. The annual disclosure includes policies and practices of the insurer's board and significant committees, policies and practices of senior management, and oversight of critical risk areas.

  ORSA is a new requirement for large insurers and insurance groups from 2015 (collectively the entities required to perform an ORSA make up over 90 per cent of the United States premium volume). The ORSA includes an internal assessment of the risks associated with the insurer's current and projected future business plan, and an assessment is required of the sufficiency of capital resources to support those risks in both the current and stressed environments. At a minimum, three major components are required: 1) a description of the insurer's risk management framework, 2) the insurer's assessment of risk exposure and 3) the group risk capital and prospective solvency assessment.

- The ***Canadian*** regime comprises an ORSA process which includes reporting forms and frequency requirements and sign-off requirements. A guideline issued in 2014 by the OSFI outlines key elements of the ORSA, such as comprehensive identification and assessment of risks, relating risk to capital, board oversight and senior management responsibility, monitoring and reporting, and internal controls and objective review.

LATIN AMERICA

- ***Brazil's*** regulator, SUSEP, has defined standards regarding requisites of internal control and governance. The enterprise risk management standard was published in 2015. Additionally, insurers are obliged to provide regular statistical data to SUSEP.

  SUSEP is currently studying ORSA issues and plans to publish general ORSA guidelines in 2016, to be tested and further reviewed in 2017.

- In ***Mexico***, the new regulatory framework also covers qualitative requirements in Pillar 2. In general, the governance requirements include rules concerning control functions, outsourcing and compliance. Furthermore, companies must undertake an ORSA, which is intended to provide a multi-year overview of the company's risks in an integrated risk management approach, covering all relevant risks of the company.

ASIA-PACIFIC

- In ***Australia***, insurers have to comply with a range of risk management requirements, comprising a documented risk management framework, a formal risk appetite statement, a reinsurance management strategy and an Internal Capital Adequacy Assessment Process (ICAAP).

  An ICAAP Summary Statement must be included as part of the process. This describes and summarises capital assessment and management processes. An ICAAP summary report has to be prepared each year and this includes an assessment of the effectiveness of ICAAP.

- In ***China***, the solvency-aligned risk management requirements and assessment (SARMRA) is one of CIRC's supervisory elements in Pillar 2 that has a strong focus on insurance companies' own solvency management. To this end, CIRC sets the minimum standards of risk management for insurers and periodically evaluates their governance structure, internal controls, management structure and processes. Additionally, insurance companies' risk management capability and risk profile are to be periodically assessed.

- In ***Japan***, the FSA introduced a formal ORSA process in 2015. Other qualitative requirements are not formalised in the current solvency regime.

- ***Singapore*** has requirements on governance, internal control and on the supervisory review process.

  Additionally, insurers are required to undertake a formal ORSA, at least annually. The ORSA should encompass all reasonable foreseeable and relevant material risks of the insurer and identify the relationship between the risks as well as the level and quality of financial resources needed.

AFRICA (South Africa)

The Solvency Assessment and Management in ***South Africa*** also includes board functions and composition, the risk

management system, strategy and policies, the internal control system, control functions and outsourcing.

Additionally, insurers will under SAM be required to undertake a formal ORSA, obliging them to take their own view (which may or may not be different from the regulatory view reflected in the regulatory capital requirement) of their risks, the amount of capital that they need to hold for these risks, and to understand how this will affect their business plans. An ORSA report will also have to be carried out on at least an annual basis.

6.6. QUALIFYING CAPITAL

The requirements as to the quality of capital resources in the ***European Union's*** Solvency II regime are issued both via a subdivision in tiers and eligibility criteria. Three tiers are present, each of them defined by different eligibility criteria. The criteria comprise the capital items' availability, subordination and duration; the ability to cancel distributions; the conditions on repayment/redemptions, loss absorption, etc. Additionally, Solvency II sets limits to each of the tiers in covering the minimum and regulatory capital requirements, depending on their quality.

In ***Switzerland*** qualifying capital resources are based on the excess of the market-consistent value of assets over liabilities, corresponding to Tier 1 'core capital', plus Tier 2 'supplementary capital', e.g. hybrid debt. Eligibility criteria apply to Tier 2 supplementary capital, including supervisory approval requirements and quantitative limits.

A subdivision of capital resources into three tiers is also present in the regimes of ***Mexico***, ***Singapore*** and ***South Africa.*** The tiers also depend on the loss absorption, availability and seniority of the capital, with slight differences in each regime with regard to the definition of criteria and limits on the extent to which the tiers can be used to cover the capital requirements.

The solvency regimes in ***Australia***, ***Canada*** and ***China*** subdivide the capital into two tiers. Whilst Tier 1 comprises mainly common equity and additional Tier 1 capital such as shareholders' funds and retained profits, Tier 2 is made up of subordinated debt. Tier 2 capital has to be approved according to various criteria and its contribution to the solvency capital of an insurer is limited.

In the current ***Brazilian*** regime, there is no explicit subdivision into capital tiers. Nevertheless, prudential and liquidity criteria exist for the assets that are used for capital coverage. In addition, it is prescribed that companies must have 20 per cent of risk capital in assets with maximum liquidity.

In the ***United States*** regime, the quality of capital resources is controlled via eligibility criteria incorporated in the NAIC *Accounting Practices and Procedures Manual* and prudence in the balance sheet valuation. A tiering system is not applied.

