

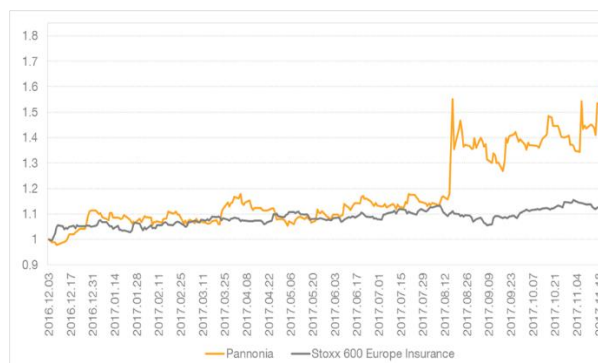
CIG Pannonia

Rating: Sell

Price target (12-m): HUF 356

Current share price: HUF 508

HUF million	2016	2017F	2018F	2019F
GWP	18 941	26 996	28 796	31 032
After-tax profits	724	2 644	1 580	1 760
Own equity	3 972	8 860	10 021	11 336
EPS [HUF]	11.7	42.1	22.6	25.2
DPS [HUF]	0.0	11.1	11.3	12.6
BVPS [HUF]	103.6	141.2	143.4	162.3
P/GWP (x)	1.6	1.1	1.2	1.1
P/E (x)	41.2	11.4	21.2	19.1
P/BV (x)	4.6	3.4	3.35	3.0
DVY (%)	0.0	2.3	2.4	2.6
ROE (%)	12.1	34.4	15.9	16.5



Performance	12M	YTD	3M	1M
Absolute	60.8%	44.4%	20.5%	13.9%
BUX relative	22.9%	17.7%	16.9%	15%

Share price closing as of 12/19/2017	HUF 482	Bloomberg	CIGP.BU
Number of shares [million]	71.3	Reuters	PANNONIA HB
Market capitalization [HUF bn/EUR mn]	34.36/ 109.3	Free float	70%
Enterprise value [HUF bn/EUR bn]	34.36 / 109.3	52 week range	199/544
Daily turnover [EUR million]	1.07	EURHUF	314.4

Elation is reason for caution

Equity Analyst

Attila Vágó
+361 489 2265
a.vago@con.hu

Alkotas Point
50 Alkotás utca,
H-1123 Budapest
www.con.hu

- We rate CIG Pannonia (Pannonia) with a **SELL** rating as we see a 30 percent downside to our 12-month price target of HUF 356 a share. With a merely 2 percent dividend yield (assuming dividend payments according to Pannonia's dividend plan), we expect a total negative return of 28 percent over the course of the next 12 months. We see Pannonia's shares as extremely overvalued compared to its peers based on 21.2 2018 P/E and a underlying average ROE of 15.5 percent expected for the next five years.
- We anticipate that consolidated net earnings will reach HUF 2.6bn in 2017 under IFRS including the one-off impact of c. HUF 1.3bn arising from the consolidation of MKB Insurance Companies. We look for underlying EPS of HUF 21.4 in 2017). We expect Pannonia's net income to come in at HUF 1.6bn in 2018 and HUF 1.8bn in 2019, implying an EPS of HUF 22.6 for 2018 and HUF 25.2, respectively). We also expect Pannonia to generate net profit of c. HUF 2.4bn by 2022, implying a 5-year EPS GAGR of c.10 percent by 2022.
- Pannonia plans to pay dividend of HUF 10 per share after the business year 2017, in case the conditions of the payment of dividends apply. Thereafter Pannonia wishes to pay a maximum of 50% of the after-tax profit available for the payment of dividends of the current year to its shareholders.

- Pannonia complies with Solvency II capital requirements with a Solvency Required Capital ratio (SCR) of 232 percent under IFRS compared to the 150 percent ratio required by the regulator. We believe Pannonia offers good financial security with respect to its ability to repay policyholder claims and obligations as they fall due. In this regard, potentially higher new business strain and potential acquisitions ahead could lead to higher upfront costs incurred when selling new businesses and offer relatively higher capital risk. That said, it is very likely that if its solvency capital failed to fulfill Solvency II capital requirements, stakeholders would ask Pannonia to reduce risks related to its operation either by selling assets or by terminating certain businesses or simply sharing risks with better rated reinsurers to ensure compliance with the new capital requirements. Although we do not incorporate the impact of the potential partnership with Konzum on Pannonia's SCR into our model, a back-of-the-envelope calculation shows that Pannonia's SCR may improve to 242 percent after the transaction.
- Pannonia purchased 98.97% ownership interest in MKB Life Insurance, while its non-life subsidiary (EMABIT), acquired 98.98% ownership interest in MKB General Insurance. The total amount of consideration transferred to the seller was HUF 972m while the total fair value of net assets purchased (at the end of September 2017) was HUF 4bn, so the acquisition resulted in a badwill (pre-tax profit) of HUF 3bn. This profit will be reduced by the losses generated by MKB Insurance Companies throughout 2017. Consequently, we expect the net effect of the acquisition should be about HUF 1.4bn on Pannonia's consolidated net income in 2017. In our view, the acquisition of MKB Insurance Companies clearly provides a significant inorganic growth and synergy potentials for Pannonia in both the life and non-life businesses, whereas the portfolio clean-up costs may turn to be significant this year.
- Pannonia is believed to be seeking further acquisition targets at an affordable price in order to realize economies of scale and extract cross-selling opportunities offered by its new banking partners. Pannonia may target a 5 to 10 percent market share, and meanwhile constantly growing earnings. If the partnership with Konzum is realized, Pannonia's capital flexibility for sizeable acquisitions may be sufficient to reach its market share goal, in our view.
- We do stress, however, that our current level of knowledge about the potential deal with Konzum does not allow us to predict whether such a cooperation is sustainable and value creative at all, simply because neither of these companies had had experience to carry out any such large transactions and form of collaboration before. Only when we have a clue about where and at what costs Pannonia intends to invest the surplus equity that it may receive from Konzum and how much synergy can be achieved through their partnership will we really be able to estimate how much profits can additionally be generated on a sustainable basis by partnering with Konzum. In our opinion, it is not impossible, although it is hardly conceivable at present, that in the foreseeable future Pannonia could benefit from synergies, if any will occur from the partnership with Konzum, in such scale that can be enough to explain today's reach stock valuation. Of course, it can happen that even under the best conditions, our estimate for Pannonia's appraisal value could prove to be too conservative.

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Preamble

The purpose of this analysis is to present an economically meaningful valuation approach to life insurance companies, such as Pannonia (or the Company). Frankly speaking, the financial analysis of life insurance companies' businesses is a cumbersome and time-consuming process. Insurers have complex products and financial accounting that certainly requires investors to have specialized knowledge in order to make an educated investment decision. As a result, only a handful of investors and analysts are willing to bother with them.

Over the course of the financial analysis of insurance carriers there are many relevant questions that need to be answered, such as: how much is the insurer's contract-portfolio worth? How much profit will this portfolio generate in the upcoming years? How is this profit or loss distributed over the different financial years? Which parameters influence – and to what extent – the profitability of the portfolio? How much capital is necessary to have to simultaneously meet regulatory and efficiency requirements? To which extent is reinsurance used? How will the expected surrender and death ratios influence the insurer's future cash flows? To answer these questions investors need to carry out a portfolio valuation.

We tend to consider that insurers' balance sheet and P&L do not reflect as accurately as they should insurance companies' value creation ability. Insurers' accounting and internal numbers follow arbitrary rules. For this reason they are in most cases entirely useless for investment purposes. Earnings, equity growth and ROE measure life insurance performance but only in the short-term and retrospectively. Focusing only on accounting numbers inescapably generates distorted value added signals, as it ignores "the embedded value" (EV) from in-force insurance policies, as well as life insurance contract specifics (higher sales/lower earnings, higher surrender (discontinuation)/higher earnings, understated shareholder's equity).

As ever the cardinal sin of investment analysis is applying wrong numbers; that is, using unadjusted reported accounting data, which is bound to produce incorrect results, and which therefore should be treated with caution when using them for major financial decisions. We deem that only economically meaningful numbers are appropriate to use in an analysis of value creation, itself the main driver of share price performance. Accounting-based investment decisions about insurers look suspicious, if not downright unreliable, as insurer firms' financial statements provide insufficient information of about how value can be created to shareholder-wealth maximization. Furthermore, the insurance business is teeming with complicated terminology that can overwhelm investors. According to our experience, misunderstanding intricate insurance products and financial reports often leads to erroneous associations and wrong conclusions concerning insurers' financial standing.

In order to figure out how, practically, insurance carriers create value investors must therefore at first thoroughly read the specific product prospectuses, and then painstakingly reconstruct insurers' accounting data, applying the right analytical framework, *mutatis mutandis*. We sincerely hope that our comprehensive research will help to better understand the major characteristics of life insurance carriers' operations and that of Pannonia's, in particular.

Of course, we are aware that there is no single correct way to determine insurance shares' intrinsic value, and the relevance of the analytical tool depends largely on the question asked. The net asset value (shareholders' capital in an accounting framework) is certainly one of the most relevant balance sheet items for shareholders – albeit not the only one –, on which investors should always keep a vigilant eye. Economically, net assets represent what shareholders possess, the net amount of capital that they have committed to insurers. Net assets are also the primary source of earnings and dividend. It is the capital that helps cover the initial costs of operation, and it is what shareholders can dispose of whenever they wish. From the regulator's perspective, insurers have to have sufficient net assets for reliable and solvent operation.

This report is organized in two major parts. The first part deals with earnings forecast, valuation and the structure and characteristics of the Hungarian insurance market. The second part attempts to give some detailed background information specifically on pension savings insurance products which insurers may use as a growth relay, as well as on life insurance economics and the impact of conversion of the interest-bearing shares to new ordinary shares as early as in 2017 (see Appendix I, II, III). Those who are only interested in the results of the implementation of the actuarial principles to determine the appraisal value of Pannonia's existing and future businesses and our price target may choose to skip the second part.

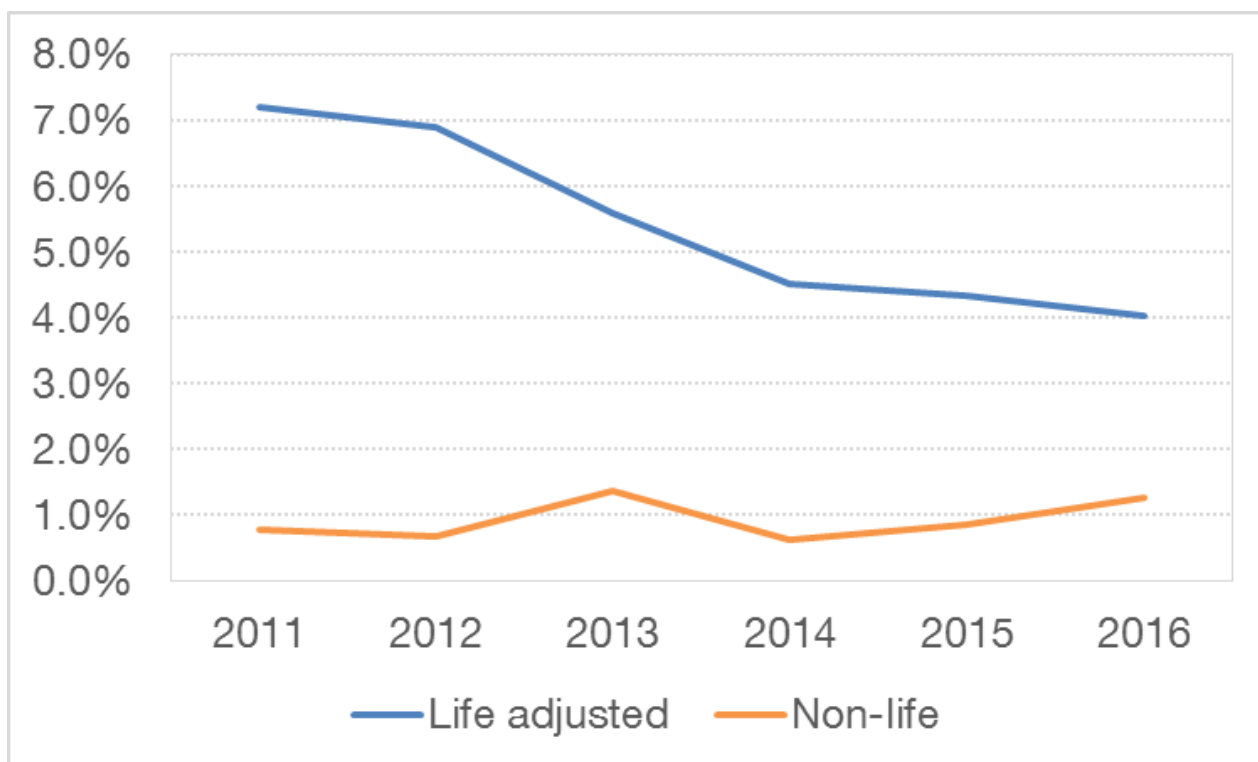
Investment case

We rate Pannonia with a SELL rating as we see a 30 percent downside to our 12-month price target of HUF 356 a share. With a merely 2 percent dividend yield (assuming dividend payments according to Pannonia’s dividend plan), we expect a total negative return of 28 percent over the course of the next 12 months. We see Pannonia’s shares as extremely overvalued compared to its peers based on 21.2 2018 P/E and a underlying average ROE of 15.5 percent expected for the next five years.

We view Pannonia’s current portfolio as still having significant exposure to long-duration, capital intensive, market-sensitive businesses such as unit linked products. However, consistent with peers it has moved deliberately to re-price and change the mix of its products towards less capital intensive products (healthcare, endowments, etc.). We do believe that Pannonia will be able to continue to generate new businesses with meaningful earnings in the future. With a gradual diversification towards risk protection insurances, we look for Pannonia’s business to trade closer to the industry average. Having that said, profitability of Pannonia’s business is yet to be validated in order for investors to reward it with a premium multiple which is more in line with public insurance carriers in other established CEE markets.

Market presence: Pannonia has been established by private investors in 2008 and organized into two business segments: life and non-life insurances. Pannonia offers a variety of insurance products primarily in unit-linked (investment-related) life insurances and retirement savings, which account for two-third of its total annual income stream. Based on adjusted life GWP, Pannonia is the 10th largest insurance company in Hungary, with a market share of c.3% (expected total market size c. HUF 943bn or EUR 3.04bn in 2017). In the life insurance segment Pannonia’s market is c.4% (expected total market size: c. HUF 454 bn or EUR 1.46bn in 2017), while in the pension insurance segment Pannonia’s market share is c.7%. In the non-life segment, Pannonia has a market share of c.1.3% (expected total market size: HUF 489bn or EUR 1.58bn in 2017).

Figure 1 Pannonia’s market share developments in the life and non-life segments

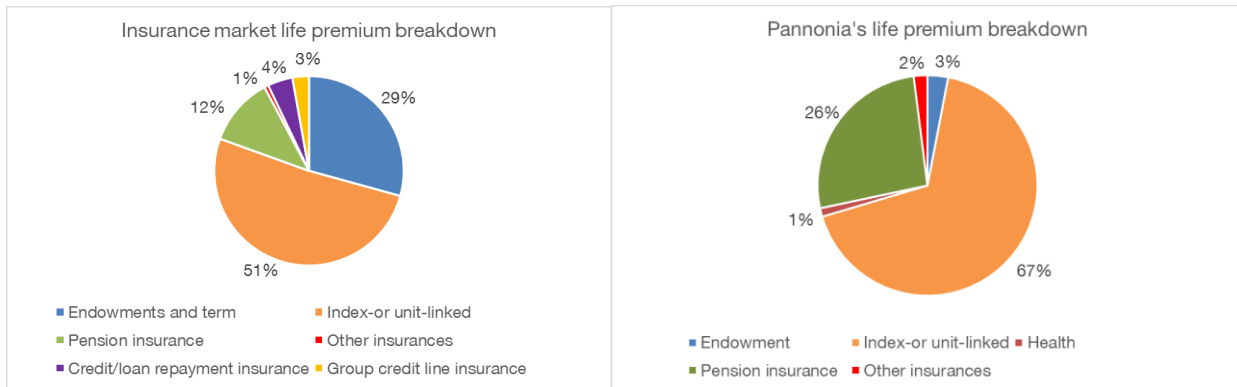


Source: Pannonia, Concorde

Flotation: Pannonia was established in 2008. It went public in the Budapest Stock Exchange (BSE) in 2010, raising its capital in the framework of an initial public offering of 10.85 million new shares for a total value of HUF 9.3 bn (EUR 34 mn). The proceeds from the IPO were earmarked for funding the expansion of business domestically as well as in the adjacent countries (Slovakia and Romania, in particular). The stock has crashed from HUF 938 when it floated to below HUF 200 by 2016 as Pannonia experienced a strain on its financial standing amid a recessionary macro environment, stagnation in the domestic life insurance industry, and consequently tepid interest from investors towards domestic small caps. In the past two and a half years, however, the share price has recovered a lot, and Pannonia has been ranked as one of the BSE’s best performing stocks thanks primarily to renewed (sometime irrational) enthusiastic about Hungarian small caps.

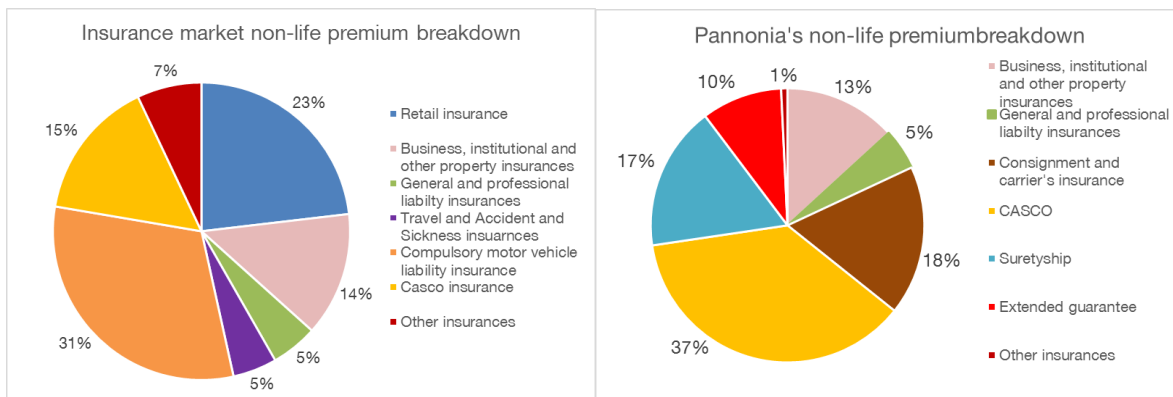
Product focus: Pannonia has been concentrating its growth strategy on market segments where penetration is relatively low and GDP, household savings and business growth provides an opportunity. In the life insurance business Pannonia is focusing on domestic middle class and SMEs, both benefiting from the government’s income policy (including energy price reduction, bail-out of FX loan borrowers and increasing family support) and the growing economy. As for products, Pannonia is increasingly focusing on pension and long term care insurance products (now represent c.60 percent of its new businesses in terms of the number of new policies sold). In the non-life segments, Pannonia changed its business strategy in 2014 abandoning vastly loss-generating compulsory motor vehicle liability insurance line and instead focusing more on niche products like suretyship-and carriers’-related insurances, extended guarantee, group health and accident and CASCO product line with full reinsurance, while intensively developing its cross border activity.

