EIOPA-BoS-17/126

EIOPA Risk Dashboard
Background Note

03.05.2017

List of indicators and calibration will further evolve as soon as reporting and data of better quality becomes available.

Executive summary

EIOPA publishes a Risk Dashboard (RDB) on a quarterly basis, in accordance with its obligations under the EIOPA Regulation[1] and following a framework determined in cooperation with the other ESAs, the ESRB and the ECB. The RDB is based on a mechanical aggregation of indicators and expert judgment, if deemed necessary. Besides publicly available market data, extensive use is made of the Solvency II reporting. Both group financial stability data and solo undertaking prudential data is used.

Context

As part of the new European legislation, EIOPA as well as the other ESAs and the ESRB are called upon to "develop a common set of quantitative and qualitative indicators (i.e. a risk dashboard) to identify and measure systemic risk". The legislation further stipulates that these dashboards should be constructed in cooperation between the ESAs and ESRB. In response to this requirement, the ESAs, together with the ESRB and the ECB have determined a set of general features for all dashboards to follow:

- Each Risk Dashboard will be constructed based on the same set of risk categories: macro risk, credit risk, market risk, funding and liquidity risk, profitability and solvency risk and risks resulting from interlinkages and imbalances. Furthermore, each institution has the option to add categories to allow for sector specific risks (e.g. insurance (underwriting) risk).
- All Risk Dashboards should be constructed on a flexible basis in order to allow each authority to reflect the most imminent risks identified.
- However, the ESAs and the ESRB should continue to work closely together to ensure consistency regarding the underlying information when the same indicator is used in different Risk Dashboards.

The new EIOPA RDB builds up on previous experience and further develops the tool by:

- Extending the sample of undertakings included in the analysis after the introduction of the Solvency II reporting.
- Improving the methodological approach in order to increase transparency.
- Evolving the presentation of the RDB by adding aggregate distributions of the data underlying the risk scores. Disclosed information is in line with the data confidentiality of the Solvency II reporting.

RDB Structure

The EIOPA RDB is based on a set of 41 indicators[2] grouped into seven risk categories plus an additional category showing how the insurance industry is perceived by financial markets.

[1] EIOPA Regulation Art 22.2; ESRB Regulation Art. 3.2(g)

[2] Currently, the Risk Dashboard encompasses 41 indicators. About 10 additional indicators are being considered in order to get a comprehensive view of the risks and vulnerabilities the European insurance industry is exposed to. These further indicators will be added when data becomes available (e.g. from prudential annual reporting as of end-2016) and further measures to improve the reporting quality take effect.

The risk categories are broadly aligned with those used by the other ESAs and by the ESRB as well as with the former EIOPA RDB and can be listed as follows:

1. Macro risks

Macro risk is an overarching category affecting the whole economy. EIOPA's contribution focuses on factors such as economic growth, state of the monetary policies, consumer price indices and fiscal balances which directly impact the insurance industry. The indicators are developed encompassing information on the main jurisdictions where European insurers are exposed to both in terms of investments and product portfolios.

2. Credit risks

The category measures the vulnerability of the European insurance industry to credit risk. To achieve this aim, credit-relevant asset class exposures of the (re)insurers are combined with the relevant risk metrics applicable to these asset classes. For instance, the holdings of government securities are combined with the credit spreads on European sovereigns.

3. Market risks

Market risk is, for most asset classes, assessed by analysing both the investment exposure of the insurance sector and an underlying risk metric. The exposures give a picture of the vulnerability of the sector to adverse developments; the risk metric, usually the volatility of the yields of the associated indices, gives a picture of the current level of riskiness. The risk category is complemented by an indicator which captures the difference between guaranteed interest rates and investment returns.

4. Liquidity and funding

This category aims at assessing the vulnerability of the European insurance industry to liquidity shocks. The set of indicators encompasses the lapse rate of the life insurance sector with high lapse rate signalling a potential risk, holdings of cash & cash equivalents as a measure of the liquidity buffer available, and the issuance of catastrophe bonds, where a very low volume of issuance and/or high spreads signals a reduction in demand which could form a risk.

5. Profitability and solvency

The category scrutinises the level of solvency and profitability of the European insurance industry. Both dimensions are analysed for the overall industry (using group data) and include a breakdown for the life and non-life companies (using solo data). In detail, the solvency level is measured via solvency ratios and quality of own funds. Standard profitability measures for the whole industry are complemented by indicators such as the combined ratio and the return on investments specifically applied to the non-life and life industry respectively.