In ***Japan***, instead of a tiering concept, the 'core solvency margin' concept (net assets plus eligible reserves) is used to define an upper limit for inclusion of some secondary capital resources such as subordinated loans.

7. Concluding Remarks

Insurance solvency regimes around the globe are currently undergoing significant changes. Jurisdictions in the North and South American, European and Asia-Pacific regions have reviewed or are reviewing their solvency regimes in order to enhance policyholder protection and financial stability.

Whilst many of the solvency regimes covered by this study have similarities, differences relating to the level of sophistication and application do exist. At a high level, the following basic principles are common amongst most of the regimes:

- All regimes examined follow a risk-based approach for deriving the regulatory capital requirements, aiming to comprehensively account for an insurer's quantifiable risks as exposed to its business activities.

- Required capital is often set at a confidence level of 99 per cent, or 99.5 per cent of the capital resources over a one-year horizon. Mostly VaR and in some cases TailVaR measures are applied.

- Whilst asset values in the solvency balance sheet of many regimes are often directly derived from IFRS (which applies fair value to most asset types), the valuation of liabilities is heterogeneous in terms of the required methodologies and assumptions, conservatism (if any) in base reserves, margins over current estimates (MOCE) and supplemental adequacy testing prescribed. Qualitative requirements including an ORSA are prescribed in most solvency regimes.

The risk-based global insurance capital standard (ICS), which is currently under development by the IAIS, is likely to bear upon these principles whilst attempting to cope with the challenges of harmonising multi-jurisdictional regulations, specific products jurisdiction or corporate law requirements at a global level.

Although this study demonstrates that there is much common ground with regard to the main elements of existing and developing solvency regimes, it is clear that these common elements are interpreted and/or applied in different ways, taking account of differences in regulatory or supervisory practices. To no one's surprise, the IAIS will have to take into account these differences as they strive towards their goal for a single ICS substantially the same across jurisdictions.

8. Literature on Solvency Regimes

Aon (2015) *Asia Pacific Solvency Regulation Report—Non-Life Solvency Calculations for Selected Countries/Regions*, Aon Benfield Analytics, available at http://thoughtleadership.aonbenfield.com/documents/201511_apac_solvency_regulation.pdf.

EIOPA (2014) *The Underlying Assumptions in the Standard Formula for the Solvency Capital Requirement Calculation*, EIOPA-14-322, Frankfurt a.M.: European Insurance and occupational Pensions Authority, available at https://eiopa.europa.eu/Publications/Standards/EIOPA-14-322_Underlying_Assumptions.pdf.

Ernst & Young (2014) *Latin America: Insurance Risk and Regulatory Developments*, available at http://www.ey.com/Publication/vwLUAssets/ey-risk-and-regulatory-developments-in-latin-america/$FILE/ey-risk-and-regulatory-developments-in-latin-america.pdf.

Ernst & Young (2015) *Risk-Based Capital and Governance in Asia-Pacific: Emerging Regulations*, available at http://www.ey.com/Publication/vwLUAssets/EY_Risk_based_capital_and_governance_in_Asia-Pacific_ebook/$FILE/EY_APAC_0306151%20(2).pdf.

European Commission (2009) *Directive 2009/138/EC of the European Parliament and of the Council of 25 November 2009 on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II)*, Official Journal of the European Union L335/1, available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:335:0001:0155:en:PDF.

EU-U.S. Dialogue Project (2012) *Comparing Certain Aspects of the Insurance Supervisory and Regulatory Regimes in the European Union and the United States*, available at https://eiopa.europa.eu/Publications/Reports/EU_US_Dilaogue_Project_Factual_Report.pdf#search=filename%3AEU%5FUS%5FDilaogue%5FProject%5FFactual%5FReport%2Epdf .

EU-U.S. Dialogue Project (2014) *The Way Forward—July 2014 Update*, available at https://eiopa.europa.eu/Publications/Events/Updated_Way_Forward_document.pdf.

KPMG (2011) *Solvency II: A Closer Look at the Evolving Process Transforming the Global Insurance Industry*, available at https://www.kpmg.com/US/en/IssuesAndInsights/ArticlesPublications/Documents/solvency-II.pdf.

KPMG (2015) *Evolving Insurance Regulation—Part 2: Regional Regulatory Developments*, available at https://www.kpmg.com/Global/en/IssuesAndInsights/ArticlesPublications/evolving-insurance-regulation/Documents/evolving-insurance-regulation-2015-report-part-2-fs.pdf.

OSFI (2015) *Life Insurance Capital Framework Standard Approach*, Office of the Superintendent of Financial Institutions policy paper, available at http://www.osfi-bsif.gc.ca/eng/fi-if/ic-sa/lf-sav/Pages/LISFSA.aspx.

Van Hulle, K. (2014) *China: A candidate for provisional equivalency under Solvency II?*, Risk Dialogue Magazine, Issue No. 10, Zurich: Swiss Re Centre for Global Dialogue, available at http://cgd.swissre.com/risk_dialogue_magazine/Insurance_regulation_in_China/China_a_candidate_for_provisional_equivalency_under_Solvency_II.html.

9. Annex 1: Country Regimes

AUSTRALIA

REGULATOR/SUPERVISORY BODY

- Australian Prudential Regulation Authority (APRA, www.apra.gov.au): in charge of licensing and prudential regulation of financial institutions.
- Australian Securities and Investments Commission (ASIC, www.asic.gov.au): responsible for consumer protection.