Figure 2 Pannonia’s life product portfolio breakdown vs. the market (1-3Q 2017)



Source: NBH, Pannonia

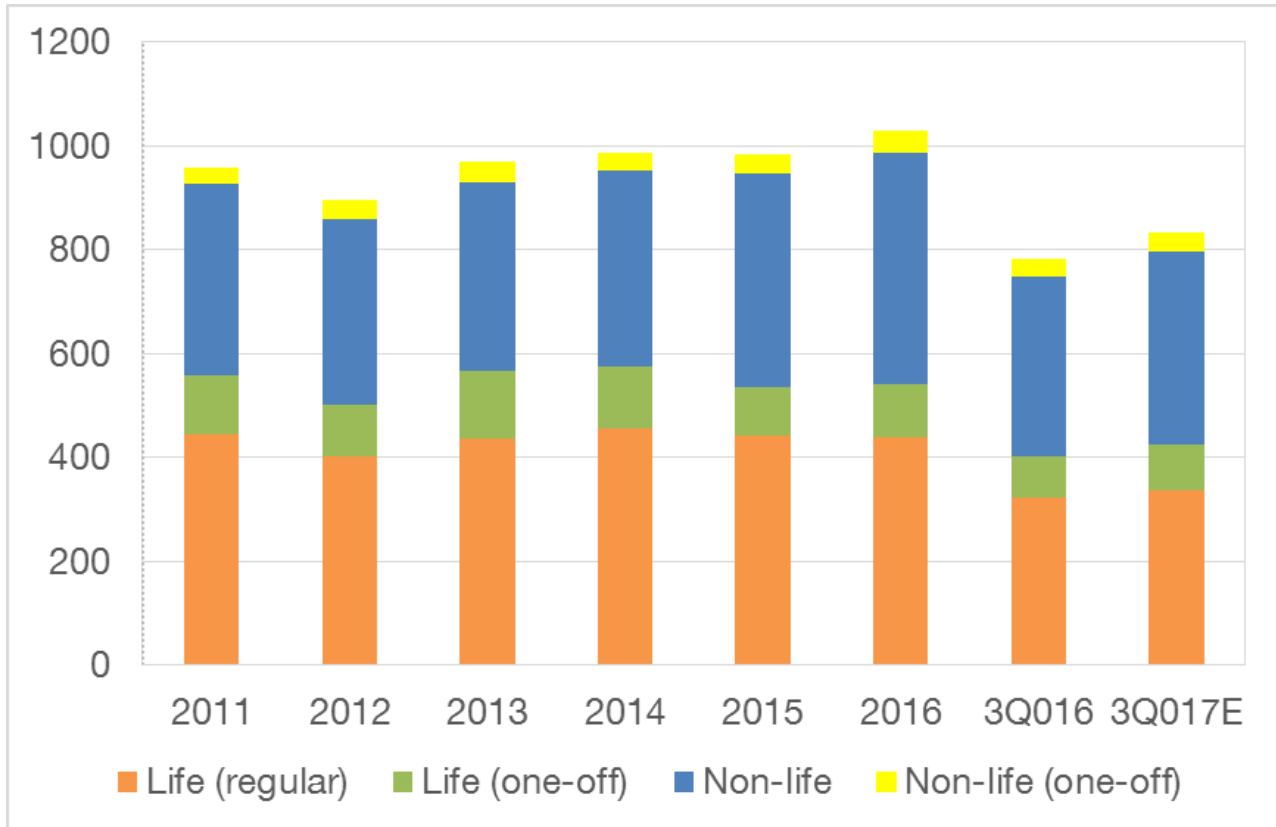
Figure 3 – Pannonia’s non-life product portfolio breakdown vs the market (1-3Q 2017)



Source: NBH, Pannonia

Premium revenue outlook: The Hungarian insurance market has been clearly on the upswing this year on the back of income growth and the government’s policy to stimulate long-term savings by tax credits granted for pension insurances.

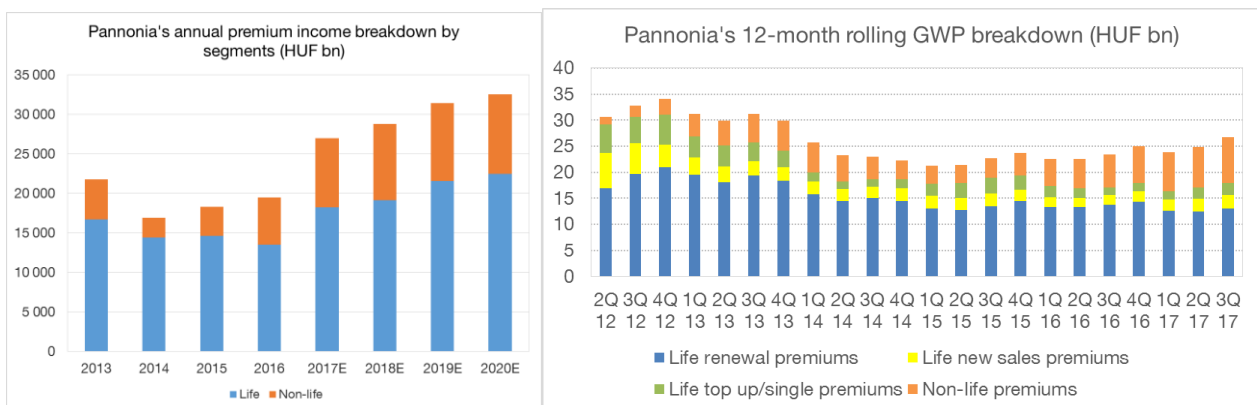
Figure 4 GWP breakdown by insurance segments



Source: MNB

We see the potential for Pannonia to continue reserve accumulation given its meaningful leverage to long term life and care insurance products and cross-selling opportunities offered by its new banking partners. Pannonia’s growth prospects is also supported by recent and future acquisitions directed towards consolidating smaller-sized domestic insurance companies suffering from capital stain and an insufficient business scale. We see Pannonia’s premium 5-year CAGR at a meaningful 3.8 percent buttressed by new business sales in a range of HUF 3-4bn annually.

Figure 5 Pannonia’s premium income developments



Source: Pannonia, Concorde

Macro background: Hungary’s economy is set to step on a route to a faster growth and that is what the insurance industry needs to benefit from. Our baseline forecast assumes the GDP growth rate at close to 4 percent in real terms this year and 3.4 percent in 2018 underpinned by a gradual recovery of the European economy and higher domestic consumption. The policy rate will be kept near zero as long as inflations remains tame and external yield conditions stay supportive. With predictable policy decisions, we expect the government to convincingly put its fiscal house in order, with no packages of austerity measures necessary to keep the public finance budget deficit in the neighborhood of 3 percent. The cabinet believes the surplus in the current account balance will persist and the country’s external debt and public debt will continue to decline from 73.9% in 2016 to 69% in 2020.

Domestic insurance market prospect: Against this macro backdrop, we expect a lukewarm recovery in the Hungarian life insurance market. Certainly, it is difficult to say ex ante how much demand for life insurance products there will be. Hungary is a relatively small but mature and competitive insurance market. There are almost 30 players and foreign ownership is close to 90 percent. Penetration is still fairly low (insurance represents 3.5 percent of GDP) compared to developed EU markets (c.5 percent of GDP), insurance density is hardly more than one tenth of Eurozone's average (2015), while insurance represent c.5 percent of domestic households' financial assets – all of them should support further growth despite being a relatively mature market. Although we have a moderately positive view of the characteristics of the Hungarian life insurance market it is important to recognize that GDP growth is relatively robust and organic market growth has been accelerating, albeit from a low base, mostly on the back of pension and compulsory motor vehicle liability insurances. Nevertheless, insurers' attempts at enhancing their underwriting profitability and asset management fee income is limited amid abysmally low yield environment. All things considered, we expect the life insurance market to grow at a meaningful 2-3 percent in real terms in the forthcoming years (somewhat slower than GDP growth). Growth should increasingly be centered on retirement savings and home insurance products as well as long term care insurances given the yawning protection gap and the need to increase self-care capacity and savings for retirement.

Market consolidation: We expect the domestic insurance sector to be less fragmented in three years, and that Pannonia may become the subject of a takeover attempt, given its reach towards premium retail customers and expertise in niche market segments. We believe Pannonia offers a fetching way to gain access to the consolidating domestic life insurance market though further earnings growth and sustained value creation disclosure is needed to underpin the stock's currently reach valuation.

In our opinion, there might be challenges facing Pannonia in keeping new business margin at the current level due to stiff competition (i.e. in the form of paying higher bonuses to policyholders), while Solvency II regulation seems to require insurance carriers to allocate more capital to cover risks associated with their operation. Consolidation of the insurance market will certainly support margin preservation. Although Pannonia has already taken appropriate measures to counteract the negative impact on its profitability of the changing regulatory environment (which encompasses new rules such as the reduction of the Annual Cost Ratio (ACR) of UL insurance policies from 8-10% to 3-5%; i.e. meaning less chargeable costs on policies; preparation of transparent statements of premiums actually invested in unit-linked insurance products; abolition of the so-called actuarial funding models; applying a higher repurchase value in case of early surrender of policies; a further reduction in agent commissions, an increase in capital requirements, changes in legislation relating to group life insurance, etc.), it is very likely that the relatively expensive traditional unit-linked products will probably lose ground in the future, while pension insurance with tax credits granted, cheaper wealth management services, combined with traditional risk products and ones which are used for achieving sound financial self-care in old ages may be brought forward. Also importantly, fintech solutions and deeper cooperation with commercial banks to promote the cross-selling of insurance products will get a higher priority in the future. We acknowledge that revenue from new pension insurance and long term care products, improving customer relationship management with the policyholders who are granted a premium holiday option, and newly built partnerships (e.g. with commercial banks) to market Pannonia's insurance products and strengthen its position in the domestic insurance market, all should help boost its premium revenue. Overall, we see Pannonia benefiting from overall growth in the market, capitalizing on its niche and competitive product reach.

Acquisition of MKB Insurance Companies: Pannonia purchased 98.97% ownership interest in MKB Life Insurance, while its non-life subsidiary (EMABIT), acquired 98.98% ownership interest in MKB General Insurance from Versicherungskammer Bayern. The contract has come into effect as of 1st January 2017. The total amount of consideration transferred to the seller was HUF 972m while the total fair value of net assets purchased (at the end of September 2017) was HUF 4bn, so the acquisition resulted in a badwill (pre-tax profit) of HUF 3bn. This profit will be reduced by the losses generated by MKB Insurance Companies throughout 2017. Consequently, we expect the net effect of the acquisition should be about HUF 1.4bn on Pannonia's consolidated net income in 2017.

Table 1 Pro-forma equity and reserve data of Pannonia and MKB insurance Companies (HUF m)

	Pannonia	MKB Insurance	Total	Pannonia	MKB Insurance	Total
	2015	2015	2015	2016	2016	2016
Life segment						
Own capital	5 515	1 554	-	6 424	1 021	-
Total technical reserves	57 632	11 269	68 901	63 349	12 711	76 060
- o/w UL reserves	54 894	7 561	62 455	60 317	8 230	68 547
- o/w other reserves	2 738	3 708	6 446	3 032	4 481	7 513
Non-life segment						
Own capital	1 473	1 218	-	1 676	1 589	-
Total reserves	1 313	4 430	5 743	2 092	n.a.	-

Source: Pannonia

Table 2 Pro-forma premium income data of Pannonia and MKB Insurance Companies (HUF m)

	Pannonia	MKB Insurance	Total	Pannonia	MKB Insurance	Total
Premium income	2015	2015	2015	2016	2016	2016
Life segment						
Regular premium	12 608	1 576	14 184	12 216	1 877	14 093
Single premium	2 034	2 504	4 538	1 320	2 168	3 488
Group insurance	165	180	345	187	144	331
Life GWP	14 642	4 080	18 722	13 536	4 045	17 581
Non-life segment						
Compulsory car insurance	40	1 675	1 715	37	2 180	2 217
CASCO	1 380	1 190	2 570	1 857	1 377	3 234
Fire and natural forces	164	2 447	2 611	151	2 619	2 770
General insurance	861	296	1 157	954	377	1 331
Other damage to property	283	62	345	887	137	1 024
Cabotage	433	0	433	1 532	0	1 532
Other	500	5	505	513	21	534
Non-life GWP	3 661	5 675	9 336	5 931	6 711	12 642
Total GWP	18 303	9 755	28 058	19 467	10 756	30 223

Source: Pannonia

Table 3 Pro-forma cost data of Pannonia and MKB Insurance Companies (HUF m)

	Pannonia	MKB	Total	Pannonia	MKB	Total
	2015	Insurance	2015	2016	Insurance	2016
		2015	2015		2016	2016
Life segment						
Admin costs	1 085	585	1 670	1 020	716	1 736
Claims	14	17	31	17	27	44
Other costs	265	134	399	334	134	468
Total life costs	1 364	736	2 100	1 371	877	2 248
Admin costs/GWP	7%	14%	9%	8%	18%	10%
Claims/GWP	0%	0%	0%	0%	1%	0%
Other costs/GWP	2%	3%	2%	2%	3%	3%
Total costs/GWP	9%	18%	11%	10%	22%	13%
Non-life segment						
Admin costs	370	759	1 129	349	1 060	1 409
Claims	86	385	471	95	504	599
Other costs	97	355	452	141	385	526
Total non-life costs	553	1 499	2 052	585	1 949	2 534
Segments total						
Admin costs/GWP	10%	13%	20%	6%	19%	25%
Claims/GWP	2%	7%	8%	2%	9%	11%
Other costs/GWP	3%	6%	8%	2%	7%	9%
Total costs/GWP	15%	26%	36%	10%	34%	45%

Source: Pannonia

MKB insurance generated c. HUF 11bn in GWP in 2016 (+10% YoY), thereof the non-life division accounted for 62% and the life business represented 38%. The insurer had a net loss of c. HUF 650 m in 2016 mostly due to its high operating costs. As a whole, losses and expenses accounted for nearly 34% of total GWP made by MKB Insurance in 2016 compared to Pannonia's total cost ratio of 10%.

Table 4 Pannonia's consolidated after tax profits by segments under HAS (HUF m)

	1-3Q2017	1H2017	1-3Q2016	1H2016	FY2016
Pannonia Life	716	658	818	623	1 065
Pannonia non-life	434	166	121	129	203
MKB Life	-210	-210		-151	-533
MKB non-life	-301	-301		-6	-113
Pannonia Asset Management	157	107	141	104	222
Elimination	-222	-222	-251	-251	-251
Total after-tax profit	574	198	829	605	1 239

Source: Pannonia

We see plenty of room for cost containment measures and product portfolio restructuring in MKB's insurance portfolio after consolidating its operation into Pannonia (Pannonia's insurance products tend to have higher margins than the policies MKB Insurance sells). There is no doubt that Pannonia will thoroughly overhaul MKB Insurance's operation to save costs, just like it has successfully done for its own operation in the past three years, so evidence of cost discipline is certainly here, in our view. We also note that the MKB Insurance acquisition has been made without stretching Pannonia's capital position due to goodwill generated on the deal. Pannonia has already sold MKB Insurance's loss-making and capital-intensive compulsory third-party motor insurance business line at a gain of HUF 300m to reduce losses and ease capital needs (though it has to set aside provisions to the tune of HUF 100m for the expected value of the adjustment due to losses according to the sale and purchase contract with Aegon).

In our view, the acquisition of MKB Insurance Companies clearly provides a significant inorganic growth and (both cost and revenue) synergy potentials for Pannonia in both the life and non-life businesses, whereas the portfolio clean-up costs may turn to be significant this year.

Targeting acquisitions: Pannonia is believed to be seeking further acquisition targets at an affordable price in order to realize economies of scale and extract cross-selling opportunities offered by its new banking

partners. Pannonia may target a 5 to 10 percent market share, and meanwhile constantly growing earnings. If the partnership with Konzum is realized, Pannonia's capital flexibility for sizeable acquisitions may be sufficient to reach its market share goal, in our view.

Table 5 Back-of-the envelope fair price calculation for Pannonia* after partnering with Konzum

No. of shares before capital increase	69 858
No. of new shares	23 466
No. of shares after capital increase	93 324
Own capital before capital increase (HUF m)	8 357
Own capital after capital increase (HUF m)	16 570
BVPS before capital increase (HUF)	120
BVPS after capital increase (HUF)	178
Share price (HUF)	480
Appraisal value per share (HUF)	322
Premium per share (HUF)	158
Fair P/E (x)	11
Implied additional EPS (HUF)	14.4
Implied additional net income (HUF m)	1 340
Assumed net profit margin on new business	7%
Implied GWP (HUF m)	19 150
Implied GWP as a % of total insurance annual GWP	2%
Pannonia's implied new market share	5%
Expected GWP w/o Konzum partnership in 2018E (HUF m)	28 796
Expected net income w/o Konzum partnership in 2018E (HUF m)	1 580
Implied increase in GWP after partnering w/ Konzum	67%
Implied increase in net income after partnering w/ Konzum	85%
Average ROE in the insurance segment	19%
New available funding for acquisitions (HUF m)	4 106
Potential amount of additional net income acquired (HUF m)	780
Profit deficit (HUF m)*	560
Profit deficit per share (HUF)	6
Per share value deficit (HUF)	66
Per share value deficit/premium per share	42%
Assumed fair price after capital increase (HUF)**	414
Assumed 12-month price target after capital increase (HUF)	452

Source: Concorde

Note: * Profit deficit is defined as the difference between the potentially available amount of new net income (assuming industry average ROE of 19% for the acquire company) and the amount of net income implied in the premium at which Pannonia is currently trading compared to our appraisal value estimate

** Assumed fair price is defined as the sum of our appraisal value estimate plus a reasonable premium that may be explained by the synergies arising from potential partnership with Konzum

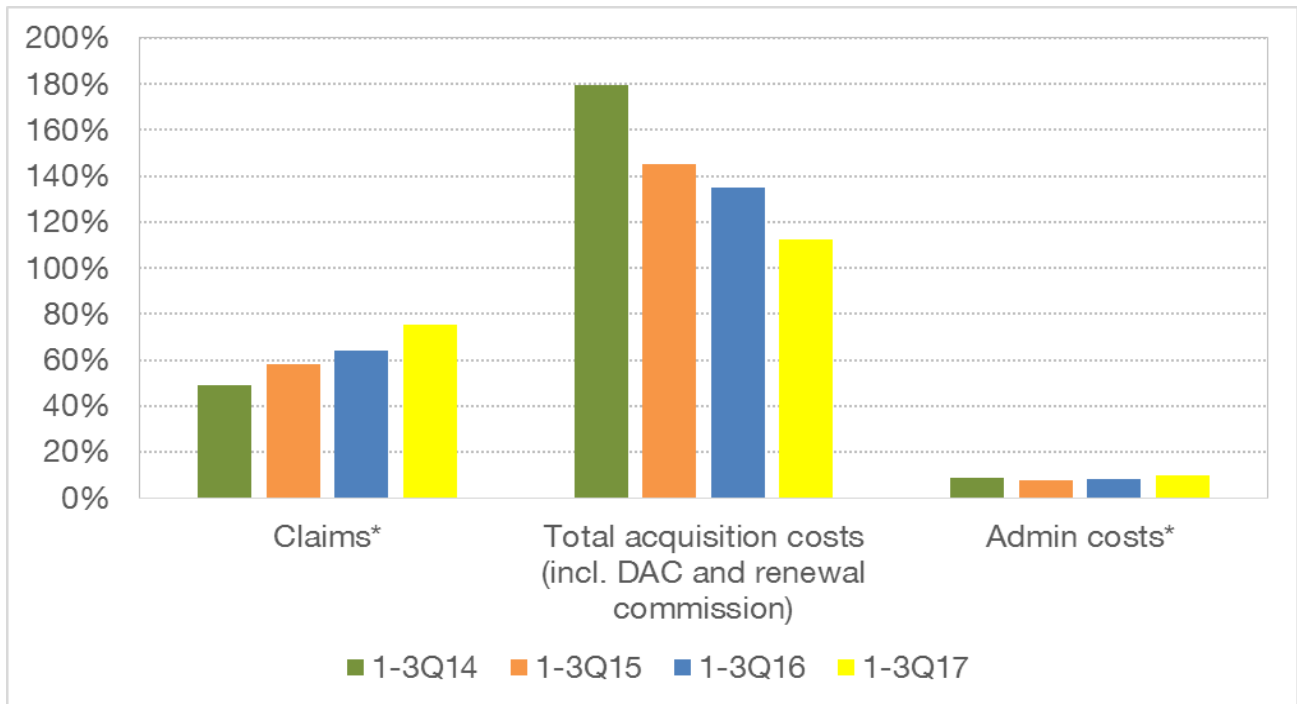
We assume Pannonia will pay a fair price for Konzum shares (HUF 3 000 a share in line with the current share price), thus the implied premium over our the appraisal value estimate might have occurred only because of the discounted value of synergies that can potentially be extracted from the partnership with Konzum. Nevertheless, we are at odds with Pannonia that its capital injection in Konzum in such size would be in line with its solid track records of prudent capital allocation. We reckon regulator should closely scrutinize the potential implication of the Konzum deal for Pannonia's capital position.

Our preliminary conclusion, which is by no means our official fair price estimate, regarding the potential partnership with Konzum is that the intrinsic value of Pannonia shares may even be c. 30 percent higher than our current estimate for the appraisal value (HUF 322 a share) should their partnership agreement and mutual capital increases be implemented successfully. We do stress that our current level of knowledge about the potential deal with Konzum does not allow us to predict whether such a cooperation is sustainable and value creative at all, simply because neither of these companies had had experience to carry out any such large transactions and form of collaboration before. Only when we have a clue about where and at what costs Pannonia intends to invest the surplus equity that it may receive from Konzum and how much synergy can be achieved through their partnership will we really be able to estimate how much profits can additionally be generated on a sustainable basis by partnering with Konzum.

In our opinion, it is not impossible, although it is hardly conceivable at present, that in the foreseeable future Pannonia could benefit from synergies, if any will occur from the partnership with Konzum, in such scale that can be enough to explain today's reach stock valuation. Of course, it can happen that even under the best conditions, our estimate for Pannonia's appraisal value could prove to be too conservative.

Cost efficiency measures: Over the course of the past three years Pannonia has constantly put considerable efforts into streamlining its business with a series of efficiency measures including sweeping cost cuts, unwinding its heavily loss-making foreign and domestic motor vehicle insurance businesses, and thorough overhauling its distribution channels. We believe the full impact of cost efficiency measures implemented in recent years will remain in place to bolster profit growth, even if increased costs associated with consolidating recently acquired MKB Insurance Companies put a drag on profitability this year.

