

Capital generation and return metrics in Europe

Solvency II-based capital generation metrics

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Introduction

As noted in the Milliman research report "Shareholder Value Reporting in Europe – Solvency II Based Metrics"¹ (the [2020 Shareholder Value Report](#)), capital generation metrics have become increasingly popular in recent years. The 2020 Shareholder Value Report set out the results of a review of the capital generation and return metrics included in the public disclosures of 20 of the largest insurance groups in Europe.

Some of the key findings of that report were that:

- Since the implementation of Solvency II, the number of companies that publicly disclose an Embedded Value has declined, with focus shifting towards Solvency II metrics. Solvency II Own Funds as a measure for value is more regularly being used because it accounts for the Value in Force (VIF) in the technical provisions due to the use of best estimate assumptions in the best estimate liabilities (BEL). Another useful metric that was provided in Embedded Value disclosures was the VIF for new business written over the reporting period, i.e., the Value of New Business (VNB). Following the implementation of Solvency II, a number of firms continue to disclose their VNB, with some providing it on a Solvency II basis and others continuing to present in accordance with the Market-Consistent Embedded Values (MCEV) Principles.²
- Around half of the firms considered disclose a Solvency II earning metric or Solvency II capital generation metric as a key metric on a regular basis. There currently appear to be three main ones: Normalised Capital Generation, Free Capital Generation and Operating Capital Generation.
- These metrics are all contained in Figure 1 along with a fourth for completeness, termed "Own Funds Generation" (simply the movement in Solvency II Own Funds over the analysis period).
- Operating Capital Generation is currently the most popular Solvency II capital generation metric, though the names used by each company to refer to the metrics differ and the exact calculation of the metric is far from standard.
- Fourteen of the 20 firms reviewed disclosed a clear breakdown of a Solvency II capital generation metric (useful for analysts and industry participants to understand the sources of the capital generation).

FIGURE 1: POTENTIAL CAPITAL GENERATION METRICS

Capital Generation Metrics	Full Movement of Own Funds	Part Movement of Own Funds
No Allowance for SCR	Own Funds Generation	Normalised Capital Generation
Allowance for SCR	Free Capital Generation	Operating Capital Generation

¹ Burgess, S., Burston, D., Reynolds S. & Wrobel, L. (November 2020). Shareholder Value Reporting in Europe – Solvency II Based Metrics. Retrieved 9 June 2022 from <https://us.milliman.com/-/media/milliman/pdfs/2020-articles/articles/11-12-20-shv-report-v1.ashx>.

² The European Insurance CFO Forum Market Consistent Embedded Value Principles. Copyright© Stichting CFO Forum Foundation 2008.

The more detailed definitions of the main capital generation metrics observed were as follows:

- **Normalised Capital Generation:** The change in the level of Solvency II Own Funds that are related to "business as usual" activities and factors which can be controlled or influenced by management actions, over the reporting period.
- **Free Capital Generation:** The change in the level of Solvency II Own Funds over and above the Solvency Capital Requirement (SCR), over the reporting period. The level of capital may or may not include a target buffer in line with the company's risk appetite and/or capital management policy. Where this buffer is included, the metric may indicate the increase in the amount of capital that could be paid out as a dividend.
- **Operating Capital Generation:** Combining parts of both Normalised Capital Generation and Free Capital Generation, Operating Capital Generation is the change in the level of Solvency II Own Funds over and above the SCR that are related to "business as usual" activities and factors which can be controlled or influenced by management, over the reporting period.

Normalised and Operating Capital Generation are typically presented before paid and planned distributions to shareholders (via dividends and share buybacks) to allow for dividends declared to be compared to the capital generated over the period. Own Funds and Free Capital Generation, on the other hand, may reflect the overall change in Own Funds over the period, which will include the impact on the capital return of the variance between the foreseeable dividend for the year and the actual dividend paid (in cash or in shares) over the period, and the impact of holding the foreseeable dividend for the end of year (i.e., in relation to the following year's known dividend distribution).

Capital generation metrics may be useful for a variety of purposes which may explain their popularity as a key disclosure metric. These purposes include:

- **Benchmarking:** To compare the value added to the company (and potentially the drivers of that change in value) for multiple insurers to help the management of a firm (and its investors) to better understand what it is doing well, or not so well, compared to its competitors and peers.
- **Historical performance review:** Comparing capital generation metrics (and drivers) from one period to another can help a firm to understand the sources of its capital, and the stability or growth of its various value generation drivers, over time. This could help a firm to decide where capital should be allocated within a company. That said, capital generation metrics are often shown as "headline" figures so there will be a need to split this aggregate figure into its component drivers or by business units.
- **Management of business:** Understanding the stability of certain drivers of capital generation will help support a forward-looking view on future value creation. This will be helpful for assessing a firm's capacity to pay out dividends or distributions, and/or to make investments in value-generating activities that aim to provide sustainable growth. It may also provide a view on the sustainability of dividend levels.
- **Solvency monitoring:** A sustainable level of positive capital generation can help to support achieving a target solvency ratio, and capital generation trends may be monitored as that may provide an indication of the financial health of a firm.
- **Remuneration:** Where remuneration packages for senior management and employees are linked to the performance of the firm, a review of historical capital generation against target generation may be an additional source of information to factor into any decision.

This paper focuses on value metrics and capital generation and return measurement metrics, defined as:

- **Valuation metrics:** A metric that represents a measure of the value of a (re)insurer at a given point in time. Common publicly disclosed examples include Solvency II Own Funds and MCEV.
- **Capital generation and return metrics:** A metric that represents the change in a valuation metric over time (e.g., the growth in Solvency II Own Funds over a financial year).

In this paper we:

- Provide an introduction to Solvency II-based valuation metrics and to capital generation and return metrics.
- Set out the results from a Milliman Mind³ model developed to calculate Solvency II valuation metrics using public data. The results will demonstrate the range of capital generation and return measurement metrics based on a sample of the largest insurance groups in Europe over a two-year period from year-end 2018 to year-end 2020.

³ The use of this software allows for the calculation of the required valuation metrics for all solo and group entities under Solvency II in a controlled environment. See <https://www.milliman.com/en/products/Milliman-Mind>.

Background

SOLVENCY II-BASED VALUATION METRICS

The starting position for most publicly disclosed capital generation metrics that we have observed is Eligible Own Funds (EOF).

This valuation metric is a simple market-consistent-based methodology that can be calculated from public information—namely information in Quantitative Reporting Templates (QRTs)—and requires no further explicit assumptions when calculating its value. This metric has tangible value, representing the available capital required to meet the SCR. The eligibility of Own Funds includes restrictions on the amount of each tier of capital an insurance company can use to cover its SCR.⁴

In the [2020 Shareholder Value Report](#), a range of Solvency II-based valuation metrics that provide alternatives to Own Funds as a valuation metric were considered. After comparing these metrics to market capitalisation, the report concluded that in certain circumstances they may provide a closer approximation to “value” than (eligible) Own Funds.

In this paper we have considered capital return metrics based on EOF as a benchmark of industry practice, and then three alternative valuation metrics that can be calculated based on publicly available Solvency II information:

- **UT1 + DTA:** A simple market-consistent-based methodology that can be calculated from public information (QRTs) and requires no further explicit assumptions. The UT1 + DTA value metric starts with unrestricted tier 1 (UT1) capital and so it *excludes* certain types of capital repayable before ordinary shareholders (i.e., it removes subordinated liabilities, preference shares and the related share premium account), but *includes* certain types of capital that have value, including the deferred tax asset (DTA).
- **Solvency II Adjusted Own Funds (S2AOF):** As covered in the Milliman paper “Solvency II Own Funds Approach to Shareholder Value Reporting,”⁵ a market-consistent metric that makes allowance for some items not captured on the Solvency II balance sheet. As such, it may require further assumptions to derive.
- **Solvency II Embedded Value (S2EV*⁶):** S2EV* is a real-world valuation methodology based on the Solvency II Appraisal Value (S2AV) described in a number of Milliman papers,^{7,8} allowing for the assumed return on risky assets and the associated cost of capital (CoC), including a target solvency ratio for the firm.

Further details on the calculation of these valuation metrics are provided in Appendix 1.

WHAT IS USEFUL IN TERMS OF A CAPITAL GENERATION METRIC?

When considering the creation of value measured by a capital generation metric, it is worth first considering what type of value drivers exist. To support this, Figure 2 includes a list of items that can impact the Solvency II Own Funds valuation of a firm over the course of a financial year.

A desirable feature for a valuation metric is that it captures the present value of all expected future return items. When this is the case, the capital return metric based on this valuation metric will be providing a view on the variance compared to the expected value for each driver, and will also be highlighting the drivers that were missing completely from the start-of-year valuation.

