

THE IMPACT OF SOLVENCY ASSESSMENT AND MANAGEMENT ON THE
SHORT-TERM INSURANCE INDUSTRY IN SOUTH AFRICA

by

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I hereby declare that “*The impact of Solvency Assessment and Management on the short-term insurance industry*” is my own work and that all the sources I have used or quoted have been indicated and acknowledged by means of complete references.

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Date

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ABSTRACT

The financial stability of the insurers is important to fulfil its role as a risk transfer mechanism and to protect the purchasers of their products. The European Union is introducing the Solvency II to modernise the current Solvency I regime and to harmonise the different insurance legislation of the members of the European Union. Solvency II introduces an architecture consisting of three pillars, with Pillar I setting the solvency capital requirements, Pillar II the governance and risk management requirements and Pillar III the reporting requirements. The South African Regulator initiated Solvency Assessment and Management for implementation in 2016 to align the South African prudential regulatory framework to meet the Solvency II requirements for third country equivalence. The problem that this study addressed is the possible effect that the introduction of Solvency Assessment and Management may have on the sustainability of short-term insurers in South Africa. The results of an empirical component of the study indicated that small and medium short-term insurers may be negatively impacted due to the costs incurred to implement and comply with the requirements of the new regulatory framework. The effect on the South African short-term industry can be that cover is concentrated among a few large short-term insurers.

KEY WORDS

Solvency II, Solvency Assessment and Management, Solvency II architecture, underwriting risk, market risk, counterparty default risk, operational risk, technical provisions, basic solvency capital requirements, minimum capital requirements.

CHAPTER 1

INTRODUCTION

1.1. BACKGROUND

The Comité Européen des Assurances (CEA) describes the role of insurance as a provider of pooling and transferring of risk by application of the law of large numbers, which in turn also facilitates economic activity (CEA 2010:13). The financial stability of the insurers is important to ensure that they can continue to fulfil their role and obligations, but also to protect the purchasers of their products and services (CEA Solvency II Glossary 2007:54). The regulators, rating agencies and investors have an interest in the ability of insurers to absorb significant, unforeseen losses, which is measured by the valuation of insurance liabilities and the calculation of a regulatory capital charge to absorb the losses when necessary. The International Association of Insurance Supervisors (IAIS 2011:3) argues that, because of the function fulfilled by the insurance industry, long- and short-term insurers should be closely regulated for the purpose of a sustainable industry, and to protect the end-buyers of insurance products and services. The insurance regulators have introduced Solvency II as the new regulatory regime for insurers with an implementation date in 2016 (EU Statement 14/61 2014) in Europe and the United Kingdom, with South Africa who will implement the Solvency and Assessment Management regime, which is based on Solvency II in 2016 (SAM Update 2013:8). Although there appear to be consensus that the insurance industry must be regulated, scholars and practitioners have concerns of the effect that the new solvency requirements may have on the small and medium insurers (ECB 2007:39 and Vivian 2007:1). The head of the Prudential Regulatory Authority of the United Kingdom also expressed concerns with the mounting cost to implement Solvency II and estimated the cost for the UK insurers at GBP 3 billion (Gray 2013).

The regulation of the insurance industry has evolved from being limited to the country in which a specific insurer operates, to harmonise the different regulatory

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approaches in Europe and the United Kingdom with Solvency I (Ford 2011:262-263). Van Hulle (2011:179) indicates that Solvency II was developed to overcome shortcomings identified with Solvency I. The Solvency II regime was adopted by a number of countries, and South Africa will align its regulatory framework with Solvency II with the implementation of the Solvency and Assessment and Management (SAM) framework (SAM Roadmap 2010:4).

Research on the 2007/2008 economic crisis and the impact thereof on the insurance industry by Njegomir, Marovic, and Maksimovic (2010:131), however indicates that the insurance industry emerged largely unscathed. In a study conducted by the European Central Bank (ECB 2007:39) on the Potential Impact of Solvency II on Financial Stability, it was found that Solvency II may lead to short- and medium risks for the insurance market. Other commentators such as European Central Bank (ECB2007:39) and indicate that the cost of implementation and compliance with the new regime may lead to higher premiums. This view is supported by the Insurance Leadership Network (IGLN Viewpoint 2012), and Davidson (2013). Lloyd's of London indicated implementation cost of GBP 300 million and on-going Solvency II-related expenses of GBP 60 to GBP 70 million per annum (Gray, A. 2013).

In a study by Cummins and Venard (2007:21), it was noted that insurance has global similarities, but local differences, for example, the terminology used is not necessarily universal. "Property-casualty insurance" or "property-liability insurance" is commonly used in the United States of America (USA), "general insurance" is used in the United Kingdom (UK) and other commonwealth countries, "non-life insurance" in other countries and "short-term insurance" in South Africa. They also noted that "long-term insurance" is used in South Africa and the UK as a synonym for "life insurance", which is used by other European countries.

Short-term or non-life insurers promise a policyholder future compensation according to specified terms and conditions, for damages suffered from well-defined contingent events. Life-insurers promise a policyholder future compensation at an agreed age or to the nominated beneficiaries upon the death of the policyholder, which by the nature of long-term insurance, covers a much longer period than short-term insurance (Doff 2007:11).

Nienaber and Reinecke (2009:4) indicate that short-term insurers provide policy holders indemnity against fortuitous and previously agreed events, while long-term insurers pay monetary consolation regardless of the financial loss on the payment of a premium by the policyholder. Doff (2007:13) notes that in providing this service, the insurer incurs a number of risks, firstly in the future liabilities of claims, but also due to the nature of the business model of insurance. The risks that the insurer incurs are discussed in the next section.

1.2. RISKS FOR THE SHORT-TERM INSURER

According to Doff (2007:13), as insurers promise policyholders future compensation for losses from previously agreed events, they raise provisions to cover these future liabilities. He further notes to cover the future liabilities under insurance policies, the insurer raises a technical provision on the liability side of the balance sheet to cover a new policy as soon as the policy is granted, and as indicated by Doff (2007:23), the technical provisions are the largest single item on the balance sheet of an insurance company. The balance sheet of a typical insurer is illustrated in Table 1.1.

Table 1.1. The balance sheet of an insurer

Assets	Liabilities
<p>Intangible assets</p> <ul style="list-style-type: none"> • Goodwill (in cases where the takeover price exceeds the net value of the insurer) • Deferred tax assets • Deferred acquisition cost (DAC) <p>Investments</p> <ul style="list-style-type: none"> • Different asset classes such as: <ul style="list-style-type: none"> ▪ equity ▪ property ▪ fixed income (bonds) 	<p>Capital</p> <ul style="list-style-type: none"> • Shareholder capital • Subordinated debts • Wholesale funding <p>Technical provisions</p> <p>The best estimate of the net present value of future claims minus the net present value of future premiums</p>

As adapted from De Weert (2011:19)

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De Weert (2011:19) indicates that the assets of the insurer consist of intangible assets and investments. He also notes that the components of the intangible assets consist of goodwill, deferred tax assets, and deferred acquisition costs (DAC). De Weert (2011:20-22) describes goodwill as the difference between the acquisition price and net asset value of an asset or the reputation of the insurer. He notes that deferred tax assets are created by the difference in the accounting value of an asset and the tax value (De Weert 2011:11). DAC would typically include the cost to develop new products and costs incurred as the premium is written, but earned and expensed over the term of the policy. Unearned premiums are invested in equities, property, fixed income, and short-term deposits.

Technical provisions consist of different obligations and liabilities, such as policyholder obligations, tax liabilities, obligations arising from business and management cost of the portfolio, creditors' and policyholders' rights in terms of premiums due and recoveries (CEA Solvency II Glossary 2007:54).

The identification and classification of risks in the insurance industry went through a number of stages with the Müller Report in 1997 as the first effort to have a general accepted risk taxonomy (Sandström 2006:41). He indicates that The International Actuarial Association (IAA) was requested in 2002 by the International Association of Insurance Supervisors (IAIS) to research insurance risks from an actuarial perspective and, consequently, the IAA formed the Insurer Solvency Assessment Working Party to conduct the research. The results of the study were published in 2004 in A Global Framework for Insurer Solvency Assessment, which identified the fundamental risks in the overall management of the insurer (IAA 2004:25). The Framework (IAA 2004:25) identifies the overall management activities of insurers as follows:

- the design, pricing, marketing and underwriting of its insurance policies;
- the selection of assets backing the policies;
- the estimation of the size and volatility of the liabilities associated with those policies;
- the determination of the insurer's capital needs;
- claims management;

- the updating of all elements over time as more data and information becomes available or because the underlying risk processes change;
- sound disclosure and communication to key stakeholders such as management, supervisors, policy holders and investors; and
- future financial conditions analysis which provides a prospective multi-scenario view of the company as a whole.

The Framework (IAA 2004:26) categorises the risks of an insurer into the four major risk types, namely underwriting risk, market risk, counterparty default risk and operational risk. The main risk types are discussed in the next paragraphs.

1.2.1. Underwriting risk

According to Eling and Schmeiser (2010:10), underwriting risk refers to the key idiosyncrasies of non-life insurance, which require special consideration regarding the:

- heterogeneity of risk;
- effects of correlation between different risks underwritten;
- difference between outstanding claims, liabilities and liabilities because of unexpired risk inherent in unearned premiums;
- annual renewal basis for the vast majority of the business;
- significant role played by reinsurance, especially in relation to concentration of risk;
- difficulty in estimating separate claim incidence; and
- severity in projecting experience for a minority of the business.

1.2.2. Market risk

Market risk arises from the level or volatility of market prices of assets and exposure to other unanticipated movements in financial variables or to movements in the actual or implied volatility of asset prices and options (Doff 2007:14). Market risk also involves the exposure to movements in the level of financial variables such as share prices, interest rates, exchange rates or commodity prices and includes the exposure of options to movements in the prices of the underlying assets (Doff 2007:14).

1.2.3. Counterparty default risk

Bouriaux and MacMinn (2009:5) define counterparty default risk as the risk of default and change in the credit quality of issuers of securities in the company's investment portfolio. Counterparty default risk also includes the risk of default or change in the credit quality of counterparties on items such as reinsurance contracts, derivative contracts, or deposits given and intermediaries to whom the company has an exposure (Bouriaux & MacMinn 2009:5).

1.2.4. Operational risk

In terms of the Solvency II Directive (SII Directive 2009:L335/24), operational risk is defined as the risk of loss resulting from inadequate or failed internal processes, people and information systems, or from external events, as adopted from the Basel II definition of operational risk. Young (2008:5,6) points out that operational risk used to be a generic term that covered different risks, but as the focus on operational risk increased, the need arose to define the term more clearly. The definition for operational risk evolved through number versions, until the Basel Committee on Banking Supervision (BCBS) formalised the definition for the banking industry in 2003 with the guidelines for the implementation of the Basel II regulatory framework (BCBS 2006:144).

Regulation of the insurance industry is important to ensure a sustainable industry and to protect the end-buyers of insurance products and services (CEA 201:13). The regulatory environment is discussed in the next section.

1.3. THE REGULATORY ENVIRONMENT OF THE INSURANCE INDUSTRY

According to the International Association of Insurance Supervisors (IAIS 2011:3), the financial stability of insurers is important to ensure that insurers can continue to fulfil their role and obligations, but also to protect the purchasers of insurance products and services.

Sandström (2006:2–4) indicates that a number of institutions were established to provide guidance, standards and training to insurance supervisors, actuaries and

insurers. International institutions established to support the insurance industry vary from the Comité Européen des Assurances (CEA) (changed to Insurance Europe in 2012), founded in 1953 by insurers to exchange information and to represent the insurance industry in the Organisation for Economic Co-operation and Development (OECD). The International Actuarial Association (IAA) was formed in 1895 to provide a platform for international actuarial research. He notes that The International Association of Insurance Supervisors (IAIS) was founded in 1994 to promote the coordination of insurance regulators and supervisors who represent these institutions in more than 200 jurisdictions in nearly 140 countries and that accounting standards are set by the International Accounting Standards Board (IASB) established in 2001 to standardise global accounting standards.

The insurance industry in South Africa is regulated by the Financial Services Board (FSB). Under current legislation, the FSB is responsible to oversee the South African non-banking financial services industry in the public interest in terms of the Financial Services Board Act, No. 97 of 1990 as stated (South Africa, 1990). The FSB sees its mission to promote sound and efficient financial institutions and services together with mechanisms for investor protection in the markets supervised, which include the short-term and long-term insurers, reinsurers, Lloyds correspondents and other credit agents. The short-term insurers are regulated in terms of the Short-Term Insurance Act, No. 53 of 1998 and the long-term insurers by the Long-Term Insurance Act, No. 52 of 1998 (FSB PAIA Manual 2000:4).

To protect the purchasers of insurance products and ensure the financial stability of the insurers and reinsurers, the regulators have introduced regulatory capital regimes, which will be discussed in the next section.

1.4. PRUDENTIAL REGULATORY REQUIREMENTS

Sandström (2006:11) indicates that Solvency I, with the publication of the first non-life directives in 1973, was introduced in the early 1970s in Europe and the United Kingdom (UK). Ford (2011:262-263) notes that the first generation of directives of Solvency I aimed to harmonise the different regulatory approaches in Europe and the UK with firstly, the freedom of establishment of insurers, prior official

authorisation of the insurance undertaking and sole supervisory authority to the member state where the head office of the insurer was situated. He indicates that the second generation of directives had the purpose to require member states of the European Union to allow cross border business on a services basis without authorisation of the host supervisor and without the requirement to open a branch or an agency in the state. The third generation directives according to Ford were established to harmonise the regulatory framework for supervision. Ford (2011:262-263) also notes that comprehensive directives were enacted in 2002 on the solvency requirements for life and non-life insurers. Other directives enacted covers aspects such as accounting for insurers, supplementary supervision of an insurance group, reorganisation and winding-up of insurers, insurance intermediation, and markets in financial instruments (Ford 2011:264).

According to Sandström (2006:11), the purpose of the solvency directives was to ensure that insurers should have over and above the technical reserves to meet their underwriting liabilities, a solvency margin as buffer against business fluctuations. Buckham, Wahl and Rose (2011:39) noted that the directives however excluded requirements for governance and risk management in insurance companies and also that the increased globalisation of economies and reduced demarcation of participants in the services and products offered by participants in the insurance industry necessitated an update of the regulatory regime. According to Van Hulle (2011:179), Solvency I has a number of shortcomings, which included the insufficient risk sensitivity of the capital requirements, overemphasis on prudence (especially with regard to technical provisions), insufficient focus on group supervision, lack of harmonisation of insurance regulation in the member states of the European Union, and insufficient coordination between insurance supervisors. He also notes that the Solvency II regime intended to provide the insurance industry with a modern approach to solvency management, which will correspond more closely with the way that the industry manages its business.

1.5. SOLVENCY II

The IAA Working Party (IAA 2004:3) recommended in the Global Framework for Insurer Solvency Assessment that a number of the Basel II principles should be adopted in the new regulatory framework. Doff (2007:6) indicates that a number of Basel II principles were adopted, and identified similarities between the Solvency II and Basel II frameworks.

According to Doff (2007:44), the Basel II framework was developed by the Banking Committee on Banking Supervision (BCBS) with consultation beginning in 1999 with the publication in 2004 of the International convergence of Capital Measurement and Capital Standards: A revised Framework with the purpose to overcome shortcomings in the Basel I framework. He also notes that the 1988 Basel I framework included capital requirements for credit risk. Although different weightings were allocated to different types of credit, banks identified the opportunity for regulatory arbitrage via swap and securitisation transactions as the increased off-balance sheet transactions did not require the same level of capital as balance sheet activities. He also indicates that the Basel I framework was amended in 1996 to include market risk requirements. Doff (2007:145) further points out that the Basel II framework includes four elements that can be regarded as an improvement over Basel I. The first element is a comprehensive framework that is based on three pillars. Pillar I provides for the capital requirements, Pillar II for supervisory review and Pillar III for market discipline. The second element has a capital requirement for credit risk, market risk and operational risk. The third element enables banks to develop internal models to calculate the capital requirements or to use the standardised approaches. The incentive for the internal models is that the improvement of their risk management may lead to a reduced capital charge. The fourth element is that regulatory arbitrage can be reduced as the bank's incentive for proper risk management can be aligned with the supervisory objectives and the increased use of internal models.

Doff (2007:6) indicates that a number of Basel II principles were adopted, and refers to similarities between the Solvency II and Basel II frameworks. The similarities highlighted by Doff (2007:128) refer to the three-pillar structure, the option for insurers between internal models or standardised approaches for the calculation of

the capital requirements, and finally, the elements eligible for capital. Doff (2007:150) also highlights important differences between the Solvency II and Basel II requirements. Solvency II includes all risk types in Pillar I, in contrast to Basel II, which includes interest rate risk in Pillar II. Value at Risk (VaR) for Solvency II is calibrated at a 99.5% confidence level over a one-year time horizon in contrast to Basel II is calibrated at a 99.9% confidence level over a one-year time horizon. He also indicates that Solvency II initially excluded group supervision, in contrast to Basel II, which is based on consolidated supervision.

The Solvency II implementation was planned for 2012 and has been postponed for a number of times, with the latest date set for 2016, caused by the delay in the adoption of the Omnibus II Directive in the European Parliament (EU Statement/14/61 2014). South Africa has already implemented the principles of Solvency I and the implementation of the principles of Solvency II as part of the South African Solvency Assessment and Management (SAM) initiative by the South African regulator is currently underway (SAM Roadmap 2010:4).

1.5.1. Underlying principle

Solvency II is a principle-based regulatory regime, which the Financial Services Authority (FSA) describes as giving the firm the responsibility to decide how to align its business objectives and processes, with the specified regulatory outcomes, and thus move away to dictate through detailed, prescriptive rules and supervisory actions how firms should operate their business (FSA 2007:4). The Solvency II architecture consists of three pillars, which are discussed in the next section.

1.5.2. Solvency II architecture

Doff (2007:128) notes that the architecture of Solvency II consists of three pillars. Pillar I includes the quantitative, Pillar II the governance and risk management, and Pillar III the reporting requirements.

1.5.2.1. Pillar I

Doff (2007:129) points out that the items included under Pillar I cover the evaluation of the balance sheet and the set pre-target levels for regulatory capital requirements. An overview of the principle of the Pillar I quantitative requirement can be illustrated by a graphical depiction of the solvency balance sheet, as illustrated in Figure 1.1.

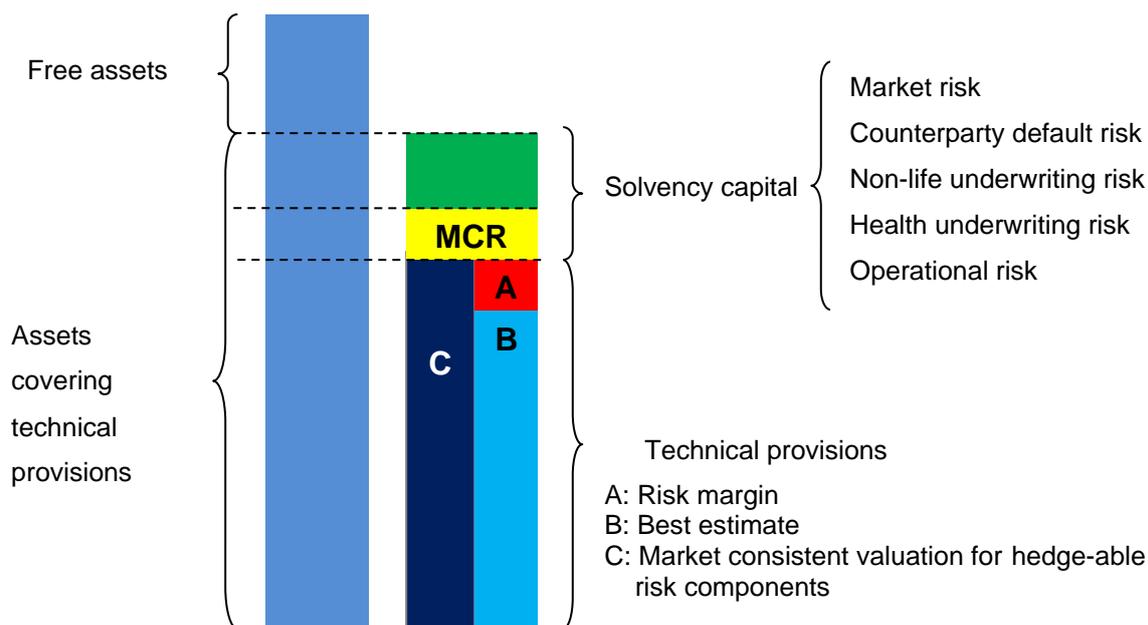


Figure 1.1. The solvency balance sheet as adapted from the SAM roadmap

The underlying principle of Pillar I is that insurers must be able to demonstrate sufficient or adequate financial resources to the regulators (Doff 2007:129). The interdependency of assets and liabilities are sub-divided into technical provisions, other liabilities, the solvency capital requirement (SCR) and the minimum capital requirement (MCR). The MCR sets the minimum lower capital requirement boundary (SAM Roadmap 2010:16). Assets and liabilities are calculated at market consistent values (SAM Roadmap 2010:15). SCR consists of the accumulated Value at Risk (VaR) that enables the insurer to absorb losses against all quantifiable risks such as market risk, counterparty default risk, operational risk and underwriting risk, which can consist of non-life underwriting risk and health underwriting risk, depending on the business model of the insurer (SAM Roadmap 2010:17). Doff (2007:129) describes the two regulatory capital requirements levels set as the solvency capital

requirement (SCR) and the minimum capital requirement (MCR). He notes that the purpose of the SCR is to incentivise sound risk management through the quantitative measurement of the risks of the insurers' and reinsurers' operations and investments.

The intention of Solvency II is also to reduce potential pro-cyclical effects by a number of quantitative and qualitative measures (IAIS 2011:209). MCR enables a supervisory response to a degradation of the insurers' or reinsurers' financial position, which may ultimately lead to the withdrawal of the license of the insurer (SAM Roadmap 2010:20). The regulatory intervention is also described by Buckham et al. (2011:61) as a range of regulatory intervention in contrast to a specific target. "Pro-cyclicality" is the term used to describe the phenomenon that short-term insurance is sensitive to the fluctuation of the business cycle between 'soft' markets of stable premiums and low returns to insurers, and 'hard' markets or insurance 'crises' of rising premiums, cut-backs on availability and tight limits on coverage (Winter 1991:458). Current solvency regulations have also been criticised as they require extra capital in periods of extreme stress and exacerbating crises (Boyle & Kim 2012:1).

1.5.2.2. Pillar II

Doff (2007:136) points out that the qualitative requirements of Pillar II consist of the system of governance. He also notes that the directive makes it a specific requirement that all insurance and reinsurance undertakings must have an effective system of governance, which provides for sound and prudent management of the business.

The Solvency II Directive (SII Directive 2009:L335/33 Article 42), requires that all persons who effectively manage the insurer or reinsurer or have other key functions must meet fit and proper requirements such as professional qualifications, knowledge and adequate experience to enable sound and prudent management (fit), and also make sure they are of good repute and integrity (proper). The directive also requires that all reasonable steps should be taken to ensure continuity and regularity in the performance of the persons who effectively manage the insurer or reinsurer. This will include their activities, such as the development of contingency plans, and

must also have written policies and ensure the implementation of the policies in relation to risk management, internal control, internal audit, and where relevant, outsourcing of key functions.

To ensure implementation of the framework, insurers and reinsurers must provide for a risk management function, which shall be structured to facilitate the implementation of the risk management system (SII Directive 2009:L335/34 Article 44). The directive further requires that all insurers and reinsurers must conduct their own risk and solvency assessment (ORSA). The own risk and solvency assessment is an integral part of business strategy and must be considered in the strategic decisions of the insurer or reinsurer. Own risk and solvency assessment must also be performed regularly, especially after any significant change in the risk profile (SII Directive 2009:L335/34 Article 45).

SII Directive (L335 2009:35 Article 46) further requires that an effective internal control system must at least include administrative and accounting procedures, an internal control framework, appropriate reporting arrangements at all levels of the undertaking and a compliance function. The directive further states that the duties of the compliance function would include advising the administrative, management or supervisory body on compliance with the laws, regulations, and administrative provisions. These duties as indicated by the directive also include an assessment of the possible effect of any changes in the legal environment on the operations of the undertaking concerned and the identification and assessment of compliance risk.

The internal audit function should include an evaluation of the adequacy and effectiveness of the internal control system and other elements of the system of governance, and should report the audit findings and recommendations to the administrative, management or supervisory body (SII Directive 2009:L335/35 Article 47). An effective actuarial function (SII Directive 2009:L335/35 Article 48) is required to contribute to the effective implementation of the risk management system, in particular to the risk modelling underlying the calculation of the capital requirements set and to the assessment. Insurers and reinsurers remain fully responsible for discharging all of their obligations when they outsource functions or any insurance or reinsurance activities (SII Directive 2009:L335/36 Article 49).

1.5.2.3. Pillar III

The disclosure requirements of Pillar III consist of the annual published report on the solvency and financial conditions, information provided to the supervisors and the link with International Financial Reporting Standards 2 (SAM Roadmap 2010:4).

Insurers and reinsurers must report on their solvency and financial condition annually (SII Directive 2009:L335/36 Article 51). The report should contain a description of –

- the business and the performance of the insurer or reinsurer;
- the system of governance;
- an assessment of the adequacy of the business for the risk profile;
- the risk exposure for each category of risk, including the concentration, mitigation and sensitivity of the risk;
- the technical provisions and other liabilities. The bases and the methods used for the valuation of technical provisions and other liabilities; and
- capital management, which would include the structure and amount of own funds, the amounts of the SCR and of the MCR and the method of calculation.

Any major differences should be explained, including the bases and methods used for the valuation in the financial statements. Non-compliance to the SCR and MCR should be disclosed with an explanation of the causes for the non-compliance and remedial action taken (SII Directive 2009:L335/36 Article 52).

South Africa is also in the process to implement Solvency Assessment and Management (SAM), and this is discussed in more detail in the next section.

1.5.3. Solvency Assessment and Management

The South African Regulator has introduced a project with the objective to align the South African prudential regulatory framework with the standards developed by the International Association of Insurance Supervisors, as contained in the Solvency II directive (SAM Roadmap 2010:4). The Roadmap further indicates that the Solvency and Assessment (SAM) project will also be developed to meet the requirements for third country equivalence assessment as established by the Solvency II directives, but adopted for South African circumstances. The Solvency II directive provides for

the assessment of the regulatory approaches of countries outside the EU, termed “third countries” to enable the regulators to treat the third country as equivalent to an EU member state (SII Directive 2009:L335/87 Article 87). The FSB (SAM Roadmap 2010:10) further indicates that third country equivalence will assist South African based insurers and reinsurers to continue their operations in the EU and other jurisdictions.

Another principle that will be implemented is proportionality, which is to ensure that the SAM requirements are proportionate to the nature, scale, and complexity of the business of the insurer or reinsurer (SAM Roadmap 2010:10).

The FSB has developed a guide or roadmap, based on the Discussion Paper for the Implementation of Solvency II of the Financial Services Authority (FSA), to assist insurers and reinsurers to prepare for the SAM implementation (SAM Roadmap 2010:4). The roadmap covers the various processes needed for the successful implementation of the new regime such as the:

- publication of the roadmap in 2010;
 - preparation of the necessary legislation and regulations;
 - economic and quantitative impact assessments;
 - interim measures and update of guidance; and
 - internal model approval process, parallel runs and final implementation in 2014.
- However, in terms of the latest update of the project (SAM Update 2013:8), the implementation date has been moved to 2016.

A governance structure, comprising of the various stakeholders was also established to facilitate the consultative process and to ensure that the concerns of stakeholders are considered (SAM Roadmap 2010:6).

1.6. CONCERNS WITH THE SOLVENCY II REGIME

Research on the 2007/2008 economic crisis and the impact the crisis had on the insurance industry conducted by Njegomir, Marovic, and Maksimovic (2010:131) indicated that even as the 2007 financial crisis unfolded and in its aftermath, the insurance industry emerged largely unscathed. Njegomir et al. (2010:131) point out

that the industry was affected through its investment portfolios due to financial market valuations. This view was also independently confirmed by an analysis of the impact of the financial crisis on the insurance sector by the OECD (2011:11) and Bell (2008:6). The noticeable exception was the American International Group Inc. (AIG), which had a division that was involved in activities closely related to the banking industry and not to the traditional insurance activities (OECD 2009:3).

Vivian (2007:1) is of the opinion that the new capital adequacy requirement started by the Financial Conditional Reporting (FCR) regime, which is the precursor of the SAM, is conceptually flawed as shareholder capital is largely irrelevant to the well-being of a short-term insurer. Vivian (2007) further states that as long as premiums received by the short-term insurance company exceed the costs of running the company, the company will exist indefinitely, without capital needed from shareholders. Benfield (2009) has also expressed concerns with the volume and complexity of new regulations, which in his opinion, may lead to the demise of insurers.

In a report on the Potential Impact of Solvency II on Financial Stability issued by the European Central Bank (ECB 2007:39), it was pointed out that the Solvency II regime may lead to short- and medium-term risks for the insurance market. A short-term implication can be the exit of insurers who are unable to implement adequate risk management tools or who lack the ability to invest in the required human resources. The report indicated that the medium impact is assessed as a potential increase in risk premiums and greater income volatility due to the introduction of the market-based evaluation rules for assets and liabilities. The report further highlights that the regulatory capital requirement of the new regime is also risk-sensitive, which will lead to a higher capital charge when the market experiences volatility. The reinsurance market may become more vulnerable as this may lead to a higher concentration of risk in the reinsurer's balance sheet with a larger requirement for rating triggers included in the reinsurance contracts (ECB 2007:5).

The question of whether more regulation and a more sophisticated regulatory regime will ensure a more robust and resilient insurance industry, needs to be answered. It is unfortunately too early to answer this question in terms of both Solvency II, which

will be implemented in 2016 (EU Statement/14/61 11/03/2014), and SAM, which is scheduled for implementation in 2016 (SAM Update 2013:6). It is however possible for participants to have an understanding of the possible effect SAM might have on short-term insurers after the completion of the Quantitative Impact Study 2.

1.7. PROBLEM STATEMENT

The insurance industry is an important stakeholder in the global and local economies, and the resilience of the industry to be able to fulfil its risk pooling and risk transfer role is especially important.

Sustainability of short-term insurers may be affected negatively by the increased regulatory capital requirement as the calculations are complex, and the regime provides for a comprehensive governance, risk management, and reporting infrastructure. The main concern is an increase in the cost of doing business, even though the underlying risk profile of the insurance company may not have changed.

The underlying principle of insurance is the pooling and the spreading of risk over a large number of policy holders. The adoption and implementation of SAM may lead to the demise of medium and small short-term insurers. The unintended consequence may be an increase in the systemic risk for the insurance industry in South Africa, which may have a detrimental impact on the local economy. The products on offer may also be affected as short-term insurers are in effect incentivised to accept only lower-risk customers. As such, specialised cover may become difficult to obtain and expensive. The research problem can be formulated as a study to examine the potential effect of the implementation of Solvency Assessment and Management (SAM) may have on the South African short-term insurance industry.

1.8. PURPOSE OF THE STUDY

The purpose of the study was to determine the possible effect that SAM may have on short-term insurers in terms of the following aspects:

- **The cost of implementing and compliance with the new solvency assessment and management regime**

A factor that may affect the cost structure of the short-term insurer is the availability of core skills. The short-term insurer may have to appoint people with modelling skills either to develop internal models or to calibrate the standard models as prescribed by the capital adequacy directive (GCCapital Ideas 2011). Short-term insurers are also required to appoint actuaries (SII Directive L335 2009:35). The models are used to calculate the regulatory capital requirements for underwriting risk, market risk, counterparty default risk, and operational risk. Short-term insurers may also need to make significant changes to their current data architecture to meet the regulatory data requirements (Actuarial Post 2013). The current data architecture may be inappropriate, which may increase the demand for skills with the ability to design, develop, and implement a data architecture that meets the regulatory requirements. The new data architecture may require changes to hardware, risk applications, interfaces between the various product systems and the risk applications to limit manual intervention in data and projects to enhance the accuracy and completeness of data (SAS 2012:7). Further cost implications may be the on-going compliance with the regulatory capital requirements and the ability to raise the prescribed amount and tiers of capital.

- **The appropriateness of the (SAM) regime for short-term insurers in South Africa**

According to Jacobs and Van Vuuren (2013:316), the capital adequacy regime may be appropriate for a short-term insurer but may not reduce the systemic risk as regulators run the risk of focussing on the detail and in doing so, lose sight of the macro-prudential picture.

- **Sustainability of small and medium short-term insurers in South Africa**

An unintended consequence of the new capital adequacy regime may be an increase in the acquisitions and mergers, or even the demise of small and medium short-term insurers. The implementation of the new regulatory regime may also increase the premiums of short-term insurance in South Africa (ECB 2007:39).

The review of the current literature with regard to the role of insurance in the economy highlighted the importance of regulation in the insurance industry. The banking industry had to overcome significant challenges with the implementation of the Basel II regime, and insurers in Europe had similar experiences with the preparation for implementation of Solvency II. Although impact studies have been conducted as part of the implementation of SAM, the participants were mainly large short-term insurers with few small and medium short-term insurers (Hewitt, 2012). The methodology to conduct the empirical research component of the study is discussed in the next section.

1.9. RESEARCH DESIGN AND METHODOLOGY

The literature review highlighted the importance of regulation in the insurance industry, but also indicated the insurers in Europe and the UK experienced problems with the preparation for implementation of Solvency II. Creswell (2009) describes research designs as plans and procedures that cover the decisions from broad assumptions to detailed methods of data collection and data analysis to develop and form a conclusion. He further indicates that the plan includes a number of decisions, including which design to use to study a topic. Slife and Williams (1995 as cited by Creswell 2009) note that the research design is influenced by the underlying philosophical paradigms or ideas. Creswell (2009) summarises the philosophical paradigms or views as postpositive, social construction, advocacy/participatory and pragmatic. He also indicates that the appropriate paradigm for a scholarly study will *inter alia* be influenced by the area of the discipline of the scholar. Creswell (2009) further indicates that scholars can use three research designs, namely quantitative, qualitative, and mixed methods.

Remler and Van Ryzin (2011:57–58) note that qualitative research involves different kinds of non-numerical data, which would, for example, consist of interviews, written texts or documents, visual images and observations. They indicate that qualitative analysis relies on the fact that the objects under investigation are human beings and that language provides a unique insight into the thoughts, experiences, and motivation of the participants being studied. They further note that quantitative

research uses instruments, for example, structured questionnaires that produce measurements or numerical data that describes different characteristics, behaviours, attitudes and observable data such as currency and equity prices published on an exchange.

Creswell (2009), Remler and Van Ryzin (2011:57) and Salkind (2012:10) indicate a scholar may use different research designs such as qualitative, quantitative and mixed methods to conduct a study. The problem this study will examine is the potential effect that the implementation of SAM may have on the South African short-term insurance industry. The study will not involve humans as the object under study, but will be designed to analyse the effects that SAM may have on the short-term insurance industry in South Africa, and the qualitative research design is regarded as unsuitable for the purpose of this study. Creswell (2009) recommends the use of the quantitative approach in studies where the factor(s), which may influence an outcome need(s) to be identified, or where an understanding of the best predictors of outcomes should be gained. He further notes that quantitative studies uses theory deductively and places the literature review towards the beginning of the study with the objective of testing or verifying a theory rather than developing it and the theory then becomes the framework for the study that organises the research questions and the data collection procedure. The quantitative approach is regarded as the most appropriate for this study as the literature relevant to Solvency II, Basel II and SAM will be reviewed to identify the research problem and provided the framework to determine the research objectives and questions.

DeVellis (2012:93) indicates that a Likert-type scale-based questionnaire is widely used to capture and measure opinions, beliefs and attitudes. Weathington, Cunningham and Pittenger (2012:191–192) indicate that the Likert-type scale format is one of the most popular options for a closed-response format questionnaire as it offers a clear and unambiguous scale of measurement, and the same format can be used for different questions. This study will consist of a survey of key participants in the SAM project to analyse the effect of SAM on the short-term insurance industry in South Africa. A Likert-type scale questionnaire will be developed to gather the data for analysis.

1.9.1. Reliability and validity

The survey questionnaire will be pretested with the use of a diagnostic questionnaire by a small team of experts to ensure face and content validity (Carmines & Zeller 1979:17; DeVellis 2012:105).

1.9.2. Population and sample selection

The FSB followed an inclusive process for the development and implementation of SAM and included all the key role-players in the insurance industry in South Africa (SAM Roadmap 2010:6). The participants in the short-term insurance industry in the SAM implementation project identified in the SAM Roadmap were the following:

- life or long-term insurance companies;
- non-life or short-term insurance companies;
- reinsurers;
- Financial Services Board (FSB);
- the South African Insurance Association (SAIA);
- Actuarial Society of South Africa (ASSA);
- National Treasury; and
- the South African Institute of Chartered Accountants (SAICA).

The role of each participant will be reviewed to determine the appropriateness for inclusion in the survey. As the study will be based on the effect that the implementation of SAM may have on the short-term insurance industry, the roles and responsibilities of the participants in the project will be analysed to ensure that the survey includes all relevant participants, but also exclude participants who may not be able to contribute to the study. The criteria that will be used to evaluate the roles of the participants in the survey are indicated in Table 1.2.

Table 1.2. Criteria for the evaluation of participants of the survey

Criteria	Discussion
Legislative role	<p>The role of National Treasury includes the regulation of markets and public entities. National Treasury is also responsible to facilitate the legislative process once the SAM framework has been developed and adapted for South African conditions (SAM Roadmap 2010:11).</p> <p>National Treasury will be excluded from the survey as other role-players such as the FSB were more involved in the development and implementation of SAM.</p>
Statutory regulatory role	<p>The role of the regulator is to regulate the compliance of the insurer with the SAM regime. The regulator will be important to ensure that the regulations will ensure a sustainable and competitive insurance industry (FSB Act No. 97 of 1990).</p> <p>The role of the FSB is critical in the development and implementation of SAM and as such, the FSB will be included in the survey.</p>
Statutory assurance provider	<p>The external auditors fulfil a statutory role to insurance companies (Companies Act No. 57 of 2008).</p> <p>Assurance providers will be excluded from the survey as other role-players are more involved in the development and implementation of SAM.</p>
Actuarial expertise	<p>All actuaries employed by insurance companies have to be members of the Actuarial Society of South Africa. The society also gives guidelines to the actuaries on the models and processes implemented used in SAM</p>

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Criteria	Discussion
	(Practice Note Series 400:2). The role of the actuaries is critical in the development and implementation of SAM and as such, actuaries will be included in the survey.
Short-term insurance providers (short-term insurers and reinsurers)	Short-term insurers and reinsurers need to implement and comply with the SAM regime. The role of the short-term insurers is critical in the development and implementation of SAM and as such, small, medium, and large short-term insurers will be included in the survey.
SAIA	SAIA represents the industry in the SAM project. The role of the actuaries is critical in the development and implementation of SAM and as such, SAIA will be included in the survey.

Hewitt (2012) indicated not all small and medium short-term insurers participated in the quantitative study (SA QIS1), which is an indication that the contribution this study can make, is to include small and medium short-term insurers in the study. The European Central Bank (ECB 2007:39) has pointed out that insurers, which are unable to implement Solvency II may exit the market. Small, medium, and large short-term insurers will be determined, based on total gross premiums written of all registered short-term insurers to ensure sufficient coverage among the population. The questionnaire will be distributed at the 2013 International Insurance hosted by the Insurance Institute of South Africa to a sample of short-term insurers and stakeholders involved in the implementation of SAM.

1.9.3. Analysis to be conducted

The data gathered from the survey will be analysed with IBM SPSS Version 22. The data will firstly be tested for validity of the completed questionnaires. The data will

then be further analysed with descriptive statistics, a cluster analyses, and a Kruskal-Wallis test. The tests are briefly discussed below.

- Descriptive analysis. The results obtained from the survey will be analysed with the use of descriptive statistics to describe and interpret the impact of SAM on the short-term industry in South Africa (Boslaugh 2013:83).
- Cluster analysis. A cluster analysis will be done to determine if questions cluster across the various constructs (Boslaugh 2013:299). Reliability on the clusters will be tested with Cronbach's alpha reliability coefficient for Likert-type scales, which is regarded as a sophisticated measure of internal reliability. Cronbach's alpha is the average of all split-half correlations, and measures how one half of a test corresponds with the other half but averages out the variation in the split-half method (DeVellis 2012:109). The statistical analysis was conducted with IBM SPSS Statistics Version 22.
- Kruskal-Wallis test. A Kruskal-Wallis test will be conducted to determine if there are any significant differences in the opinions or perceptions among small, medium, and large short-term insurers that the implementation of SAM may have on the South African short-term industry (Boslaugh 2013:314).

1.10. ETHICAL CONSIDERATIONS

Weathington et al. (2012:24) define ethics as the process of studying moral standards and examining how these should be interpreted and applied in various situations. They distinguish ethics from morals, which are described as the principles or rules that define what is right and wrong. Weathington et al. (2012) recommend that the researcher should determine whether the actions of the researcher are right or wrong, and he or she should be able to justify such decision. They further indicate that research on humans is a new phenomenon as previously, research was conducted on topics unrelated to human behaviour or the human body. Gilman (2008) describes survey ethics as a set of ethical procedures with the purpose to guide researches using surveys. She indicates that no harm should be done to any respondent and the respondent should not be pressured or made to feel obligated to

participate in a survey. According to Burton and Bartlett (2009), the key aspects of the ethical principles that should be applied are informed consent, confidentiality and privacy, honesty and openness, access to findings and avoidance of harm. The questionnaire that was used for the purpose of the current study was designed in such a way that no personal information of the respondents or of the employers of the respondents was recorded. Participation was also voluntary.

In order to come to sound conclusions and recommendations, the study was approached in a structured way, based on chapters as indicated in the next section.

1.11. CHAPTER OUTLINE

The research report will be structured as follows:

Chapter 1 consists of a brief overview of previous studies with regard to solvency regulations in the EU and South Africa, the problem statement, purpose of the research and a short description of the research methodologies used.

Chapter 2 provides a literature review, which covers the history and role of insurance in the economy, the participants in the insurance markets, the regulatory environment in the insurance industry and the products offered by short-term insurers. This chapter also provides an overview of the risk inherent in the business model of the short-term insurer and the Solvency II framework in terms of its purpose, principles, and architecture.

Chapter 3 provides an overview of the three pillars of the Solvency II framework, including the implementation of SAM in South Africa. This chapter also highlights the difficulties experienced by insurers with the implementation of Solvency II in Europe and the UK and the concerns of a number of researchers and practitioners who also questioned the appropriateness and effectiveness of the Solvency II regime, especially for the short-term insurance industry.

Chapter 4 entails a description of the research methodologies applied in the study and the design of the questionnaire used to perform and interpret the empirical research.

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Chapter 5 comprises an analysis and interpretation of the findings of the survey results on the impact of SAM on the short-term insurance industry in South Africa.

Chapter 6 concludes with a summary of the study, the conclusion reached based on the findings of the survey on the effect that the implementation of SAM may have on the short-term industry and recommendations for further research.

The next chapter introduces the literature review that covers the history and role of insurance in the economy, the participants in the insurance markets, the regulatory environment in the insurance industry and the risks inherent in the insurance industry.

CHAPTER 2

LITERATURE REVIEW

2.1. INTRODUCTION

The potential effect that the implementation of a new solvency assessment and management regime may have on South African short-term insurers was highlighted in Chapter 1. The purpose of this chapter is to review the insurance industry with a focus on the role of insurers in the economy, the participants, and the coverage offered by short-term insurers.

The insurance industry provides an important service to the economy by facilitating the transfer and pooling of risk. The origins of insurance dates back to before the Roman period where there is evidence of both long- and short-term insurance contracts. Modern participants in the insurance industry comprise a wide range of providers of insurance products providing cover for individuals and commercial enterprises.

The products on offer also underwent significant development from standard insurance policies to sophisticated risk retention facilities and capital market instruments. In providing services to customers, insurers in addition to normal business risks, also expose themselves to risks particular to the insurance industry.

The chapter will conclude with a summary of the literature reviewed, highlighting the role and history of the insurance industry in the economy, the participants in the insurance markets, the products offered by short-term insurers, the regulatory environment in the insurance industry and the risk inherent in the business model of the short-term insurer and the Solvency II framework.

2.2. THE ROLE OF INSURANCE IN THE ECONOMY

Insurance provides an important service to the economy by facilitating the transfer and pooling of risk. The origins of insurance dates back to before the Roman period where there is evidence of both long- and short-term insurance contracts. The following section will discuss the purpose of insurance to illustrate the important function it fulfils in an economy.

2.2.1. The description and purpose of insurance

The CEA describes the insurance industry as a provider of the pooling and transferring risk for stakeholders in the economy such as financial institutions, commercial entities, other organisations and households (CEA 2010:13). According to De Weert (2011:15), the insurance industry has both differences and similarities when compared to the other financial sectors. Insurance is characterised by the reversal of the production cycle as premiums are collected when the contract is entered into and claims arise only if a specified event occurs. De Weert (2011:14) notes that the difference between a bank and an insurer is that the customers of the bank retain the legal ownership of their deposits at the bank, but the customers of the insurer transfer such legal ownership to the insurer with the payment of the insurance premium.

Short-term insurers provide protection against fortuitous losses such as accidents, theft, and fire for the payment of a premium in contrast to long-term insurers which mobilise contractual savings by people who need protection against the possibility of premature death, illness, and retirement at the cost of a premium (Saunders & Cornett 2011:78). Nienaber and Reinecke (2009:2) indicate that the perceived benefits for the insured is that the long-term insurer assumes the financial risk of at least some uncertainties of the future and provides the insured with the reassurance that their life savings are being managed professionally. Even though Nienaber and Reinecke (2009:2) note that the undesirable events cannot be averted by the long-term insurance contract, they indicate that the financial burden of the potentially negative consequences can be avoided or alleviated with the transfer to the insurer.

Ward and Zurbruegg (2000:491,492) explain that by offering risk transfer and indemnification services, insurers aid risk-averse individuals and entities in purchasing expensive items such as vehicles, real estate, and other assets. They further their argument by saying that pharmaceutical companies may refrain from developing and marketing beneficial products in the absence of product liability insurance. According to these authors, the positive externalities identified due to the increased purchases are increased profits for the developers and sellers of the goods and services and the employment created in the process outside the insurance sector. Another benefit of insurance is the possible change to less risky behaviour of risk-taking individuals such as smokers and reckless vehicle drivers due to premium loading by the insurers for the higher risk. An additional benefit from the financial intermediary function of insurers put forward by Ward and Zurbruegg is the accumulation of productive capital within an economy and enabling investors to access diversified investment portfolios, which also facilitates the investment in high-risk, high-productivity projects and in the process, liquidity in the financial markets. Levene (2011) also indicate that insurers and brokers need to understand and be aware of developments outside insurance to assist their customers not only with their current risk exposures, also what the customers may experience in the future.

2.2.2. The origin of insurance

The important role of insurance in the economy with regard to the pooling of risk and as a savings vehicle was discussed in the previous section. Insurance is however not a new concept as highlighted by Trennery (1926:5) and confirmed by Doff (2007:11). Figure 2.1 illustrates a genealogical tree of the contracts of loans on bottomry and respondentia, which gave rise to the formalisation of insurance.

The impact of Solvency Assessment and Management on the short-term insurance industry in South Africa

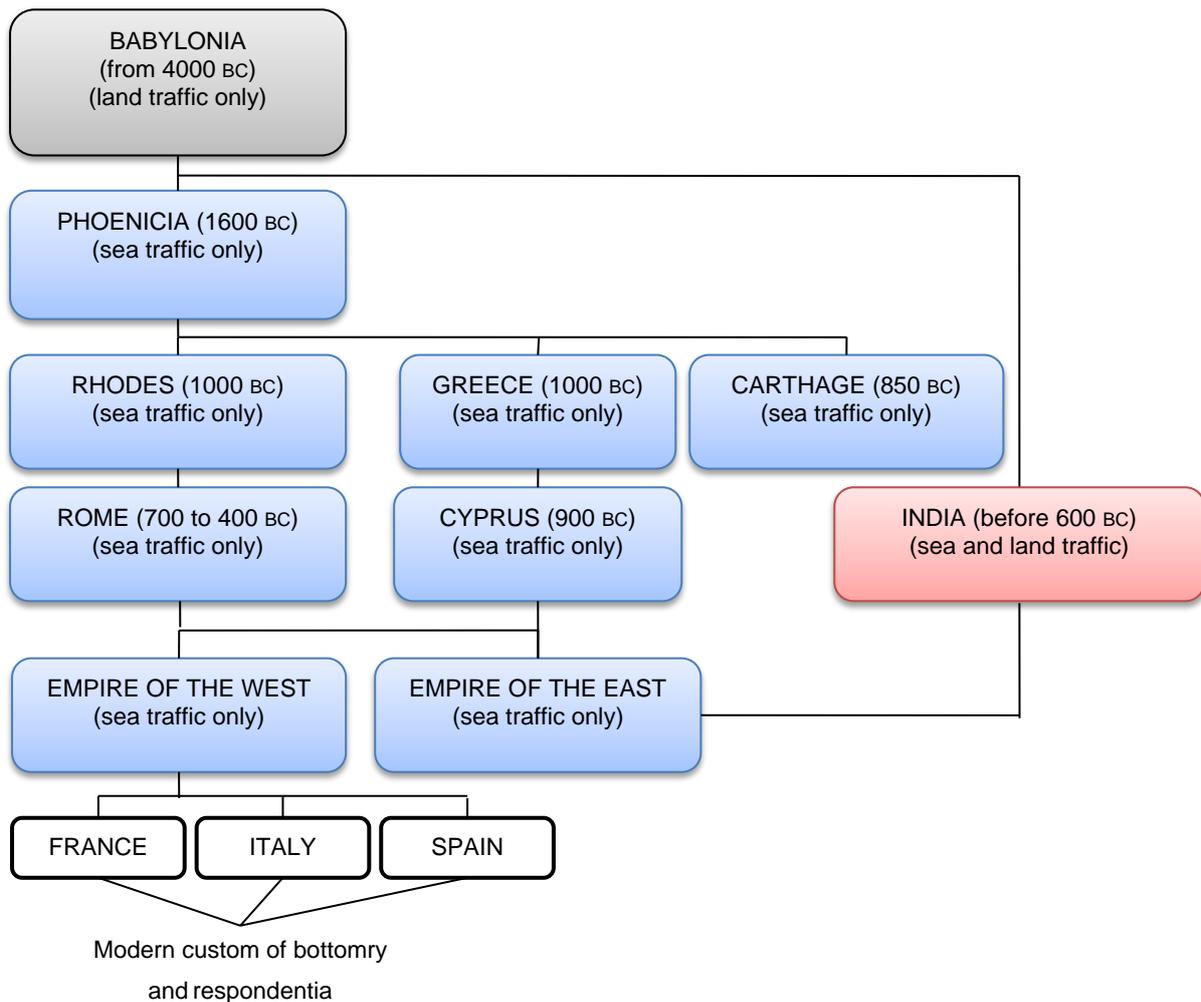


Figure 2.1. Genealogical tree of contracts of loans on bottomry and respondentia as adapted from Trennery (1926:4)

According to Trennery (1926:45), the *Encyclopaedia Britannica* defines “bottomry” as:

“a maritime contract by which a ship (or bottom) is hypothecated in security for money borrowed for expenses incurred in the course of her voyage under the condition that if she arrives at her destination the ship shall be liable for repayment of the loan, together with such premium thereon as may have been agreed to; but that if the ship is lost, the lender shall have no claim against the borrower, either for the sum advanced or the premium.”