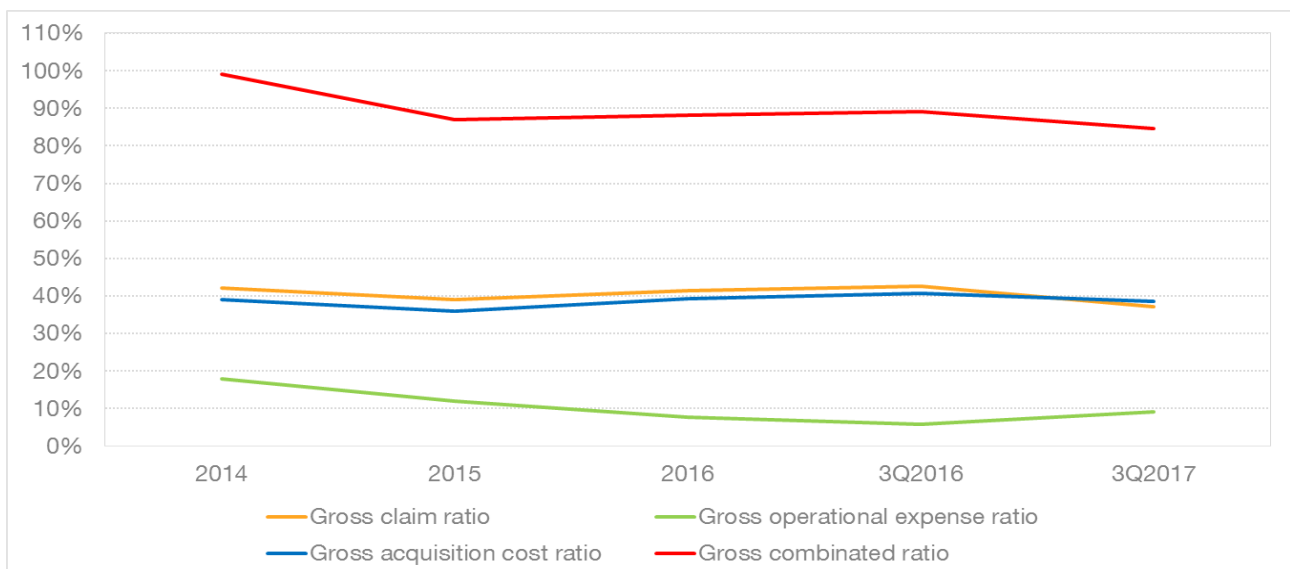
Figure 6 Breakdown of life insurance operating costs as a % of Pannonia's life insurance GWP



Source: Pannonia, Concorde

We also believe cost conscious marketing of new pension insurance and long term care product sales via a sales network (which tends to be more captive and partnered with commercial banks than independent), coupled with rigorous cost control and the reigning management's proven track record in responding to challenges should continue to lending support to keep earnings on an upward trajectory.

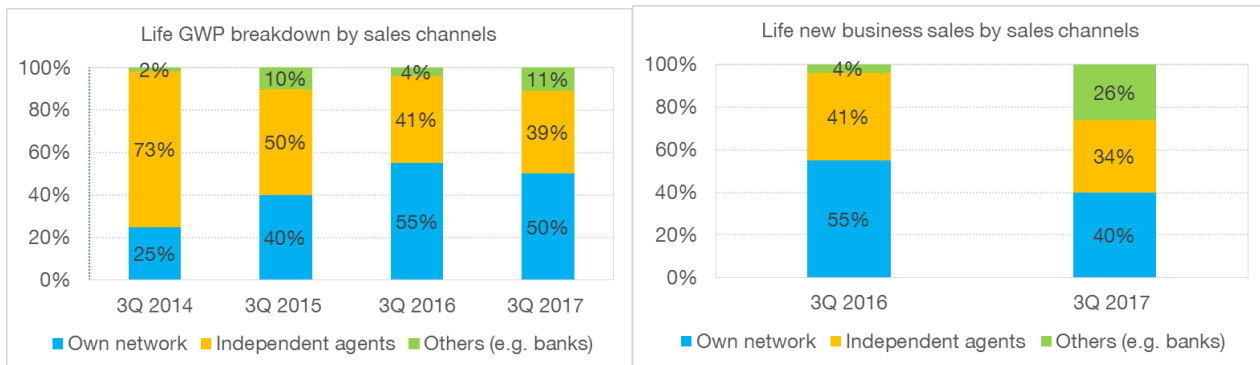
Figure 7 Cost ratios of Pannonia's non-life segment



Source: Pannonia, Concorde

Sales channels: Own sales channel is expected to represent an increasing part of new business sales going forward. The sales activity of the tied agent network has increased by 25% YoY in the first nine months of 2016, which compensated for the decline of 33% in the independent agents' and other networks' sales performance. How well the own network will be utilized will determine the success of Pannonia's strategy in the coming years. Management made a strong statement of the need to manage it, so as to generate higher new sales. Increasingly using bank networks' for cross-selling of insurance products will also be indispensable to reach economies of scale, and thereby upholding profit margins. Pannonia has so far had a natural approach towards commissions (acquisition costs) paid for own agents and other brokers, but stricter regulation, which forces lowering agent commissions, seems to make it inevitable to differentiate commission levels between sales channels in the future.

Figure 8 Premium breakdown by sales channels

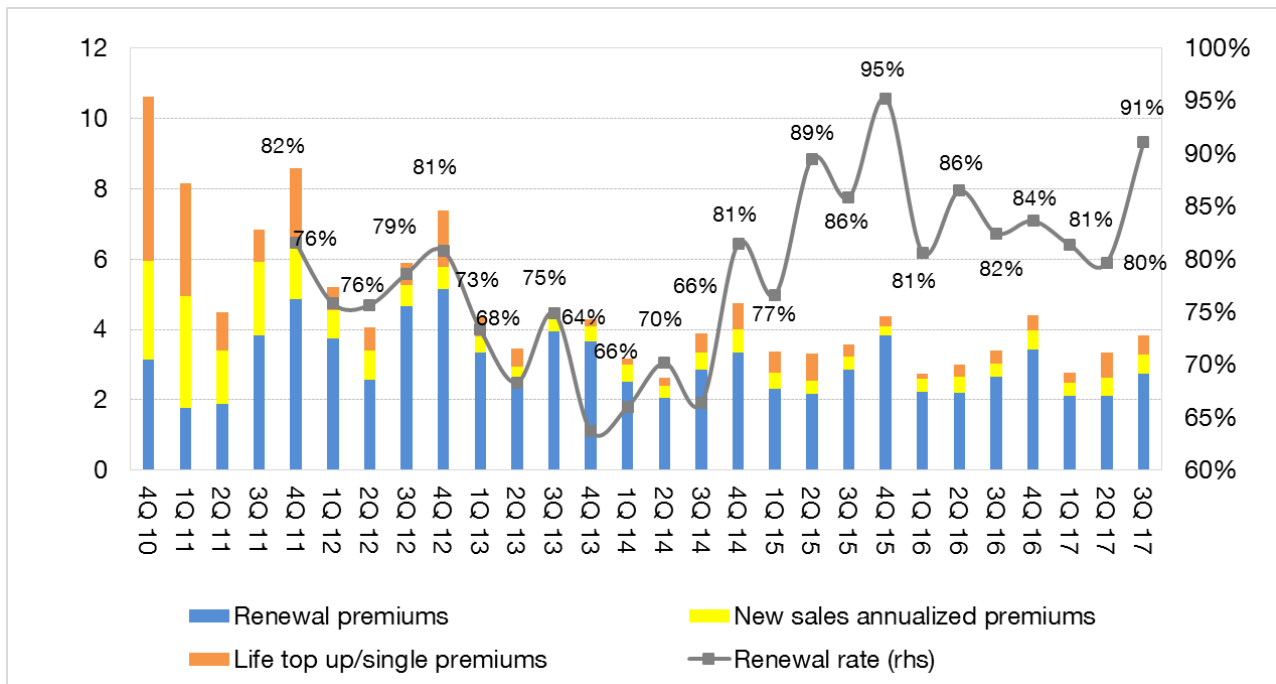


Source: Pannonia

Capital intensive products: Since the capital injection in 2011 capital deployment for Pannonia has been largely defensive as it has primarily focused on scaling back operations and its leverage. Even so, Pannonia's operations are still concentrated in capital intensive, capital market dependent and volatile lines of business including, among others, unit-linked insurances.

With pension insurance products representing an increasing part of new sales, lapse ratios tend to improve. The lapse rate of pension insurance products is estimated at only half the rate of other UL products in two years' time (5-8% vs. 10-15%) thanks to tax allowances that are associated with them.

Figure 9 Pannonia's life insurance renewal rate

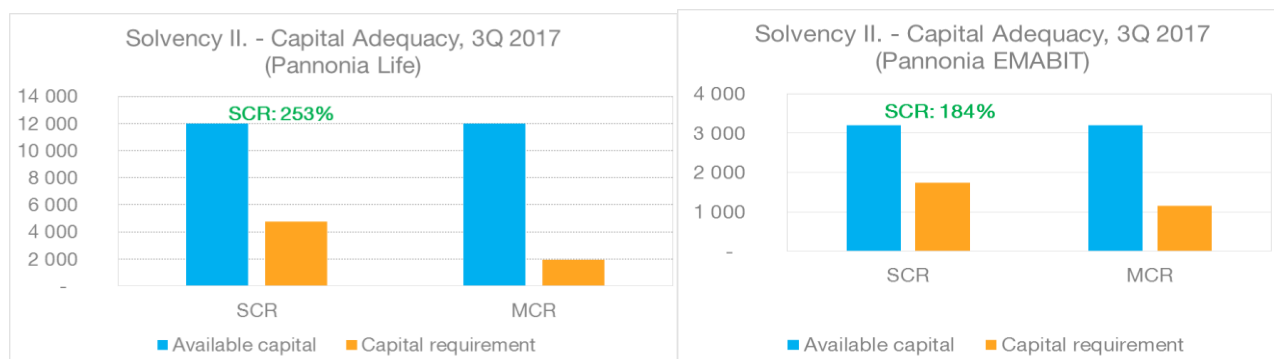


Source: Pannonia, Concorde

Solvency: Pannonia complies with Solvency II capital requirements. We believe Pannonia offers good financial security with respect to its ability to repay policyholder claims and obligations as they fall due. In this regard, potentially higher new business strain and potential acquisitions ahead could lead to higher upfront costs

incurred when selling new businesses and offer relatively higher capital risk. That said, it is very likely that if its solvency capital failed to fulfill Solvency II capital requirements, stakeholders would ask Pannonia to reduce risks related to its operation either by selling assets or by terminating certain businesses or simply sharing risks with better rated reinsurers to ensure compliance with the new capital requirements.

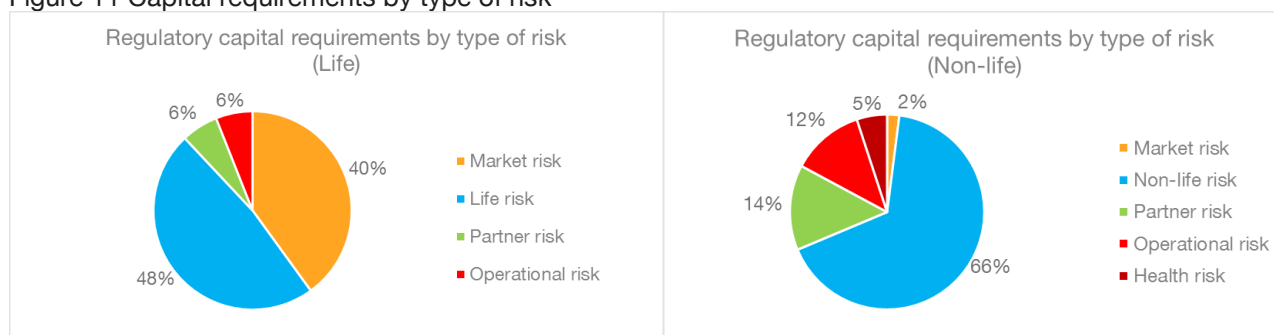
Figure 10 Capital adequacy ratios by segments



Source: Pannonia

Note: Available capital is the sum of the total shareholders' equity and the present value of probability-weighted cash flows arising from the existing insurance policies.

Figure 11 Capital requirements by type of risk



Source: Pannonia

Although we do not incorporate the impact of the potential partnership with Konzum on Pannonia's SCR into our model, a back-of-the-envelope calculation shows that Pannonia's SCR may improve after the transaction:

Table 6 Potential impact of partnership with Konzum on Pannonia's consolidated SCR

	HUF bn
(I.) Konzum's capital injection into Pannonia	8.2
(II.) Pannonia's capital injection into Konzum	4.1
(III. = I. - II.) Increase in Pannonia's net available funds	4.1
(IV. = 44% of II.) Capital requirements on investment in Konzum	1.8
(V. = III./2.22) Capital requirements on further acquisitions*	1.85
(VI. = IV. + V.) Total additional capital requirements	3.65
(VII.) Current available capital	12.0
(VIII. = Current capital requirement	4.7
(IX. = I. + VII.) New available capital	20.2
(X. = VI. + VIII.) New capital requirements	8.35
(XI.) Current consolidated SCR	232%
(XII. = IX./X.) Expected consolidated SCR	242%

Source: Pannonia, Concorde

Note: *Using an industry's average SCR of 222 percent to calculate additional capital requirements in case Pannonia makes further acquisitions at fair prices, meaning that it will buy insurers at the value of their technical reserve.

Reasonable capital management: We now see an opportunity for Pannonia to be more tactical with capital management (acquisitions, reasonable dividend payments) given a gradual improvement in its earnings as a combined result of sweeping cost cuts, acquisitions below book value, divestments, a shift in business mix towards less capital intensive businesses in the non-life segment (resulting in potentially less capital volatility), its broad distribution reach in the highly fragmented Hungarian life insurance market, and its growing asset management capability.

Interest-bearing shares: In 2011, Pannonia issued 1.88 million (HUF- and EUR-denominated) interest-bearing shares in a deal worth HUF 1.41 bn to bolster its beleaguered capital base and enhance its financial capacity to exploit the full potential of its non-life operation. The interest-bearing shares pay fixed annual interests of 7 or 9 percent based on the issue value and according to the currency they have been issued. The interest-bearing shares were exchanged to ordinary shares in November 2017 leading to a capital increase of HUF 232m and a 11 percent increase in outstanding shares. At present, Pannonia has a market value of HUF 34bn (EUR 108m).

Valuation

We carry out the valuation on Pannonia according to two common approaches: comparative valuation and the general actuarial principles used to determine the appraisal value of existing and future businesses. Under the latter method we use the discounted cash flow (DCF) method focusing principally on maximum payable dividends Pannonia would be able to pay to the shareholders from its expected net earnings over time. Over the course of the valuation process, we take into consideration the effect of recent changes in life insurance regulations on profitability, the expected lapse ratios and other factors that can influence the future net earnings as an income or outgo. In particular, asset and liability cash flows are valued using risk discount rates consistent with those applied to similar cash flows in the capital markets. Sensitivity analysis is also part of the examination: we determine how much Pannonia's estimated appraisal value depends on the changes in the value of the various parameters. We use consolidated financial data reported under IFRS for our analysis, but when it makes sense, we also use segmental data reported according to HAS.

Comparative valuation has its own boundaries in respect to Pannonia, considering that most of the European insurers are running mature composite businesses whose size is several times that of Pannonia's. As there seems to be no better choice to find comparable assets, we use PZU and VIG as references for ascribing revenue and earnings multiples for the Pannonia's business, bearing in mind their size differences. PZU is regarded as a counterpart with no business in markets where Pannonia is present, while VIG is a rival company that tries to outdo Pannonia in the Hungarian insurance landscape.

We view Pannonia's current policy portfolio as having significant exposure to long-duration, capital and market-sensitive products such as unit linked products. However, consistent with peers it has moved deliberately to re-price and change the mix of its products towards less capital intensive products. With a gradual diversification towards pension and risk protection insurances, we look for Pannonia's business to trade closer to the industry average.

Pannonia is currently trading at 9.7x on a 2015 P/E basis and 2.8x on a current P/BV basis. This compares to multiples based on last year's earnings and book value of 32.5x and 3.0x, respectively.

On the basis of 2018 P/E ratio and a forecasted ROE of 16.1 percent on average for the next five years Pannonia now appears overvalued, trading at a 58 percent premium over PZU and 77 percent premium over VIG, respectively. Pannonia's relative lofty valuation, even after adjusting for growth potential and efficiency gains, can partly be justified by irrational exuberances around its potential partnership with Konzum. In fact, Pannonia's business is less mature in most of the market segments it is present in versus foreign insurance companies whose operations have larger scales. However, it would probably stand to reason that the huge premium at which Pannonia is presently trading at should ebb as investors will perceive a more meaningful rate of its earnings growth. Evidently, in order for investors to ascribe this high multiple to Pannonia's business, we think Pannonia has to provide greater disclosure about how to develop growth of its businesses on a sustainable basis.

Table 7 Comparative valuation

	Market cap. (EUR th)	Embedded Value (EUR th)	Equity	BVPS	Market cap/EV	P/E	P/BV	Div yield (%)	ROE (%)	Solvency ratio
Pannonia HUN	108.90	52.71	26.61	0.38	2.07x	21.22x	3.35x	2.08	15.88	2.32
VIG AUT	3207.68	6015.00	4501.32	35.17	0.53x	12.02x	0.71x	3.384	5.90	1.95
PZU POL	8917.00	6102.74	3224.29	3.73	1.46x	13.41x	2.70x	4.556	21.24	2.70
UNIQUA AUT	2672.85	5068.00	3107.50	10.06	0.53x	12.81x	0.86x	5.923	3.51	0.86
Anadolu TUR	722.33	-	211.27	0.49	-	14.33x	3.67x	4.43	26.79	3.67
Sigorta TUR	320.66	-	248.50	0.50	-	10.04x	1.39x	2.069	14.58	1.39

Source: Bloomberg, Concorde

The sum-of-the parts valuation approach also seems to be reasonable to be applied for determining the fair value of Pannonia shares, as it better reflects the intrinsic value of insurers' existing and future businesses for both Pannonia's life and non-life segments.

When setting our 12-month price target estimate we have first estimated the combined value of Pannonia's in-force and future businesses (the so called appraisal value) of life insurances based on a DCF model, and then multiplied it by the pro rata value of appropriate required cost of capital to arrive at our 12-month price target.

Our proprietary model indicates a 12-month price target of of HUF 356; implying a 30 percent downside potential from the current share price. Based on dividend payments suggested by Pannonia's dividend policy, we see the potential for investors to earn a total negative return of 28 percent over the course of the next 12 months (which will be the sum of alpha plus cost of capital plus the theoretical dividend yield).

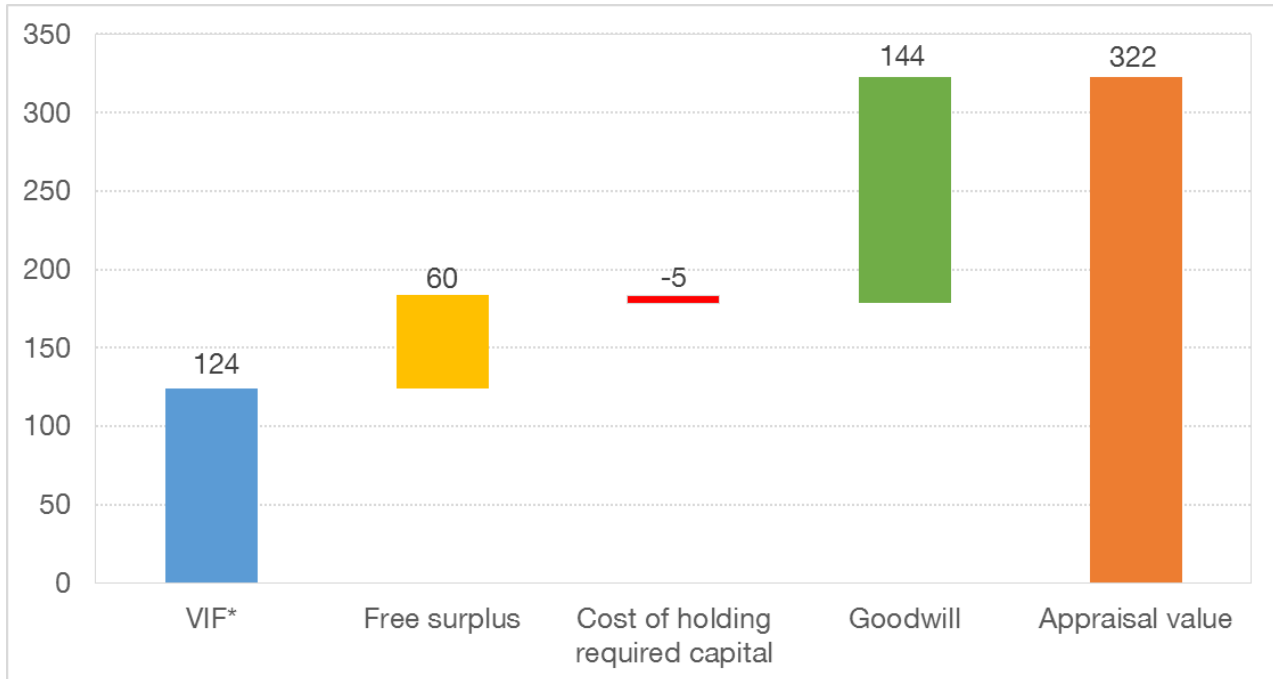
We estimated the embedded value (EV) of Pannonia's existing life business as well (see details in the embedded value section). The life insurance business' EV is an estimate of the economic value of insurance business including for covered business future profits on existing business, but excluding any profits on future new business. It corresponds to the total net of tax statutory profits distributable to the shareholders after allowance for the risks included in the covered business. The life insurance business' EV excludes any value from future new business and is essentially defined as the sum of the value of business in-force (VIF) plus the free capital minus the opportunity costs of holding the required capital (the higher of the targeted SCR or the MCR). The Value of In-Force (VIF) of the life business is determined as the stochastic present value of future profits minus net risk margin (NRM). The NRM allows for the non-financial (i.e. mortality, morbidity, lapse and expense) and operational risks on the basis of the cost of holding risk capital to cover these risks and is presented net of tax. The risk capital is based on Solvency II capital requirements and projected over the life time of the portfolio on the basis of appropriate risk drivers of the risk capital components consistently applied to in-force (and new business).

