HOW TO MEASURE ADEQUACY OF TECHNICAL PROVISIONS IN GENERAL INSURANCE – PRACTICAL PERSPECTIVE

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Abstract

The goal of this article is to outline possible applications of liability adequacy test (LAT) for non-life business applied by the insurance companies according to local accounting policy and IFRS. As LAT is very indicative tool to quantify adequacy of liabilities, therefore every non-life insurance company should apply certain method of LAT. In the first part, the article focused on the legislative framework and general descriptions of LAT according to IFRS 4. The general definitions and possible applied methodology are described in the next section. The final part is dedicated to calculations and illustrative examples of the topic.

Keywords: IFRS 4, liability adequacy test, RBNS, IBNR, run-off, UPR LAT

Legislative framework

The basic principle of accounting applied in every country is the one by which financial statements should give a true and fair view of the financial position and results of an entity. This general principle allows harmonization of the rules in accounting. The result of this harmonization process has become International Financial Reporting Standards (IFRS), which are published since 2001 and the International Accounting Standards (IAS), which were published from 1973 to 2001. These standards are developed and published since 2001 by the International Accounting Standards (IASB). The objective of the IASB was to create clear standards for high-quality class financial reporting. Nevertheless, by adopting IFRS, a business can present its financial statements on the same basis as its foreign competitors, making comparisons easier. Furthermore, companies with subsidiaries in countries that require or permit IFRS may be able to use one accounting language company-wide. Companies may also benefit by using IFRS if they wish to raise capital abroad [6].

IFRS adaptation has an increasing trend on a global level. Currently more than 120 countries permit or require (fully or partially) reporting of the financial statements according to IFRS [4, 6].

Chart 1: Map of IFRS adoption. Source: Author's work by using [7]

IFRS in many countries have become a part of national legislation or common practice. Adoption of IFRS is recommended by the Bank of Cape Verde, however due to many constraints it is not allowed reporting according to IFRS in the country. Hopefully, many steps will be made towards the IFRS adoption taking into account the national specifics. In March 2004, the IASB issued IFRS 4 [1, 2], which is the first phase of the project of the international standards regarding to specific issues of insurance relations. As the second phase of IFRS 4 is still waiting for approval from the European Commission, as well as the introduction of risk-based Solvency II system is still delayed, insurance companies are required to prepare their financial statements (those parts of it) according to IFRS 4 which is engaged in insurance policies, especially their classification, accounting and reporting. Insurance companies have to take into account the definition of insurance contract as it is the core business of such an entity. Insurance contract described in the Annex A to IFRS 4 is defined as [1, p. 11]: „A contract under which one party (the insurer) accepts significant insurance risk from another party (the policyholder) by agreeing to compensate the policyholder if a specified uncertain future event (the insured event) adversely affects the policyholder." It means that insurance is the equitable transfer of the risk of a loss, from client to insurance company in exchange for payment. It is a form of risk management primarily used to hedge against the risk of a contingent, uncertain loss. The insurance company compensates the insured in the case of certain negative losses due to uncertain event which is defined in Annex B to IFRS 4 [1, p. 13]: „Uncertainty (or risk) is the essence of an insurance contract. Accordingly, at least one of the following is uncertain at the inception of an insurance contract: whether an insured event will occur; when it will occur; or
how much the insurer will need to pay if it occurs."

The main objective of IFRS 4 standard is to specify the financial reporting for insurance contracts. In particular IFRS 4 requires disclosure that identifies and explains the amounts in an insurer's financial statements arising from insurance contracts and helps users of those financial statements understand the amount, timing and uncertainty of future cash flows from insurance contracts.

Taken into account the disclosure requirements according to IFRS (4.36 to 4.37), insurers should separately disclose information explaining the amounts that are recognized in the financial statements and assumptions considered for quantifying these amounts, respectively. This information includes details about the particular risks (e.g. interest rate risk, market risk, insurance risk), which may have a significant impact on the figures reported in the financial statements.

Insurance companies are exposed to insurance risk and underwriting risk where the most important part of the described risks is the risk of lack of adequate technical provisions. Liability adequacy test is used to eliminate of that risk.

The precise description of principles of the liability adequacy test (LAT) is formulated in parts of IFRS 4.15 to 4.19. To perform the LAT is not possible to provide a general guide, therefore an actuary or a person who performs the LAT should consider all of the circumstances and propose the appropriate model and assumptions based on own best professional judgment.