⁴ Given these restrictions relate purely to the current solvency regime, value and return metrics based on EOF are solvency/regulatory metrics. We observe that some insurers choose to present alternative value and return metrics in their investor presentations that aim to present a shareholder perspective on the change in the value of a firm over time. The return metrics based on UT1 + DTA, S2AOF and Solvency II Appraisal Value (S2AV*) presented in this paper include such adjustments, and so can be considered shareholder return metrics.

⁵ Egoshina, T., Reynolds S. & Simpson, P. (June 2017). Solvency II Own Funds Approach to Shareholder Value Reporting. Milliman Shareholder Value Reporting. Retrieved 9 June 2022 from <https://uk.milliman.com/en-gb/insight/Solvency-II-own-funds-approach-to-shareholder-value-reporting>.

⁶ The use of a limited data set based on publicly available data leads to some approximation in the resulting value calculation of a Solvency II Embedded Value (S2EV). We have therefore termed the calculated metric as S2EV* in this paper (and other papers) to differentiate from “full” calculations of S2EV, which would be based on a more complete set of information and hence would not suffer the same limitations.

⁷ Morgan, E. & Kent, J. (September 2017). Measuring New Business Profitability Under Solvency II (S2NBV). Milliman Research Report. Retrieved 9 June 2022 from <http://uk.milliman.com/uploadedFiles/insight/2017/new-business-profitability-Solvency-II.pdfhttps://www.milliman.com/en/insight/measuring-new-business-profitability-under-solvency-ii-s2nbv>.

⁸ Morgan, E. & Kent, J. (March 2019). Shining New Light on European Insurance M&A. Milliman White Paper. Retrieved 9 June 2022 from <https://www.milliman.com/-/media/milliman/importedfiles/uploadedfiles/insight/2019/shining-new-light-eu-insurance-ma.ashx>.

As shown by Figure 2, each of the alternative valuation metrics considered in this report include the present value of some of the items of expected future return, and so the expected surplus from these capital generation drivers will not be captured in the associated return metric—only the variances.

Secondly, it may be beneficial to remove the impact of certain “Capital Management” drivers from the capital generation metric that are, from a shareholder’s perspective, less useful in understanding the change or growth in the value of a firm. For example, EOF contains the value of *subordinated debt* (also referred to as *subordinated liabilities* in Solvency II public disclosures and in this paper) that it would be beneficial to exclude from a shareholder value metric (and the associated return metrics); given that this debt needs to be repaid, any debt issues and repayments that occur over the course of the financial year do not represent a true change in value to shareholders.⁹

An example of this was witnessed in 2020 where, due to the COVID-19 pandemic and resulting financial turmoil, firms may have experienced an adverse impact on the VIF of the existing business, but due to raising a significant amount of subordinated liabilities they were able to record a positive growth in value (as measured by EOF). Likewise, a firm could have experienced growth over a period but, due to the repayment of subordinate liabilities, it would have a negative return based on the change in the value of its EOF.

In addition, capital flows to shareholders via dividend payments and share buybacks¹⁰ over the course of the year will reduce the end of period “value”. It is our view that a useful capital return metric would be presented before the payment of such items as it provides a clearer view on the return available to support distributions to shareholders. For consistency, we would also exclude the impact on the capital return of the variance between the foreseeable dividend for the year and the actual dividend paid (in cash or in shares) over the period, and exclude the impact of holding the foreseeable dividend for the end of year (i.e., in relation to the following year’s known dividend distribution).

Finally, whilst capital injections from the group (or a parent company within the group) to a subsidiary that is within the scope of Solvency II would ensure that the group level assets (and so Own Funds) remain unchanged, those made to subsidiaries outside the scope of Solvency II (and thus no longer be considered part of the group Own Funds) would reduce the group Own Funds. Likewise, any dividends paid by subsidiaries that are outside the scope of Solvency II to the group will “artificially” increase the group’s Own Funds and return metrics. Unless the value of such subsidiaries can be included in the start and end values of the company in some way (which can be challenging if starting with Solvency II EOF), such one-off capital movements should be excluded from the calculation of Solvency II-based value return metrics to avoid distorting the “true change in value” over the period.

⁹ Subordinated debt does have some value to shareholders as the capital can be used to support new business growth or pursue other strategic options that can support value creation. However, this value will be challenging to quantify and as such it is reasonable to exclude the value of the debt entirely from value and return metrics.

¹⁰ The purchase of shares by the company from shareholders.

FIGURE 2: VALUATION METRICS INCLUDED IN THIS PAPER – DRIVERS OF RETURN CAPTURED

In this exhibit, a tick (✓) indicates that the valuation metric would include the present value of the future return items, and a cross (X) indicates that it would not. If the return item is not captured in the valuation metric (i.e., X), then the full actual experience will contribute to the associated capital generation/return metric rather than variances to the expected levels. Expected future return items have been highlighted in blue.

		Valuation Metric			
		EOF	UT1 + DTA	S2AOF	S2EV*
1.	Opening adjustments, split into:				
	a. Model changes	X	X	X	X
	b. Methodology changes	X	X	X	X
2.	Existing business contribution, split into:				
	a. The expected real-world return on assets in excess of the BEL	X	X	X	✓
	b. The expected real-world spread ¹¹ on assets backing the BEL (including the impact on the BEL)	X	X	X	✓
	c. The impact of the unwinding of the Ultimate Forward Rate (UFR) and UFR drag ¹²	X	X	X	X
	d. The release of the Risk Margin (on existing business)	X	X	✓	✓
	e. The impact of run-off of the Solvency II transitionals (on existing business)	X	X	✓	✓
3.	New business contribution				
	a. The expected new business contribution	X	X	X	X
	b. New business contribution variances	X	X	X	X
4.	Impact of management actions (typically relating to actions taken with respect to the SCR such as reinsurance, hedging etc.)	X	X	X	X
5.	Financing costs (i.e., paying interest stream payments on current subordinated debt)	X	✓	✓	✓
6.	Changes to operating or non-economic assumptions	X	X	X	X
7.	Operating or non-economic experience variances (where the variances are with reference to the expected return/spread levels in 2a and 2b above)	X	X	X	X
8.	Changes to non-operating/economic assumptions, including:				
	a. The impact of any changes to Solvency II parameters provided by the PRA or EIOPA such as the UFR or volatility adjustment	X	X	X	X
9.	Non-operating and economic experience variances	X	X	X	X
10.	Other items, including tax, holding company expenses, pension scheme impacts, mergers and acquisitions, portfolio and business transfers ¹³	X	X	X	X
11.	Capital Management, such as the issuance and repayment of debt, share buybacks and dividends				
	a. Issuance and repayment of debt	X	✓	✓	✓
	b. Share buybacks ¹⁴	X	X	X	X
	c. Dividend payments ¹⁴	X	X	X	X
12.	Closing adjustments	X	X	X	X

¹¹ This expected real-world spread is the expected return over the risk-free rate used in the calculation of the BEL so it would include the volatility adjustment and matching adjustment, if these are relevant for the company.

¹² UFR drag arises due to the extrapolation of the Solvency II risk-free interest rate curve beyond the assumed last liquid point (LLP). It is therefore most relevant for currencies that have an LLP shorter than the duration of liabilities (such as the euro where the LLP is assumed to be 20 years). The UFR is currently higher than the market-implied swap rates, leading to the Solvency II risk-free interest rate curve being relatively high at longer durations. In the case of the euro this is true for durations in excess of 20 years. Each time the Solvency II risk-free interest rate curve is determined the market-implied part of the curve is updated and the extrapolation process is reapplied. This means that the updated Solvency II risk-free interest rate typically ends up being lower at longer durations than would be the case if the previous interest rate curve was "rolled forward" in a market-consistent fashion. Assuming liability outflows are being discounted, the use of the lower interest rate curve leads to a higher BEL with the increase being termed "UFR drag."

¹³ The present value of future shareholder transfers from with-profits funds may also be included for companies with participating business.

¹⁴ The present value of expected future distributions of capital to shareholders (via share buybacks and dividends) would be the value of the "foreseeable dividend/distributions" as all future distributions are uncertain. The value of foreseeable dividends and distributions have been added back to the start-of-year and end-of-year valuation metrics (see the Methodology section) so that the associated return metrics will contain the impact of the actual distribution made over the course of the year.

Methodology

This section sets out the methodology carried out to calculate the results presented in this paper.

The companies included in our analysis are 20 (re)insurers in the European market which span the following countries (based on their headquarters): the Netherlands, Belgium, Germany, Italy, France, UK, Spain and Finland.

In selecting our sample, we have focused on those companies considered to be "larger/more significant players" operating within the European life insurance industry. We believe that this group of companies is a representative sample from which we can draw some initial findings. We have also chosen group rather than solo entities as group disclosures typically include more detail given their focus on providing information to shareholders and investors. A smaller sample was necessary, as certain metrics require a manual review of public disclosures (see the Data and Assumptions section below).