The value of new life insurance business represents the value generated by new policies sold during a reporting period. New business premiums are defined as premiums arising from new business. New business includes policies where a new contract is signed or underwriting is carried out. The value of premium increases on existing contracts during the period is included in the VIF.

In case of Pannonia's non-life insurance business only shareholders' equity under IFRS is included in EV computation together with the surplus in claims and unearned premium reserves.

Our EV calculations includes numerous assumptions with respect to economic conditions, operating conditions, taxes, and other matters. Although our assumptions used to calculate EV represent estimates which we believe are together reasonable, actual experience in the future may vary from the expected results of our current EV calculation for Pannonia and any such variations may be material since it may not encompass all of the many factors that may bear upon Pannonia's fair equity value.

Figure 12 Appraisal value estimation for Pannonia (HUF per share)*



Source: Concorde

Note: Out of VIF we estimate that the life segment represents HUF 48 a share while non-life business represents HUF 76 a share, respectively.

We computed the opportunity cost of holding the required capital as the difference of the present value of maximum payable future dividends given a certain level of MCR to be held and the present value of maximum payable future dividend given no MCR to be held. Further complicating matters, we felt it fair to link only a portion of future overhead expenses, taxes, regulatory capital etc. to the existing contracts, while the rest of these we considered as outlays associated with potential new businesses.

Insurers typically invest the SCR in low-risk financial instruments (e.g. in gilt-edged securities). Yields on such bonds reduce the cost of holding the SCR (or MCR) and add to the insurers' earnings. Obviously, when the SCR is kept in short term cash deposit at a zero interest rate, the cost of holding the required capital is higher than when the SCR is invested in long-term government securities yielding more, ceteris paribus. We expect Pannonia to invest the SCR in long-term government bonds offering a yield of 2-3 percent annually.

The cost of capital reflects the cost of own capital and reinsurance. We apply the same rate for both (11 percent in HUF terms). We keep the cost of capital unchanged at this level during the run-off period the existing portfolio (until 2028 in our model) because it has to reflect the current yield curve and a reasonable estimate of the risk premium demanded by shareholders, and not the expected interest rate curves and risk premiums in the future. It may also be appropriate to assume that future returns on stocks will not be higher than the cost of capital, which helps to avoid creating unusual appraisal value movements in the future.

We incorporate neither the impact of capital increase by Konzum into our valuation model nor any capital injections in the future.

The stochastic present value of profits generated by the in-force policies and future businesses (goodwill) is discounted using the return expected by shareholders on their investment. We stop our estimation of net earnings in 2028 and then compute a terminal value that reflects the value of Pannonia at that point. We view Pannonia as a (mature) going concern at the time of the terminal value estimation. This method assumes that net earnings of Pannonia may grow at a sustainable rate forever taking into account the expected surrender and mortality rates and dwindling new businesses. This is equivalent as though we predicted a liquidation of Pannonia's assets in the terminal year and estimated what others would pay for the portfolio that Pannonia has accumulated at the point. An alternative approach would be to assume that the portfolio (existing plus potential future businesses) will generate a constant amount in net earnings for another 15 years after the terminal year that can be discounted at the cost of capital (liquidation value = constant net earnings * PV of annuity (15 years @ 11%).

Although we do not expect business termination, we expect Pannonia's premium income to gradually decline from 2024 onwards. Of course, it is key to estimate when and how the transition to stable growth (even if it is

negative) will occur for Pannonia. To this end, we have looked at market growth potential, profit margins, Pannonia’s size relative to the domestic market, its current growth rate and competitive advantages.

Other actuarial assumptions such as mortality and morbidity rates, lapse, paid-up, and annuity take-up rates are included on our best estimate basis. We regularly review these assumptions and adjust them to reflect historical experience and expected trends. Our expense assumptions for the covered businesses are based on Pannonia’s historical cost base and expected trends in expenses. No expenses are excluded as one-off expenses and all the expenses are allocated to the life and non-life operating segments.

We have concluded that Pannonia, as a primarily domestic insurance firm, will see negative growth rate in its net earnings from 2028 and on because of constraints such as those imposed either by competition or a potentially stricter regulatory environment. With a stable negative growth rate, we estimate the terminal value using a perpetual growth model. To make this estimate, we first determine the expected net distributable earnings on insurances and then discount cash flows back to the present, using different discount rates, i.e. we use 150 bps lower the cost of capital to discount cash flows from the existing business back to the present than that we apply for future businesses, as the level of risk attached to cash flows from the existing portfolio is certainly different from what should be applied to uncertain future businesses.

When assuming payable dividends we first estimate how much capital Pannonia may need to have to set aside to meet capital requirements in the future. In our model, when Pannonia makes profits, which is our central assumption, we put any excess capital to its (free) surplus that it can theoretically be used for dividend payments to the shareholders (the free surplus is the NAV in excess of the required capital). This approach demands a method of quantifying the capital that is sufficient to run the business efficiently while also complying with capital requirements. Nonetheless, we do not believe that Pannonia will distribute all of its free surplus as dividends to its shareholders.

The minimum capital requirements are defined as 150% of the solvency ratio for both the life and non-life segments. We assume that Pannonia can maintain an SCR ratio at a level of around 230 percent going forward. We acknowledge that Pannonia’s high SCR is clearly reflects its strong ability to pay policies and contracts, but it also presents an inefficient use of its capital from an economic perspective.

We assume the return on capital will fall below the cost of capital when Pannonia will be well into the stable growth stage. Furthermore, we expect Pannonia to have average risk and market beta at that point.

Table 8 Appraisal value estimate

Cost of capital applied for EV calculations	9%
Cost of capital applied for new businesses	11%
Cost of capital for terminal period	11%
Terminal growth rate	-2%
Value of businesses	8 652
- thereof life business	3 352
- thereof non-life business	5 300
PV(CF from future business net of tax)*	10 046
Free Surplus	4 174
Cost of holding required capital, net of tax**	351
Total appraisal value	22 522
No. of outstanding shares (mn)	69.9
Appraisal value per share (HUF)	322
Price target (12-m)	356
Current share price (HUF)	480
Downside potential to our 12-m price target	26%

Source: Concorde

Note: * Assuming a 100 percent pay-out of net income in excess of the cost of required capital, ** CoE minus the risk free rate

Table 9 Sensitivity analysis to Price Target

	Terminal growth rate				
Cost of capital	356	-5%	-2%	2%	5%
	9%	351	369	415	520
	10%	346	362	398	470
	11%	343	356	386	438
	12%	339	351	376	416
	13%	336	347	368	399

Source: Concorde

We have found that one percent change in the ratio of operating costs per GWP results in a c. 4 percent change in our price target, while applying a 150 percent targeted SCR in line with the regulator’s requirements instead of a 100 percent ratio leads to c. 3 percent reduction in our price target, all else held constant.

The process of valuation of operating income from policies led us to conclude that new business margin (the probability-weighted net present value of net earnings stream that Pannonia is likely to earn on a new 15-year unit linked insurance policy given a certain level of mortality and surrender rates amounts to c. 20 percent of the first annual premium paid.

Asset management. Pannonia has 16% ownership in Pannonia CIG Fund Manager (which is founded by the CIG Pannónia Life Insurance Plc. and it’s strategic partner, the Pannonia Pension Fund) that managed nearly HUF 181bn (EUR 576m) at the end of September, 2017, out of which c. HUF 114bn was related to insurance- and pension fund portfolios, herewith gaining a 8 percent market share in the domestic institutional fund portfolio management market and almost 13 percent in the unit-linked asset management market. The asset management firm’s after tax profit amounted to HUF 487m in 2016 (of which Pannonia’s share was HUF 222m) on revenue of HUF 1.04bn in 2013. The average management fee is thought to be about 0.5% collected on AUM, reflecting that a vast majority of assets that are under its management have come from institutional funds. The asset management company is providing a healthy source of cash to Pannonia which gives us confidence that capital management activity will increasingly be a crucial contributor to earnings generation. We expect income from asset managements to gradually increase and account for about 20-25 percent of profits in the future. When building our proprietary earnings model, we have considered ownership rata earnings coming from Pannonia CIG Fund Manager.

As an alternative approach, we use a short-cut way to arrive at a stand-alone value estimate for Pannonia CIG Fund Manager.

Although asset management has consistently underperformed peers in terms of yield generation over the recent years, it is clearly being viewed more prominently. We apply, as a rules-of-thumb, a multiple of 12 times net income that we think is reasonable to pay for a steadily growing asset manager with a firm position in the fee-based institutional fund market segment. Accordingly, Pannonia’s minority stake should be worth about HUF 0.7bn or c. HUF 10 a share (representing 2 percent of the current share price), implying a price-to-AUM ratio of 3%, which seems in line with the industry’s average multiple. Of course, there are many risks to our valuation, including *inter alia* emerging downward pressure on management fees due to low investment yields, and stricter regulatory requirements with regards to overall insurance operation.

Earnings outlook

We believe that Pannonia has room to grow (at least in earnings) more rapidly in the near future than larger insurance firms in Hungary and the potential growth rate of the overall insurance market thanks to the acquisition of MKB Insurance Companies and its flexibility to adjust or develop strategies to respond to external or internal challenges. We are confident that Pannonia remains on track to achieve efficiency gains through rigorous cost control, sophisticated risk management, unwinding of the loss-making and capital intensive businesses and diversification of its distribution channels.

The fact that Pannonia has preserved its solid capital position despite that its annual life premium has plummeted more than 30 percent since 2012 and it has used a great deal of capital to acquire MKB Insurance Companies, makes us confident that Pannonia has the ability to deliver even more of shareholder value in the future. We believe Pannonia may remain capable of holding capital cushion going forward, hence our conviction about its increasing ability to pay meaningful dividends in the future.

We acknowledge that revenue from new pension insurance and long term care products, niche non-life product lines in suretyship and carriers' insurances, increasing cross-border extended guarantee business towards South European and Baltic countries, as well as strategic partnerships with commercial banks operating national retail branch networks, all should support Pannonia to generate new business sales of c. HUF 3-4bn annually. We conclude that new pension insurance and unit-linked products issued aligned with the concept of ethical life insurance will not necessarily earn a slimmer margin than Pannonia's previous mainstay unit-linked products. We also note that unit-linked life insurance policies issued between 2010 and 2012 will start lapse in en masse in 2022, resulting in a huge increase in claims and simultaneous drop in reserves.

We anticipate that consolidated net earnings will reach HUF 2.6bn in 2017 under IFRS including the one-off impact of c. HUF 1.3bn arising from the consolidation of MKB Insurance Companies. We look for underlying EPS of HUF 21.4 in 2017). We expect Pannonia's net income to come in at HUF 1.6bn in 2018 and HUF 1.8bn in 2019, implying an EPS of HUF 22.6 for 2018 and HUF 25.2, respectively). We also expect Pannonia to generate net profit of c. HUF 2.4bn by 2022, implying a 5-year EPS GAGR of c.10 percent by 2022.

Effective corporate tax rate may average around 6 percent in the coming years because of a loss carryforward presumably providing tax shield by 2023 in both the life and non-life segments.

As long as there is low clarity on how Pannonia's collaboration with Konzum Investment and Asset Management, a Hungarian investment holding company (Konzum) will look like in the future and uncertainty as to whether their strategic partnership is created at all, we do not incorporate any results from their potential cooperation into our earnings model. Our earnings model does not include any further merge or acquisitions.

As for the downside risk to our baseline outlook, Pannonia's profitability is likely to be further challenged by the abysmal low yield environment and volatile capital markets. Investments in fixed income securities, by far the main asset class in insurers' portfolio, may result in only lackluster yields while being exposed to plenty of risks. Maturing bonds and premiums can only be (re)invested at lower yields, bringing down the average return on bond portfolios. Even if interest rates will start to take off from their low levels, the results that Pannonia may earn on its bond investments may remain flat or negative. Other asset classes, e.g. equity, may offer better returns and a hedge against inflation, but at the expense of elevated volatility.

There are also some upside risks to our earnings estimate as well. We are genuinely thrilled that the growing Hungarian economy and some positive regulatory developments (e.g. tax allowances on pension savings products) might give the Hungarian life insurance market a slight nudge in the direction it is meant to take. Monetary policy is clearly stimulative boosting business confidence and spending. The housing market could continue to be encouraging, given pent-up demand, descending mortgage rates, thereby coming in handy for the non-life businesses. It is also noteworthy that expropriation of private pension savings in 2011 has made individuals feel the need to consider more seriously the life annuity component of their financial coverage for old age to be secured by retirement savings forms (e.g. voluntary pension funds or pension savings insurances). We are confident that Pannonia can continue offering a more holistic product suite and capitalizing on the opportunities ahead and in niche market segments.

Table 10 P&L of Pannonia's life insurance business under HAS (HUF m, if not otherwise sated)

	2016	2017F	2018F	2019F	2020F
Gross written premium	13 535	18 236	19 116	20 578	20 463
Changes in reserves	5 718	8 116	7 954	9 539	9 481
Claims	7 949	8 384	8 884	9 333	9 742
DAC	-68	0	0	0	0
Investment results	3738	2292	1884	2468	2847
Commission	2 176	2 468	2 336	2 205	2 097
Reinsurance costs	74	92	69	60	54
Operating costs	1 020	1 227	1 294	1 371	1 360
Other operating results, net	682	529	613	658	681
Technical results	949	770	1 076	1 196	1 257
Other items, net	146	214	217	220	224
Pre-tax profit	1 095	985	1 294	1 417	1 481
Tax	-30	-64	-84	-92	-96
After-tax profit	1 065	921	1 209	1 325	1 385
Approved interests on interest-bearing shares	120	120	0	0	0
Net earnings	945	801	1 209	1 325	1 385
GWP growth (%)	-7.6	34.7	4.8	7.6	-0.6
Net earnings growth (%)	118.3	-15.3	51.1	9.5	4.5
Loss ratio*	58.7	46.0	46.5	45.4	47.6
Overhead cost ratio*	7.5	6.7	6.8	6.7	6.6

Source: Pannonia, Concorde

Note: as a % of GWP

Table 11 P&L of Pannonia's non-life insurance business under HAS (HUF m, if not otherwise sated)

	2016	2017F	2018F	2019F	2020F
Gross written premium	5 934	8 760	9 680	10 454	11 238
Reinsurance	3 213	5 957	6 582	7 109	7 642
Ch. in UP reserves, net of reinsurance	-586	130	294	248	251
Net earned premium	2 135	2 933	3 392	3 593	3 847
Claims net of reinsurance	463	440	535	578	621
Changes in reserves	-12	0	0	0	0
Acquisition costs	1 787	2 638	2 915	3 148	3 384
Admin costs	349	639	678	732	787
Insurance tax	157	307	826	784	843
Commission from reinsurers	802	1 752	1 936	2 091	2 248
Technical results	193	661	375	442	460
Other income, net	19	-80	20	21	22
Pre-tax profit	212	581	395	463	482
Tax	9	38	26	30	31
After-tax profit	203	543	369	433	451
GWP growth (%)	62.1	47.6	10.5	8.0	7.5
Net earnings growth (%)	48.5	242.3	-43.3	18.1	4.0
Loss ratio, net of insurance*	21.7	15.0	15.8	16.1	16.1
Overhead cost ratio*	5.9	7.3	7.0	7.0	7.0

Source: Pannonia, Concorde

Note: as a % of GWP

Table 12 Key assumptions for non-life business

Product	Claim ratio (%)
Compulsory thrid-party motor insurance	71.6
CASCO	69.3
Property and liability	37.3
Extended guarantee	157.7
Suretyship	1.2
Freight	9.9
Carrier's liability	62.1
Carrier's service provider liability	1.3
Accident	68.4
Polish extended guarantee	1.5
Product	Cost ratio
Compulsory third-party motor insurance	13.1
CASCO	29.5
Property and liability	32.9
Extended guarantee	10.7
Suretyship	54.7
Freight	48.7
Carrier's liability	37.8
Carrier's service provider liability	68.4
Accident	27.7
Polish extended guarantee	97.2
Insurance tax	7.5
Reinsurance rate on CASCO	100
Average reinsurance rate*	68
Commission from resinsurance*	30
Acquisition cost	18

Source: Pannonia, Concorde

Note: Based on reinsurance part of premium

Table 13 Highlights of Pannonia's IFRS consolidated statements (HUF m, if not otherwise sated)

	2016	2017F	2018F	2019F	2020F
Gross Written Premium	18 941	26 996	28 796	31 032	31 702
Unit linked reserves	58 918	76 216	83 919	93 157	102 369
Other reserves	7 281	16 341	16 886	17 434	17 955
Total reserves	66 199	92 557	100 805	110 592	120 323
Own capital	3 972	8 860	10 018	11 330	12 698
Interest-bearing convertible liabilities	2 460	0	0	0	0
Total capital	6 432	8 860	10 018	11 330	12 698
Debt and reinsurance	1 270	1 270	1 270	1 270	1 270
Other liabilities	3 494	3 921	4 323	4 805	5 284
Total liabilities	77 395	106 607	116 416	127 996	139 575
After tax profit	724	2 644	1 578	1 758	1 835
EPS (HUF)	11.7	42.1	22.6	25.2	26.3
DPS (HUF)	0.0	11.1	11.3	12.6	13.1
BVPS (HUF)	103.6	141.2	143.4	162.3	181.8
ROE (%)	12.1	34.4	15.9	16.5	15.3

Source: Pannonia, Concorde

Dividend: Pannonia plans to pay dividend of HUF 10 per share after the business year 2017, in case the conditions of the payment of dividends apply. Thereafter Pannonia wishes to pay a maximum of 50% of the after-tax profit available for the payment of dividends of the current year to its shareholders. Pannonia can pay dividends in the future not only from its annual net profit, but also from retained earnings to the tune of the amount of surplus equity. However, it should be indifferent for investors when Pannonia pays dividend as long as it can reinvest its earnings at the required rate of return.

If Pannonia's EGM, to be held next January, approves the issuing of 23,466,020 ordinary shares at a price of HUF 350 per each share in the framework of a private placement on a share capital increase of HUF 8.2bn paid fully by Konzum, Pannonia will have to pay dividends for the newly issued shares as well. That would

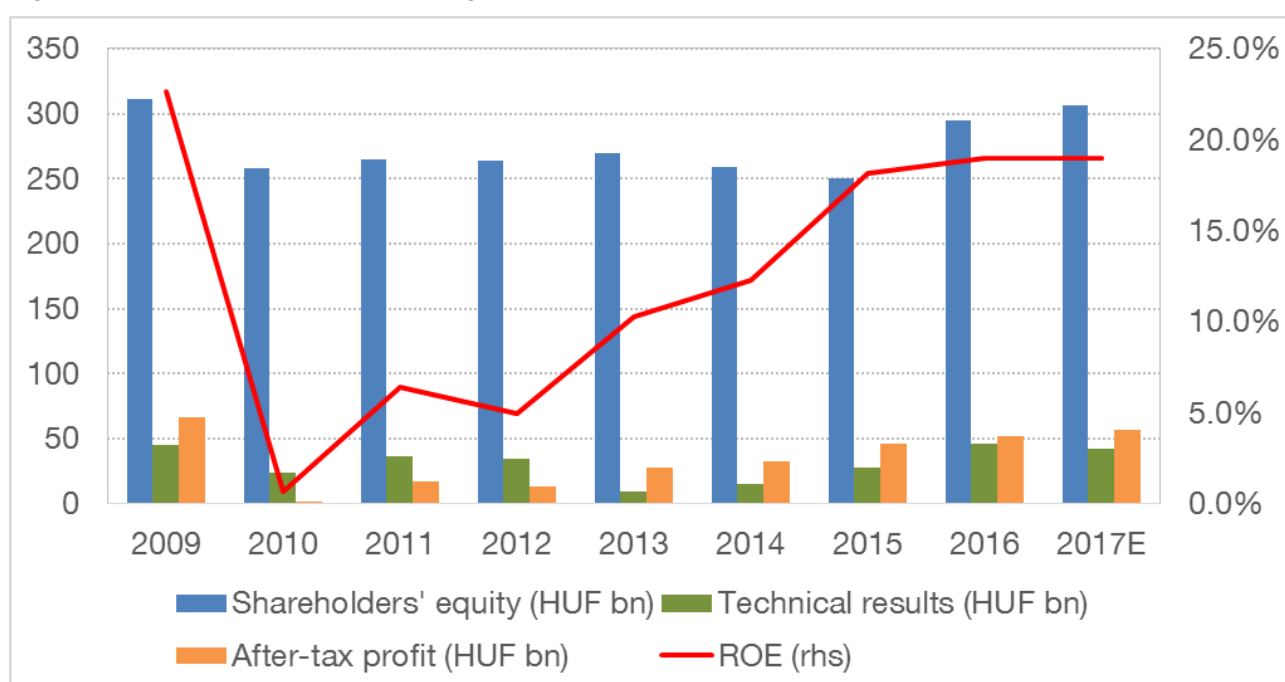
entail dividend payments in a total value of HUF 933m for 2017 for which the amount of retained earnings under HAS may not be sufficient, on our estimate, unless Pannonia creates additional earnings reserves by e.g. releasing provisions created for loss-making businesses in the past.

