AvivaSA Emeklilik ve Hayat A.Ş.

Market Consistent Embedded Value Report

Full-year 2018

Market Consistent Embedded Value Report

1. Introduction

Embedded value is a financial reporting metric specifically developed for long-term life insurance and pension business over the years. It aims to overcome the known shortcomings of accounting metrics by taking into account the projected cash flows throughout the lifetime of the products using best estimate assumptions. This is necessary to give a more economic and transparent picture of the profitability of the long-term life insurance products since writing new business leads to a financial loss on day one in the financial statements. The projected expected profits arising out of the cash flows are adjusted by a risk allowance to reflect the inherent uncertainties of such projection. Additionally, there is an allowance for cost of capital, to reflect the cost of holding capital.

This report should be considered as an addition to and not as a substitute for AvivaSA's primary financial statements.

This report provides the Market Consistent Embedded Value (MCEV) results of AvivaSA on a 100% ownership basis as of December 31, 2018 and the value of new business and related metrics for the year ended December 31, 2018.

2. Definition of Embedded Value

MCEV represents the present value of shareholders' interests in the earnings distributable from assets allocated to the covered business after making sufficient allowance for the aggregate risks in the covered business, plus the shareholders' net worth. The allowance for risk is calibrated to match the market price for risk where reliably observable.

The value of future new business is excluded from the MCEV. New business is defined as business arising from the sale of new contracts and includes expected renewals on those contracts (noting the exception for yearly renewable life insurance term business, which is detailed below in section 6) and expected future contractual alterations to those contracts. Non-contractual increases in premiums, such as additional contributions to the pensions business, is included within new business. For group pension and auto-enrolment pension business, new business is defined as newly obtained schemes or additions of members to existing schemes.

The results have been prepared under the European Insurance CFO Forum Market Consistent Embedded Value Principles (''MCEV Principles'') © (Copyright © Stichting CFO Forum Foundation 2008) published October 2009.

Calculations are performed after allowing for reinsurance and on an after-tax basis applying current legislation and practice, together with future known and certain changes.

The methodology, assumptions and results have been reviewed by PwC. Their opinion is included in section 16.

3. Covered business

The MCEV Principles draw a distinction between "covered business" to which the MCEV methodology is applied, and "non-covered business" which is reported on an unadjusted IFRS net asset value basis. All of AvivaSA's business is regarded as covered business for purposes of MCEV reporting as all of the company's business is related to insurance business and the assets backing that business. As such, no non-covered business or a Group MCEV are presented.

4. Methodology and components of MCEV

MCEV consists of the aggregate of shareholders' net worth and the value of in-force business relating to the covered business.

4.1. Shareholders' net worth

Shareholders' net worth is defined as the market value of assets allocated to the covered business not required to back the in-force regulatory liabilities at the valuation date. The shareholders' net worth is calculated on the basis of the local regulatory surplus.

The shareholders' net worth is comprised of required capital and free surplus. The required capital is the market value of assets allocated to the covered business over and above that required to back liabilities for the covered business, whose distribution to shareholders is restricted. The required capital is defined as 150% of the Turkish regulatory capital requirements, as this is management's target capital ratio.

The free surplus is the market value of any assets allocated to, but not required to back liabilities or support required capital, the in-force covered business at the valuation date. The free surplus excludes any DAC asset. A reconciliation of the shareholders' net worth and the IFRS shareholders' equity (referred to as "IFRS net asset value" in the MCEV Principles) is provided under section 9.

4.2. Value of in-force covered business

The in-force portfolio consists of policies underwritten up to the valuation date and excluding future new business.

The value of in-force (VIF) of covered business is the value arising from the in-force portfolio, and consists of the following components:

- the present value of future profits (PVFP), where profits are post taxation shareholder cash flows from the in-force covered business and the assets backing the associated liabilities;
- the time value of financial options and guarantees (TVOG);
- the frictional costs of required capital (FC); and
- the costs of residual non-hedgeable risks (CNHR).

The methodology used to calculate each of these components is set out below.

<u>Present value of future profits (PVFP)</u>

The PVFP is the present value of the profits distributable to shareholders arising from the in-force covered business projected on a best estimate basis. Distributable profits generally arise when they are released following valuations carried out in accordance with Turkish regulatory requirements, which are designed to demonstrate and ensure solvency.