The analysis covers capital generation between two fiscal years:

- **2019:** The return between year-end 2018 (YE18) and year-end 2019 (YE19).
- **2020:** The return between YE19 and year-end 2020 (YE20).

The values of the capital generation metrics are expected to differ substantially between the two fiscal years included in the analysis. Whilst 2019 could be viewed as a more "typical" year for European (re)insurers, the study also includes the 2020 fiscal year, an atypical year, which includes the impact of the COVID-19 pandemic on the various drivers of value (e.g., economic variances, demographic variances).

For these 20 firms we have calculated the return metrics for the following valuation metrics as at YE18, YE19 and YE20 using publicly available information:

- Eligible Own Funds (EOF)
- S2AOF
- UT1 + DTA
- S2EV*

A more detailed description of these metrics along with further details on their derivation is included in Appendix 1.

To create a robust environment that ensured these metrics can be calculated quickly and consistently for many companies, over multiple reporting periods, a model was created using the Milliman Mind modelling solution.¹⁵

We have derived capital generation metrics over the period from year-end X-1 to X as:

Capital Generation Metric =

$$\frac{[\text{Adjusted Valuation Metric}_{\text{YE } X}]}{[\text{Adjusted Valuation Metric}_{\text{YE } X-1}]} - 1$$

where

Adjusted Valuation Metric_{YE X} =

(Valuation Metric_{YE X}) + (Foreseeable dividends, distributions and charges at YE X¹⁶) + (Capital distributed to shareholders in Year X)

Adjusted Valuation Metric_{YE X-1} =

(Valuation Metric_{YE X-1}) + (Foreseeable dividends, distributions and charges at YE X-1¹⁶)

The capital distributed to shareholders includes both dividends and share buybacks. We also reviewed whether there had been a significant share issuance over the course of the year to adjust for, but there were no cases in our sample of firms.

¹⁵ For more information about Milliman Mind, see <https://www.milliman.com/en/products/milliman-mind>.

¹⁶ This adjustment is only required for EOF and UT1 + DTA because S2AOF and S2EV* already includes it.

ADJUSTMENTS AND OUTLIER REMOVAL

Given that we aim to demonstrate "typical" values in this paper for the return metrics, as well as the adjustment for capital distributions set out above, other adjustments may need to be made on a case-by-case basis for firms where they have undergone significant structural or regulatory changes over the course of the year, e.g., mergers and acquisitions (M&A) or approval to use an internal model. This is required to prevent these one-off items, which in some cases can be significant, from skewing the return.

The additional adjustments made to the sample of firms included in this piece of analysis are outlined below.

Adjustments

For one company in our sample there was a significant M&A event in 2020 whereby the company acquired 100% of the issued share capital of another insurer.

The acquisition was paid for using cash (primarily paid following a subordinated debt raise), and by issuing shares to the parent of the company that was being acquired. Given that the transaction price was significantly lower than the EOF of the company that was acquired, without any adjustment the return metrics in the 2020 fiscal year for the acquirer are very high (e.g., EOF return of about 60%).

Consequently, in calculating the 2020 return metrics for this company, adjustments were made to include the value of the company acquired in the start-of-year value of the acquirer. This then provides an estimate of the return over 2020 if the acquisition had occurred prior to the 31 December 2019 (i.e., to strip out the one-off impact of the M&A event from the 2020 return).

For this firm the adjustments made are as follows:

- Adding the YE19 value (EOF, UT1 + DTA, S2AOF, S2EV*) of the company that was acquired to the YE19 value of the acquirer.
- Adjusting the YE20 value of the acquirer for any significant cash flows in 2020 in relation to the acquisition. This differs for each metric:
 - **EOF:** Increase EOF by the cash amount paid by the acquirer in relation to the acquisition, and reduce EOF by the value of the subordinated debt raised in 2020 to fund the acquisition.
 - **UT1 + DTA, S2AOF and S2EV*:** Increase EOF by the amount paid in cash by the acquirer in relation to the acquisition. Subordinated debt is not included in these metrics and so no adjustment is needed for this.

Removal of significant outliers

Given the relatively small sample size, the "typical" ranges for the return metrics calculated in this study will be very sensitive to significant outliers.

Consequently, we have chosen to remove any significant outliers from the data set used to calculate the results presented in the Results section of this report based on the following methodology:

- An outlier has been defined as any point of data that lies over 1.5 interquartile ranges (IQRs) below the lower quartile, or above the upper quartile in the data set.
- Following removal of these outliers, the remaining data points are rereviewed, and any results that do not appear to represent typical or sustainable returns have been investigated. Where these high or low results are due to reasons that are assumed to be one-off (e.g., M&A, regulatory changes) judgement has been applied on whether to remove the data point from the analysis.
- To ensure that a consistent number of firms are being reviewed under each return metric, if a firm is an outlier for one metric only (e.g., S2EV*), then the firm will be removed from the analysis of all metrics.

Figure 3 sets out the firms that have been removed for the 2019 and 2020 fiscal years, and the reasons for the outlier returns.

For completeness, a full set of results can be found in Appendix 2.

FIGURE 3: REMOVAL OF OUTLIERS

Number of companies removed (year)	Outlier metric(s)	Category	Rationale
1 company (2019)	S2EV*	<ul style="list-style-type: none"> • Transactions • Methodology changes 	<p>For one company we observe significantly higher returns under S2EV* than the other return metrics driven by changes in the cost of holding capital (cost of holding capital is not considered in EOF or UT1 + DTA) for items excluded under the CoC for S2AOF. In particular:</p> <ul style="list-style-type: none"> • IPO: Over 2019 there was a reduction in the cost of holding capital in relation to entities whose capital requirement is calculated under the D&A method (banks, pension funds, asset managers, entities in Solvency II-equivalent regions). This is driven by a one-off event; in 2019 the company completed an initial public offering (IPO) of a US subsidiary with Solvency II equivalence. • SCR methodology changes: Over 2019 there was a reduction in the cost of holding capital following a change in the methodology for calculating capital requirements. The company moved from the Bermuda Standard Formula (under the equivalence regime) to the Solvency II Standard Formula for one of its subsidiaries.
2 companies (2019)	All	Regulatory changes	In 2019, in light of low interest rates and to align to other EU regulators, the French supervisor changed its regulation in relation to the provision for profit sharing on participating business to allow insurers to hold up to 70% of the value of the provision as unrestricted Tier 1 Own Funds. This impacts the metrics of French insurers, or groups with a significant French subsidiary.
1 company (2019)	S2EV*	Cost of holding capital in relation to entities in other financial sectors (non-insurance)	<p>For one company we observe significantly higher returns under S2EV* than under the other return metrics, driven by changes in the cost of holding capital (cost of holding capital is not considered in EOF or UT1 + DTA) for items excluded under the CoC for S2AOF.</p> <p>The reduction in the cost of holding capital was due to a change in the capital treatment of a subsidiary following a reduction in the company's shareholding in it.</p>
1 company (2019)	All	Transactions	One company in our sample was formed in 2019 following a de-merger. Given this, we have excluded this company from the 2019 return metrics shown in this paper and only consider it in the 2020 metrics.
1 company (2019, 2020)	All	Typical range for small firm	The return metrics can be very high for firms that have a low value metric at the start of year. The returns in 2019 and 2020 for one firm within our sample are significant as small absolute changes in its valuation translate into large relative changes. Thus, the "typical" value of return metrics determined for our sample may only be meaningful for larger firms, or rather, there may be different bands of "typical values" for the return metric applicable for small, medium and large firms.
1 company (2020)	EOF	<ul style="list-style-type: none"> • Subordinated debt issue • Methodology changes 	<p>The EOF return metric includes the impact of the issuance of subordinated liabilities in 2020. This only impacts the EOF metric as UT1 + DTA, S2AOF and S2EV* do not include the value of subordinated liabilities.</p> <p>In addition, from 31 December 2020 the company started to include the effects from the application of transitional measures for the technical provisions (TMTP) for two of its entities. The consequent capital return from including TMTP on the balance sheet is included in the EOF and UT1 + DTA return metrics, but not S2AOF and S2EV*.</p>
1 company (2020)	S2AOF	Regulatory changes	In 2020 the Dutch supervisor changed its guidance on the treatment of banking entities in the calculation of a group's solvency figures, with Dutch insurers including Own Funds in relation to these entities in their EOFs for the first time. This is a one-off impact. It results in one company in our sample having a higher 2020 return than is typical for all metrics, with S2AOF in particular being an outlier.

Data and Assumptions

This section sets out the data and assumptions used to calculate the various valuation metrics, and return metrics presented in the results in this paper.