ACCOUNTING STANDARDS

- Australian GAAP: IFRS-equivalent accounting standards.
- Standards on general insurance: AASB 4 and AASB 1023.

SOLVENCY REGIME

- 2013: Update on capital adequacy requirements and implementation of the Life and General Insurance Capital Standards (LAGIC).
- Use of a three-pillar supervisory approach.
- Prudential Standards CPS 220 'Risk Management' became effective on 1 January 2015.

SOLVENCY ASSESSMENT

- ***Regulatory capital requirement:*** According to Prudential Standards GPS 110, an insurer must provide available capital in excess of its Prudential Capital Requirement (PCR). The standard method to calculate PCR accounts for the following risks: insurance, insurance concentration, asset, asset concentration and operational risk.
- ***Group regulatory capital requirement:*** Regulatory capital requirements are calculated at single entity and at group level.
- ***Risk measure and confidence level:*** The regulatory capital requirements are set at a 99.5 per cent probability of sufficiency over a 12-month period from the reporting date.
- ***Internal model/standard formula:*** The calculation of the required capital amount is based on APRA's 'Standard Method' or on an internal model approved by APRA.

VALUATION

- ***Assets:*** Valuation is based on Australian Accounting Board Standards. For SCR calculation purposes, intangible assets and goodwill as well as assets in excess of specified asset concentration limits are written off.
- ***Liabilities:*** Valuation is based on the Australian Accounting Standard AASB1038 adjusted according to the Australian prudential rules. The calculation is performed by discounting the best estimate with the risk-free yield curve (based on government bonds). Margins for future adverse experience are explicitly allowed and real interest rate shocks may be applied to the risk-free yield curve.

QUALITATIVE REQUIREMENTS

- CPS 510 'Governance' and CPS 220 'Risk Management' commenced on 1 January 2015.
- An ORSA is performed according to Prudential Standards GPS 110, the so-called Internal Capital Adequacy Assessment Process (ICAAP).

BRAZIL

REGULATOR/SUPERVISORY BODY

- Superintendência de Seguros Privados (SUSEP—National Regulatory Agency for Private Insurance, http://susep.gov.br/): regulates, controls and inspects P&C, life, and pension insurance business lines.
- Agência Nacional de Saúde Suplementar (ANS—National Regulatory Agency for Private Health Insurance and Plans): regulates, standardises, controls and inspects the private health insurance and plans sector.

ACCOUNTING STANDARDS

- SUSEP Brazilian GAAP (compliant to IFRS).
- ANS GAAP (major part compliant to IFRS, except IFRS 4).

SOLVENCY REGIME

- Evolvement of the regulatory environment over the last three years.
- Development by SUSEP in collaboration with EIOPA of a standard risk-based solvency framework similar to Solvency II.
- Although Brazil has obtained the equivalence to Solvency II model regarding solvency assessment, some actions are under development, such as improving group supervision and ORSA regulation, which are planned to be implemented from 2017.

SOLVENCY ASSESSMENT

- ***Regulatory capital requirement:*** The regulatory capital requirement measures introduced by SUSEP are comparable to Pillar 1 of Solvency II, including market (interest rate risk, equity risk, commodities risk and currency risk by December 2016), liquidity, underwriting, credit and operational risk (with loss-data base requirement for companies above a certain premium level). For ANS, solvency capital is not based on risk, but on factors applied on premiums or losses.
- ***Group regulatory capital requirement:*** Regulatory capital requirements are calculated for the single company.
- ***Risk measure and confidence level:*** Currently, the solvency requirement is not set at a predetermined confidence level. A factor-based approach is in use.
- ***Internal model/standard formula:*** Internal models are allowed to substitute the standard formula. The process of internal model approval is not fully defined by SUSEP. For ANS-regulated insurers, there is no standard, defined risk-based capital formula. Internal models are allowed but applied rarely or not at all. It is planned to set the solvency requirement at a specified confidence level.

VALUATION

- ***Assets:*** According to local GAAP and similar to IFRS, accrued or market-consistent valuation is used depending on the type of assets. 'Mark-to-market', 'available for sale' and 'held to maturity' assets are distinguished.
- ***Liabilities:*** There are technical provisions that are defined in contracts (private pension plans mathematical provisions), provisions defined by accounting rules (premium reserves) and provisions defined in market consistent adjustments. For the provisions that are not defined with market-consistent adjustments and are below the adequate value, the companies must constitute an additional provision, turning the overall constituted value to a market value approach.

QUALITATIVE REQUIREMENTS

- SUSEP and ANS require specific risk disclosures in financials explanation notes.
- Discussion of a new regulation similar to Solvency II Pillar 2 requirements, including an ORSA by SUSEP.

CANADA

REGULATOR/SUPERVISORY BODY

The Office of the Superintendent of Financial Institutions (OSFI, http://www.osfi-bsif.gc.ca) sets solvency regulation for large Canadian insurance companies.

ACCOUNTING STANDARDS

Canadian GAAP (compliant to IFRS).

SOLVENCY REGIME

- In recent years, updated guidelines on regulatory risk management, requiring an enterprise-wide framework.
- ORSA requirement since 2014.
- Continuous evolvement of regulatory capital requirements.