Future distributable profits are projected using best estimate non-economic assumptions and market consistent economic assumptions. The PVFP is calculated using the certainty equivalent approach, consistent with MCEV Principles, under which the same reference rate is used for both the projected investment return and the discount rate.

Time value of financial options and guarantees (TVOG)

An allowance for TVOG must be required with respect to Principle 7 where policyholders are provided with financial options and guarantees. Guarantees are present for certain unit-linked life savings contracts which portfolio is in run-off. For certain unit-linked life savings contracts, the policyholder has been provided with financial guarantees around the level of financial return on its investment. The analysis carried out to determine the TVOG indicates that the financial guarantees is immaterial due to the size of the unit-linked life savings and the high interest rate environment in Turkey relative to the guaranteed level of financial return on the contracts. Therefore, the TVOG for all covered business has been approximated to be immaterial.

Frictional costs of required capital (FC)

The FC reflects the present value of additional costs to shareholders of holding the assets backing required capital within an insurance company. The frictional costs allowed for are the taxation costs applicable to investment returns and any additional investment expenses on the assets backing the required capital. These frictional costs are projected and then discounted at the reference rate to determine the FC.

Cost of residual non-hedgeable risks (CNHR)

The CNHR allows for risks which have not been sufficiently allowed for elsewhere in the valuation by using weigthed averages. The allowance for relevant risks within the CNHR, includes but is not limited to:

- potential regulatory action (e.g. a change to the pensions State Contribution) and uncertainty around further capping of the pension business fees;
- operational risk, in so far as this has generally not been allowed for elsewhere;
- actual experience can vary from best estimate assumptions (including mortality, mass lapse and expenses) and some allowance for uncertainty has been made; and
- counterparty default risk of business partners.

The CNHR is allowed for by using a ‘cost of capital’ approach, where the charge assumed has been set to ensure that the total CNHR is sufficient to meet the impact of the risks considered as outlined above. In 2017 the method to derive relevant capitals was aligned with the Solvency II framework for deriving capitals for Non-hedgeable risks. This lowered the anticipated risk capitals and as such lowered the CHNR effect. The CNHR has been calculated by projecting the relevant risk capital using appropriate risk drivers over the term of the business. The reference rate has been used as the discount rate for this calculation.

The CNHR calculation allows for diversification between different non-hedgeable risks, but no diversification between hedgeable and non-hedgeable risk has been allowed for.

5. Value of new business

The value of new business (VNB) is calculated consistently with the VIF and represents the value arising from new business written in the year ended December 31, 2018.

The VNB consists of the present value of future distributable profits of business written in the relevant reporting period, with allowance for related CNHR, FC and TVOG. This is calculated using a point of sale approach where separate calculations are carried out for each quarter’s new business, using economic assumptions at the end of the previous quarter and throughout using non-economic assumptions as of the valuation date December 31, 2018.

6. Additional matters relating to the MCEV methodology

Treatment of yearly renewable term assurance

All yearly renewable products are assumed to have a term of one year only as there is currently not yet sufficient experience of the yearly renewable business to set a renewal assumption with confidence. Any renewals on the in-force business are classified as new business. Given the current volumes of in-force and new yearly renewable products, the methodology set out here does not have a material impact on the VIF or VNB.

Policy data treatment as of the valuation date

For full-year reporting, the in-force business data is extracted from the administration systems as of 31 December, 2018. The value of new business and other new business metrics are based on twelve months of actual policy data.

7. Assumptions

This section describes the key assumptions used in preparing the MCEV results.

The projection assumptions used to value new business are consistent with those used to value in force business.

7.1. Economic assumptions

Reference rate

The table below sets out the reference rates used in the MCEV calculations as of December 31, 2018 and December 31, 2017 at sample durations, expressed in swap spot rates (%).

Table 1

	TL Swap spot rates (%)	
Term	**December 31, 2018**	**December 31, 2017**
1	21.8	14.4
2	19.4	13.9
3	18.8	13.5
4	17.7	13.0
5	16.3	12.5
6	15.9	12.2
7	15.8	11.9
8	15.2	11.7
9	14.4	11.4
10	13.6	11.2
20	9.8	10.2
30	8.4	9.8

Table 2	U.S. dollar Swap spot rates (%)	
Term	**December 31, 2018**	**December 31, 2017**
1	2.6	1.9
2	2.5	2.1
3	2.4	2.2
4	2.4	2.2
5	2.4	2.3
6	2.4	2.3
7	2.5	2.3
8	2.5	2.4
9	2.5	2.4
10	2.6	2.4
20	2.7	2.6
30	2.7	2.6

For December 31, 2018 onwards EIOPA spot rates will be used to be consistent with the Solvency II Directive. This is specifically required to address the lack of deep and liquid market at the longer end of Turkish Lira yield curve, exacerbated in light of the inverted nature of the curve. Those rates are then converted in the forward rates to be used in the projections.