6. Interlinkages and imbalances

In this section various kinds of interlinkages are assessed, both within the insurance sector, namely between primary insurers and reinsurers, between the insurance sector and the banking sector, as well as interlinkages created via

derivative holdings. Exposure towards domestic sovereign debt is included as well.

7. Insurance (underwriting) risks

As indicators for insurance risks gross written premiums of both life and non-life business are an important input. Both significant expansion and contraction are taken as indicators of risks in the sector; the former due to concerns over sustainability and the latter as an indicator of widespread contraction of insurance markets. Information on claims and insurance losses due to natural catastrophes also contribute to this risk category.

8. Market perception

This category encompasses the financial markets' perception of the healthiness and profitability of the European insurance sector. For this purpose, relative stock market performances of European insurance indices against the total market are assessed, as well as fundamental valuations of insurance stocks (price/earnings ratio), CDS spreads and external ratings/rating outlooks.

Data Sources

The Solvency II (SII) reporting provides information both at solo and group level. Groups represent the most systemically relevant institutions in the European insurance industry, both from an entity perspective (i.e. size, interconnectedness, complexity) and from an activity perspective (i.e. wide spectrum of activities covered). The major sources of data are the Quarterly and Annual Financial Stability Reporting for Groups (QFG and AFG). The dataset is complemented by the Solo Prudential Reporting through its quarterly (QRS) and annual (ARS) submissions. Solvency II data are complemented by publicly available market data.

Methodology

The level of each indicator is represented by a discrete score ranging from 1 (very low risk) to 10 (very high risk). The risk scores are used discretely at the level of each risk indicator, but transformed to non-discrete scores at the level of each risk category, i.e. after aggregation. Final scores are transformed into colour codes based on four colours to represent the final level of the risk. Changes over time of the scores (quarter-on-quarter variation) are represented by arrows.

Definition of the thresholds

Thresholds used to transform risk levels to discrete risk scores are calculated according to specific guidelines on when and how expert judgment and/or historic distributions shall be applied. At this stage, different options on the possible length of the observation periods of the time series are under scrutiny.

According to the characteristics of each indicator, one of the following approaches is applied:

a) Historical distribution: Thresholds are derived from the deciles of the distribution of the time series. This approach is applied where sufficiently long time series without structural breaks are available;

b) Pre-defined: The approach is applied to all the indicators that have a "natural threshold" defined by regulation (e.g. SCR coverage ratio > 100%) or implied by economic theory (e.g. return on assets > 0%);

c) Transition adjustment: Indicators that were already utilised for the RDB under the Solvency I regime are recalibrated taking into account the changes introduced by the Solvency II regime, relying on the time series and evaluating the effect of the change of the regimes via expert judgement;

d) Cross-sectional distribution: For newly developed indicators fully based on SII data, the calibration is currently based solely on the cross-sectional distribution of the values.

Use of cross-sectional weighted distributions

Risk scores aim to capture the riskiness of the European insurance industry from a financial stability perspective. The relative importance (e.g. size) of the different entities included in the sample is taken into account in the analysis. To this aim, specific weighting parameters for the definition of the cross-sectional distribution and the subsequent risk scores are applied.

Thanks to Solvency II data, the number of the entities utilised for the analysis is substantially larger and more heterogeneous in terms of size compared to the previous version of the RDB. Hence, the old definition of the indicators based on an equally weighted approach can give misleading results. The relevance of the contribution of an entity to the total exposure, measured by each indicator, is therefore accounted for by building a weighted cross-sectional distribution. According to the characteristics of each indicator one of the following items is used: total premiums, total technical provisions, total assets or the Solvency Capital Requirement.

Use of weights within risk categories

The new Solvency II reporting templates encompass much relevant information about the risks. This information is converted into risk indicators. It might be decided that an indicator is relevant for the risk assessment of a certain risk category but, to some extent, correlated with others causing an over-evaluation of the risk factor. In this circumstance, instead of removing one of the indicators, applying weights can solve the issue.

In principle, indicators are considered equally weighted. However, the following guidelines are applied:

- Increase the weight if an indicator is of particular importance to a risk category;
- Reduce the weight if indicators are highly correlated.

For the different risk categories, the weightings for aggregating the indicators have been determined to take into account the above criteria.