SOLVENCY ASSESSMENT

- ***Regulatory capital requirement:*** The risk-based capital requirements in Canada reflect the quantifiable key risks an insurance company is exposed to. The calculation of RBC is performed using a scenario approach for insurance and interest rate risk, and a factor approach for credit, asset and operational risks. The regulatory framework does not directly account for the following risks: credit spread risk, liquidity risk, legal risk, strategic risk and reputational risk.
- ***Group regulatory capital requirement:*** The solvency framework is defined as a consolidated group solvency requirement.
- ***Risk measure and confidence level:*** The risk-based capital requirement is calibrated over a one-year horizon, using conditional TailVaR measure at confidence level of 99 per cent.
- ***Internal model/standard formula:*** The model is prescribed by the regulator as a standard approach. Internal models are only recognised for variable annuities and segregated fund guarantees.

VALUATION

- ***Assets:*** Asset valuation is based on the relevant accounting standards.
- ***Liabilities:*** The Canadian Asset Liability Method (CALM) is used to define actuarial reserves. For calculating the required capital, the liability cash flows are based on best-estimate assumptions without additional margins and discounted by regulatory prescribed rates for interest rate and insurance risk.

QUALITATIVE REQUIREMENTS

- An ORSA process is prescribed. It includes reporting requirements with forms and frequency and sign-off requirements.
- A guideline, issued in 2014 by OSFI, outlines key elements of the ORSA, such as comprehensive identification and assessment of risks, relating risk to capital, board oversight and senior management responsibility, monitoring and reporting, internal controls and objective review.

CHINA

REGULATOR/SUPERVISORY BODY

The China Insurance Regulatory Commission (CIRC, http://www.circ.gov.cn).

ACCOUNTING STANDARDS

Chinese Accounting Standards for Business Enterprises (ASBE).

SOLVENCY REGIME

- The China Risk Oriented Solvency System (C-ROSS) was introduced in 2016.
- C-ROSS is based on a three-pillar supervisory regime with similarities to Solvency II.
- C-ROSS formally came into force on 1 January 2016

SOLVENCY ASSESSMENT

- ***Regulatory capital requirement:*** Pillar 1 of C-ROSS links its capital requirements to three types of risks: insurance risk, market risk and credit risk. The capital requirements for these three types of risks are calculated using a prescribed standard method. Further, diversification effects between the risks are included when aggregating the risks.
- ***Group regulatory capital requirement:*** The details are still developing. In principle, the group aggregated capital requirement considers the capital requirements from group companies and subsidiaries, diversification effects, special considerations due to contagion effects, DSII etc.
- ***Risk measure and confidence level:*** The conceptual framework adopted a VaR approach for the calculation of the quantitative capital requirements. The confidence level will be set based on China's current circumstances, with reference to industry quantitative impact study (e.g. 99.5 per cent).
- ***Internal model/standard formula:*** The standard formula is adopted.

VALUATION

- ***Assets/liabilities:*** China does currently not follow a market-consistent valuation due to the lack of a sophisticated market.

QUALITATIVE REQUIREMENTS

- The risk management requirements and assessment (SARMRA) is one of CIRC's supervisory elements in Pillar 2 that has a strong focus on the companies' own solvency management.
- CIRC sets the minimum standards of risk management for insurers and periodically evaluates their practices, such as governance structure, internal controls, management structure and processes. Additionally, insurance companies' risk management capability and risk profile is periodically assessed.

EUROPEAN UNION (Solvency II)

REGULATOR/SUPERVISORY BODY

- Insurance undertakings in the European Union are supervised by national competent authorities.
- The European Insurance and Occupational Pensions Authority (EIOPA, https://eiopa.europa.eu) plays an important role in coordinating supervisory rules and practice and in developing a common supervisory approach (single European rule book).

ACCOUNTING STANDARDS

The International Financial Reporting Standards (IFRS) must be applied in the consolidated financial statements of listed insurance undertakings.

SOLVENCY REGIME

- The Solvency II Framework Directive (2009/138/EC) was adopted on 25 November 2009 and became applicable as of 1 January 2016.
- Solvency II introduces a new solvency capital regime based on a three-pillar approach:
  - > Pillar 1: Quantitative requirements.
  - > Pillar 2: Governance requirements and supervisory review process.
  - > Pillar 3: Public disclosure and supervisory reporting.

SOLVENCY ASSESSMENT

- ***Regulatory capital requirement:*** The Solvency Capital Requirement (SCR) must comprise all quantifiable risk an insurer is exposed to. Risks that are not directly quantifiable, such as reputational or strategic risk, are covered through a more qualitative assessment under Pillar 2. The SCR can either be calculated through a standard formula or a full or partial internal model, developed by the company and approved by the supervisor.
- ***Group regulatory capital requirement:*** The SCR has to be calculated at single level for all entities part of a group and at group level.
- ***Risk measure and confidence level:*** SCR is calibrated at a 99.5 per cent level of confidence over a period of one year, using a VaR measure.
- ***Internal model/standard formula:*** The SCR may be computed by internal models for all or some of the risks. Internal models must fulfill specific and demanding requirements, including documentation and integration of the model in risk management and decision-making processes. Internal models are subject to the regulator's approval.