No liquidity premium is assumed in the reference rate.

Foreign exchange rates

The MCEV and VNB are calculated in the currency applicable to each of the underlying contracts and then converted to Turkish Lira using the corresponding exchange rates as of the valuation dates for the VIF and end of the previous quarter for the VNB. The U.S. dollar exchange rates used in the MCEV calculations as of December 31, 2018 and December 31, 2017 are given below.

Table 3	U.S. dollar exchange rates	
	December 31, 2018	**December 31, 2017**
U.S dollar/Turkish Lira	5.28	3.77

Real-world investment returns

Spot rates were materially at the same level as the yield on the Turkish Lira denominated interest-bearing assets in Turkey. In light of this, the real-world yields are set equal to the reference rates as given above. Any equity risk premium that would be earned on equity assets is ignored on grounds of materiality and will be reflected in economic variances. The resulting yield is consistent with management’s expectation of the return on the business. Real-world investment returns are used for calculating the expected return in the analysis of MCEV earnings, IRR and payback period new business metrics.

Inflation assumption

The inflation assumption has been set with regard to current data for consumer price and AvivaSA's assessment of long-term rates which has been informed by the implied inflation between nominal and real Turkish government bonds. As there is no liquid market in inflation-linked swap instruments, management's ability to set reliable inflation assumption with reference to the swap curve is reduced.

Inflation assumption has been changed to reflect the current macro-economic environment. Inflation forecast of the Central Bank of Turkey was used as of December 31, 2018. According to the Bank inflation report, inflation rate was 20.3% for year-end 2018. In 2019, the inflation is expected to be 15% pa then gradually reducing to the long-term target of 7% pa.

The expense inflation is assumed to be the same as the inflation assumption.

Cost of capital for CNHR

AvivaSA's methodology includes a charge on non-hedgeable risk capital set at 6% per annum (after tax) over and above the risk free rate. This charge is applied to the non-hedgeable risk capital, in line with the risk margin derivation as defined by the Solvency II Directive.

7.2. Non-economic assumptions

Operating assumptions are reviewed on a regular basis, and updated typically at each year-end date to reflect changes in emerging experience when considered appropriate to do so, unless management becomes aware of a material change in the emerging experience that should be reflected sooner at the end of the year.

In light of the emerging experience, assumptions were updated for expenses and lapses as of December 31, 2018 both for new business and in-force.

Expense assumptions

The best estimate expense assumptions have been set on a going concern basis and are based on the current level of expenses allocated to the covered businesses.

Management expenses have been analysed and split between expenses relating to segments and further with respect to the acquisition of new business, the maintenance of in-force business, exceptional development and one-off expenses.

For maintenance expenses (excluding investment expenses), assumptions are derived for each product line and are typically expressed as per policy amounts. Per policy maintenance expenses are assumed to increase in the future with an appropriate level of inflation as described in the previous section. The amount of acquisition expenses in the relevant period is allowed for as a deduction in the calculation of the VNB for that period.

Expenses of an exceptional nature are excluded from the expense assumptions used in the VIF and VNB calculations. These are identified separately when they occur and will impact the shareholder's net worth as and when they are incurred. Investment management expenses paid to third parties are allowed for in the projection.

No future productivity gains were assumed in the MCEV.

Demographic assumptions (including persistency and mortality)

Assumptions have been made in respect of future levels of lapses, morbidity, mortality, premium persistency and surrenders. The assumptions reflect the best estimates of the likely future experience, and are based on recent experience and relevant industry data, where available, and management judgement.

The assumptions for future mortality rates for the pensions, individual life and group whole life businesses are based on the company's experience to date. No allowance is made for the expected improvements in mortality of the business.

The long-term value arising from pensions business is highly dependent on the persistency assumptions such as surrenders and premium collection. These assumptions have been set with reference to AvivaSA's relevant historical experience to provide a credible estimate of future experience. Lapse rates assumptions are set below average levels experienced over the last years in anticipation of a less volatile economic environment.

Any external developments such as regulatory changes are taken into the decision process when considering assumptions changes.