Theoretically, Pannonia could pay out all its free surplus (i.e. the accumulated amount of profit in excess of the amount of solvency capital required by regulator) as dividend to its shareholders. However, it is extremely unlikely that this might happen, and there is no guarantee that Pannonia would pay as much dividend in the future as it could.

Overview of the domestic insurance sector

The Hungarian insurance industry’s ROE of 19% is considered to be still reasonably healthy (before the crisis it was well over 20%, but in 2010 it was practically ruined as a combined result of the newly imposed extra tax burden on non-life insurance, higher claims in the non-life industry and other factors). The aggregated amount of net profit of the insurance sector is expected to rise 10 percent to HUF 57 bn in 2017; however, the technical results may drop 8 percent due to provisioning.

Figure 13 Profit breakdown of the Hungarian insurance sector

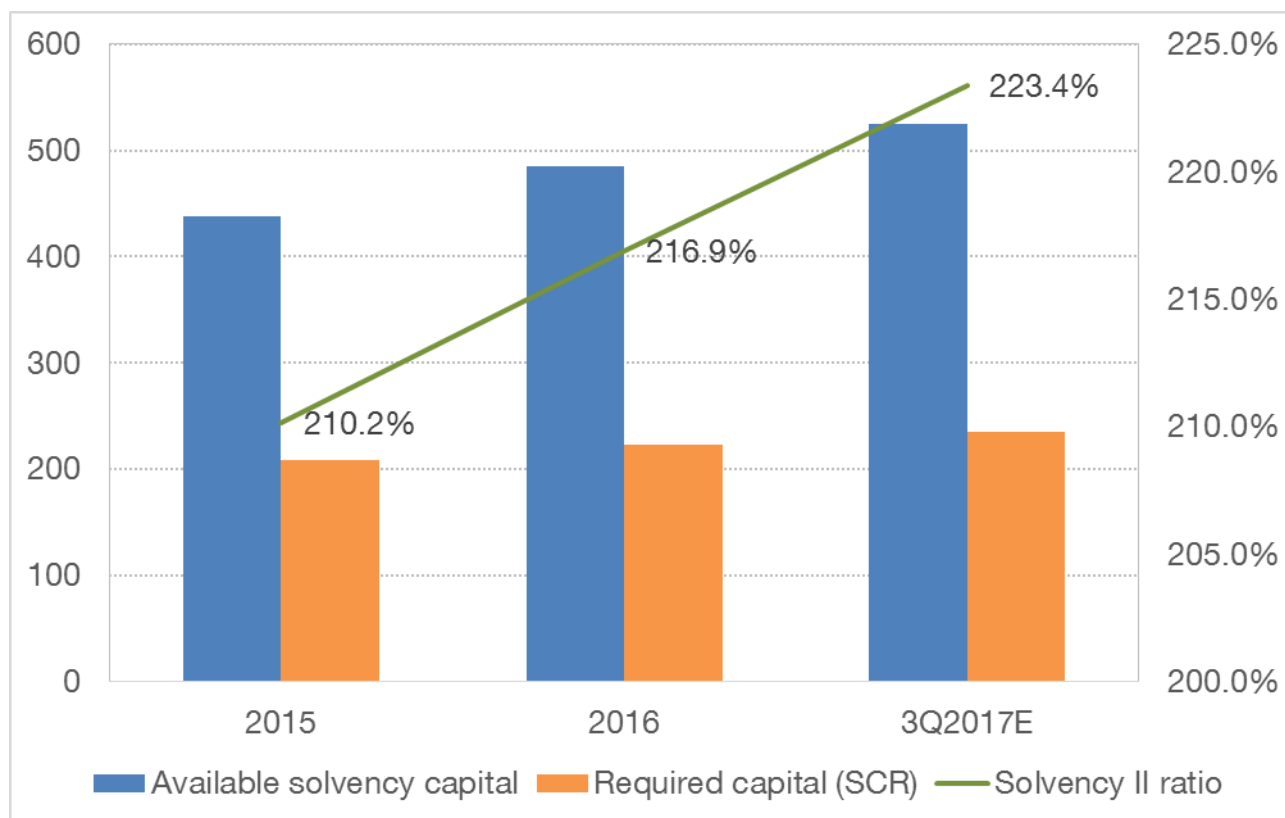


Source: NBH, Concorde

In 2017 Q3, the sector-level CAR, calculated according to the Solvency II regulatory framework, stood at 223.4%, reflecting a slight drop of 1 pp relative to the previous quarter, but a significant increase of 8.1 pp relative to 2016 Q3. The CAR significantly exceeded the requirements of 100 percent prescribed by law and the prudentially required 150 percent under the regulator’s statutory provision recommendation. Nearly 70 percent of insurance companies (17 institutions) had their solvency margin ratio, calculated from eligible own funds and the solvency capital requirement, above 200 percent.

With this high level of the capital adequacy ratio, stability of the sector is high and seems sufficient to be compliant with regulations even after Solvency II has been adopted. At the same time, the relatively high capital adequacy ratio points out insurers’ reluctance to take risks even in the current economic climate, while shareholders seem willing to accept an inefficient use of capital (partly because at the regulator’s request).

Figure 14 Capital adequacy of the Hungarian insurance sector according to Solvency II



Source: NBH, Concorde

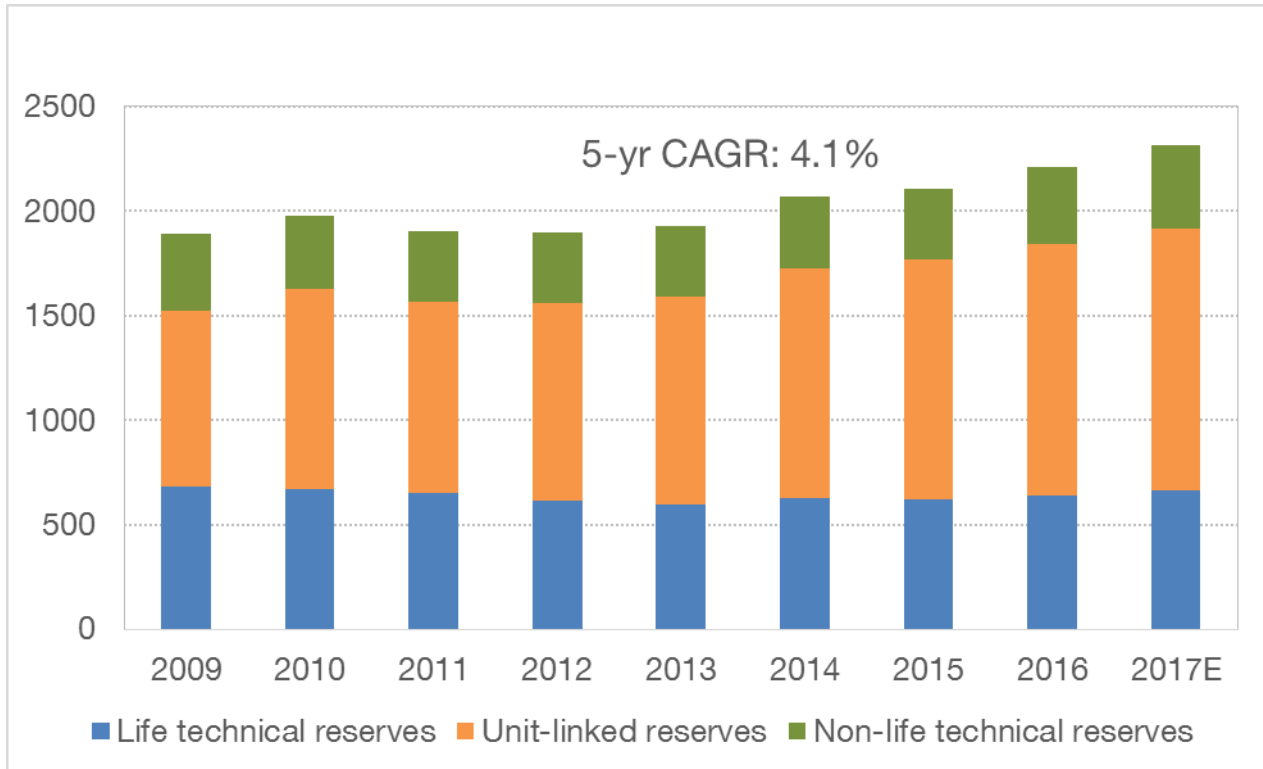
Hungarian insurers' third-quarter revenue from premiums rose 7 percent YoY to HUF 225bn. Revenue from premiums on life insurance policies rose 7.3 percent to HUF 110bn. Revenue from non-life insurance premiums increased 6.8 percent to HUF 116bn. The number of insurance contracts rose by 3.8 percent in Q3 YoY to 13.31 m. There were 2.38m life insurance contracts, up 0.5 percent, and 10.93 m non-life contracts after a 4.5 percent rise at the end of September.

In the first nine months of the year, revenue from premiums reached HUF 711bn, up by 6.4 percent YoY. Nonetheless, average insurance premiums are still far below the premium level of neighboring countries. Growth in regular life insurance premiums clearly resulted from pension insurances that are supported by state tax allowance, which saw the number of contracts rising 34 percent alone. And so, although the market continues to show signs of stability, there is scope for considerable growth.

Although a low interest rate environment presents challenge to life insurance companies, revenue from premiums on life insurance policies rose 4.4 percent to HUF 338bn. Life insurance accounted for 48 percent of the industry's gross written premium in 2017. The life segment has remained highly fragmented, with the 10 leading insurers accounting for over 85 percent of the segment's gross written premium in the first nine months of 2017.

Meanwhile, revenue from traditional insurance policies was up 8.2 percent at HUF 373bn. Current economic trends are more beneficial for the development of non-life insurances - written premiums and penetration are increasing. Revenue expansion in non-life insurance can primarily be attributed to the fact that after a long period of time, the fierce premium competition in the field of compulsory third party liability motor insurance did not continue. This in turn has caused the written premiums of this line of business to increase by 16 percent to HUF 107bn in the first three quarters of 2017.

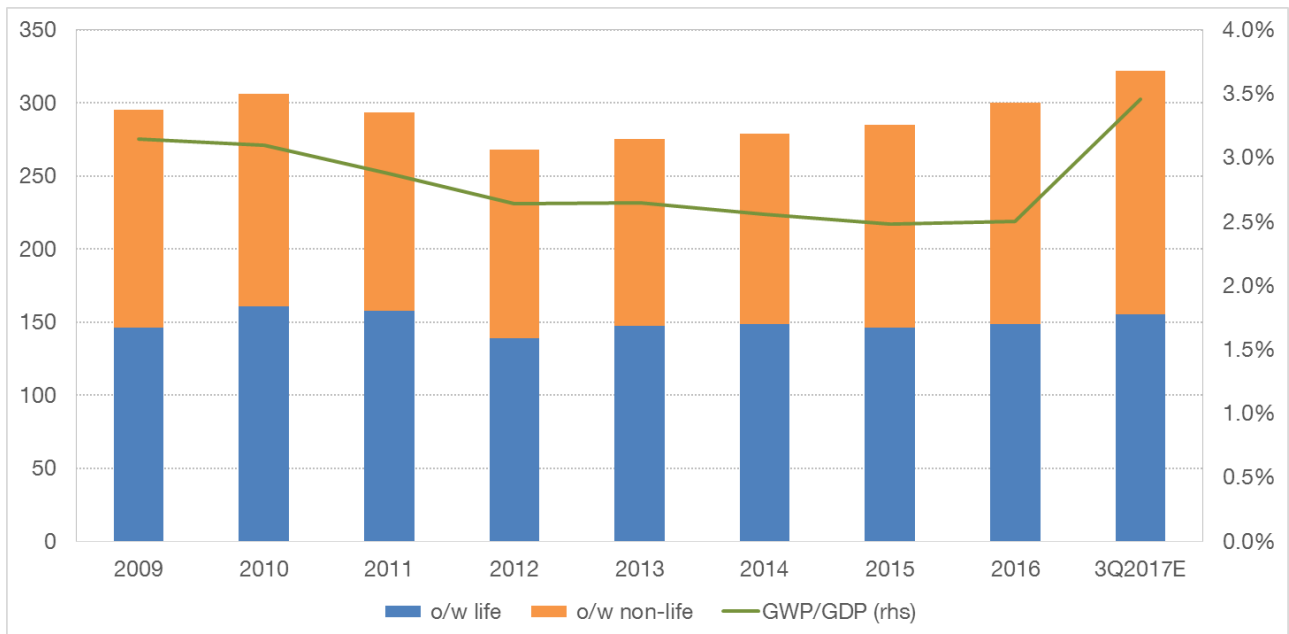
Figure 15 Insurance reserves (HUF bn)



Source: NBH

As evidence shows, insurance penetration depends on economic development, i.e. on the progress in the economy. The Hungarian insurance market seems adequately insured in international comparison with a penetration rate of 3.5 percent (total regular gross written premium/nominal GDP) remaining unchanged YoY, which is by far the highest ratio in a decade. Per capita annual premiums

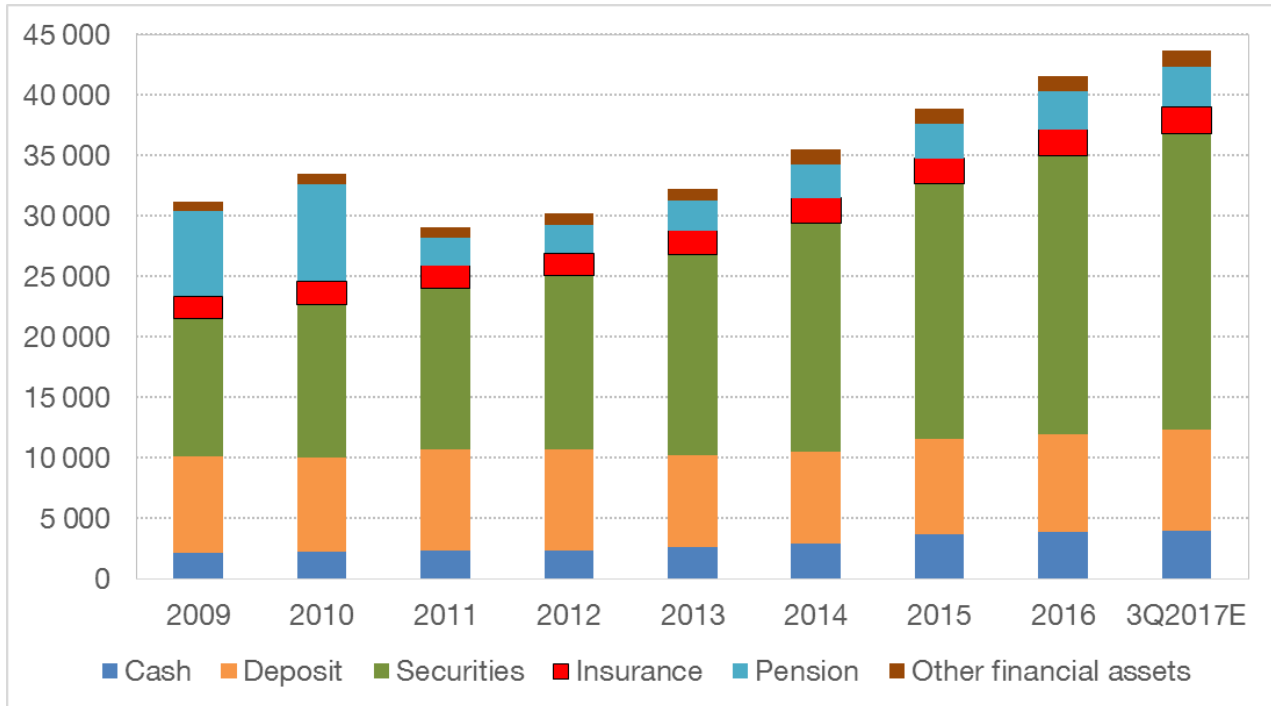
Figure 16 Per capita insurance premium per GDP (EUR)



Source: NHB

Within households' total savings insurance premium represents a stable c. 5 percent for years.

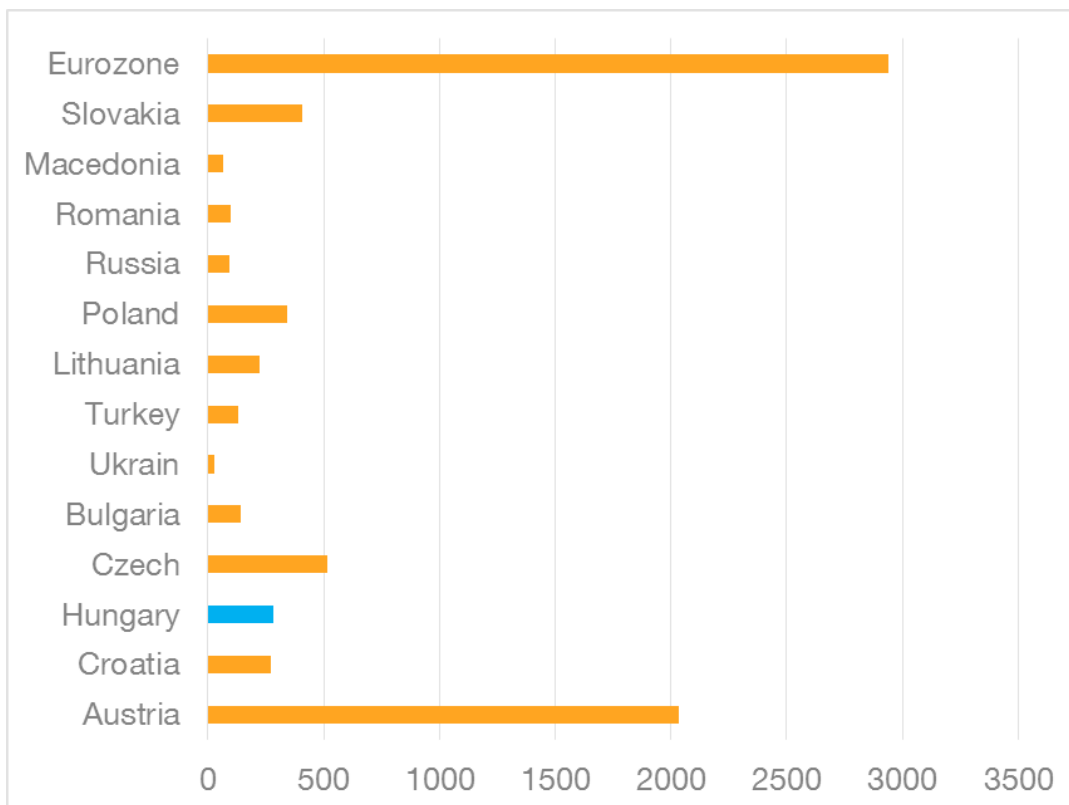
Figure 17 Households' savings structure (HUF bn)



Source: NBH

However, evidence suggests that premiums do not patently depend on short term economic conditions but generally follow long term economic growth, while the growth rate of penetration (beyond a point) is decreasing as GDP grows. During the past year the rate of growth in premium volume has accelerated in Hungary, but it is premature to predict the beginning of a new era of sustainably faster premium growth. Per capita annual insurance premium represented EUR 270 (life: EUR 146 and non-life: EUR 124) in 2015 ó, only 14 percent of the European average.