VALUATION

- ***Assets:*** A market-consistent valuation is applied for the assets side, utilising a mark-to-market or mark-to-model approach. In the economic balance sheet, intangible assets and goodwill are not recognised.
- ***Liabilities:*** Technical provisions are valued on a market-consistent basis, comprising the sum of the best estimate and a margin over current estimate. The best-estimate liability represents the probability-weighted average of future cash flows discounted using a risk-free rate term structure. A matching adjustment or volatility adjustment may be included in the discount rate as a countercyclical element.

QUALITATIVE REQUIREMENTS

The qualitative requirements are set out in Pillar 2 of the framework. They include requirements for the system of governance, risk management, internal control, outsourcing activities, and ORSA as well as on the supervisory review process.

MEXICO

REGULATOR/SUPERVISORY BODY

Comisión Nacional de Seguros y Fianzas (CNSF, www.cnsf.gob.mx).

ACCOUNTING STANDARDS

Mexican Financial Reporting Standards (IFRS compliant).

SOLVENCY REGIME

- Evolvement of the regulatory environment over the last years, aiming at a more sophisticated risk-based capital approach than the actual one.
- The Insurance and Surety Institutions Law (LISF) is inspired by Solvency II.
- The new regulation with certain quantitative and disclosure requirements is planned to become effective by 2016.

SOLVENCY ASSESSMENT

- ***Regulatory capital requirement:*** The Mexican solvency requirements are based on an economic valuation of the whole balance sheet. The risk-based capital for an insurer is determined according to the standard formula software provided by the regulator. Liquidity, reputational and strategic risks are not quantified in the standard formula.
- ***Group regulatory capital requirement:*** Regulatory capital requirements are calculated for the single company.
- ***Risk measure and confidence level:*** VaR is the risk measure for calibrating the regulatory capital requirement at a confidence level of 99.5 per cent over a one-year horizon.
- ***Internal model/standard formula:*** Internal models could be applied after the transition period.

VALUATION

- ***Assets:*** LISF introduces a requirement to use market values for asset valuation purposes. Institutions should classify their investments in the following three categories that are compatible with IFRS: securities to finance the operation, to be held to maturity, or available for sale.
- ***Liabilities:*** The value of the technical provisions should correspond to their market value, i.e. to the amount another insurer would pay if all contractual rights and obligations of the insurance portfolio were transferred. In order to comply with this requirement, institutions should value technical provisions by using best-estimate methodologies (BEL), plus a margin over current estimate. The BEL should reflect the probability-weighted average of the expected present value of future cash flows, using the relevant risk-free interest rate term structure. Countercyclical elements are considered in the valuation approach.

QUALITATIVE REQUIREMENTS

- Requirements for the system of corporate governance deal with the control functions, outsourcing, compliance and reporting.
- An ORSA is prescribed which is intended to provide a multi-year overview of the company's risks in an integrated risk management approach, covering all relevant risks of the company.

JAPAN

REGULATOR/SUPERVISORY BODY

Financial Services Agency of the Japanese Government (FSA, www.fsa.go.jp); Bureau of the Ministry of Finance.

ACCOUNTING STANDARDS

Japanese GAAP.

SOLVENCY REGIME

- Requirements are set in the Insurance Business Act.
- An updated financial monitoring policy for financial institutions was announced in 2014.
- Further evolvements of the regulatory framework focusing on supervision, capital adequacy and the introduction of an economic value-based solvency regime are ongoing.

SOLVENCY ASSESSMENT

- ***Regulatory capital requirement:*** Regulatory capital requirement reflect the underlying risks of the insurance company.
- ***Group regulatory capital requirement:*** Regulatory capital requirements have to be calculated at single-entity and at group level.
- ***Risk measure and confidence level:*** Generally, VaR is used as a risk measure. The confidence level varies in dependence on the risk category: 95 per cent of VaR for general underwriting and investment related risks, 99 per cent for the third underwriting risks (generally health, accident insurance), 99.5 per cent for natural catastrophe risk from earthquakes and 98.7 per cent for natural catastrophe risk from flood and storm.
- ***Internal model/standard formula:*** The use of an internal model is allowed only for catastrophe and minimum guarantee risks upon specific requirements set by the supervisor.

VALUATION

- ***Assets:*** Assets and liabilities are measured according to the Japanese GAAP principles with some adjustments for the solvency assessment. For most of the assets a fair value measurement applies.
- ***Liabilities:*** Liabilities for life business are measured based on locked-in assumptions combined with a future cash-flow analysis in order to verify if accumulating additional reserves in addition to existing technical provisions is required. Liabilities for non-life business are not based on discounted values, except for long-term business. Generally, a current estimate for liability valuation is not used, and the discount rate, where applicable, is a statutory-defined assumed interest rate based on Japanese government bond yields and a safety factor coefficient.

QUALITATIVE REQUIREMENTS

- Insurers are required to undertake a formal ORSA from 2015.

SINGAPORE

REGULATOR/SUPERVISORY BODY

The Monetary Authority of Singapore (MAS, www.mas.gov.sg).

ACCOUNTING STANDARDS

- Singapore Standards, equivalent to IFRS with modifications.
- New financial reporting framework, which is identical to IFRS, is planned to be effective for annual periods beginning on or after 1 January 2018 for Singapore listed companies with voluntary application for non-listed Singapore-incorporated companies.