Tax assumptions

The corporate tax rate assumptions used in the projection of the distributable earnings at each valuation date has been set to the Turkish corporate tax rate of 22% to 2020 and 20% thereafter.

8. Market Consistent Embedded Value Results

The table below shows the summary statement of the AvivaSA MCEV as of December 31, 2018 and as of December 31, 2017.

Table 4

(TL millions)	December 31, 2018	December 31, 2017	*Change (%)*
Value of In-force	**1,511.3**	**1,398.3**	***8.1%***
PVFP	1,671.2	1,526.3	*9.5%*
FC	-37.7	-27.8	*35.3%*
CNHR	-122.2	-100.1	*22.1%*
TVOG	0.0	0.0	*N/A*
Net Worth	**370.3**	**264.1**	***40.2%***
Free surplus	62.8	16.6	*278.1%*
Required capital	307.5	247.4	*24.3%*
MCEV	**1,881.6**	**1,662.4**	***13.2%***

AvivaSA exceeds the management's target capital of 150% of statutory required capital, with a surplus of 62.8m TL.

The table below shows the VIF broken down by segment.

Table 5

(TL millions)	**December 31, 2018**	**December 31, 2017**	***Change***
Individual pensions	960.4	980.4	*-2.0%*
Group pensions	140.6	136.1	*3.3%*
Life protection	385.9	259.8	*48.6%*
Personal accident	22.0	18.2	*20.6%*
Life savings	2.5	3.8	*-35.5%*
VIF	**1,511.3**	**1,398.3**	***8.1%***

Pensions business remains by far the most significant portion of the in-force book, representing about 73% of the VIF. The growth in VIF for life protection is primarily due to the flagship product Return of Premium.

9. Reconciliation from IFRS shareholders' equity to MCEV shareholders' net worth

The table below shows the reconciliation between the IFRS shareholders' equity and the MCEV shareholders' net worth.

Table 6

(TL millions)	**December 31, 2018**	**December 31, 2017**	***Change***
IFRS shareholders' equity	621.1	549.4	*13.1%*
IFRS deferred acquisition costs	-273.9	-263.3	*4.0%*
IFRS deferred income reserve	43.0	-7.2	*-697.2%*
Difference in technical provisions between IFRS and MCEV	-19.9	-14.9	*33.6%*
MCEV shareholders' net worth	**370.3**	**264.1**	***40.2%***

The MCEV shareholders' net worth differs from the IFRS shareholders' equity with respect to the following items:

- IFRS deferred acquisition costs in relation to the covered business are not included in the MCEV shareholders' net worth, which amounted to 273.9m TL as of December 31, 2018 and 263.3m TL as of December 31, 2017.

- IFRS deferred income reserves in relation to the covered business are not included in the MCEV shareholders' net worth, which amounted to 43.0m TL as of December 31, 2018.

- Difference in technical provisions between IFRS and MCEV arises because the IFRS basis does not allow for equalisation reserves which are included in the statutory reserves used to derive the MCEV shareholders' net worth.

The increase in MCEV shareholders' net worth is due to the capital generation capability of the business after allowing for the dividend payment in the end of the year.

10. Analysis of MCEV Earnings

The table below set out the analysis of the embedded value earnings for the period from December 31, 2017 to December 31, 2018.

Table 7

(TL millions)	Free Surplus	Required Capital	VIF	MCEV
Opening MCEV	**16.6**	**247.4**	**1,398.3**	**1,662.4**
Value of new business	-211.0	89.5	354.8	233.3
Expected existing business contribution (reference rate)	1.9	27.8	219.5	249.1
Expected existing business contribution (in excess of reference rate)	-	-	-	-
Transfers from VIF and required capital to free surplus	393.1	-71.9	-321.1	-
Experience variances	-0.1	-13.4	-87.2	-100.7
Assumption changes	-8.9	8.9	-113.2	-113.2
Other operating variances	0.7	-0.7	12.3	12.3
Operating MCEV earnings	**175.6**	**40.2**	**64.9**	**280.7**
Economic variances	-36.5	18.3	48.0	29.9
Other non-operating variance	-	-	-	-
Total MCEV earnings	**139.1**	**58.5**	**113.0**	**310.6**
Capital movements	-92.9	1.5	-	-91.3
Closing MCEV	**62.8**	**307.5**	**1,511.3**	**1,881.6**

The following section explains the driver of changes between the opening and closing MCEV. The value of new business is separately discussed in “New business results” below.