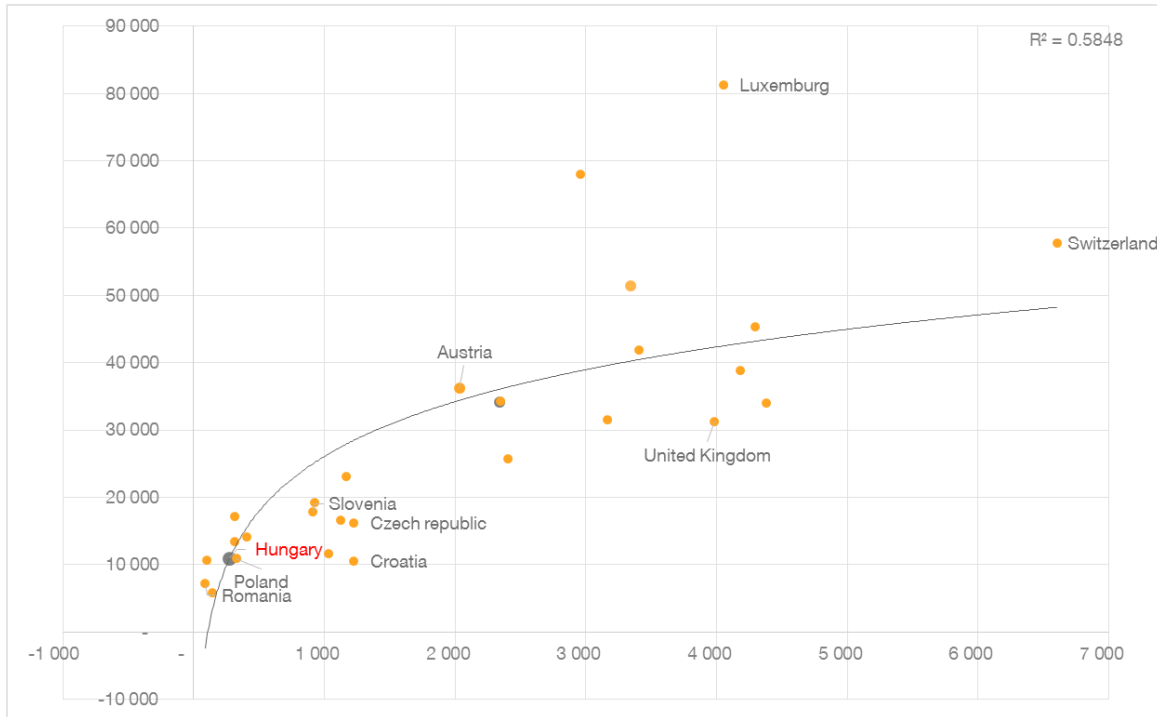
Figure 18 Per capita annual premiums in 2015 in Europe (insurance density)



Source: European insurance companies, Concorde

As a matter of fact, poor countries (in terms of per capita GDP) hardly spend money on insurance, while it is also evident that wealthy countries do not increase the ratio of insurance as a percentage of GDP beyond a certain level.

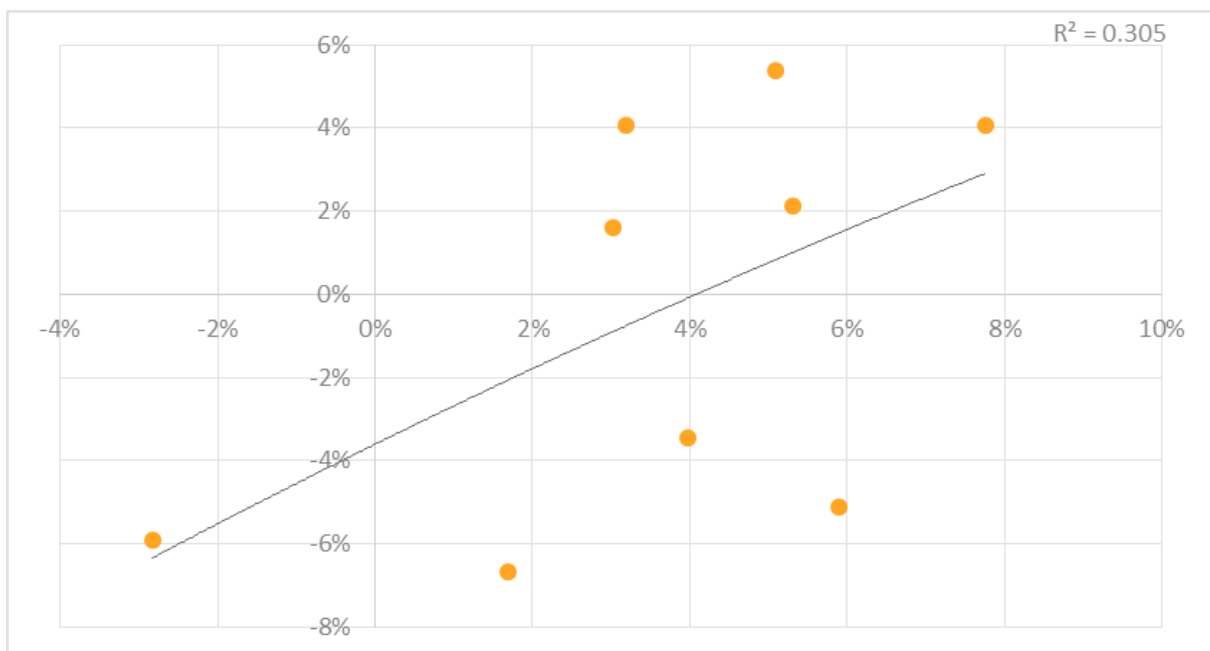
Figure 19 Correlation between GDP and premium revenue (logistic)



Source: Concorde

The regression line below shows an upward sloping relationship between GDP and premium growth rates in Hungary (Figure 20). Having said that, the R-squared of the regression analysis between the two variables is 0.305, meaning that a change in the growth rate explains is hardly more than 30 percent of the change in the premium growth rate. This is equivalent to saying that these two variables are dependent on one another at a lower level than the flick of a coin. This does not really mean that GDP and premium growth are randomly associated. The 0.6 correlation coefficient indicates a positive correlation between these two variables, suggesting that the faster the GDP growth, the better the chance that the insurance market can reap the benefits of economic development.

Figure 20 Correlation between GDP growth and insurance premium growth (2008-2016)

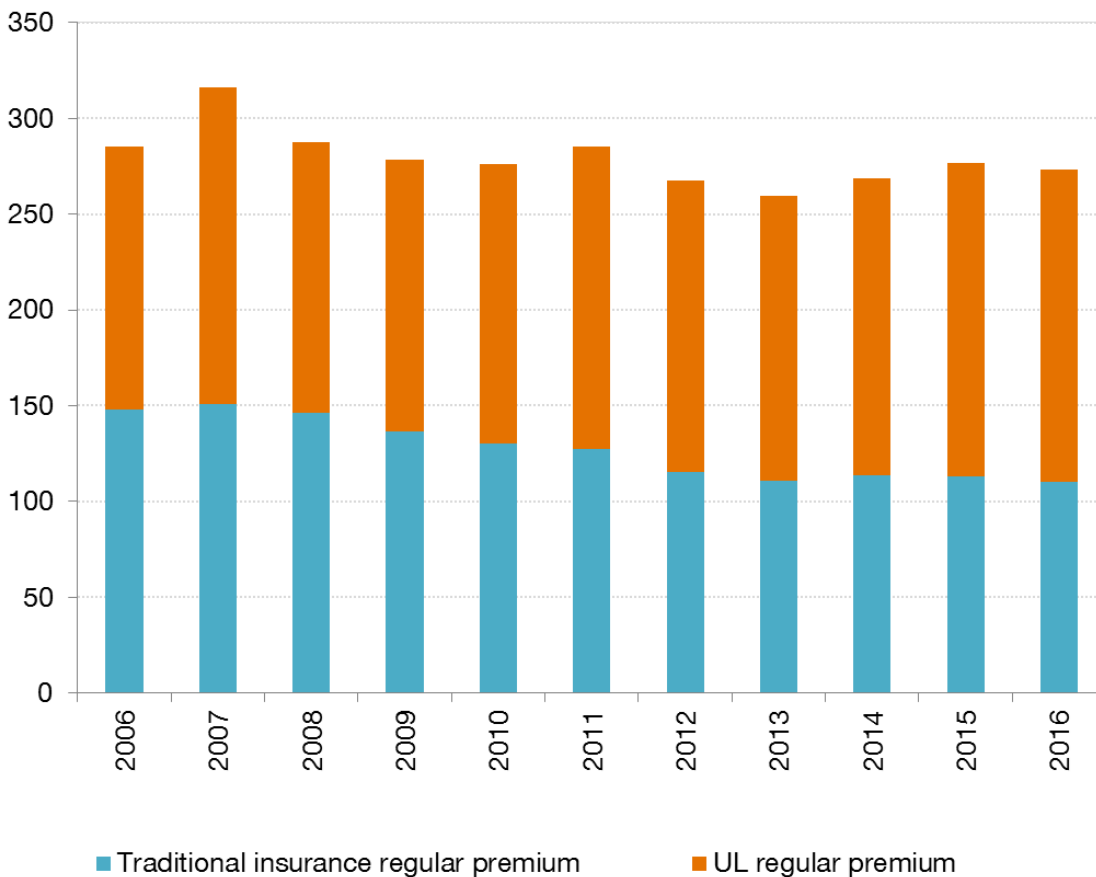


Source: Concorde

It is the significance of this correlation that is not very strong, as shown by an R-squared of far less than 0.5. In less technical terms, this suggests that GDP growth does not give a particular clue about where the insurance market will head for. It simply reflects a loose relationship and may or may not help to predict market developments. For example, in the second half of 2011, there was a negative correlation between the two variables when the early repayment of some FX loans triggered extensive withdrawals from insurance contracts, whereby a negative premium growth rate ensued despite a positive GDP growth rate at the time (noting that early repayments of FX loans is believed to ultimately trigger a 0.8 percent drop in real GDP later). If GDP and premium growth data are such that we cannot glean any reassuring statistical conclusions from it, then the idea that GDP growth promotes, by all means, premium growth should be approached with caution, and the positive correlation we observe is more a result of the outcomes that can occur with too small a sample size and not from characteristics on how the insurance market operates.

There are considerable differences between the structures of European and Hungarian life insurance markets. In the EU traditional life insurance products represent c.60 percent of total life insurance premium, whereas unit-linked products make up 30-35 percent. In Hungary, the opposite is true: unit-linked products dominates life insurance markets, representing more than 60 percent of total premium income of the life insurance segment, let alone insurance density - annual premium from unit-linked products are two times higher than that from traditional ones.

Figure 21 Traditional life insurance and UL life insurance regular premiums

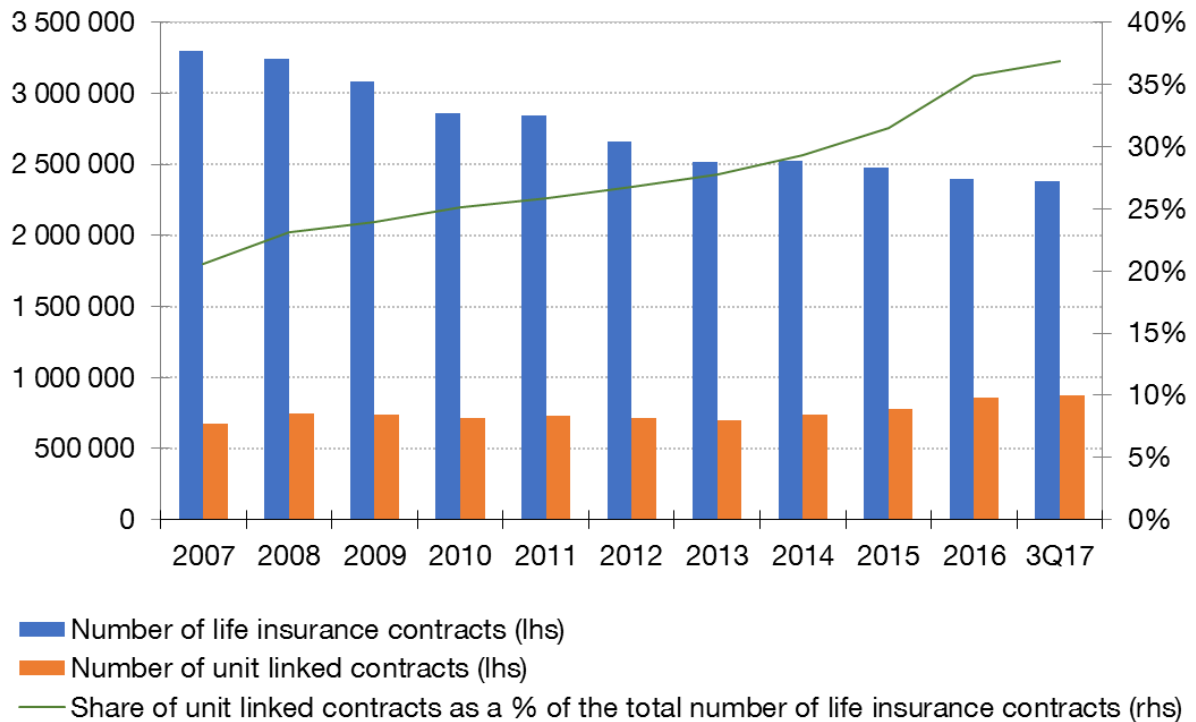


Source: NBH

Penetration of unit-linked type insurance products (including pension insurance policies) has started recovering after the government has granted tax allowances to pension insurances and real disposable income growth has accelerated considerably. Moreover, competitive advantages of the unit-linked products had previously been boosted by their exemption from interest tax granted on long-term investment structures. In the meantime, demand for traditional insurances has declined. Although these products offer more

protection against risks and contain a guarantee element, they are considered often as short-term liquid investment products wrapped in insurance, and this is what actually explained their declining popularity amid a low yield environment. Unit-linked insurances usually have higher annual written premiums in absolute terms than traditional life insurances.

Figure 22 Share of unit-linked life insurance contract

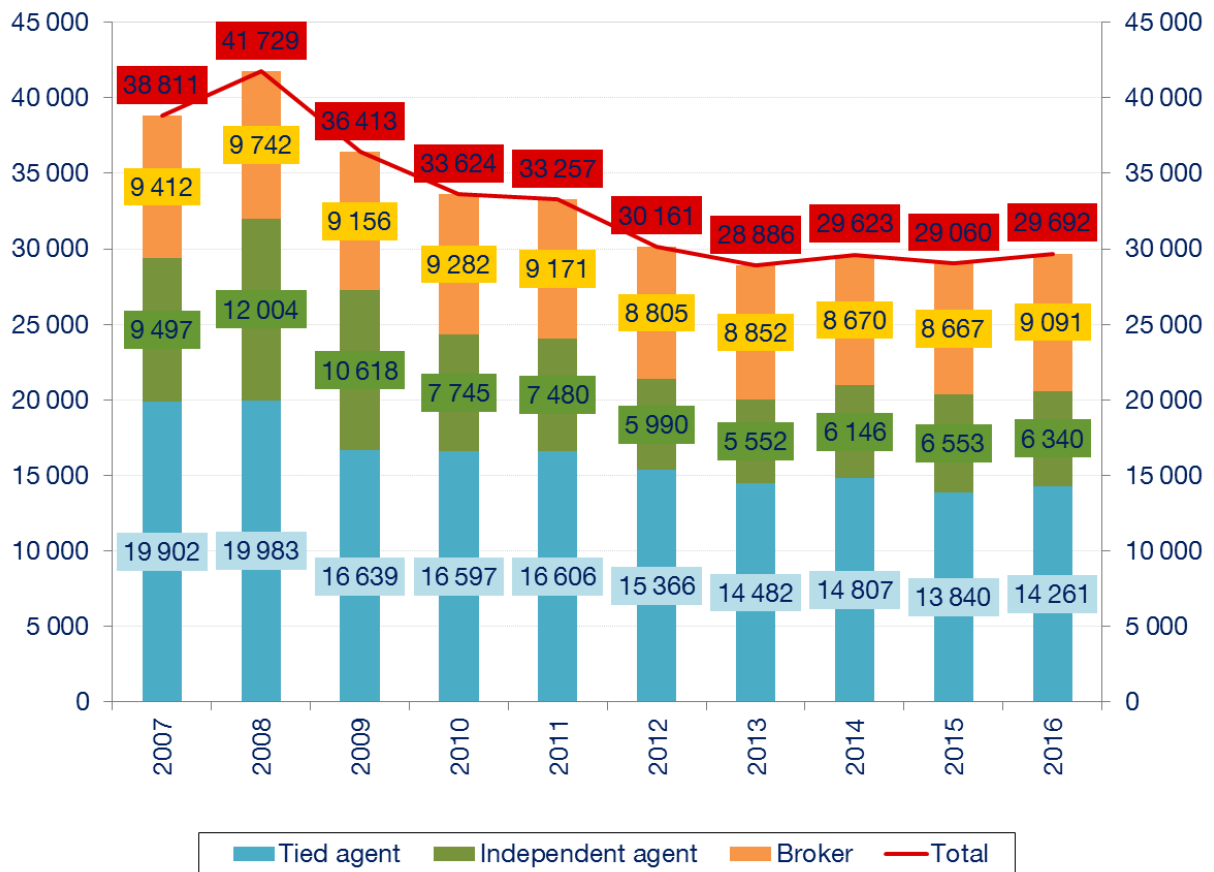


Source: NBH, Concorde

The dominance of unit-linked products in Hungary can be traced back to the fact that independent agents dominate over tied distribution. Tied distribution refers to insurance sales through a distributor who owns allegiance to one insurer and sells only this insurer’s products. Independent distribution refers to sales where the distributor can work with multiple insurers. The advantage of independent distribution is that consumers take centre-stage with more choice and better options offered. Despite high costs of entry, the lack of capital and a dearth of talent regarding the capability to handle multiple products, independent agents have been able to rapidly expand distribution reach in the past 10 years in Hungary.

The success of independent distribution’s expansion lies in the incentive compensation system (mostly multi-level marketing), according to which agents are compensated not only for sales they personally generate, but also for the sales of the other salespeople that they recruit. Independent distribution has now become so prevalent that most insurers need to heavily rely on it in any case, if they want to successfully compete with other insurers. Independent agents can have a big say on insurers’ product developments, pricing and commission, which is, indeed, the reason why the cost-content of unit-linked insurance products (driven by elevated commission, in particular) is relatively high compared to other savings forms. In last six years the number of both tied and independent agents significantly decreased as a combined result of lower demand for insurance products in the aftermath of the early FX-loan repayment scheme and the introduction of the concept of ethical life insurance, which has led to lower commission paid.

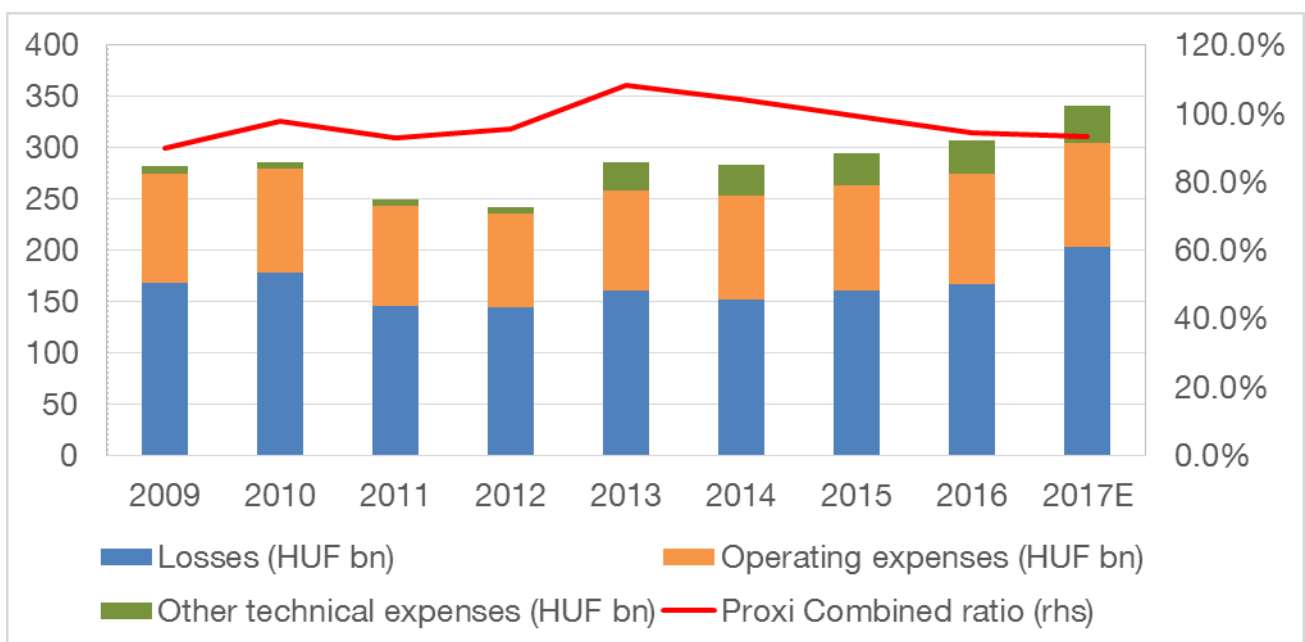
Figure 23 Number of agents



Source: NBH

In Q1-Q3 2017 insurers paid a combined HUF 437bn of damages up by 7.2 percent compared to Q1-Q3 2016. Total expenses for life insurance contracts was at HUF 70bn in Q1-Q3, up only 0.1 percent. Costs for non-life contracts grew by 6.2 percent to HUF 196bn in the first three quarters of 2017, down 11 percent from the same period a year earlier while after-tax profit was down 5.4 percent to HUF 45bn.