Respondentia is described as the transaction where money is borrowed on security of the cargo alone.

Insurance developed over a long period with initial coverage limited to cargo, and life coverage, developing at a later stage during the Roman period. The understanding of insurance as a risk transfer mechanism is important as risk transfer is fundamental to insurance and is explained by describing the risk transfer process, the pooling of risks and calculation of an equitable premium as discussed in the next section.

2.3. THE INSURANCE CONCEPT

Insurance provides an important service to the economy by facilitating the transfer and pooling of risk. By offering risk transfer and indemnification services and products, insurers assist risk-averse individuals and entities in purchasing expensive items such as vehicles, real estate and other assets, but also enable for example pharmaceutical companies to develop and market beneficial products due to the availability of product liability insurance. Another benefit is that, due to premium loading by the insurers for high-risk behaviour, risk-taking individuals such as smokers and dangerous vehicle drivers may change to less risky behaviour. The insurance model or concept can be described by a discussion of the three main activities of insurers as identified by Thoyts (2010), namely the risk transfer function, the pooling of risks and the calculation of equitable premiums. The insurance concept is illustrated in Figure 2.2.

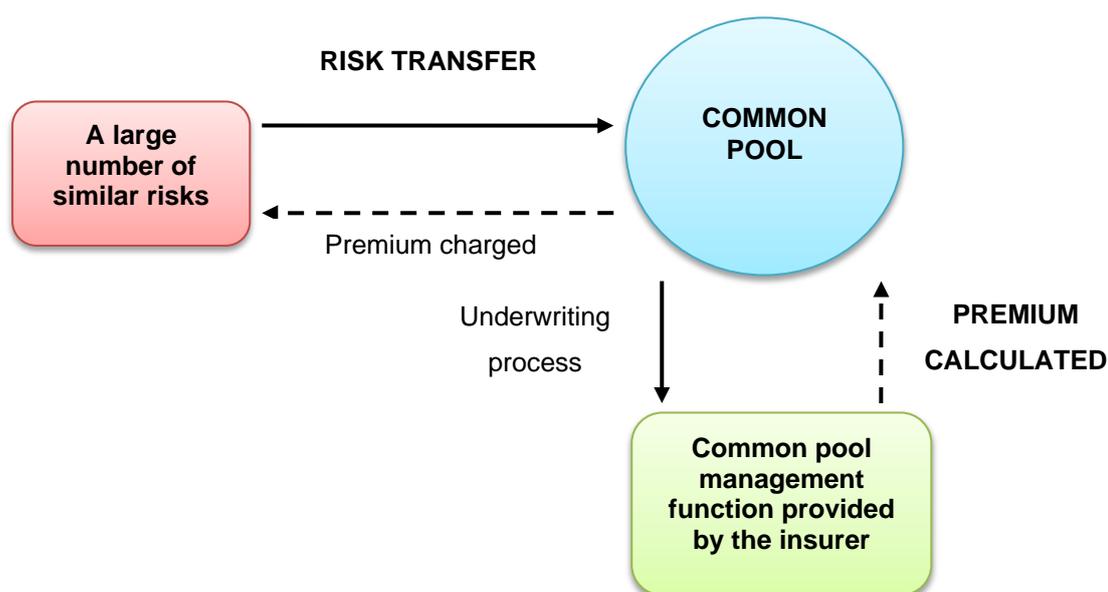


Figure 2.2. The insurance concept as adapted from Thoyts (2010)

2.3.1. Risk transfer

Thoyts (2010) points out that the function of insurance can be approached from different directions. The first approach is that insurance is considered as the transfer of risk by the policyholder, the second approach is that the policyholder is spreading the risk and thirdly, that insurance is a risk financing mechanism. Thoyts (2010) describes risk transfer as the traditional view, as the policyholder transfers the risk of which policyholders may regard as a catastrophic financial loss. The policyholder thus transfers the consequences of the event to the insurer, should the event occur. Thoyts (2010) regards the spreading of risk by the policyholder as the more realistic view. Thoyts then indicates that in any single policy period, if the policyholder claims that the claim will most probably be greater than the premiums paid for that specific period. The risk transformation view implies that a range of risks in financial terms be converted through an insurance policy. From a risk management perspective, insurance is regarded as a risk financing mechanism as the risk manager can use insurance as a source and application of funds to meet the cost of the risk occurrence.

Banks (2004:16) supports this definition of risk transfer, but also points out that risk transfer is facilitated by the ability of the insurer to predict the amount of losses that will occur for a given type of risk exposure. He indicates this is possible due to two statistical principles, namely the law of large numbers and the central limit theorem. The law of large numbers states that, as the number of participants (in the pool) gets very large, the average outcomes approach the expected value (EV). According to Boslough (2013:59), the central limit theorem states that the sampling distribution of the sample mean approximates the normal distribution if the sample size is sufficiently large, irrespective of the distribution of the population of which the samples were drawn. She further points out that the central limit theorem enables insurers to make statistical inferences based on the properties of the normal distribution although the sample may be drawn from a population that may not be normally distributed.

2.3.2. Common pool

Thoyts (2010) indicates that, although policyholders individually enter into a contract with the insurer, the insurer acts as an intermediary and pool similar risks faced by a large number of individual policyholders into a common pool. He further indicates that the pool not only contains the risks transferred during this process from the individual policyholders, but also the collective premiums to meet the occurrence of the risk. Each member of the pool pays a premium to the pool with the intention that this should be used to meet the collective loss, regardless where the loss actually falls. The risks borne by the pool are similar in nature, but are not necessarily identical.

Banks (2004:19) points out that pooling enable the probability distribution of costs for each participant to change and that the standard deviation, which is used as a proxy for risk, declines. He describes risk pooling as a risk reduction mechanism as long as the risks are uncorrelated or weakly correlated. Negatively correlated risks can be used as countercyclical covers as they will reduce the overall risks in the pool.

2.3.3. Equitable premium

Thoyts (2010) indicates that a member's contribution to the pool can be calculated according to two methodologies. The first method is by charging the average loss of the pool plus the administrative cost of administering the pool. Provided the size of the premium is so small that the differential in the premiums will not have a distorting effect on the pool, this option is not viable as the cost of underwriting could be out of proportion to the benefits, which may also increase the premiums, irrespective whether the risk is good or bad.

The second method is by calculating an equitable premium, which according to Thoyts (2010), is a more appropriate method to calculate premiums. The equitable premium is calculated by determining the risk that each member is contributing towards the pool. The expected cost of the loss is then calculated by multiplying the probable frequency or likelihood and probable severity of the loss. A sum that is equivalent to the expected cost can then be charged, which is described as the pure risk premium. The pure risk premium is the part of the premium that goes into the

pool to cover the risk. By charging an equitable or fair premium to each policy holder, cross-subsidisation is reduced. Thoyts (2010) points out that the insurer incurs cost such as commissions, the issuing of documentation and administrative costs in the settling of claims in the underwriting of risk. These costs are added to the pure premium, which means that the premium charges should be more than the pure premium.

According to Banks (2004:36–39), the equitable premium consists of a pure risk premium component to cover expected losses and loss adjustment costs and a premium loading component, which includes the administrative costs, which can also include a profit margin component for the compensation of investors. Banks (2004) notes that insurers can be faced with information asymmetries which may cause the premiums to be less than optimal. To complicate matters further, the insurance market may be in a state of disequilibria where the market is either “hard” or “soft”. A “soft” market can be identified when there is an excess supply of insurance capacity, which results in lower premiums. Insurers may then compete for a market share by either lowering their underwriting standards or by lowering the premiums charged. A “hard” market is the opposite, namely the supply of insurance capacity is decreased, which then results in higher premiums. The “hard” market is the opposite, namely the supply of insurance capacity is decreased, which then results in higher premiums. The ‘hard’ market can be triggered by a significant disaster that leads to excess of claims or clash losses when various insurance lines are experiencing simultaneous claims.

Winter (1991:458) also describes the phenomenon that the short-term insurance is sensitive to the business cycle as it fluctuates between ‘soft’ markets of stable premiums and low returns to insurers, and ‘hard’ markets or insurance ‘crises’ of rising premiums, cut-backs on availability and tight limits on coverage. He further uses “pro-cyclicality” as the term to describe the phenomenon.

Kaas, Goovaerts, Dhaene and Denuit (2009:120-121) list the desirable properties for premium principles as follows:

- non-negative loading, as a premium without a positive premium will lead to ruin as the premium recovered in this case will be less than the risk assumed.
- no rip-off. The premium should be large enough to cover the risk, but not be exploitative.
- consistency to ensure when claims are raised by a certain amount, the premiums should be increased with a similar amount.
- premiums are additive, which implies that the pooling of the independent risks should not affect the total premium needed.

Kaas et al. (2009:121) further points out that another useful property is that premiums for smaller risks should be less than the premiums for bigger risks.

In a study conducted by Trennery (1926:5), he noted that forms of insurance have been in existence from approximately 4000 to 3000 BC in Babylonia, although the more modern forms of insurance are recognised to have been used since 215 BC. Although there was significant development of insurance products since the inception of insurance, the types of insurance provided could still be divided into life or non-life, as discussed below.

2.4. TYPES OF INSURANCE

De Weert (2011:12) classifies insurance providers into two broad categories, namely non-life and life insurers as illustrated in Figure 2.3.

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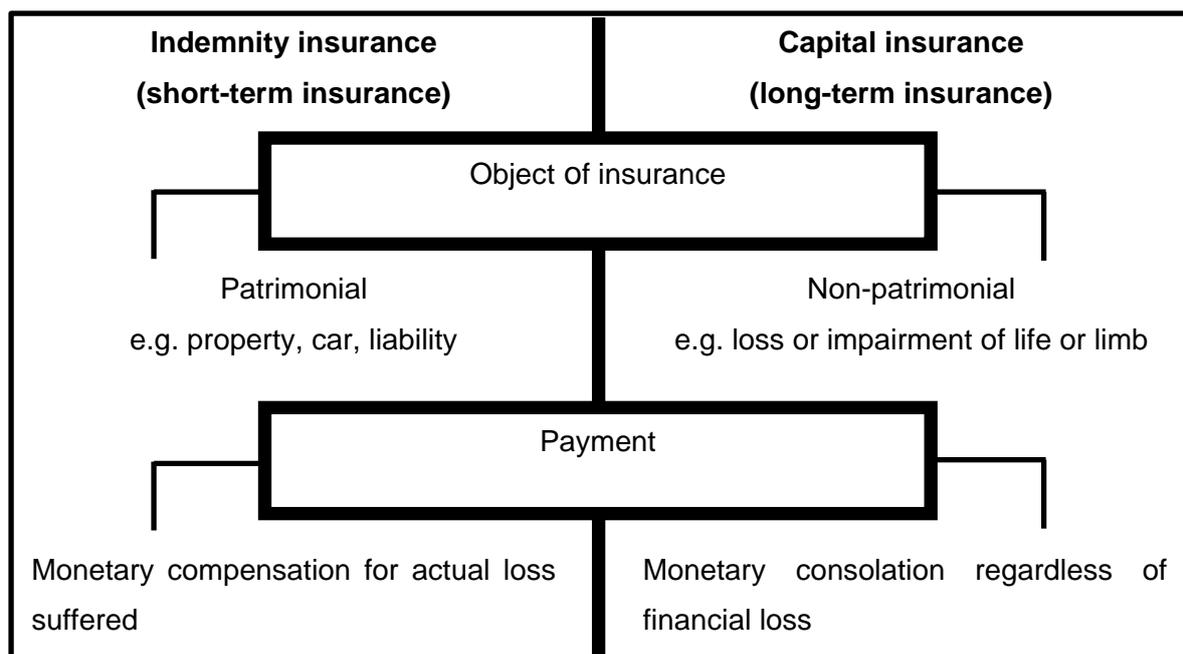


Figure 2.3. Types of insurance adapted from Nienaber & Reinecke (2009:4)

Figure 2.3 illustrates the difference between non-life or indemnity insurance and life or capital insurance. Non-life or indemnity insurance indemnifies the policyholder against fortuitous incidents such as damage caused by events such as fire, floods, and theft of the insured items for example property, motor, and liability. Life or capital insurance provides the policyholder with a monetary amount as consolation or satisfaction in the case of the loss or impairment on the occurrence of the peril insured against (Nienaber & Reinecke 2009:3).

Based on the review of the literature of this section, it can be concluded that insurers fulfil the function as a risk transfer mechanism by pooling the risks. The contributions of a large number of individuals are transferred into a common pool and in doing so, insurers also provide a valuable service by assisting risk-averse individuals and entities to purchase expensive items, and develop and market new products. The survival of the pool can be ensured by calculating an equitable premium by assessing the risk that each member is contributing to the pool.

Although the global insurance industry demonstrates similarities among countries, significant differences can be noticed on closer examination. The global similarities and local differences are discussed next.

2.5. GLOBAL SIMILARITIES AND LOCAL DIFFERENCES

In a report on the Convergence of Insurance and Capital Markets, the World Economic Forum (WEF 2008:9–14) indicate the global insurance industry registered growth over the last decade, for example ILS increased with 40% to USD 14.4 billion between 2006 and 2007, and weather derivatives from USD 9.7 billion in 2004/2005 to USD 32 billion for 2007/2008. The report further indicates the growth in ILS was made possible by globalisation and the development of new insurance products, which enabled global insurers to develop and exploit new markets. The growth in different markets has however increased the complexity to manage the global insurers as they also had to consider the local legislation and regulations of the countries in which they operate. Cummins and Venard (2007:17) identified similarities in the global insurance industry, but found that there are also important differences among the countries. The global similarities are discussed in the next paragraph.

2.5.1. Global similarities

The important global similarities in the insurance market as identified by Cummins and Venard (2007:17–23) can be summarised as follows:

2.5.1.1. Deregulation

Cummins and Venard (2007:17) indicate the European Union implemented banking and insurance directives during the 1980s and 1990s, which had the objective to create a single European financial services market and enabled the fragmented components of the financial services market such as banks, insurance, underwriting, and securities dealing to integrate. Japan also introduced financial reforms in 1990 to bring the Japanese financial markets and products on a par with those in Europe, the United States, and the United Kingdom. They note a number of supranational agencies such as the World Bank, the Inter-American Development Bank, and the World Trade Organization (WTO) have been promoters of globalisation. They further note the Chinese government for example, made significant commitments to liberalise the insurance sector to open the Chinese insurance market, which now

enables global firms to compete in the Chinese insurance market. They indicate globalisation of the financial services sector was facilitated by the deregulation of financial markets in Europe, the United States, and Asia.

A number of countries embarked on privatisation programmes, which resulted in private insurance companies as dominant economic actors, applicable not only in developed countries such as France but also in the former Eastern bloc countries and emerging economies. An example is India, which enabled the development of the private sector since 2000.

Regulatory reforms also enabled financial services firms to compete across markets. Life insurers, non-life insurers, and banks are now able to offer financial products and services other than their traditional products and services. A development over the last three decades has been that the insurance and financial industries have begun to converge as insurers, and policyholders have started to use capital and financial instruments to design insurance products (Cummins & Weiss 2009:493).

2.5.1.2. Convergence of the insurance, banking, and other segments of the financial markets

The World Economic Forum (WEF 2008:4) regards the convergence of the capital markets and the insurance and reinsurance sectors as significant economic development as financial instruments, such as insurance-linked securities, can contribute to address and syndicate particular types of insurance risk. According to Hartwig and Wilkinson (2007:930), convergence of the capital markets and the insurance and reinsurance sectors has also coincided with increased globalisation of the financial services sector. Cummins and Weiss (2009:494) identified six reasons for the convergence of the financial services industry. The reasons for the convergence are summarised below.

- **Corporations have increased their focus to maximise shareholder value**

Although natural disasters such as those caused by Hurricanes Katrina, Rita and Wilma combined with other events caused losses of USD 114 billion, which, although it may seem large to the total equity of global reinsurers, represents less than half a per cent of the value of the US stock and bond markets. Insurance-linked securities (ILS)

such as catastrophic risk bonds and options are therefore regarded as more efficient to finance this type of risk in the securities markets.

- **The reinsurance underwriting cycle**

Prices are relatively low during 'soft' markets, and coverage is readily available, but the reverse is true during 'hard' markets. Underwriting cycles tend to have low correlations with securities market returns, and convergence can therefore have the potential to moderate the effects of the reinsurance underwriting cycle. Convergence can create value for insurers, and insurance buyers as insurers may find it difficult to predict cost and manage risk under 'hard' market conditions.

- **Advances in computing and communication technologies**

The advances in the computing and communication technologies have enabled the collection and analysis of underwriting exposure and loss data and the development of catastrophe modelling, which improved risk management and enhanced market transparency.

- **The development of holistic or enterprise-wide risk management (ERM)**

The development of ERM has assisted to increase the understanding and use of financial instruments and enhanced acceptance to innovative solutions.

- **Regulatory, accounting, tax and rating agency factors**

Regulatory, accounting, tax and rating agency factors can serve as facilitators for market convergence as they enable insurers and reinsurers to develop products to control regulatory and tax costs.

- **Better understanding of risk management**

Market participants acquired understanding of risk management and facilitated financial innovation based on modern financial theory.

- **Emergence of new products and distribution channels**

The global insurance markets have experienced an increase in the sophistication in insurance technology, which enabled the rapid development and release of new products such as insurance-linked securities and other alternative risk transfer products. These changes were facilitated by advances in computer and

communication technologies and the theoretical and empirical modelling in financial engineering.

The continuing evolution of insurance product distribution systems is another commonality among many national insurance markets, particularly in the consumer lines of insurance and direct marketing. The main advantage of direct distribution is that the marketing costs tend to be lower than for traditional distribution channels such as brokers and agents. In the commercial lines, it is likely that intermediaries such as brokers and agents will continue to assist commercial buyers with access to the global markets for risk transfer.

2.5.2. Local differences

Local differences identified by Cummins and Venard (2007:21) that impede the globalisation of the insurance industry and convergence of the insurance and other segments of the financial markets are:

- **Terminology used in the technical insurance vocabulary**

The terminology for the different types of insurers differs around the globe (Cummins & Venard 2007:21). “Property-casualty insurance” or “property-liability insurance” are commonly used in the USA, “general insurance” is used in the UK and other commonwealth countries, “non-life insurance”, in other countries and “short-term insurance” in South Africa. “Long-term insurance” is used in South Africa and the UK as a synonym for “life insurance” (Cummins & Venard 2008:317).

- **Country-specific regulatory frameworks**

The regulatory frameworks for the financial services and insurance industries differ among countries. Although deregulatory efforts such as those in the EU have resulted in a greater degree of homogeneity, regulatory differences among countries remain, even within the EU. The implementation of Solvency II will standardise regulation in the EU, but significant differences will remain among countries outside the EU, if they are not in the process to adopt the EU Solvency II Directives. Accounting principles also differ significantly across countries.

- **Infrastructure to enable e-commerce**

The role of electronic commerce (e-commerce) in the insurance industry varies among countries due to availability and affordability of the Internet and access to a computer. A large section of the population in many developing countries has no access to telephones or bank accounts, which implies that e-commerce needs further development (Cummins & Venard 2008:296). Although Cummins and Venard (2007:22) indicate that direct insurance marketing in particularly the UK and the USA is increasing, the bulk of insurance contracts are still sold through insurance agents or bank employees. The Internet is primarily still used to provide product information and premium quotations. In a study conducted by the external audit firm, PricewaterhouseCoopers (PWC 2012:36), South African short-term insurers indicated that direct insurance offerings, with growth in the core insurance products and micro-insurance are the top three growth areas.

- **Different insurance channels**

Cummins and Venard (2007:17–23) point out that countries have very different dominant insurance distribution channels. Brokers are for example very important in insurance distribution in the UK, but have limited influence in France. Cummins and Venard further note the distribution of insurance products through bank channels remains marginal in many countries such as Germany, but is more developed in others, for example France and Spain.

- **Political systems**

All countries have their own political systems, and this diversity has an impact on the insurance industry. Political instability and government corruption in many developing nations hinder the development of the insurance industry, as well as impeding economic growth in general.

- **Portfolio of insurance products**

The portfolio of insurance products in various countries shows important variations. Some countries, such as South Africa, have an active life insurance market, sometimes reaching two-thirds of the insurance market share, while other markets have motor insurance as their main product (Cummins & Venard 2007:4). Insurance

penetration differs also significantly among countries with higher penetration in developed countries.

Countries also differ significantly in their mechanisms for financing catastrophe risk, with countries like France and Spain having mandatory coverage backed by government reinsurance, while catastrophe financing is fairly ad hoc in many other countries (Cummins 2006:362). Both global and local trends imply that world insurance markets are facing common worldwide trends while at the same time showing an important diversity.

Holzheu and Lechner (2007:877) indicate that reinsurance and primary insurance represent separate elements in the insurance value chain. Insurers can reduce their financial leverage and the variability of their cash flows by ceding all or a part of a loss to a reinsurer. Reinsurance enables the insurer to manage its risk both from a risk management and capital structure perspective, as reinsurance enables the entity who ceded the risk (cedant) to create a more diversified portfolio (Garven 2003:217). According to Holzheu and Lechner (2007:877), reinsurance also provides the benefit that insurers can accept more business with a given capital base as the cedant can afford to accept larger individual risks or risks that may be exposed to larger loss accumulations from a single event. They also noted that reinsurance covers risks from insurers represented in many geographical locations.

2.5.3. The South African context

According to Cummins and Venard (2007:4), South Africans purchase more life-insurance as a percentage of the gross domestic product (GDP) than any other country in the world. South Africa also has high levels of insurance penetration with annual premiums in 2010 of 12% of the GDP for life business and 2.8% for non-life business (PWC 2012:32). According to the PWC report, the portion of South African insurance premiums of the total insurance premiums of the African continent accounted for 90% of the life insurance market, and more than 50% for the short-term insurance market. The world market share for Africa is 1.9% for life premiums and 1.1% for non-life. The same study also indicates that South African short-term insurers regard motor insurance and then property insurance (excluding motor) as

the most important markets, with alternative risk transfer (ART) as the least important market (PWC 2012:24).

Based on the review of the global similarities and local differences, globalisation and the development of new insurance products enabled global insurers to develop, exploit, and grow new markets. The growth in different markets has however increased the complexity to manage the global insurers as they also have to consider the local legislation and regulations of the countries in which they operate. Although similarities exist in the global insurance market, significant local differences were identified that impede the further globalisation of the insurance industry and convergence of the insurance and other segments of the financial markets. The discussion of the global similarities and local differences not only highlighted the opportunities for insurers to grow and develop their products and markets, but also indicated the complexity of doing business in different countries as a “one size fits all approach” may not necessarily be the solution for both the insurer and the regulator.

The participants and their roles are discussed in the next section.

2.6. PARTICIPANTS IN THE SHORT-TERM INSURANCE INDUSTRY AND ALTERNATIVE RISK TRANSFER MARKET

There are a number of participants in the insurance industry, who ensure that the insurance needs, which range from sophisticated and structured products, to standard policies, of institutions, businesses, and individuals are met. Table 2.1 summarises the participants in the insurance industry and the roles those participants fulfil in the insurance markets.

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Table 2.1 The role of short-term insurance and ART market participants

THE ROLE OF SHORT-TERM INSURANCE AND ART MARKET PARTICIPANTS						
ROLE	INSURERS/ REINSURERS	FINANCIAL INSTITUTIONS	CORPORATE/ COMMERCIAL END-USERS	INSTITUTIONAL INVESTORS	AGENTS/ BROKERS	INDIVIDUAL END-USERS
Product development	✓	✓			✓	
Risk advisory	✓	✓			✓	
Risk capacity (provider)	✓	✓		✓		
Risk capacity (user)	✓	✓	✓			✓

As adapted from Banks (2004:58)

The most important participants in the insurance industry as identified by Banks (2004:52–55) are discussed below.

- **Insurers and reinsurers**

Insurers and reinsurers provide risk capacity in traditional insurance such as motor, property and commercial, health, liability insurance. They are also involved in underwriting, rate-making, settling claims, managing investments and managing risks by using reinsurance/retrocession, derivatives, and other techniques to balance internal risks. Insurers and reinsurers are also active participants in the ART market by designing and marketing ART products, managing their own risk exposures through ART-related assets such as catastrophic bonds and credit transfer mechanisms, and by supplying specific layers of risk capacity through ART instruments.

- **Financial institutions**

Financial institutions such as investment, commercial and universal banks focus on originating and managing financial risks. The role that banks fulfil in the ART market includes originating credit facilities and loans, underwriting capital markets securities such as equities and bonds on a primary basis, trading assets in local and foreign currency such as equities, bonds, loans and derivatives, developing structured

products and other synthetic assets and providing wealth management, risk management and advisory services.

- **Corporate end-users**

With the focus on risk management and governance, corporate end-users have increased their focus to maximise shareholder value (Cummins & Venard 2007:19). The effect is that corporates are developing risk management programmes that cover the spectrum from traditional insurance and financial derivatives to alternative risk transfer products and vehicles, such as finite insurance programmes, captives, and contingent securities.

- **Institutional investors**

Institutional investors provide capital and/or risk capital to provide liquidity and so enable the products and programmes to be developed and arranged. Investors are normally large institutions that seek adequate returns on their investment portfolios through the provision of different forms of capital.

- **Agents and brokers**

Agents and brokers act as intermediaries to arrange insurance and other risk-related functions in the insurance/reinsurance markets. The products may also include ART-related transactions.

- **Individuals**

Individuals are the ultimate end-users of insurance, whether it is from a short-term insurance perspective or contributing towards annuities of other insurance-related savings.

Based on the review of the literature of this section, it can be concluded that the short-term insurance market has different participants as suppliers and customers of the products and services. The different participants in the insurance market facilitate that the needs of institutions, businesses, and individuals by providing standard insurance, but also where needed, providing sophisticated and structured products, which will be discussed next.

2.7. RISK TRANSFER AND RETENTION PRODUCTS

The needs of the corporate and individual end-users differ with regard to the nature of the type and sophistication of the short-term insurance cover required. Short-term insurance cover ranges from minimum transfer contracts to full risk retention by the business. The migration and risk transfer mechanisms are depicted in Figure 2.4.

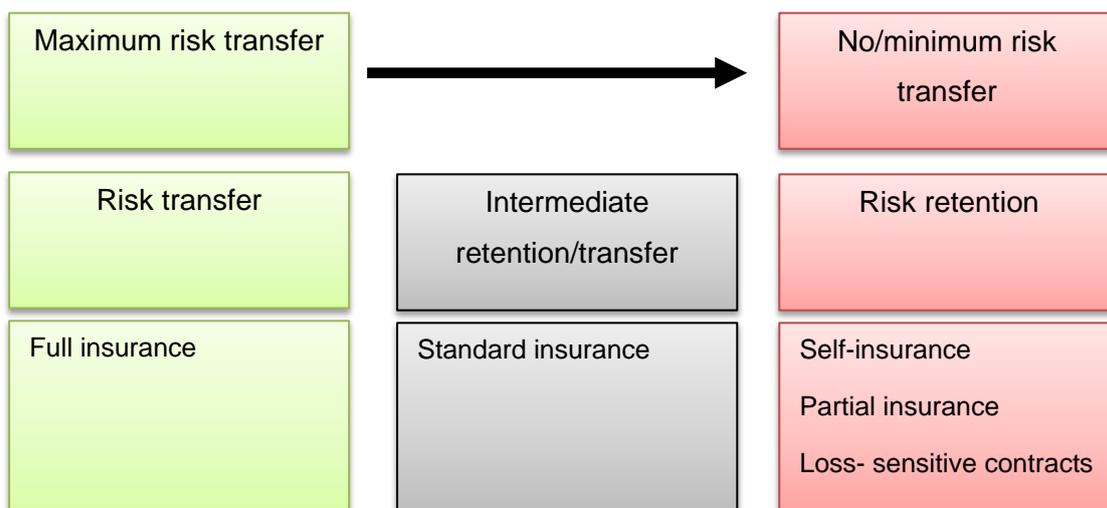


Figure 2.4 Types of short-term insurance contracts to retain and transfer risks. As adapted from Banks (2004:65)

As illustrated in Figure 2.4, the short-term insurance products available range from the standard, full insurance products, where the insured retains the minimum risk and transfer the maximum risk, to the other end of the spectrum where the maximum of the risk is retained, with a minimum transfer in terms of the standardised insurance contracts. The different short-term insurance products are discussed below.

- **Maximum risk transfer contracts**

Full insurance is an example of maximum risk transfer contracts. Full insurance is an insurance contract that provides complete coverage of risk exposure in exchange for a higher premium. Full insurance can be considered as a maximum risk transfer contract and is characterised by small deductibles, large policy caps, limited or no co-pay/coinsurance and limited exclusions (Banks 2004:65).

- **Minimum transfer products**

Short-term insurers have developed comprehensive standard and specialised insurance cover for individuals and businesses. Banks (2004:66) also notes with the development of risk management techniques and risk retention and risk finance, businesses identified the need for alternative risk transfer and instruments have been developed which were enabled when the insurance and capital markets began to converge.

The maximum transfer products are discussed in the next section under short-term insurance products, which is then followed by the minimum transfer products under alternative risk transfer (ART) products.

2.8. SHORT-TERM INSURANCE PRODUCTS

Short-term insurers in South Africa have developed a range of insurance cover to enable individuals, businesses, and organisations to transfer risk to the insurer. The types of short-term insurance typically offered are discussed under personal cover and business cover.

2.8.1. Personal cover

Personal or individual cover is focused on the needs and requirements of the individual end-users. Products on offer will typically consist of a wide range of cover such as motor insurance, homeowner's cover for the protection of dwellings and the outbuildings and household contents. General and specified goods cover is also available for smaller and more valuable items. Motorcycle insurance can also be arranged to cover motorbikes, quad or off-road bikes and separate comprehensive cover for trailers and/or caravans. Personal liability and legal cost cover with different limits for protection against claims made by third parties is also included (Mutual & Federal, 2013).

2.8.2. Business cover

Corporate or commercial cover can be divided broadly into three categories, namely business insurance, specialist insurance solutions, and agricultural insurance.

- **Business insurance**

Business insurance provides insurance for the whole spectrum of businesses, from sole proprietors to large businesses and includes coverage against anything from fire and theft to business interruption and liability cover (Mutual & Federal, 2013).

- **Specialist insurance solutions**

Specialist insurance cover includes items such as asset protection, fire cover, accident cover, and motor fleet insurance. Specialist insurance solutions would include engineering insurance cover, which can include civil, electronic, mechanical, and structural insurance needs. Marine insurance would typically provide cover for cargo, transit risks, loss of profit and hull insurance (Mutual & Federal, 2013).

- **Agricultural insurance**

Agricultural insurance is available in the form of personal agricultural insurance cover that includes insurance for farming activities, crop insurance against direct and systemic perils and specialised cover for the wine industry (Mutual & Federal, 2013).

With improvement in governance and risk management, businesses have become more prepared to retain risk, particularly for high-frequency and low-severity events that has led to alternative risk transfer programmes, which will be discussed in the next section.

2.9. ALTERNATIVE RISK TRANSFER

According to the world Economic Forum (WEF 2008:4), the convergence of the insurance and capital market has led to the development of more sophisticated products, which in turn led to the development of an active market for alternative risk transfer (ART). Banks (2004:51) further explains that the ART market goes beyond traditional insurance and reinsurance markets to find innovative solutions to risk financing and risk management. In a report commissioned by the WEF on the

convergence of the insurance and capital markets (WEF 2008:6), insurance-linked securities (ILS) are regarded as desirable to investors as short-term insurance liabilities are, in contrast to risks in bank assets, uncorrelated or weakly correlated. The argument highlighted in the report is that major natural disasters such as Hurricane Katrina, affected a relatively small geographical area in a region of the US, and so the effect of the hurricane on the US and globally was regarded as minimal as a typical short-term insurance portfolio consists of uncorrelated risks, which creates diversification benefits.

The ART market provides risk-bearing capacity where little or no traditional insurance and reinsurance coverage is available or where insurance coverage is inadequate. High severity, low-frequency exposures such as earthquakes and tsunamis are suited to capital market solutions such as catastrophe risk (CAT) bonds, which can greatly expand available capacity as indicated in the report on the convergence of insurance and capital markets by the World Economic Forum (WEF 2008:6).

According to Cummins and Venard (2007:16), non-insurance organisations have also become increasingly inclined to carry risk, particularly for high-frequency and low-severity events, which also indicates that the retention of risk has led to increased interest in solutions such as self-insurance programmes and captive insurance companies. Banks (2004:66–67) describes the examples of products or structures that enable users to retain more risk, such as partial insurance, where the insurance contract provides fractional coverage of risk for a lower risk premium. He further adds that fractional coverage is achieved through deductibles, exclusions, and policy caps.

Another product is loss-sensitive contracts, which are partial insurance policies where the premiums are determined by considering the loss experience of the insured. Banks (2004:70) notes that finite risk programmes are used to finance rather than transfer exposures. These programmes can be structured as retrospective finite programmes and prospective finite programmes. Finite contracts are used to manage risks associated with loss exposure or the rate of loss accrual and they serve primarily as cash flow timing rather than loss transfer mechanisms.

Banks (2004:74) indicates that, although finite and full insurance are both subjected to underwriting, credit, investment and cash flow risks, they represent different risk management alternatives. Another risk retention technique is the establishment or use of captives, which is discussed in the next paragraph.

2.9.1. Captives

According to Banks (2004:89), retention can be achieved through self-retention programmes on the corporate balance sheet and certain insurance contracts. Captives form a central component of the ART market and remain the most actively used channel for ART-related activity. Banks (2004:89) further indicates that a captive is used to facilitate a company's insurance/reinsurance programme and retention/transfer activities. Captives are generally formed as a licensed insurance/reinsurance company, controlled either by a single owner or multiple owners or sponsors. The sponsors provide upfront capital to commence the operation. In exchange for the provision of capital, the captive generally pays the sponsors periodic interest and dividends. The captive insures the sponsors or third-party users directly by accepting a transfer of risk in exchange for a premium, or it can act as a reinsurer by dealing through a fronting insurer.

The Centre for Financial Regulation and Inclusion (Cenfri 2009:2) indicate short-term insurers registered to sell individual cells, enables an organisation to buy or "rent" a part of the licence. The cell owner thus transfers its insurance risk into the cell. The RBC Trust Company (RBC 2009:6) indicates although captives have benefits, two concerns are the capitalisation and the administration of the captive, and that captives are exposed to market fluctuations between "hard" and "soft" markets. RBC notes captives are exposed to the same risks as that a "normal" short-term insurer. England, Druker and Keenan (2007:702) note the benefit of captives include the reduction of a company's long term cost of risk, but also highlight it is important that the business rationale of a captive must be for legitimate reasons, and must be confirmed with a feasibility study.

The convergence of the capital and insurance markets has also enabled the development of insurance linked securities, which facilitated the development of a

range of new insurance vehicles (WEF 2008:14). Insurance linked securities are discussed in the next paragraph.

2.9.2. Insurance-linked securities

The convergence of the capital markets and the insurance and reinsurance sectors is regarded as a significant economic development by the World Economic Forum (2008:4) as the financial instruments such as insurance-linked securities (ILS) can contribute to address and syndicate particular insurance types of risk. According to Hartwig and Wilkinson (2007:930), convergence of the capital markets and the insurance and reinsurance sectors has also coincided with increased globalisation of the financial services sector. Cummins and Venard (2007:17) highlight that the globalisation of the financial services sector was also facilitated by the deregulation of financial markets in Europe, the United States, and Asia. ILS cover a broad range of instruments such as securitisation, catastrophe risk (CAT) bonds, CAT options, CAT swaps, sidecars, industry loss warranties and contingent capital. The securitisation of insurance cover is discussed in the next paragraph.

2.9.3. Securitisation of insurance cover

According to Doherty and Schlesinger (2007:47), securitisation consists of the decomposition and repackaging of risk, and can entail both the direct packaging of the loss liabilities of an individual insurer for sale in the capital market or the design of securitised products that are based on an economic index. They note that securitisation can also be used as a substitute for reinsurance as it enables the insurer to transfer excess risk. The underwriting risks of insurers and reinsurers can be transferred to the capital markets by creating and issuing financial securities. Gorvett (1999:134) states that the process, which can be followed to securitize underwriting risks, consists of the following elements, namely the transformation of the underwriting cash flows into tradable financial securities and the transfer of the underwriting risks to the capital markets through the trading of the securities. He further states that securitisation also has the ability to carve out components of the risk rather than treating the risk as a whole, and therefore requires an understanding of the mathematical structure of the loss correlations. Efficient risk transfer may also

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require different contracts based on different mathematical structures and different markets. Gorvett (1999:146) also notes that the effectiveness of securitisation depends on certain principles, namely the separation of the systemic and idiosyncratic risk components and a strong correlation within the systemic component.

According to Gorvett (1999:147), insurance securitisation products can be classified as –

- risk transfer instruments, which entail swaps that can be used to transfer risks to the capital markets or other insurers;
- catastrophe bonds, which are used to transfer risk to the capital markets; and
- exchange-traded derivatives used to transfer risk to the capital markets.

Individuals, organisations, and businesses purchase insurance policies to protect themselves against various insurable risks and thereby transfer the risks to the primary insurer. The insured pays a premium and in return, receives a contingent promise that the insurer will pay claims covered in the insurance policy (Doff 2007:11). Frankel and LaPlume (2000:203) indicate that the primary insurer warehouses most of the assumed risks but will also attempt to reduce the risk through internal diversification. Internal diversification is achieved by issuing policies to different policyholders spread across geographical areas and a variety of lines. Internal diversification is however insufficient to eliminate all the risks and the insurer may consider further measures to manage its own risk profile. Cummins and Trainar (2009:467) note that the primary insurer can further reduce its risk with external diversification by purchasing reinsurance from a reinsurer. The reinsurer will warehouse the risks and will attempt to diversify the risks by issuing policies to multiple primary insurers across different geographical and regions and countries. According to Cummins and Trainar (2009:204), reinsurers can further diversify risks by retro ceding risks to other reinsurers.

According to Frankel and LaPlume (2000:204), insurers and reinsurers can transfer their risks to the capital market through securitisation to diversify their risk. Securitisation can be achieved by issuing ILS to investors. Cummins and Trainar (2009:466) indicate that the process as highlighted by insurance securitisation

follows traditional forms of securitisation, which consist of the establishment of a special purpose vehicle (SPV). The insurer or the reinsurer transfers its risk into the SPV and issues bonds to investors via the SPV. The SPV issues securities, which can be in the form of bonds or shares, to investors. The SPV enters into reinsurance contracts with ceding insurers or other beneficiaries for an annual payment (premiums), and calculates the appropriate amount of the premiums by investing the proceeds from the bond distribution and the premiums and ensures the financial stability of the SPV and the investments. The funds are held in trust and are invested in instruments with minimum risk. The interest payments are distributed as part of the SPV's obligations enabled by the net earnings and premiums received. Call options are purchased from the SPV by the primary insurer or the reinsurer purchases call options, which will pay on a predetermined trigger event. The investors in ILSs can further diversify their risk by also investing in other non-related securitisation transactions.

According to Cummins and Trainar (2009:466), securitisation can benefit primary insurers and reinsurers when the cost of reinsurance is high, or if there is limited capacity. Catastrophe bonds (CAT bonds) are one of the most utilised instruments used in the insurance-linked securities market. Aon Benfield LLC (2013:3) has reported a Cat bond issuance increase of 35% in 2012, which is the highest volume since 2007. Catastrophe bonds are discussed in the next section.

2.9.4. Catastrophe bonds

The process to transfer risk from the primary insurer or reinsurers to the capital markets was discussed under securitisation. Cummins and Trainar (2009:464) note the securitisation of catastrophe risk enables insurers and reinsurers to use the potential of the global capital markets. Insurers, reinsurers, or other organisations may identify a need to securitize catastrophe risk by issuing a catastrophe bond (Valsamakis, Vivian & Du Toit 2010:351). Investors purchase bonds from an SPV in return for interest payments received on the principal. The primary insurer or the reinsurer purchases call options from the SPV, which will pay on a predetermined trigger event. Triggers on ILS determine the conditions under which payments are made to the insurer or reinsurer. Cummins and Weiss (2009:497) identify four types

of triggers that can be used to trigger a payoff event for a CAT security was designed. The triggers are categorised as indemnity triggers, where the bond payoff is determined by the event losses of the issuing insurer, or industry-indexed triggers, where the bond payoff is triggered by the value of an industry loss index. With modelled loss triggers, the bond payoff is determined by the simulated losses calculated by inputting specific event parameters into a catastrophe model. In the case of parametric triggers, the payoff is triggered when the insured event exceeds a specific severity level (Finken & Lauz 2009:581).

According to Gorvett (1999:153), triggers are used to address basis risk and moral risk. He describes basis risk as how close the losses of the insurer follow the index used to determine the payoff of the CAT bond. Basis risk would be the difference between the catastrophe loss experience of the industry and the individual insurer, where the index is based on the aggregate losses to the short-term insurance industry. Bouriaux and MacMinn (2009:1) describe moral risk as the reduced motivation to limit losses and consequent increases in the cost of coverage.

Although the CAT bond market was established in 1994, Bouriaux and MacMinn (2009:2) regard the ability of the credit rating agencies to rate CAT bond offerings as a contributing factor for the growth in the CAT bond market since 1997. According to Bouriaux and MacMinn (2009:5), the credit ratings of the CAT bond are important to facilitate the marketability of the bonds. They note that the rating methodology of the CAT-linked securities focuses on a number of factors. The first factor is the insurance risk of the issuer. Different scenarios and assumptions of the issuer's loss against the probability of the loss, which is based on the proprietary insurance models developed by the rating agencies, or input based on models developed by catastrophe modelling firms. The second factor is default risk. The probability of catastrophic losses are compared with the probability of default of corporate bonds using historical data on corporate bond defaults and if similar, the CAT bond is allocated the same rating as the corresponding corporate bond. The third factor is the terms and structure of the CAT bond. The penultimate factor is the quality of the collateral placed in the SPV trust, and the credit rating of the counterparty of the swap engineered by the SPV is evaluated. The final factor is the capacity of the CAT-linked security sponsor and the criteria considered would include the financial

strength, management quality, and experience in sponsoring insurance-linked securities.

The WEF (2008:24) indicates that the availability and accuracy of data, such as the historic loss, historic parametric and exposure effects the quality of the risk assessment. The report further indicates that the valuation of ILS is complex and specialised knowledge is necessary to understand the models and risks involved (WEF 2008:30).

Based on the abovementioned review, it can be concluded that insurers are able to provide a function as a risk transfer mechanism by pooling the risks and contributions of a large number of individuals into a common pool. The survival of the pool can be ensured by calculating an equitable premium by assessing the risk that each member is contributing to the pool. Insurers provide both standard insurance products, with maximum transfer of risk and exotic insurance products with a higher rate of retention and a lower rate of risk transfer. Examples of maximum risk transfer insurance products are typically standard insurance policies, such as personal cover, for example motor and household insurance, and business insurance, for example small and medium businesses, and specialist insurance products such as contract works, marine and aviation and agricultural insurance policies. Minimum transfer products or alternative risk transfer would include partial insurance contracts, loss-sensitive contracts, finite insurance, captives, and insurance-linked securities.

Insurers have the benefit that the risk in the pool is understood for the standard insurance contracts as they have a long history of collecting data, which enables a more accurate calculation of the equitable premium and loss probabilities. This stands in contrast with the more exotic products with a smaller underwriting pool and a paucity of data. The need for regulation can be illustrated with a review of the balance sheet of a typical short-term insurer.

2.10. BALANCE SHEET OF A TYPICAL SHORT-TERM INSURER

The balance sheet of a typical short-term insurer is discussed to gain an understanding of the risks an insurer is exposed to in the normal course of business.

The balance sheet of a typical short-term insurer is illustrated in Table 2.1 below.

Table 2.1. The balance sheet of a short-term insurer

Assets	Liabilities
<p>Intangible assets</p> <ul style="list-style-type: none"> • Goodwill (in cases where the takeover price exceeds the net value of the insurer) • Deferred tax assets • Deferred acquisition cost (DAC) <p>Investments</p> <ul style="list-style-type: none"> • Different asset classes such as: <ul style="list-style-type: none"> ▪ Equity ▪ Property ▪ Fixed income (bonds) 	<p>Capital</p> <ul style="list-style-type: none"> • Shareholder capital • Subordinated debts • Wholesale funding <p>Technical provisions</p> <p>The best estimate of the net present value of future claims minus the net present value of future premiums</p>

As adapted from De Weert (2011:19)

The assets and liabilities of an insurer are explained in more detail in the following paragraphs.

2.10.1 Assets

The assets of the insurer or reinsurer consist of intangible assets, created during the course of business, and the investments of the premiums received to earn a dividend and interest income to serve future claims.

- **Intangible assets**

Intangible assets consist of goodwill, deferred tax, and deferred acquisition cost. De Weert (2011:20) describes goodwill is an accounting concept which indicates that the value of an asset that is owned is intangible, but has a quantifiable value. Examples are the reputation that a firm builds up over years or where a company paid more than the value of the tangible assets at acquisition (De Weert 2011:20).

According to De Weert (2011:20), “deferred tax assets” refers to the amount of loss reserves or unearned premium that is not deducted from income when tax is calculated. The European Insurance and Occupational Pensions Authority (EIOPA 2012:1) note the deferral in the tax deduction arises due to the requirement to discount loss and unearned premium reserves. The insurer or reinsurer records an asset equal to the expected future amount of the tax deduction. De Weert (2011:117) further notes deferred tax assets are deferred claims, contingent on sufficient future profits and from that perspective, are not officially an asset.

De Weert (2011:20) describes deferred acquisition cost (DAC) as the amount of an insurer’s acquisition costs incurred when premium is written but earned and expensed over the term of the policy. The unearned portion is capitalised and recognised as an asset on the balance sheet (EIOPA 2012:125). As in the case of deferred tax, DAC is also a deferred claim, but with DAC, the claim is on the future premiums (EIOPA 2012:125, Adam 2007:196).

- **Investments**

The investments by the insurer or reinsurer are in equities, property, and interest-bearing instruments (De Weert 2011:118). Equities can be in the form of companies listed on an exchange such as the Johannesburg Securities Exchange (JSE) or can be non-listed or private equity. Insurers also invest in property, for example by developing shopping centres and office blocks. The insurer receives an income from the management and renting of the property. A component of the assets is also invested in interest rate instruments such as government and corporate bonds and money market investments (SAM QIS2 2013:38–40).

The investments are exposed to the level or volatility of market prices of assets and the exposure to other unanticipated movements in financial variables or to

movements in the actual or implied volatility of assets prices and options. Investments are further exposed to default by the issuer of the security (SAM QIS2 2013:39).

2.10.2. Liabilities

The liabilities of the insurer or reinsurer consist of capital and the technical provisions created once a new policy is granted.

- **Capital**

The capital of the insurer or reinsurer consists of the shareholder capital and subordinated debt. The capital structure of the short-term insurer is discussed in Chapter 3 under Pillar I in more detail.

- **Technical provisions**

Technical provisions consist of different obligations and liabilities such as policyholder obligations, tax liabilities, obligations arising from business and management cost of the portfolio, creditors and policyholders rights in term of premiums due and recoveries (CEA Solvency II Glossary 2007:54). The Institute and Faculty of Actuaries (2013:3) indicate the technical provisions are the best estimate of the net present value of future claims minus the net present value of future premiums and that the expression is also often used in association with the reserve deposited by a reinsurer with the cedant to cover in part outstanding claims. The Institute (2013:3) further indicate the technical provisions are the largest item on the balance sheet of the short-term insurer and that the calculation is an essential component in the construction of the solvency balance sheet.

According to Doff (2007:23), the insurer raises a technical provision at the beginning of the insurance contract and the technical provisions are invested in different asset classes. The assets are exposed to a variety of risks, such as the fluctuation in the value of the assets, due to changes in the prices of the assets or the default of an issuer of a security. Due the nature of the risk transfer function, the short-term insurer is exposed to a number of risks, which are discussed in the next section.