Expected existing business contribution

The expected existing business contribution represents the unwinding of the reference rate on the opening MCEV and reflects management’s expectation of the earnings on this business. This is essentially the change in MCEV during the reporting period arising from the in-force at the start of the year. The existing business contribution in excess of reference rate is nil, consistent with the real-world investment returns being set to be the same as the reference rate.

Transfer of VIF and required capital to free surplus

This denotes the capital generation from the in-force business at the start of the period. It is composed of two items. The monetisation of VIF following the emergence of earnings of 321.1m TL during the period and the release of required capital running off, 71.9m TL.

Experience variances

Experience variances represent the impact on the MCEV as a result of the difference between assumed and actual operating experience in the reporting period, including expense, mortality and persistency experience.

Pensions business exhibited higher than assumed lapses due to the volatile economic environment leading to loss of future profits. The negative impact was partially offset by higher release of the required capital. Return of premium experienced a negative variance from paid-up policies.

Expenses during the period were higher than expected due to high expense inflation specifically in the second half of the year.

Positive mortality experience variance is due to the favourable mortality and morbidity experience which have been continuing over the years.

Assumption changes

Given the volatile market conditions, forming a long-term best estimate view for pension lapse assumption is not reliable. AvivaSA is closely monitoring the lapse experience across all channels and will update its position if the high lapse experience turns out to be permanent. This view is set out on the back of the strengthening of lapse assumptions in 2017.

Pension premium collection assumption has been changed in light of historic trends that better reflect the future evolution. The impact of this change was -16.4m TL.

Life protection lapse and paid-up assumptions have been changed to reflect the experience giving an impact of -28.0m TL.

Expense assumptions are set with respect to the activity based costing methodology. Higher cost allocation to in-force policies has led to a maintenance expense assumption change of -85.9m TL.

Mortality and morbidity assumptions have been updated to reflect the year-after-year favourable experience of AvivaSA in line with the demographics of market. This is primarily due to the profitable nature of rider benefits such as accidental death and disability. The capitalisation of these prudent margins is giving a VIF of 17.7m TL.

Other operating on VIF was as a result of prior period adjustment.

Economic variances

This item includes the impact of both economic assumption changes and economic variances. Economic variance reflects the impact of actual investment return experience in the period differing from assumed investment returns.

The combined effect of the swap spot rates for Turkish Lira and U.S. dollar is a negative impact of 30m TL where the latter has partially offset the former. As stated in section 7.1 changing from Bloomberg swap rates to EIOPA spot rates had a further negative impact of 12m TL.

Recent volatility in the market had an adverse impact on investment performance leading to a lower free surplus. VIF benefitted from exchange rate movements and the escalation of the minimum wage.

Capital movements

Capital movements are composed of dividends which was 48.3m TL and unrealised losses of 36.7m TL. Unrealised losses are primarily arising from an increase in yields from assets backing Return of Premium liabilities leading to mark-to-market losses.

11. New business results

VNB is one of the key indicators that AvivaSA uses to measure the profitability and steer the growth of new business written in the life and pensions segments. The table below sets out an overview of the value of new business and other related metrics (defined below) for the year ended December 31, 2018 and December 31, 2017.

Table 8

(TL millions)	**Full-year 2018**	**Full-year 2017**	***Change***
Value of New Business (VNB)	233.3	232.5	*0.3%*
Present Value New Business Premiums (PVNBP) (1)	5,324.7	5,542.8	*-3.9%*
New business margin (PVNBP basis) (2)	4.4%	4.2%	*0.2%*
Single premium	1,256.7	1,356.7	*-7.4%*
Annual premium	1,151.0	1,137.8	*1.2%*
Average annual premium multiplier (3)	3.5	3.7	*-3.9%*
Annual Premium Equivalent (APE) (4)	1,276.7	1,273.5	*0.3%*
Internal Rate of Return (IRR)	35.6%	34.7%	*0.9%*
Payback period (in years)	3.2	3.4	*-0.2*

Note (1): The present value of premiums arising from new business calculated by projecting the premiums expected in each future year from point of sale.

Note (2): Calculated as VNB divided by PVNBP.

Note (3): Calculated by the following formula: (PVNBP - single premium)/annual premium.

Note (4): APE = annual premium + 10% of single premium.