SOLVENCY REGIME

- The RBC framework for insurers was introduced in 2004 by MAS.
- Supported by an industry consultation process in 2012, MAS reviewed the framework and issued details of the new risk-based capital regulatory calculations, called RBC 2, in 2014. The final industry consultation combined with a Quantitative Impact Study is expected for Q2 2016. An official implementation date has not been communicated yet, but MAS indicated that the industry will be given two years to comply with the new rules making 1 January 2019 a realistic date for introducing RBC2.

SOLVENCY ASSESSMENT

- ***Regulatory capital requirement:*** Singapore links its regulatory capital requirements to insurance, market, credit and asset concentration risk together with asset and liability mismatching. New explicit risk charges for operational risk, credit spread risk and insurance catastrophe risk will be introduced under the revised framework, RBC 2. The MAS also requires insurers to perform a series of prescribed stress tests on an annual basis to determine the robustness of their capital positions.
- ***Group regulatory capital requirement:*** Group solvency requirements are applicable to groups where MAS is the group-wide supervisor.
- ***Risk measure and confidence level:*** Currently, a factor approach to determine the total risk requirements which correspond to a VaR with a 99.5 per cent confidence level over a one-year period is in discussion.
- ***Internal model/standard formula:*** The use of internal models to calculate regulatory capital requirement is currently not allowed, but will be considered in later phases of the RBC 2 review. However, insurers are encouraged to use internal models for their ORSA.

VALUATION

- ***Assets:*** The valuation rules for assets are set out in the Insurance ('Valuation and Capital') Regulations 2004 ('Valuation Regulations'). The valuation of other types of assets follows local GAAP standards that are in compliance with IFRS.
- ***Liabilities:*** The liabilities for both life and non-life businesses are calculated based on expected cash flows of the underlying policies, with appropriate provision for adverse deviation added to the expected current estimate. Discounting of cash-flow projections is used for life insurance (risk-free rate), whilst for general insurance, no discounting is employed. As part of the RBC 2 review, it is intended to introduce a matching adjustment concept to reflect the illiquid nature of life liabilities. Such adjustment will be added to the risk-free rates for certain life business that meet the eligibility criteria.

QUALITATIVE REQUIREMENTS

- Singapore has requirements on governance, internal controls, supervisory review and public disclosure.
- Additionally, insurers are required to undertake a formal ORSA, at least annually. The ORSA should encompass all reasonable foreseeable and relevant material risks of the insurer and identify the relationship between the risks, as well as the level and quality of financial resources needed. Tier 1 insurers have to submit their ORSA to MAS annually, whereas for smaller Tier 2 insurers it's only every three years.

SOUTH AFRICA

REGULATOR/SUPERVISORY BODY

- Currently the South African Reserve Bank (SARB, www.resbank.co.za) has the responsibility for prudential regulation of banks and the Financial Services Board (FSB) for the prudential and market conduct regulation of insurers and other non-banking financial institutions. In future (post the enactment of the Financial Sector Regulation Bill) the Prudential Authority, under the auspices of the SARB, will be responsible for the prudential regulation of both banks and insurers and the FSB will become the Financial Sector Conduct Authority responsible for market conduct regulation.

ACCOUNTING STANDARDS

International Financial Reporting Standards.

SOLVENCY REGIME

- Major change in insurance regulation with upcoming Solvency Assessment and Management (SAM). SAM is a risk-based regulatory framework on the basis of three pillars that is considered equivalent to Solvency II but adapted to South African circumstances.

- The framework will be enshrined in legislation by the Insurance Bill and is expected to be effective on 1 January 2017.

SOLVENCY ASSESSMENT[25]

- ***Regulatory capital requirement:*** The regulatory capital requirement calculation will capture a number of quantifiable risks including market, life underwriting, non-life underwriting, credit and operational risks. Business, liquidity, reputational and strategic risks, and any other risk that the insurer believes is relevant should be taken into consideration as part of the ORSA.

- ***Group regulatory capital requirement:*** Regulatory capital requirements are calculated for the single company.

- ***Risk measure and confidence level:*** Calibration is done at a 99.5 per cent confidence level over one year, applying a VaR of the basic own funds over a one-year time horizon.

- ***Internal model/standard formula:*** The standard formula to calculate the SCR is based on a modular approach, primarily using a scenario approach, even though a factor approach applies for some risks such as operational risk. The use of internal models is subject to defined criteria and a supervisor's approval process.

VALUATION

- ***Assets:*** Market consistency is the overriding principle used for the valuation of assets and liabilities. IFRS builds the accounting basis, explicitly set out in the SAM framework, and is mainly applied to assets and liabilities other than technical provisions.

- ***Liabilities:*** Liability measurement is performed on a current estimate plus margin over current estimate approach. The current estimate is a probability weighted discounted cash-flow calculation of all cash flows that are expected for the insurance contract, based on the best estimates of the insurer as at the valuation date.

QUALITATIVE REQUIREMENTS

The qualitative requirements provided here are based on the future prudential regulatory regime that will be given effect to through the Insurance Bill, which is currently serving before parliament.

- The SAM framework has a focus on the governance system, including the topics of board functions and composition, the risk management system, strategy and policies, internal control system; control functions and outsourcing.

- Additionally, insurers are required to undertake a formal ORSA process. An ORSA report has to be sent to the regulator on at least an annual basis.