In carrying out our analysis we relied on the data provided in the Solvency II public disclosures—Solvency and Financial Condition Reports (SFCR) and QRTs—of our sample companies for year-end 2018, year-end 2019 and year-end 2020.¹⁷

Where relevant, we have also studied the companies' SFCRs, annual reports, analyst presentations and other investor communications to gain additional insights that are not captured in the QRT data. In particular, to find information required to calculate the metrics, which includes the dividend payments and share buybacks made over the course of the fiscal years of interest, target solvency ratios (TSR), and the value of the Risk Margin gross of the transitional measure on technical provisions (TMTP).

We performed a limited review of the data used directly in our analysis for reasonableness and consistency and have not found material defects in the data. However, we have not audited or verified this data or other information.

Assumptions used for the calculation of both S2AOF and S2EV* include:

- **Tax rates:** Assumed to be the tax rate on profits in the country where the group is headquartered.

For the calculation of S2AOF the following further assumptions were required:

- **Cost of capital:** Assumed in this analysis to be 3.0% for all firms. In the Milliman paper "Shareholder Value Reporting in Europe: Year-End 2018"¹⁸ the cost of capital rates for various firms were taken from their Embedded Value reports. Given the extended scope of firms covered in this analysis only a minority disclose their Embedded Value. Consequently, in the absence of this data we have used a 3.0% cost of capital rate for all firms, which is representative of rates observed in historical Embedded Value reporting, taking into account current economic conditions.

Similarly, further assumptions are required for S2EV* compared to S2AOF, including:

- **Spread earned on risky assets:** Assumed in this analysis to be 4.0% per annum (p.a.).
- **Shareholders' required rate of return (for cost of capital calculations):** Assumed in this analysis to be: risk-free rates (RFR) + 7.0% p.a.
- **Target solvency ratio:** Determined based on target coverage ratios found in recent public disclosures (ranging from 140% to 185% for the companies included in our sample). For companies that provide a target solvency range, we have applied judgement and have used the lower end of the target range as the target solvency ratio. In the event that a ratio could not be found in supplementary disclosures, we have used a 150% target solvency ratio.

The difference between the spread and the shareholders' required rate of return used in the S2EV* calculations equates to a cost of capital of about 3% p.a. consistent with the rate used in the calculation of S2AOF.

The spread and required rate of return assumptions have been assumed for all firms within our sample. For firms that use the matching adjustment this approach may overstate the S2EV*. It is not possible to refine this methodology as information on matching adjustment portfolios is not systematically disclosed in public data.

Expert judgement is required in the calculation of S2AOF and S2EV*:

- **Gross Risk Margin:** Judgement is considered where firms do not quote this figure explicitly in order to gross up the publicly disclosed Risk Margin from the QRTs (that is net of TMTP) for an amount equal to the TMTP. Our methodology may overstate this value, but the impact is not considered to be material.

¹⁷ The data has been sourced from Solvency II Wire Data and is available via subscription from: <https://solvencyiiwiredata.com/about/>.

¹⁸ Burston, D., Reynolds, S., Simpson, P. & Wrobel, L. (January 2020). Shareholder Value Reporting in Europe: Year-End 2018. Milliman Research Report. Retrieved 10 June 2022 from <https://uk.milliman.com/en-GB/insight/shareholder-value-reporting-in-europe-year-end-2018>.

An underlying assumption in all of the valuation metrics shown in this report is that the reported Own Funds amount in relation to any non-EU subsidiaries in the group is calculated on a basis that is equivalent to a market-consistent valuation under the Solvency II regime.

We have also assumed that the projected expense cash flows in the BEL reflect best estimate assumptions for the expenses the (re)insurer will incur.

Results

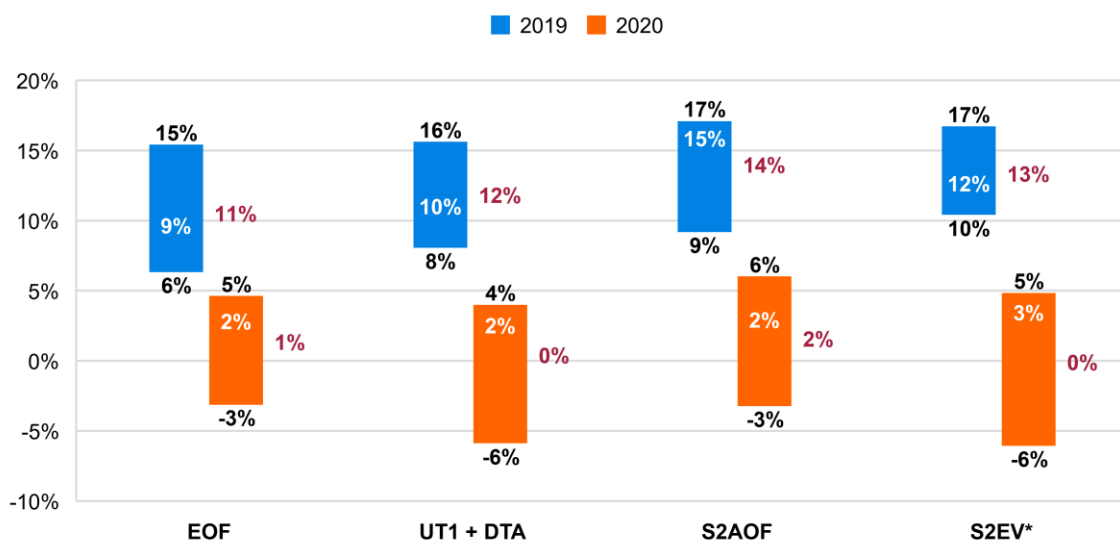
Figure 4 provides an overall summary of the return metrics observed for the companies in our sample (following the removal of any outliers).

FIGURE 4: SOLVENCY II BASED RETURN METRICS – AVERAGE, LOWER AND UPPER QUANTILES AND INTERQUARTILE RANGE

	2019			2020		
	Average (mean)	Lower and Upper Quartiles	IQR	Average (mean)	Lower and Upper Quartiles	IQR
EOF	11%	6% and 15%	9%	1%	-3% and 5%	8%
UT1 + DTA	12%	8% and 16%	8%	0%	-6% and 4%	10%
S2AOF	14%	9% and 17%	8%	2%	-3% and 6%	9%
S2EV*	13%	10% and 17%	6%	0%	-6% and 5%	11%

Figure 5 shows these results in a series of box plots putting 2019 (blue) and 2020 (orange) results side by side for comparison of the various metrics. The plots show the upper and lower quartiles and median values in black, and the mean average in red.

FIGURE 5: SOLVENCY II-BASED RETURN METRICS BOX PLOTS



The results show that, in a typical year (e.g., 2019 in our sample), we may expect firms to earn a return on EOF of between 6% and 15% p.a.¹⁹ Values well in excess of this upper bound or well below this lower bound would be worthy of further review as they may be outliers resulting from one-off capital generation drivers (e.g. M&A, regulatory changes).

Upon an atypical year where there is a systemic impact on insurance markets (as was the case in 2020 for COVID-19 in our sample) we see:

- Higher volatility in the returns between firms (as seen by the higher interquartile range for most metrics) that may be arising from greater experience variances.
- The average return and the range of return metrics are shifted up or down in line with this systemic impact.

This observation is consistent with findings reported in the Milliman report "Shareholder Value Reporting in Europe – Solvency II Based Metrics"²⁰ (the [2021 Shareholder Value Report](#)), which showed that in 2020 Normalised Capital Generation was almost entirely offset by the impact of market variances driven by the pandemic.

More detailed results are provided on the following pages for each of the return metrics included in our analysis, as follows:

- **Figures 6 and 7** set out the results on Eligible Own Funds (EOF) generation in 2019 and 2020, showing the return for each firm, the average return and the interquartile range (IQR) of the return.
- **Figures 8 and 9** set out the results on UT1 + DTA generation in 2019 and 2020.
- **Figures 10 and 11** set out the results on S2AOF generation in 2019 and 2020.
- **Figures 12 and 13** set out the results on S2EV* generation in 2019 and 2020.

¹⁹ The results shown are before capital distributions to shareholders via dividend payments and share buybacks in respect to the profits earned over the period. A lower range of "typical" values would be calculated if the returns netted off any capital distributions made over the year.

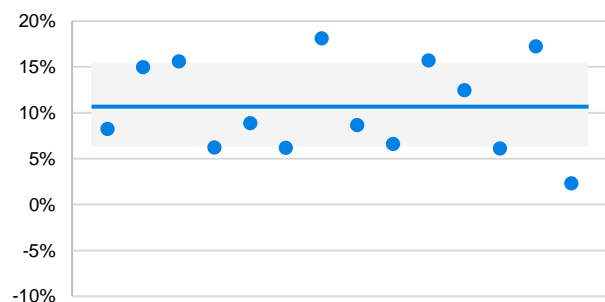
²⁰ Burgess S., Reynolds & Wrobel, L. (November 2021). Shareholder Value Reporting in Europe – Solvency II Based Metrics. Milliman Report. Retrieved 10 June 2022 from https://us.milliman.com/-/media/milliman/pdfs/2021-articles/12-1-21-2793ldp_shv-report.ashx.