An IRR is the discount rate at which the present value at the time of issue of projected distributable profits (net of the impact of required capital) from new business is nil, with no explicit allowance for CNHR. Specifically it is more relevant when a particular product consumes capital at the point of sale.

The payback period is calculated using the same cash flows as are used for the IRR calculations. The payback period is calculated as the time period (measured in years) at which the sum of all undiscounted distributable profits (net of the impact of required capital), measured from the time of issue, first becomes greater than nil.

11. 1 New business bridging

Table 9

Full-year 2018 ***(TL millions)***	**VNB**	**NB Margin**	**PVNBP**
Opening	232.5	4.2%	5,542.8
Volume impact	-31.4	-0.3%	-312.9
Mix impact	7.4	0.1%	0.0
Economics and others	24.8	0.4%	94.8
Closing	**233.3**	**4.4%**	**5,324.7**

Lower sales volumes of retail pension business is the primary reason of a flat VNB. This was slightly offset due to the shift in new business mix towards the life protection. Higher U.S dollar swap rates and exchange rate gains contributed a 24.8m TL positive impact.

The following tables set out the VNB and other new business metrics by product for the year ended December 31, 2018 and December 31, 2017 respectively.

Table 10

Full-year 2018 *(TL millions)*	**Life protection(*)**	**Personal accident**	**Individual pensions**	**Group pensions**	**Pensions**	**Total**
VNB	164.3	11.0	55.0	3.0	58.0	**233.3**
PVNBP	919.2	100.6	2,712.4	1,592.5	4,304.9	**5,324.7**
New business margin (PVNBP basis)	17.9%	10.9%	2.0%	0.2%	1.3%	**4.4%**
Single premium	212.2	100.6	890.6	53.2	943.8	**1,256.7**
Annual premium	154.4	0.0	635.0	361.6	996.6	**1,151.0**
Average annual premium multiplier	4.6	N/A	2.9	4.3	3.4	**3.5**
APE	175.6	10.1	724.0	366.9	1,091.0	**1,276.7**
IRR	125.7%	48.5%	25.4%	21.2%	25.4%	**35.6%**
Payback period (in years)	0.9	1.0	3.7	6.0	3.8	**3.2**

Table 11

Full-year 2017 *(TL millions)*	**Life protection(*)**	**Personal accident**	**Individual pensions**	**Group pensions**	**Pensions**	**Total**
VNB	150.5	6.5	65.2	10.3	75.5	**232.5**
PVNBP	831.9	84.5	2,906.8	1,719.5	4,626.4	**5,542.8**
New business margin (PVNBP basis)	18.1%	7.8%	2.2%	0.6%	1.6%	**4.2%**
Single premium	227.0	84.5	1,006.3	38.9	1,045.3	**1,356.7**
Annual premium	127.2	0.0	644.4	366.2	1,010.6	**1,137.8**
Average annual premium multiplier	4.8	N/A	2.9	4.6	3.5	**3.7**
APE	149.9	8.4	745.0	370.1	1,115.1	**1,273.5**
IRR	125.4%	31.9%	23.3%	17.2%	20.0%	**34.7%**
Payback period (in years)	0.8	1.0	3.8	8.6	5.8	**3.4**

* There is no new business attributable to the life savings segment.

* Group pension business results includes pension auto-enrolment.

The life protection and personal accident businesses have higher new business margins, compared to the pensions mainly due to the value from the projected release of prudent mortality and morbidity margins from the statutory reserves. This is supported by the favourable experience over the years which AvivaSA decided to allow in the long-term assumptions.

Life protection

New business margin has slightly decreased year-on-year due to higher weight in stand-alone life protection compared to credit-linked life protection. Overall, change in operating assumptions had a negative impact on VNB. Life protection business is largely capital generative with fast payback periods of less than 1 year despite these changes.

Personal accident

New business margin has improved as a result of the expense assumption change.

Individual pensions

Individual pensions business has exhibited lower sales volumes in another year of transition and challenging market conditions. This has led to a lower VNB year-on-year.

Group pensions

Group pensions segment is now primarily auto-enrolment with lower fees compared to retail (group) pensions.

12. Maturity profile of business

The tables below represent the profile of the VIF emergence expected to turn into undiscounted profits over the projection years for in-force and new business respectively.