2.11. CLASSIFICATION OF RISKS OF THE SHORT-TERM INSURER

The definition and classification of risks in the insurance industry went through a number of stages with the Müller Report in 1997 as the first effort to develop an accepted risk taxonomy for the insurance industry (Sandström 2006:41). In 2002, the International Association of Insurance Supervisors (IAIS) requested the International Actuarial Association (IAA) to research insurance risks from an actuarial perspective. The IAA formed the Insurer Solvency Assessment Working Party to conduct the research. The results of the study were published in 2004 in A Global Framework for Insurer Solvency Assessment, which identified the fundamental risks in the overall management of the insurer. The Framework (IAA 2004:25) identifies the overall management activities of insurers as follows:

- the design, pricing, marketing and underwriting of insurance policies;
- the selection of assets backing the policies;
- the estimation of the size and volatility of the liabilities associated with those policies;
- the determination of the insurer's capital needs;
- claims management;
- the updating of all elements over time as more data and information becomes available or because the underlying risk process changes;
- sound disclosure and communication to key stakeholders such as management, supervisors, policy holders and investors; and
- future financial conditions analysis, which provides a prospective multi-scenario view of the company as a whole.

The Framework (IAA 2004:26) also recommended that the risks an insurer is exposed to are to be categorised into four major insurer risk types underwriting risk, counterparty default risk, market risk and operational risk. The risk types are discussed in more detail below.

2.11.1. Underwriting risk

Eling and Schmeiser (2010:10) indicate that a significant component of the overall risk of the insurer or reinsurer underwriting risk. Although the liability portfolio is

diversified in many different lines of business due to the different types of policies, the underwriting risk is largely uncorrelated with the asset side and the capital market in which the insurer or reinsurer invests. Eling and Schmeiser (2010:10) indicate that “underwriting risk” refers to the key idiosyncrasies of short-term insurance and that short-term insurers consider the following aspects of when assessing underwriting risk:

- the heterogeneity of risk;
- the effects of correlation between different risks underwritten;
- the difference between outstanding claims liabilities and liabilities because of unexpired risk inherent in unearned premiums;
- annual renewal basis for the vast majority of the businesses;
- significant role played by reinsurance especially in relation to concentration of risk;
- difficulty in estimating separate claim incidences; and
- severity in projecting experience for a minority of the businesses.

The losses experienced by AIG in 2008 due to the fact that the default probabilities for the collateralised debt obligations (CDOs) were underestimated (Guillén & Suárez 2010:263) is a typical example of underwriting risk where the insurer underestimated the concentration of the risk underwritten and the severity in the event of claims.

The South African insurance industry also experienced significant underwriting events during 2012, such as floods in Mpumalanga in January, a number of significant hailstorms in Gauteng during October and November and a fire at St Francis Bay in November (Santam AFS 2013:5).

2.11.2. Market risk

Market risk arises from the level or volatility of market prices of assets and the exposure to other unanticipated movements in financial variables or to movements in the actual or implied volatility of assets prices and options. Market risk also involves the exposure to movements in the level of financial variables such as stock prices,

interest rates, exchange rates or commodity prices, and includes the exposure of options to movements in the prices of the underlying asset (Doff 2007:14).

As a large component of the investments of insurers and reinsurers are in equities and fixed income, a general decrease in the value of equities and fixed income can have a significant effect on the investment portfolio of the insurer. As the insurer or reinsurer marks the investment portfolios to market, the decrease in the value of the investment portfolio can have a devastating effect on the capital and thus sustainability of the insurer or reinsurer (Eling & Schmeiser 2010:12).

2.11.3. Counterparty default risk

From the perspective of the insurer or reinsurer, the risk of default and change in the credit quality of issuers of securities in the insurer's investment portfolio can have a devastating effect. Counterparty default risk also includes the risk of default or change in the credit quality of counterparties on items such as reinsurance contracts, derivative contracts, bonds or deposits given and intermediaries, to whom the company has an exposure (Bouriaux & MacMinn 2009:5). The payments of short-term insurers are linked to claim events and due to the nature of the business are actually funded in advance. When the business models of banks and insurers are compared, the insurers are less affected by a credit crisis than banks. Where the insurers are, however, affected by a credit crisis, this is due to the institutional investment role in the capital markets, especially, where the issuers of shares or bonds in which the insurer invested default (Eling & Schmeiser 2010:12).

2.11.4. Operational risk

Operational risk, in terms of the Solvency II Directive (SII Directive L335 2009:24), is defined as the risk of loss resulting from inadequate or failed internal processes, people or information systems, or from external events, as adopted from the Basel II definition of operational risk. Young (2006:5,6) points out that operational risk used to be a generic term that covered different risks, but as the focus on operational risk increased, the need arose to define it more clearly. The definition for operational risk evolved through number versions, until the Basel Committee on Banking Supervision

(BCBS) formalised the definition for the banking industry in 2003 with the guidelines for the implementation of the Basel II regulatory framework.

According to the above review, it can be deduced that the items in the balance sheet of the short-term insurer illustrate that the insurance model affects both sides of the balance sheet. The calculation of the technical provisions on the liability side of the balance sheet for regulatory capital purposes is used to protect the insurance pool to ensure the sustainability of the short-term insurer. Short-term insurers also implement different methods to manage the risk in the pool such as enlarging the pool to benefit from the law of large numbers, accepting risks from different geographical areas, and purchasing reinsurance to transfer some of the risks.

Furthermore, short-term insurance premiums could be invested in different asset classes, which are exposed to market risk caused by changes in prices and interest rates, which can not only adversely affect the value of the individual investments, but also the total portfolio. The issuers of the securities can however also default on their obligations to repay the capital or interest, which also adversely affects the value of the investments, which expose the short-term insurer to counterparty default risk.

As indicated in paragraph 2.5, management of insurers with offices in different countries also need to consider the laws and regulations in different jurisdictions, but it has also increased the complexity of supervising those entities and enables regulatory arbitrage opportunities for global insurers (Jacobs & Van Vuuren 2013:316). Directive 2009/123/EC emphasises the importance of harmonising the regulatory regimes at international and country level. The different international institutions that were established to assist in the development and harmonising of the prudential regulatory regimes are discussed in the next section.

2.12. THE REGULATORY ENVIRONMENT OF THE INSURANCE INDUSTRY

The financial stability of insurers is important to ensure that insurers can continue to fulfil their role and obligations, according to the International Association of Insurance Supervisors (IAIS 2011:3), but also to protect the purchasers of the insurance products and services. Long- and short-term insurers are closely regulated for the

purpose of a sustainable industry and to protect the end-buyers of insurance products and services (Report on QIS 5 2011).

A number of institutions were established to share information and provide guidance to insurers, regulators, actuaries, and setting accounting standards for implementation by the insurance industry.

2.12.1. International

Insurers and regulators in different countries have formed a number of committees and organisations to exchange information and set international standards. Sandström (2006:2–4) identified the following organisations that formed an important part in the discussions and development of international standards and the solvency regime.

- **Insurance Europe**

Insurance Europe was founded as the Comité Européen des Assurances (CEA) was formed in 1953 by European insurers to exchange information and for representation at the Insurance Committee of the Organisation for European Economic Cooperation (Boldijar, 2012). The CEA assisted in developing the first EU insurance directive (Insurance Europe, 2013).

- **Committee of European Insurance and Pensions Supervisors and European Insurance and Occupational Pensions Committee**

The Committee of European Insurance and Pension Supervisors (CEIOPS) was established in 2003 as a successor for the Conference of Insurance Supervisory Authorities of the European Union, which was formed in 1958 with the purpose to act as an independent advisory group on insurance and occupational pensions. CEIOPS was established to assist the commission with the implementation of the EU directives (EIOPC, 2012).

- **European Insurance and Occupational Pensions Authority**

The European Insurance and Occupational Pensions Authority (EIOPA) was established in 2011 with the objective to support the stability of the financial system, financial products and market transparency, and the protection of policyholders and

pension scheme members and beneficiaries (EIOPA, 2012). EIOPA is an advisory body to the European Parliament, Council of the European Union and the European Commission (EIOPA, 2012).

- **The Actuarial Association of Europe**

The Actuarial Association of Europe (AAE), previously Groupe Consultatif was established in 1978 to bring together the actuarial associations in the European Union to represent the actuarial profession in discussion with European Union institutions on existing and proposed EU legislation, which has an impact on the profession. The Groupe Consultatif also provides a forum for discussion amongst all actuarial associations throughout Europe. The Groupe Consultatif currently has thirty-seven member associations in thirty-five European countries, representing about 20 000 actuaries. Advice and comments provided by the Groupe Consultatif on behalf of the European actuarial profession are totally independent of industry interests (AAE, 2014).

- **International Actuarial Association**

The International Actuarial Association (IAA) was founded in 1895 and is a global association of professional actuarial associations, with a number of special interest sections for individual actuaries. The IAA describes its mission to represent the actuarial profession and promote its role, reputation, and recognition internationally and to promote professionalism, develop education standards and encourage research to address changing needs (IAA, 2012).

- **International Association of Insurance Supervisors**

The International Association of Insurance Supervisors (IAIS) was established in 1994 with the objectives to promote effective and globally consistent supervision of the insurance industry in order to develop and maintain fair, safe, and stable insurance markets for the benefit and protection of policyholders, and ultimately, to contribute to global financial stability. The IAIS represents insurance regulators and supervisors of more than 200 jurisdictions in nearly 140 countries (IAIS, 2012).

- **International Accounting Standards Board**

The International Accounting Standards Board (IASB) was formed in 2001 to replace the International Accounting Standards Committee (IASC). The IASB is an

independent, private-sector body that develops and approves International Financial Reporting Standards (IFRSs). The IASB operates under the oversight of the IFRS Foundation. The objectives of the IASB are to-

- develop a single set of globally accepted international financial reporting standards through the IASB;
- promote the use and application of the standards;
- considering the financial reporting needs of emerging economies and small and medium entities; and
- promote and facilitate adoption of IFRSs through the convergence of national accounting standards and IFRSs (IASB, 2012).

2.12.2. South Africa

The insurance industry in South Africa is regulated by the Financial Services Board (FSB). Under the current legislation, the FSB is responsible to oversee the South African non-banking financial services industry in the public interest in terms of the Financial Services Board Act, No. 97 of 1990. The specific functions of the FSB in terms of the act are to:

- supervise the compliance with laws regulating financial institutions and the provision of financial services;
- advise the Minister of Finance on matters concerning financial institutions and financial services, either of its own accord or at the request of the Minister of Finance; and
- promote programmes and initiatives by financial institutions and bodies representing the financial services industry to inform and educate users and potential users of financial products and services.

The FSB further sees its mission to promote sound and efficient financial institutions and services together with mechanisms for investor protection in the markets supervised, which include the short-term and long-term insurers, reinsurers, Lloyd's Correspondents and other Credit Agents. The short-term insurers are regulated in terms of the Short-Term Insurance Act, No. 53 of 1998 and the long-term insurers by the Long-Term Insurance Act, No. 52 of 1998.

The financial stability of insurers is important to ensure that they can fulfil their roles and responsibility in the economy, but also to protect the purchasers of the insurance products. The growth in different markets has increased the complexity to manage the global insurers, as they also had to consider the local legislation and regulations of the countries in which they operate. This has necessitated the establishment of an international insurance framework and institutions to share information and provide guidance to insurers, regulators, actuaries, and setting accounting standards for implementation by the insurance industry.

2.13. PRUDENTIAL REGULATION

Sandström (2006:11) indicates that Solvency I, with the publication of the first Non-life Directives in 1973, was introduced in the early 1970s in Europe and the United Kingdom (UK) to ensure that insurers should have over and above the technical reserves to meet their underwriting liabilities, a solvency margin as buffer against business fluctuations. Buckham et al. (2011:39) also noted that the directives however, excluded requirements for governance and risk management in insurance companies and also that the increased globalisation of economies and reduced demarcation of participants in the services and products offered by participants in the insurance industry necessitated a more modern regulatory regime.

According to Van Hulle (2011:179), Solvency I had a number of shortcomings, which included the insufficient risk sensitivity of the capital requirements, overemphasis on prudence, especially with regard to technical provisions, insufficient focus on group supervision, lack of harmonisation of insurance regulation in the member states of the European Union and insufficient coordination between insurance supervisors. He also notes that the Solvency II regime intends to provide the insurance industry with a modern approach to solvency management, which will correspond more closely with the way that the industry manages its business. In the Global Framework for Insurer Solvency Assessment, the IAA Working Party (IAA 2004:3) recommended that a number of the Basel II principles should be adopted in the new regulatory framework. Doff (2009:6) indicates that a number of Basel II principles were adopted and refers to similarities between the Solvency II and Basel II frameworks.

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The Basel II framework was developed by the Banking Committee on Banking Supervision (BCBS) with consultation beginning in 1999 and with the publication in 2004 of the International Convergence of Capital Measurement and Capital Standards: A revised Framework with the purpose to overcome shortcomings in the Basel I framework. Doff (2007:144) notes that the 1988 Basel I framework included capital requirements for credit risk. Although different weightings were allocated to different types of credit, banks identified the opportunity for regulatory arbitrage via swap and securitisation transactions as the increased off-balance sheet transactions did not require the same level of capital as balance sheet activities. He also indicates the Basel I framework was amended in 1996 to include market risk requirements.

Doff (2007:145) points out that the Basel II framework included four elements that can be regarded as an improvement over Basel I. The first element consists of a comprehensive framework based on three pillars. Pillar I provides for the capital requirements, Pillar II for supervisory review, and Pillar III for market discipline. The second element involves a capital requirement for counterparty default risk, market risk and operational risk. The third element enables insurers to develop internal models to calculate the capital requirements or to use the standardised approaches. The incentive for the internal models is that the improvement of risk management of the banks may lead to a reduced capital charge. The fourth element refers to the fact that regulatory arbitrage can be reduced as the bank's incentive for proper risk management can be aligned with the supervisory objectives with the increased use of internal models.

Doff (2009:6) indicates that a number of Basel II principles were adopted, and refers to similarities between the Solvency II and Basel II frameworks. The similarities highlighted by Doff (2009:6) refer to the three-pillar structure, the option for insurers between internal models or standardised approaches for the calculation of the capital requirements and, finally, the elements eligible for capital. Doff (2007:150) however also highlights important differences between the Solvency II and Basel II requirements. Solvency II includes all risk types in Pillar I, in contrast to Basel II, which includes interest rate risk in Pillar II. Value at risk (VaR) for Solvency II is calibrated at a 99,5% confidence level over a one-year time horizon in contrast to Basel II, which is calibrated at a 99,9% confidence level over a one-year time horizon.

Solvency II initially excluded group supervision, in contrast to Basel II, which is based on consolidated supervision.

2.13.1. Solvency II

The Solvency II implementation was planned for 2012 but has been postponed for a number of times. As the adoption of the Omnibus II Directive was delayed in the European Parliament, the European Commission published a proposal to change the implementation date to January 2016 (EU Statement/14/61 2014).

- **Objectives of Solvency II**

Van Hulle (2011:180) indicates Solvency II has broad and specific objectives. He summarises the broad objective as follows:

- to harmonise the rules of the member states and to enhance the convergence of the supervisory practices, deepening the integration of the insurance market of the European Union;
- to introduce risk sensitivity measurements in the new solvency regime to further enhance the protection of policyholders; and
- to adopt more modern actuarial, accounting, risk management and supervisory standards and techniques to improve the international competitiveness of insurers and reinsurers.

The specific objectives of the Solvency II regime as summarised by Van Hulle (2011:180) are as follows:

- to provide an incentive for better measurement and proper management of risks by the insurers and reinsurers;
- to advance supervisory convergence and cooperation with the establishment of colleges of supervisors, cooperation between supervisors and by introducing the same toolkit for supervisors in all member states;
- to remove potential regulatory arbitrage, especially of financial conglomerates by encouraging consistency;
- to enable more efficient allocation of capital resources with the introduction of risk sensitive capital requirements;

- to promote international convergence by making Solvency II compatible with current and future international standards; and
- to increase transparency with the introduction of uniform requirements on public disclosure and supervisory reporting.

- **Underlying principles**

The Solvency II Pillar I requirements are economic risk-based and should enable better coverage of the real risks run by any particular insurer as all the risks and their interactions are considered as the requirements consider both the insurance risks on the liability side of the balance sheet and investments on the asset side of the balance sheet. Solvency II is a principle-based regulatory regime. The FSA describes principle base regulation as placing the responsibility to decide how to align its business objectives and processes with the specified regulatory outcomes on the insurer and so to move away to dictate through detailed, prescriptive rules and supervisory actions how firms should operate their business (FSA 2007:4). The Solvency II architecture consists of three pillars, which are discussed in the next section.

- **Solvency II architecture**

The architecture of Solvency II consists of three pillars. Pillar I includes the quantitative requirements, Pillar II the governance and risk management requirements and Pillar III the reporting requirements.

2.13.2. Solvency Assessment and Management

South Africa has already implemented the principles of Solvency I, and the implementation of the principles of Solvency II as part of the South African Solvency Assessment and Management (SAM) initiative by the FSB is currently underway (SAM Roadmap 2010:4).

Based on the literature review of section on prudential regulation, Solvency I was introduced in the early 1970s in Europe and the United Kingdom (UK) to ensure that insurers should have over and above the technical reserves to meet their underwriting liabilities, a solvency margin as buffer against business fluctuations. Solvency I, however, had a number of shortcomings, which included the insufficient

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risk sensitivity of the capital requirements, overemphasis on prudence, especially with regard to technical provisions, insufficient focus on group supervision, lack of harmonisation of insurance regulation in the member states of the European Union and insufficient coordination between insurance supervisors. The Solvency II regime intends to provide the insurance industry with a modern approach to solvency management, which will correspond more closely with the way that the industry manages its business.

The broad objectives of Solvency II include the harmonisation of the rules and converging supervisory practices of the member states. Solvency II also introduce risk sensitivity measurements to further enhance the protection of policyholders, and to adopt more modern actuarial, accounting, risk management and supervisory standards and techniques to improve the international competitiveness of insurers and reinsurers.

The Solvency II Pillar I requirements are economic risk-based, which enable coverage of the real risks run by any particular insurer as all the risks and their interactions are considered as the requirements consider both the insurance risks on the liability side of the balance sheet and investments on the asset side of the balance sheet. Solvency II is a principle-based regulatory regime by placing the responsibility to decide how to align its business objectives and processes with the specified regulatory outcomes on the insurer and so to move away to dictate through detailed, prescriptive rules and supervisory actions how firms should operate their business. The Solvency II architecture consists of three pillars, with Pillar I setting the quantitative, Pillar II the governance and risk management requirements and Pillar III the reporting requirements.

South Africa will be implementing the principles of Solvency II as part of Solvency Assessment and Management (SAM).

2.14. CONCLUSION

This chapter reviewed the insurance industry with a focus on the role of insurers in the economy, the origins, and history of insurance, types of insurers, the participants

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and coverage and products available in the short-term insurance industry, risk to the short-term insurer and the regulatory and Solvency II framework.

Insurers are able to fulfil a function as a risk transfer mechanism by pooling the risks. The contributions of a large number of individuals are transferred into a common pool and in doing so, insurers also provide a valuable service by assisting risk-averse individuals and entities to purchase expensive items, and develop and market new products. The survival of the pool can be ensured by calculating an equitable premium by assessing the risk that each member is contributing to the pool.

The globalisation and the development of new insurance products enabled global insurers to develop, exploit, and grow new markets. The growth in different markets has however increased the complexity to manage the global insurers as they also have to consider the local legislation and regulations of the countries in which they operate. Although similarities exist in the global insurance market, significant local differences were identified that impede the further globalisation of the insurance industry and convergence of the insurance and other segments of the financial markets. The discussion of the global similarities and local differences not only highlighted the opportunities for insurers to grow and develop their products and markets, but also indicated the complexity of doing business in different countries as a “one size fits all approach” may not necessarily be the solution for both the insurer and the regulator.

Insurers provide both standard insurance products, with maximum transfer of risk and exotic insurance products with a higher rate of retention and a lower rate of risk transfer. Examples of maximum risk transfer insurance products are typically standard insurance policies, such as personal cover, for example motor and household insurance, and business insurance, for example small and medium businesses, and specialist insurance products such as contract works, marine and aviation and agricultural insurance policies. Minimum transfer products or alternative risk transfer would include partial insurance contracts, loss-sensitive contracts, finite insurance, captives, and insurance-linked securities. Insurers have the benefit that the risk in the pool is understood for the standard insurance contracts as they have a long history of collecting data, which enables a more accurate calculation of the

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equitable premium and loss probabilities. This stands in contrast with the more exotic products with a smaller underwriting pool and a paucity of data.

The items in the balance sheet of the short-term insurer illustrate that the insurance model affects both sides of the balance sheet. The calculation of the technical provisions on the liability side of the balance sheet for regulatory capital purposes is used to protect the insurance pool to ensure the sustainability of the short-term insurer. Furthermore, short-term insurance premiums could be invested in different asset classes, which are exposed to market risk caused by changes in prices and interest rates, which can not only adversely affect the value of the individual investments, but also the total portfolio. The issuers of the securities can however also default on their obligations to repay the capital or interest, which also adversely affects the value of the investments, which expose the short-term insurer to credit risk.

Solvency I was introduced in the early 1970s in Europe and the United Kingdom (UK) to ensure that insurers should have over and above the technical reserves to meet their underwriting liabilities, a solvency margin as buffer against business fluctuations. Solvency I, however, had a number of shortcomings, which included the insufficient risk sensitivity of the capital requirements, overemphasis on prudence, especially with regard to technical provisions, insufficient focus on group supervision, lack of harmonisation of insurance regulation in the member states of the European Union and insufficient coordination between insurance supervisors. The Solvency II regime intends to provide the insurance industry with a modern approach to solvency management, which will correspond more closely with the way that the industry manages its business.

The broad objectives of Solvency II include the harmonisation of the rules and converging supervisory practices of the member states. Solvency II also introduce risk sensitivity measurements to further enhance the protection of policyholders, and to adopt more modern actuarial, accounting, risk management and supervisory standards and techniques to improve the international competitiveness of insurers and reinsurers.

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The Solvency II Pillar I requirements are economic risk-based, which enable coverage of the real risks run by any particular insurer as all the risks and their interactions are considered as the requirements consider both the insurance risks on the liability side of the balance sheet and investments on the asset side of the balance sheet. Solvency II is a principle-based regulatory regime by placing the responsibility to decide how to align its business objectives and processes with the specified regulatory outcomes on the insurer and so to move away to dictate through detailed, prescriptive rules and supervisory actions how firms should operate their business. The Solvency II architecture consists of three pillars, with Pillar I setting the quantitative, Pillar II the governance and risk management requirements and Pillar III the reporting requirements. South Africa will be implementing the principles of Solvency II as part of Solvency Assessment and Management (SAM).

The next chapter provides an overview of the Solvency II framework in terms of its purpose, principles, and architecture, including the implementation of SAM in South Africa. A number of researchers and practitioners also question the appropriateness and effectiveness of the Solvency II regime, especially for the short-term insurance industry.

CHAPTER 3

SOLVENCY II

3.1. INTRODUCTION

Chapter 2 gave an overview of the insurance industry as a provider of pooling and transferring risk by application of the law of large numbers, which in turn also facilitates economic activity (CEA 2010:13). The chapter also describes the importance of the financial stability of the insurers to ensure they can continue to fulfil their role and obligations, but also to protect the purchasers of their products and services (CEA Solvency II Glossary 2007:54). Chapter 2 further indicated the regulation of the insurance industry has evolved from being limited to the country in which a specific insurer operates, to facilitate in harmonising the different regulatory approaches in Europe and the United Kingdom with Solvency I (Ford 2011:262-263).

Although there is agreement that the financial stability of insurers is important and requires a well-regulated environment (IAIS 2011:3), a number of insurers and organisations have stated their concerns with the cost of implementing the Solvency II regime. Solvency II is a principle-based regulatory regime, and the architecture of the Solvency II consists of three pillars. Pillar I includes the quantitative requirements for the calculation of the solvency capital requirements, Pillar II the qualitative requirements related to governance and risk management and Pillar III the reporting requirements.

This chapter provides an overview of the Solvency II framework in terms of its architecture, by covering the technical requirements of the pillars, including the implementation of SAM in South Africa. A number of researchers and practitioners also question the appropriateness and effectiveness of the Solvency II regime, especially for the short-term insurance industry. The chapter includes a discussion of the difficulties experienced by insurers with the implementation of Solvency II in the UK and concerns with regard to the cost and appropriateness of the new regime.

Items included under Pillar I cover the evaluation of the balance sheet and the set target levels for regulatory capital requirements. Pillar I is discussed in the next section.

3.2. SOLVENCY II ARCHITECTURE

Chapter 2 introduced the Solvency II architecture, which consists of Pillar I determining the regulatory capital requirements, Pillar II the governance requirements and Pillar III, the reporting requirements. The three pillars will be discussed in more detail in the next paragraphs.

3.3. PILLAR I

Items included under Pillar I cover the evaluation of the balance sheet and set pre-target levels for regulatory capital requirements (SAM Roadmap 2010:20). The two regulatory capital requirements levels set are the solvency capital requirement (SCR) and minimum capital requirement (MCR). The purpose of the SCR is to incentivise sound risk management through the quantitative measurement of the risks of the insurers' and reinsurers' operations and investments (Sam Roadmap 2010:20). The MCR will enable a supervisory response to a degradation of the insurers' or reinsurers' financial position, which may ultimately lead to the withdrawal of the license of the insurer (SAM Roadmap 2010:20).

The intention of Solvency II is also to reduce potential pro-cyclical effects by a number of quantitative and qualitative measures (SII Directives 2009:L335/7). "Pro-cyclicality" is the term used to describe the phenomenon regarding the sensitivity of short-term insurance to the business cycle as the cycle fluctuates between 'soft' markets of stable premiums and low returns to insurers, and 'hard' markets or insurance 'crises' of rising premiums, cut-backs on availability and tight limits on coverage (Winter 1991:458). Boyle and Kim (2012:1) notes that current solvency regulations have been criticised of requiring extra capital in periods of extreme stress and an exacerbating a crisis.

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An overview of the principle of the Pillar I, the quantitative requirement of the solvency balance sheet is illustrated in Figure 3.1.

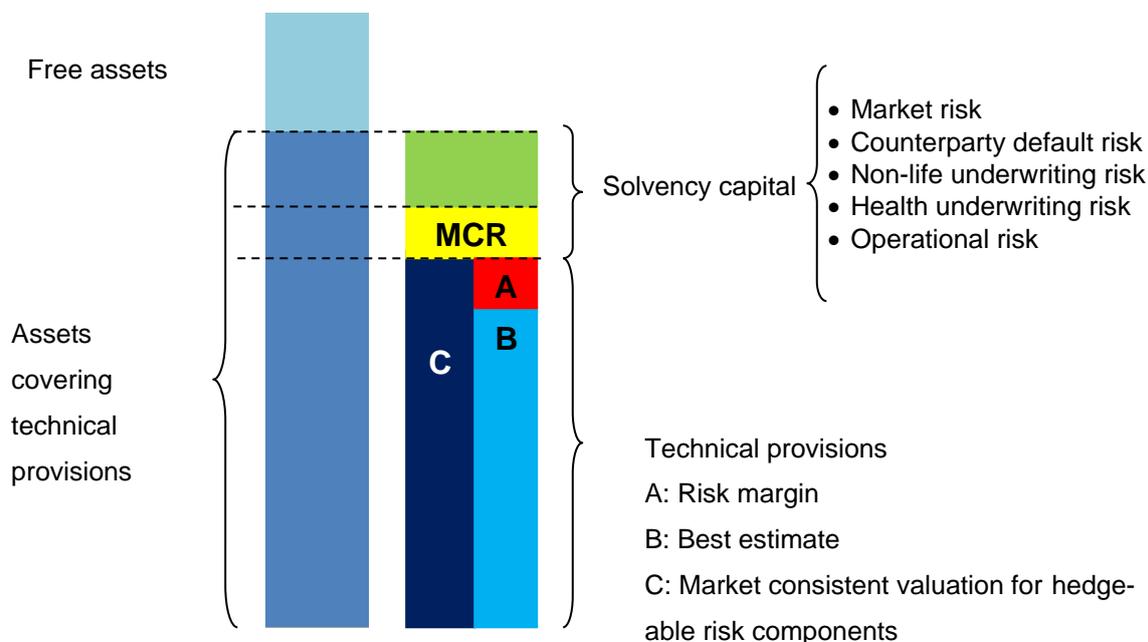


Figure 3.1. The Solvency balance sheet as adapted from SAM Roadmap (2010:16)

The underlying principle of Pillar I is that insurers must be able to demonstrate that they have sufficient or adequate financial resources to absorb losses (Sandström 2006:145; SAM Roadmap 2010:19). According to the FSB (SAM Roadmap 2010:19), “solvency” is defined in terms of the “total balance sheet requirement”. The total balance sheet requirement captures the true economic value in the balance sheet by defining solvency capital as the difference between the market value consistent value of assets and liabilities by taking into account the:

- interaction between assets and liabilities;
- diversification; and
- risk mitigation.

The interdependency of assets and liabilities are sub-divided into technical provisions, other liabilities and SCR and MCR setting the minimum lower capital

requirement boundary (Sandström 2006:145). The SCR and MCR are discussed in more detail in Paragraphs 3.3.4 and 3.3.5 below and the technical provisions in Paragraph 3.3.7.

Solvency II (SII Directive 2009:L335/5) defines the capital resources required to absorb the losses as “own funds”. The FSB (SAM Roadmap 2010:19) indicates that the capital resources can be divided into two classes namely “basic own funds” and “ancillary own funds”. The FSB further indicates that basic own funds are defined as the excess of assets over liabilities plus subordinated liabilities. Ancillary own funds consists of off-balance sheet capital resources, which can be called upon to absorb losses (SAM Roadmap 2010:19). The economic and regulatory capital is discussed in the next paragraph.

3.3.1. Economic and regulatory capital

Doff (2007:19) identified two reasons for the holding of capital by insurers and reinsurers. The first reason is to enable the insurer or reinsurer to absorb extreme unexpected losses, which should enable the long-term continuity of the firm. This form of capital is also referred to as “economic capital”, to indicate the economic base for holding such capital. He notes economic capital is calculated for internal purposes as too much capital would be expensive and can endanger profitability, while too little capital may have a negative effect on the credit rating of the insurer or reinsurer.

The second reason according to Doff (2007:19) for the holding of capital is that supervisors require a minimum capital buffer with the purpose of protecting policyholders and the economic system (SAM Roadmap 2010:19). A further safeguard required by the supervisors is that the quality of the capital should be regulated so that it may serve as a buffer for the protection of policyholders and the economic system (SAM Roadmap 2010:19). The quality of the capital will depend on the permanence of the various capital instruments and their ability to absorb risks. Doff (2007:135) further notes that the following criteria are used to classify capital into the different tiers:

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- the first criterion is subordination, to determine whether other repayments rank higher than in the event of a write-down;
- the second criterion determines whether the capital item can be used to absorb losses as it is important to determine if the capital is permanently available to absorb losses or callable on demand;
- the penultimate criterion determines whether the duration of the capital matches that of the obligations; and
- the last criterion is the cost to service the capital, which would include interest payments and or incentives to repay the capital.

The tier structure required by Solvency II that reflects the quality of the eligible capital is summarised in Table 3.1.

Table 3.1. Eligible elements to cover MCR and SCR

TIER 1	TIER 2	TIER 3
Paid-up shareholders' equity capital or foundation fund	Subordinated liabilities that satisfy the criteria and which are available in wind-down scenarios only	Other subordinated liabilities not eligible for Tiers 1 and 2
Retained earnings	Letters of credit and guarantees	Contingent capital not eligible for Tiers 1 and 2
Subordinated member accounts	Members' calls	
Subordinated liabilities that satisfy the criteria and are available in wind-down and going-concern scenarios.	Other contingent capital satisfying the criteria and available in wind-down and going-concern scenarios	
Used to cover MCR and SCR	Used to cover MCR and SCR	Used to cover SCR only

Adapted from Doff (2007:136)

Tier 1 is regarded as the highest quality, Tier 2 of a lesser quality and Tier 3 may only provide loss absorption under certain circumstances. Insurers and reinsurers

are also affected by the change in the accounting practices with the implementation of Phase II of the accounting standards for insurance contracts (SAM Roadmap 2010:19).

SII Directive (2009:L335/5) prescribe that the valuation of assets and liabilities should be in terms an economic, market-consistent approach. According to the European Insurance and Occupational Pensions Authority (EIOPA 2012:7, 8), assets and liabilities should be valued based on the amount at which it could be exchanged between knowledgeable willing parties in an arm's length transaction, without considering or adjustment of the own credit standing of the insurer or reinsurer. EIOPA (2012:7) further indicate that the valuation of the assets and liabilities, excluding technical provisions, should conform to international accounting standards.

According to EIOPA (2012:8), insurers and reinsurers must follow a hierarchy of high level principles for the valuation of assets and liabilities. Where possible, insurers and reinsurers should use quoted market prices for the same assets and liabilities as the default valuation method, and if quoted prices for the same assets and liabilities are not available, quoted market prices in active markets for similar assets and liabilities with adjustments to reflect any differences, should be used (EIOPA 2012:8). Foroughi (2012:2) highlight the difficulties with applying a market-consistent valuation, including the pricing of new business, and pro-cyclicality.

Insurers and reinsurers may also have to use mark-to-model techniques if quoted prices in active markets are not available. The mark-to-model valuation technique has to be benchmarked, extrapolated, or calculated from a market input, with the least reliance on unobservable and specific input by the insurer or reinsurer (EIOPA 2012:8). The Solvency II and international financial reporting standards are discussed in the next paragraph.

3.3.2. Solvency II and international financial reporting standards (IFRS)

Insurance contracts expose entities to long-term and uncertain obligations (De Weert 2011:144). De Weert (2011:44) indicates the current accounting standards for insurance contracts do not provide users with the information needed to understand the financial position, performance, and risk exposure of the insurer. The application

of IFRS is inconsistent and different accounting practices have developed over time. Ernst & Young (2011:5) indicate the International Accounting Standards Board (IASB) has initiated the development of an international accounting standard (IFRS 4) for insurance liabilities. IFRS 4 was first published as an interim standard for insurance contracts. According to Nguyen and Molinari (2013:376), the interim IFRS 4 will be replaced with the final standard with the completion of Phase II of the project. The estimated implementation date for IFRS 4 is 2018 (KPMG 2012:3).

According to the IASB (ED/2013/7:8), the aim of IFRS 4 is to provide a single principle-based framework to account for all types of insurance contracts, including reinsurance contracts held by the insurer. The benefit of IFRS 4 should be that inconsistencies and weaknesses in existing practices will be eliminated and requirements for presentation and disclosures to improve comparability between entities will be included (ED/2013/7:8).

Nguyen and Molinari (2013:381) highlight the difficulty with the valuation of insurance contracts in terms of IFRS 4 as there is not a liquid market for insurance contracts, which is also confirmed by Klumpes and Morgan (2010:3). The lack of a liquid market for insurance contracts means that fair prices cannot be observed and the fair value for insurance liabilities has to be calculated by using models Nguyen and Molinari (2013:381). IFRS 4 aims to determine the value based on fulfilment cash flows adjusted for the time value of money and adjusted with a risk factor in the event the actual claim payments are higher than the expected value (ED/2013/7:8).

The methodology used to calculate the accounting value of insurance liabilities differs from the methodology required for regulatory purposes, which may also lead to deferred tax, and intangible assets as discussed under the balance sheet of the insurer (De Weert 2011:43). EIOPA (2012:9) indicate deferred tax follows IFRS 13 recognition principles, but for temporary differences, the deferred tax is based on the differences between the value of the Solvency II balance sheet and the value of assets and liabilities for tax purposes. Deferred tax from carry-forward of unused tax credits or losses are valued as per the IFRS balance sheet. The requirements to calculate the regulatory capital are discussed in the next paragraph.

3.3.3. Calculation of solvency capital requirements

The EU Directive (SII Directive 2009: L335/56 Article 112) stipulates that the SCR can be calculated with three approaches, namely the standard approach, internal model approach or partial model approach. The purpose of the current study was not to analyse the mathematical soundness of the prescribed methods of calculating the capital requirements, but to summarise the different methods.

3.3.3.1. Standard approach

The standard approach forms part of the EU Directive (SII Directive 2009:L335/51 Article 101). The SCR requirement based on the standard formula is the sum of the following:

- basic solvency capital requirement (Article 104);
- capital requirement for operational risk (Article 107); and
- adjustment for the loss-absorbing capacity of technical provisions and deferred taxes (Article 108).

The Institute and Faculty of Actuaries (2013:6) highlight insurers and reinsurers need to have established internal processes and procedures to ensure that the data used in calculations is appropriate, complete, and accurate. The minimum criteria set in the SII Directives according to the Institute (2013:6), for the appropriateness of data are that data is suitable for the calculation technical provisions, there is no undue estimation error arising from the amount or nature of the data, and that the data appropriately capture the underlying risk. For the completeness of data, the Institute notes that data should be of sufficient granularity and should include sufficient information to identify trends and assess the characteristics of the underlying risk, data is available for each homogenous risk group in the calculation, and no relevant data is excluded from use in the calculation without justification. The accuracy requirement stipulates that data must be free from material errors, data from different time periods used for the same estimation are consistent, and recording of the data is consistent and performed in a timely manner (Institute 2013:6,7).

Insurers and reinsurers can also develop their own internal models where the insurer or reinsurer is of the opinion the SCR is more accurately captured when compared to

the standard approach and the use of the internal model has been approved by the local supervisor (SII Directive 2009:L335/51 Article 112). The requirements for the use of internal models are discussed in the next section.

3.3.3.2. Internal models

In terms of the SII Directive (2009:L335/54 Article 112), insurers and reinsurers can develop their own internal models for the calculation of the SCR. The internal models can then be used to calculate the SCR after the application for the use of the internal model was approved by the supervisor (SII Directive 2009:L335/54 Article 112). Although the development of internal models is not included in the scope of this study, a discussion of the requirements for internal model approval is appropriate as insurers may have to appoint people with modelling skills to develop and implement internal models. To obtain internal model approval, the insurer or reinsurer will have to provide documentary evidence to convince the supervisor of the appropriateness of the model (SII Directive 2009:L335/54 Article 112). The requirements for approval in terms of the Directive are discussed below.

- **Use test**

The internal model must be widely used by the insurer and reinsurer. The risk management function of the insurer and reinsurer must also be involved inter alia, in the design, implementation, validation, evaluation, and documentation of the internal model. The insurers and reinsurers must also conduct their own risk and solvency assessment (ORSA), which must also be performed regularly, especially after any significant change in the risk profile by using the internal model. The supervisor should also ensure that the design and on-going operation of the internal model is appropriate and continues to reflect the risk profile of the insurer and reinsurer (SII Directives 2009: L335/56 Article 120).

- **Statistical quality standards**

The insurers and reinsurers must be able to justify the assumptions on which the internal model is based, and the methods used to calculate the probability distribution forecast must be based upon adequate, applicable, and relevant actuarial and statistical techniques. The techniques must also be consistent with the

methods used to calculate the technical provisions. The internal model must cover all material risks to which the insurer and reinsurer are exposed. The requirements for the data used for the internal model are further that it must be accurate, complete, and appropriate (SII Directives 2009: L335/56 Article 121). The minimum criteria set in the SII Directives according to the Institute (2013:6) for the appropriateness of data are that data is suitable for the calculation technical provisions, there is no undue estimation error arising from the amount or nature of the data, and that the data appropriately capture the underlying risk. For the completeness of data, the Institute notes data should be of sufficient granularity and include sufficient information to identify trends and assess the characteristics of the underlying risk, data is available for each homogenous risk group in the calculation, and no relevant data is excluded from use in the calculation without justification. The accuracy requirement stipulates that data must be free from material errors, data from different time periods used for the same estimation are consistent, and recording of the data is consistent and performed in a timely manner (Institute 2013:6,7).

- **Calibration standards**

The SII Directives (2009: L335/56 Article 122) indicate the underlying principle of the calibration standard is that when insurers and reinsurers use different time horizons, confidence levels and approximations for the probability distributions forecasts to calculate the SCR, the protection to policyholders and beneficiaries should be equivalent to the protection as calculated by the standard formula. The supervisor may require the insurer or reinsurer to subject its internal model to benchmark tests on external data and portfolios for the verification of the calibration of the internal model and compare the specification of the internal model with generally accepted market practice (SII Directives 2009: L335/56 Article 122).

- **Profit and loss attribution**

The (SII Directives 2009: L335/56 Article 123) require the categorisation of risk and the attribution of the profits and losses to reflect the risk profile of the insurer or reinsurer. The internal model must be able to explain the causes and sources of profit and loss. The profit and loss attribution must be reviewed at least annually (SII Directives 2009: L335/56 Article 123).

- **Validation standards**

The SII Directives (2009: L335/56 Article 124) stipulate the internal models used by the insurers and reinsurers must be validated regularly to ensure the:

- stability of the internal model and the sensitivity of the results of the internal model towards changes in key underlying assumptions;
- appropriateness of the probability distribution forecast to the loss experience and all material new data and related information;
- assessment of the accuracy, completeness and appropriateness of the data used; and
- appropriateness of the resulting capital requirements.

- **Documentation standards**

The SII Directives (2009: L335/56 Article 125) require that the design and operational details of the internal model should be documented. Insurers and reinsurers should also develop a policy to specify what is regarded as major and minor changes as all major changes to the internal models must be submitted to the supervisor for approval. The documentation of the internal models must also have sufficient detail on the theory, assumptions, mathematical and empirical bases underlying the internal model (SII Directives 2009: L335/56 Article 125).

In the case of insurers and reinsurers that apply for the approval of a partial internal model, the requirements as discussed above (Articles 120 to 125) must be adapted to incorporate the limited scope of the application of the model. The expected benefits as identified by Cadoni (2009:79–80) for the use of the internal model can be summarised as follows:

- the internal model can better capture the characteristics and particularities of the insurer and reinsurer.
- internal models can also overcome some of the limitations of the standard formula, provided the insurer or reinsurer possesses the expertise and resources for parameterisation, model building, validation, interpretation, and communication.
- an internal modelling framework that is integrated into the risk management system of the insurer and reinsurer can be tailored for the risk profile and risk sensitivity of the SCR, which may further lead to:

- more adequate modelling of non-standard and non-linear contracts;
- a better understanding of the risk profile and strategies in the context of the risk appetite of the insurer and reinsurer;
- evaluations of the returns and risk-adjusted capital for individual business segments; and
- a better understanding of the relative contribution of the major risk categories for a more efficient allocation of capital.

Insurers and reinsurers can also use a combination of standard and internal models (partial models) for the calculation of the SCR. Partial models are discussed in the next paragraph.

3.3.3.3. Partial models

SII Directive (2009:L335/54 Article 109) indicates a simplified calculation for a specific sub-module or risk module can be used where the simplification can be justified by the nature, scale, and complexity of the risks and where the requirement for the standardised calculation would be disproportionate to the risk profile of the insurer. In the case where the risk profile of the insurer or reinsurer deviates significantly from the assumptions underlying the standard formula calculation, the supervisor can approve the replacement of a subset of the parameters used in the standard formula calculation (SII Directive 2009:L335/55 Article 110). The SCR can be calculated by using a full or partial model as approved by the supervisor and can use partial internal models for the calculation of one or more of the following:

- risk modules or sub-modules of the basic solvency capital requirement (BSCR), as set out in (SII Directive 2009:L335/52 Articles 104 and 105);
- the capital requirement for operational risk. (SII Directive 2009:L335/54 Article 107); and
- the adjustment for the loss absorbing capacity of technical provisions and deferred taxes SII Directive (2009:L335/54 Article 108). SII Directive (2009:L335/56 Article 112) indicates partial modelling can be applied to the whole business of insurance and reinsurance undertakings, or only to one or more major business units.

EIOPA published the technical specifications for the SCR (EIOPA 2012:118), which indicate the principle of proportionality applies to the calculation of the SCR to support the consistent application of the principle-based requirements to all insurers. The authority further indicates the principle of proportionality should be approached to ensure that the actuarial and statistical methodologies are proportionate to the nature, scale, and complexity of the underlying risks. The insurer or reinsurer is allowed to apply a valuation method, which is suitable to calculate a market-consistent valuation compatible with the Solvency II principles and is only as sophisticated as required (EIOPA 2012:95). Insurers or reinsurers need to assess the nature, scale, and complexity of the risks to determine the appropriateness of specific simplifications, and assess the model error introduced by the simplified model, which can then be used if the difference between the simplified method and a more accurate model is insignificant (EIOPA 2012:119).

For the purpose of this study, the review will focus on the standard approach, as the internal models of simplified models being developed by the short-term insurers are for the purpose of the specific short-term insurer and fall outside the scope of this study. The calculation of the basic solvency capital requirement by using the standard approach is discussed in the next section.

3.3.4. Solvency Capital Requirement

The calculation of the solvency capital requirement according to the standardised approach consists of a number of prescribed modules (SII Directive 2009:L335/52 Article 103). The composition of the SCR is illustrated in Figure 3.2.

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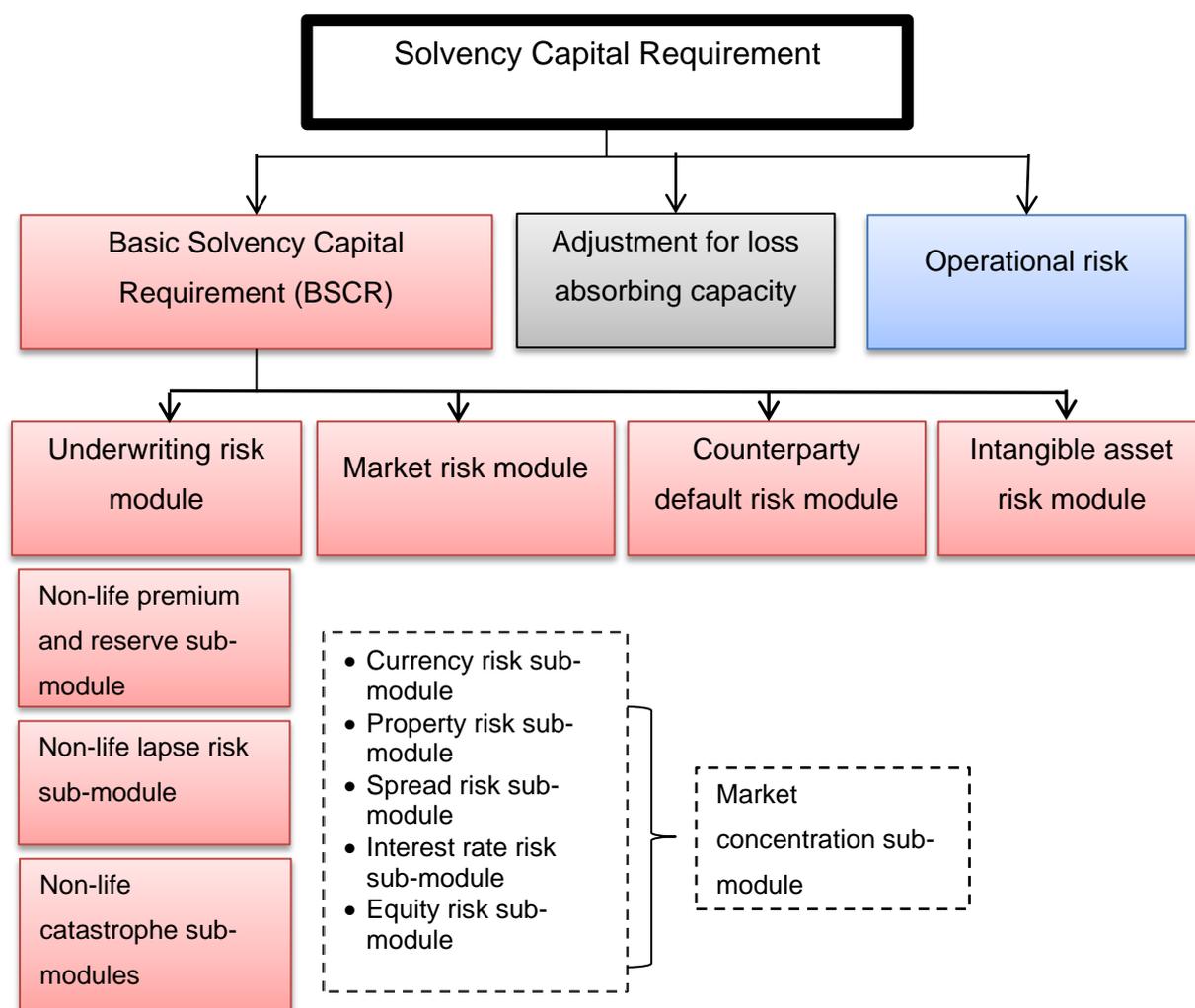


Figure 3.2 Solvency II Capital requirements as adapted from Bourdeau (2009:198) and EIOPA (2012:115)

The SCR consists of the BSCR, the adjustments for loss absorbing capacity, and the capital required for operational risk. The BSCR consists of the underwriting risk, the market risk, and counterparty default risk modules (EIOPA 2012:115). The underwriting risk module, depending on the nature of the insurer, can consist of the capital requirement for life underwriting risk, non-life underwriting risk, and health underwriting risk (EIOPA 2012:120). The adjustment for loss absorbing capacity refers to the loss absorbing capacity of technical provisions and deferred taxes due to the potential compensation through a decrease in technical provisions or deferred taxes (EIOPA 2012:1). The intangible assets are the differences between the valuation of items in terms of the Solvency II framework and the International Financial Reporting Standards (EIOPA 2012:9-45). The operational risk model

incorporate operational risks that were not explicitly covered in the other risk models (EIOPA 2012:128).