ELIGIBLE OWN FUNDS (EOF) GENERATION

The following figures set out the return measure of the *percentage change in Eligible Own Funds* over one calendar year, for the firms in our sample. The *solid horizontal lines* provide the average value for this return measure for all firms, and the *shaded regions* show the interquartile range.

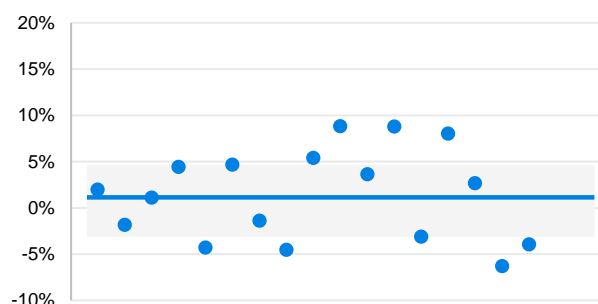
2019

FIGURE 6: EOF % CHANGE FROM YE18 TO YE19



2020

FIGURE 7: EOF % CHANGE FROM YE19 TO YE20



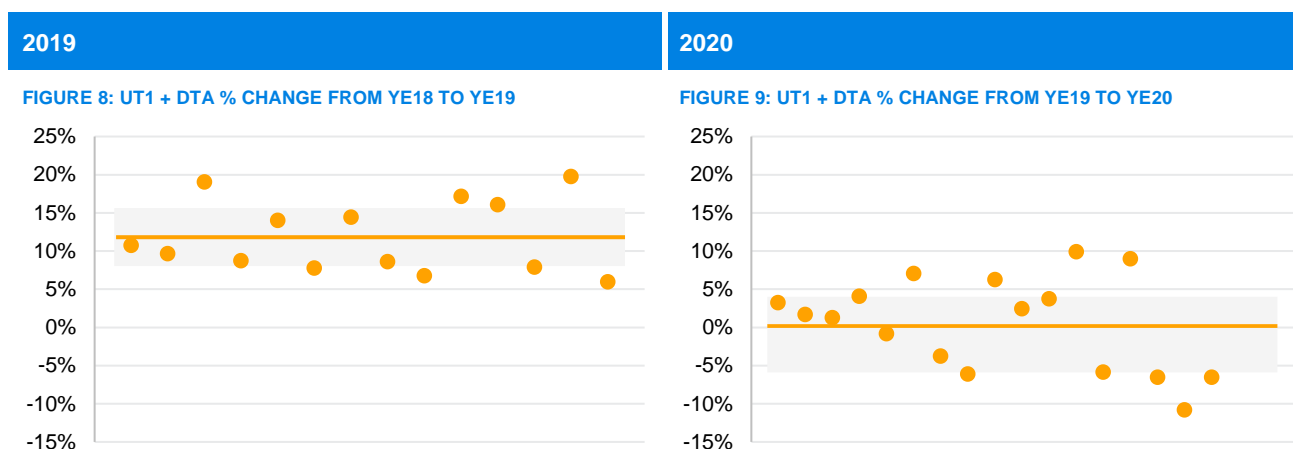
OBSERVATIONS:

- **Returns are impacted by market variance:**
 - The average return of EOF was 11% in 2019, with values ranging from 2% to 18% growth in our sample. There was positive EOF generation for all companies in the sample, reflecting strong growth across the industry based on this measure. Strong EOF growth is expected as this metric will capture the change in the value of the firm arising from a number of anticipated drivers of change such as real-world growth in investments and the run-off of the Risk Margin (net of the run-off of the TMTP). See Figure 2 above.
 - The average return on EOF was 1% in 2020, with values ranging from -6% to 9% growth in our sample. Seven of the 17 companies in our sample have negative returns based on this metric in 2020. The downward shift in the average return (and the lower and upper quartile returns) can be mainly attributed to COVID-19-driven economic variances over the course of 2020.
- **Broadly consistent variability in return observed in typical and atypical years:**
 - The interquartile range in 2019 was 9.1%—lower quartile (LQ) 6.3% and upper quartile (UQ) 15.4%—showing variability in results between firms.
 - The interquartile range in 2020 was 7.8% (LQ -3.1%, UQ 4.6%), showing a slightly lower variability in returns among firms than in 2019. This was the only metric where the 2020 variability was lower than the 2019 metric. This may be due to capturing capital management actions in this return metric that are not captured in the other metrics, which may offset a firm's negative market variance in 2020 (e.g., raising of subordinated debt).
- **This is an easily accessible metric** that can be sourced using public data and requires no expert judgement.
- **One-off items like regulatory changes, M&A and model changes can result in significant positive or negative returns based on this metric and can make it challenging to determine the typical return for a firm**, reducing the utility of comparisons of the metric among firms.
- Items included in this metric that can result in higher-than-average and lower-than-average returns over the period are:
 - **Issue or repayment of subordinated debt:** Subordinated debt raised over the period will be included in the EOF return, which increases the return based on this metric. Likewise, the repayment of subordinated debt will reduce the return based on this metric.
 - **Changes in tiering restrictions:** There are restrictions on the EOF to cover the consolidated group SCR. Changes in the composition of Own Funds (between the various tiers) that increase or decrease the restrictions versus the prior reporting period will decrease or increase the value of this return metric.

This metric includes the impact on EOF from one-off changes (e.g., model changes, regulatory changes) that impact the value of the Risk Margin and TMTP. For example, at YE20, Company 3 in our sample started to include the effects from the application of TMTP for two of its entities, which increased EOF and resulted in a high return of 22% (an outlier and so removed from the final sample). Such impacts also directly affect UT1 + DTA, and also result in a second-order impact on the S2AOF and S2EV* return metrics too, but to a lesser extent (e.g., via the cost of holding the Risk Margin in S2EV* and the cost of capital on S2AOF).
- **This metric is important as a solvency metric** as it highlights the change in the regulatory or solvency position over the year. However, it may be *less useful as metric to monitor the growth in shareholder value* (e.g., subordinated debt needs to be repaid so it doesn't represent value to shareholders, tiering restrictions are related to current regulatory regime, Risk Margin and TMTP will run off so the value can be quantified and included in the valuation metric).

UT1 + DTA GENERATION

The following figures set out the return measure of the *percentage change in UT1 + DTA* over one calendar year, for the firms in our sample. The *solid horizontal lines* provide the average value for this return measure for all firms, and the *shaded regions* show the interquartile range.



OBSERVATIONS:

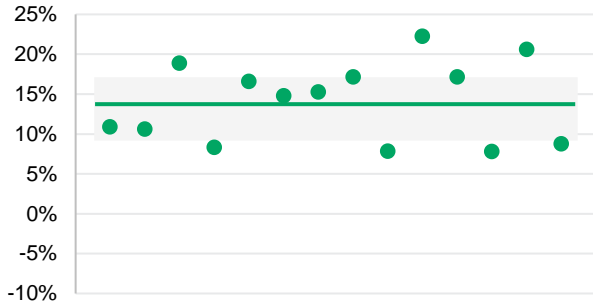
- **Returns are impacted by market variance:**
 - The average return of UT1 + DTA was 12% in 2019, with values ranging from 6% to 20% growth in our sample. There was positive UT1 + DTA generation for all companies in the sample, reflecting strong growth across the industry based on this measure. Strong UT1 + DTA growth is expected as this metric will capture the change in the value of the firm arising from a number of anticipated drivers of change such as real-world growth in investments and the run-off of the Risk Margin (net of the run-off of the TMTP). See Figure 2 above.
 - The average return on UT1 + DTA was 0% in 2020, with values ranging from -11% to 10% growth in our sample. Seven of the 17 companies in our sample have a negative return based on this metric in 2020. The downward shift in the average return (and the lower and upper quartile returns) can be attributed to COVID-19-driven economic variances over the course of 2020.
- **Higher variability in returns in atypical years:**
 - The interquartile range in 2019 was 7.6% (LQ 8.0%, UQ 15.6%), showing reasonably low variability in results among firms.
 - The interquartile range in 2020 was 9.9% (LQ -5.9%, UQ 4.0%), showing higher variability in returns among firms than in 2019.
- **This is an easily accessible metric** that can be sourced using public data and requires no expert judgement.
- **Unlike EOF return, the metric does not include any return arising from the capital management actions of issuing or repaying subordinated liabilities**, allowing for greater comparability of the typical return for a firm (albeit significant one-off items like regulatory changes, M&A and model changes are still included, so similar conclusions as for EOF remain relevant). In particular:
 - This metric includes the impact on UT1 + DTA from one-off changes (e.g., model changes, regulatory changes) that impact the value of the Risk Margin and TMTP. As mentioned for EOF above, in 2020 one-off changes that impact the value of the Risk Margin for Company 3 in our sample gave rise to a high return of 21% based on UT1 + DTA (EOF 22%). Consequently, this company was removed from the sample shown in the charts as it was an outlier.
- Despite the removal of certain capital management items, *we do not observe a significant reduction in the volatility in the returns* for this metric when compared to EOF, with 2019 showing a slightly lower volatility and 2020 showing a slightly higher volatility when compared to EOF. Although the average UT1 + DTA return is only marginally lower on average than EOF in 2020, there is a much lower value to the lower quartile (UT1 + DTA -5.9% and EOF -3.1%), suggesting returns are materially lower at the low end. This is in part due to firms using the issuance of subordinated debt in 2020 to mitigate the impact of the pandemic.
- Overall, the results are relatively consistent with EOF return, reflecting that, in general, EOF return arises from changes in unrestricted tier 1 Own Funds. Given this, and *the benefit of stripping out subordinated liabilities that remain payable and hence do not represent “value” to a shareholder, UT1 + DTA could be a more useful return metric than EOF for quickly assessing the return on the value of the company from a shareholder’s perspective.*