Table 12 – In-force

In Years	Full-year 2018	Full-year 2017
1	11.9%	17.2%
2	23.3%	29.4%
3	33.5%	40.9%
4	44.1%	51.5%
5	54.5%	60.5%
6	62.5%	68.1%
7	69.2%	74.5%
8	75.5%	79.7%
9	81.0%	83.8%
10	85.4%	86.9%
11 to 15	95.9%	95.5%
16 to 20	99.1%	98.8%
Above 20	100.0%	100.0%

More than half of the VIF is expected to monetise into profits within five years with a slight slow down from 2017.

Table 13 – New business

In Years	Full-year 2018	Full-year 2017
1	37.0%	29.7%
2	51.0%	39.3%
3	63.0%	49.8%
4	71.5%	59.4%
5	76.1%	67.1%
6	80.3%	73.2%
7	84.8%	78.6%
8	88.3%	83.4%
9	91.0%	87.4%
10	92.6%	90.1%
11 to 15	96.2%	95.7%
16 to 20	98.2%	98.4%
Above 20	100.0%	100.0%

The pace of VIF monetisation for new business is faster year-on-year primarily due to shift in mix towards life protection products.

13. Sensitivity analysis

Embedded value calculations rely upon best estimate assumptions such as expense, interest rate, investment return, lapse rate and mortality rate assumptions.

Sensitivity testing of the embedded value outcomes for alternative assumptions is provided in the tables below. AvivaSA does not have material exposure to equity or property assets so no sensitivity has been provided for these asset classes.

The sensitivities are applied proportionately for the non-economic assumptions but as an additive for the economic assumptions.

Table 14

	December 31, 2018	
(TL millions)	**MCEV**	**Value of new business**
Base Value	**1,881.6**	**233.3**
Sensitivity to non-economic assumptions		
Lapse rates +10%	-73.9	-17.9
Lapse rates -10%	83.1	20.1
Maintenance expenses +10%	-46.0	-11.1
Maintenance expenses -10%	46.0	11.1
Assurance mortality/morbidity +5%	-5.8	-2.8
Assurance mortality/morbidity -5%	5.9	2.8
Paid-up rates +10%	5.8	0.1
Paid-up rates -10%	-6.4	-0.2
Required capital at the Solvency I level	13.9	1.7
Market interest rates +1%	10.5	16.0
Market interest rates -1%	-26.6	-19.3

Table 15

	December 31, 2017	
(TL millions)	**MCEV**	**Value of new business**
Base Value	**1,662.4**	**232.5**
Sensitivity to non-economic assumptions		
Lapse rates +10%	-69.5	-14.2
Lapse rates -10%	78.6	16.1
Maintenance expenses +10%	-36.2	-10.2
Maintenance expenses -10%	36.2	10.2
Assurance mortality/morbidity +5%	-5.0	-3.5
Assurance mortality/morbidity -5%	5.0	3.5
Paid-up rates +10%	-4.0	-2.8
Paid-up rates -10%	4.0	2.9
Required capital at the Solvency I level	9.2	2.9
Market interest rates +1%	-7.4	9.4
Market interest rates -1%	0.1	-11.3

A brief explanation of each of the sensitivities is provided below.

Lapse rates +10%/-10%: To illustrate the impact of a different scenario in the assumed level of lapses, lapse rates were increased and decreased by 10% of the base assumption. Premium collection rates are excluded from the lapse sensitivity. The relatively large impact of the lapse sensitivity is due to loss of future charges for the pensions business partially offset by higher deferred entry fee income, which is charged to participants at the time of exit.

Maintenance expenses -10%: The MCEV increases when maintenance expenses are lower by 10% due to an increase in future earnings.

Assurance mortality/morbidity -5%: To illustrate the impact of lower mortality/morbidity, it was assumed that mortality and morbidity rates decrease by 5% of the base assumptions. This sensitivity shows that the insurance portfolio is dominated by the risk business.

Premium collection rates +10%/-10%: To illustrate the impact of a different scenario in the assumed level of premium collection, premium collection rates were increased and decreased by 10% of the base assumption for the pensions business only. An increase in premium collection rates implies that there are more contracts paying contributions leading to a higher embedded value and vice versa for pensions business. Life protection business benefits from higher paid-ups in line with the nature of these products.

Required capital at the Solvency I level: This is to show the impact of targeting a higher internal required capital in the base MCEV, which is an addition of 50% on top of the Solvency I capital requirement.