EIOPA (2012:122) indicate that the SCR for each risk should include a gross and net calculation. The gross calculation should be used for the BSCR and adjustment for the loss-absorbing capacity of technical provisions, and the results of the gross adjustments are used to prevent double counting of the risk mitigation effects, but does not reflect all aspects of economic reality as it ignores the risk-mitigating effect of future discretionary benefits (EIOPA 2012:122). The SCR is calculated as follows:

$$\text{SCR} = \text{BSCR} + \text{Adj} + \text{SCR}_{\text{Op}}$$

- SCR denotes the solvency capital requirement, and is the overall standard formula capital requirement.
- BSCR denotes the basic solvency capital requirement, which consists of the underwriting risk module, market risk module, counterparty default risk module and the intangible risk module.
- Adj denotes the adjustments required for loss absorbing capacity.
- SCR_{Op} denotes the operational risk capital requirement.

The components of SCR are discussed in more detail below.

3.3.4.1. Basic Solvency Capital Requirement

The BSCR consist of the underwriting risk, market risk and counterparty default risk modules, which are aggregated to calculate the capital charge (SII Directive 2009:L335/124). The BSCR must consist of the capital requirements of at least the following modules:

- non-life underwriting risk;
- market risk;
- counterparty default risk; and
- intangible asset risk.

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The output of the modules gives the capital requirement per module. The BSCR is calculated by combining the capital requirements for the risk modules with the use of a correlation matrix.

The formula for the BSCR (EIOPA 2012:121) is as follows:

$$BSCR = \sqrt{\sum_{i,j} \text{Corr}_{i,j} \times SCR_i \times SCR_j \times SCR_{\text{intangible}}}$$

- SCR_i and SCR_j denote the capital requirements for the SCR of the risks (underwriting, market, and counterparty default) according to the rows and columns of the correlation matrix as prescribed by the Solvency II Directive (EIOPA 2012:121). The prescribed correlation matrix is in Table 3.2.
- $SCR_{\text{intangible}}$ denotes the capital requirement for intangible asset risk.

Table 3.2. Prescribed correlation matrix

i \ j	MARKET	DEFAULT	LIFE	HEALTH	NON-LIFE
Market	1				
Default	0.25	1			
Life	0.25	0.25	1		
Health	0.25	0.25	0.25	1	
Non-life	0.25	0.5	0	0	1

Adapted from EIOPA (2012:121)

The calculation of the non-life risk module as a component of the BSCR is discussed in the next section.

• Calculation of the non-life risk module

SII Directive (2009:L335/52 Article 105) stipulates the BSCR should reflect the risk from the non-life insurance obligations in relation to the perils covered and the processes used in the conduct of the business by the insurer and reinsurer. EIOPA

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(2012:229) indicate the SCR for underwriting risk should be calculated per the non-life line of business as indicated in Table 3.3. The second component to be included in the underwriting risk is the risk from uncertainty in the assumptions regarding the renewal or termination of policies by policyholders, and the last component includes undertakings related to insurance and reinsurance obligations and new business that may be written over the next 12 months (EIOPA 2012:225). EIOPA (2012:225) indicate that the non-life risk module requires the following input:

- **NL_{pr} = capital requirement for non-life premium and reserve risk**

Non-life premium and reserve risk are the result of fluctuations in the timing, frequency, and severity of the insured events, and relates to policies to be written, including renewals, during the period and to unexpired risks on existing contracts. Premium risk also includes the risk that premium provisions may be insufficient to cover claims, or need to be increased. Premium risk includes volatility of expense payments. Reserve risk results from the fluctuation in the timing and amount of claim settlements (EIOPA 2012:226).

EIOPA (2012:228) indicate the calculation of the premium and reserve risk sub-modules should be based on the same segmentation into the lines of business as applicable for the calculation of technical provisions. EIOPA point out that the insurance and corresponding line of business for proportional reinsurance can be merged as the assumption is that the risk profile of the lines of business is similar.

Table 3.3. Segments per lines of business

1	Motor vehicle liability insurance and proportional reinsurance
2	Other motor insurance and proportional reinsurance
3	Marine, aviation and transport insurance and proportional reinsurance
4	Fire and other damage to property insurance and proportional reinsurance
5	General liability insurance and proportional reinsurance
6	Credit and surety ship insurance and proportional reinsurance
7	Legal expenses insurance and proportional reinsurance

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8	Assistance and its proportional reinsurance
9	Miscellaneous financial loss insurance and proportional reinsurance
10	Non-proportional casualty reinsurance
11	Non-proportional marine, aviation and transport reinsurance
12	Non-proportional property reinsurance

Adapted from EIOPA (2012:229)

▪ **NL_{lapse} = capital requirement for non-life lapse risk**

Lapse risk refers to the risk from uncertainty regarding the renewal or termination of policies by the policyholders. EIOPA (2012:233) indicate that the capital requirement for lapse risk should be equal to the loss in basic own funds that would result from the combination of the discontinuance of 40% of the policies, or a decrease of 40% in the number of future insurance or reinsurance contracts. The discontinuance of 40% of the policies that would result in an increase of technical provisions without the risk margin is classified as “lapseschock 1”. The decrease of 40% of the number of future insurance or reinsurance contracts used in the calculation of technical provisions associated with reinsurance contract cover, or future reinsurance contracts to be written is classified as “lapseschock 2”. The guidelines set by EIOPA (2012:233) further indicate that the lapse shocks shall apply to all insurance and reinsurance contracts. The insurer must also base the stress on the type of discontinuance which would most negatively affect the basic own funds per policy.

▪ **NL_{CAT} = capital requirement for non-life catastrophe risk**

EIOPA (2012:234) indicate that non-life catastrophe risk is defined in the directive (SII Directive 2009:L335/53) as “the risk of loss, or of adverse change in the value of insurance liabilities, resulting from significant uncertainty of pricing and provisioning assumptions related to extreme or exceptional events”. EIOPA (2012:234) further indicate that catastrophe risks result from extreme or irregular events, which are not sufficiently captured by the capital requirements for the premium and reserve risk.

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The output of the modules gives the capital requirement for non-life underwriting risk per module. The capital for non-life underwriting risk is calculated by combining the capital requirements for the non-life sub-risks with the use of a correlation matrix. The formula for the non-life risk module (EIOPA 2012:225) is as follows:

$$SCR_{\text{Non-life}} = \sqrt{\sum \text{CorrNL}_{r,c} \times NL_r \times NL_c}$$

- $\text{CorrNL}_{r,c}$ denotes the entries of the correlation matrix CorrNL
- NL_r and NL_c denote the capital requirements for individual non-life underwriting sub-risks according to the rows and columns of the correlation matrix CorrNL .
The prescribed correlation matrix CorrNL is included in Table 3.3.

Table 3.4. Correlation matrix CorrNL

CorrNL	NL_{pr}	NL_{lapse}	NL_{CAT}
NL_{pr}	1		
NL_{lapse}	0	1	
NL_{CAT}	.25	0	1

Adapted from EIOPA (2012:226)

The insurer or reinsurer is exposed to market risk due to the investment portfolio on the asset side of the balance sheet. The calculation of the market risk capital requirement is the next component of the BSCR that will be discussed.

- **Market risk module**

SII Directive (2009:L335/53 Article 105) stipulates that insurers and reinsurers should calculate the capital requirement for market risk separately, including the capital requirements for the market risk sub-risks. As indicated in Paragraph 2.10, insurers and reinsurers invest premiums received in different assets classes, such as equity, property, and bonds. The form of the investments can be a direct investment in the shares of a company, property, and bonds, or in the form of collective investment scheme. According to Profile's Unit Trusts and Collective Investments (2014:141), the collective investments can further be either directly in the underlying shares or financial instrument, or into a "fund of funds", which is a fund investing in

other collective investment schemes. As indicated in Paragraph 3.3.1, insurers and reinsurers can use market prices for assets such as listed equities, tradable securities, or other financial instruments such as packaged loans (EIOPA 2012:8). EIOPA (2012:134) also state it is a requirement for insurers and reinsurers to investigate the economic substance to assess the market risk inherent in investment funds or collective investment scheme, for both actively and passively managed funds. Insurers and reinsurers should use the “look-through” approach to determine the market risk inherent in the underlying investment of the investment fund or collective investment schemes (EIOPA 2012:134).

EIOPA further indicates it may be necessary for the insurers and reinsurers to have a number of iterations of the look-through approach in cases where an investment fund is invested in other investment funds. In cases where the asset manager is unable to provide the required data for the allocation of the investments into the market risk sub-risks, the insurer and reinsurer should refer to the investment mandate of the scheme as a base for the classification into the market risk sub-risks (EIOPA 2012:134). Insurers and reinsurers can also treat the investment scheme as an equity type 2 stress in the event of non-material indirect market risk exposures (EIOPA 2012:134).

The market risk sub-risks are discussed below.

- **Interest rate risk sub-module**

EIOPA (2012:135-136) indicate all assets and liabilities where the net asset value is sensitive to the term structure or volatility of interest rates, are exposed to interest rate risk and as such, the interest rate sub-module should be applied to all interest rate sensitive assets and liabilities, irrespective of the valuation method (mark to market or mark to model). Examples of assets with sensitive to interest rates are fixed income investments, financing instruments, policy loans, interest rate derivatives and any insurance assets.

- **Equity risk sub-module**

EIOPA (2012:138) indicate that exposure to equity risk refers to all assets and liabilities with a sensitivity to changes in the prices of equities. Insurers and reinsurers should consider hedges and risk transferring mechanisms when

calculating the equity capital requirement, but should not include the risk mitigation effect as provided by discretionary profit participation.

▪ **Property risk sub-module**

Property risk arises due to the sensitivity of assets, liabilities and financial investments to volatility of market prices of property (EIOPA 2012:143). Investments that should be treated as property and their risks considered accordingly in the property risk sub-module are land, buildings, and immovable-property rights and property investment for the own use (EIOPA 2012:143). Other investments such as investments in a company engaged in real estate management, or direct or indirect participations in real estate companies, should be treated as part of the equity risk sub-module.

Collective real estate investment vehicles should be treated like other collective investment vehicles with a look-through approach (EIOPA 2012:143).

▪ **Currency risk sub-module**

Currency risk arises from changes in the level or volatility of currency exchange rates (EIOPA 2012:144).

▪ **Spread risk sub-module**

According to EIOPA (2012:146), spread risk results from the sensitivity of the value of assets, liabilities, and financial instruments to changes in the level or in the volatility of credit spreads over the risk-free interest rate term structure. EIOPA further indicate that the spread risk module applies to investment grade corporate bonds, high yields corporate bonds, subordinated debt, and hybrid debt. EIOPA also indicate that the spread risk sub-module applies the credit risk of other investments with regard to the participating interests, debt securities issued by, and loans to, affiliated organisations and organisations in which the insurer or reinsurer has a participating interest, debt securities and other fixed-income securities, participation in investment pools, and deposits with credit institutions (EIOPA 2012:147).

EIOPA (2012:147) indicate insurers and reinsurers can incorporate credit spread risk hedging programmes when calculating the capital requirement, which enables appropriate recognition and allowance for the hedging instruments subject to proper treatment of the risks inherent in the hedging programmes.

▪ **Market risk concentrations sub-risk module**

EIOPA (2012:156) indicate the concentration risk sub-module extends to assets considered in the equity, spread risk, and property risk sub-modules. Assets covered by the counterparty default risk module are excluded to avoid any overlap between the elements of the standard calculation of the SCR.

EIOPA (2012:132) indicate the input required for the calculation of market risk should include the following components:

- Mkt_{int}^{Up} = capital requirement for interest rate risk for the “up” shock
- Mkt_{int}^{Down} = capital requirement for interest rate risk for the “down” shock
- Mkt_{int} = capital requirement for intangible asset risk
- Mkt_{eq} = capital requirement for equity risk
- Mkt_{prop} = capital requirement for property risk
- Mkt_{conc} = capital requirement for risk concentrations
- Mkt_{fx} = capital requirement for currency risk
- Mkt_{ccp} = capital requirement for counter-cyclical premium risk
- $nMkt_{int}^{Up}$ = capital requirement for interest rate risk for the “up” shock, including the loss absorbing capacity of technical provisions
- $nMkt_{int}^{Down}$ = capital requirement for interest rate risk for the “down” shock, including the loss absorbing capacity of technical provisions
- $nMkt_{int}$ = capital requirement for intangible asset risk, including the loss absorbing capacity of technical

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- | | | | |
|-----------------|---|------------|--|
| | | provisions | |
| ▪ $nMkt_{eq}$ | = | | capital requirement for equity risk, including the loss absorbing capacity of technical provisions |
| ▪ $nMkt_{prop}$ | = | | capital requirement for property risk, including the loss absorbing capacity of technical provisions |
| ▪ $nMkt_{conc}$ | = | | capital requirement for risk concentrations, including the loss absorbing capacity of technical provisions |
| ▪ $nMkt_{fx}$ | = | | capital requirement for currency risk, including the loss absorbing capacity of technical provisions |
| ▪ $nMkt_{ccp}$ | = | | capital requirement for counter-cyclical premium risk, including the loss absorbing capacity of technical provisions |

The output of the market risk module provides the capital requirement for market risk (SCR_{mkt}) and the capital requirement for market risk including the loss-absorbing capacity of the technical provisions ($nSCR_{mkt}$) (EIOPA 2012:133).

EIOPA (2012:133) indicate the market sub-risks should be combined to give the market capital requirement SCR_{mkt} with the use of the correlation matrix $CorrMkt$. The formula for the market risk module (EIOPA 2012:133) is as follows:

$$SCR_{Mkt} = \sqrt{\sum CorrMkt_{r,c} \times Mkt_r \times Mkt_c}$$

- $CorrMkt$ denotes the correlation matrix $CorrMkt$
- Mkt_r and Mkt_c denote the capital requirements for the individual market risks under the interest rate stress according to the correlation matrix. $CorrMkt$ in table 3.5.

Table 3.5 Correlation matrix CorrMkt

CorrMkt	INTEREST	EQUITY	PROPERTY	SPREAD	CURRENCY	CONCENTRATION	COUNTER CYCLICAL PREMIUM
Interest	1						
Equity	A	1					
Property	A	.075	1				
Spread	A	0.75	0.5	1			
Currency	0.25	0.25	0.25	0.25	1		
Concentration	0	0	0	0	0	1	
Counter cyclical premium	0	0	0	0	0	0	1

Adapted from EIOPA (2012:134)

Factor A is equal to 0 when the capital requirement for interest rate risk based on the condition that the value of future discretionary benefits in technical provisions does not change, is derived from the capital requirement for the risk of an increase in the interest term structure, which also include the loss absorbing capacity of technical provisions. Factor A will be 0.5 in all other cases (EIOPA 2012:134).

The capital requirement for market risk including the loss-absorbing capacity of technical provisions, $nSCR_{Mkt}$ (EIOPA 2012:134) is calculated as follows:

$$nSCR_{Mkt} = \sqrt{\sum \text{CorrMkt}_{r,c} \times nMkt_r \times nMkt_c}$$

- $nSCR_{Mkt}$ denotes the capital requirement for market risk including the loss-absorbing capacity of the technical provisions.
- $\text{CorrMkt}_{r,c}$ denotes the correlation matrix CorrMkt
- $nMkt_r$ and $nMkt_c$ denote the capital requirements for the individual market risks including the loss-absorbing capacity of the technical provisions.

- **Counterparty default risk module**

EIOPA (2012:161) indicate counterparty default risk is losses caused by unexpected default, deterioration in credit standing losses, the counterparty default risk of counterparties and debtors of undertakings over the next twelve months. The counterparty default risk module includes risk-mitigating contracts, such as reinsurance arrangements, securitisations and derivatives, and receivables from intermediaries, including any other credit exposures not covered in the spread risk sub-module (EIOPA 2012:161). EIOPA also indicate the counterparty default risk module include the total counterparty risk exposure irrespective of the legal form of the contractual obligations to the counterparty.

Insurers and reinsurers should also classify counterparty default risk into type 1 and type 2 exposures (EIOPA 2012:162). EIOPA indicates type 1 exposures include exposures to counterparties where the counterparty is likely to be rated by a credit rating agency and where the counterparty risk may not be diversified. Type 1 exposures would typically include:

- risk mitigation contracts such as reinsurance arrangements, insurance securitisation and derivatives;
- cash at bank;
- deposits with ceding undertakings where the number of single name exposures does not exceed 15;
- commitments received, which have been called up but are unpaid where the number of single name exposures does not exceed 15, such as ordinary share capital and preference shares, legally binding commitments to subscribe and pay for subordinated liabilities, guarantees, and letters of credit.
- legally binding commitments provided by the insurer or reinsurer, which may create payment obligations depending on the credit standing or default on a counterpart, which also include guarantees, letters of credit, and letters of comfort.

EIOPA (2012:162) classify type 2 exposures as exposures, which are usually diversified, the counterparty is likely not rated by a credit rating agency, not covered

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by the spread risk module, are in the scope of the counterparty default risk module and are not of type 1. Type 2 exposures would typically include receivables from intermediaries, policy holder debtors, mortgage loans, deposits with ceding undertakings, where the number of single name exposures exceeds 15, and commitments received by insurers or reinsurers which have been called up but are unpaid but where the number of single name exposures exceeds 15.

EIOPA (2012:163) indicate that credit risks not be covered in the counterparty default risk module would include credit risk transferred by a credit derivative, credit risk on debt issuance by special purpose vehicles, the underwriting risk of credit and suretyship insurance or reinsurance, and credit risk on mortgage loans which do not meet the requirements for mortgage. EIOPA (2012:163) indicate that the following input is required to calculate the type 1 exposures:

- Recoverables_{*i*} = The best estimate recoverables from the reinsurance contract or special purpose vehicle_{*i*} (SPV) plus any other debtors arising out of the reinsurance arrangement or SPV securitisation
- MarketValue_{*i*} = The market value of the derivative *i* according to Article 75 of the SII Directive
- Collateral_{*i*} = The risk-adjusted value of collateral in terms of the reinsurance arrangement of SPV securitisation *i* or in relation to derivative *i*.
- Guarantee_{*i*} = The nominal value of the guarantee, letter of credit, letter of comfort or a similar commitment *i*.
- MVGuarantee_{*i*} = The value of the letter of credit, guarantee, letter of comfort or a similar commitment *i* in terms of Article 75 of the SII Directives.
- SCR^{hyp} = The hypothetical capital requirement for the underwriting and market risk under the condition that the risk mitigating effect of the reinsurance arrangement, SPV, or derivative of a particular counterparty is not incorporated in the calculation.

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The value is calculated for the purpose of the counterparty default risk module.

- SCR^{without} = The capital requirement for underwriting risk and market risk without amendments.
- $Rating_i$ = Rating of the counterparty with regard to reinsurance, SPV, derivative, guarantee, letter of credit, letter of comfort or similar commitment i .
- $Solvency\ ratio_i$ = The ratio of the eligible amount of own funds to cover the solvency capital requirement.

EIOPA (2012:164) indicate the following input is required to calculate the type 2 exposures:

- E = The sum of the values of type 2 exposures, excluding receivables from intermediaries, where the due date is longer than 3 months.
- $E_{\text{past due}}$ = The sum of the values of receivables from intermediaries due for more than 3 months.

The module will provide the capital requirement for counterparty defaults risk (SCR_{def}) (EIOPA 2012:164). The capital requirement for the counterparty default risk, which includes the risk absorbing capacity of the technical provisions ($nSCR_{\text{def}}$) is defined as the loss in net asset value resulting from a counterparty default loss of the amount SCR_{def} . The capital requirement for the counterparty default risk module which includes the absorbing capacity of the technical provisions $nSCR_{\text{def}}$, should be determined under the condition that the value of future discretionary benefits can change and that undertakings are able to vary its assumptions in future bonus rates in response to the shock being tested (EIOPA 2012:165).

The counterparty default risk requirement for type 1 and type 2 exposures is calculated separately, includes a low diversification effect in the aggregation of the requirements (EIOPA 2012:165), and the capital requirement for counterparty default risk is calculated as follows:

$$SCR_{def} = \sqrt{SCR_{def,1}^2 + 1.5 \times SCR_{def,1} \times SCR_{def,1} + SCR_{def,2}^2}$$

- SCR_{def} denotes the capital requirement for counterparty default risk.
- $SCR_{def,1}$ denotes the capital requirement for counterparty default risk type 1 exposure.
- $SCR_{def,2}$ denotes the capital requirement for counterparty default risk of type 2 exposures.

- **Intangible asset risk module**

EIOPA (2012:131) indicate intangible assets are exposed to market risk and internal risk. EIOPA describe internal risk as the risk inherent in the failures or unfavourable deviations in the process of finalisation of the intangible asset, or where future benefits are not expected from the intangible asset, or a reduction of the amount of the intangible asset is expected. Market risk is caused by a decrease of prices in an active market and from an unexpected reduction in liquidity in an active market where the lack of liquidity may in itself have an effect on prices or may lead to impeding a transaction (EIOPA 2012:131). Intangible assets are valued in terms of Article 75 of the SII Directive 2009/138 or IFRS and the market and internal risks applicable to these assets should be included in the $SCR_{intangible}$. (EIOPA 2012:7 and 131).

3.3.4.2. Adjustment for loss absorbing capacity

The purpose of the adjustment for loss absorbing capacity is to create a buffer for unexpected losses through a decrease in technical provisions or deferred taxes (EIOPA 2012:123). EIOPA further indicate the adjustment should incorporate the risk mitigating effect provided by future discretionary benefits to enable the insurer or reinsurer to determine that a reduction in such benefits can be used to cover unexpected losses and cannot be positive (EIOPA 2012:123). A modular approach should be used for the calculation of the adjustment for the loss absorbing capacity, and should be split into the adjustment for loss absorbency of technical provisions and the adjustment for loss absorbency of deferred taxes (EIOPA 2012:123) and is calculated as follows:

$$\text{Adj} = \text{AdjTP} + \text{AdjDT}$$

- Adj denotes the adjustment for loss absorbing capacity of technical provisions and deferred taxes
- AdjTP denotes the adjustment for loss absorbency of technical provisions
- AdjDT denotes the adjustment for loss absorbency of deferred taxes

- **Adjustment for loss absorbency of technical provisions**

The SCR for each risk should be calculated both gross and net of the loss absorbency of technical provisions and the BSCR by aggregating the gross capital requirements with the use of the relevant correlation matrices. The nBSCR is calculated by aggregating the net capital requirements by using the relevant correlation matrices (EIOPA 2012:124). The adjustment to the BSCR for the loss-absorbing capacity is the difference between the BSCR and nBSCR. The absolute amount of the adjustment should not exceed the total value of the technical provisions without risk margin in relation to future discretionary benefits. The adjustment for loss-absorbing capacity of technical provisions should incorporate the risk mitigating effects for the market and counterparty default risk, based on the assumptions of future management and the gross capital requirement and the net capital requirement is the same for all other risks (EIOPA 2012:124). The calculation of the nBSCR for counterparty default risk is equal to the loss in basic own funds that would result from an instantaneous loss due to default events relating to type 1 exposures (EIOPA 2012:124).

- **Adjustment for deferred taxes**

EIOPA (2012:125) indicate that the adjustment for the loss-absorbing capacity of deferred taxes should be equal to the change in the value of deferred taxes of insurers and reinsurers, which would result from an instantaneous loss of an amount, as expressed in $\text{SCR}_{\text{shock}} = \text{BSCR} + \text{AdjTP} + \text{SCR}_{\text{Op}}$.

- BSCR denotes the basic solvency capital requirement.
- AdjTP denotes the adjustment for the loss-absorbing capacity of technical provisions

- SCR_{Op} denotes the capital requirement for operational risk.

The solvency capital requirement for the operational risk module is discussed in the next section.

3.3.4.2. Operational risk capital risk modules

As the insurer or reinsurer incurs operational risk in the normal course of business, the Solvency II regulations also require that insurers and reinsurers should calculate a capital charge for operational risk. The operational risk module includes operational risk, which has not been covered in the other risk modules, and that the technical provisions exclude the risk margin, without deduction of recoverables from reinsurance contracts and SPVs (EIOPA 2012:127). The inputs for this module are (EIOPA 2012:129):

- TP_{nl} = Total non-life insurance obligations, excluding obligations under non-life contracts, which are similar to life obligations, including annuities. The technical provisions should exclude the risk margin, deduction for recoverables from reinsurance contracts and SPVs.
- $Earn_{nl}$ = Earned premium during the previous 12 months for non-life insurance obligations, including the premiums ceded to reinsurance
- Exp_{ul} = Amount of annual expenses (gross of reinsurance) incurred in respect of unit-linked business. Administrative expenses should be used (excluding acquisition expenses), and the calculation should be based on the latest past year's expenses and not on future projected expenses
- BSCR = The basic solvency capital requirement

The output of the module is the capital requirement for operational risk SCR_{Op} (EIOPA 2012:129).

3.3.6. Minimum Capital Requirement

The MCR enables a supervisory response to a degradation of the insurers' or reinsurers' financial position, which may ultimately lead to the withdrawal of the license of the insurer (SAM Roadmap 2010:20). The regulatory intervention is also described by Buckham et al. (2011:61) as a range of regulatory intervention in contrast to a specific target. EIOPA (2012:283) indicate that to calculate MCR, a linear formula with a floor of 25% and a cap of 45% of the SCR is combined.

EIOPA (2012:283) indicate that MCR is calculated with the following input:

- MCR_{NL} = The linear formula component for non-life insurance or reinsurance obligations.
- MCT_L = The linear formula components for life insurance or reinsurance obligations
- SCR = The SCR of the insurer or reinsurer
- AMCR = The absolute floor as defined in Article 129 of the SII Directive.

The output of the module is the minimum capital requirement (MCR), with MCR_{linear} and $MCR_{combined}$. $MCR_{combined}$ denotes the combined MCR for the insurer or reinsurer, which is the result of the linear formula subject to a floor of 25% and cap of 45% of the SCR, without the absolute floor (EIOPA 2012:284). MCR_{linear} is the result of MCR_{NI} and MCR_L , where MCR_{NI} is the linear formula component for non-life or reinsurance obligations and MCR_L the linear formula component for life insurance or reinsurance obligations (EIOPA 2012:284, 287).

3.3.7. Technical provisions

The Institute and Faculty of Actuaries (2013:8) indicate that the technical provisions are the best estimate of the current liabilities of insurance contracts plus a risk margin, and that the claims and provisions should be calculated separately, as prescribed in Articles 75 to 78 of the Solvency II Directive, and can be summarised as the: Technical provision = claims provision + premium provision + risk margin.

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The Institute also indicate the claims provision should be equal to the present value of future cash inflows and cash outflows that can arise from claims occurring before or at the valuation date. The calculation should also include associated future premiums relating to the claims (Institute 2013:8). According to the Institute (2013:9), the premium provision is calculated on future claims covered by insurance and reinsurance obligations, which fall within the contract boundaries, and is a best estimate of the net present value of cash flow projections, which include benefits, expenses and the premiums related to the future events and incorporate future expected profits (Institute 2013:8). EIOPA (2012:46) indicate the insurance and reinsurance obligations should be segmented into homogeneous risk groups and as a minimum, by line of business when calculating technical provisions, as indicated in Table 3.3. EIOPA further indicate the purpose of the segmentation of the insurance and reinsurance obligations is to ensure an accurate valuation of technical provisions, and avoid distortion by combining data from dissimilar lines of business (EIOPA 2012:46).

According to the Institute (2013:9), provisions for claims and premiums are closely related as both represent a provision to cover cash flows. The claims provision however covers events that occurred before or at the valuation date and provision for premiums to cash-flows to future exposure. The concept is illustrated in Figure 3.3.

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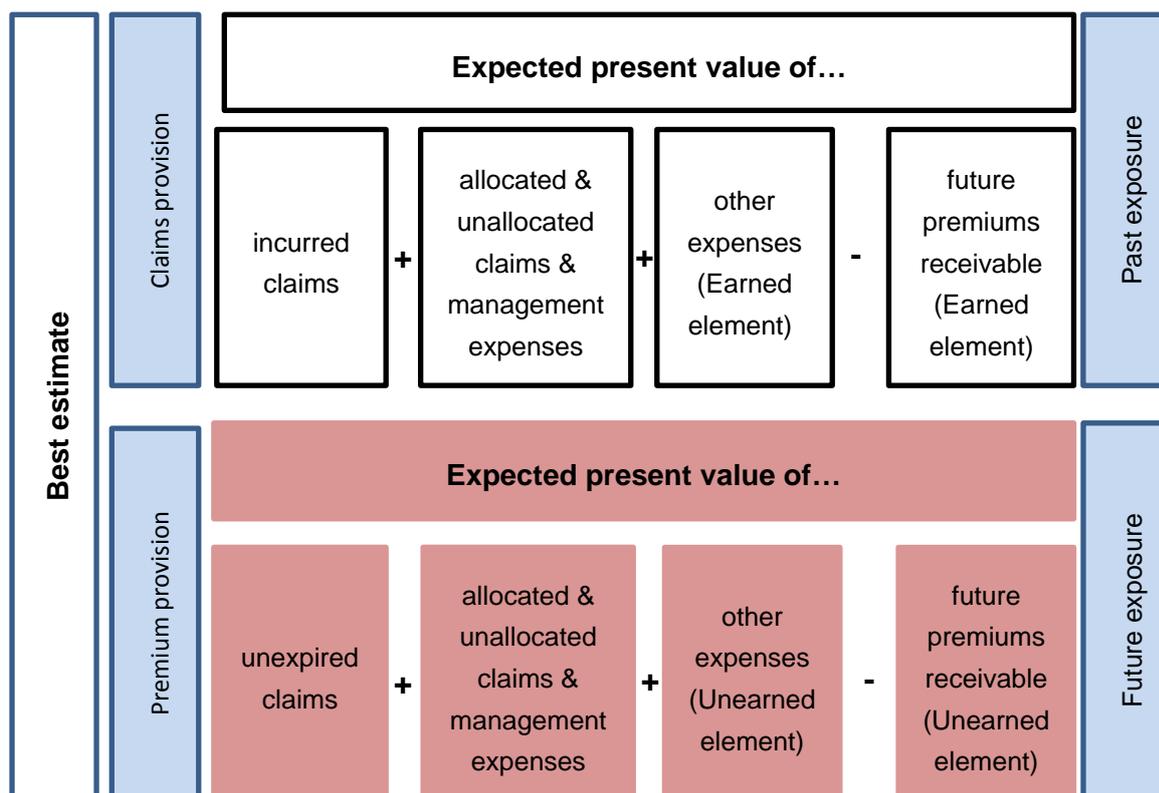


Figure 3.3. Calculation of premiums and claims provisions adapted from the Institute and Faculty of Actuaries 2013:9)

Figure 3.3 indicates the components needed to calculate the technical provisions for the short-term insurer. The Institute (2013:10) identified the best estimate components as the claims provision (for claims incurred), premium provision for unexpired claims, expenses earned, and unearned future premiums receivable. The components are discussed in more detail below.

3.3.7.1. Claims provision: Claims (Incurred)

According to the Institute (2013:10), the provision for claims incurred is the expected present value of future cash flows with regard to past claim events. The Institute further indicate the present values of the cash flows can be calculated by applying a payment pattern, which is likely to be based on historic payments if sufficient credible data is available. The Institute also highlights that the current reporting proposals requires insurers and reinsurers to strip out expenses, which may have an additional

effect on the data architecture with regard to the accuracy and availability of data (Institute 2013:10).

3.3.7.2. Premium provision: Claims (Unexpired)

The Institute (2013:10) indicate that the premium provision for unexpired claims refers to the expected present value of future cash flows on existing policies. The Institute (2013:11) indicate that insurers and reinsurers can use different approaches to calculate the element of the premium provision such as loss ratio, burning cost method, and payment patterns method.

The loss ratio is applied to the unearned premium to estimate the total undiscounted claims, and a payment pattern is created to generate future cash flows, discounted and summed to generate the present value (Institute 2013:11). The Institute indicate the unexpired risk reserve (URR) is the most appropriate approach, although using alternative approaches are also acceptable if appropriate (Institute 2013:11).

3.3.7.3. Expenses

According to the Institute (2013:40) all future expenses such as administrative, investment management, claims management, and acquisition should be included in the calculation of the technical provisions. The Institute (2013:40, 41) indicate the items that should be included, but are not limited to, in the calculation are:

- administration expenses e.g. salaries, information technology, property (rent, depreciation, heating, lighting, cleaning), and management expenses (actuarial, finance, risk, commercial, data, administration of reinsurance contracts or SPVs)
- other administration expenses
- investment management expenses
- claims management expenses including claims handling expenses
- acquisition expenses, including commission
- costs associated with arranging and managing outward reinsurance
- insurance premium tax

3.3.7.4. Future premiums receivable

The Institute (2013:13) note the calculation for the technical provisions of earned and unearned future premiums receivable should exclude overdue future premiums, as overdue premiums remain part of “insurance and intermediary receivables” on the Solvency II balance sheet. The future premium receivable should be net of expected premium defaults (Institute 2013:13).

3.3.7.5. Risk margin

The Institute (2013:62) note the risk margin should be calculated by determining the cost of capital as providing an amount of eligible own funds equal to the SCR to support the contractual insurance obligations over its lifetime. The Institute further indicate the intention of the “cost of capital” approach is to reflect the costs incurred by a notional insurer or reinsurer to raise capital to accept a transfer of liabilities, based on the assumption that the notional insurer or reinsurer capitalises itself at the time of the transfer (Institute 2013:62).

The risks to be incorporated in the calculation of the SCR of the risk margin are the unavoidable market risk, operational risk, counterparty default risk in terms of the ceded reinsurance and SPVs and the insurance risk (Institute 2013:63). According to the Institute (2013:63), insurance risk refers to the any current and future premiums and associated exposures. The SCR must be projected each future year until business is run off and each of the SCRs is then multiplied with the cost of capital to determine the cost of holding the future SCRs (Institute 2013:63).

3.3.8. Group supervision

Solvency II provides for the supervision of insurance groups in different jurisdictions for example, Zurich Insurance Group, which has a head office in Switzerland with subsidiaries in 170 countries, with an office in South Africa (Zurich, 2013). Insurance groups will have a dedicated “group supervisor” under Solvency II with powers and responsibilities to organise the supervision of that group. The group supervisor will set the SCR for the group, will validate any group internal model, and will act as the

central point for the effective supervision of the group, in close co-operation with the other supervisors (SAM Roadmap 2010:15).

3.3.9 Conclusion on Pillar I

Based on the review of the literature of the Pillar I requirements, it can be concluded that the quantification of the risk of the insurer and reinsurer, and the calculation of the capital to safeguard the policyholder form an important component of the Solvency II framework. The purpose of the SCR is to incentivise sound risk management through the quantitative measurement of the risks of the insurers' and reinsurers' operations and investments. The second reason is that supervisors require a minimum capital buffer with the purpose of protecting policyholders and the economic system. A further safeguard required by the supervisors is the regulation of the quality of the capital to serve as a buffer for the protection of policyholders and the economic system. The quality of the capital depends on the permanence of the various capital instruments and their ability to absorb risks.

SCR can be calculated by using the standard approach, the internal model approach, or a partial modelling approach. Partial modelling can be applied to the whole business of insurance and reinsurance undertakings, or only to one or more major business units. Insurers and reinsurers can develop their own internal models for the calculation of the SCR. The internal models can then be used to calculate the SCR after the application for the use of the internal model had been approved by the supervisor. To obtain internal model approval, the insurer or reinsurer will have to provide documentary evidence to convince the supervisor that the internal model must be used widely by the insurer and reinsurer.

The supervisor should also ensure that the design and on-going operation of the internal model is appropriate and continues to reflect the risk profile of the insurer and reinsurer. The insurers and reinsurers must be able to justify the assumptions on which the internal model is based, and the methods used to calculate the probability distribution forecast must be based upon adequate, applicable, and relevant actuarial and statistical techniques.

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The insurers and reinsurers need to meet stringent data requirements for the calculation of the SCR, MCR, and technical provisions at both individual and group level. Insurers and reinsurers need to have established internal processes and procedures to ensure that the data used in calculations is appropriate, complete, and accurate. The minimum criteria set for the appropriateness of data are that data is suitable for the calculation technical provisions, there is no undue estimation error arising from the amount or nature of the data, and that the data appropriately capture the underlying risk. For the completeness, data should be of sufficient granularity and include sufficient information to identify trends and assess the characteristics of the underlying risk, data is available for each homogenous risk group in the calculation, and no relevant data is excluded from use in the calculation without justification. The accuracy requirement stipulates that data must be free from material errors, data from different periods used for the same estimation are consistent, and recording of the data is consistent and performed in a timely manner.

The SCR for underwriting risk and the technical provisions need to be calculated per line of business, which also implies that data should be granular and sufficient for the purpose of the calculation and to ensure that the results of a business line is not distorted with the data of another line. Insurers and reinsurers are required to investigate the economic substance of the underlying investments to assess the market risk inherent in the underlying investments. Insurers and reinsurers should use the “look-through” approach to determine the market risk inherent in the underlying investment of the investment fund or collective investment schemes, and that it may be necessary for the insurers and reinsurers to have a number of iterations of the look-through approach in cases where an investment fund is invested in other investment funds. In cases where the asset manager is unable to provide the required data for the allocation of the investments into the market risk sub-risks, the insurer and reinsurer should refer to the investment mandate of the scheme as a base for the classification into the market risk sub-risks. In conclusion, insurers and reinsurers need to have the sufficient data to do the necessary calculations for the SCR, MCR, and technical provisions. The quality and quantity of the data cannot be assessed in isolation, as people with the prerequisite skills are needed to develop/implement the modules do the calculations, even when the

standardised approach is used. The skills required will typically be modelling and actuarial skills for the development and implementation of the modules, but also IT skills to implement and develop the IT infrastructure where necessary.

Solvency II has also introduced a system of governance requirements, which is discussed under Pillar II in the next section.

3.4. PILLAR II

The qualitative requirements of Pillar II are contained in the system of governance. The Directive makes it a specific requirement that all insurance and reinsurance undertakings must have an effective system of governance, which provides for sound and prudent management of the business. This section will deal with the general governance requirements, the fit and proper requirements of office bearers, risk management, the own solvency assessment, internal controls, internal audit, the actuarial function and the outsourcing of key functions.

3.4.1. General governance requirements

The SII Directives (2009: L335/56 Article 41) place a premium on the governance of insurers and reinsurers as part of the Solvency II regime. The Directive makes it a specific requirement that all insurance and reinsurance undertakings must have an effective system of governance, which provides for sound and prudent management of the business. The Directive further requires that the system of governance be subject to regular internal review, and that the system of governance be proportionate to the nature, scale, and complexity of the operations of the insurer or reinsurer.

Insurers and reinsurers are required to take reasonable steps to ensure continuity and regularity in the performance of their activities, including the development of contingency plans, and they must have written policies and ensure the implementation of the policies in relation to risk management, internal control, internal audit and, where relevant, outsourcing.

3.4.2. Fit and proper requirements for persons who effectively manage the undertaking or have other key functions

The SII Directives (2009: L335/56 Article 42) require all persons who effectively manage the insurer or reinsurer or have other key functions must meet the following requirements:

- their professional qualifications, knowledge and experience are adequate to enable sound and prudent management (fit); and
- they are of good repute and integrity (proper).

The supervisor must be advised of all changes of the persons or their replacements, along with all information needed to assess whether any new persons appointed to manage the undertaking are meeting the fit and proper requirements (SII Directives 2009: L335/56 Article 42).

3.4.3. Risk management

SII Directives (2009: L335/56 Article 44) require insurers and reinsurers to establish a risk management function, which should be structured to facilitate the implementation of the risk management system. The risk management system must also be effective and integrated into the organisational structure and in the decision-making processes of the insurer or reinsurer (SII Directives 2009: L335/56 Article 44). According to the SII Directives (2009: L335/56 Article 44), the risk management system should cover at least the following areas:

- underwriting and reserving;
- asset and liability management;
- investment, in particular derivatives and similar commitments;
- liquidity and concentration risk management;
- operational risk management; and
- reinsurance and other risk mitigation techniques.

The SII Directives (2009: L335/56 Article 44) further indicate where insurers or reinsurers are using an approved partial or full internal model, the risk management function will also have the responsibility to:

- design and implement the internal model;
- test and validate the internal model;
- document the internal model and any subsequent changes made to it;
- analyse the performance of the internal model and produce summary reports thereof; and
- inform senior management about the performance of the internal model, suggesting areas needing improvement, and updating senior management on the status of efforts to improve previously identified weaknesses.

3.4.4. Own risk and solvency assessment

The SII Directives (2009: L335/56 Article 45) require all insurers and reinsurers to conduct their own risk and solvency assessment (ORSA). ORSA is regarded as an integral part of the business strategy and should be considered in the strategic decisions of the insurer or reinsurer. Insurers are required to perform the assessment regularly, but especially after any significant change in the risk profile (SII Directives 2009: L335/56 Article 45). An assessment should include at least the following:

- the overall solvency needs, considering the specific risk profile, approved risk tolerance limits and the business strategy;
- compliance, on a continuous basis, with the capital requirements; and
- the significance with which the risk profile of the undertaking concerned deviates from the assumptions underlying the SCR, calculated by the standard formula or by its partial or full internal model. Where an internal model is used, the assessment should be performed together with the recalibration that transforms the internal risk numbers into the SCR risk measure and calibration.

The processes implemented by the insurer or reinsurer must be proportionate to the nature, scale and complexity of the risks inherent in the business and which enable it to properly identify and assess the risks in the short and long term and to which it is or could be exposed (SII Directives 2009: L335/56 Article 45).

3.4.5. Internal control

SII Directives (2009: L335/56 Article 46) require insurers and reinsurers to have an effective internal control system, which must at least include administrative and accounting procedures, an internal control framework, appropriate reporting arrangements at all levels of the undertaking and a compliance function. The duties of the compliance function should include advising the administrative, management or supervisory body on compliance with the laws, regulations, and administrative provisions. The duties also include an assessment of the possible impact of any changes in the legal environment on the operations of the undertaking concerned and the identification and assessment of compliance risk.

3.4.6. Internal audit

SII Directives (2009: L335/56 Article 47) require insurers and reinsurers to establish an effective and independent internal audit function. The internal audit function should include an evaluation of the adequacy and effectiveness of the internal control system and other elements of the system of governance. Any internal audit findings and recommendations must be reported to the administrative, management or supervisory body, which shall determine which actions are to be taken with respect to each of the internal audit findings and recommendations, and shall ensure that those actions are carried out (SII Directives 2009: L335/56 Article 46).

3.4.7. Actuarial function

SII Directives (2009: L335/56 Article 48) require insurers and reinsurers to establish an effective actuarial function to:

- coordinate the calculation of technical provisions;
- ensure the appropriateness of the methodologies and underlying models used as well as the assumptions made in the calculation of technical provisions;
- assess the sufficiency and quality of the data used in the calculation of technical provisions;
- compare best estimates against experience;

- inform senior management of the reliability and adequacy of the calculation of technical provisions;
- oversee the calculation of technical provisions;
- express an opinion on the overall underwriting policy;
- express an opinion on the adequacy of reinsurance arrangements; and
- contribute to the effective implementation of the risk management system in particular to the risk modelling underlying the calculation of the capital requirement set and to the assessment.

The actuarial function must be staffed by persons who have knowledge of actuarial and financial mathematics, commensurate with the nature, scale, and complexity of the risks inherent in the business of the insurer or reinsurer, and who are able to demonstrate their relevant experience with applicable professional and other standards (SII Directives 2009: L335/56 Article 48).

3.4.8. Outsourcing

SII Directives (2009: L335/56 Article 48) indicate insurers and reinsurers remain fully responsible for discharging all of their obligations when they outsource functions or any insurance or reinsurance activities. SII Directives (2009: L335/56 Article 48) require insurers and reinsurers to notify the supervisor prior to the outsourcing of critical or important functions or activities as well as of any subsequent material developments with respect to those functions or activities in a timely manner. The last component of the Solvency II architecture is Pillar III, which governs disclosure and reporting to the board of the insurer or reinsurer, shareholders and the supervisor.

3.4.9. Conclusion on Pillar II

The qualitative requirements of Pillar II consist of the system of governance. The Directive makes it a specific requirement that all insurance and reinsurance undertakings must have an effective system of governance, which provides for sound and prudent management of the business. The requirements include an adequate transparent organisational structure with clear allocation and appropriate

segregation of responsibilities. The reporting of information is also important, and the insurers and reinsurers must provide for an effective system for ensuring the transmission of information. The Directive also stipulates the fit and proper requirements of management and people in key functions and proof of good repute. The Directive further requires a risk management function, independent internal audit function, and an actuarial function. Insurers and reinsurers must also perform an ORSA, which must form an integral part of the business strategy and should be considered in the strategic decisions of the insurer or reinsurer. The ORSA should be performed regularly, especially after any significant change in the risk profile.

The last pillar of Solvency II is the reporting requirements contained in Pillar III, which are discussed next.

3.5. PILLAR III

The SII Directives (2009: L335/56 Article 51) regulates the disclosure requirements of Pillar III, which consist of the annual published report on the solvency and financial conditions, information provided to the supervisors and the link with IFRS.

3.5.1. Contents of reports

SII Directives (2009: L335/56 Article 51) require insurers and reinsurers to report on their solvency and financial condition annually. The report should contain a description of the business and the performance, the system of governance and an assessment of its adequacy for the risk profile. The directives require a separate description for each risk category, the risk exposure, concentration, mitigation, and sensitivity, a description for all assets, technical provisions and other liabilities. The description must also include the bases and methods used for their valuation, with an explanation of any major differences in the bases and methods used for their valuation in the financial statements (SII Directives 2009: L335/56 Article 51).

SII Directives (2009: L335/56 Article 51) require the description of the capital management to include information on the structure, amount and quality of own funds. The description should include an analysis of any significant changes

compared to the previous reporting period, and an explanation of any major differences in the value of the elements in financial statements, and a brief description of the transferability of the capital. The description must include the SCR and MCR, and the option used for the calculation of the SCR. Insurers and reinsurers should also provide sufficient information to ensure the main differences between the underlying assumptions of the standard formula and those of any internal model can be understood (SII Directives 2009: L335/56 Article 51). The amount of any non-compliance with the MCR or any significant non-compliance with the SCR during the reporting period, even if subsequently resolved, with an explanation of its origin and consequences as well as any remedial measures taken (SII Directives 2009: L335/56 Article 51).

Insurers and reinsurers must have appropriate systems and structures to report on the solvency and financial condition to meet the requirements of the Directive. Insurers and reinsurers are required to have a written policy ensuring the on-going appropriateness of any information disclosed in accordance with the directive.

3.5.2. Applicable principles

SII Directives (2009: L335/56 Article 53) allow the supervisor to permit insurance and reinsurance undertakings not to disclose information where competitors of the insurer or reinsurer could gain significant undue advantage through such information and there are obligations to policyholders or other counterparty relationships binding the insurer or reinsurer to secrecy or confidentiality. Insurers and reinsurers must disclose the fact that the non-disclosure of information was permitted by the supervisor and the reasons for the non-disclosure (SII Directives (2009: L335/56 Article 53)).

3.5.3. Updates and additional voluntary information

In the event of any major development significantly affecting the relevance of the information disclosed, insurers and reinsurers must disclose appropriate information on the nature and effects of that major development. The following should be regarded as major developments (SII Directives 2009: L335/56 Article 54).

3.5.3.1. Non-compliance with the marginal capital requirement

According to SII Directives (2009: L335/56 Article 54), if the insurer or reinsurer is unable to submit what the supervisor may regard as a realistic short-term finance scheme to the supervisor, or is unable to obtain the scheme within one month of the date on which non-compliance was identified. The insurer or reinsurer must immediately disclose the amount of non-compliance with an explanation of the causes and consequences, including remedial measures that were implemented to rectify the situation. Where the insurer or reinsurer did not comply with the MCR three months after the deficiency was identified, the insurer or reinsurer must disclose this fact, with an explanation of the causes and consequences, including any remedial measures, that were implemented and any further remedial measures planned at the end of that period (SII Directives 2009: L335/56 Article 54).

3.5.3.2. Significant non-compliance with the solvency capital requirement

According to SII Directives (2009: L335/56 Article 54), when non-compliance with the SCR is identified and the insurer or reinsurer is unable to present a realistic recovery plan within two months of the date of non-compliance was identified, the supervisor may require immediate disclosure of the amount of non-compliance. The causes and consequences, including any remedial measure taken must also be explained (SII Directives 2009: L335/56 Article 54). Where, significant non-compliance with the SCR has not been resolved six months in spite of the recovery plan initially considered to be realistic, the non-compliance must be disclosed at the end of that period, with an explanation of the causes and consequences, including any remedial measures taken and any further remedial measures planned. Insurers or reinsurers may voluntarily disclose any additional information or explanation related to their solvency and financial condition, which is not already a requirement (SII Directives 2009: L335/56 Article 54).

The solvency and financial condition report is subject for approval by the administrative, management or supervisor of the insurer or reinsurer and can only be published after approval. The disclosure requirements of Pillar III consist of the annual published report on the solvency and financial conditions, information

provided to the supervisors and the link with IFRS and on their solvency and financial condition annually (SII Directives 2009: L335/56 Article 55).

3.5.4. Conclusion on Pillar III

The disclosure requirements of Pillar III consist of the annual published report on the solvency and financial conditions, information provided to the supervisors and the link with IFRS. Insurers and reinsurers must have appropriate systems and structures to report on the solvency and financial condition to meet the requirements of the Directive. Insurers and reinsurers are required to have a written policy ensuring the on-going appropriateness of any information disclosed in accordance with the directive. Insurers and reinsurers disclose appropriate information on the nature and effects of any major development that may affecting the relevance of the information disclosed, such as non-compliance with the minimum capital requirement or the solvency capital requirement, including the corrective actions to be taken, and progress in terms of the action plans.