S2AOF GENERATION

The following figures set out the return measure of the *percentage change in S2AOF* over one calendar year, for the firms in our sample. The *solid horizontal lines* provide the average value for this return measure for all firms, and the *shaded regions* show the interquartile range.

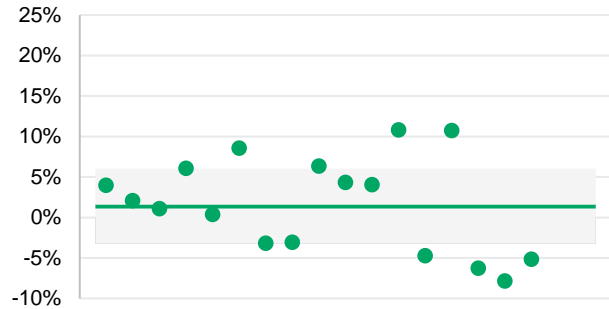
2019

FIGURE 10: S2AOF % CHANGE FROM YE18 TO YE19



2020

FIGURE 11: S2AOF % CHANGE FROM YE19 TO YE20

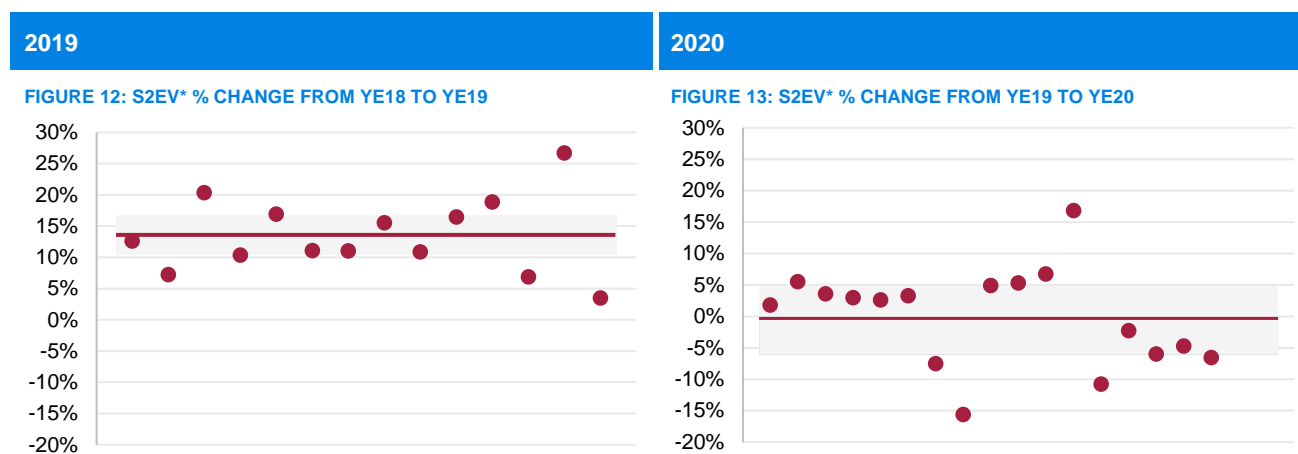


OBSERVATIONS:

- **Returns are impacted by market variance:**
 - The average return of S2AOF was 14% in 2019, with values ranging from 8% to 22% growth in our sample. There was positive S2AOF generation for all companies in the sample, reflecting strong growth across the industry based on this measure. Strong S2AOF growth is expected as this metric will capture the change in the value of the firm arising from a number of anticipated drivers of change such as real-world growth in investments (see Figure 2 above).
 - The average return on S2AOF was 2% in 2020, with values ranging from -8% to 11% growth in our sample. Six of the 17 companies in our sample have a negative return based on this metric in 2020. The downward shift in the average return (and the lower and upper quartile returns) can be attributed to COVID-19-driven economic variances over the course of 2020.
- **We observe a higher S2AOF return than for EOF and UT1 + DTA in 2019 and 2020.** There will be a number of offsetting impacts that will make the return higher or lower between metrics. They include the *additional sources of return* (see below) captured by S2AOF (which may have positive or negative impacts on the return), and *the exclusion of the run-off of the Risk Margin (net of the run-off of the TMTP) in the return metric*, as the value of this item is already captured in the valuation metric. For the latter, this was particularly noteworthy for Company 3 in 2020 (EOF 22%, UT1 + DTA 21% and S2AOF 2%; see Appendix 2), as the EOF and UT1 + DTA returns included the impact of a significant new TMTP amount (positive impact on return) that under S2AOF would not be reflected in the return over the period.
- **Higher variability in returns in atypical years:**
 - The interquartile range in 2019 was 7.9% (LQ 9.2%, UQ 17.1%), showing reasonably low variability in results among firms.
 - The interquartile range in 2020 was 9.3% (LQ -3.2%, UQ 6.0%), showing slightly higher variability in returns among firms than in 2019.
- **This is a metric that can be sourced using public data but, unlike EOF and UT1 + DTA returns, requires additional assumptions, expert judgement and potentially time-consuming data reviews of a firm's public disclosures to calculate** (see the Data and Assumptions section above). This restricts the ability for the metric to be calculated en masse for a large data set of firms.
- In addition to the items that contribute towards the UT1 + DTA return metric, for S2AOF there are *additional sources of return*:
 - **Changes to the Cost of Residual Non-Hedgeable Risk (CRNHR) and Frictional Costs of Required Capital (FCRC)** over the period, whereas these items of value are not considered under EOF or UT1 + DTA.

S2EV* GENERATION

The following figures set out the return measure of the *percentage change in S2EV** over one calendar year, for the firms in our sample. The *solid horizontal lines* provide the average value for this return measure for all firms, and the *shaded regions* show the interquartile range.



OBSERVATIONS:

- **Returns are impacted by market variance:**
 - The average return of S2EV* was 13% in 2019, with values ranging from 3% to 27% growth in our sample. There was positive S2EV* generation for all companies in the sample reflecting strong growth across the industry based on this measure.
 - The average return on S2EV* was 0% in 2020, with values ranging from -16% to 17% growth in our sample. Seven of the 17 companies in our sample have a negative return based on this metric in 2020. The downward shift in the average return (and the lower and upper quartile returns) can be attributed to COVID-19-driven economic variances over the course of 2020.
- **We observe a higher S2EV* return than EOF and UT1 + DTA in 2019 and a broadly consistent return in 2020.** There will be a number of offsetting impacts that will make the return higher or lower between metrics. They include the *additional sources of return* (see below) captured by S2EV* (which may have positive or negative impacts on the return), and *the exclusion of the run-off of the Risk Margin (net of the run-off of the TMTP) and the expected real-world growth in investments over the period* from the return metric, as the value of these items are already captured in the valuation metric.
- **Higher variability in returns in atypical years:**
 - The interquartile range in 2019 was 6.3% (LQ 10.4%, UQ 16.7%), showing reasonably low variability in results among firms.
 - The interquartile range in 2020 was 10.9% (LQ -6.1%, UQ 4.9%), showing higher variability in returns among firms than in 2019.
- **This is a metric that can be sourced using public data but, unlike EOF and UT1 + DTA returns, requires additional assumptions, expert judgement and potentially time-consuming data reviews of a firm's public disclosures to calculate** (see the Data and Assumptions section above). In comparison to S2AOF, this metric requires more assumptions, judgement and data review.
- In addition to the items that contribute towards the S2AOF return metric, for S2EV* there are *additional sources of return*:
 - **Changes to the value of future profits in relation to the expected real-world return in excess of RFR** (offset by the change in the cost of capital held in relation to market risk).
 - **Changes in the cost of capital in relation to the SCR and Risk Margin above that captured in the CRNHR and FCRC** under S2AOF. In addition, the cost of holding capital in relation to non-hedgeable risks may be more volatile from year to year for S2EV* than S2AOF. This is because, based on our methodology, the S2EV* cost of capital considers the capital requirements for non-hedgeable risks separately, whereas the S2AOF metric considers the value of the gross Risk Margin, which will include some further diversification.