Finally, based on the disclosure requirements of IFRS 4 (4.36 to 4.37), documentation of LAT should also include material about the segmentation of portfolios into groups, assumptions used and their derivation. In addition, documentation is not complete without a variance analysis, sensitivity analysis and back testing.

General methodology of liability adequacy test

In accordance with the requirements of IFRS 4 (4.15 to 4.19) the insurance company should perform liability adequacy test (LAT) of technical provisions in non-life insurance at least once a year. However, in practice the insurance companies perform LAT at least once a

year as at 31.12. (or as at each reporting date). Implementation of LAT in practice consists of several steps.

The first step determines the best estimate (BE) of technical provisions, which takes into account all available information. The methodology used to estimate the BE should be in accordance with IFRS 4.

In the second step are adequately taken into account the different risks of estimation and application of risk margins (RM). Therefore, risk margins are added to the best estimate which represents certain level of prudence in the estimation process. Level of uncertainty in the estimate of technical provisions should be in each LAT quantified. Quantification includes indication whether there was an increase, decrease or stable level of prudence compared to the previous LAT. Based on IFRS 4.29 prudence is allowed in the estimation process, but if the technical provisions are already measured with sufficient prudence, it should not be added any additional prudence.

When calculating the best estimate with risk margins insurance companies can apply some aggregation of certain groups of insurance contracts of a similar nature. It means that the portfolios of insurance contracts can be divided into groups (e.g. by the nature of the products, by underwriting period). IFRS 4 does not specify which insurance contract should be in which group, therefore insurance companies can classify non-life insurance contracts according to own actuarial judgment. The main criterion should be that products with similar risks should be included within one group and managed together as a single portfolio. Separation can be done according to Solvency II directive (12 lines of business) or according to internal classification of insurance company. LAT of technical provisions should be assessed for each group separately. However, in practice is often applied simplified way where for the purpose of LAT particular groups are created (significant lines of business and others; short tail and long tail business).

In the last step is performed the LAT of technical provision by comparing best estimate with risk margins to the value of technical provisions in the financial statement. There are some basic types of LAT in non-life insurance:

liability adequacy test of claim provisions,

liability adequacy test of unearned premium reserve.

Liability adequacy test of claim provisions (Run-off for RBNS and IBNR)

For LAT of claim provisions is used the result of claim settlements (run-off). This run-off test is used for checking of the proper amount of technical provision carried out for a certain term (usually one year). In case of negative result the reasons of the phenomenon are analyzed. Furthermore, the negative result has only informative character, but it also indicates some inconsistencies, therefore it is an indication for reviewing and analyzing of the methodology applied in the estimation process. LAT of technical provisions are linked to:

Provision for reported but not settled claims (RBNS). Components needed to perform the run-off are:

RBNS provision at the beginning of the period,

Claims paid from the beginning of the period to the end of the period which were reported until the beginning of the period,RBNS provision at the end of the period for claims reported until the beginning of the period.

Result of the run-off test for RBNS is then 1) – 2) – 3). If the result is less than 0, then the provision at the beginning of the period was not sufficient. Otherwise, the provision was sufficient.

Provision for incurred but not reported claims (IBNR). Components needed to perform the run-off are:

IBNR provision at the beginning of the period,

Claims paid from the beginning of the period to the end of the period for claims incurred until the beginning of the period but reported from the beginning of the period to the end of the period,

RBNS provision at the end of the period for claims incurred until the beginning of the period but reported from the beginning of the period to the end of the period,

IBNR provision at the end of the period for claims incurred until the beginning of the period.

Result of the run-off test for IBNR is then 1) – 2) – 3) – 4). If the result is less than 0, then the provision at the beginning of the period was not sufficient. Otherwise, the provision was sufficient.