The EU countries have been implementing sophisticated prudential regulatory regimes since the 1970s, which will be culminating with the implementation of Solvency II in 2016 (Captive Review 2013/04/05). As South Africa has a reasonably developed financial system and strong economic links with Europe and a number of insurers with subsidiaries in EU countries, the FSB has decided to implement a more sophisticated prudential regulatory framework based on the Solvency II principles (SAM Roadmap 2010:10). The new South African prudential regulatory framework, the Solvency and Assessment Management (SAM), is discussed in the next section.

3.6. IMPLEMENTATION OF THE SOLVENCY II PRINCIPLES IN SOUTH AFRICA

The FSB is in the process of developing a new risk-based solvency regime for South African short-term and long-term insurers, known as the Solvency Assessment and Management regime (SAM). SAM is based on Solvency II with the purpose to align the South African prudential regulatory framework with the standards being developed by the International Association of Insurance Supervisors (IAIS) (SAM Roadmap 2010:10).

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The FSB (SAM Roadmap 2010:10) indicates that SAM will apply to all insurance entities operated on a commercial basis, which would also include government-owned insurers, but will exclude entities licensed under the proposed micro-insurance legislation. Micro-insurers will operate under a separate regulatory environment. The FSB also indicates that micro-insurance regulation will be rules-based prudential and market conduct requirements with the aim of facilitating lower underwriting and distribution costs (SAM Roadmap 2010:4). The SAM project is discussed in the next section.

The FSB (SAM Roadmap 2010:10) notes that Solvency II was chosen as the conceptual basis to implement a risk-based regulatory regime in South Africa due to the strong economic links with Europe. Other factors considered according to the FSB, were the principles-based three-pillar framework of Solvency II, which represents international regulatory best practice. Attaining third country equivalence will also ensure that South African-based insurers may continue doing business in the European Union (EU) and other jurisdictions without concerns with respect to the quality of their home supervision.

According to the FSB, the primary purpose of SAM is the protection of policyholders and beneficiaries. Additional objectives are to:

- align capital requirements with the underlying risks of an insurer;
- develop a proportionate, risk-based approach to supervision with appropriate treatment for both small insurers and large, cross-border groups;
- provide incentives to insurers to adopt more sophisticated risk monitoring and risk management tools; and
- maintain financial stability.

SAM will also be aligned to meet the requirements for third country equivalence assessment as established by the European Union (EU) and adapted for South African circumstances (SAM Roadmap 2012:10). Where South African insurance groups have subsidiaries elsewhere in Africa, the equivalence assessment will be on the basis of group supervision arrangements under SAM, rather than on an assessment of the regulatory regime in each of those other African jurisdictions. The benefit of third country equivalence is that South African-based insurers and

reinsurers to continue their operations in the EU and other jurisdiction without concerns regarding the quality of their home supervision.

Another principle that will be implemented is proportionality, which is to ensure that the SAM requirements are proportionate to the nature, scale, and complexity of the business of the insurer or reinsurer (SAM Roadmap 2010:10).

3.6.1. SAM structure and architecture

The FSB has developed a guide or roadmap, based on the Discussion Paper for the Implementation of Solvency II of the Financial Services Authority (FSA) to assist insurers and reinsurers to prepare for the SAM implementation (SAM Roadmap 2010:3). The roadmap covers the various processes needed for the successful implementation for the new regime such as the publication of the roadmap in 2010, preparation of the necessary legislation and regulations, economic and quantitative impact assessments, interim measures and update of guidance, the internal model approval process, parallel runs and final implementation in 2016 (SAM Update 2013:8). A governance structure, comprising of the various stakeholders, was also established to facilitate the consultative process and to ensure that the concerns of stakeholders are considered (SAM Roadmap 2010:10).

The FSB (SAM Roadmap 2010:9) indicates that SAM will be based on the Solvency II capital adequacy, risk governance, and risk disclosure regime being implemented for European insurers and reinsurers. SAM will share the same broad features as Solvency II, being a principles-based regulation based on an economic balance sheet, and utilising the same three-pillar structure of capital adequacy (Pillar I), systems of governance (Pillar II), and reporting requirements (Pillar III).

It can furthermore be deduced from the aforementioned that SAM will share the same broad features as Solvency II, being a principles-based regulation based on an economic balance sheet, and utilising the same three-pillar structure of capital adequacy (Pillar I), systems of governance (Pillar II) and reporting requirements (Pillar III). The FSB has initiated a number of quantitative impact studies as part of the SAM preparation and implementation project (SAM Roadmap 2010:11). The purpose, scope, and results of the studies are discussed in the next paragraph.

3.6.2. SAM project progress

The FSB initiated three quantitative impact studies during the course of the SAM project. The objective of SA QIS1 was to measure the effect the new regime may have on insurers (SA QIS1 2011:6). SA QIS2 focused on the quantitative measures of the SAM framework, and the purpose of SA QIS3 was to assist insurers to prepare for the parallel run before implementation of SAM (SA QIS2 2013:4; SA QIS3 2013:4).

3.6.2.1. First South African quantitative impact study (SA QIS1)

The FSB (SA QIS1 2011:6) indicate that the purpose of the first quantitative study was to measure the direct impact of the new regime may have on insurers. Participation in SA QIS1 was voluntary (SA QIS1 2011:15) and 50% of the insurers participated in the study, which represented 90% of the industry based on the volume of premiums (SA QIS1 2011:13). The reports highlights that 600 skilled person months were used for this study, with approximately 67% allocated to actuarial time.

The SA QIS1 (2011:15) report indicates that many areas of the study were difficult to complete with the current data structures of the insurers. The problems experienced with the data received form insurers were summarised by the report as follows:

- balance sheets did not balance
- amounts calculated in the study did not reconcile with statutory returns
- own funds were not allocated to the tiers of the capital
- incomplete information were included to calculate the MCR

The report (SA QIS1 2011:15) highlighted a number of challenges with regard to the data required for the calculations. Insurers had trouble in obtaining relevant data to perform the “look through” calculations for assets invested in collective investment schemes. Short-term insurers had difficulties to obtain accurate pricing and claims data, including the data required for catastrophe risk calculations, and to split the data into the lines of business. The report further notes that short-term insurers had concerns to obtain data from customers, brokers, and reinsurers, and where data were obtained, it was not necessarily in the correct format (SA QIS1 2011:16).

The median capital coverage ration decreased from 234% under the current regime to 156% according to the SA QIS1 calculation (SA QIS 2011:9). Of the 55 short-term insurers participating in the study, 81.8% met both the SCR and MCR, 14.5% did not meet the SCR, and 3.6% did not meet the SCR and MCR (SA QIS1 2011:10).

The report indicates that insurers and reinsurers estimate approximately 10 000 “skilled” person months for the SAM implementation, with life insurers committing more resources than short-term insurers for the SAM projects (SA QIS1 2011:14).

3.6.2.2. Second South African quantitative impact study (SA QIS2)

Participation in SA QIS2 was voluntary (SA QIS2 2013:15) and 65.4% of the insurers participated in the study, which represented 98.5% of the industry based on the volume of premiums (SA QIS2 2013:12). The reports highlights that 760 “skilled” person months were used for this study, with approximately 67% allocated to actuarial time.

The SA QIS2 (2013:16) report indicates many areas of the study were difficult to complete with the current data structures of the insurers and reinsurers. The problems experienced with the data received from insurers were summarised in the report as follows:

- balance sheets did not balance
- amounts calculated in the study did not reconcile with statutory returns
- own funds were not allocated to the tiers of the capital
- incomplete information were included to calculate the MCR
- not all the required information was provided such as asset and counterparty data, including the required sensitivities as per the SA QIS2 technical specifications

The report (SA QIS2 2013:16) highlighted a number of challenges with regard to the data required for the calculations. Insurers and reinsurers continued to experience challenges in obtaining relevant data to perform the “look through” calculations for assets invested in collective investment schemes. Short-term insurers had difficulties to obtain accurate pricing and claims data, including the data required for catastrophe risk calculations, and to split the data into the lines of business. The report further notes that short-term insurers continued to experience difficulties to

obtain data from customers, brokers, and reinsurers, and where data were obtained, it was not necessarily in the correct format, and splitting discretionary participation business in the respective guaranteed and future discretionary benefits (SA QIS2 2013:16).

The median capital coverage ratio decreased from 156% under the SA QIS1 regime to 185% according to the SA QIS2 calculation (SA QIS2 2013:27). Of the 63 short-term insurers participating in the study, 49 met both the SCR and MCR, 14 did not meet the SCR, and three did not meet the SCR and MCR (SA QIS2 2013:8).

The report indicates insurers and reinsurers estimate approximately 13 500 “skilled” person months for the SAM implementation, with life insurers committing more resources than short-term insurers for the SAM projects (SA QIS2 2013:12).

3.6.2.3. Third South African quantitative impact study (SA QIS3)

The FSB (SA QIS3 2013:4) indicate SA QIS3 is the final quantitative impact study for the SAM project, and is compulsory for all short-term insurers. The FSB further indicate that although the SAM project is nearing the end of the development phase, the final regulatory requirements are still being developed (SA QIS3 2013:4). The purpose of SA QIS3 is also to form a foundation for the parallel run planned for the second half of 2014. SA QIS3 must be completed on a solo and group basis for insurers or reinsurers forming part of an insurance group (SA QIS3 2013:4).

The technical requirements for SAM Pillar I still have to be finalised, but an important difference between Solvency II and SAM needs to be highlighted due to the granularity of the data required for the calculation of the technical provisions is the difference between the lines of business identified between Solvency II and SAM. As indicated in table 3.3., Solvency II identified 12 lines of business, but the 23 lines of business applicable to SAM (SA QIS3 Part 6 2013:8) are listed below.

- Motor – personal lines
- Motor – commercial lines
- Aviation
- Marine

- Rail
- Transport
- Agriculture
- Engineering
- Property – personal lines
- Property – commercial lines
- Liability – motor
- Liability – aircraft
- Liability marine
- Liability rail
- Liability transport
- Liability – engineering
- Liability – other
- Trade credit, suretyship and guarantee
- Legal
- Travel
- Miscellaneous
- Non-proportional reinsurance

As part of the proportionality principle, short-term insurers and reinsurers can also use a prescribed best estimate percentage to calculate technical provisions and the underwriting risk SCR (SA QIS3 Part 1 2013:71 and SA QIS3 Part 5 2013:53).

The results of SA QIS3 were excluded for the purpose of the study, as it was not available at the time of completion of the literature review. The next section includes a discussion of the difficulties experienced by insurers with the implementation of Solvency II in Europe.

3.7. PROBLEMS EXPERIENCED WITH THE PREPARATION FOR AND SOLVENCY II IMPLEMENTATION

The insurance industry started with the preparation for implementation of Solvency II in 2004 and encountered challenges with the preparation for implementation of

Solvency II. The insurers in the UK and Europe experienced a number of challenges with the preparation for the implementation of Solvency II, which can be grouped into the availability of core skills, data architecture, and continued compliance with the Solvency II requirements. The groups are discussed in more detail in the next paragraphs.

3.7.1. Availability of core skills

The short-term insurer needs to appoint an actuary in terms of the Pillar II requirements, but also needs people with modelling skills to assist in either implementing the standard formula, the hybrid approach or in developing their own internal models. An article by Guy Carpenter (GCCapital Ideas 2011) highlights that firms experienced a shortage of actuarial staff and had to increase salaries by up to 20% to attract and retain skilled personnel for the Solvency II project. In an article on the cost of implementing Solvency II in the UK, it was pointed out that the larger insurers in the UK estimated the cost to implement Solvency II would be GBP 200 million, and 65% of the cost would be towards information management (Actuarial Post 2013).

3.7.2. Data architecture

The short-term insurers may also need to make significant changes to their current data architecture to meet the regulatory data requirements. The current data architecture may be inappropriate, which may increase the demand for skills in terms of the ability to design, develop, and implement a data architecture that meets the regulatory requirements. The new data architecture may require changes to hardware, risk applications, interfaces between the various product systems and the risk applications to limit manual intervention in data and projects to enhance the accuracy and completeness of data. The estimated compliance spent on Solvency II for the large insurers in the UK exceeds GBP 200 million each with approximately 65% allocated towards new technology (Actuarial Post 2013).

SCR can be calculated by using the standard approach, the internal model approach, or a partial modelling approach. Partial modelling can be applied to the whole

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business of insurance and reinsurance undertakings, or only to one or more major business units. Insurers and reinsurers can develop their own internal models for the calculation of SCR. The internal models can then be used to calculate SCR after the application for the use of the internal model had been approved by the supervisor.

The FSA (2011:12) indicated in the thematic review that the insurer or reinsurer will have to provide documentary evidence to convince the supervisor that the internal model must be widely used by the insurer and reinsurer. The FSA further indicated the risk management function of the insurer and reinsurer must be involved in the design, implementation, validation, evaluation, and documentation of the internal model. The insurers and reinsurers must also conduct their ORSA, which must further be performed regularly, especially after any significant change in the risk profile, by using the internal model (FSA 2011:14).

The FSA has highlighted in a thematic report on the internal model approval process (FSA 2011:7, 8) the importance of having proper data architecture, which includes a comprehensive data policy, approved by senior management, on data quality and data updates. The FSA further indicated that insurers should ensure data integrity by design as the availability, quality, and traceability of data are critical for internal model approval. The SAS institute Inc. (2012:7) issued a White Paper, in which the organisation discussed the importance of taking a strategic approach and ensuring that a comprehensive data governance structure that reaches across the organisation, covering all systems and establishing a decision making mechanism that transcends silos.

To meet the Solvency II data requirements, insurers need to define asset data in the form of new data fields, new data coding conventions, greater granularity of data and increased frequency of reporting (KPMG 2012:8). KPMG (2012) also indicated in the report that insurers who had developed an integrated process for the capture, storage and processing of data within the organisation, without gaps or inconsistencies in the way the data was sourced, controlled, defined, or used were better prepared to meet the data requirements. An integrated process would include a data management, structure and quality controls and assessments. The FSB (2011:15) also indicated that insurers who presented a comprehensive data policy

alongside an IT solution were better prepared. Data quality is regarded as a key area for the successful introduction of Solvency II (FSA 2011:16).

In an article by the Insurance Governance Leadership Network (IGLN) (IGLN Viewpoint 2012), it was highlighted the Pillar III reporting requirements to the regulators are more granular than required by management and for investors. The ORSA development is also reliable in terms of the improvement on information management (IGLN Viewpoint 2012). Davidson (2013) reports as insurers in the UK and Europe move from the preparation for Pillar I and Pillar II to Pillar III, the regulatory authorities require more information than was applicable under Solvency I and also at a higher frequency. He further indicates that some of the data requirements are ambiguous and is difficult to interpret which information should be included in some of the reporting templates. Davidson (2013) also noted more data was required from asset managers than previously supplied or required.

3.7.3. Compliance and maintenance

Further cost implications will include the on-going compliance with the regulatory capital requirements and the ability to raise the prescribed amount and tiers of capital. Lloyd's of London expected to spend GBP 250 million on implementation and further annual on-going Solvency II-related expenses of between GBP 60 to GBP 70 million. The article further indicated that the cost of maintaining the required levels of capital will rise when compared to the Solvency I requirements. As Solvency II is risk-based, the capital requirements differ per line of business and are based on the QIS 5 data for non-life insurers, and the capital requirements for non-proportional lines are more than five times higher and for vehicle insurance more than twice when compared with the Solvency I requirements (GCCapital Ideas 2011).

The SA QIS1 report has highlighted the number of months used by participants in the project. A large number of short-term insurers have not participated in SA QIS1 and will have to go through the preparation phase.

Insurers experienced a number of challenges to prepare and implement Solvency II in the UK. These challenges can be grouped into the availability of skills, data architecture, and the cost to implement and comply with the Solvency II

requirements. The short-term insurer may have to appoint people with modelling skills to either develop internal models or calibrate the standard models as prescribed by the capital adequacy directive. The models are used to calculate the regulatory capital requirements for underwriting risk, market risk, credit risk, and operational risk. Short-term insurers are also required to appoint actuaries.

Short-term insurers may also need to make significant changes to their current data architecture to meet the regulatory data requirements. The current data architecture may be inappropriate which may increase the demand for skills with the ability to design, develop, and implement a data architecture that meets the regulatory requirements. The new data architecture may require changes to hardware, risk applications, interfaces between the various product systems and the risk applications to limit manual intervention in data and projects to enhance the accuracy and completeness of data. Further cost effects may be the on-going compliance with the regulatory capital requirements and the ability to raise the prescribed amount and tiers of capital.

3.8. DISSENTING VIEWS

Opponents to the new Solvency II regulatory framework are quick to point out that, even as the 2007 financial crisis unfolded and in its aftermath, the insurance industry emerged largely unscathed. The noticeable exception was the American Insurance Group (AIG), which had a division that was involved in activities closely related to the banking industry and not to the traditional insurance activities. The literature also indicates that, although insurers participate in the global economy, their risks remain largely local (OECD 2011).

Vivian (2007) is of the opinion that the new capital adequacy requirement started by the Financial Conditional Reporting (FCR) regime, which was the precursor of the SAM, is conceptually flawed as shareholder capital is largely irrelevant to the well-being of a short-term insurer. As long as premiums received by the short-term insurance company exceed the costs of running the company, the company will exist indefinitely, without capital needed from shareholders (Vivian 2007).

In an article by Interim Partners (2011), 90% of senior financial executives indicated they expected that the implementation of Solvency II would reduce the choice in the insurance markets. The opinion of the senior executives was that insurers would be encouraged to exit business lines that are no longer profitable to them as they have to hold capital requirements for those lines in terms of the Solvency II capital requirements. The article further concluded that this would lead to an increase in premiums as the result of reduced competition and higher cost to provide cover in the business lines. Interim Partners (2011) also indicated that participants in the survey predicted an increase in mergers and acquisitions of insurers.

Based on the aforementioned, it can be deduced that an unintended consequence of the new capital adequacy regime may be an increase in mergers and acquisitions or even the demise of small and medium short-term insurers as a result of the increased cost to implement and comply with the SAM requirements. Short-term insurers may also exit unprofitable business lines due to the Pillar I requirement to calculate a solvency capital requirement per line of business for the underwriting risk module.

3.9. CONCLUSION

The insurance industry fulfils an important role as a provider of pooling and transferring of risk by application of the law of large numbers, which in turn also facilitates economic activity. The financial stability of the insurers is important to ensure that the providers of insurance can continue to fulfil their role and obligations, but also to protect the purchasers of their products and services.

The ability of short-term insurers to absorb significant unforeseen losses is important. This ability is measured by the valuation of insurance liabilities and the calculation of a regulatory capital charge to absorb the losses when necessary. This chapter gave a brief overview of the role of the regulators and the capital adequacy regimes that are being implemented to regulate the capital adequacy requirements of short-term insurers.

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The items in the balance sheet of the short-term insurer illustrate that the insurance model affects both sides of the balance sheet (see paragraph 3.3.). The calculation of the technical provisions on the liability side of the balance sheet for regulatory capital purposes is used to protect the pool to ensure the sustainability of short-term insurers.

Short-term insurance premiums are invested in different asset classes, which are exposed to market risk caused by changes in prices and interest rates, which can not only adversely influence the value of the individual investments, but also the total portfolio (see paragraph 2.11.2). The issuers of the securities can however also default on their obligations to repay the capital or interest, which also have an adversely effect on the value of the investments, which expose the short-term insurer to credit risk (see paragraph 2.11.3.).

Insurers experienced a number of challenges to prepare and implement Solvency II in the UK. These challenges can be grouped into those related to the availability of skills data architecture and the cost to implement and comply with the Solvency II requirements (see paragraph 3.7.2.).

The short-term insurer may have to appoint people with modelling skills to either develop internal models or to calibrate the standard models as prescribed by the capital adequacy directive. The models are used to calculate the regulatory capital requirements for underwriting risk, market risk, counterparty default risk, and operational risk. Short-term insurers are also required to appoint actuaries (see paragraph 3.4.7.).

Short-term insurers may also need to make significant changes to their current data architecture to meet the regulatory data requirements (see paragraph 3.7.2). The current data architecture may be inappropriate, which may increase the demand for skills in terms of the ability to design, develop, and implement a data architecture that meets the regulatory requirements. The new data architecture may require changes to hardware, risk applications, interfaces between the various product systems and the risk applications to limit manual intervention in data and projects to enhance the accuracy and completeness of data.

Further cost implications may include the on-going compliance with the regulatory capital requirements and the ability to raise the prescribed amount and tiers of capital.

Based on the aforementioned, it can be deduced that an unintended consequence of the new capital adequacy regime may be an increase in mergers and acquisitions or even the demise of small and medium short-term insurers as a result of the increased cost to implement and comply with the SAM requirements. Short-term insurers may also exit unprofitable business lines due to the Pillar I requirement to calculate a solvency capital requirement per line of business for the underwriting risk module.

Chapter 3 concluded the review of the literature. Chapter 4 covers the research methodology that will be followed for the empirical component of the study.

CHAPTER 4

RESEARCH METHODOLOGY

4.1. INTRODUCTION

The insurance concept was introduced in the literature review and highlighted the importance of insurance as a provider of the pooling and transfer of risk, facilitates economic activity (CEA 2010:13). The International Association of Insurance Supervisors (IAIS 2011:3) argues that the insurance industry should be closely regulated to ensure the sustainability of industry, and to protect the end-buyers of insurance products and services. The insurance regulators have introduced Solvency II as the new regulatory regime for insurers with an implementation date in 2016 (EU Statement 14/61 2014) in Europe and the United Kingdom, with South Africa who will implement the Solvency and Assessment Management regime, which is based on Solvency II in 2016 (SAM Update 2013:8).

Although there appear to be consensus that the insurance industry must be regulated, scholars and practitioners have concerns of the effect that the new solvency requirements may have on the small and medium insurers (ECB 2007:39 and Vivian 2007:1). The head of the Prudential Regulatory Authority of the United Kingdom also expressed concerns with the mounting cost to implement Solvency II and estimated the cost for the UK insurers at GBP 3 billion (Gray 2013). The literature review identified obstacles encountered by the insurers in Europe and the UK with the preparation and implementation of Solvency II. The purpose and research objectives of the study are discussed in the next section.

4.2. RESEARCH PROBLEM AND OBJECTIVES

The literature confirmed the importance of the role of insurance in the economy, the need for insurance and the number of concerns with the implementation of Solvency II in Europe and the UK. South Africa is implementing SAM, which is based on the

Solvency II regime and the problem this study examines is the impact that SAM may have on the short-term insurance industry in South Africa. The problems experienced with the implementation of Solvency II are summarised as follows:

4.2.1. The cost of implementing and compliance with the new solvency assessment and management regime

The cost to implement Solvency II and SAM is driven by a number of factors such as the appointment of people with the required skills and the changes that need to be made to information technology, which would include changes made to the data and physical architecture. A factor that may affect the cost structure of the short-term insurer is the availability of key skills. The short-term insurer may have to appoint people with modelling skills either to develop internal models or to calibrate the standard models as prescribed by the capital adequacy directive (GCCapital Ideas 2011). Short-term insurers are also required to appoint actuaries (SII Directive L335 2009:35). The models are used to calculate the regulatory capital requirements for underwriting risk, market risk, credit risk, and operational risk. Short-term insurers may also need to make significant changes to their current data architecture to meet the regulatory data requirements (Actuarial Post 2013). The current data architecture may be inappropriate, which may increase the demand for skills with the ability to design, develop, and implement a data architecture that meets the regulatory requirements. The new data architecture may require changes to hardware, risk applications, interfaces between the various product systems and the risk applications to limit manual intervention in data and projects to enhance the accuracy and completeness of data (SAS 2012:7). Further cost implications may be the on-going compliance with the regulatory capital requirements and the ability to raise the prescribed amount and tiers of capital.

4.2.2. The appropriateness of the (SAM) regime for short-term insurers in South Africa

According to Jacobs and Van Vuuren (2013:316), the capital adequacy regime may be appropriate for a short-term insurer but may not reduce the systemic risk as

regulators run the risk of focusing on the detail and in doing so, lose sight of the macro-prudential picture.

4.2.3. Sustainability of small and medium short-term insurers in South Africa

An unintended consequence of the new capital adequacy regime may be an increase in the acquisitions and mergers, or even the demise of small and medium short-term insurers. The implementation of the new regulatory regime may also increase the premiums of short-term insurance in South Africa (ECB 2007:39).

A number of different research designs could be used for scholarly research. The different research designs and the selection of the appropriate design for this study are discussed in the next section.

4.3. THE RESEARCH DESIGN PROCESS

Creswell (2009) describes research designs as “plans and procedures” that cover the decisions from broad assumptions to detailed methods of data collection and data analysis to develop and form a conclusion. He further indicates that such plans include a number of decisions, including which design to use to study a topic. According to Kumar (2011:94), the researcher decides and communicates to others through the research design of the study, the method for collecting the information, selection of the respondents and the way by which the collected data will be analysed and the findings reported. Figure 4.1 summarises the process that was followed with the conceptualisation and design of this study.

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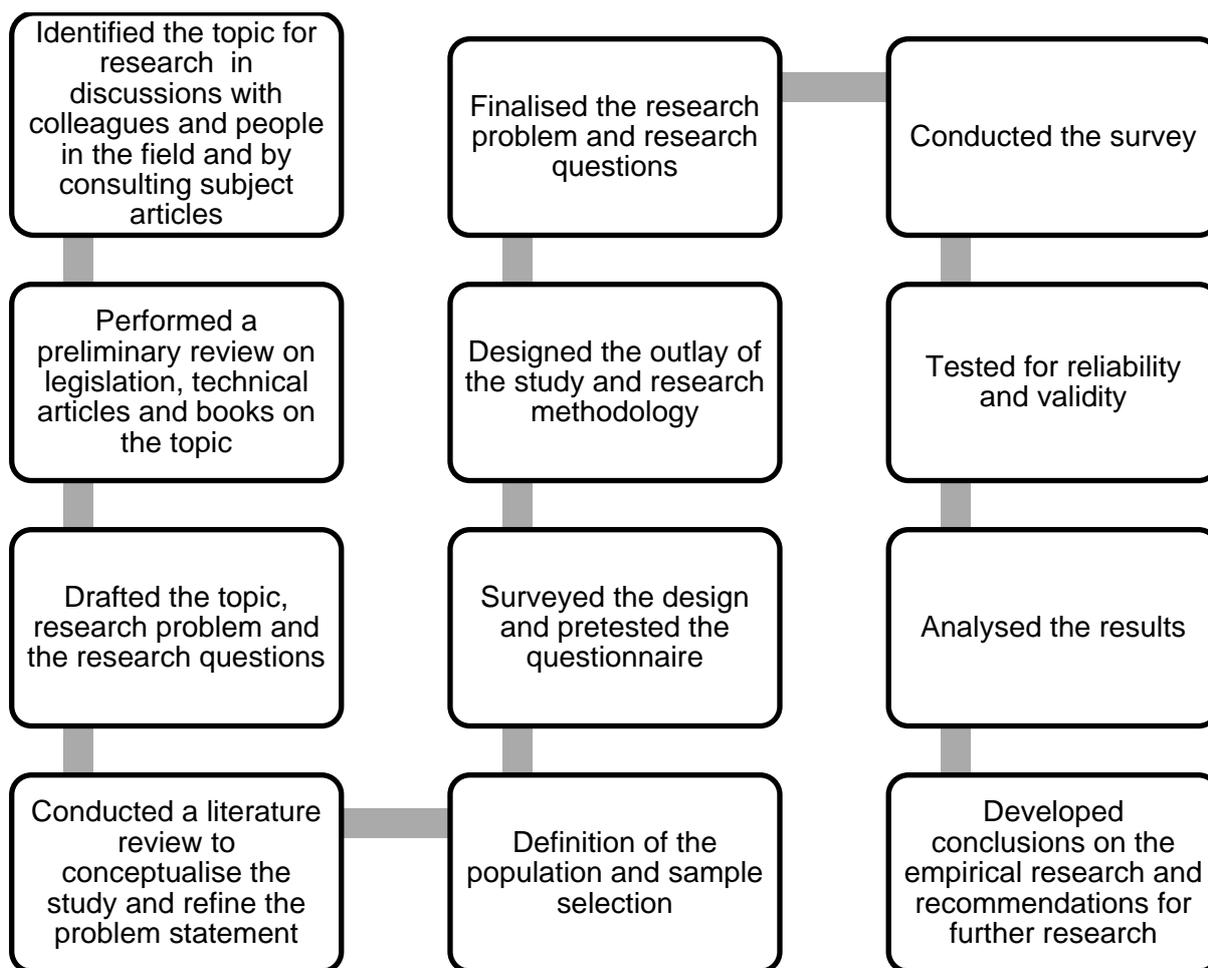


Figure 4.1 Overview of the research process followed.

4.3.1. Research paradigms

Slife and Williams (1995 as cited by Creswell 2009) note that the research design is influenced by the underlying philosophical paradigms or ideas. Creswell (2009) summarises the philosophical paradigms or views as “post-positive, social construction, advocacy/participatory and pragmatic”. He also indicates that the appropriate paradigm for a scholarly study will inter alia be influenced by the area of the discipline of the scholar. He describes the post-positive paradigm, which is also named the “scientific method”, as the traditional form of research and this form holds more true for quantitative than qualitative research. Phillips and Burbules (2000:26) indicate that post-positivism challenges the notion of the absolute truth of knowledge. They note that the post-positivism philosophy is deterministic in the need to identify and assess the causes that influence outcomes and it is also reductionist as the

intent is to reduce a broad set of ideas into smaller and discrete variables that consist of hypotheses and research questions.

Creswell (2009) describes social construction where individuals seek understanding of the world and in doing so develop subjective meanings of their experiences. He notes that the goal of research within this paradigm is to rely on the views of the participants of the situation under study and that is seen as an approach to qualitative research. The advocacy/participatory paradigm assume that the research objective should include politics and the political agenda (Creswell 2009). Creswell also notes that this type of research may involve participants in the design of the questions, collection of data, and the analysis of the information and may include the benefits of the research. The last paradigm described by Creswell (2009) is pragmatism, which arises out of the actions, situations or consequences rather than the antecedent conditions as is the case with post-positivism. Taatila and Raij (2011:3) describe pragmatism as an action-oriented philosophy of science, which studies the link between action and truth and practice and theory. Creswell (2009) further notes that researchers focus on the research problem and use all approaches available to understand the problem.

Based on the review of the research paradigms, the post- positive paradigm, or the “scientific method”, is the most appropriate research paradigm for the purpose of this study. The next phase of the research design process is to determine the most appropriate research design for this study, which is discussed in the next paragraph.

4.3.2. Research design

Creswell (2009) indicates that scholars can use three research designs, namely quantitative, qualitative, and mixed methods. Remler and Van Ryzin (2011:57–58) note that qualitative research involves different kinds of non-numerical data, which would, for example, consist of interviews, written texts or documents, visual images and observations. They indicate that qualitative analysis relies on the fact that the objects under investigation are human beings, and that language provides a unique insight into the thoughts, experiences, and motivations of the participants being studied. They further note quantitative research uses instruments, for example

structured questionnaires that produce measurements or numerical data that describes different characteristics, behaviours, attitudes and observable data such as currency and equity prices published on an exchange. Creswell (2009) describes mixed methods research as a combination of qualitative and quantitative approaches.

The problem that the current study examined was the impact of the implementation of SAM on the South African short-term insurance industry. The study does not involve humans as the objects under study, but was designed to analyse the perceptions of the participants of the impact that SAM may have on the short-term industry in South Africa, and the qualitative research design was regarded unsuitable for the purpose of this study.

Creswell (2009) recommends the use of the quantitative approach in studies where the factors that may influence an outcome have to be identified, or where an understanding of the best predictors of outcomes has to be gained. He further notes that quantitative studies use theory deductively and place the literature review towards the beginning of the study with the objective of testing or verifying a theory rather than developing it, and the theory then becomes the framework for the study that organises the research questions and the data collection procedure.

The quantitative approach is the most appropriate for the current study as the literature relevant to Solvency II, Basel II and SAM was reviewed to identify the research problem and to provide the framework to determine the research objectives and questions. The next phase of the research design process is to determine the most appropriate quantitative research method for this study, which is discussed in the next paragraph.

4.3.3. Quantitative research design

Salkind (2012:10) indicates that quantitative research can be classified into experimental and non-experimental research design. Remler and Van Ryzin (2011:347) indicate, with experimental design, the researcher endeavours to change a situation, circumstances, or the experiences of the participants, which may lead to a change in the behaviour of the participants or subject under study, but by having a control group where the circumstances or data are fixed. Salkind (2012:10) notes, in

contrast to experimental research, non-experimental research does not manipulate the situation, circumstances or the experiences of the participants or subjects.

As SAM has yet to be implemented by the short-term insurers in South Africa, the experimental research design, based on the description provided by Remler and Van Ryzin (2011:347), will not be appropriate. A non-experimental research design appears to be the most appropriate for this study. The data collection methods are discussed in the next paragraph.

4.3.4. Data collection

Sekaran and Bougie (2013) indicate that data can be collected from different sources. They highlight two sources of data, namely primary data, which they describe as information obtained by the researcher for the specific purpose of a study and secondary data as information obtained from sources that already exist. Primary and secondary data is described in more detail in the next paragraph.

- **4.3.4.1. Sources of data**

Sekaran and Bougie (2013) identifies the sources for primary data collection as focus groups, panels, and unobtrusive measures. They describe focus groups as a team of eight to ten members with a moderator who leads the participants in a discussion on a topic. Members are chosen for their expertise and the aim of the session is to obtain their opinions, interpretations, and impressions on the topic. Sekaran and Bougie (2013) indicate that focus groups can be used for exploratory studies, making generalisations based on the information generated during a session, and for conducting sample surveys. They indicate that panels meet more than once and are useful where interventions and changes need to be studied over a period. Unobtrusive measures do not involve people and an example highlighted by Sekaran and Bougie (2013) is the wear and tear of journals in a university library as an indication of their frequency of use or popularity.

According to Sekaran and Bougie (2013), sources of secondary data consists of information obtained from sources such as books, government publications, economic indicator, the media, and annual reports of companies.

SAM will only be fully implemented in 2016 (SAM Update 2013:8) and as the South African short-term insurers are still preparing to implement SAM, primary data has to be created for the purpose of this study. The methods that can be used to collect primary data are discussed in the next paragraph.

4.3.4.2. Primary data collection methods

Sekaran and Bougie (2013) identified the main data collection methods as interviews, observation, questionnaires, and unobtrusive measures.

- **Interviews**

Sekaran and Bougie (2013) indicate that interviews can be face-to-face, telephone, computer assisted interviews and interviews through electronic media. They further indicate that interviews have the advantage of flexibility as questions can be changed as the interview proceeds the benefit comes at the cost of time and energy. Interviews can be structured or unstructured. Structured interviews are conducted when the information required was predetermined and unstructured when the interviewer does not necessarily have a planned sequence of questions for the interview Remler and Van Ryzin (2011:63). Although interviews could be appropriate for this study, time is a constraint and another data collection method may be more appropriate.

- **Observation**

Sekaran and Bougie (2013) describes observation as watching what the people, whether it is for example workers, traders, clerks do, and describing, analysing and interpreting what has been observed. Observation is deemed inappropriate for the purpose of this study as SAM has not been implemented, nor will it be practical to observe how short-term insurers are implementing SAM.

- **Questionnaires**

Sekaran and Bougie (2013) defines questionnaires as a pre-formulated written set of questions, which are answered by the respondents. They further indicate that

questionnaires are less expensive to administer and time consuming than interviews and observation, but may experience a high nonresponse rate.

- **Unobtrusive measures**

Unobtrusive measures do not involve people Sekaran and Bougie (2013). They also indicate that annual financial statements can be used, but as SAM has not been implemented, unobtrusive measures are not deemed appropriate for the purpose of this study.

The use of a questionnaire is deemed the best option to collect the data based on the analysis of the primary data collection methods. The design of the questionnaire is discussed in the next paragraph.

4.4. QUESTIONNAIRE DESIGN

Groves, Fowler, and Couper et al. (2009) point out a survey moves from design to execution, and that a survey consists of two parts. The first part comprises the measurement of the constructs and the second part of the descriptions of the population attributes. Groves et al. note the measurement part describes which data must be collected about the units in the sample and in the second part, the “what population” is described by the survey and the importance of survey design is emphasised. Trobia (2008) indicates the questionnaire consists of three parts, where the first part consists of the covering letter, the second part of the instructions and the third part of the actual questions. He indicates the covering letter explains the purpose of the research, guarantees the confidentiality and anonymity of the respondents and the arrangements or contract between the researcher and the respondent. The design of the questions will be influenced by the type of measurements or scales that can be used and the selection of scales will be discussed in the next paragraph.

4.4.1. Selection of scales

According to Sekaran and Bougie (2013), researches can use different types of measurements or scales to classify data. They define a scale as a tool or

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mechanism to determine how respondents differ from each other on the variables of a study. The types of scales identified by Sekaran and Bougie (2013) are the nominal, ordinal, interval, and ratio. The properties of the scales are summarized in Table 4.1.

Table 4.1. Summary of scale properties

SCALE	DIFFERENCE	ORDER	DISTANCE	UNIQUE ORIGIN	MEASURE OF CENTRAL TENDENCY	MEASURE OF DISPERSION
Nominal	Yes	Yes	No	No	Mode	-
Ordinal	Yes	Yes	No	No	Median	Standard deviation, variance and coefficient of variation
Interval	Yes	Yes	Yes	No	Arithmetic mean	Standard deviation or variance of coefficient of variation
Ratio	Yes	Yes	Yes	Yes	Arithmetic and geometric mean	

Adapted from Sekaran and Bougie (2013)

Sekaran and Bougie (2013) indicate that the columns of the table can be interpreted as follows:

- scale: the type of scale – nominal, ordinal, interval, or ratio.
- difference – categories or groups.

- order – rank order of the categories.
- distance - indicates the magnitude of the differences between points on the scale.
- unique origin – indicates that the ratio scale has a natural origin “0”, which is meaningful as it is not an arbitrary starting point (Remler & Van Ryzin 2011:126).
- measure of central tendency. The measures of central tendency are the mean, the median, and the mode (Sekaran & Bougie 2013).
- measure of dispersion. The measures of dispersion are the range, the variance, and the standard deviation (Sekaran & Bougie 2013).

The nominal scale enables respondents to assign subjects into certain categories or groups without any inherent order to them, for example male and female (Remler & Van Ryzin 2011:127). The nominal scale gives basic information per category and the mode as a measure of central tendency (Sekaran & Bougie 2013). The nominal scale does not provide any information on the order, distance, unique origin, or measure of dispersion (Sekaran & Bougie 2013).

The ordinal scale categorises variables to indicate differences among the various categories and rank orders the categories in a meaningful way (Remler & Van Ryzin 2011:127). The ordinal scale however does not indicate the magnitude of differences in the ranking of the objects (Sekaran & Bougie 2013). The ordinal scale produces the median as a measure of central tendency and the standard deviation, variance and coefficient of variation as measures of dispersion (Sekaran & Bougie 2013).

Over and above the properties of the ordinal scale, the interval scale enables the measurement between any two points on the scale, which enable the calculation of the arithmetic mean as a measure of central tendency and the standard deviation variance and coefficient of variation as measures of dispersion (Remler & Van Ryzin 2011:126; Sekaran & Bougie 2013).

The ratio scale is the most sophisticated scale as not only has all the properties of the other scales, but it measures the magnitude of the differences between the points in the scale and the properties in the differences, and has an unique zero point (Remler & Van Ryzin 2011:127; Sekaran & Bougie 2013).

Sekaran and Bougie (2013) indicate that the scaling techniques can be classified into rating and ranking scales. Rating and ranking scales are discussed in the next paragraph.

4.4.2. Rating scales

Sekaran and Bougie (2013) describes a ranking scale as a scale where each object is scaled independently of the other objects under study and the ranking scale is used when comparisons are to be made between objects, where the preferred choices need to be ranked. Garson (2012) identified the Guttman, Mokken, and Likert scales, which can be used as rating scales

- **Guttman scale**

DeVellis (2012:87) describes the Guttman Scales as a unidimensional series of items focussing on progressively higher levels of an attribute. Garson (2012) points out that the application of the Guttman scale is limited when the phenomenon of interest is not concrete as the Guttman scale are criticized as too stringent and deterministic. The Guttman scale was not regarded as appropriate for this study as SAM is still being implemented.

- **Mokken scale**

Garson (2012) indicates that Mokken scales are similar to the Guttman scale, but is regarded as probabilistic, and can so overcome the limitations of the Guttman scales.

- **Likert scale**

DeVellis (2012:93) indicates that the use of a Likert-type scale questionnaire is widely used to capture and measure opinions, beliefs and attitudes. Weathington et al. (2012:191–192) indicate that the Likert-type scale format is one of the most popular options for a closed-response format questionnaire as it offers a clear and unambiguous scale of measurement and the same format can be used for different questions. They further note that a benefit is that the responses to multiple questions can be combined to calculate an overall or average score. They highlight the other benefits of using a Likert-type scale as offering a clear and unambiguous ordinal

scale of measurement and that the researcher can use the same format for many different questions. Boslaugh (2013:145) indicates that the Likert-type scale as a “classic” ordinal scale as “strongly agree” represents more agreement than “agree” and “agree” more agreement than “disagree”. Brill (2008) describes a Likert-type scale as a multi-item measure with each item in a Likert-type scale referred to as a “Likert item” and the response categories of a Likert item, a “Likert response set”. He further indicates that true Likert items use a symmetrically balanced ‘agree–disagree’ continuum for individual labelled response choices. Dykema, Blixt and Stevenson (2008) indicate data from Likert scales can be treated as ordinal data, the results can be analysed with the use of nonparametric tests.

DeVellis (2012:93) indicates the use of a Likert scale based questionnaire is widely used to capture and measure opinions, beliefs, and attitudes. DeVellis is supported by Boslaugh (2013:145), who indicates a Likert-type scale can be used to measure opinions, attitudes, and perceptions where no natural metrics exist. The use of a Likert-type questionnaire seemed to be the most appropriate for the purposes of this study.

A questionnaire will be designed for the current study as appropriate questionnaires that would have met the purpose of the study were not available. The literature review identified a number of problems that can be divided into themes or constructs, experienced by the participant insurers with the preparation for the implementation of Solvency II. The constructs are discussed in the next paragraph.

4.4.3. Constructs

Groves et al. (2009) describe a construct as the elements of information sought by the researcher. The literature review identified obstacles encountered by the banking industry with the preparation of Solvency II implementation in Europe. The constructs are discussed in more detail below.

4.4.3.1. Construct 1: Availability of core skills

The availability of core skills was identified as an obstacle in the literature review IT skills to produce the data needed to meet the SAM implementation deadline and actuarial skills to meet the SAM requirements.

4.4.3.2. Construct 2: Data architecture

The construct with regard to the data architecture covers various aspects such as the data definitions, completeness, and accuracy of data. The design of the infrastructure is also important as it is a requirement that no manual transferring or manipulation of data is allowed, which may require to the upgrade or redesign of the IT infrastructure.

4.4.3.3. Construct 3: Cost of implementation and compliance

The construct relates to the cost of implementation and compliance in terms of the cost involved to implement SAM, the effect of the cost structure to ensure compliance with SAM in the future and whether additional capital would be required to meet the SAM Pillar I requirements.

4.4.3.4. Construct 4: Appropriateness for the short-term industry

The construct with regard to the appropriateness of SAM for the short-term insurance industry relates to the appropriateness for the firm and then the appropriateness for the industry.

4.4.3.5. Construct 5: Risk management

The risk management construct relates to the improvement of risk management for the firm and the reduction of systemic risk in the short-term insurance industry.

4.4.3.6. Construct 6: Potential impact on the short-term insurance industry

The construct relates to the potential increase in mergers and acquisitions among short-term insurers, the demise of small and medium short-term insurers, cost outweighing the benefits derived from SAM, an increase in premiums and the reduction of coverage available.

The constructs or elements of information needed from participants in SAM were informed by the literature review. The constructs need to be informed by asking specific questions from the participants in the implementation of SAM. The questions or measurements are discussed in the next paragraph.

4.4.4. Question design and development

The measurements included in the questionnaire related to the questions to gather information about the constructs (Groves et al. 2009). A number of measurements or questions were designed to gather the necessary data from participants in the study for analysis. Holyk (2008) identified the criteria that can be considered when developing questions for research purposes, namely:

- The purpose of the questionnaire should be clear. Holyk (2008) also indicates that the developer of the questionnaire should identify the information that must be obtained from the questionnaire at the beginning of the design.
- Questions should be specific and direct to ensure that the information needed for the study is obtained. The questionnaire should be user-friendly. This is supported by Olson (2008), who adds that the language should be simple and should not include complex syntax and the questions should be tailored for the group of respondents. Holyk (2008) further recommends that questions should be kept short and simple and questions with the following characteristics should be avoided:
 - Double-barrelled questions, which would force two decisions in one. Olson (2008) indicates that a double-barrelled question covers more than one construct in a single survey question and points out that statements aligned to two different constructs are also regarded as double-barrelled. A one-and-a-half-barrelled question, where the question asks about one construct in the wording, but a second construct is introduced through the response options. Olsen warns that double-barrelled questions can lead to higher rates of non-response and unstable attitudes.
 - “Double negative questions” refers to the use of two negatives in one statement or question. Wolf (2008) indicates that a double negative creates confusion in the mind of respondents and can further make it for the

researcher to determine accurately with what the respondent agreed or disagreed. He further notes that double negatives also increase measurement error as double negative questions lead to item non-response and misunderstanding of the questions.

- Leading questions, which incorporate the preferred outcomes or biases of the researcher. Weathington et al. (2012:195) support the neutrality of statements and questions and indicate that the researcher must avoid using a biased tone.
- Hypothetical questions, which lack context or require too much scrutiny from respondents,
- Questions with long lists. Roe (2008) notes that questions should be as short as possible and that question stems should be succinct and complex issues should be broken up into separate questions to avoid the creation of double-barrelled questions.
- “User-friendliness” refers to the practicalities of implementing and using a questionnaire, including ease to administer, score, and interpret and the resources needed to implement the questionnaire.
- A study is reliable if similar results would be obtained by others using the same questions and using the same sampling criteria.
- A study also needs to be valid and should actually measure what it sets out to measure.

A number of questions were designed to gather more information and inform the identified constructs. The questions were developed with the criteria, discussed above in mind, and incorporating the suggestions made by participants in the pre-test of the questionnaire. The questions were written in the first person as three participants in the pre-test indicated that they were uncertain whether the original questions referred to the industry in general, or to a specific insurer. The pre-test for reliability and validity is discussed in paragraph 4.4. The purpose behind the questions was to gather information on the specific insurer and the questions were changed accordingly. The questions are discussed in the next paragraph.

4.4.4.1. Construct 1: Availability of core skills

The availability of core skills was identified as a possible obstacle with SAM implementation. According to Hewitt (2012), most of the large short-term insurers participated in the quantitative impact studies, with a small number of medium and small insurers. A shortage of the skills may lead to an increase in salaries as people with the prerequisite skills may have to be appointed from competitors, or short-term insurers may have to appoint consultants to assist with the preparation and implementation of SAM. The three core skills identified in the literature review related to modelling skills, IT skills, and actuaries. The purpose of the three questions was to gain an understanding among the participants of the ability to appoint people with the prerequisite skills.

Question 1

It is easy to acquire people with the prerequisite modelling skills to meet the SAM implementation deadline.

Question 2

It is easy to acquire people with the prerequisite IT skills to produce the data needed to meet the SAM implementation deadline.

Question 3

It is easy to acquire people with the actuarial skills to meet the SAM requirements.

4.4.4.2. Construct 2: Data architecture

Changes to the way the data architecture is designed and managed had a significant impact on the banks with the Basel II implementation and the European and UK insurers in their preparation for Solvency II. The purpose of the questions was to gain an insight into the changes required by the insurers especially where insurers did not participate in the quantitative impact studies.

Question 4

The current IT systems of the short-term insurance company I am involved in require the minimal manual intervention (e.g. Excel spreadsheets) to calculate the statutory requirements e.g. IBNR, UPR, and SCR.

Question 5

The data definitions of the systems in the short-term insurance company I am involved in need minimal adjustment to meet the SAM data requirements.

Question 6

All the data required to calculate the SCR in the short-term insurance company I am involved in, is readily available.

Question 7

The available data to calculate the SCR in the short-term insurance company I am involved in are accurate and need the minimum adjustment.

Question 8

The current systems in the short-term insurance company I am involved in need minimal changes to support the implementation of SAM.

4.4.4.3. Construct 3: Cost of implementation and compliance

The questions related to the cost of implementation and compliance in terms of the cost involved to implement SAM, the effect of the cost structure to ensure compliance with SAM in the future and whether additional capital would be required to meet the SAM Pillar I requirements.

Question 9

The cost to implement the SAM requirements will have a minimal impact on the short-term insurance company I am involved in.

Question 10

The continued compliance with the SAM requirements will have a minimal impact on the cost structure of the short-term insurance company I am involved in.

Question 11

The short-term insurance company I am involved in will have sufficient capital to meet the SCR and MCR on the envisaged SAM implementation date.

4.4.4.4. Construct 4: Appropriateness for the short-term industry

The construct with regard to the appropriateness of SAM for the short-term insurance industry related to the appropriateness for the firm and then the appropriateness for the industry.

Question 12

The SAM requirements are appropriate for short-term insurance companies.

Question 13

The SAM requirements are appropriate for the short-term insurance industry in South Africa.

4.4.4.5. Construct 5: Risk management

The risk management construct relates to the improvement of risk management for the firm and the reduction of systemic risk in the short-term insurance industry.

Question 14

The implementation of the SAM requirements will enable the short-term insurance company I am involved in to improve its risk management.