25 The solvency assessment provided here is based on the future prudential regulatory regime that will be given effect to through the Insurance Bill, which is currently serving before parliament.

SWITZERLAND

REGULATOR/SUPERVISORY BODY

- FINMA's (www.finma.ch) mandate is to supervise banks, insurance companies, exchanges, securities dealers, collective investment schemes, and their asset managers and fund management companies. It further regulates distributors and insurance intermediaries.

ACCOUNTING STANDARDS

- Swiss GAAP and IFRS. The SST does not rely on or make reference to these.

SOLVENCY REGIME: SWISS SOLVENCY TEST (SST)

- The regime is principles-based and uses a risk-oriented approach to its supervision of insurance companies.
- The intensity of supervision is proportionate to the risk potential of an insurance company.
- The SST has been developed since 2003 and the legislation has entered into force in 2006, with a transitional period of 5 years. The SST is a fully risk-based system, using a total balance sheet that is fully market consistent. Since 2007/8 insurance companies and groups need to submit a comprehensive SST report to FINMA.
- Since 2011 SST can be directly used by FINMA to enforce supervisory action based on a ladder on intervention. In 2015, the legal basis for the SST has been strengthened and revised.
- The European Union (Parliament, Commission and Council) have classified SST as fully equivalent to Solvency II. SST is the only regulatory systems that has been granted equivalence from the very beginning of Solvency II.

SOLVENCY ASSESSMENT

- ***Regulatory capital requirement:*** FINMA uses the SST as a supervisory tool, which adopts a risk-based approach using a total (i.e. no off-balance sheet items), fully market-consistent balance sheet.
- SST captures all risk to the market-consistent balance sheet of the insurance company or group.
- Operational risk is sometimes not required to be quantified in the SST. Despite this, for companies calculating both, the SST ratio could sometimes be lower than the SII ratio.
- ***Group regulatory capital requirement:*** For Swiss-based groups, the requirement is set both at solo and a group level (group SST).
- ***Risk measure and confidence level:*** SST sets the Required Capital Benchmark at a level needed to pursue the business planned for the next 12 months. The required capital benchmark is the 1 per cent TailVaR of the capital resources over a one-year time horizon (99 per cent confidence level).
- ***Internal model/standard formula:*** Insurance companies need to calculate their Required Capital Benchmark appropriately. If needed, they must use an internal model, especially where the FINMA developed standard models (which generally are stochastic models and not formulas) do not calculate the Required Capital Benchmark correctly. Internal models have to fulfil specific criteria and are subject to approval by the supervisor.

VALUATION

- ***Assets:*** Market (consistent) values for all assets
- ***Liabilities:*** Uses optimally risk reducing replication (giving rise to a best estimate) and a cost of capital MOCE (to cover the cost of Capital Resources during the entire run-off of the residual risk) for all liabilities. This implies truly risk-free rates and proper valuation of all options and guarantees.
- Supervisors have the full, unrestricted set of interventions available as they can perform any transaction at prevailing market prices.

QUALITATIVE REQUIREMENTS

Qualitative requirements are in line with Solvency II and include an ORSA.

UNITED STATES

REGULATOR/SUPERVISORY BODY

- Insurance companies are supervised by state insurance commissioners.
- The Federal Reserve has obtained supervisory powers for designated systemically important insurers.
- The National Association of Insurance Commissioners (NAIC, www.naic.org) is the national standard-setting organisation created and governed by the chief insurance regulators from the 50 states, the District of Columbia and five U.S. territories. It has an important coordinating function, provides regulatory support for state insurance departments and develops model acts, which are taken up by individual states.

ACCOUNTING STANDARDS

- U.S. statutory accounting principles.

SOLVENCY REGIME

- The NAIC's Solvency Modernization Initiative (SMI) started in June 2008 and was completed in 2012, focuses on five key solvency areas: capital requirements, international accounting, insurance valuation, reinsurance, and group regulatory issues.
- The principles-based approach to valuation of life insurance liabilities is to be effective in all U.S. states from 1 January 2017.

SOLVENCY ASSESSMENT

- ***Regulatory capital requirement:*** The U.S. risk-based capital (RBC) formula is primarily factor-based and considers all risks that are quantifiable and material for the industry, i.e. the U.S. framework typically covers all risks to some degree even if they are not explicitly reflected within the calculation of required capital.
- Strategic risk, reputational risk and currency risk are not explicitly accounted for in the RBC. The factors of the formula are derived from historical industry-wide data, whilst internal models are used for interest rate and market risk only to some extent.
- ***Group regulatory capital requirement:*** Regulatory capital requirements are calculated for the legal entity insurer. Recently, an initiative to develop a calculation of group capital from a regulatory perspective has been launched.
- ***Risk measure and confidence level:*** The formula was not designed to produce a minimum level of aggregate RBC at an explicit level representing a certain statistical outcome. However, the components and factors of RBC, such as asset risk or the catastrophe risk charge, do have a statistical calibration base.
- ***Internal model/standard formula:*** Internal model application, using prescribed parameters and time horizons, is limited to specific products in the life RBC formula and will be utilised in the catastrophe risk module currently under development for P/C insurers. For the (limited) cases where partial internal models are allowed for life insurance, these models do not need a supervisory authority's approval as regulatory minimum/floor scenarios persist.