Illustrative example 1

The insurance company usually has a large portion of data about claims, current amounts of RBNS per policy basis, amount of IBNR per line of business. The records usually contain identification data, the date of the occurrence of claim, date of registration, date of payment, etc. Sufficiency of technical provisions should be assessed for each group separately as it is illustrated in the example below. Beginning of the period is January 1, 2013 and December 31, 2013 is the end of the period, therefore the run-off test is performed on annual basis. Suppose that the insurance company has prepared a dataset illustrated in the Table 1 from the available data (the data in the table below were generated and are for illustrative purpose):

Table 1: Data

Calendar year		2013	
Total paid claims – actual year (1.1.2013 – 31.12.2013)		17 976	A=B+C
of which	reported in past years	9 761	B
	reported in actual year	8 215	C=D+E
	but incurred in past years	346	D
	but incurred in actual year	7 869	E
RBNS at the beginning of the period (1.1.2013)		57 227	F
RBNS at the end of the period (31.12.2013)		54 902	G=H+I+J
of which	claims reported in past years	46 822	H
	claims reported in actual year, but incurred in past years	491	I
	claims reported in actual year and incurred in actual year	7 589	J
IBNR at the beginning of the period (1.1.2013)		33 445	K
IBNR at the end of the period (31.12.2013)		31 100	L=M+N
of which	claims incurred in past years	27 552	M
	claims incurred in actual year	3 548	N

Source: Author's calculation

From the data illustrated above, it is simple to construct a run-off test for RBNS and IBNR. Based on the methodology of run-off test for RBNS the components needed for the run-off test are RBNS at the beginning of the period, total paid claims in actual year but reported in the past years and RBNS at the end of the period for claims reported in the past years. The result is presented in the following table. The number before the component description is a reference to the methodology described above. The last column indicates a link to input data from Table 1.

Table 2: Run-off for RBNS

1) RBNS at the beginning of the period	57 227	F
2) Total paid claims in actual year but reported in the past years	9 761	B
3) RBNS at the end of the period for claims reported in the past years	46 822	H
1)-2)-3) Run-off result	644	
Run-off result in %	1%	

Source: Author's calculation

Result of run-off test is positive, which means that the provision for RBNS was sufficient at the beginning of the period because the provision covers all paid claims reported in recent years. The positive result of 1% indicates that the provision was set appropriately. If the result is positive, and is very close to zero, then the determination of RBNS reflects appropriate estimate. In case that the result of run-off test is negative, it would be necessary to revise the methodology of RBNS provision. On the other hand, very high positive % is not appropriate, because it may indicate a deeply conservative approach and may cause excessive prudence, which is inconsistent with IFRS 4.29 (prudence in the estimation process).

Based on the methodology of run-off test for IBNR the components needed for the run-off test are IBNR at the beginning of the period, total paid claims in actual year reported in actual year but incurred in past years, RBNS at the end of the period for claims reported in actual year but incurred in past years, IBNR at the end of the period for claims incurred in past years. The result is presented in the following table. The number before the component description is a reference to the methodology described in the previous section. The last column indicates a link to input data from Table 1.

Table 3: Run-off for IBNR

1) IBNR at the beginning of the period	33 445	K
2) Total paid claims in actual year, reported in actual year, but incurred in past years	346	D
3) RBNS at the end of the period for claims reported in actual year but incurred in past years	491	I
4) IBNR at the end of the period for claims incurred in past years	27 552	M
1)-2)-3)-4) Run-off result	5 056	
Run-off result in %	15%	

Source: Author's calculation

Result of run-off test is positive (EUR 5 056 or 15%), which means that the IBNR provision was sufficient because the estimated provision covered all claims paid in the current year, reported in the current year, but occurred in the past years.

The positive result of 15% indicates that the provision was set appropriately. If the result is positive, and is very close to zero, then the determination of IBNR reflects appropriate estimate. Negative result is an indication for revision of IBNR methodology, because the provision should cover all the incurred but not reported claims. Very high positive % (usually more than 30-40%) is a sign of deeply conservative approach and may cause excessive prudence which is not allowed according to IFRS 4.29 (prudence in the estimation process).

Liability adequacy test of unearned premium reserve (LAT for UPR)

This type of test is performed as a control of sufficient amount of UPR less the corresponding deferred acquisition costs. This value is then compared with the value of expected future cash flows from the insurance contracts. To create the expected future cash flows are used combined ratio, claim ratio and expense ratio. These values are determined by

the values of estimated future administrative costs, the amount of future commissions and expected claim ratio.

If the value of combined ratio is below 100%, UPR can be considered as adequate. On the other hand, if the value of combined ratio is above 100% it can be considered as a signal for inadequate premium. In case of deficiency of UPR the insurance company either amortizes deferred acquisition costs or creates provision for unexpired risks (Unexpired Risk Provision, URP). The following components are needed for the UPR LAT test.