Question 15

The implementation of SAM will reduce systemic risk in the short-term insurance industry in South Africa.

4.4.4.6. Construct 6: Potential impact on the short-term insurance industry

The questions covered the potential increase in mergers and acquisitions among short-term insurers, the demise of small and medium short-term insurers, cost outweighing the benefits derived from SAM, an increase in premiums and the reduction of coverage available.

Question 16

Compliance with SAM requirements will lead to an increase in mergers and acquisitions among short-term insurers in South Africa.

Question 17

Compliance with SAM requirements will lead to the demise of medium to small short-term insurers.

Question 18

Compliance with the SAM requirements will increase the cost of doing business for short-term insurers disproportionately compared to the benefits derived from SAM.

Question 19

Compliance with the SAM requirements will lead to a general increase in premiums for short-term insurance coverage.

Question 20

Compliance with SAM requirements will lead to a decrease in the short-term insurance coverage available in South Africa.

The constructs and questions were developed based on the problems experienced with the implementation of Solvency II as highlighted in the literature review. The use of a Likert-type scale was also identified as the most appropriate for this study. Although a sound theoretical foundation exists for the constructs and questions, the ultimate success of the questionnaire is whether participants in the survey will complete the questionnaire, understand the questions, and select the correct scale to represent their opinion on the question. The questionnaire was pre-tested to determine the validity of the questions in the questionnaire. The process followed to pre-test the questionnaire is and results of the pre-test are discussed in the next paragraph.

4.5. PRE-TEST FOR RELIABILITY AND VALIDITY

Carmines and Zeller (1979:17) indicate that the content or items included in the questionnaire should be relevant to the items under study, clear, concise, and comprehensive. DeVellis (2012:59) describes validity as the adequacy of a scale to measure a specific variable. He has identified three types of validity namely content, criterion, and construct validity. Salkind (2012:123) supports this classification. He describes content validity as the extent to which a test represents the items from

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which it is drawn. He indicates that criterion validity can be described as how well a test estimates present or future performance. Salkind (2012:125) indicates that construct validity refers to how the results of a test are related to an underlying theory that is, to what extent does the test measure what it is designed to measure.

The draft questionnaire was pre-tested to determine its validity by means of a diagnostic questionnaire specifically developed for this purpose (Carmines & Zeller 1979:11). The participants consisted of colleagues of the University of South Africa, the University of the Witwatersrand, industry experts, and a statistician, which brought the number of participants to 8. The diagnostic questionnaire is in Table 4.2.

Table 4.2. Diagnostic questionnaire to test validity

Please circle the number which represents your opinion that the implementation of SAM may have on the South African Short-Term Insurance Industry	Strongly Disagree	Disagree	No opinion	Agree	Strongly Agree
	1	2	3	4	5
1. The objective of the questionnaire is clear.	1	2	3	4	5
2. The instructions to complete the questionnaire are clear.	1	2	3	4	5
3. The questionnaire is structured in a logical manner.	1	2	3	4	5
4. The questions are easy to understand.	1	2	3	4	5
5. The scale of the questionnaire is appropriate.	1	2	3	4	5
6. The questions cover the issues that may affect the short-term insurance industry.	1	2	3	4	5
7. The time in minutes required to complete the questionnaire was ...	0 – 10	10 – 20	20– 30	30 – 40	>40

4.5.1. Validity

The results of the Diagnostic questionnaire are discussed in Table 4.3.

Table 4.3. Results of the diagnostic questionnaire

1	The objective of the questionnaire is clear.	All the participants answered the question. 62% of the participants agreed with the statement and 38% strongly agreed with the statement.
2	The instructions to complete the questionnaire are clear.	All the participants answered the question. 100% of the participants strongly agreed with the statement.
3	The questionnaire is structured in a logical manner.	All the participants answered the question. 100% of the participants agreed with the statement.
4	The questions are easy to understand.	All the participants answered the question. 100% of the participants agreed with the statement.
5	The scale of the questionnaire is appropriate.	All the participants answered the question. 12% of the participants did not have an opinion and 88% agreed with the statement. All the participants agreed that the Likert-type scale was appropriate for this questionnaire.
6	The questions cover the issues that may affect the short-term insurance industry.	All the participants answered the question. 38% of the participants did not have an opinion, 50% agreed and 12% strongly agreed with the statement.

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7	<p>The time in minutes required to complete the questionnaire was between ... minutes.</p> <ul style="list-style-type: none"> • 0 – 10 • 10 – 20 • 20 – 30 • 30 – 40 • >40 	<p>All the participants answered the question. 62% of the participants indicated that they needed between 0 – 10 minutes to complete the questionnaire with 38% indicated they needed more than 10, but less than 20 minutes.</p>
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A few recommendations were made to improve the questions, which were incorporated into the final questionnaire. Based on the pre-test, the questionnaire could be regarded as being valid.

4.5.2. Reliability

Remler and Van Ryzin (2011:118) indicate that reliability refers to the consistency and predictability of a measure. DeVellis (2012:31) confirms that for a scale to be reliable, the scores must represent the true state of the variable being assessed, and is especially important in psychological measurement. DeVellis further indicates that the score of the instrument should not change unless if there has been an actual change in the variable the instrument is measuring. He defines reliability as “the proportion of variance attributable to the true score of the latent variable” (DeVellis 2012:31). Garson (2012) describes reliability as the correlation of an instrument with a hypothetical instrument, which truly measures what it is supposed to be. He further indicates that as the true instrument is not available, reliability can be estimated as follows:

- **Internal consistency**

Garson (2012) notes that internal consistency as an estimation based on the correlation among the variables of the set, for example Cronbach’s alpha coefficient of reliability.

- **Split-half reliability**

Garson (2012) describes split-half reliability as an estimation based on the correlation of two equivalent forms of the instrument, for example, the Spearman-Brown coefficient.

- **Test-retest reliability**

According to Garson (2012), the test-retest reliability estimation is based on the correlation between two or more administrations of the same instrument on different times, locations, or populations, when the two administrations do not differ on other relevant variables, for example the spearman-Brown coefficient.

- **Inter-rater reliability**

Garson (2012) indicates that inter-rater reliability is an estimation based on the correlation of scores between two or more raters who rate the same instrument.

The pre-test of the questionnaire did not include a test for reliability, as the number of people who participated in the in the pre-test was too small for this purpose. The statistician recommended that Cronbach’s alpha coefficient for reliability can be used on the results of the cluster analysis as described in paragraph 4.9.2.

4.6. SURVEY DESIGN

Sekaran and Bougie (2013), Cobanoglu, Ward and Moreo (2001: 441-452), and Groves et al. (2009), indicate that a researcher has a number of choices to administer questionnaires, which ranges from personally or self-administered questionnaires, to mail shots and electronic surveys. The advantages and disadvantages of the three methods are summarised in Table 4.4.

Table 4.4. Advantages and disadvantages of different questionnaire administration methods

COLLECTION METHOD	ADVANTAGES	DISADVANTAGES
Self-administered questionnaires	Ambiguities can be clarified.	Explanations may introduce bias.

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COLLECTION METHOD	ADVANTAGES	DISADVANTAGES
	Cheaper when administered to groups. A higher response rate can be expected as participants can be encouraged to participate. Anonymity of respondents is high.	
Mail	Large geographical reach. Correspondents can respond when convenient. Can be administered electronically.	Questions cannot be clarified. Follow-up is necessary to improve response rate. Response rate normally low – 30% response rate deemed to be acceptable.
Electronic	Easy to administer. Global reach possible. Inexpensive. Respondents can answer when convenient.	Computer literacy essential and respondents must have access to a computer and the internet. Respondents must be willing to participate.

Source: Adapted from Sekaran and Bougie (2013) and Groves et al. (2009)

The identification of the population and sampling technique are discussed in Paragraph 4.8, but based on the advantages of the self-administered questionnaire, combined with the sampling technique, the self-administered questionnaire seems to be the most appropriate for the purposes of this study.

Remler and Van Ryzin (2011:482) indicate that ethical problems can arise during a research project, as participants can be harmed in the process. The ethical principles that were considered the design of this study are discussed in the section.

4.7. ETHICAL CONSIDERATIONS

Weathington et al. (2012:24) define ethics as the process of studying moral standards and examining how these should be interpreted and applied in various situations. They distinguish ethics from morals, which are described as the principles or rules that define what is right and wrong. Weathington et al. (2012) recommend that the researcher should determine whether the actions of the researcher is right or wrong and be able to justify the decision. They further indicate that research on humans is a new phenomenon as previously, research was conducted on topics unrelated to human behaviour or body. Gilman (2008) describes survey ethics as a set of ethical procedures with the purpose to guide researches using surveys. She indicates that no harm should be done to any respondent and the respondent should not be pressured or made to feel obligated to participate in a survey.

According to Burton and Bartlett (2009), the key aspects of the ethical principles that should be applied are informed consent, confidentiality and privacy, honesty and openness, access to findings and avoidance of harm.

4.7.1. Informed consent

Weathington et al. (2012:35) are of the opinion that informed consent is not needed in the case of anonymous questionnaires and surveys. The questionnaire that was used for the purpose of this study was designed in such a way that no personal information of either the employer or the respondents was recorded. Participation was also voluntary.

4.7.2. Confidentiality and privacy

Burton and Bartlett (2009) note that confidentiality with regard to information given and the privacy of respondents is guaranteed through a promise of anonymity. They also indicate that the researcher must consider how the data should be stored after collection, how long the data will be kept, where it will be kept and whether the data can be used in other studies and how research findings may be reported in the public domain. According to Weathington et al. (2012:37), anonymity means that the researcher does not link the data collected with the name of the participant. The

questionnaire that was used for the purpose of the current study was designed in such a way that no personal information of either the employer or the respondents was recorded. Access to paper and electronic records will be controlled to ensure the confidentiality and anonymity of participants. Participation was also voluntary.

4.7.3. Honesty and openness

According to Weathington et al. (2012:35), deception in research means that the researcher is untruthful toward the participants about some important component of the research in which they participate. They also note that deception can be by omission of important facts to the participants or the researcher can mislead the participants on purpose. For the purpose of this study, the cover page of the questionnaire clearly stated the context and purpose of the study and questionnaire.

4.7.4. Access to findings

Burton and Bartlett (2009) highlight the principle of the final report or submission of findings to the respondents. The questionnaire that was used for the purpose of this study was designed in such a way that no personal information of either the employer or the respondents was recorded. Participation was also voluntary. The conclusion of the study will be made available to respondents upon written request.

4.7.5. Avoidance of harm

According to Burton and Bartlett (2009), an assessment should be performed of any harm or benefits that may be caused by the research. The questionnaire that was used for the purpose of this study was designed in such a way that no personal information of either the employer or the respondents was recorded. Access to paper and electronic records will be controlled to ensure the confidentiality and anonymity of participants.

The data will be collected by means of a survey. It was important that ethics were considered in the process that was followed to collect and store the data and that the participants in the survey were protected and for this reason, ethical clearance from the Ethics Board of the College of Economic and Management Sciences was

obtained for this study. The processes followed to select the sample are discussed in the next section.

4.8. SAMPLE SELECTION

According to the Registrar of Short-Term Insurance (STI Registrar 2012:44), 93 short-term insurers were registered at 31 December 2012, and a number of stakeholders are involved with the SAM implementation (SAM Roadmap 2010:6). The use of a sample of the participants in the SAM implementation was regarded as appropriate due to limited resources and time available for this study (Remler and Van Ryzin (2011:145,146).

4.8.1. Sample selection method

According to Remler and Van Ryzin (2011:145), researchers can use non-probability and probability sampling. Examples of non-probability sampling are voluntary, convenience, and purposive sampling. They indicate that participants are recruited to participate in the case of voluntary sampling, and with convenience sampling, the researcher can take advantage of a specific situation to recruit people into the study (Remler & Van Ryzin 2011:153, 154). They describe purposive sampling selecting people with a unique perspective, specific role, or categorisation and is used in qualitative research. Remler and Van Ryzin (2011:157) describe random or probability sampling as using chance to select people or elements from the population, which gives it the benefit that the sample can fairly represent the population.

Remler and Van Ryzin (2011:169-173) indicate researchers can use different methods to determine the sample, such as systematic sampling, stratified sampling, and sampling with probabilities proportional to size. They describe systematic sampling as for example, drawing every 10th name from a list, beginning at a certain starting point. Another method that can be used is stratified sampling, where the population is divided into groups or strata. The strata should cover the total population and must be mutually exclusive (Remler & Van Ryzin 2011:170). Sampling with probabilities proportional to size is used when not only the number of

elements is considered, but also the size and importance in the population (Remler and Van Ryzin (2011:172). The process followed to identify the population of the survey, and sample selection is discussed in the next paragraph.

The FSB (SAM Roadmap 2010:10) indicates that SAM will apply to all insurance entities operated on a commercial basis, which would also include government-owned insurers, but will exclude entities licensed under the proposed micro-insurance legislation. Micro-insurers will operate under a separate regulatory environment. The population of the participants in the SAM project, and the short-term insurers are defined in the next paragraph.

4.8.2. Defining the population

The FSB followed an inclusive process (SAM Roadmap 2010:6) for the development and implementation of SAM and included all the key role-players in the insurance industry in South Africa. The participants in the short-term insurance industry in the SAM implementation project identified in the SAM Roadmap are the following:

- non-life or short-term insurance companies;
- reinsurers;
- the Financial Services Board (FSB);
- the South African Insurance Association (SAIA);
- the Actuarial Society of South Africa (ASSA);
- the National Treasury; and
- the South African Institute of Chartered Accountants (SAICA).

The role of each participant was reviewed to determine the appropriateness for inclusion in the survey. As the study was based on the implementation of a regulatory framework, it was important to analyse the roles and responsibilities of the participants in the project to ensure that the survey included all relevant participants, but also excluded participants who would not be able to contribute. Criteria used to evaluate the roles of the participants in the survey are indicated in Table 4.5.

Table 4.5. Criteria for the evaluation of participants of the survey

Criteria	Discussion
Legislative role	<p>The role of National Treasury includes the regulation of markets and public entities. The National Treasury will also be responsible for facilitating the legislative process once the SAM framework has been developed and adapted for South African conditions. (SAM Roadmap 2010:11).</p> <p>The National Treasury was excluded from the survey as other role-players were more involved in the development and implementation of SAM.</p>
Statutory regulatory role	<p>The role of the FSB is to regulate the compliance of the insurer with the SAM regime. The regulator will be important to ensure that the regulations will ensure a sustainable and competitive insurance industry (FSB Act No. 97 of 1990).</p> <p>The role of the FSB is critical in the development and implementation of SAM and as such, the FSB was included in the survey.</p>
Statutory assurance provider	<p>The external auditors fulfil a statutory role (Companies Act No. 57 of 2008).</p> <p>The assurance providers were excluded from the survey as other role-players were more involved in the development and implementation of SAM.</p>
Actuarial expertise	<p>All actuaries employed by insurance companies have to be a member of the Actuarial Society of South Africa. The society also gives guidelines to the actuaries on the models and processes implemented in SAM (Practice Note Series 400:2).</p> <p>The role of the actuaries is critical in the development and implementation of SAM and as such, actuaries were included in the survey.</p>

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Criteria	Discussion
Short-term insurance providers (short-term insurers and reinsurers)	<p>The short-term insurers and reinsurers need to implement and comply with the SAM regime.</p> <p>The role of the short-term insurers is critical in the development and implementation of SAM and as such, actuaries were included in the survey.</p>
SAIA	SAIA represents the insurance industry in the SAM project. The role of the actuaries is critical in the development and implementation of SAM and as such, SAIA was included in the survey.

4.8.3. Selection of short-term insurers

The population of the registered short-term insurers as at 31 December 2012 was obtained from the 2012 Annual Report of the Registrar of Short-Term Insurance (STI Registrar 2012:44) and is listed in Table 4.2. The following information was extracted from the report:

- name of the insurer;
- total gross premiums written; and
- market share.

“Total gross premiums written” is used as an industry standard to determine the market share of the short-term insurer. As the literature indicated the implementation of Solvency II may have an effect on the sustainability on medium and small short-term insurance, the population of short-term insurers were stratified by using the total gross premium written. The strata were determined by considering the number of insurers and the total gross premiums written and market share. The strata were defined as follows:

- | | | |
|---|--------|-------------|
| • \geq R 1 billion | Large | 19 insurers |
| • Between R 500 million and R 1 billion | Medium | 15 insurers |
| • \leq R 500 million | Small | 59 insurers |

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Table 4.6. Registered short-terms insurers as at 31 December 2012

INSURER	TOTAL GROSS PREMIUMS WRITTEN R'000	MARKET SHARE %
Santam	R16,527,094	19
Mutual and Federal	R7,537,799	8.7
Hollard	R5,566,673	6.4
Guardrisk	R5,498,070	6.3
OUTsurance	R5,340,678	6.1
Absa	R3,426,990	3.9
Zurich	R3,403,040	3.9
Auto & General	R3,152,661	3.6
Allianz Global	R2,469,679	2.8
Centriq	R2,208,404	2.5
Etana	R1,994,312	2.3
AIG	R1,960,812	2.3
Regent	R1,823,704	2.1
Standard	R1,638,765	1.9
Lombard	R1,213,720	1.4
Compass	R1,172,208	1.3
Sasria	R1,087,133	1.2
Escap	R1,077,731	1.2
MiWay	R1,059,813	1.2
Monarch	R964,789	1.1
Rand Mutual Assurance	R952,699	1.1
Alexander Forbes	R926,382	1.1
Constantia	R909,533	1
New National	R893,009	1
DialDirect	R890,672	1
Nedgroup	R862,823	1

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INSURER	TOTAL GROSS PREMIUMS WRITTEN R'000	MARKET SHARE %
Lion of Africa	R822,976	0.9
Credit Guarantee	R776,246	0.9
Absa Risk	R738,674	0.8
M&F Risk	R670,397	0.8
Infiniti	R619,240	0.7
Relyant	R605,006	0.7
Renasa	R585,889	0.7
Legal Expenses	R536,066	0.6
JDG Micro	R460,398	0.5
Shoprite	R456,726	0.5
FEM	R452,303	0.5
Ace	R410,567	0.5
RMB Structured	R345,594	0.4
HDI Gerling	R335,814	0.4
SAHL	R300,834	0.3
Momentum STI	R277,270	0.3
AGRe	R253,033	0.3
Absa Idirect	R245,905	0.3
Safire	R238,182	0.3
Unity	R237,992	0.3
Western National	R222,289	0.3
NMS	R218,442	0.3
Unitrans	R204,361	0.2
Export Credit	R199,864	0.2
Bidvest	R193,127	0.2
Kingfisher	R183,707	0.2
Firststrand	R182,767	0.2

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INSURER	TOTAL GROSS PREMIUMS WRITTEN R'000	MARKET SHARE %
Oakhurst	R175,228	0.2
Coface	R162,803	0.2
Clientele General	R135,846	0.2
AECI Captive	R118,198	0.1
Zurich Risk Financing	R113,981	0.1
Exxaro	R109,151	0.1
Saxum	R103,481	0.1
Resolution	R101,829	0.1
Aurora	R99,449	0.1
Discovery	R91,467	0.1
Attorneys	R83,047	0.1
Sasguard	R76,708	0.1
Sabsure	R43,327	0
Enpet	R36,541	0
Indequity Specialised	R35,384	0
Corporate Guarantee	R32,810	0
G4S	R28,572	0
Nova Risk	R20,329	0
Sunderland Marine	R18,242	0
IGF	R15,787	0
Densecure	R15,673	0
SARBCIC	R14,485	0
Home Loan Guarantee	R13,482	0
Workers Life	R6,915	0
Momentum Structured	R5,629	0
Khula Credit Guarantee	R5,219	0
Old Mutual Health	R3,517	0

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INSURER	TOTAL GROSS PREMIUMS WRITTEN R'000	MARKET SHARE %
AEGIS	R0	0
CGU	R0	0
Customer Protection	R0	0
Guardian National	R0	0
Momentum Alternative	R0	0
Oakleaf	R0	0
Parktown	R0	0
Pinnafrica	R0	0
Sentrasure	R0	0
Truck and General	R0	0
MUA	-R37	0
Emerald	-R419	0

Source: STI Registrar (2012:44)

Attendees of the 2013 annual conference of the International Insurance Conference hosted by the Insurance Institute of South Africa at Sun City were requested to complete the questionnaire. The attendees of the conference were representative of the short-term industry as attendees represented small, medium, and large insurers, reinsurers, insurers who specialise in alternative risk transfers such as captive insurers, SASRIA, the regulator, and SAIA. Refer to Annexure B for the organisations that attended The International Insurance Conference – Southern Africa 2013.

4.8.4. Conducting the survey

The potential participants as indicated in paragraphs 4.8.2 and 4.8.3. were approached to complete the questionnaire. Executive members of the Insurance Institute of South Africa (IISA) and SAIA will also be approached to assist in the

distribution and collection of the questionnaire. The analyses to be conducted are discussed in the next paragraph.

4.9. ANALYSES TO BE CONDUCTED

The analysis for this study will consist of three tests. The first analysis will be a descriptive analysis, the second a cluster analysis and the third, the Kruskal-Wallis test. The statistical analysis was conducted with IBM SPSS Statistics Version 22. The analyses are discussed in more detail below.

4.9.1. Descriptive analysis

The results obtained from the survey will be analysed with the use of descriptive statistics to describe and interpret the impact of SAM on the short-term industry in South Africa (Boslaugh 2013:83).

4.9.2. Cluster analysis

The results of the survey will be analysed further with a cluster analysis to determine if questions cluster across the various constructs (Boslaugh 2013:299). Everitt, Landau, Leese, and Stahl (2011:7) indicate it is difficult to develop a formal definition of a cluster and that a single definition is unlikely to be sufficient for all situations. As an example, the cost of implementing SAM is spread among a number of constructs and questions and even though the changes to systems forms part of Construct 2, there is an underlying cost implication. The purpose of the cluster analysis is to determine if all the questions that may relate to the cost of implementation appear in one or two clusters. The statistician who assisted with the analysis of the data also recommended that reliability on the cluster analysis will be tested with Cronbach's alpha reliability coefficient for Likert-type scales, which is regarded by DeVellis (2012:35) as a widely used and sophisticated measure of internal reliability. According to DeVellis (2012:109), Cronbach's alpha is the average of all split-half correlations and measures how one half of a test corresponds with the other, but averages out the variation in the split-half method. Alpha ranges between 0 and 1 (DeVellis 2012:109). The closer the value to 1, the higher the reliability based on

Cronbach's alpha, but according to George and Mallery (as cited by Gliem & Gliem 2003:87), the following values give an indication of the reliability of the calculated values:

≤ 0.5	Unacceptable
≥ 0.5	Poor
≥ 0.6	Questionable
≥ 0.7	Acceptable
≥ 0.8	Good
≥ 0.9	Excellent

The results of the test for reliability of the clusters are discussed in paragraph 5.5.2.

4.9.3. Kruskal-Wallis test

The Kruskal-Wallis test is regarded as the nonparametric alternative to the regular one-way analysis of variance and is used to compare the medians of three or more independent samples (Boslaugh 2013:314). The Kruskal-Wallis test will be conducted to determine any significant differences in the opinions or perceptions of the participants who indicated that they are involved in large, medium, or small short-term insurers with regard to the impact of the implementation of SAM on the South African short-term industry.

4.10. SUMMARY

The literature review highlighted the importance of regulation in the insurance industry, but also indicated that the banking industry experienced problems with the implementation of Basel II and the insurers in Europe for the implementation of Solvency II.

The problem examined by this study was the potential effect of the implementation of SAM on the South African short-term insurance industry. The study did not involve humans as the objects under study, but was designed to analyse the effect that SAM may have on the short-term industry in South Africa and the qualitative research

design was unsuitable for the purpose of this study. The quantitative approach was deemed the most appropriate for this study as the literature relevant to Solvency II, Basel II and SAM was reviewed to identify the research problem and to provide the framework to determine the research objectives and questions.

The results obtained from the survey will be analysed with the use of descriptive statistics to describe and interpret the impact of SAM on the short-term industry in South Africa. A Kruskal-Wallis test will be conducted to determine if there are any significant differences in the opinions or perceptions among the participants in the survey who indicated that they are involved in small, medium, and large short-term insurers regarding the impact of SAM on the South African short-term industry. A cluster analysis will be done to determine if questions cluster across the various constructs. The results of the survey are discussed in chapter 5.

CHAPTER 5

ANALYSIS AND RESULTS

5.1. INTRODUCTION

Studies undertaken in Europe have indicated that the implementation of Solvency II may have a negative impact on small and medium sized insurance firms in the insurance industry. The literature review identified obstacles encountered by the banking industry with the implementation of Solvency II in Europe, indicated that the cost to implement the new regimes, the data architecture, which include the integrity, availability and accuracy of data had a significant impact on the cost structures of the organisations. The implementation of SAM in South Africa is still in process and it is therefore impossible to conduct a study on the pre- and post - implementation of the SAM regime by using financial criteria.

The problem that this study examines is the potential impact of the implementation of SAM on the South African Short-Term Insurance Industry and in doing so, the study will attempt to describe the opinions and perceptions that people involved in the short-term insurance industry may have on the implementation of SAM.

The purpose of the study is to determine the possible impact that SAM may have on short-term insurers on the following aspects:

- **The cost of implementing and compliance with SAM**

A factor that may affect the cost structure of the short-term insurer is the availability of core skills. The short-term insurer may have to appoint people with modelling skills either to develop internal models or to calibrate the standard models as prescribed by the capital adequacy directive (GCCapital Ideas 2011). Short-term insurers are also required to appoint actuaries (SII Directive L335 2009:35). The models are used to calculate the regulatory capital requirements for underwriting risk, market risk, credit risk, and operational risk. Short-term insurers may also need to make significant changes to their current data architecture to meet the regulatory data

requirements (Actuarial Post 2013). The current data architecture may be inappropriate, which may increase the demand for skills with the ability to design, develop, and implement a data architecture that meets the regulatory requirements. The new data architecture may require changes to hardware, risk applications, interfaces between the various product systems and the risk applications to limit manual intervention in data and projects to enhance the accuracy and completeness of data (SAS 2012:7). Further cost implications may be the on-going compliance with the regulatory capital requirements and the ability to raise the prescribed amount and tiers of capital.

- **The appropriateness of the (SAM) regime for short-term insurers in South Africa**

According to Jacobs and Van Vuuren (2013:316), the capital adequacy regime may be appropriate for a short-term insurer but may not reduce the systemic risk as regulators run the risk of focussing on the detail and in doing so, lose sight of the macro-prudential picture.

- **Sustainability of small and medium short-term insurers in South Africa**

An unintended consequence of the new capital adequacy regime may be an increase in the acquisitions and mergers, or even the demise of small and medium short-term insurers. The implementation of the new regulatory regime may also increase the premiums of short-term insurance in South Africa (ECB 2007:39).

The review of the current literature with regard to the role of insurance in the economy highlighted the importance of regulation in the insurance industry. The banking industry had to overcome significant challenges with the implementation of the Basel II regime, and insurers in Europe had similar experiences with the preparation for implementation of Solvency II. Although impact studies have been conducted as part of the implementation of SAM, the participants were mainly large short-term insurers with few small and medium short-term insurers (Hewitt, 2012).

5.2. ANALYSIS CONDUCTED

The analysis of the survey consisted of three parts. A descriptive analysis was performed to describe the and interpret the impact SAM may have on the short-term industry, the second part consisted of a Kruskal-Wallis test to determine if any significant differences in the opinions or perceptions among small, medium and large short-term insurers and finally, a cluster analysis was performed to determine if questions clustered around certain concepts. The results of the survey are discussed in the next section.

5.3. SURVEY RESULTS

The survey was conducted among attendees at the 2013 Annual IISA Conference at Sun City. Seventy questionnaires were distributed and 48 completed questionnaires were received, which gives a response rate of 69%. The findings from the data analysis are presented below. The questionnaire consisted of two parts. The first part gathered demographic data from the participants and the second part consisted of the questions related to the study. The demographic data is discussed below.

5.3.1. Involvement in the short-term insurance industry

The participants in the study were requested to provide their involvement in the short-term insurance industry by indicating whether they are involved as a short-term insurer, regulator, or other. Where the participant indicated their involvement as "Other", they provided further information. The data of the involvement in the short-term insurance industry is summarised in Table 5.1.

Table 5.1. Involvement in the short-term industry

INVOLVEMENT IN THE SHORT-TERM INSURANCE INDUSTRY	NUMBER OF PARTICIPANTS
Short-term insurer	40
Regulator	2
Other	6
- SAM Project Coordinator	1
- Consultant	5
Total	48

5.3.2. Size of the short-term insurer

Participants were also requested to indicate the size of the short-term insurer. The data is summarised in Table 5.2.

Table 5.2. Size of the short-term insurer

INDICATION OF THE SIZE OF THE SHORT-TERM INSURER	NUMBER OF PARTICIPANTS
Small (< R500m)	12
Medium (Between R500m and R1bn)	8
Large (> R1bn)	20
Not applicable	8
Total	48

The participants, who indicated that they could not indicate the size of the short-term insurer, included the regulators, consultants, and participants that indicated “other” as indicated in Table 5.1.

5.3.3. Capacity involved in the short-term industry

Participants were also requested to indicate whether they are involved in the SAM implementation. Of the 48 participants, 22 (46%) indicated that they are directly involved in the SAM implementation. The involvement included the regulators, actuaries, information technology, and management.

The analysis for this study consisted of three tests. The first analysis to be discussed is the descriptive analysis, the second the cluster analysis and the third, the Kruskal-Wallis test.

5.4. DESCRIPTIVE ANALYSIS OF THE SURVEY

The constructs covers:

- The availability of core skills
- Data architecture
- Cost of implementation and compliance
- Appropriateness for the short-term insurance industry
- Risk management
- Potential impact on the short-term insurance industry

5.4.1. Availability of core skills

The availability of core skills was identified as a factor that may affect the implementation of SAM, but also as a cost factor as skills may have to be acquired at a higher cost. The Pillar I requirements involve the modelling of capital and the people involved in the implementation still need to have a detailed knowledge of the mathematical foundation and limitations of the models.

The responses of the participants with regard to the requiring of people with modelling skills are indicated in Table 5.3.

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Table 5.3. Question 1

It is easy to acquire people with the prerequisite modelling skills to meet the SAM implementation deadline.					
N	48				
- Valid	48				
Mean	2.17				
Median	2.00				
Mode	2				
Category	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Small	2	8	2	0	0
Medium	2	2	1	3	0
Large	3	13	0	4	0
Regulator	0	0	1	1	0
Others	3	2	0	1	0
Total	10	25	4	9	0

All the respondents answered the question and 73% of the respondents either strongly disagreed or disagreed with the question that it is easy to acquire people with modelling skills. The highest concentration of participants that either strongly disagreed or disagreed with the statement was among the large short-term insurers and the second highest among small short-term insurers and was supported by the respondents classified in the “Others” category. This opinion was in contrast with the opinion of the regulator, who was of the opinion that there is not a shortage of skills.

The opinion of the respondents with regard to the availability of the IT skills is summarised in Table 5.4.

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Table 5.4 Question 2

It is easy to acquire people with the prerequisite IT skills to produce the data needed to meet the SAM implementation deadline.					
N	48				
- Valid	48				
Mean	2.50				
Median	2.00				
Mode	2				
Category	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Small	1	8	1	2	0
Medium	1	4	1	1	1
Large	3	7	3	7	0
Regulator	0	0	1	1	0
Others	2	3	0	0	1
Total	7	22	6	11	2

All the respondents answered the question. The opinion of the respondents indicated that acquiring the prerequisite IT skills is a difficult as 60% of the respondents strongly disagreed or disagreed, against 27% that either agreed or strongly agreed with the statement and 15% of the respondents who did not have an opinion. This analysis may change once the SAM progress to prepare for the Pillar III implementation based on the experience of the UK and European insurers with Pillar III preparation.

The responses of the participants with regard to the acquiring of people with actuarial skills are indicated in Table 5.5.

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Table 5.5. Question 3

It is easy to acquire people with the actuarial skills to meet the SAM requirements.					
N	48				
- Valid	48				
Mean	2.29				
Median	2.00				
Mode	2				
Category	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Small	5	5	1	1	0
Medium	0	3	2	2	1
Large	4	10	2	4	0
Regulator	0	0	1	1	0
Others	2	2	1	0	1
Total	11	20	7	8	2

All the respondents answered the question and 67% of the respondents either strongly disagreed or disagreed with the question that it is easy to acquire people with actuarial skills. The highest concentration of participants that either strongly disagreed or disagreed with the statement was among the large short-term insurers and the second highest among small short-term insurers and was supported by the respondents classified in the “Others” category. This opinion is also in contrast with the opinion of the regulator.

Based on the analyses of the questions of the first construct, the participants in the survey indicated that the core skills required for the implementation of SAM could be a limitation. There appears to be a difference in the opinion between the industry and the regulator, as the industry is of the opinion that the acquiring of core skills can be problematic, as is depicted in Figure 5.1.

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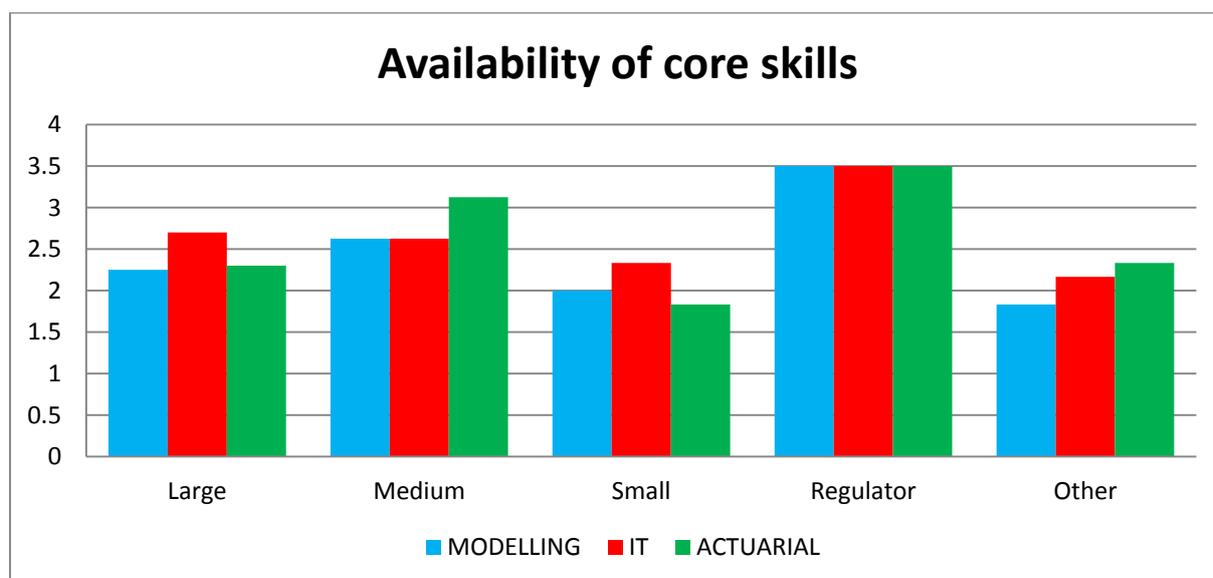


Figure 5.1. Availability of core skills

The findings of the survey with regard to the availability of core skills correspond with the experience of the insurers in the UK and Europe, namely the shortage of skills can have a negative impact on the implementation of Solvency II and SAM. The shortage of skills may also lead to an increase in cost to acquire the necessary skills to implement SAM.

The second construct relates to the development of data architecture to enable short-term insurers to calculate the Pillar I capital requirements and comply with the Pillar III reporting requirements.

5.4.2. Data architecture

The short-term insurers may also need to make significant changes to their current data architecture to meet the regulatory data requirements. The current data architecture of the short-term insurer may be inappropriate which may increase the demand for skills with the ability to design, develop, and implement a data architecture that meets the regulatory requirements. The new data architecture may require changes to hardware, risk applications, interfaces between the various product systems and the risk applications to limit manual intervention in data and projects to enhance the accuracy and completeness of data.

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The opinion of the respondents with regard to the manual intervention required for the data that will be used in the calculation of the regulatory capital requirements is summarised in Table 5.6.

Table 5.6. Question 4

The current IT systems of the short-term insurance company I am involved in, require the minimal manual intervention (e.g. Excel spreadsheets) to calculate the statutory requirements e.g. IBNR, UPR and SCR.					
N	48				
- Valid	48				
Mean	2.42				
Median	2.00				
Mode	2				
Category	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Small	3	7	2	0	0
Medium	1	4	0	2	1
Large	4	6	1	9	0
Regulator	0	1	0	1	0
Others	4	2	0	0	0
Total	12	20	3	12	1

All the respondents answered the question and 67% of the respondents either strongly disagreed or disagreed with the statement that minimum manual intervention were required with the calculation of the regulatory capital requirements. The highest concentration of participants who either strongly disagreed or disagreed with the statement was among the small short-term insurers and the second highest among medium short-term insurers and was supported by the respondents classified in the “Others” category. The large short-term insurers are more balanced, which can be due to the participation in SA QIS1 in 2011.

The opinion of the respondents with regard to the data definitions will be used in the calculation of the regulatory capital requirements and reporting in terms of the Pillar III requirement is summarised in Table 5.7 below.

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Table 5.7. Question 5

The data definitions of the systems in the short-term insurance company I am involved in need minimal adjustment to meet the SAM data requirements.					
N	48				
- Valid	47				
- Missing	1				
Mean	2.55				
Median	2.00				
Mode	2				
Category	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Small	1	6	4	1	0
Medium	0	4	1	2	1
Large	4	6	4	4	2
Regulator	0	1	0	0	0
Others	2	3	0	1	0
Total	7	20	9	8	3

Not all the respondents answered the question, as one participant indicated having insufficient knowledge to answer the question however, of the participants that did answer the question, 57% of the respondents either strongly disagreed or disagreed with the statement that minimum adjustments are needed of their current systems. The highest concentration of participants that either strongly disagreed or disagreed with the statement was among the small short-term insurers and the second highest among medium short-term insurers and were strongly supported by the respondents classified in the “Others” category.

The opinion of the large short-term insurers is more balanced, which can be due to the participation in SA QIS1 in 2011. The SAM project has however not progressed to the Pillar III requirements yet at the time of this study and the opinions of the participants may change during the Pillar III preparation phase.

The opinion of the participants with regard to the completeness of the data required to calculate the regulatory capital requirements are summarised in Table 5.8.

Table 5.8. Question 6

All the data required to calculate the SCR in the short-term insurance company I am involved in, is readily available.					
N	48				
- Valid	47				
- Missing	1				
Mean	2.66				
Median	2.00				
Mode	2				
Category	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Small	2	5	4	1	0
Medium	0	5	1	2	0
Large	0	7	4	8	1
Regulator	0	1	0	0	0
Others	2	3	0	1	0
Total	4	21	9	12	1

Not all the respondents answered the question, as one participant indicated having insufficient information to answer the question however, of the participants that did answer the question, 53% of the respondents either strongly disagree or disagree with the statement, 19% of the respondents having no opinion, and 28% that either agreed or strongly agreed. The analysis illustrates that small and medium short-term insurers are experiencing problems with the availability of data. The availability of data for large short-term insurers appears to be less of a problem when compared to the medium and small short-term insurers, which also corresponds with the higher participation rate of large insurers with the QIS1 compared to the medium and small insurers.

The opinion of the participants with regard to the accuracy of the data required to calculate the regulatory capital requirements are summarised in Table 5.9.

Table 5.9. Question 7

The available data to calculate the SCR in the short-term insurance company I am involved in are accurate and need the minimum adjustment.					
N	48				
- Valid	47				
- Missing	1				
Mean	2.66				
Median	2.00				
Mode	2				
Category	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Small	1	6	4	1	0
Medium	0	2	2	4	0
Large	1	8	3	7	1
Regulator	0	1	0	0	0
Others	4	0	0	2	0
Total	6	17	9	14	1

Not all the respondents answered the question, as one participant indicated having insufficient knowledge to answer the question however, of the participants that did answer the question, 49% of the respondents indicated that they either strongly disagreed or disagreed with the statement, against 19% with no opinion and 32% who either agreed or strongly agreed.

The opinion of the participants with regard to the changes needed to the current systems for SAM implementation are summarised in Table 5.10.

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Table 5.10. Question 8

The current systems in the short-term insurance company I am involved in need minimal changes to support the implementation of SAM.					
N	48				
- Valid	47				
- Missing	1				
Mean	2.43				
Median	2.00				
Mode	2				
Category	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Small	3	7	2	0	0
Medium	0	4	1	2	1
Large	2	8	4	6	0
Regulator	0	0	1	0	0
Others	5	1	0	0	0
Total	10	20	8	8	1

Not all the respondents answered the question, as one participant indicated insufficient knowledge to answer the question however, of the participants that did answer the question, 64% of the respondents indicated that changes are required to prepare systems for the implementation of SAM, against 17% with no opinion and 19% who either agreed or strongly agreed. The opinion of the small short-term insurers is in contrast to that of the medium short-term insurers. The opinions of the large short-term insurers were more balanced.

Based on the analyses of the questions of the second construct, short-term insurers may need to make significant changes to their current data architecture to meet the regulatory data requirements. The results are summarised in Figure 5.2.

The impact of Solvency Assessment and Management on the short-term insurance industry in South Africa

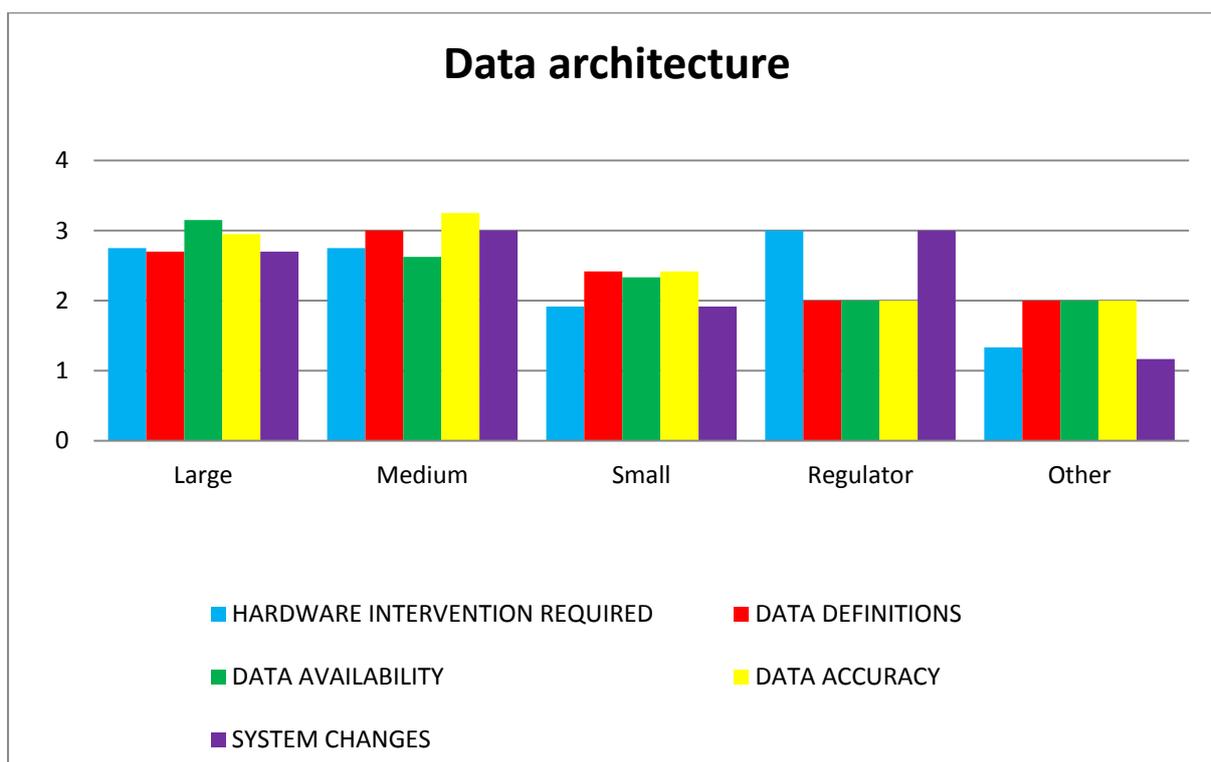


Figure 5.2. Data architecture

The current data architecture of the short-term insurer may be inappropriate to meet the SAM requirements, which may increase the demand for skills with the ability to design, develop, and implement a data architecture that meets the regulatory requirements. The new data architecture may require changes to hardware, risk applications, interfaces between the various product systems and the risk applications to limit manual intervention in data and projects to enhance the accuracy and completeness of data. The results correspond with the experience for Solvency II preparation in Europe and the UK.

The next construct covers the cost or investment the insurer has to make to prepare for the implementation to meet the SAM requirements, continued cost to comply with the SAM requirements and to obtain sufficient capital to meet the capital requirements where necessary.

5.4.3. Cost of implementation and compliance

The opinion of the participants with regard to the cost to implement the SAM requirements are summarised in Table 5.11.

The impact of Solvency Assessment and Management on the short-term insurance industry in South Africa

Table 5.11. Question 9

The cost to implement the SAM requirements will have a minimal impact on the short-term insurance company I am involved in.					
N	48				
- Valid	48				
Mean	2.17				
Median	2.00				
Mode	2				
Category	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Small	3	7	2	0	0
Medium	2	3	1	2	0
Large	3	12	2	3	0
Regulator	0	0	0	2	0
Others	5	2	0	1	0
Total	13	22	5	7	0

All the respondents answered the question and 73% of the respondents either strongly disagreed or disagreed with the statement that the implementation cost will have a minimal impact on the short-term insurer with 10% who had no opinion and 17% that either agreed or strongly agreed.

The opinion of the industry was also in contrast with that of the regulator. The opinion of the industry agrees with the experience of the insurers in the UK and Europe with the implementation of the Solvency II requirements.

The opinion of the participants with regard to the cost of continued compliance with the SAM requirements are summarised in Table 5.12.

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Table 5.12. Question 10

The continued compliance with the SAM requirements will have a minimal impact on the cost structure of the short-term insurance company I am involved in.					
N	48				
- Valid	48				
Mean	2.25				
Median	2.00				
Mode	2				
Category	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Small	3	6	2	1	0
Medium	2	3	2	1	0
Large	3	10	5	2	0
Regulator	0	0	0	2	0
Others	3	2	0	1	0
Total	11	21	9	7	0

All the respondents answered the question and 67% of the respondents either strongly disagreed or disagreed with the statement that the continued cost to comply with the SAM requirements will have a minimal impact on the short-term insurer with 19% who had no opinion and 15% that either agreed or strongly agreed. The opinion of the industry was also in contrast with the opinion of the regulator. The opinion of the industry agrees with the experience of the insurers in the UK and Europe with the implementation of the Solvency II requirements.

The opinion of the participants of having sufficient capital to meet the SAM requirements are summarised in Table 5.13.

Table 5.13. Question 11

The short-term insurance company I am involved in will have sufficient capital to meet the SCR and MCR on the envisaged SAM implementation date.					
N	48				
- Valid	47				
- Missing	1				
Mean	3.81				
Median	4.00				
Mode	4				
Category	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Small	0	1	4	6	1
Medium	0	0	1	8	0
Large	0	0	4	10	6
Regulator	0	0	0	1	0
Others	0	0	1	4	1
Total	0	1	9	29	8

Not all the respondents answered the question, as one participant indicated having insufficient knowledge to answer the question. Of the participants that did answer the question, 79% of the respondents either strongly agreed or agreed with the statement that the short-term insurers will have sufficient capital to meet the SAM capital requirements, with 19% who had no opinion and 2% that either disagreed or strongly disagreed. The opinion of the short-term insurers was also in agreement with the experience of the insurers in the UK and Europe with the preliminary results of the Solvency II preparation.

Based on the analyses of the question of the third construct, the participants are of the opinion that the cost implement, and comply with SAM will a significant effect on the cost structure of the short-term insurer. The results of the construct are summarised in Figure 5.3.

The impact of Solvency Assessment and Management on the short-term insurance industry in South Africa

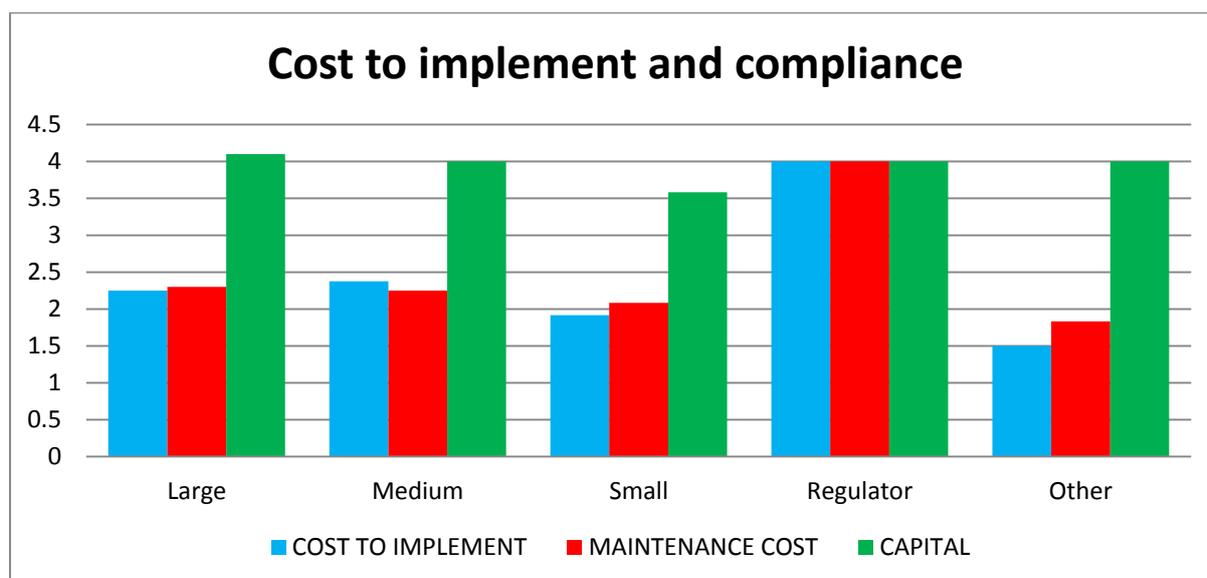


Figure 5.3. Cost to implement and compliance

- Seventy-three per cent of the respondents disagreed or strongly disagreed that the implementation cost will have a minimal impact on the short-term insurer.
- Sixty-seven per cent of the respondents disagreed or strongly disagreed that the continued cost to comply with the SAM requirements will have a minimal impact on the short-term insurer.
- The majority of the respondents, 79%, either strongly agreed or agreed with the statement that the short-term insurers will have sufficient capital to meet the SAM capital requirements.