Appendix

Category	Indicator	Aggregation approach	Data Source
1 – Macro risk	GDP Consensus Forecasts	The final score is reached by applying a 2-step aggregation of the indicators in order to take into account the comovements (correlations) of specific indicators. Step 1: - Indicators "GDP Consensus Forecasts", "Unemployment rate", "Fiscal Balance", "Consumer Price Index" and "Credit to GDP Gap" are grouped in an intermediate indicator by computing the simple average of the scores. Step 2: - The scores of the intermediate indicator computed in step 1 is averaged with "Level of 10 Year SWAP Rates" and "State of Monetary Policy" in order to obtain the final score of the Macro Risk category.	Market
	Unemployment rate		Market
	Fiscal Balance		Market
	Consumer Price Index		Market
	Level of 10 Year SWAP Rates		Market
	Credit to GDP Gap		Market
	State of Monetary Policy		Market
2 – Credit risk	Investments in government bonds	The final score is reached by applying a 2-step aggregation of the indicators. Step 1: - The four seperate indicators on bond investments are grouped in an intermediate indicator via weighted average based on the median and 90th percentile distribution of the exposures. Step 2: - The final score is obteined by computing the simple average of the intermediate indicator obtained in step 1 and the indicator "Average rating of Investments".	QFG, Market
	Investments Corporate Bonds - Financials - unsecured		QFG, Market
	Investments Corporate Bonds - Financials - secured		QFG, Market
	Investments Corporate Bonds - Non-Financials		QFG, Market
	Average rating of Investments		QFG, Market
3 - Market risk	Investments in Bonds	The final score is reached by applying a 2-step aggregation of the indicators. Step 1: - Indicators "Investments in Bonds", "Investments Equity & Participations", "Investments Property" are grouped in an intermediate indicator via weighted average based on the median and 90th percentile distribution of the exposures. Step 2: - The final score is obteined by applying a weighted average to the score of the intermediate indicator obtained in step 1, the score of indicator "Concentration of Assets" and the score of indicator "Durtion Mismatch".	QFG, Market
	Investments Equity & Participations		QFG, Market
	Investments Property		QFG, Market
	Duration Mismatch		AFG
	Concentration of Assets		QFG
4 - Liquidity & funding	Cash Holdings	The score fo the category is obtained by applying a weighted average to the indicators' scores.	QFG
	Liquid assets ratio		QFG
	Cat bond issuance		Market
	Lapse rate		QRG
	Bond issuance		Market
5 - Profitability & solvency	Combined ratio - non-life (net)	The final score is reached by applying a 2-step aggregation of the indicators. Step 1: - The scores of the indicators "Return on excess of assets over liabilites", "Return on Assets", "Return to Premiums" are averaged (simple average) to obtain an intermediate "Profitability" indicator. - The scores of the indicators "Solvency Ratio Total", "Solvency Ratio Life", "Solvency Ratio Non-Life" are averaged (simple average) to obtain an intermediate "Solvency" indicator. - The scores of the indicators "Combined ratio - non-life (net)", "Change in excess of assets over liabilities", "Quality of Own Funds" are averaged (simple average) to obtain a third intermediate indicator. Step 2: - The scores of the 3 intermediate indicators equally concur to the final score of the risk category (simple average).	QRS
	Change in excess of assets over liabilities		QFG
	Return on excess of assets over liabilities		QFG
	Return on Assets		QFG
	Return to Premiums		QFG
	Solvency Ratio Total		QFG
	Solvency Ratio Life		QRS
	Solvency Ratio Non-Life		QRS
	Quality of Own Funds		QFG
6 - Interlinkages & imbalances	Derivative holdings	The score fo the category is obtained by applying an unweighted average to the indicators' scores for "Derivative holdings", "Insurers' "non-insurance" liabilities", "Investments domestic sovereing debt", "Reinsureance part of Premium" and "Investments in Banks, Insurance and other financials".	QFG
	Insurers' "non-insurance" liabilities		QFG
	Investment in domestic sovereign debt		QFG
	Reinsurance part of Premium		QFG
	Investments in Banks, Insurance and other financials		ARS
7 - Insurance (underwriting) risk	Catastrophe Loss Ratio	The score fo the category is obtained by applying a weighted average to the indicators' scores.	Market
	Loss Ratio		QRS
8 - Market Perceptions	Outperformance of insurance stock prices	The final score is reached by applying a 2-step aggregation of the indicators. Step 1: - The scores of the indicators "Insurers' External Ratings", "Insurers' External Ratings Outlook" are averaged (simple average) to obtain an intermediate indicator as they are be strongly interrelated. Step 2: - The scores of the intermediate indicator and of indicators "Outperformance of insurance stock prices", "Insurers' price/earnings ratio", "Insurers' CDS spreads" are averaged (simple average) to obtain the category's score.	Market
	Insurers' price/earnings ratio		Market
	Insurers' CDS spreads		Market
	Insurers' External Ratings		Market
	Insurers' External Ratings Outlook		Market