VALUATION

- ***Assets:*** Regulatory reporting is based on statutory accounting principles (SAP), applying various prescribed modifications to U.S. GAAP and using an amortised cost basis for most bonds and fixed-income assets rather than market values (e.g. used for equities and other similar investments). Additionally, assets are subject to impairment testing.
- ***Liabilities:*** Life and health insurance liabilities are valued with significant prudence, according to SAP and distinct from U.S. GAAP, whilst most non-life (property/casualty) liabilities are valued aligned with U.S. GAAP. Liabilities are subject to adequacy testing, utilising a minimum reserve that uses locked-in assumptions as well as a cash-flow projection model with an 'unlocked book yield' approach. The discount rate formula is intended to represent a prudent estimate of the investment earnings of a typical insurer's investment portfolio over a long time horizon. For non-life insurance, discounting is not used except for qualifying claims in certain defined lines of business (e.g. workers' compensation and certain long-term disability policies).

QUALITATIVE REQUIREMENTS

- The Corporate Governance Annual Disclosure Model Act of 2014 requires insurers to disclose their corporate governance framework and structure.

- An ORSA has to be performed by larger insurers and insurance groups from 2015.

9. Annex 2: Survey Questionnaire

1. VALUATION PRINCIPLE

a. Are assets and liabilities measured consistently, i.e. based on comparable principles (for example, at market-consistent values?) If not, please explain shortly the difference in principles used.

b. Is valuation based upon local GAAP? Is local GAAP adjusted? How?

c. Is valuation based upon IFRS? Is IFRS adjusted? How?

d. Are there important differences in the methodologies used for life and non-life, respectively?

Especially on liability measurement:

i. Are companies required to base liability valuation on updated assumptions?

ii. Are liabilities estimated independently from premiums?

iii. If liabilities are based on cash-flow projections, are conservative assumptions made or do you calculate a current estimate? Is discounting of cash-flow projections used?

iv. If a current estimate is used, is a margin over current estimate added to it?

v. Is the discount rate used linked to assets? Or which discount rate is used?

vi. Are there countercyclical elements, reflecting the degree of illiquidity, in the discount rate used? Or would you consider countercyclical elements to be built into the valuation approach?

2. RISK SENSITIVITY

a. Does the solvency capital requirement reflect the underlying risks of the insurance company?

b. Are all quantifiable risks taken included in the prescribed formula for calculating the capital requirement?

c. Is the formula for the calculation of the solvency capital requirement based on a factor or a scenario approach?

d. Would you say that the solvency requirements provide incentives for sound risk management, for example by proper reflection of risk diversification and risk management?

e. Are there any risks not taken into account? Which ones and how/where are they considered?

f. Is the impact of risk mitigation techniques allowed or are there restrictions?

3. CALIBRATION

a. Is the solvency requirement explicitly set at a predetermined confidence level? Which level? What is the risk measure and time horizon?

b. Are management actions allowed for in the calculation of required capital?

c. Is the confidence level set taking into account the existence of an insurance guarantee protection scheme? (besides capital requirements)

4. QUALITATIVE REQUIREMENTS

a. Does the solvency regime besides quantitative requirements also focus on governance issues, the supervisory reporting process, reporting requirements and other qualitative requirements etc.? Which?

b. Are companies required to undertake a formal ORSA (own risk and solvency assessment) process?

5. GROUP ISSUES

a. Do groups have to calculate a group solvency requirement or are solvency capital requirements only calculated for solo entities? Or is there a requirement to do both?

b. If a group solvency capital requirement is calculated, is account taken of diversification effects at group level?

c. Are diversification effects fully taken into account?

d. Is there a requirement to perform an ORSA process at group level?

6. INTERNAL MODELS

a. Is it allowed to calculate the solvency capital requirement based upon an internal model?

b. What is the scope of the internal model, only required capital or also available capital (valuation)?

c. Are there specific requirements which must be met when preparing an internal model (such as predefined parameters by supervisors?)

d. Who determines the criteria for approval of internal models?

e. Who is responsible for approving internal models—the (group) supervisor? Or is responsibility delegated to an external party?

7. MULTI-LAYER SUPERVISORY SYSTEM

a. Are multi-layer groups required to calculate a solvency capital requirement at each level of the group?

8. QUALIFYING CAPITAL

a. Is the quality of capital resources controlled via a subdivision in tiers or handled via eligibility criteria or for example prudence in the balance sheet valuation?

b. If tiering is applied, how many tiers are required?

Acknowledgements

This report has been conducted by The Geneva Association. Dr Matthias Schmautz, independent researcher and lecturer, has assisted The Geneva Association as an analyst and writer of the report, whilst Professor Karel Van Hulle acted as a reviewer.

We especially thank the responding insurance groups and insurance regulators for having taken the time to reply to our structured questionnaire.

This report demonstrates that there is much common ground with regard to the main objectives and key elements of existing and developing solvency regimes. The International Association of Insurance Supervisors (IAIS) is currently developing its global Insurance Capital Standard (ICS), as part of its Common Framework for the supervision of internationally active insurance groups (ComFrame). It is clear that the common elements identified in this report are interpreted and applied in different ways. The IAIS will have to take into account these differences as they strive towards their goal to introduce the ICS.

The Geneva Association—'International Association for the Study of Insurance Economics'
Zurich | Talstrasse 70, CH-8001 Zurich | Tel: +41 44 200 49 00 | Fax: +41 44 200 49 99