The opinion of the industry is also in contrast with that of the regulator. The opinion of the industry agrees with the experience of the insurers in the UK and Europe with the implementation of the Solvency II requirements. The opinion is also in line with the experience of the insurers in the UK and Europe with the preliminary results of the Solvency II preparation.

The next construct analyses the appropriateness of SAM for the short-term insurance industry in South Africa. Although the capital adequacy regime may be appropriate for a short-term insurer, the regime may not reduce the systemic risk due to pro-cyclicality.

5.4.4. Appropriateness for the short-term insurance industry

The opinion of the participants regarding the appropriateness of SAM for short-term insurers is summarised in Table 5.14.

Table 5.14. Question 12

The SAM requirements are appropriate for short-term insurance companies.					
N	48				
- Valid	0				
Mean	3.60				
Median	4.00				
Mode	4				
Category	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Small	0	1	4	3	4
Medium	0	1	1	5	1
Large	0	2	4	14	0
Regulator	0	0	0	1	1
Others	0	2	1	3	0
Total	0	6	10	26	4

All the respondents answered the question and 67% of the respondents either strongly agreed or agreed with the statement that the SAM is appropriate for short-term insurers, with 21% who had no opinion and 13% that either disagreed or strongly disagreed.

The opinion of the participants regarding the appropriateness of SAM for short-term insurers in South Africa is summarised in Table 5.15.

The impact of Solvency Assessment and Management on the short-term insurance industry in South Africa

Table 5.15. Question 13

The SAM requirements are appropriate for the short-term insurance industry in South Africa.					
N	48				
- Valid	0				
Mean	3.44				
Median	4.00				
Mode	4				
Category	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Small	1	1	4	5	1
Medium	0	1	1	5	1
Large	2	1	3	13	1
Regulator	0	0	0	1	1
Others	1	2	0	3	0
Total	4	5	8	27	4

All the respondents answered the question and 65% of the respondents either strongly agreed or agreed with the statement that SAM is appropriate for the short-term insurance industry with 17% who had no opinion and 19% that either disagreed or strongly disagreed.

Based on the results of the analyses of the questions of the fourth construct, the majority of participants agree that SAM is appropriate for the individual short-term insurer and for the short-term industry. The results of the construct is summarised in Figure 5.4.

The impact of Solvency Assessment and Management on the short-term insurance industry in South Africa

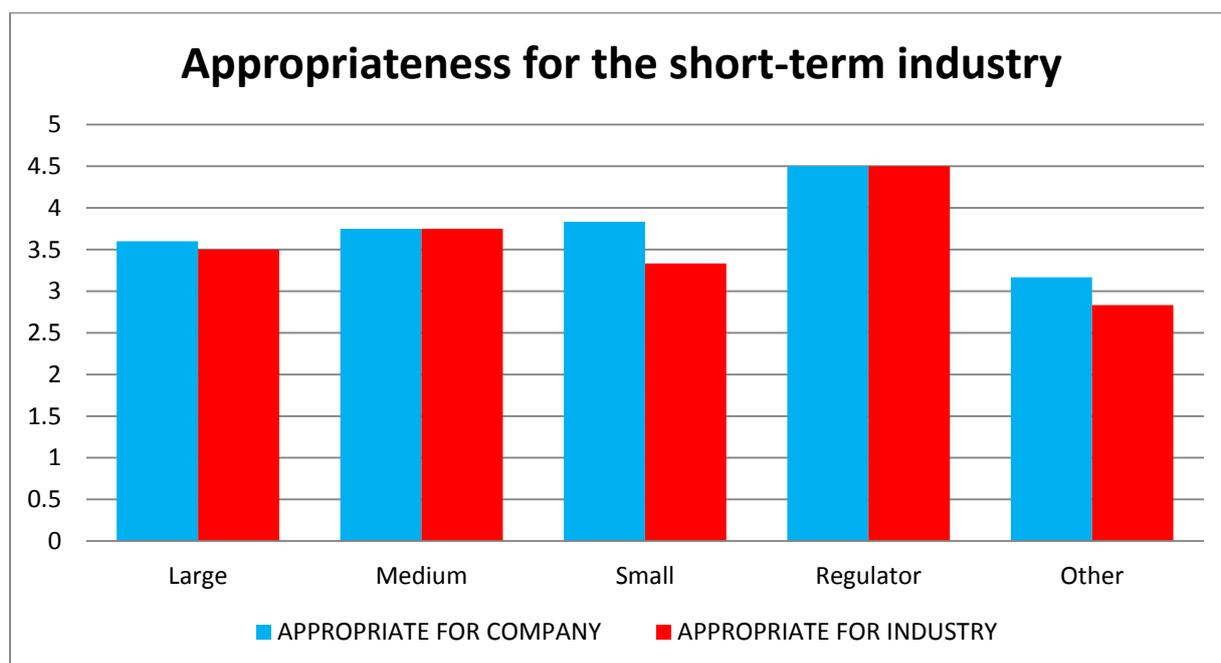


Figure 5.4. Appropriateness for the short-term insurance industry

- Sixty-seven per cent of the respondents either strongly agreed or agreed with the statement that the SAM is appropriate for short-term insurers.
- Sixty-five per cent of the respondents either strongly agreed or agreed with the statement that the SAM is appropriate for short-term insurance industry.

It is unfortunately too early to determine to what extent SAM is appropriate for short-term insurers, including the industry. The appropriateness of SAM for the short-term insurance industry warrants further research as indicated in chapter 6, paragraph 6.7.

The next construct that will be analysed relates to risk management in the short-term insurance companies and the influence of SAM on systemic risk.

5.4.5. Risk management

The opinion of the participants of whether the implementation of SAM will improve risk management for the short-term insurers are summarised in Table 5.16.

The impact of Solvency Assessment and Management on the short-term insurance industry in South Africa

Table 5.16. Question 14

The implementation of the SAM requirements will enable the short-term insurance company I am involved in to improve its risk management.					
N	48				
- Valid	47				
- Missing	1				
Mean	3.91				
Median	4.00				
Mode	4				
Category	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Small	0	0	1	7	4
Medium	0	0	1	5	2
Large	0	3	3	11	3
Regulator	0	0	0	0	1
Others	0	0	0	3	3
Total	0	3	5	26	13

Not all the respondents answered the question, as one participant indicated insufficient knowledge to answer the question. Of the participants that did answer the question, 83% of the respondents either strongly agreed or agreed with the statement that SAM will improve risk management for the insurer with 11% who had no opinion and 6% that either disagreed or strongly disagreed.

The opinion of the participants of whether the implementation of SAM will reduce systemic risk in the short-term insurance industry in South Africa is summarised in Table 5.17.

The impact of Solvency Assessment and Management on the short-term insurance industry in South Africa

Table 5. 17. Question 15

The implementation of SAM will reduce systemic risk in the short-term insurance industry in South Africa.					
N	48				
- Valid	47				
- Missing	1				
Mean	3.4				
Median	4.00				
Mode	4				
Category	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Small	0	1	6	3	2
Medium	0	0	2	4	2
Large	0	6	3	11	0
Regulator	0	0	0	1	0
Others	0	1	2	0	3
Total	0	8	13	19	7

Not all the respondents answered the question, as one participant indicated insufficient knowledge to answer the question however, of the participants that did answer the question, 55% of the respondents either strongly agreed or agreed with 28% having no opinion and 17% that either disagree or strongly disagree with the statement.

Based on the analyses of the questions of the fifth construct, the majority of participants agree that SAM will improve risk management and will reduce systemic risk in the short-term insurance industry in South Africa. is appropriate for the individual short-term insurer and for the short-term industry. The results of the construct is summarised in Figure 5.5.

The impact of Solvency Assessment and Management on the short-term insurance industry in South Africa

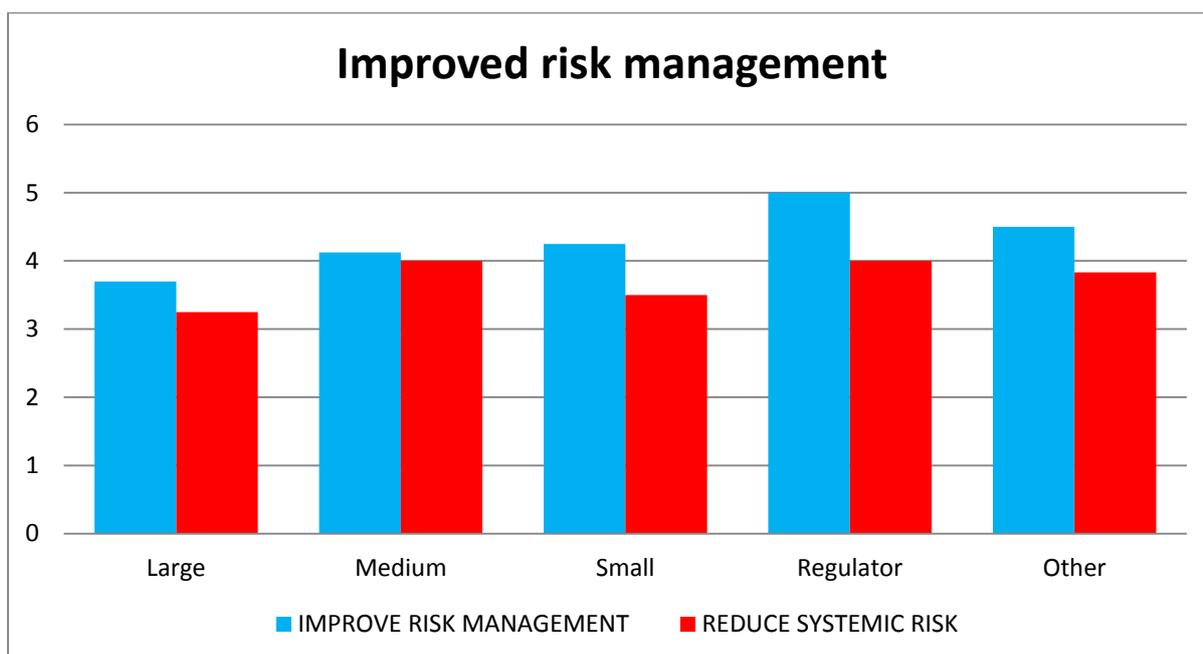


Figure 5.5. Improved risk management

- Eighty-three per cent of the respondents either strongly agreed or agreed with the statement that SAM will improve risk management for the insurer with 11% who had no opinion and 6% that either disagreed or strongly disagreed.
- Fifty-five per cent of the respondents either strongly agreed or agreed with 28% who had no opinion and 17% that either disagreed or strongly disagreed with the statement that SAM will reduce systemic risk in the short-term insurance industry.

It is unfortunately too early to determine to what extent SAM will reduce systemic risk in the short-term insurance industry. The effectiveness of SAM in reducing systemic risk warrants further research as indicated in chapter 6, paragraph 6.7.

The next construct analyses the potential impact of SAM on the short-term insurance industry in South Africa.

5.4.6. Potential impact on the short-term insurance industry

The opinion of the participants of whether compliance with the SAM requirements will lead to an increase in mergers and acquisitions among short-term insurers in South Africa is summarised in Table 5.18.

The impact of Solvency Assessment and Management on the short-term insurance industry in South Africa

Table 5.18. Question 16

Compliance with SAM requirements will lead to an increase in mergers and acquisitions among short-term insurers in South Africa.					
N	48				
- Valid	48				
Mean	3.75				
Median	4.00				
Mode	4				
Category	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Small	0	2	2	4	4
Medium	0	0	1	6	1
Large	0	2	5	10	3
Regulator	0	0	2	0	0
Others	1	1	0	2	2
Total	1	5	10	22	10

All the respondents answered the question and 67% either strongly agreed or agreed that compliance with the SAM requirements will lead to an increase in merger and acquisition activities, with 21% who had no opinion and 13% who either strongly disagreed or disagreed. The regulator did not offer an opinion. The opinion of the regulator, who strongly disagrees with this statement, is in contrast to the industry where 65% of the large, 88% of the medium, and 67% of the small short-term insurers agreed or strongly agreed that SAM will lead to the demise of medium and small insurers.

The opinion of the participants of whether compliance with the SAM requirements will lead to the demise of medium and small short-term insurers in South Africa is summarised in Table 5.19.

The impact of Solvency Assessment and Management on the short-term insurance industry in South Africa

Table 5.19. Question 17

Compliance with SAM requirements will lead to the demise of medium to small short-term insurers.					
N	48				
- Valid	48				
Mean	3.21				
Median	3.50				
Mode	4				
Category	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Small	0	2	4	4	2
Medium	0	2	3	3	0
Large	1	4	4	11	0
Regulator	2	0	0	0	0
Others	1	0	2	3	0
Total	4	8	13	21	2

All the respondents answered the question and 48% of the respondents either strongly agreed or agreed that compliance with the SAM requirements will lead to the demise of medium and small short-term insurers in South Africa, with 25% who had no opinion and 27% who either strongly disagreed or disagreed.

The opinion of the regulator, who strongly disagrees with this statement, is in contrast to the industry where 55% of the large, 38% of the medium, and 50% of the small short-term insurers agreed or strongly agreed that SAM will lead to the demise of medium and small insurers.

The opinion of the participants of whether compliance with SAM requirements will increase the cost of doing business for short-term disproportionately compared to the benefits derived from SAM is summarised in Table 5.20.

The impact of Solvency Assessment and Management on the short-term insurance industry in South Africa

Table 5. 20. Question 18

Compliance with the SAM requirements will increase the cost of doing business for short-term insurers disproportionately compared to the benefits derived from SAM.					
N	48				
- Valid	48				
Mean	3.46				
Median	4.00				
Mode	4				
Category	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Small	0	0	4	7	1
Medium	0	0	5	3	0
Large	0	5	3	11	1
Regulator	1	0	1	0	0
Others	1	0	1	3	1
Total	2	5	14	24	3

All the respondents answered the question and 56% of the respondents either strongly agreed or agreed that compliance with the SAM requirements will lead to an increase in the cost of doing business for short-term disproportionately when compared to the benefits derived from SAM, with 29% who had no opinion and 15% who either strongly disagreed or disagreed. The opinion of the regulator, who strongly disagrees with this statement or had no opinion, is in contrast to the industry where 60% of the large, 38% of the medium, and 67% of the small short-term insurers agreed or strongly agreed that SAM will lead to the demise of medium and small insurers.

The opinion of the participants of whether compliance with the SAM requirements will lead to increase in premiums for short-term insurance coverage in South Africa is summarised in Table 5.21.

The impact of Solvency Assessment and Management on the short-term insurance industry in South Africa

Table 5. 21. Question 19

Compliance with the SAM requirements will lead to a general increase in premiums for short-term insurance coverage.					
N	48				
- Valid	48				
Mean	3.46				
Median	4.00				
Mode	4				
Category	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Small	0	1	3	7	1
Medium	0	1	2	5	0
Large	0	7	3	8	2
Regulator	0	1	1	0	0
Others	1	1	0	3	1
Total	1	11	9	23	4

All the respondents answered the question and 56% of the respondents either strongly agreed or agreed that compliance with the SAM requirements will lead to an increase in premiums for short-term coverage, with 19% who had no opinion and 25% who either strongly disagreed or disagreed. The opinion of the regulator, who disagrees or had no opinion with this statement, is in contrast to the industry where 50% of the large, 63% of the medium, and 67% of the small short-term insurers agreed or strongly agreed that SAM will lead to the demise of medium and small insurers.

The opinion of the participants of whether compliance with the SAM requirements will lead to a decrease in short-term insurance coverage is summarised in Table 5.22.

The impact of Solvency Assessment and Management on the short-term insurance industry in South Africa

Table 5.22. Question 20

Compliance with SAM requirements will lead to a decrease in the short-term insurance coverage available in South Africa.					
N	48				
- Valid	48				
Mean	2.56				
Median	2.00				
Mode	2				
Category	Strongly disagree	Disagree	No opinion	Agree	Strongly agree
Small	1	7	2	2	0
Medium	0	4	3	1	0
Large	1	10	4	5	0
Regulator	1	0	1	0	0
Others	2	1	1	2	0
Total	5	22	11	10	0

All the respondents answered the question and 56% of the respondents either strongly disagreed or disagreed, that compliance with the SAM requirements will lead to a decrease in short-term coverage, with 23% have no opinion and 21% who either strongly agreed or agreed.

Based on the analyses of the questions of last construct, the majority of participants agree that SAM will affect small and medium short-term insurers negatively. The participants also foresee an increase in the short-term insurance premiums, and did not expect short-term insurance cover to be reduced due to the implementation of SAM. The results of the construct is summarised in Figure 5.6.

The impact of Solvency Assessment and Management on the short-term insurance industry in South Africa

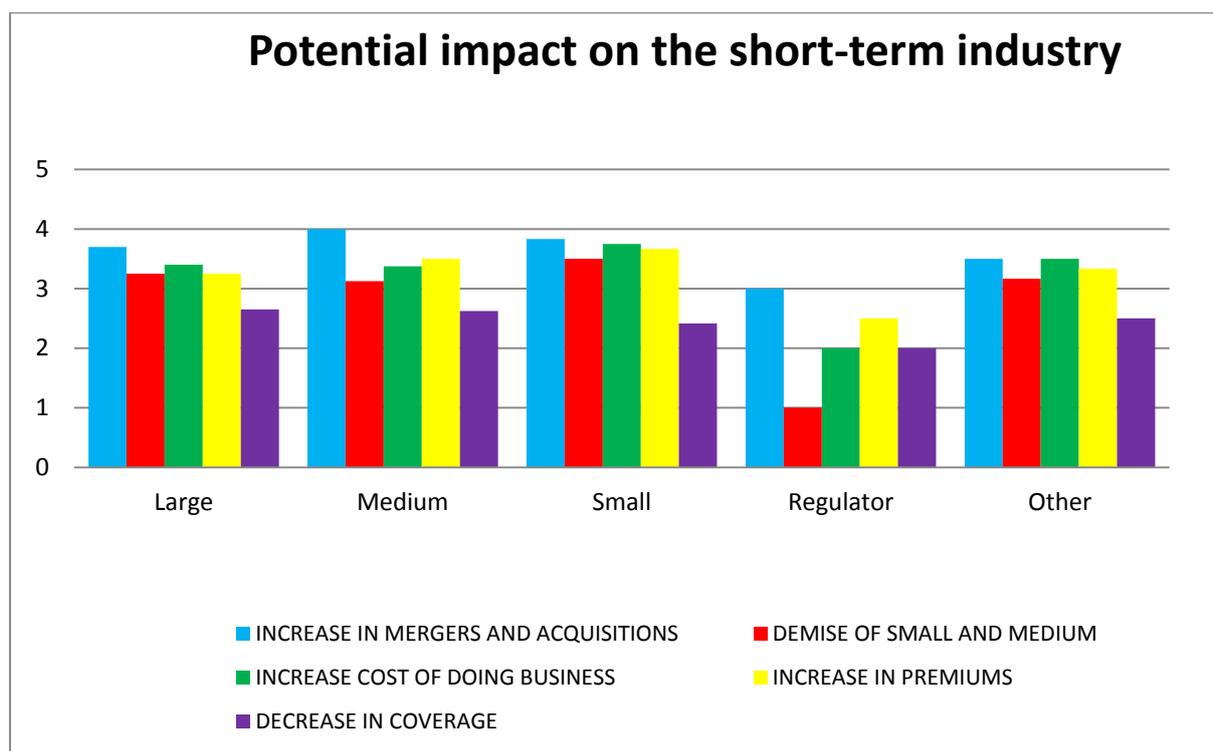


Figure 5.6. Potential impact on the short-term insurance industry

- **Impact of SAM on small and medium short-term insurers**

The respondents are of the opinion that the implementation of SAM will lead to increased merger and acquisition activity of small and medium short-term insurers with 67% agreed or strongly agreed. This statement is supported by 65% of the small, 88% of the medium, and 67% of the large short-term insurers. The regulators did not have an opinion on the statement.

The insurers agree or strongly agree to a lesser extent that the implementation of SAM will lead to the demise of small and medium short-term insurers, as 50% of small, 38% of medium, and 55% of the large short-term insurers supported the statement. The regulators strongly disagreed with this statement. Although there seems to be agreement among insurers that SAM may have a negative effect on the small and medium short-term insurers, the impact of SAM on small and medium short-term insurers warrants further research as indicated in chapter 6, paragraph 6.7.

- **Impact on the cost of doing business, premiums and coverage**

The participants in the study supported the statement that the implementation of SAM will lead to an increase in the cost of doing business. This statement is supported by 54% of the participants, consisting largely (85%) of insurers of the participants who either strongly agreed or agreed with the statement. The participants in the study supported the statement that the implementation of SAM will lead to an increase in short-term insurance premiums. This statement was supported by 54% of the respondents, of which the largest proportion (85%) is represented by insurers of the participants who either strongly agreed or agreed with the statement. The participants in the study do not support the statement that the implementation of SAM will lead to a decrease in short-term insurance cover, as only 21% of the participants supported the statement.

The impact of SAM on small and medium insurers, the cost of doing business, short-term insurance premiums, and short-term insurance coverage warrants further research as indicated in chapter 6, paragraph 6.7.

5.4.7. Conclusion of the descriptive analysis

The results of the survey with regard to the availability of core skills correspond with the experience of the insurers in the UK and Europe, namely that the shortage of skills can have a negative impact on the implementation of Solvency II and SAM. The shortage of skills may also lead to an increase in cost to acquire the necessary skills to implement SAM.

The current data architecture of the short-term insurer may be inappropriate to meet the SAM requirements, which may increase the demand for skills with the ability to design, develop, and implement a data architecture that meets the regulatory requirements. The new data architecture may require changes to hardware, risk applications, interfaces between the various product systems and the risk applications to limit manual intervention in data and projects to enhance the accuracy and completeness of data. The results correspond with the experience for Solvency II preparation in Europe and the UK.

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The participants in the survey also indicated that the cost of implementing SAM, and the continued compliance with the regulations will have a negative impact on the short-term insurers. The opinion of the industry is however in contrast with the opinion of the regulator. The opinion of the industry agrees with the experience of the insurers in the UK and Europe with the implementation of the Solvency II requirements. The respondents also indicated that short-term insurers will have sufficient capital to meet the SAM requirements. The opinion is also in line with the experience of the insurers in the UK and Europe with the preliminary results of the Solvency II preparation.

The majority of respondents (67%) are of the opinion that SAM is appropriate for short-term and insurers with 65% are of the opinion that SAM is appropriate for the short-term insurance industry. It is unfortunately too early to determine to what extent SAM is appropriate for short-term insurers, including the industry. The appropriateness of SAM for the short-term insurance industry warrants further research as indicated in chapter 6 in paragraph 6.7.

The respondents (83%) also indicate that SAM will improve risk management for the insurer, although a smaller percentage (55%) think SAM will reduce systemic risk in the short-term insurance industry. It is unfortunately too early to determine to what extent SAM will reduce systemic risk in the short-term insurance industry. The effectiveness of SAM in reducing systemic risk warrants further research as indicated in chapter 6, paragraph 6.7.

The short-term insurers (48%) are of the opinion that the implementation of SAM will lead to increased merger and acquisition activity of small and medium short-term insurers. The insurers agree to a lesser extent that the implementation of SAM will lead to the demise of small and medium short-term insurers, as 50% of small, 38% of medium, and 55% of the large short-term insurers supported the statement. The regulators strongly disagreed with this statement. Although there seems to be agreement among insurers that SAM may have a negative effect on the small and medium short-term insurers, the impact of SAM on small and medium short-term insurers warrants further research as indicated in chapter 6, paragraph 6.7.

The participants in the study supported the statement that the implementation of SAM will lead to an increase in the cost of doing business. This statement is supported by 54% of the participants, consisting largely (88%) of insurers. The participants in the study supported the statement that the implementation of SAM will lead to an increase in short-term insurance premiums. This statement was supported by 54% of the respondents, of which the largest proportion (88%) is represented by insurers. The participants in the study do not agree with the statement that the implementation of SAM will lead to a decrease in short-term insurance coverage, as only 21% of the participants supported the statement. The impact of SAM on small and medium insurers, the cost of doing business, short-term insurance premiums, and short-term insurance coverage warrants further research as indicated in chapter 6, paragraph 6.7.

The next analysis conducted as part of the empirical study is the cluster analysis, which is discussed in the next paragraph.

5.5. CLUSTER ANALYSIS

A cluster analysis was performed to determine if the questions of the survey can be grouped into logical clusters. A question can also appear in more than one cluster, as the question may have related to more than one concept for the participant. The phenomenon that question may appear in more than one cluster is possible as for example, insurers may have had to incur cost to acquire sufficient capital to meet the Solvency Capital Requirements, which may affect both the cost of acquiring the capital, and meeting the capital requirement.

5.5.1. Cluster identification

The cluster analysis identified five clusters with IBM SPSS V22 as depicted in Figure 5.7.

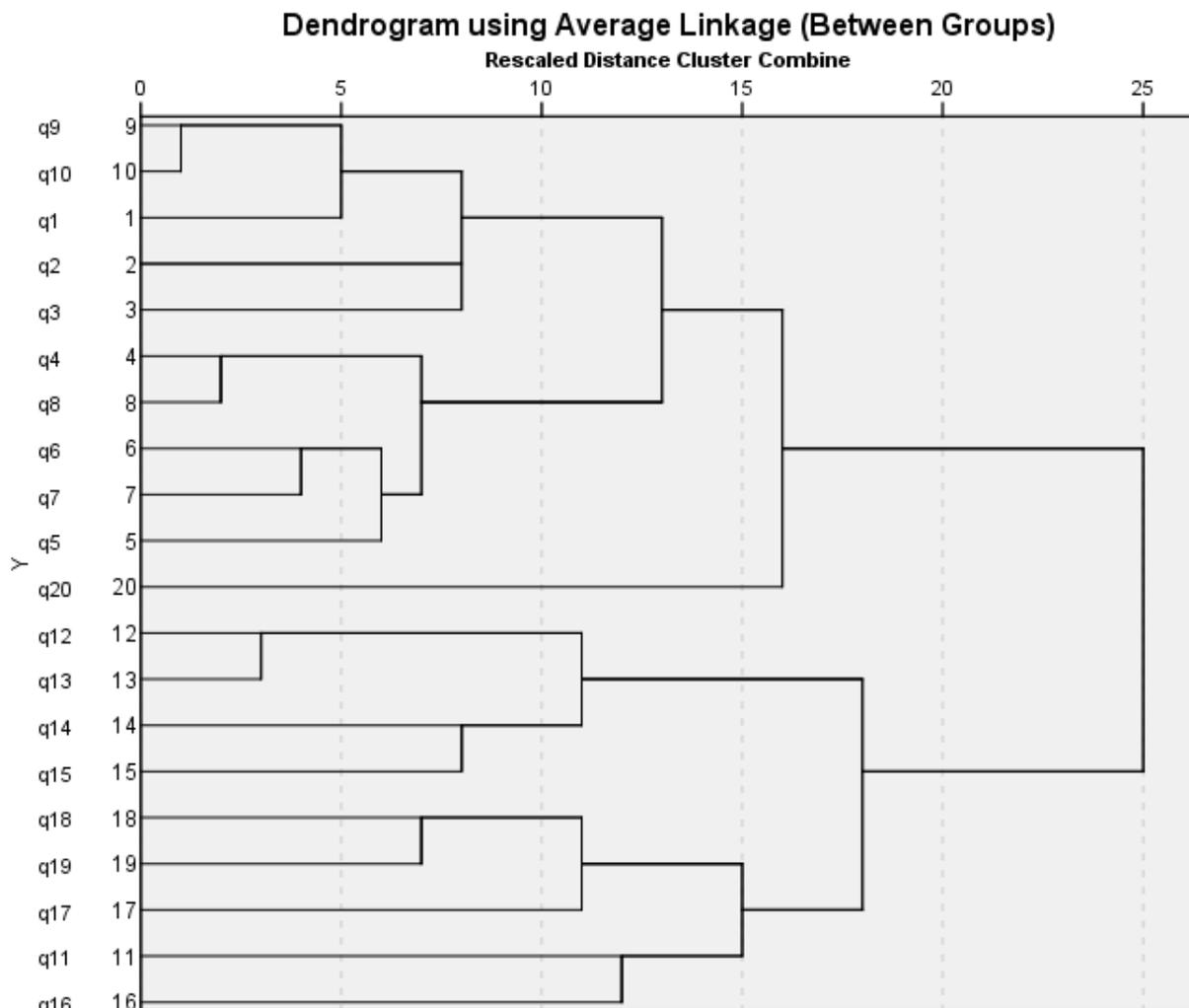


Figure 5.7. Combined cluster analysis

The questions included in the five clusters are indicated below.

- **Cluster 1: Impact of premiums and coverage**

The questions related to this cluster are questions 19 and 20. The questions related to whether the implementation of SAM will lead to an increase in premiums of short-term insurance coverage and whether the implementation of SAM will lead to a decrease in short-term insurance coverage.

- **Cluster 2: Cost of implementation and compliance**

A number of questions clustered around the cost of implementation and compliance. The following questions are included in this cluster.

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- Question 6: The availability of data to calculate the Solvency Capital Requirement.
- Question 7: The accuracy of the data required to calculate the Solvency Capital Requirement.
- Question 11: Sufficiency of capital to meet the Solvency Capital Requirement and the Marginal Capital Requirement.
- Question 16: Compliance with SAM requirements will lead to an increase in mergers and acquisitions among short-term insurers in South Africa.
- Question 17: Compliance with SAM requirements will lead to a demise of medium to small short-term insurers.
- Question 18: Compliance with SAM requirements will increase the cost of doing business for short-term insurers disproportionately to the benefits derived.

- **Cluster 3: Data and information technology systems**

The cluster consisted of three questions. Question 4 related to the level of manual intervention required to calculate the statutory requirements, such as Incurred but Not Reported, Unearned Premium Reserves and the Solvency Capital Requirement. Question 5 referred to the adjustment required to meet the SAM data requirements and question 8 relates to the system changes required to support the implementation of SAM.

- **Cluster 4: Capital, risk management and appropriateness of SAM**

A number of questions clustered around the concept of capital, risk management, and appropriateness of SAM to the short-term insurance industry. The following questions

- Question 11: Sufficiency of capital to meet the Solvency Capital Requirement and the Marginal Capital Requirement.
- Question 12: Appropriateness of SAM for short-term insurers.
- Question 13: Appropriateness of SAM for the short-term insurance industry.
- Question 14: SAM will improve risk management for the short-term insurer.
- Question 15: SAM will reduce systemic risk in South Africa.

- **Cluster 5: Cost of implementation and the availability of core skills**

The final cluster relates to the cost of compliance and the availability of core skills.

The questions the clustered around this concept are:

- Question 9: The cost to implement SAM on the short-term insurer.
- Question 10: The cost to ensure continued compliance with the SAM requirements on the short-term insurer.
- Question 2: The availability of people with the necessary IT skills to meet the SAM implementation deadline.
- Question 3: The availability of people with the actuarial skills to meet the SAM implementation deadline.
- Question 1: The availability of people with the modelling skills to meet the SAM implementation deadline.

The first component of the cluster analysis proved that the questions clustered around the constructs designed as part of the questionnaire. As indicated in chapter 4, the reliability of the clusters will be tested with Cronbach's alpha coefficient of reliability. The results of the test are discussed below.

5.5.2. Test for reliability

The cluster analysis identified five clusters and a reliability test was performed with Cronbach's alpha to determine the reliability of the survey questionnaire, which was discussed in chapter 4, paragraph 4.7.2.

The first cluster tested for Cronbach's alpha related to the possible impact on premiums and coverage available. The test results are explained in Table 5.23.

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Table 5.23. Reliability Statistics for Cluster 1: Impact on premiums and coverage

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.586	.588	2

Item Statistics	Mean	Std. Deviation	N
19. Compliance with the SAM requirements will lead to a general increase in premiums for short-term insurance coverage.	8.85	.744	34
20. Compliance with SAM requirements will lead to a decrease in the short-term insurance coverage available in South Africa.	8.18	.673	34

Alpha has a score of .586 for Cluster 1, which is regarded as “poor to questionable” based on the scale developed by Gliem and Gliem (2003:87). The low score can be ascribed to the small number of items as a minimum number of five items is recommended. It was however decided to keep the cluster as it is relevant to the study as the literature review indicated that Solvency II may lead to an increase in insurance premiums and reduce coverage due to the higher capital requirements for more specialised or exotic lines.

The next cluster refers to the cost of implementation and compliance of which the results are displayed in Table 5.24.

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Table 5.24. Reliability Statistics for Cluster 2: Cost of implementation and compliance

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.707	.704	6

Item Statistics	Mean	Std. Deviation	N
6. All the data required to calculate the SCR in the short-term insurance company I am involved in, is readily available.	8.53	.717	17
7. The available data to calculate the SCR in the short-term insurance company I am involved in are accurate and need the minimum adjustment.	8.29	.920	17
11. The short-term insurance company I am involved in will have sufficient capital to meet the SCR and MCR on the envisaged SAM implementation date.	9.00	.707	17
16. Compliance with SAM requirements will lead to an increase in mergers and acquisitions among short-term insurers in South Africa.	9.12	.781	17

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Item Statistics	Mean	Std. Deviation	N
17. Compliance with SAM requirements will lead to the demise of medium to small short-term insurers.	8.65	.702	17
18. Compliance with the SAM requirements will increase the cost of doing business for short-term insurers disproportionately compared to the benefits derived from SAM.	8.82	.728	17

Cluster 2 consists of six items and has an Alpha of .707, which is regarded as “Acceptable” in terms of the classification by Gliem and Gliem.

The third cluster can be identified by items that cluster around data and information technology and systems, as displayed in Table 5.25.

Table 5.25. Reliability Statistics for Cluster 3: Data and information technology systems

Cronbach's alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.848	.850	3

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Item Statistics	Mean	Std. Deviation	N
4. The current IT systems of the short-term insurance company I am involved in, require the minimal manual intervention (e.g. Excel spreadsheets) to calculate the statutory requirements e.g. IBNR, UPR and SCR.	8.03	.797	34
5. The data definitions of the systems in the short-term insurance company I am involved in, need minimal adjustment to meet the SAM data requirements.	8.09	.830	34
8. The current systems in the short-term insurance company I am involved in need minimal changes to support the implementation of SAM.	8.03	.758	34

The cluster consisted of three items and has an alpha of .848, which is regarded as “Good” in terms of the Gliem and Gliem classification. One of the reasons for the higher Alpha may relate to the timing of the survey as short-term insurers are in the process of making changes to their data architecture. The next cluster refers to questions that clustered around capital, risk management and the appropriateness of SAM for short-term insurers in South Africa.

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Table 5.26. Reliability Statistics for Cluster 4: Capital, risk management and appropriateness of SAM

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.773	.772	5

Item Statistics	Mean	Std. Deviation	N
11. The short-term insurance company I am involved in will have sufficient capital to meet the SCR and MCR on the envisaged SAM implementation date.	9.07	.616	27
12. The SAM requirements are appropriate for short-term insurance companies.	8.85	.662	27
13. The SAM requirements are appropriate for the short-term insurance industry in South Africa.	8.81	.736	27
14. The implementation of the SAM requirements will enable the short-term insurance company I am involved in to improve its risk management.	9.15	.718	27
15. The implementation of SAM will reduce systemic risk in the short-term insurance industry in South Africa.	8.93	.730	27

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The Alpha for Cluster 4 is .773, which is 'Acceptable' in terms of the Gliem and Gliem classification.

The last cluster refers to the implementation and compliance cost and the ability to obtain the required skills.

Table 5.27. Reliability Statistics for Cluster 5 cost of implementation and the availability of core skills

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.858	.859	5

Item Statistics	Mean	Std. Deviation	N
9. The cost to implement the SAM requirements will have a minimal impact on the short-term insurance company I am involved in.	7.83	.658	29
10. The continued compliance with the SAM requirements will have a minimal impact on the cost structure of the short-term insurance company I am involved in.	7.83	.658	29
2. It is easy to acquire people with the prerequisite IT skills to produce the data needed to meet the SAM implementation deadline.	8.24	.739	29

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Item Statistics	Mean	Std. Deviation	N
3. It is easy to acquire people with the actuarial skills to meet the SAM requirements.	8.00	.802	29
1. It is easy to acquire people with the prerequisite modelling skills to meet the SAM implementation deadline.	7.90	.724	29

The Alpha for this cluster is .858, which is “Good” in terms of the Gliem and Gliem classification.

Reliability was tested with Cronbach’s alpha coefficient of reliability, which is regarded as a sophisticated measure of internal reliability. Cronbach’s alpha is the average of all split-half correlations and measures how one half of a test corresponds with the other but averages out the variation in the split-half method (DeVellis 2012:109).

Although alpha has a score of .586 for Cluster 1, which is regarded as poor to questionable based on the scale developed by Gliem and Gliem (2003: 87), the low score can be ascribed to the low number of items as a minimum number of five items is recommended. It was however decided to keep the questions as it is relevant to the study as the literature review indicated that Solvency II may lead to an increase in insurance premiums and reduce coverage due to the higher capital requirements for more specialised or exotic lines.

Cluster 2 consists of six items and has an alpha of .707, which is regarded as “Acceptable”. Cluster 3 consisted of three items and has an alpha of .848, which is regarded as ‘Good’. One of the reasons for the higher alpha may relate to the timing of the survey as short-term insurers are in the process of making changes to their data architecture. The alpha for Cluster 4 is .773, which is “Acceptable”. The alpha for Cluster 5 is .858, which is classified as “Good”.

Based on the above analysis by means of the Cronbach's alpha coefficient of reliability test for the cluster analysis of this study is regarded as acceptable. The analysis of the clusters is discussed in the next paragraph.

5.5.3. Analysis of the clusters

A cluster analysis was performed to determine if the questions of the survey can be grouped into logical clusters. A question can also appear in more than one cluster, as the question may have related to more than one concept for the participant. The phenomenon that question may appear in more than one cluster is possible.

5.5.3.1. Cluster 1: Impact of premiums and coverage

The impact that SAM may have on the sustainability of small and medium short-term insurers may not be as clear as participants may only have more clarity after the implementation. As concluded in the descriptive analysis section of the study, 54% of the participants indicated they expect the premiums to increase because of the implementation of SAM, but 56% did not expect short-term insurance coverage the decrease caused by the implementation. The effect of the implementation of SAM on the premiums and coverage of short-term insurance warrants further research and is discussed in more detail in Paragraph 6.7.

5.5.3.2. Cluster 2: Cost of implementation and compliance

The literature review indicated the implementation of Solvency II lead to an increase in cost. Six questions clustered around the cost of implementation and compliance with the SAM regime. The first two questions of this cluster relate the availability and accuracy of the data to calculate the capital requirements. As indicated in this analysis, and in the descriptive section, short-term insurers are of the opinion that quality of data demands effort to meet the SAM requirements, which also corresponds with the experience of UK insurers.

Question 11 relates to the availability of capital for the short-term insurer. Although 78% of the participants indicated that short-term insurers will meet the capital

adequacy requirements, extra capital may be needed and the cost to acquire capital will come at a cost. The last three questions relate to the impact that the implementation of SAM may have on short-term insurers.

Based on this analysis, the cost to implement and continued compliance with SAM is a concern to short-term insurers.

5.5.3.3. Cluster 3: Data and information technology systems

The cluster consists of three questions. Question 4 related to the level of manual intervention required to calculate the statutory requirements, such as Incurred but Not Reported, Unearned Premium Reserves and the Solvency Capital Requirement. Question 5 referred to the adjustment required to meet the SAM data requirements and question 8 relates to the system changes required to support the implementation of SAM. Based on the analysis of the questions in this cluster, it can be concluded that short-term insurers are concerned with the preparing of data and information technology systems.

5.5.3.4. Cluster 4: Capital, risk management and appropriateness of SAM

This cluster consists of five questions. With regard to the sufficiency of capital to meet the SCR and the MCR, 78% of the respondents either agreed or strongly agreed with the statement. The majority of participants (68%) agreed or strongly agreed that SAM is appropriate for short-term insurers. A slightly smaller percentage (66%) of respondents agreed or strongly agreed that SAM is appropriate for the short-term insurance industry. The statement that SAM will improve risk management for the short-term insurer was strongly supported, with 82% of the respondents who either agreed or strongly agreed with the statement. The question of whether SAM will reduce systemic risk in South Africa received a less strong response as 55% of the respondents either agreed or strongly agreed with the statement, 28% had no opinion, and 17% disagreed.

Based on the results of the cluster, the respondents are of the opinion that the implementation of SAM is appropriate for short-term insurers and the short-term insurance industry, and will improve risk management of the short-term insurer.

There is less certainty of whether the implementation of SAM will reduce systemic risk in South Africa.

5.5.3.5. Cluster 5: Cost of implementation and the availability of core skills

The last cluster relates to the cost of compliance and the availability of core skills. The results with regard to the statement on the cost to implement SAM on the short-term insurer indicate that the majority (65%) disagreed or strongly disagreed that the implementation cost will have a minimal impact. This opinion is also supported with the results of the questions that relate to the availability of core skills. Participants in the survey indicated that it is difficult to appoint people with the required (71%) modelling skills, IT skills (58%), and actuarial skills (65%). Based on the results of the cluster, it can be concluded that participants are of the opinion that the acquiring of core skills is a cost driver with regard to the implementation of SAM.

5.5.3.6. Conclusion of the cluster analysis

The effect of the implementation of SAM on the premiums and coverage of short-term insurance warrants further research and is discussed in more detail in chapter 6, paragraph 6.7. Cluster 2 and cluster 5 relate strongly to the cost of implementation and compliance with SAM, and the availability of skills to prepare for the implementation of SAM. Based on the results of the analysis of the two clusters, it can be concluded that short-term insurers are of the opinion that the preparation for the implementation and continued compliance with the SAM requirements has, and will continue to have a negative effect on the cost structure of short-term insurers.

Based on the analysis of the questions in this cluster 3, with regard to data and information technology systems, it can be concluded that short-term insurers are concerned with the preparing of data and information technology systems.

The results of cluster 4 with regard to capital, risk management, and appropriateness of SAM, indicate that respondents are of the opinion that the implementation of SAM is appropriate for short-term insurers and the short-term insurance industry, and will improve risk management of the short-term insurer. There is less certainty of whether the implementation of SAM will reduce systemic risk in South Africa.

The results of cluster 5, cost of implementation and availability of core skills, indicate that participants in the survey are of the opinion that the implementation of SAM will have a negative impact on the cost structure of the short-term insurers. Participants also indicate the availability of the requisite modelling, IT, and actuarial skills is limited, which is also a cost driver in the implementation of SAM.

The last test conducted as part of this study was the Kruskal-Wallis test to determine if there were any significant differences in the opinions of the small, medium, and large short-term insurers. The results of the Kruskal-Wallis test are discussed in the next paragraph.

5.6. KRUSKAL-WALLIS TEST

A Kruskal-Wallis analysis was performed on the clusters identified in the previous section, to determine whether there are any significant differences among small, medium, and large short-term insurers with regard to the impact that SAM may have on the short-term insurance industry in South Africa.

5.6.1. Hypotheses

H_0 = There is not a significant difference in the opinion among small, medium and large short-term on the impact that SAM may have on the short-term insurance industry in South Africa

H_1 = There is a significant difference in the opinion among small, medium and large short-term on the impact that SAM may have on the short-term insurance industry in South Africa.

5.6.2. Results of the Kruskal-Wallis test

The Kruskal-Wallis analysis was performed on the clusters to determine whether there are any significant differences among small, medium, and large short-term insurers. Figure 5.8 produced in IBM SPSS V22, indicates the number of small, medium and large short-term insurers.

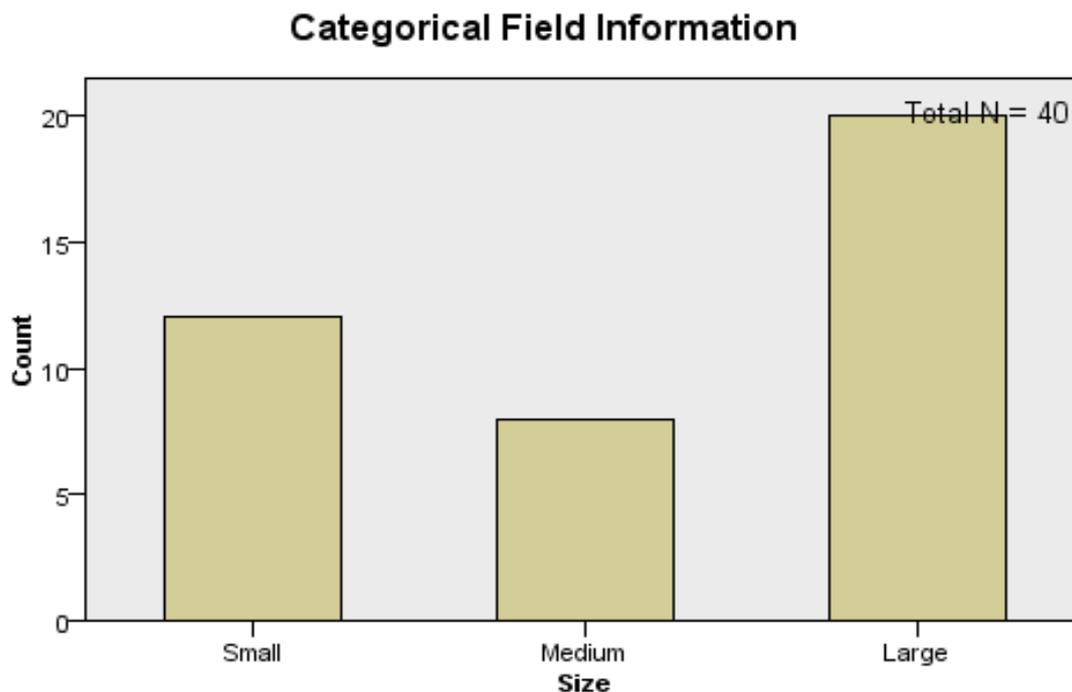


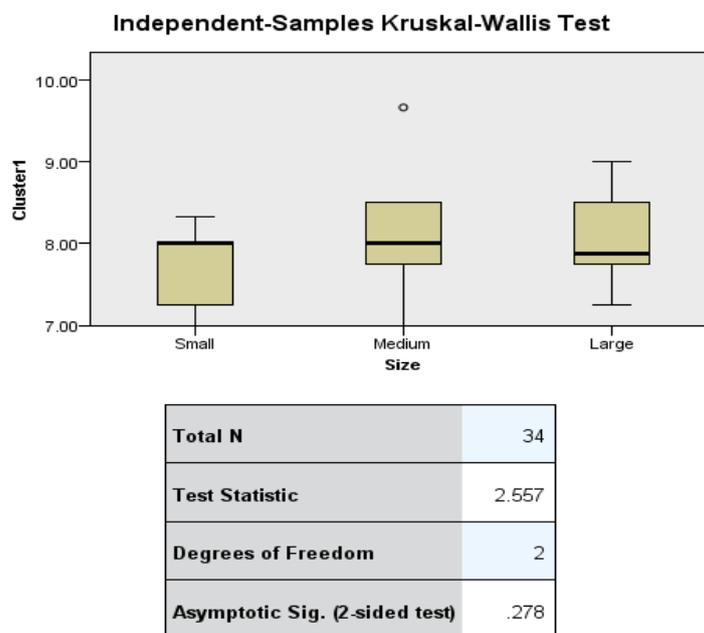
Figure 5.8 Number of small, medium, and large short-term insurers

Figure 5.8 illustrates the number of participants and the representation per small, medium, and large short-term insurers, which consisted of 12 small, 8 medium and 20 large short-term insurers. The Kruskal-Wallis test for Cluster 1 is discussed in the next paragraph.

5.6.2.1. Kruskal-Wallis test of Cluster 1: Impact on premiums and coverage

The questions included in Cluster 1 related to whether the implementation of SAM will lead to an increase in premiums of short-term insurance coverage and whether the implementation of SAM will lead to a decrease in short-term insurance coverage. Figure 5.9 produced in IBM SPSS V22, indicates the results of the Kruskal-Wallis test for Cluster 1.

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1. The test statistic is adjusted for ties.
2. Multiple comparisons are not performed because the overall test does not show significant differences across samples.