Market interest rates +1%/-1%: When the market interest rate sensitivities are performed, consequential changes in yield and values are allowed for on all interest-bearing assets and liabilities, including updating the assumptions for indexation of regular premiums and expense inflation. Pensions' VIF increases when interest rates decrease and decreases when interest rates increase due to its exposure to the fee-based pensions business which is of a longer duration than the life insurance business. Underlying assets backing life savings liabilities are assumed to be invested in cash when carrying out the interest rate sensitivities. An increase in interest rates are now having a positive overall impact on both MCEV and VNB. This is due to the spread nature of Return of Premium product where higher profits are projected as a result of higher interest rates.

14. Differences between reported Aviva plc MCEV disclosures

The differences between the MCEV of AvivaSA in this report and that reported in the supplementary information to the accounts of Aviva plc are primarily the result of the following factors:

- CNHR capital charge of 2% per annum is increased to 6% per annum where the former allowed for the diversification benefit of non-hedgeable risks at Aviva Group level; and
- allowance is no longer made for the withholding tax that would be incurred by Aviva plc on the distributable earnings.

15. Statement of Directors' responsibilities in respect of the MCEV basis

When compliance with the MCEV Principles is stated, those principles require the directors to prepare supplementary information in accordance with the methodology contained in the MCEV Principles and to disclose and explain any non-compliance with the guidance included in the MCEV Principles. In preparing this supplementary information, the directors have done so in accordance with these MCEV Principles and have also fully complied with all the guidance. Specifically the directors have:

- determined assumptions on a realistic basis, having regard to past, current and expected future experience and to relevant external data, and then applied them consistently;
- made estimates that are reasonable and consistent; and
- provided additional disclosures when compliance with the specific requirements of the MCEV Principles is insufficient to enable users to understand the impact of particular transactions, other events and conditions, and AvivaSA's financial position and financial performance.

16. Independent Opinion

PwC has been engaged to review the Market Consistent Embedded Value ('MCEV') results of the Life segment of AvivaSA Emeklilik ve Hayat AS (hereafter: 'AvivaSA') as of 31 December 2018 (hereafter: 'valuation date'), which includes: the Value of the In-Force Business, the Value of New Business ('VNB') and the Analysis of Change as disclosed in the relevant parts AvivaSa's Full Year 2018 MCEV report.

Management's responsibilities for the MCEV report

The CFO Forum MCEV Principles & Guidelines (published in June 2008 and amended in October 2009) (hereafter: 'Guidelines'), have been adopted by AvivaSA. Management is responsible for the preparation and fair presentation of the MCEV, using these Principles and the market consistent methodology and assumptions as set out in AvivaSA's Full Year 2018 MCEV Report, and by performing the internal controls as management deems it necessary to enable the preparation of its calculations and documentation free from material misstatement.

Inherent limitations

The MCEV FY2018 Reporting is based on numerous assumptions with respect to economic conditions, operating conditions, policyholders' behaviour, taxes and other matters, many of which are beyond the Management's control. Although the assumptions used represent AvivaSA's best estimates as at the valuation date, actual experience in the future may vary from assumptions used in the calculation of the MCEV and such variation may be material. The projections and the figures developed have been constructed on a 'going concern' basis and assume continuation of the current taxation, legal and regulatory environment prevailing in Turkey. PwC has not considered possible financial implications arising from the changes in these areas.

Scope of the work

PwC undertook a review of the aggregated results from AvivaSA's models in order to satisfy itself on the basis of a number of checks that the disclosed results have been prepared in accordance with the methodology and assumptions disclosed. In arriving at its conclusions PwC has relied without independent verification upon the completeness and accuracy of the data, models and information provided by AvivaSA, both orally and in written form. This review opinion is made solely to AvivaSA in accordance with the terms of the Engagement Letter.

Conclusions

On the basis of the scope above, PwC has concluded that the disclosed results in scope of its review have been prepared, in all material aspects in accordance with the methodology and assumptions set out in this report. The operating assumptions are reasonable in the context of available experience and management expectations about the future operating environment and policyholder behaviour.

In arriving at its conclusions, PwC has relied on data and information provided by AvivaSA. This review opinion is in accordance with the terms of the Engagement Letter. To the fullest extent permitted by applicable law, PwC does not accept or assume any responsibility, duty of care or liability to anyone other than AvivaSA for or in connection with its review work, the opinion it has formed, or any statement set forth in this opinion.

Yours sincerely,
PricewaterhouseCoopers Pensions, Actuarial & Insurance Services B.V.
T.A.P.M. Berg
Partner
theo.berg@pwc.com

THeo Berg