Figure 24 Non-life segment's combined ratio (proxy)

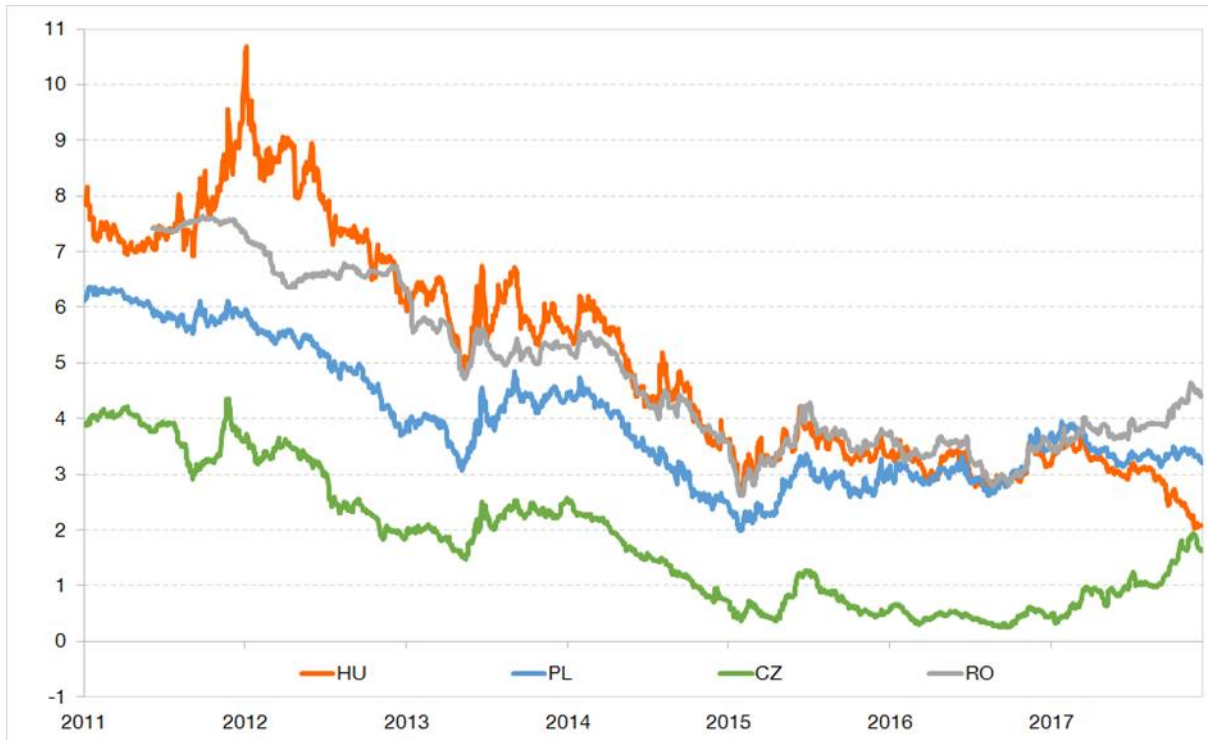


Source: NBH, Concorde

Challenging yield environment

The current low interest rates have an impact on insurers’ asset portfolio in two different ways. On the one hand, the lower discount rate used to calculate the net present value of cash flows from in-force policies leads to a higher fair value, all else held equal, not to mention a temporary, mark-to-market investment gains on fixed-income portfolio, and so higher asset management fees. On the other hand, the decline in yields results in lower earnings for life insurers as time goes by whose magnitude depends on the life insurer’s product mix and the type of guarantees offered. In addition, in many cases, the duration of liabilities (e.g. pension insurances) is longer than that of assets, posing a daunting challenge to life insurers to fully adjust product prices and guarantees as quickly as market rates change. That is true even if the negative effect of low interest rates on investment yields takes time to play out, as only current premium income is invested at prevailing market rates.

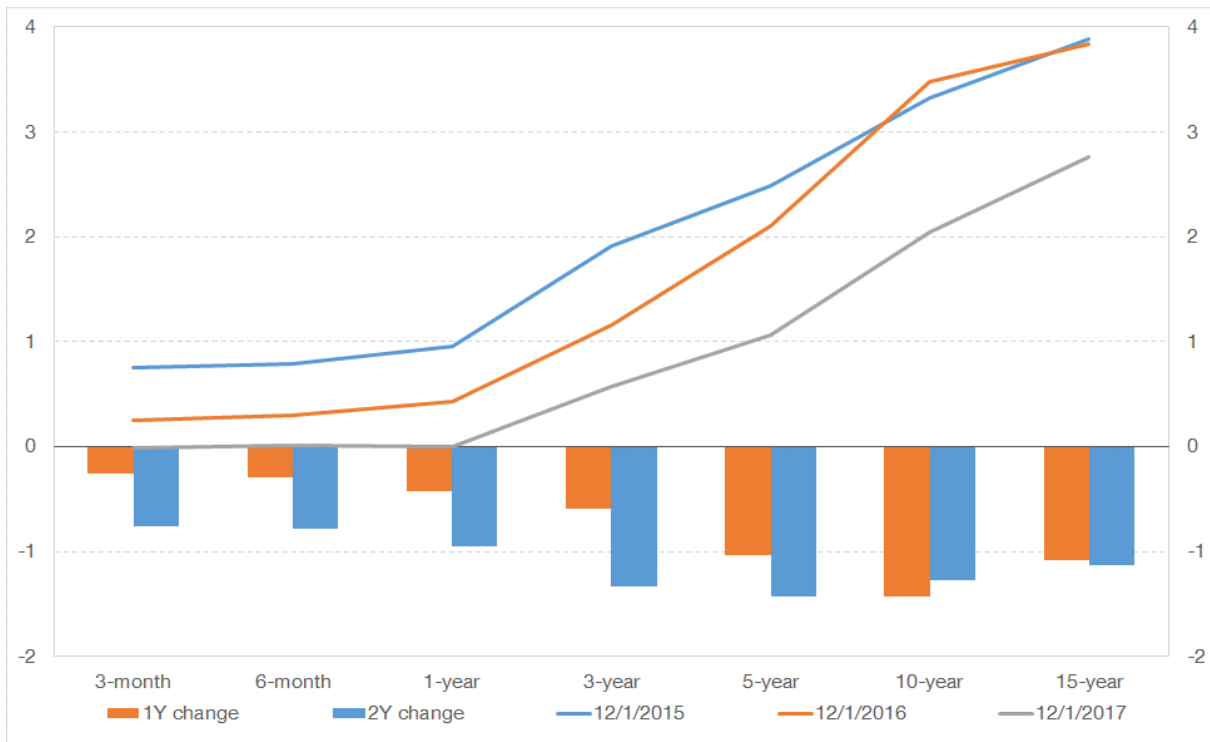
Figure 25 CEE 10-year bond yields (%)



Source: Bloomberg

Given that interest rates may rise but remain below the level where they stay three years ago, life insurers may feel the continued pressure of tougher competition prompting them to offer bonuses and guarantees above the average investment yields. That, in turn, could end up driving down profitability and for this reason put pressure on their solvency and valuation. Although there are expectation The current level of low yields is rather troublesome and a severe challenge which insurers will be wrestling with in the foreseeable years.

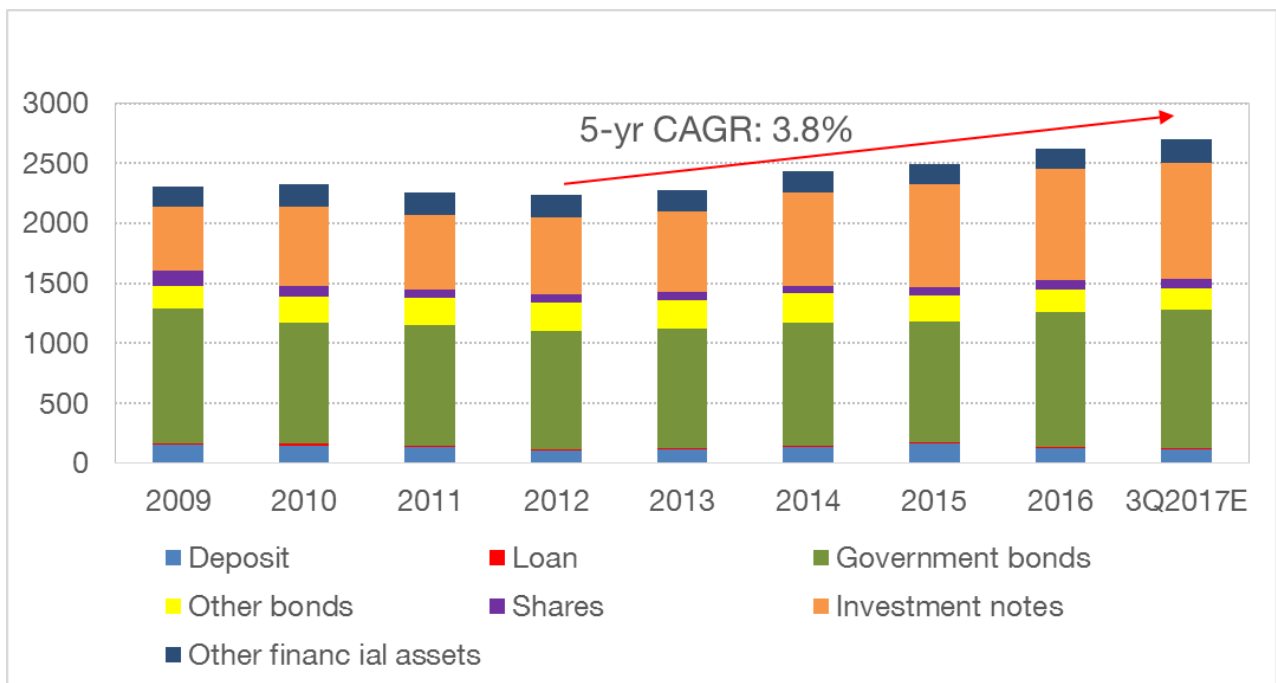
Figure 26 Yield curve developments (%)



Source: Bloomberg

Insurers’ asset portfolio typically consists of fixed-income securities (c.50% at the end of September, 2017). The life insurance portfolio is usually more sensitive to changes in yields (long-term securities) than non-life insurers (annual renewable investments).

Figure 27 Insurers’ asset breakdown



Source: NBH

In an era of declining yields the value of insurers’ existing bond portfolio gradually rises but principals and future coupons from a bond will not be reinvested at the prevailing interest rate when the bond was initially purchased (reinvestment risk). Even new premiums can only be invested at lower yields.

In contrast, when interest rates are on the rise the value of an existing bond portfolio decreases. In the case of fast-rising yields, the insurer cannot timely reprice its products. At redemption, there may be a loss on bonds, which could negatively affect the insurer's capital position.

When holding securities up to maturity the value of an existing portfolio becomes insensitive to the change in yields, but new incoming written premiums can only be invested in lower yields. In addition, the duration of the insurance policy may be longer than available long-term government securities (reinvestment risk).

In case of an inverse or a flat yield curve (= worst-case scenario) life insurance companies cannot compete successfully with short term deposits, while the risk of "mismatch" may rise if they decide to compete for savings.

Interest rate risk depending on life insurance:

a) unit-linked life insurances

- the investment risk is to be borne entirely by the policyholder (however, the amount of bonuses refunded to policyholders may increase as a result of competition)

- the technical result varies due to a change in the discount rate (100 basis points change in the 10-year bond yield may result in a 10 percent change in the technical result)

- EV is usually more sensitive to yield decline than yield increase due to guaranteed returns and the compulsory profit sharing with policyholders of traditional insurances (in other words, a 100 bps yield sensitivity is more significant than a +100 bps yield sensitivity because it leads to more interest guarantees on the participating business coming into the money but the losses in this situation are partly compensated by reducing future policyholder profit participation, while the higher surplus for a +100 bps yield sensitivity has to be shared with policyholders)

- return on invested own equity changes

- maturity gap risk

b) traditional life insurance

- sources of payment to policyholders are the technical interest rate, the surplus yield and premium reserves

- the insurer covers both mortality and investment related risks, and it may pose to the so-called guaranteed gap risk (the insurer is obliged to bear the difference between actual yield and the technical interest rate offered, and must refund 80% of excess yield to policyholders, meaning that insurers have to pay the technical interest rate prevailing at the signing of the policy contract (currently 2.3 percent in HUF and 1.1 percent in EUR) on each premium paid by the policyholders in the lifespan of an endowment policy, which seems a "challenge" at this juncture (the renewal risk of policies is high) and could lead to lower supply of traditional insurance products and higher fees)

Against the backdrop of low yields insurers may opt to pursue a defensive and less risky investment strategy based on sophisticated risk management, which includes buying real estates, shares, ETFs, etc. What makes it difficult to stick to this strategy, however, is that almost all asset classes are considered expensive, in our opinion, while insurers cannot completely eliminate the risk to their bond portfolio amid the current low yield environment.

Profitability depends on the ratio of the traditional and UL business lines, as well as the difference between the maturity of existing investments and liabilities. If the ratio of technical result is significant in total results, it can offset the negative effects of the decline in yields. In the short term, the decline in yields will result in higher profits on existing investments since insurers may realize gains on almost any of previously purchased bonds, if they are sold, hence there will potentially be higher dividends to be paid to shareholders.

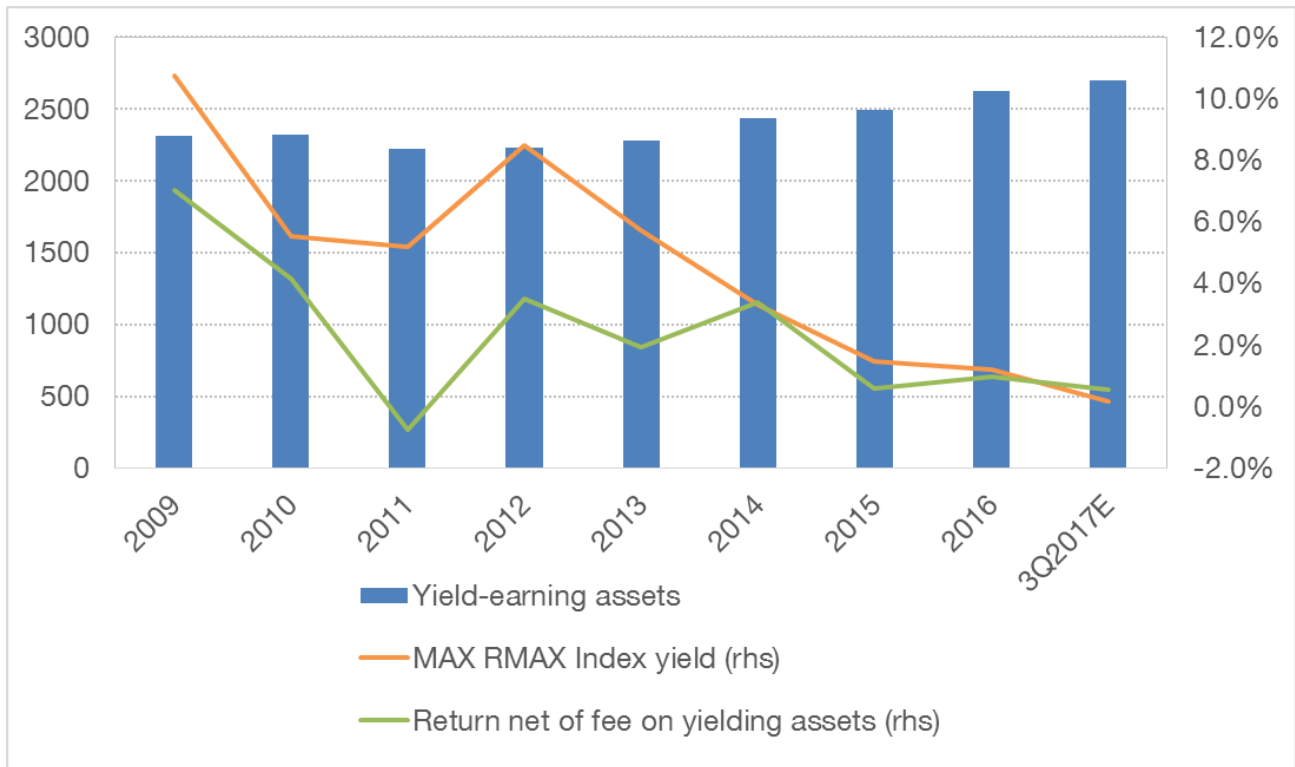
Nevertheless, the value of liabilities may also increase due to the lower discount rate applied to valuing the fair value of liabilities. Therefore, more capital must eventually be necessary to meet strict capital requirements. Moreover, in the long run, the decline in yields may affect the profitability of the insurer, as it reduces the profit that can potentially be realized in the outer years. Due to the long maturity, the fixed income portfolio's "present" yield may differ from the prevailing market yields in a low yield environment it may seem like insurers could have relatively better investment performance, but it can turn out to be a false assessment of insurers' ability to generate a sufficient level of return to policyholders.

Solvency II requires that the available capital exceeds the required solvency capital (available capital > required capital = surplus equity). However, this alone does not guarantee that future risks are constrained, i.e. surplus equity can easily be destroyed by pursuing inappropriate investment policy. Under Solvency II asset allocation will also have a strong impact on the solvency margin and capital requirements => greater

risk-taking ensues greater capital requirements. Therefore, insurers are interested in reducing short-term risks (capital requirement optimization) and eliminating risks arising from maturity mismatch between assets and liabilities.

In order to maximize the return on investment using the stochastic scenario-based asset management model (ALM model based on Monte Carlo simulation") and simultaneously optimize the capital required, it is not enough just to make appropriate allocation among the different asset classes (not enough to diversify assets, to add a new asset to the portfolio, e.g. a hedge fund, may lead to additional capital requirement), duration risk should also be considered before making any investment decision. Equally important is the diversification of activities, which also mitigates the need for solvency capital. And, the composition of assets purchased from own equity has also an effect on the solvency capital requirement.

Figure 28 Insurers' yield generating ability



Source: NBH, Concorde

In response to a prolonged period of low yields insurers may

- attempt to increase fund management fees (affects net returns allocated to policyholders), though tough competition may exert pressure on fees;
- reduce operating costs (limited room);
- increase the insurance risk-related fees, e.g. mortality fee (insignificant effect);
- lower commissions (significant effect but it entails the risk of lower new sales - we note that the agency commission ceiling does not really represent an effective ceiling for commissions, because what it is not paid by the insurers to the agent in the first policy year will be paid in the second policy year. As a result, the first policy year's funding needs are reduced but it may increase in the second policy year, or at least the second policy-year profit may decrease consequently. The risk of fraud and repayment may decrease, as well);
- provide additional guarantees (i.e. higher yield promise, but this can be burdensome on insurers' capital);
- shift towards traditional risk insurances depending on the size of sales network and demand (fees are lower than for UL products, requiring higher volume sold to reach economics of scale);
- acquire competitors or portfolio in an attempt to be have a more efficient business size;
- provide niche products (e.g. pension and health insurances);
- emphasize tax incentives on pension insurances;
- accelerate redistribution of profits to shareholders (risk: the operation must be scaled down poses if the volume of new sales decreases for a prolonged period);
- spend more on creating a diversified network of agents (the importance of cross-selling of own sales channels and products may increase)

- become accustomed to lower ROE as even lower profitability may be sufficient for stakeholders
- sale business line or op to a complete exit

Under Solvency II the assets covering future liabilities should be selected with taking into account the best interests of policyholders, which is likely to prompt insurers to reduce risk taking, increase diversification among assets and promise more reasonable yields to policyholders in the future, and so may have an impact on demand for risky assets, in our opinion.

In summary, amid a low yield environment, the long-term return requirements of the owners of insurance companies should be lower. Owners have to compromise over the desired risk / return trade off (minimizing the level of required capital while maximizing long-term return) that may lead to the use of more appropriate investment policies, thereby competitiveness in the insurance sector and compared with other financial products may improve.

Question: Will the return calculated and the compulsory allocation of capital be appropriate, in the light of the guarantees? => In the low yield environment, the expected return rate is also lower

Improper investment strategies and assessment of future liabilities will certainly generate additional solvency capital needs. Insurers have to pursue conservative investment policies using sophisticated internal risk management and asset valuation models. Maintaining solvency and expected return on investment requires a thorough reflection on investment strategies in terms of both asset allocation and maturity. Short-term investment decisions must take into account the long-term profitability and capital position of the insurer.

The attractiveness of insurance products can grow in a persistently low yield environment as they offer access to products with higher expected yields. In addition to providing a higher level of protection against financial risks, they also provide insurance for any adverse events in the life of the insured people.