Figure 5.9 Kruskal-Wallis test for Cluster 1

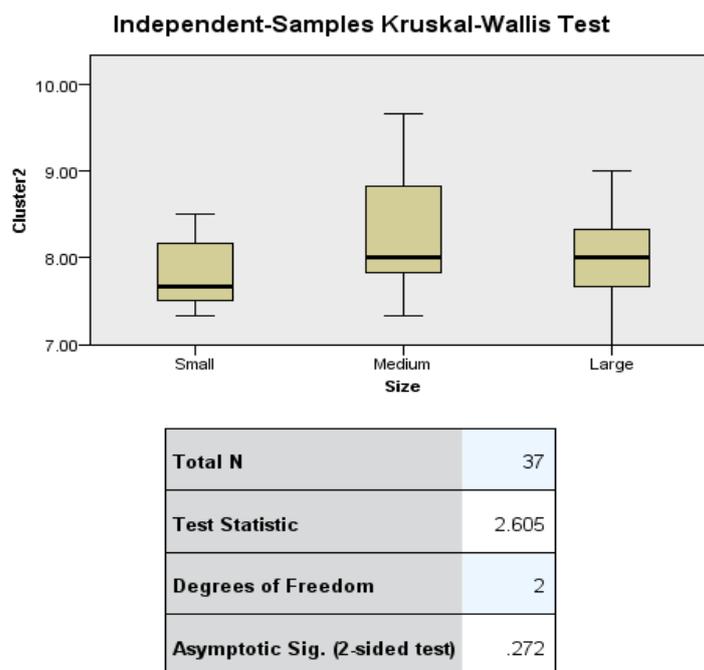
The test on Cluster 1 does not show significant differences across small, medium, and large short-term insurers and the null hypothesis should be retained.

5.6.2.2. Kruskal-Wallis test of Cluster 2: Cost of implementation and compliance

A number of questions clustered around the cost of implementation and compliance. The questions related to the availability of data to calculate the Solvency Capital Requirement, and the accuracy of the data required to calculate the Solvency Capital Requirement from the data architecture perspective. The sufficiency of capital of short-term insurers to meet the SCR and the MCR for short-term insurers was also included as costs may be incurred to meet the capital requirements. Other questions included in this cluster related to the possible increase in mergers and acquisitions among short-term insurers in South Africa because of SAM, the demise of medium to small short-term insurers, and that compliance with SAM requirements will

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increase the cost of doing business for short-term insurers disproportionately to the benefits derived. Figure 5.10 produced in IBM SPSS V22, indicates the results of the Kruskal-Wallis test for Cluster 2.



1. The test statistic is adjusted for ties.
2. Multiple comparisons are not performed because the overall test does not show significant differences across samples.

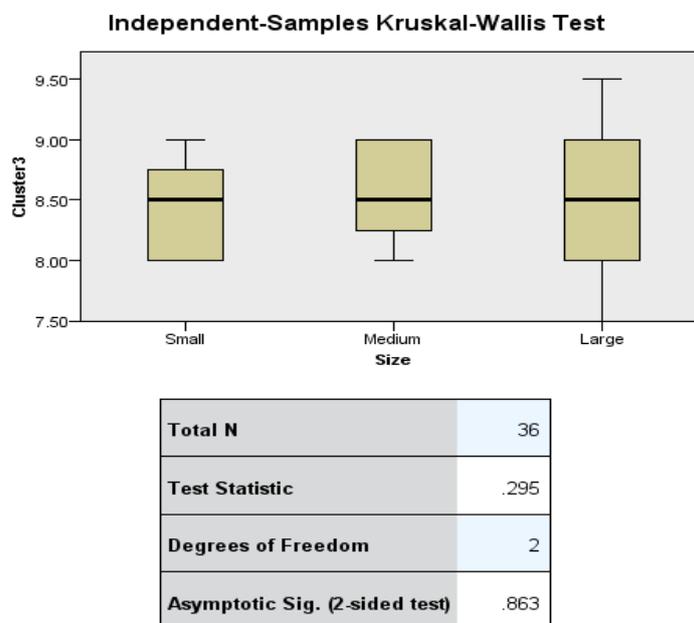
Figure 5.10 Kruskal-Wallis test for Cluster 2

The test on Cluster 2 does not show significant differences across small, medium, and large short-term insurers and the null hypothesis should be retained.

5.6.2.3. Kruskal-Wallis test of Cluster 3: Data and information technology systems

The cluster consisted of three questions. Question 4 related to the level of manual intervention required to calculate the statutory requirements, such as Incurred but Not Reported, Unearned Premium Reserves and the Solvency Capital Requirement. Question 5 referred to the adjustment required to meet the SAM data requirements and question 8 relates to the system changes required to support the implementation

of SAM. Figure 5.11 produced in IBM SPSS V22, indicates the results of the Kruskal-Wallis test for Cluster 3.



1. The test statistic is adjusted for ties.
2. Multiple comparisons are not performed because the overall test does not show significant differences across samples.

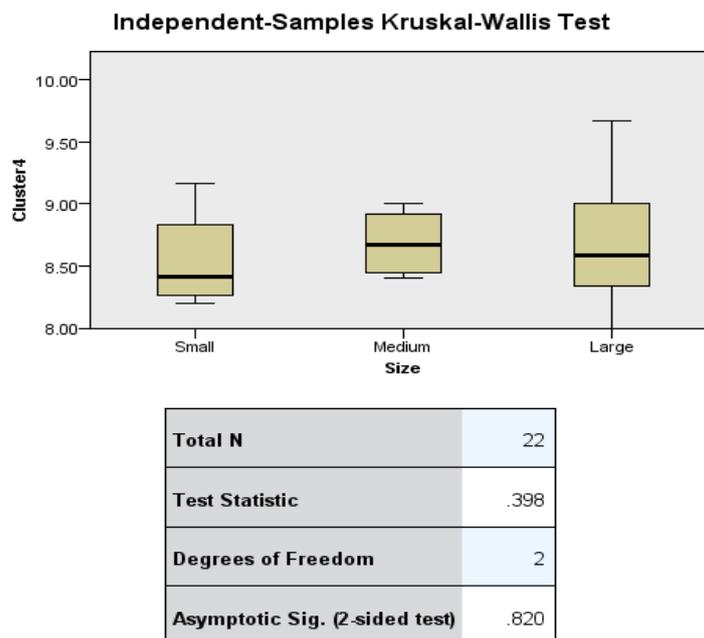
Figure 5.11 Kruskal-Wallis test for Cluster 3

The test on Cluster 3 does not show significant differences across small, medium, and large short-term insurers and the null hypothesis should be retained.

5.6.2.4. Kruskal-Wallis test of Cluster 4: Capital, risk management and appropriateness of SAM

A number of questions clustered around the concept of capital, risk management, and appropriateness of SAM to the short-term insurance industry. The questions included in this cluster related to the sufficiency of capital of short-term insurers to meet the SCR and MCR, appropriateness of SAM for the individual short-term insurers, and the industry, appropriateness of SAM for the individual short-term insurer and whether SAM will reduce systemic risk in South Africa. Figure 5.12 produced in IBM SPSS V22, indicates the results of the Kruskal-Wallis test for Cluster 4.

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1. The test statistic is adjusted for ties.
2. Multiple comparisons are not performed because the overall test does not show significant differences across samples.

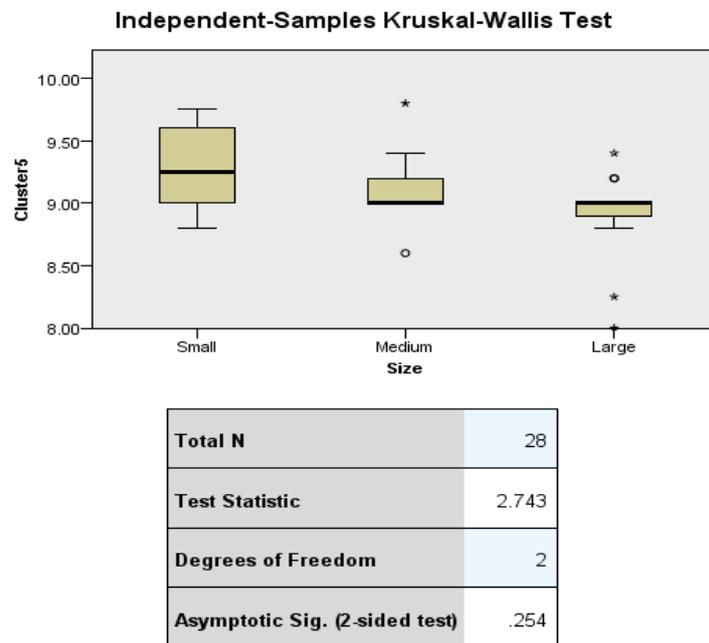
Figure 5.12 Kruskal-Wallis test for Cluster 4

The test on Cluster 4 does not show significant differences across small, medium, and large short-term insurers and the null hypothesis should be retained.

5.6.2.5. Kruskal-Wallis test of Cluster 5: Cost of implementation and the availability of core skills

The final cluster relates to the cost of compliance and the availability of core skills. The questions clustered around this concept related to the cost to implement SAM and continued compliance with the SAM requirements, and the availability to acquire the necessary modelling, IT, and actuarial skills to meet the SAM implementation deadline. Figure 5.13 produced in IBM SPSS V22, indicates the results of the Kruskal-Wallis test for Cluster 5.

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1. The test statistic is adjusted for ties.
2. Multiple comparisons are not performed because the overall test does not show significant differences across samples.

Figure 5.13 Kruskal-Wallis test for Cluster 5

The test on Cluster 5 does not show significant differences across small, medium, and large short-term insurers and the null hypothesis should be retained.

5.6.3. Conclusion of the Kruskal-Wallis test

The results of the Kruskal-Wallis test are summarised in Table 5.28.

Table 5.28. Summary of results of the Kruskal-Wallis test

HYPOTHESIS TEST SUMMARY			
NULL HYPOTHESIS	TEST	SIGNIFICANCE	DECISION
The distribution of Cluster 1 is the same across categories of Size	Independent-samples Kruskal Wallis test	.278	Retain the null hypothesis
The distribution of Cluster 2 is the same across categories	Independent-samples Kruskal Wallis	.272	Retain the null hypothesis
The distribution of Cluster 3 is the same across categories	Independent-samples Kruskal Wallis	.863	Retain the null hypothesis
The distribution of Cluster 4 is the same across categories	Independent-samples Kruskal Wallis	.820	Retain the null hypothesis
The distribution of Cluster 5 is the same across categories	Independent-samples Kruskal Wallis	.254	Retain the null hypothesis
Asymptotic significances are displayed. The significance level is .05.			

As indicated in the Hypothesis Test Summary, the null hypothesis should be retained in all the clusters, and the differences among the samples are small and there is consistency across the small, medium, and large short-term insurers on the impact that SAM may have on the short-term insurance industry in South Africa.

5.7. CONCLUSION

The analysis for this study consisted of three tests. The first analysis was a descriptive analysis, the second a cluster analysis and the third, the Kruskal-Wallis test.

The participants in the survey indicated the core skills required for the implementation of SAM could be a limitation. The findings of the survey with regard to the availability of core skills correspond with the experience of the insurers in the UK and Europe, namely the shortage of skills can have a negative impact on the implementation of Solvency II and SAM. The shortage of skills may also lead to an increase in cost to acquire the necessary skills to implement SAM.

Short-term insurers may need to make significant changes to their current data architecture to meet the regulatory data requirements. The current data architecture of the short-term insurer may be inappropriate to meet the SAM requirements, which may increase the demand for skills with the ability to design, develop, and implement a data architecture that meets the regulatory requirements. The new data architecture may require changes to hardware, risk applications, interfaces between the various product systems and the risk applications to limit manual intervention in data and projects to enhance the accuracy and completeness of data. The results correspond with the experience for Solvency II preparation in Europe and the UK.

The participants are of the opinion that the cost to implement, and comply with SAM will have a significant effect on the cost structure of the short-term insurer as 72% of the respondents disagree or strongly disagree that the implementation cost will have a minimal impact on the short-term insurer. Sixty-five per cent of the respondents disagree or strongly disagree that the continued cost to comply with the SAM requirements will have a minimal impact on the short-term insurer. The majority of the respondents, 78%, either strongly agree or agree with the statement that the short-term insurers will have sufficient capital to meet the SAM capital requirements. The opinion of the industry is also in contrast with the opinion of the regulator. The opinion of the industry agrees with the experience of the insurers in the UK and Europe with the implementation of the Solvency II requirements. The opinion is also

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in line with the experience of the insurers in the UK and Europe with the preliminary results of the Solvency II preparation.

The majority of participants agree that SAM is appropriate for the individual short-term insurer and for the short-term industry as 69% of the respondents either strongly agree or agree with the statement that the SAM is appropriate for short-term insurers. Sixty-six per cent of the respondents either strongly agree or agree with the statement that the SAM is appropriate for the short-term insurance industry.

It is unfortunately too early to determine to what extent SAM is appropriate for short-term insurers, including the industry. The appropriateness of SAM for the short-term insurance industry warrants further research as indicated in chapter 6, paragraph 6.7. The next construct that will be analysed relates to risk management in the short-term insurance companies and the influence of SAM on systemic risk.

The majority of participants agree that SAM will improve risk management as 82% of the respondents either strongly agree or agree with the statement that SAM will improve risk management for the insurer. Fifty-five per cent of the respondents either strongly agree or agree with the statement that SAM will reduce systemic risk in the short-term insurance industry. It is unfortunately too early to determine to what extent SAM will reduce systemic risk in the short-term insurance industry. The effectiveness of SAM in reducing systemic risk warrants further research as indicated in chapter 6, paragraph 6.7.

Based on the analyses of the questions of last construct, the majority of participants agree that SAM will affect small and medium short-term insurers negatively. The participants also foresee an increase in the short-term insurance premiums, but do not expect short-term insurance cover to be reduced.

The insurers agree or strongly agree the implementation of SAM will lead to increased merger and acquisition activity of small and medium short-term insurers. This statement is supported by 75% of the small, 88% of the medium, and 65% of the large short-term insurers. The regulators did not have an opinion on the statement.

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The insurers agree or strongly agree to a lesser extent that the implementation of SAM will lead to the demise of small and medium short-term insurers, as 50% of small, 38% of medium, and 55% of the large short-term insurers supported the statement. The regulators strongly disagreed with this statement. Although there seems to be agreement among insurers that SAM may have a negative effect on the small and medium short-term insurers, the impact of SAM on small and medium short-term insurers warrants further research as indicated in chapter 6, paragraph 6.7.

The participants in the study supported the statement that the implementation of SAM will lead to an increase in the cost of doing business. This statement is supported by 54% of the participants, consisting largely (88%) of insurers. The participants in the study supported the statement that the implementation of SAM will lead to an increase in short-term insurance premiums. This statement was supported by 54% of the respondents, of which the largest proportion (88%) is represented by insurers. The participants in the study do not support the statement that the implementation of SAM will lead to a decrease in short-term insurance, as only 21% of the participants supported the statement.

The impact of SAM on small and medium insurers, the cost of doing business, short-term insurance premiums, and short-term insurance coverage warrants further research as indicated in chapter 6, paragraph 6.7.

The results of the cluster analysis indicate the effect of the implementation of SAM on the premiums and coverage of short-term insurance warrants further research and is discussed in more detail in chapter 6, paragraph 6.7. Cluster 2 and cluster 5 relate strongly to the cost of implementation and compliance with SAM, and the availability of skills to prepare for the implementation of SAM. Based on the results of the analysis of the two clusters, it can be concluded that short-term insurers are of the opinion that the preparation for the implementation and continued compliance with the SAM requirements has, and will continue to have a negative effect on the cost structure of short-term insurers.

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Based on the analysis of the questions in this cluster 3, with regard to data and information technology systems, it can be concluded that short-term insurers are concerned with the preparing of data and information technology systems.

The results of cluster 4 with regard to capital, risk management, and appropriateness of SAM, indicate that respondents are of the opinion that the implementation of SAM is appropriate for short-term insurers and the short-term insurance industry, and will improve risk management of the short-term insurer. There is less certainty of whether the implementation of SAM will reduce systemic risk in South Africa.

The results of cluster 5, cost of implementation and availability of core skills, indicate that participants in the survey are of the opinion that the implementation of SAM will have a negative impact on the cost structure of the short-term insurers. Participants also indicate the availability of the requisite modelling, IT, and actuarial skills is limited, which is also a cost driver in the implementation of SAM.

The results of the Kruskal-Wallis test indicated the differences among the samples are small and there is consistency across the small, medium, and large short-term insurers on the impact that SAM may have on the short-term insurance industry in South Africa.

The next chapter will conclude the study and provide recommendations on possible future research.

CHAPTER 6

SUMMARY AND RECOMMENDATIONS

6.1. INTRODUCTION

The literature review highlighted the importance of the insurance industry in providing a service to the economy by facilitating the transfer and pooling of risk. Insurers promise policyholders future compensation from losses from previously agreed events and provide cover for individuals and different enterprises. The products on offer range from standard insurance policies to sophisticated risk retention facilities and capital market instruments. In providing services to customers, insurers in addition to normal business risks, also expose themselves to risks particular to the insurance industry. To protect the buyers of insurance products, insurers are closely regulated. The regulation of insurers have evolved over time from different regulatory requirements in the individual countries, to more harmonised regulatory regimes, required by globalisation and the development of the European Union with the implementation of Solvency I in the 1970s and preparation of the implementation of Solvency II in 2016. South Africa is implementing the Solvency Assessment and Management framework in 2016, which is based on the Solvency II framework.

Although there is consensus amongst practitioners and scholars for prudential regulation of the insurance industry, concerns were raised regarding the cost to implement and comply with the Solvency II regime. Critics of the Solvency II regime argue that the effect of the 2007 financial crisis on the insurance industry was limited, and where individual insurers did experience problems, the cause was more related to losses in the investment portfolios than to the underwriting risks of the insurers.

Studies undertaken in Europe, and experience with the preparation of implementation of Solvency II in Europe and the United Kingdom, indicated that the cost to implement and comply with the Solvency II requirements can have a

detrimental effect on small and medium insurers. The purpose of this study was to determine what the possible impact of the implementation of SAM may be on the South African short-term insurance industry, specifically related to the small and medium short-term insurers. The contribution of this study is the comparison of the experience of insurers in Europe and the UK with the implementation of Solvency II and the perspective of short-term insurers in South Africa on the impact of SAM on the short-term industry in South Africa. Topics for further research are also discussed at the end of the chapter.

The aim of the preceding chapters was to structure the study, which can be summarised as follows:

- **Chapter 1**

Chapter 1 consisted of a brief overview of previous studies with regard to solvency regulations in the EU, UK, and South Africa, the problem statement, purpose of the study and a short description of the research methodology used.

- **Chapter 2**

Chapter 2 provided the literature review, which covered the history and role of insurance in the economy, the participants in the insurance markets, the products offered by short-term insurers, the risks of the short-term insurer and the regulatory environment of the insurance industry.

- **Chapter 3**

Chapter 3 focused on the Solvency II framework in terms of the Pillar I, Pillar II and Pillar III requirements and group supervision, including the implementation of SAM in South Africa. This chapter also highlighted the problems that banks experienced with the implementation of Basel II and the difficulties experienced by insurers with the implementation of Solvency II in Europe and the concerns of a number of researchers and practitioners who also questioned the appropriateness and effectiveness of the Solvency II regime, especially for the short-term insurance industry.

- **Chapter 4**

Chapter 4 entailed a description of the research methodologies applied in the study and the design of the questionnaire used to perform and interpret the empirical research.

- **Chapter 5**

Chapter 5 comprised an analysis and interpretation of the findings of the survey results on the impact of SAM on the short-term insurance industry in South Africa.

The literature covered in the research is summarised in the next paragraph.

6.2. SUMMARY OF THE LITERATURE

Insurers are able to fulfil their function as a risk transfer mechanism by pooling the risks and contributions of a large number of individuals into a common pool. The survival of the pool can be ensured by calculating an equitable premium by assessing the risk each member is contributing to the pool. The origins of insurance can be traced back to 4 000BC with the development of more recognisable forms of insurance in Roman times. The types of insurers and insurance products can still be classified as life, and non-life insurance providers and products.

The global insurance industry registered significant growth over the last decade, which can be attributed to globalisation and the development of new insurance products, which enabled global insurers to develop and exploit new markets. Although similarities exist in the global insurance, market, significant local differences were identified that impede the further globalisation of the insurance industry and convergence of the insurance and other segments of the financial markets.

The financial stability of insurers is important to ensure that they can fulfil their roles and responsibility in the economy, but also to protect the purchasers of the insurance products. The growth in different markets has however increased the complexity to manage the global insurers as local legislation and regulations of the countries in which they operate need to be considered. This has necessitated the establishment

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of an international insurance framework and institutions to share information and provide guidance to insurers, regulators, actuaries, and setting accounting standards for implementation by the insurance industry.

The short-term insurance market has different participants as suppliers and customers of the products and services. The users of the products and services have different needs and abilities to retain risk, which ranges from basic insurance products to alternative risk transfer (ART) products. Insurers provide both standard insurance products, with maximum transfer of risk, and more products, which enable a higher rate of retention and lower rate of risk transfer. Examples of maximum risk transfer insurance products are typically standard insurance policies such as personal cover for example motor and household insurance and business insurance, for example small, medium and large businesses, and specialist insurance products such as contract works, marine and aviation and agricultural insurance policies. Minimum transfer products or alternative risk transfer would include partial insurance contracts, loss-sensitive contracts, finite insurance, captives, and insurance linked securities.

Insurers have the benefit that the risk in the pool is much better understood for the standard insurance contracts as they have a long history of collecting data, which enables a more accurate calculation of the equitable premium and loss probabilities. This stands in contrast with the more exotic products with a smaller pool and paucity of data. The products and channels provided by the short-term insurers also mean that the short-term insurer not only incurs business risk in the process, but by the nature of the service provided and the allocation of the premiums received is also exposed to a number of investment related risk. The ability of short-term insurers to absorb significant unforeseen losses is important and it is measured by the valuation of insurance liabilities and the calculation of a regulatory capital charge to absorb the losses when necessary.

The items in the balance sheet of the short-term insurer illustrate that the insurance model affects both sides of the balance sheet. The calculation of the technical provisions on the liability side of the balance sheet is used to protect the pool to ensure the sustainability of the short-term insurer. Short-term insurers also

implement different methods to manage the risk in the pool such as enlarging the pool to benefit from the Law of Large Numbers, accepting risks from different geographical areas, and purchasing reinsurance to transfer some of the risks to reinsurers. Short-term insurance premiums are invested in different asset classes, which are exposed to market risk caused by changes in prices and interest rates, which can not only adversely impact the value of the individual investments, but also the total portfolio. The issuer of the securities can however also default on their obligations to repay the capital or interest, which also adversely affect the value of the investments, which expose the short-term insurer to credit risk.

The insurers experienced a number of challenges to prepare and implement Solvency II in the UK, as the short-term insurer may have to appoint people with modelling skills to either develop internal models or calibrate the standard models as prescribed by the capital adequacy directive. The models are used to calculate the regulatory capital requirements for underwriting risk, market risk, credit risk, and operational risk.

Short-term insurers may also need to make significant changes to their current data architecture to meet the regulatory data requirements. The current data architecture may be inappropriate which may increase the demand for skills with the ability to design, develop, and implement a data architecture that meets the regulatory requirements. The new data architecture may require changes to hardware, risk applications, interfaces between the various product systems and the risk applications to limit manual intervention in data and projects to enhance the accuracy and completeness of data. Further cost implications may be the on-going compliance with the regulatory capital requirements and the ability to raise the prescribed amount and tiers of capital.

6.3. SUMMARY OF THE FINDINGS OF THE RESEARCH QUESTIONNAIRE

A questionnaire, based on a five point Likert scale was used as a data collection method. The questionnaire was distributed at the IISA 2013 conference to key

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stakeholders in the short-term insurance industry. Seventy questionnaires were distributed and 48 were received, which gives a response rate of 69%.

The most important findings from the data analysis are presented below.

The participants in the survey indicated that the core skills required for the implementation of SAM could be a limitation. The findings of the survey with regard to the availability of core skills correspond with the experience of the insurers in the UK and Europe, namely the shortage of skills can have a negative impact on the implementation of Solvency II and SAM. The shortage of skills may also lead to an increase in cost to acquire the necessary skills to implement SAM.

Short-term insurers may need to make significant changes to their current data architecture to meet the regulatory data requirements. The current data architecture of the short-term insurer may be inappropriate to meet the SAM requirements, which may increase the demand for skills with the ability to design, develop, and implement a data architecture that meets the regulatory requirements. The new data architecture may require changes to hardware, risk applications, interfaces between the various product systems and the risk applications to limit manual intervention in data and projects to enhance the accuracy and completeness of data. The results correspond with the experience for Solvency II preparation in Europe and the UK.

The participants are of the opinion that the cost implement, and comply with SAM will a significant effect on the cost structure of the short-term insurer as 72% of the respondents disagree or strongly disagree that the implementation cost will have a minimal impact on the short-term insurer. Sixty-five per cent of the respondents disagree or strongly disagree that the continued cost to comply with the SAM requirements will have a minimal impact on the short-term insurer. The majority of the respondents, 78%, either strongly agree or agree with the statement that the short-term insurers will have sufficient capital to meet the SAM capital requirements. The opinion of the industry is also in contrast with the opinion of the regulator. The opinion of the industry agrees with the experience of the insurers in the UK and Europe with the implementation of the Solvency II requirements. The opinion is also in line with the experience of the insurers in the UK and Europe with the preliminary results of the Solvency II preparation.

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The majority of participants agree that SAM is appropriate for the individual short-term insurer and for the short-term industry as 69% of the respondents either strongly agree or agree with the statement that the SAM is appropriate for short-term insurers. Sixty-six per cent of the respondents either strongly agree or agree with the statement that the SAM is appropriate for the short-term insurance industry.

It is unfortunately too early to determine to what extent SAM is appropriate for short-term insurers, including the industry. The appropriateness of SAM for the short-term insurance industry warrants further research as indicated in paragraph 6.7. The next construct that will be analysed relates to risk management in the short-term insurance companies and the influence of SAM on systemic risk.

The majority of participants agree that SAM will improve risk management as 82% of the respondents either strongly agree or agree with the statement that SAM will improve risk management for the insurer. Fifty-five per cent of the respondents either strongly agree or agree with the statement that SAM will reduce systemic risk in the short-term insurance industry. It is unfortunately too early to determine to what extent SAM will reduce systemic risk in the short-term insurance industry. The effectiveness of SAM in reducing systemic risk warrants further research as indicated in paragraph 6.7.

Based on the analyses of the questions of last construct, the majority of participants agree that SAM will affect small and medium short-term insurers negatively. The participants also foresee an increase in the short-term insurance premiums, but do not expect short-term insurance cover to be reduced.

The insurers agree or strongly agree the implementation of SAM will lead to increased merger and acquisition activity of small and medium short-term insurers. This statement is supported by 75% of the small, 88% of the medium, and 65% of the large short-term insurers. The regulators did not have an opinion on the statement.

The insurers agree or strongly agree to a lesser extent that the implementation of SAM will lead to the demise of small and medium short-term insurers, as 50% of small, 38% of medium, and 55% of the large short-term insurers supported the

statement. The regulators strongly disagreed with this statement. Although there seems to be agreement among insurers that SAM may have a negative effect on the small and medium short-term insurers, the impact of SAM on small and medium short-term insurers warrants further research as indicated in paragraph 6.7.

The participants in the study supported the statement that the implementation of SAM will lead to an increase in the cost of doing business. This statement is supported by 54% of the participants, consisting largely (88%) of insurers. The participants in the study supported the statement that the implementation of SAM will lead to an increase in short-term insurance premiums. This statement was supported by 54% of the respondents, of which the largest proportion (88%) is represented by insurers. The participants in the study do not support the statement that the implementation of SAM will lead to a decrease in short-term insurance, as only 21% of the participants supported the statement.

The impact of SAM on small and medium insurers, the cost of doing business, short-term insurance premiums, and short-term insurance coverage warrants further research as indicated in paragraph 6.7.

The cluster analysis indicate the effect of the implementation of SAM on the premiums and coverage of short-term insurance warrants further research and is discussed in more detail in paragraph 6.7. Cluster 2 and cluster 5 relate strongly to the cost of implementation and compliance with SAM, and the availability of skills to prepare for the implementation of SAM. Based on the results of the analysis of the two clusters, it can be concluded that short-term insurers are of the opinion that the preparation for the implementation and continued compliance with the SAM requirements has, and will continue to have a negative effect on the cost structure of short-term insurers. Based on the analysis of the questions in this cluster 3, with regard to data and information technology systems, it can be concluded that short-term insurers are concerned with the preparing of data and information technology systems. The results of cluster 4 with regard to capital, risk management, and appropriateness of SAM, indicate that respondents are of the opinion that the implementation of SAM is appropriate for short-term insurers and the short-term insurance industry, and will improve risk management of the short-term insurer.

There is less certainty of whether the implementation of SAM will reduce systemic risk in South Africa. The results of cluster 5, cost of implementation and availability of core skills, indicate that participants in the survey are of the opinion that the implementation of SAM will have a negative impact on the cost structure of the short-term insurers. Participants also indicate the availability of the requisite modelling, IT, and actuarial skills is limited, which is also a cost driver in the implementation of SAM.

The results of the Kruskal-Wallis test indicated the differences among the samples are small and there is consistency across the small, medium, and large short-term insurers on the impact that SAM may have on the short-term insurance industry in South Africa.

6.4. CONCLUSION

Insurers fulfil an important role by facilitating the pooling and transferring of risk to protect policyholders against fortuitous and previously agreed events. The financial stability is important to ensure insurers are able to fulfil their obligations under normal and stress conditions by absorbing foreseen and unforeseen losses.

Prudential regulations were introduced with the purpose to protect policyholders. Globalisation and the development of sophisticated products, such as insurance linked securities, to complement traditional insurance products such as personal and commercial insurance, have also increased the need for a more risk sensitive regulatory approach. The Solvency II regime, and from the South African perspective SAM, focuses on the economic balance sheet of the insurer or reinsurer and to harmonise the regulatory approaches in the different countries. The review of the literature indicated that the implementation of the Solvency II regime is costly and may impact small and medium insurers negatively.

The empirical part of this study consisted of a survey and the analysis of the questionnaire included a descriptive study, cluster analysis, and Kruskal-Wallis test. The results of the descriptive analysis indicate that insurers are of the opinion that it is difficult to acquire people with the necessary modelling, information technology,

and actuarial skills. This opinion of the industry is however not shared by the regulator. Insurers also indicated that updates or changes to data architecture are required to meet the SAM requirements. Participants in the survey have the opinion that SAM will have a positive effect on risk management of the insurer and the insurance industry. Insurers also have the opinion that the implementation of SAM can have a negative impact on small and medium insurers as an increase in merger and acquisition activity are expected and that the cost of doing business as a short-term insurer will increase.

6.5. CONTRIBUTION OF THE STUDY

The contribution of the study can be summarised in the contribution made with the literature review and the conclusions from the empirical component of the study.

6.5.1. Contribution of the literature review

The contribution of this study of the impact that the implementation of SAM may have in South Africa, is the first comparison of the problems experienced with the implementation of Solvency II in Europe and the UK and an analysis of the opinions of stakeholders in the short-term insurance industry in South Africa.

The literature review explained the role of insurance in the economy, the types of insurance products available, which covered both the standard insurance contracts and insurance linked securities, and the risks to insurer inherent in the insurance business model. The literature review included a comprehensive review of the Solvency II requirements, with the problems experienced with the preparation for the implementation of Solvency II. The review of the Solvency II requirements and the problems experienced by insurers in the UK enabled a comparison with the SAM stakeholders in the South African insurance industry.

6.5.2. Contribution of the empirical component of the study

The contribution of the empirical component of the study included an analysis of the opinions of the participants in the South African short-term insurance industry.

Although, as indicated in chapter 3 paragraph 3.6.2.2, 63 short-term insurers participated in SA QIS2, the quantitative impact study was not specifically focused on the effect of SAM on small and medium short-term insurers. Furthermore, the quantitative studies did not focus on the effect on future premiums or short-term insurance coverage. The study indicated small and medium short-term insurers may be negatively impacted as it may be difficult to implement and comply with the SAM requirements, which may lead to mergers and acquisition of small and medium short-term insurers.

Although recommendations for adjustments of the SAM regime did not form part of the study, a case can be made to accommodate small and medium short-term insurers, not involved in ILS or operating outside the South African jurisdiction. Chapter 2 highlighted the complexity of ILS with regard to the modelling and evaluation of the risks inherent in ILS, and the availability of data for and accurate risk assessment and valuations. Small and medium short-term insurers not interested in global expansion and with limited or no ILS exposures are currently required to comply with SAM, which may be excessive considering SAM is based on a regulatory regime of countries with significantly larger economies and levels of development. The inherent risk profile of small and medium short-term insurers may not warrant as sophisticated regulatory regime.

6.6. LIMITATIONS OF THE STUDY

This study provided an overview of the Solvency II regime, which will be implemented in Europe and the UK, and SAM in South Africa, and highlighted the problems experienced by insurers with the preparation for Solvency II. Neither Solvency II, nor SAM has been implemented which makes it difficult to accurately predict the impact that the new regulatory regimes may have on the short-term insurance industry and individual insurers. Developments in Solvency II and SAM until December 2013 have been included. The results of the SA QIS3 were not available at the time the literature review was finalised and were thus not included in the study.

The review of the literature focused on the standard approach, as the internal models of simplified models being developed by the short-term insurers and reinsurers are for the purpose of the specific short-term insurer and reinsurer and fell outside the scope of this study. The study did not include a review of the validity of the mathematical models, and where formulae were included in the literature review, the purpose was to demonstrate the criticality of data needed for the solvency capital calculations. A number of topics, which warrant further research have been identified and are discussed in the next paragraph.

6.7. RECOMMENDATIONS FOR FURTHER RESEARCH

The latest date for the implementation of Solvency II and SAM are planned for 2016, with the effect that the full effect of the regulatory regimes on the short-term insurance industry cannot be analysed. Although this study analysed the opinion of stakeholders in the short-term insurance industry at a point in time, the full impact of SAM can only be studied after implementation. Topics for further research are discussed can include the effect on small and medium short-term insurers, the cost of doing business as a short-term insurer, and the change in premiums and short-term insurance cover.

6.7.1. Effect on small and medium short-term insurers

A point for further research is to do a longitudinal study on the impact of SAM on small and medium short-term insurers related to mergers and acquisitions. The expectation is that a number of small and medium insurers may be acquired by larger short-term insurers, or a number of small and medium short-term insurers may merge. Small and medium short-term insurers may also outsource of the regulatory functions to a provider with regard to the calculation of the Pillar I capital requirements and Pillar III reporting requirements. Components of the Pillar II requirements such as the management of the data architecture, actuarial and risk management functions may also be included in the outsourcing functions.

6.7.2. Cost of doing business as a short-term insurer

The operating cost of short-term insurers is expected to increase due to the implementation of SAM and the cost incurred to comply with SAM. An increase in the cost of doing business may put the profit margins of the small and medium short-term insurers under pressure, which may lead to mergers and acquisitions or even the demise of the insurers. A longitudinal study can be conducted on the cost to income ratios and the coverage provided by small and medium short-term insurers after the implementation of SAM.

6.7.3. Effect on premiums and short-term insurance cover

Short-term insurers have to calculate the basic solvency capital requirement per line of business, which can incentivise short-term insurers to stop cover for the unprofitable lines, or increase the premiums to ensure profitability. Although the results of the questionnaire indicated that premiums will not necessarily increase due to the increase in operating cost, it is unlikely that insurers will absorb the cost without increasing the premiums. A study on the impact of the SAM regulations on short-term insurance premiums and cover also warrants further research.

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Annexure A: Survey questionnaire

INTRODUCTION

I am conducting research on the impact that the implementation of Solvency Assessment and Management (SAM) may have on the short-term insurance industry in South Africa.

The purpose of this questionnaire is to obtain the views of senior/executive management of a short-term insurance company, the regulator, auditors, consultants, and brokers involved in the Short - Term Insurance Industry on the possible impact that the implementation of SAM may have on the South African Short-Term Insurance Industry. Your participation in the survey is voluntary, but your input into the research, by completing this questionnaire, will be greatly appreciated.

CONFIDENTIALITY

Your answers will be treated **as strictly confidential**. Neither the names of the participants nor the organisations/institutions that participated in the survey will be disclosed at any stage.

BACKGROUND

Short-term insurers fulfil an important function in the economy in providing protection against future fortuitous losses such as accidents, theft and fire. As the protection provided by insurers is against future losses or events, the financial stability of insurers is important and closely regulated to protect policyholders. The liabilities on the balance sheet of the insurer are the incurred claims and associated claims costs. In addition, the insurer must hold assets as a buffer, which is defined as the solvency margin. This ensures the stability of financial markets and protects policyholders.

The purpose of SAM is to align the South African short-term insurance industry with international standards, specifically Solvency II, which is based on the bank's Basel II accord. This will align the South African prudential regulatory framework with the standards being recommended by the International Association of Insurance Supervisors.

It is proposed that SAM will apply to all short-term insurance entities operating on a commercial basis, which includes government - owned insurers, but will exclude entities licensed under the proposed micro-insurance legislation, which will operate under a separate regulatory environment. The latest indication is that SAM will be implemented in 2016.

The impact of Solvency Assessment and Management on the short-term insurance industry in South Africa

DEMOGRAPHIC INFORMATION

Please circle your answer

1. Please indicate your involvement in the short-term industry.	Short-term	Regulator	Broker	Other
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If you circled **other**, please indicate your industry

2. If you are involved as a short-term insurer, or the regulator, auditor, consultant or broker of a short-term insurer, please indicate the size of the short-term company you are involved in, in terms of gross premiums written.	Small <R500m	Medium Between R500m and R1bn	Large >R1bn	Not Applicable
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3. Are you involved in the implementation of SAM in your short-term insurance company or as a regulator, auditor or consultant of a short-term insurance company?	Yes	No
--	-----	----

If you circled **Yes**, in which capacity?

The impact of Solvency Assessment and Management on the short-term insurance industry in South Africa

Please circle the number which represents your opinion that the implementation of SAM may have on the South African Short-Term Insurance Industry

	Strongly Disagree	Disagree	No opinion	Agree	Strongly Agree
AVAILABILITY OF CORE SKILLS					
1. It is easy to acquire people with the prerequisite modelling skills to meet the SAM implementation deadline.	1	2	3	4	5
2. It is easy to acquire people with the prerequisite IT skills to produce the data needed to meet the SAM implementation deadline.	1	2	3	4	5
3. It is easy to acquire people with the actuarial skills to meet the SAM requirements.	1	2	3	4	5
DATA ARCHITECTURE					
4. The current IT systems of the short-term insurance company I am involved in, require the minimal manual intervention (e.g. Excel spreadsheets) to calculate the statutory requirements e.g. IBNR, UPR and SCR.	1	2	3	4	5
5. The data definitions of the systems in the short-term insurance company I am involved in, need minimal adjustment to meet the SAM data requirements.	1	2	3	4	5
6. All the data required to calculate the SCR in the short-term insurance company I am involved in, is readily available.	1	2	3	4	5

The impact of Solvency Assessment and Management on the short-term insurance industry in South Africa

Please circle the number which represents your opinion that the implementation of SAM may have on the South African Short-Term Insurance Industry

	Strongly Disagree	Disagree	No opinion	Agree	Strongly Agree
7. The available data to calculate the SCR in the short-term insurance company I am involved in are accurate and need the minimum adjustment.	1	2	3	4	5
8. The current systems in the short-term insurance company I am involved in need minimal changes to support the implementation of SAM.	1	2	3	4	5

COST OF IMPLEMENTATION AND COMPLIANCE

9. The cost to implement the SAM requirements will have a minimal impact on the short-term insurance company I am involved in.	1	2	3	4	5
10. The continued compliance with the SAM requirements will have a minimal impact on the cost structure of the short-term insurance company I am involved in.	1	2	3	4	5
11. The short-term insurance company I am involved in will have sufficient capital to meet the SCR and MCR on the envisaged SAM implementation date.	1	2	3	4	5

APPROPRIATENESS FOR THE SHORT-TERM INDUSTRY

12. The SAM requirements are appropriate for short-term insurance companies.	1	2	3	4	5
13. The SAM requirements are appropriate for the short-term insurance industry in South Africa.	1	2	3	4	5

The impact of Solvency Assessment and Management on the short-term insurance industry in South Africa

Please circle the number which represents your opinion that the implementation of SAM may have on the South African Short-Term Insurance Industry

Strongly Disagree
Disagree
No opinion
Agree
Strongly Agree

RISK MANAGEMENT

14. The implementation of the SAM requirements will enable the short-term insurance company I am involved in to improve its risk management. 1 2 3 4 5

15. The implementation of SAM will reduce systemic risk in the short-term insurance industry in South Africa. 1 2 3 4 5

POTENTIAL IMPACT ON THE SHORT-TERM INSURANCE INDUSTRY

16. Compliance with SAM requirements will lead to an increase in mergers and acquisitions among short-term insurers in South Africa. 1 2 3 4 5

17. Compliance with SAM requirements will lead to the demise of medium to small short-term insurers. 1 2 3 4 5

18. Compliance with the SAM requirements will increase the cost of doing business for short-term insurers disproportionately compared to the benefits derived from SAM. 1 2 3 4 5

19. Compliance with the SAM requirements will lead to a general increase in premiums for short-term insurance coverage. 1 2 3 4 5

The impact of Solvency Assessment and Management on the short-term insurance industry in South Africa

Please circle the number which represents your opinion that the implementation of SAM may have on the South African Short-Term Insurance Industry

	Strongly Disagree	Disagree	No opinion	Agree	Strongly Agree
20. Compliance with SAM requirements will lead to a decrease in the short-term insurance coverage available in South Africa.	1	2	3	4	5

Thank you very much for your time and participation in this survey.

Annexure B: The International Insurance Conference – Southern Africa 2013 organisations represented

ORGANISATION

24Fix

Absa

Absa Insurance & Financial Advisers

Absa Insurance Company

Absa Life

ACE Insurance

ACORD

Active Operations

Affinion Mobile Solutions

Afre Corporation

Africa Insurance Review - Pageant Media

African Independent Brokers

African Reinsurance Corporation

AFRISURE

Age Group

AIBA

AIG MEA Limited

AIG South Africa Limited

AIICO Insurance PLC

Akani Retirement Fund Administrators

Alexander Forbes

Alexander Proudfoot

Alliance Insurance Company

Allianz Global Corporate & Specialty

Allianz SE

Allied Insurance Company

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industry in South Africa

Allied World Re

ALTARA FINANCIAL SERVICES

Altech Netstar

ANTENIA

AOM Africa

AOMI International

Aon Benfield Aon Botswana Aon South Africa

Aquarius Underwriting Managers

Aquila Consultants

Arch Re

Arch Underwriters at Lloyd's SA

Astute

Auto & General

Automobile Association

Avis Rent A Car South Africa

Bar

Bayport Financial Services

Bestsure Financial Services

BetterSure

Beyonda

BMW Financial Services

Botswana Insurance Company

BrightRock

Brokersure

Brokoop Insurance Brokers

Brolink

B-Sure Africa

Business Against Crime South Africa (BACSA)

Business Connexion

Cardinal
Cardinal Insurance Management Systems
Cartrack
CELL INSURANCE COMPANY
CENSEO
Centriq Insurance Company
CIB Insurance Administrators
Cims South Africa
CitizensZA
Collective Dynamics
Collision Repairers Co-operative
Collision Repairers Association
Compass Insurance
Complete Exhibitions
Consort Technical Underwriting Managers
Constantia Insurance Company
Continental Reinsurance Plc
Cooper Gay & Co
Corpsure
COSA Communications
Cotswold Reinsurance Services
COVER Publications
CRA
Credit Guarantee Insurance Corporation of Africa Ltd
Credit Insurance Zimbabwe Ltd
Ctrack
Customer Loyalty Consultants
Cutting Edge Training and Consulting (Pty) Ltd
Damelin

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Diamond Events
Digicall Solutions
Discovery Insure
Drive-report
Dry Force
Eikos Risk Applications
Emerald Risk Transfer
Emeritus Re-Insurance Company
Entertainer
Eqstra Fleet Management
Eskom Holdings
Eskom Holdings SCO Limited
Etana
Europ Assistance South Africa
Europcar
Excel Recovery Services (Pty) Ltd
Exiliti Services
FA News
Factory & Industrial
Fair Isaac Services Ltd
FIA FICO
Financial Services Board
First Group
First Mutual Life Assurance Company
First Rand
firstEquity Risk Management Services
FirstRand Bank
Flexible Accident & Sickness Acceptances (Pty) Ltd.
FM Global

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industry in South Africa

FMRE Property & Casualty
FNB Insurance
Foschini Retail Group
FPASA
FPI
Frontline Underwriting Managers
Fulcrum Group
Fürstenburg Brokers
Gen Re
Genasys Technologies
Generic Insurance Company Limited
Gift Bucks (Pty) Ltd
GIVA
GIVA (Russia)
Glasfit
Glenrand MIB Zimbabwe
GLINSO-Insurance Brokers
Global Alliance
Global Choices
Grandmark International
Guarantee Placings
Guardrisk
Guy Carpenter
Hamilton Insurance
Hamtern Financial Services
Hannover Re
Harvey's Premium Guarantee (Pty) Ltd
HDI Gerling Insurance of SA
Hollard

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Hollard Insurance Botswana

I R M S A

iCreate digital post

Iemas Financial Services Co-Operative

Ignition Group

IISA IML

Impac Risk Solutions

In Place Recruitment

Indwe Risk Services

Infiniti Insurance

Informatics International Limited

Initiative Media

InnoSys

Innovation Group Innovation Group (Pty) Ltd

INSETA

Institute of Loss Adjusters of Southern Africa

Insurance Brief

Insurance Council of Zimbabwe

Insurance Institute of KZN

Insurance Institute of Zimbabwe

Insurance Learning Academy

Insurance News Ghana Ltd

Insurance Talent Solutions

Insure Group

IntegriSure

International Finance Corporation, The World Bank Group

IS Services

JLT SA

Kapara Insurance Brokers

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KPMG

Lateral Unison Insurance Brokers

Lidwala Insurance Company

Lightstone

Lion Assurance Co. Ltd Uganda

Lion of Africa

Lireas Holdings

Lloyd's SA

Lloyd's SA (Pty) Ltd

Lockton First Equity

Lombard Insurance

Madison Life Insurance Company Zambia

Marketing Merchants

Marsh

Marsh - Kapela Holdings

Marsh - Nespresso

Marsh Africa

Marsh Botswana

Marsh Zimbabwe

Maverisk

MCB

Mercantile Insurance Brokers

Milpark Business School

Mirabilis

MiX Telematics

MiX Telematics (Matrix)

MMSI

Momentum Short-term Insurance

Momentum Specialised Solutions

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Monday Band
Monitor Affinity
Moorivier Group
MTN
MUA Insurance Acceptances
Multiline Insurance Administrators
Munich Mauritius Reinsurance
MunichRe
Mutual & Federal
Mutual & Federal Botswana
Naledi Reinsurance Brokers
Namibia National Reinsurance Corporation
National Treasury
Natsure
Navistar Insurance Brokers
Nedbank
Nedgroup Insurance Company
Nelson Mandela Metro University
Nespresso - Marsh Supplier
NICO Mocambique Vida Companhia de Seguros
Nicoz Diamond Insurance
NMG Risk Managers
NONE
North Coast Insurance Brokers
Norton Rose Fulbright
O'Keeffe & Swartz
Oak Tree Intermediaries
Oakhurst Insurance
Oasis

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O'Keeffe & Swartz
Old Mutual
One Alliance
One Financial Services Holdings
One Insurance
One Loyalty Rewards
One Re
Onecard Investments
OneCard Management Services
Oojah Travel Protection
OUTsurance
Pan African Underwriting Managers
Pan-African Capital Holdings
PCBS Pensioner
Performance & Customs Bond Service (Pty) Ltd
PetroSA
PFP Insurance Brokers
PG Glass Photographer Porto Agencies
Prefsure (Botswana) Limited
Premier Claims Services
Principa Decisions
Private
Professional Insurance
PROFIDA – Computer Science Software
PwC (PriceWaterhouse Coopers)
QBE Insurance Europe
Quality Insurance Company
Quoting Engine Rand Water RCS
Real Insurance – Mozambique

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Regent Insurance
Regent Insurance Botswana
Relyant Insurance
Renasa Insurance
Ripcord Promotions
RKHarrison Reinsurance Brokers
RMB Structured Insurance
Road Protect
RoadCover
Rock Consulting
Royal Union Insurance Brokers
Rubicon Media
S A I A
SA Home Loans
Safire Insurance Company
SAICB
Salvage Management & Disposal
Sanlam
Santam
SAS Institute
Sasria SOC
Sasria SOC Limited
SAUMA
Schanel Versekeringsmakelaars
Scintilla
SCOR Africa
Sfera Group Holdings
Shelter Reinsurance
Showgroup

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industry in South Africa

Skyddo Corretora de Seguros
South African Reserve Bank
Southern Cross Risk Management (Pty) Ltd
Speaker
SSP Africa
Stalker Hutchison Admiral
Standard & Poor's
Standard Bank Insurance Brokers
Standard Insurance
Steve Slatter Insurance Brokers
Stoker Risk and ICT STRIDE
Sure Settle
Sureport Risk Solutions
Swaziland Building Society
Swaziland Royal Insurance Corporation
Swiss Reinsurance Company
Symbility Solutions
Talk Radio 702
TEBA
Tnova Mining & Minerals
Thatch Risk Acceptances
The Insurance Learning Academy
The Ombudsman for Short Term Insurance
The Omnicover Group
The Unlimited
Towers Watson Hartford, USA
Towers Watson SA
Tracker
Tracker Entertainment

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Transition Risk Solutions

Transnet Soc

TransRe

Transunion Auto Information Solutions

TransUnion Credit Bureau

Trifecta Capital Services

Tru Trade

Tuffstuff 4x4 Insurance Brokers

Umnotho Consulting

UNISA CBM

United Nations Environment Programme Finance Initiative

University of South Africa

University of the Witwatersrand

Webber Wentzel

Western Administration Services

Willis

Willis Re

Windscreen Distributors

Your Insurance Brokers

Zenith Horizon Insurance Company

ZEP Re-Insurance Company

Zurich Insurance

350 Organisations Listed