Conclusions

RESULTS AND CONCLUSIONS

Firms commonly report on changes in their EOFs and based on our analysis in a more “typical” year (i.e., 2019) could expect to earn between 6% and 15% based on this metric (before distributions to shareholders through dividends and share buybacks). Any returns significantly above or below this range will likely arise due to one-off impacts.

Despite its ease of calculation, capital generation and return as measured as a change in EOF may not be the most useful metric for assessing changes in shareholder value, as it includes changes in balance sheet items such as the value of the subordinated debts of a company. A company could artificially inflate its capital return based on this metric by issuing debt. Likewise, repayment of these debts by the (re)insurer would cause a drag on the capital return over the period. It therefore does not allow for a fair comparison among firms.

The alternative is to instead use UT1 + DTA as a starting point. This approach, often considered in transaction pricing (see Section 5 of the [2021 Shareholder Value Report](#)), benefits from the exclusion of subordinated liabilities in the valuation metric. Consequently, changes in the subordinated liability position over a period are not included in the UT1 + DTA capital generation and return metric, allowing for greater comparability in returns between firms. The metric can be easily calculated en masse using publicly available data and does not require any expert judgement to derive. Based on our sample, firms generated around 8% to 16% p.a. on this metric in a “typical” year (with this range expected to shift in accordance to market variances).

A shortcoming of both EOF and UT1 + DTA is that the valuation metrics do not capture the present value of some expected future return items (e.g., Risk Margin run-off, TMTP run-off, expected investment return above RFR). Consequently, the associated capital return metrics include the impact from both the expected return items over the year and from the variance to the expected return. This makes it challenging to determine where value has been created over the course of the year in excess of expectation.

From a shareholder’s perspective, as someone who wishes to understand how value is added over time in excess of the value already expected in the VIF, S2AOF and S2EV* may present more useful metrics:

- **S2AOF:** Certain shareholder value items are included in the S2AOF valuation metric (e.g., the value of Risk Margin and TMTP run-off, see Figure 2 above) and so the expected surplus emerging over the calendar year from these items is not included in the capital generation metric. Compared to EOF and UT1 + DTA, this metric includes a different view on the cost of holding capital that is lower and more in line with what we typically expect firms to hold based on information from public disclosures.
- **S2EV*:** In addition to the above metric, the S2EV* valuation metric also includes the value of the shareholders’ proportion of expected real-world investment growth (above RFR). See Figure 2 above. The S2EV* return metric therefore does not include the impact of the expected surplus emerging over the calendar year in relation to real-world growth. In addition, the S2EV* includes a different and more market-based view of the adjustment for cost of capital on the value of the company compared to the other metrics, which includes the cost of holding capital in relation to market risks.

For the S2AOF and S2EV* metrics, the capital return metric will be providing a view on the variance against the expected drivers of return, and will also be highlighting the drivers that were missing completely. In our sample, higher ranges of values for these metrics were observed in a “typical” year than for EOF and UT1 + DTA (9% to 17% and 10% to 17% for S2AOF and S2EV*, respectively), with reasonably consistent volatility in return between the four metrics.

An observation for all metrics was that the return due to market variance will move the “typical range” for these metrics from one year to the next, making it necessary to recalibrate these bands in atypical years. The benefit of S2EV* versus the other market-consistent valuation metrics is that the S2EV* return will show market variance versus an expected level of real-world investment return, rather than versus the risk-free rate which most firms will likely assume they will outperform.

Given that S2EV* includes the greatest number of expected return items in its valuation metric, we conclude that, of the metrics we reviewed in this report, it may provide the most useful return metric for assessing changes in shareholder value over time.

CHALLENGES AND CONSIDERATIONS

Whilst S2AOF and S2EV* may present, theoretically, more useful valuation and return metrics than EOF and UT1 + DTA, they do require additional judgement and assumptions to derive than EOF and UT1 + DTA, making the metrics more challenging to calculate accurately en masse. The reliance on additional public data also limits the scope of firms that can be considered under these approaches, because the public disclosures for subsidiaries may be less clear than for group entities.

All of the Solvency II-based metrics considered in this report face certain challenges that users of the metrics should consider:

- One-off impacts are included in the capital return over the period and are often significant (e.g., M&A, regulatory changes, model changes). Until these items are stripped out of the capital return, it is challenging to compare the returns generated between firms consistently. Determining the adjustments required for S2AOF and S2EV* to remove the impact of one-off items may be more challenging than for EOF or UT1 + DTA, as whilst firms may disclose the impact of these items on EOF, the impact on S2AOF or S2EV* may not be as clear.
- The metrics assume that the Solvency II Own Funds calculated for subsidiaries based outside of the EU with equivalence (e.g., the US and Bermuda) accounts for the VIF in the technical provisions for the business covered by these entities. This may not be the case (see Figure 3 above).
- Due to Solvency II contract boundary rules, within the calculation of the Solvency II BEL some existing business may be valued using a shorter duration than the company may assume in the absence of the Solvency II regulations. Consequently, the VIF in the technical provisions for this business may be understated.
- In addition, all of the methodologies discussed assume that the projected expense cash flows in the Solvency II BEL are accurate and reflect the best estimate expenses that will be incurred by the (re)insurer. In reality this may not always be the case. For example, assumed contract boundaries for products (and the associated impact they may have on expense assumptions) and the treatment of investment management expenses may differ between a Solvency II valuation basis and one that would be used for a full Embedded Value or appraisal value calculation. Consequently, the VIF in the technical provisions may not reflect the VIF that would be calculated in a full Embedded Value or appraisal value calculation.
- In this report we have presented the return prior to the distribution of capital to shareholders (via dividends and share buybacks). Whilst dividend paid by larger groups may be disclosed publicly, there may be less available information on “dividends payments” made from subsidiaries up to group level, or on capital injections from the group to the subsidiary. It may also be more challenging to get information on dividends paid to privately owned firms.
- The lack of harmonisation and standardisation in the reporting of capital distributions to shareholders (i.e., dividend and share buyback) presents a barrier to the en masse production of return metrics for all group firms. In this analysis it was found that the availability and transparency of this information in public disclosures varies widely among firms.

Next steps

The analysis set out in this report has provided an introduction to Solvency II-based valuation and capital generation metrics. Potential next steps for this area of research would be:

- **Further development of the S2EV* valuation metric:** As indicated by the items highlighted blue in Figure 2 above, there remain some expected return items that could be valued and included in the S2EV* valuation metric. In particular, the expected impact on the value of the firm from the unwinding of the UFR and from UFR drag, and the expected contribution of new business.²¹ These return items can be quantified and included in the S2EV* valuation metric, with the resulting return metric providing the variance against the expected new business levels and the expected impact from the UFR (providing a more useful return metric from a shareholders’ perspective).

²¹ The inclusion of new business sales would be as described in other Milliman papers (e.g., Shareholder Value Reporting in Europe – Solvency II Based Metrics, November 2020, op cit. in footnote 1) as the Solvency II Appraisal Value (S2AV*).

- **To identify implied unanticipated drivers:** The Milliman Mind model built for this analysis can easily be used to calculate the four metrics included in this report for all firms whose data is available on Solvency II Wire Data (using reasonable judgement and assumptions for S2AOF and S2EV* where needed). This would be useful as it would quickly identify:
 - "Typical" return values for metrics widely used in the market for a particular fiscal year (i.e., EOF, UT1 + DTA) in light of any systemic impacts (e.g., market variances) that have occurred.
 - Markets where there has been a significant regulatory development in a fiscal year that has impacted the value of all firms within the country.
 - Firms where there has been a significant high or low return (i.e., outliers) when compared to other firms within a market, or with respect to its historical returns.

In particular, the Milliman Mind model built for this analysis can be used to quickly automate the production of a list of firms that warrant further reading of their public disclosures to better understand the rationale for the observed "outlier" return, saving time in market analysis.

- **Extending the scope of the analysis:**
 - **Years covered:** We intend to widen the scope of the analysis to the fiscal years 2017 and 2018 and will start to produce the valuation and return metrics for 2021 fiscal year onwards. This will allow us to monitor whether the returns observed in this paper for firms are typical and sustainable for the relevant firms, and building up a database of historical returns for firms over time will further assist us in highlighting outlier returns.
 - **Firms covered:** The analysis was carried out on a sample set of 20 firms, of which the results are based on a subset due to the removal of outliers. As outlined in Figure 3 above, the primary reasons for outliers are the unanticipated one-off drivers of change in capital, and we will consider how to adjust our methodology in future papers for such impacts. In addition, we would look to consider widening the analysis to a wider set of firms going forward, including subsidiaries (for example, to calculate these metrics for all subsidiaries within a group to determine insights on where capital is being allocated in the group and the return on that capital allocation).