Unearned Premium Reserve (UPR). Gross written premium (cost of insurance which is paid by the client) includes the total amount of payment of insurance contract during the period, regardless of the fact whether this amount relates fully or partially to future periods (unearned premiums). UPR is created for the premiums corresponding to the time period remaining on an insurance policy. Unearned premiums are proportionate to the unexpired portion of the risk, thus it is deemed to have not yet been earned by the insurer. It is usually calculated separately for each insurance contract by "pro rata" method. Alternatively it can be calculated as the gross written premium minus the change in the UPR.

Deferred acquisition costs (DAC). It is a term commonly used in the insurance business. It describes the practice of deferring the cost of acquiring a new client over the duration of the insurance contract. Insurance companies face large upfront costs incurred in issuing new business, such as commissions to sales agents, underwriting costs and other acquisition expenses. Insurance companies should spread out these expenses over the period in which revenues are earned. The DAC is treated as an asset and amortized over the life of the insurance contract.

Claim ratio. Claim ratio is used to illustrate the technical costs, which compares the amount of claims (total losses incurred in claims) to earned premiums. The lower the percentage, the greater part remains from the premium as profit.

Administrative ratio. It compares the amount of administrative costs (operating expenses related to insurance business) to earned premium. If the insurance company does not record these costs by lines of business then non-technical costs of non-life insurance can be allocated to each line of business according to the amount of earned premium.

Components in the general methodology of UPR LAT process can be described as follows:

UPR at the end of the period,

DAC at the end of the period,

Combined ratio.

Result of the UPR LAT is then $(1 – 2) – 3 * 1$. If the result is below 0, then liabilities at the end of the period are insufficient to cover expected future liabilities, therefore it is necessary to reduce the DAC or to create a provision for unexpired risks (URP). Otherwise liabilities are sufficient to cover expected future liabilities.

Illustrative example 2

The insurance company usually has a large portion of data about claims, current amounts of RBNS per policy basis, IBNR, earned premium, administrative expenses, etc. Sufficiency of UPR should be assessed for each group separately as it is illustrated in the example below. Beginning of the period is January 1, 2013 and December 31, 2013 is the end of the period. Suppose that the insurance company has prepared a dataset illustrated in the Table 4 from the available data (the data in the table below were generated and are for illustrative purpose):

Table 4: Data

Calendar year	2013	
Earned Premium at the end of the period (31.12.2013)	19 165	A
UPR at the end of the period (31.12.2013)	13 897	B
DAC at the end of the period (31.12.2013)	1 905	C
Claims paid in current year (1.1.2013 - 31.12.2013)	9 067	D
Change of RBNS (balance as at 31.12.2013 – balance as at 1.1.2013)	-438	E
Change of IBNR (balance as at 31.12.2013 – balance as at 1.1.2013)	254	F
Total claims paid in current year (1.1.2013 - 31.12.2013)	8 883	G=D+E+F
Administrative expenses in current year (1.1.2013 - 31.12.2013)	4 581	H

Source: Author's calculation

Based on the methodology of UPR LAT described above, all items are needed for the adequacy test purpose. The last column indicates a link to input data from Table 4.

Table 5: UPR LAT

Calendar year	2013	
Claim ratio	46%	I=G/A
Expense ratio	24%	J=H/A
Combined ratio	70%	K=I+J
Liabilities at the end of the period (31.12.2013)	11 992	L=B-C
Expected future liabilities at the end of the period (31.12.2013)	9 763	M=K*B
Result	2 229	N=L-M
Unexpired risk provision (URP)	0	

Source: Author's calculation

The result of the test is positive (EUR 2 229), which means that the UPR less DAC is sufficient to cover expected future liabilities. Therefore, the provision for unexpired risks is not needed. On the other hand, if the result is negative, the insurance company should create URP in amount of the final result.

Conclusion

As performing LAT is required by IFRS 4, the insurance companies have to select and apply a certain method to quantify adequacy of liabilities. For this purpose is described above and illustrated the LAT of UPR which is the most common test applied by the insurance companies. It is simple and transparent method to measure adequacy of technical provisions in general insurance. Insurance companies have appropriate data to perform this LAT of UPR according to local and international accounting standards as the general methodology is introduced and illustrated through examples. Additionally run-off tests should be performed on regular basis to follow and monitor development of technical provisions carried out for a certain term. The results of run-off and impact on the LAT have to be analyzed.

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