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Appendix 1 – Solvency II Valuation Metrics

In this appendix, we present methodologies that allow for a standardised approach in assessing value based on Solvency II Own Funds. In most cases, publicly available information from the SFCRs and/or QRTs of a company is used, supplemented by assumptions based on expert judgement (where necessary).

UT1 + DTA

This valuation metric has been calculated as:

$$\begin{aligned} \text{UT1 + DTA} = & \\ & \text{Unrestricted Tier 1 Own Funds (UT1)} \\ & + \text{Net deferred tax asset (net of amount not available at group level),}^{22} \text{ or DTA} \end{aligned}$$

Compared to the level of Solvency II EOF:

- **Subordinated liabilities are removed:** whilst subordinated liabilities rank below policyholder liabilities and, hence, under Solvency II are included as part of Eligible Own Funds. Ultimately these liabilities remain payable and should be removed from the shareholder value measure.
- **Preference shares, and share premium account are removed:** Whilst preference shares, and the share premium account in relation to such shares, rank below policyholder liabilities and, hence, under Solvency II are included as part of EOF. Ultimately we are considering the value to common shareholders, thus these amounts should be removed from the shareholder value measure.

The value of the DTA is included because it may have value to a prospective buyer (depending on the circumstances of the prospective buyer) as it is contingent on the projected size and timing of future profits. However, in the absence of any further information, the value of the DTA on a company's balance sheet can be considered a suitable initial estimate of the value.

Given the simplicity of the metric and the fact that it can be easily calculated from information in the public domain, the value of UT1 + DTA has also been used as the starting point for the other metrics in this Appendix.

SOLVENCY II ADJUSTED OWN FUNDS (S2AOF)

For the purposes of the analysis outlined in this report, the definition of S2AOF has been revised to be:

$$\begin{aligned} \text{S2AOF} = & \\ & \text{UT1 + DTA} \\ & + \text{Foreseeable dividends, distributions and charges} \\ & + \text{Risk Margin less TMTP (net of tax)} \\ & - \text{Ratioed (gross) Risk Margin} \end{aligned}$$

Compared to the value of UT1 + DTA the following adjustments are made to calculate S2AOF:

- **Foreseeable dividends, distributions and charges:** Dividends become foreseeable at the latest when they are declared or approved by the firm's board of directors, regardless of any requirement for formal approval at the annual general meeting (AGM). However, until the dividends have been paid out to shareholders, they still contribute value to a company.
- **Risk Margin less TMTP (net of tax):**²³ If future experience follows the current best estimate assumptions underlying the Solvency II balance sheet, the Risk Margin would be expected to be released over time and would flow straight to profit (and be subject to taxation). For this reason, the (net of tax) Risk Margin has been added in the formula. Similarly, the transitional measure on technical provisions (TMTP) will run off over time and hence would be a drag on future profits (and affect the level of taxation).

²² Net deferred assets means the value of deferred tax assets less the value of deferred tax liabilities.

²³ Although disclosure is not required under Solvency II, certain (re)insurers quote their gross of TMTP Risk Margin in their SFCRs. For those firms that do not quote this figure, our methodology may overstate the value to accredit for the Risk Margin less TMTP (net of tax) by an amount equal to the TMTP that is used to reduce the best estimate liabilities. The impact is not considered to be material.

- **Ratioed (gross of tax) Risk Margin:** A "ratioed" Risk Margin quantity has been deducted to reflect Cost of Residual Non-Hedgeable Risk (CRNHR) and Frictional Costs of Required Capital (FCRC). The total of these amounts is approximated by scaling the Risk Margin to allow for a cost of capital (CoC) rate applicable to the firm, adjusted for tax where necessary.

SOLVENCY II EMBEDDED VALUE (S2EV*)

For the purposes of the analysis in this section, the definition of S2EV* is:

S2EV* =
 UT1 + DTA
 + Foreseeable dividends, distributions and charges
 + Risk Margin less TMTP (net of tax) reduced by the cost of holding capital to back this amount
 - Cost of capital associated with holding the SCR (including the target solvency ratio)
 + The proportion of the assumed (net of tax) impact of return above risk-free on risky assets attributable to shareholders

This S2EV* formula shares some similarities with the formula used for S2AOF above with the main differences being:

- An allowance for assumed "real-world" returns on risky assets.
- An allowance for a higher cost of capital which includes the capital held to cover market risks along with the capital needed to support the target solvency ratio.
- The cost of holding capital backing the Risk Margin (net of the TMTP) that does not arise under a market-consistent valuation methodology.²⁴

²⁴ Under a market-consistent approach, we assume there is no cost of holding the capital backing the Risk Margin (net of TMTP) and so we accredit the full amount immediately. Under a real-world approach, we assume there is a cost of holding the capital backing the Risk Margin (net of TMTP).

Appendix 2 – Full Results

In this appendix we present the full results for the four capital generation return metrics covered in this paper for the 2019 and 2020 fiscal years. Firms that were excluded from the results presented in Figures 4 to 13 above, for reasons outlined in Figure 3 above, are coloured in red.

FIGURE 14: 2019 FULL RESULTS

	EOF	UT1 + DTA	S2AOF	S2EV*
Company 1	8%	11%	11%	13%
Company 2	15%	10%	11%	7%
Company 3	16%	19%	19%	20%
Company 4	6%	9%	8%	10%
Company 5	9%	14%	17%	17%
Company 6	8%	13%	14%	41%
Company 7	56%	82%	81%	118%
Company 8	40%	51%	50%	60%
Company 9	6%	8%	15%	11%
Company 10	18%	14%	15%	11%
Company 11	9%	9%	17%	15%
Company 12	7%	7%	8%	11%
Company 14	16%	17%	22%	16%
Company 15	12%	16%	17%	19%
Company 16	6%	8%	8%	7%
Company 17	11%	18%	19%	57%
Company 18	17%	20%	21%	27%
Company 19	2%	6%	9%	3%
Company 20	40%	40%	39%	46%
Average (mean)	16%	19%	21%	27%
Lower and Upper Quartiles	7% and 16%	9% and 19%	11% and 19%	11% and 34%
IQR	9%	10%	9%	23%

FIGURE 15: 2020 FULL RESULTS

	EOF	UT1 + DTA	S2AOF	S2EV*
Company 1	2%	3%	4%	2%
Company 2	-2%	2%	2%	5%
Company 3	22%	21%	2%	10%
Company 4	1%	1%	1%	4%
Company 5	4%	4%	6%	3%
Company 6	-4%	-1%	0%	3%
Company 7	5%	7%	9%	3%
Company 8	-1%	-4%	-3%	-8%
Company 9	-5%	-6%	-3%	-16%
Company 10	5%	6%	6%	5%
Company 11	9%	2%	4%	5%
Company 12	4%	4%	4%	7%
Company 13	9%	10%	11%	17%
Company 14	-3%	-6%	-5%	-11%
Company 15	18%	23%	22%	24%
Company 16	8%	9%	11%	-2%
Company 17	3%	-7%	-6%	-6%
Company 18	-6%	-11%	-8%	-5%
Company 19	-4%	-7%	-5%	-7%
Company 20	25%	25%	24%	28%
Average (mean)	4%	4%	4%	3%
Lower and Upper Quartiles	-2% and 8%	-4% and 8%	-3% and 7%	-5% and 6%
IQR	10%	12%	10%	11%

Appendix 3 – Reliances and Limitations

In carrying out our analysis and preparing this research report we have relied upon the accuracy and completeness of publicly available data and information in relation to the companies included in our analysis. Reliance has been placed upon, but not limited to, the following information:

- Public QRT data sourced from Solvency II Wire Data (available via subscription from <https://solvencyiiwiredata.com/about/>).
- Data sourced from companies' publicly disclosed:
 - SFCRs.
 - Annual reports and accounts.
 - Investor presentations and communications.
 - Public information on capital distributions to shareholders through dividend and share buybacks.

We have not audited or verified this data or other information. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete. In that event, the results of our analysis may not be suitable for the intended purpose.

We performed a limited review of the data used directly in our analysis for reasonableness and consistency and have not found material defects in the data. We have made minor adjustments to the data to correct known errors, such as inconsistencies among QRTs, to better inform our analysis. However, we have not made any material changes to the underlying data. We have not made any changes to the data to reflect additional information or changes following the reporting date.

This research report is intended solely for informational purposes. The underlying data and analysis have been reviewed on this basis. This report is not intended to guide or determine any specific individual situation, and persons should consult qualified professionals before taking specific actions.

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