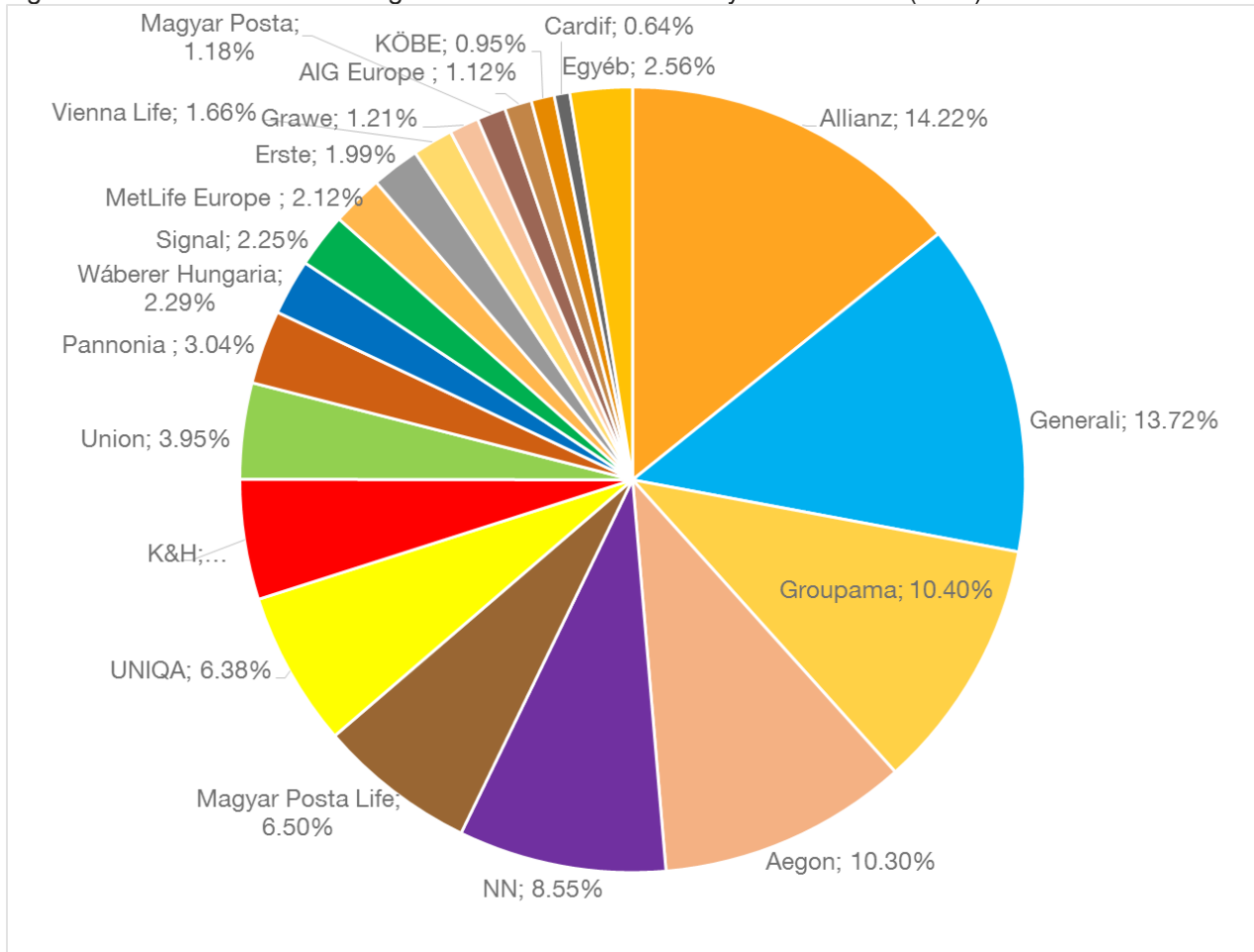
Consolidation of the domestic life insurance market is likely to continue

The commonly held view is that cut-throat competition makes it all the more difficult for insurers to deliver dynamic growth through their existing operations alone, particularly amid an abysmally low yield environment. Furthermore, the higher capital requirements (Solvency II) will likely increase predilection towards consolidation in the CEE insurance landscape over the next three years, just as attractive valuations across the sector may promote further acquisitions (many firms trading below their embedded values). Meanwhile, the CEE economic environment is expected to become more conducive to deal making (with reasonably good growth prospects and low funding costs).

Under the conditions given, we believe the domestic insurance sector will be less fragmented in three years, and that smaller sized insurance companies may become the subject of a takeover attempt, given their reach towards premium retail customers and expertise in niche market segments.

The need for capital raising or asset divestitures on account of Solvency II is also likely to increase predilection towards consolidation over the next three years, just as dampened valuations across the sector may promote acquisitions (many firms trading below their book or embedded values). In this context, we believe the domestic insurance sector looks set to become less fragmented.

Figure 29 Breakdown of the Hungarian life insurance sector by market share (2016)*



Source: MABISZ

* Based on adjusted gross written premium (only 10 percent of top up premium is taken into consideration)

Note: AXA, UNIQUA and Erste belong to Vienna Insurance Group, which so control c.10 percent of total market

Source: Hungarian Insurance Association

While insurance carriers, like Pannonia, looking to focus on niches often are ahead of the curve, stricter regulation is tilted more toward universal insurers with the resources and financial strength to achieve scale in several different market segments. Pannonia may need more capital to compete successfully with stronger multinational players in the long run. In view of the fact that Pannonia’s current stakeholders have strict discipline of return on capital invested, the company may find it necessary to take on a situation that requires more capital contribution from third party investors should they intend to fund inorganic expansion.

All things considered, we believe that Pannonia is well positioned to become a target of even financial or strategic investors during the next three years, given its growing earnings and expertise in niche market segments. If so, the stakeholders may decide on the sale of their shareholdings or a capital increase at a reasonable price, particularly after Pannonia has solidified its market share and reached its peak profitability and Solvency II will come into force, in our opinion.

We cannot exclude the possibility either that Pannonia will continue to seek to get a hold of small-sized domestic counterparts that are up for sale at affordable prices (see the acquisition of MKB Insurance Companies last year). Pannonia has articulated its intent to buy further insurance companies for generating economies of scale and extracting cross-selling opportunities offered by its new banking partners. Instead of an aggressive growth strategy in quest of generic market leadership, Pannonia’s particular objectives are to be ranked among the top five players in the Hungarian life insurance market, targeting a c.5 percent market share and constantly growing earnings. Even so, Pannonia’s war-chest earmarked for further acquisitions and capital position are far from robust, thus its market share goal thus seems to be ambitious without a capital increase, in our opinion.

The concept of ethical life insurance

On 1 January 2017, new regulation for life insurance products has been introduced in Hungary (the concept of ethical life insurance). Pannonia's unit-linked products and services meet customers' needs in a fair manner and are align with new regulation. Pannonia performs regular reviews to ensure that all products and services meet customer, compliance, risk, capital and profitability requirements.

New regulation requires insurers to be more transparent by providing clear information to consumers regarding the related costs, fees, commissions and risks charged to align with the concept of fair (price) competition in a way that the description makes their purpose and content clear without a doubt. The transparency of traditional life insurance products has always been considered by policyholders as rather low, whereas clarity of the contracts has always been regarded considerably higher in case of unit-linked products (providing product prospectus with detailed conditions). According to a recent market survey, 48 percent of consumers them do not understand products.

The amendments to regulation was very timely and necessarily as the complexity of about half of the asset funds in which unit-linked life insurance premiums were invested had poor returns and did not justify high fees and costs at all. Only low-risk and liquid asset funds met the ACR limits expected based on the (pension) insurance policy recommendation.

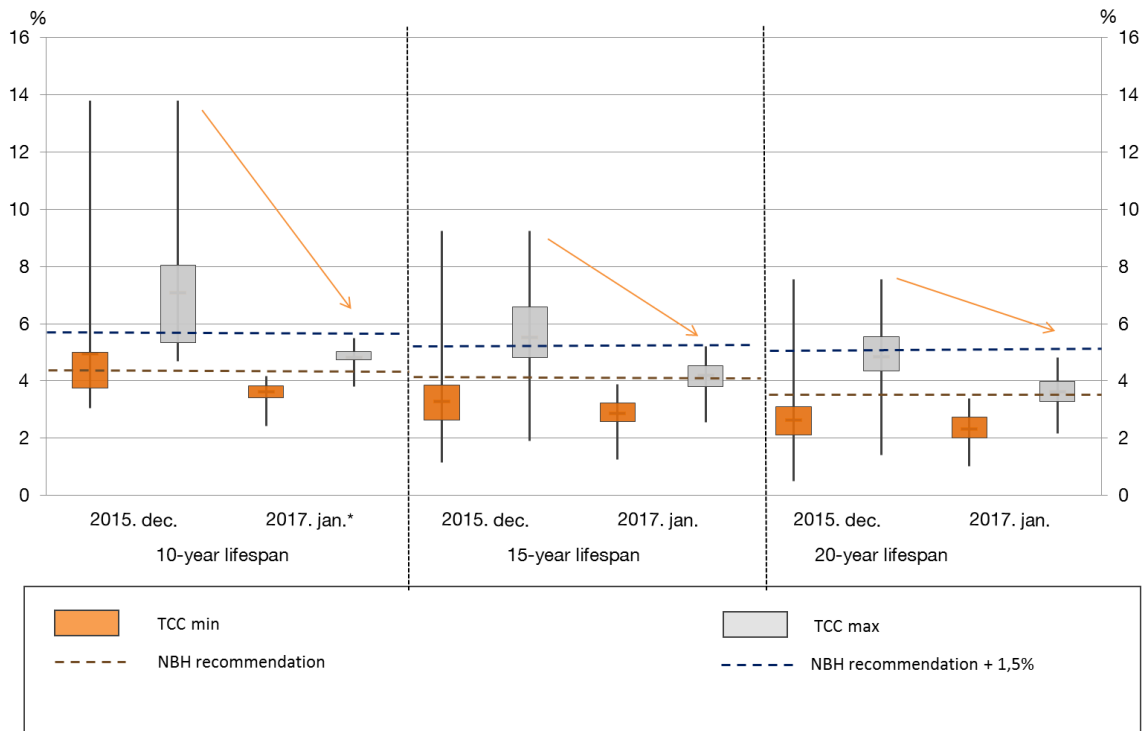
The terms and conditions of life insurance policies must contain all costs and fees that may be deducted in a quantitative way in order to avoid hidden and unpredictable costs. The insurer is obliged to designate any charges on the insurance policy in a way that clearly identifies its purpose and underlying content. To further strengthen insurance rules, it has also become mandatory to involve depositaries. Life insurers are no longer allowed to use the so-called actuarial funding technique to cover their first-year expenses, and from next January only those units that have been invested by the insurance company may be shown.

Formerly, though the statement to the policyholder showed that units corresponding to the full premium paid have been allocated, the actual assets purchased were only for a certain percent of the premium (which actually was almost nil in the first two policy years – for that reason the surrender value was also zero). The balance (actually 100 percent of the premium paid) was used for meeting the high first-year commission expenses. The proportion of the assets held to that shown in the statement to the policyholder then increased year after year and, at the end of the policy term, conceivably became 100 percent.

The National Bank of Hungary (NBH) has introduced new rules and limitations for the ACR for unit-linked life insurances, effective as of 1 January 2017, to increase the transparency of the cost elements of unit-linked life insurance. Up until now, insurance companies could charge most fees in the early years of the lifespan of an insurance policy, and so they had already profited significantly during the first years. The latest amendment to the Hungarian insurance act sets a limit to the minimum amount which can be charged on the insurance premium, to be utilized for investment during the initial years of the insurance policy, i.e. it stipulates the minimum required investment at the beginning of the lifespan of an insurance policy in order to limit the cost of investing in a life insurance policy.

The NBH recommends to limit the percentage of the ACR depending on the term of the insurance policy. The general percentage of the limitation is 4.25% for insurance policies with a lifespan of 10 years, 3.95% for a 15 year policy, and 3.5% for a policy which expires after 20 years. If the insurance policy contains a complex portfolio, a higher insurance risk, equity or return guarantee, then the limitation may increase by 1.5% respectively. The NBH's recommendation also limits the percentage of the ACR for insurance policies payed in one single sum at 3.5%.

Figure 30 Changes in Annual Cost Ratio limits on UL life insurances



Source: NBH

Note: The Annual Cost Ratio (ACR) is an indicator – which was introduced in 2010 by insurance undertakings for unit-linked life insurances as a self-regulating measure and calculated in line with the rules of Hungarian insurance regulations – showing all costs charged on life insurance policies having a savings element, reflected as a percentage value. **ACR is calculated only for unit-linked type insurance products as the difference of the IRR on paid premiums with no costs charged but with (benchmark risk free) yield earned and the IRR on paid premiums charged by all costs.** Indeed, based on an IRR calculation, the ACR displays the minimum gross yield that is necessary to recover at least the original amount invested to the policy. The ACR calculation assumes permanent (constant) benchmark risk free yields throughout the entire term of the insurance agreement so as to get the lowest average gross annual yield (before the deduction of the asset management costs). That yield must be achieved by the investment instruments and investment funds forming the underlying asset funds of the pension insurance products concerned and containing the investments, for the policyholders to recover the nominal value of the insurance premium paid based on the original gross written premium at times used for calculating ACR. Costs charged by insurers in relation to unit-linked products contain “acquisition and maintenance costs, any administrative fixed and variable cost, the risk life and/or accident insurance premium, which is a mandatory component of the insurance contract, the asset management costs of the underlying funds (including the costs of asset funds, the asset management fee of investment units and other cost deductions, such as costs resulting from the difference between the purchase and sales price of investment units, the fees and charges collected based on the promised nominal premium and their impact on the investment return, as well as the investment costs of the underlying instruments). If the management fees of the particular insurance company’s asset fund and underlying fund are different for the various asset funds, then a minimum-maximum range will be defined. The costs of asset funds and the costs extracted from the investment instruments contained in the asset funds by their managers (which should not necessarily be the insurer that effectively contracts with customers or issuers must be presented as an asset management fee, including especially the asset management fee of the investment units contained in the asset fund and the deducted costs presented in the prospectus of structured bonds and the fee of the promised nominal premium paid from the investment result. When the costs are applied, the calculation must be taken down to the first investment fund level, until the fund of funds solution disappears” (Hungarian Insurance Association).

Obviously, costs reduce the value of the policyholders’ investments. Also importantly, the higher the level of yields used to calculate return on invested premiums, the higher the ACR as the absolute amount of asset management fee increases in line with the higher yields (even if the asset management fee in percentage terms remains unchanged). However, the potential tax and contribution liabilities and/or preferences related

to the premium and payments for different effective periods are not and cannot even be taken into account in the ACR calculation, meaning that the ACR must be calculated without the positive impact of tax allowances on yields policyholders are likely to earn over the policy term. Of course, the ACR is lower when taking into account tax allowances because the tax credit is not charged by any fees (previously the tax credit had been charged by management fees). The ACR must be calculated for each unit-linked life insurance product (including pension insurances) with regular (continued and continuous) and single premium payment which insurers sell to a large group of consumers, and which was not withdrawn from sales, or the sale of which was not halted.

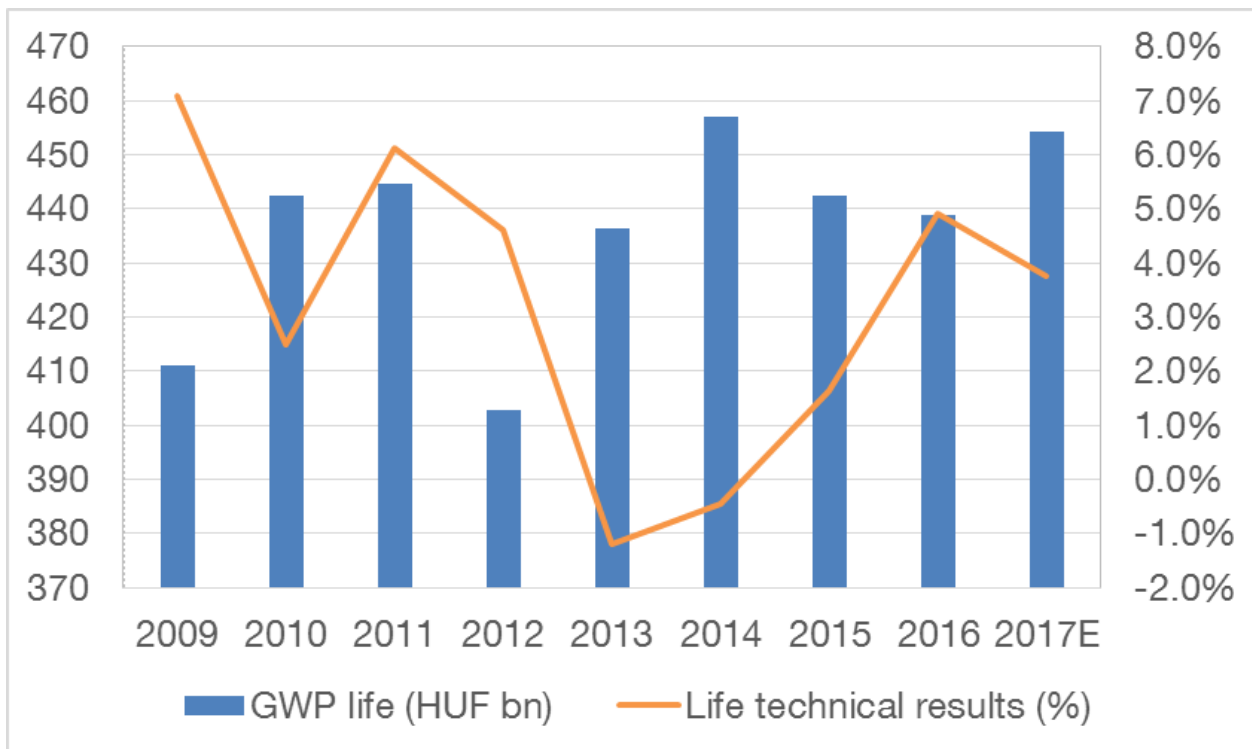
Actually, insurers are allowed to charge on premiums paid for:

- mortality risk,
- covering the contracting and account maintenance costs,
- managing the asset portfolio.

New regulation also stipulates the minimum levels of investment and surrender values while limiting the commission rate payable for life insurance. The investment and surrender value percentage is a minimum 20% of the insurance premium (minus risk element) for the first year, 50% for the second, and 80% for the third year. This would essentially mean that insurance companies would not be allowed to deduct more than 150% of a full-year premium (i.e. half of the premiums paid in the first three years) as costs. Also importantly, agents are not allowed to take more than 14-month premiums' worth of commission when they sell a policy, stipulating that the source for such commission payouts should be the premium income already paid by the client. The limit on commission will be further reduced to 13-month premiums from 1 January, 2018, and to 12-month premiums from 1 January, 2019.

As a result of new regulation the number of unit-linked life insurance products has dropped to 156 from 324, mostly that of expensive products (i.e. products with high a ACR), the average level of the ACR decreased by a quarter, commissions charged on unit-linked life insurance products declined, the quality of customer information has improved significantly, and most importantly, the life insurance segment's profitability has declined.

Figure 31 Hungarian life insurance segment's profitability



Source: NBH, Concorde

With the ACR being maximized in relation to unit-linked insurance products, it is conceivable that insurers will make attempts to reduce asset management fees that they have to pay to independent fund managers, while agent commissions might also be trimmed down by as much as 20 percent to enable insurers to reach reasonable profitability on pension savings products.

Pension insurance products – the engine of future growth

Given that the economy is set to provide a tailwind at the sector's back, there are potentially three market segments where insurers may cruise along in search of growth: pension insurance, supplemental health insurance and liability insurance. In practice, pension insurance products can be either endowment or unit linked type insurances. Pension insurance products could serve as a springboard to offset weaker sales volumes in other product lines, and should generate stable earnings for an extended period of time offsetting volatility from other riskier businesses, in our opinion.

The attractiveness of pension insurance products has significantly increased after tax disadvantages have been eliminated. According to new regulation policyholders can reap the benefits of a 20% tax credit on pension insurance products, or a maximum of HUF 130,000 per year, which are paid at maturity but deductible from annual income taxes. This implies a maximum HUF 650,000 gross annualized premium per policyholder. Pension insurance products together with retirement savings accounts (NYESZ) and voluntary cash contributions to pension funds may give a maximum of HUF 280,000 per year tax credit for policyholders, which is an amount representing 10% of average gross annual salary.

Pension insurances include risk elements that may provide protection against adverse outcomes of unexpected events (death) and, in some cases, provide guaranteed financial services (i.e. savings are safe under any market circumstances and do not depend on the volatility of financial markets), but the costs are higher than that of other forms of retirement savings. The regular premium payment scheme makes this savings form more predictable. Moreover, the monthly premium can be adjusted according to the policyholders' life situations, that is, for example, can be increased after a salary raise. The amount saved over the course of the policy term can be taken out as an annuity. In cases when the pension insurance is an endowment policy the insurer bears the risk of investing, while the policyholders are guaranteed to receive 100 percent of the sum assured at the maturity date. In general, 30 percent of the sum assured is accounted for by the tax credit (representing max. 16 percent of the total sum assured) and the estimated yield.

Apart from cost burden, the major difference between new pension insurance products and other unit-linked insurance products is that pension insurance products eventually act as endowment policies, which pay a lump sum on a fixed date (at the date of maturity) or upon the death of policyholders. The age at which this condition is reached is known as the endowment age, and this is the date when the policyholders are allowed to get the cumulative cash value of the policy without losing tax allowances.

It is widely expected that pension insurance products will account for as much as 30 percent of new insurance contract sales going forward. The recent sales figures show that 83 percent of the pension insurance policyholders are aged between 40 and 50 years, the thirty-and forty-year-olds make up 15 percent, while the proportion of younger people is only 2 percent.

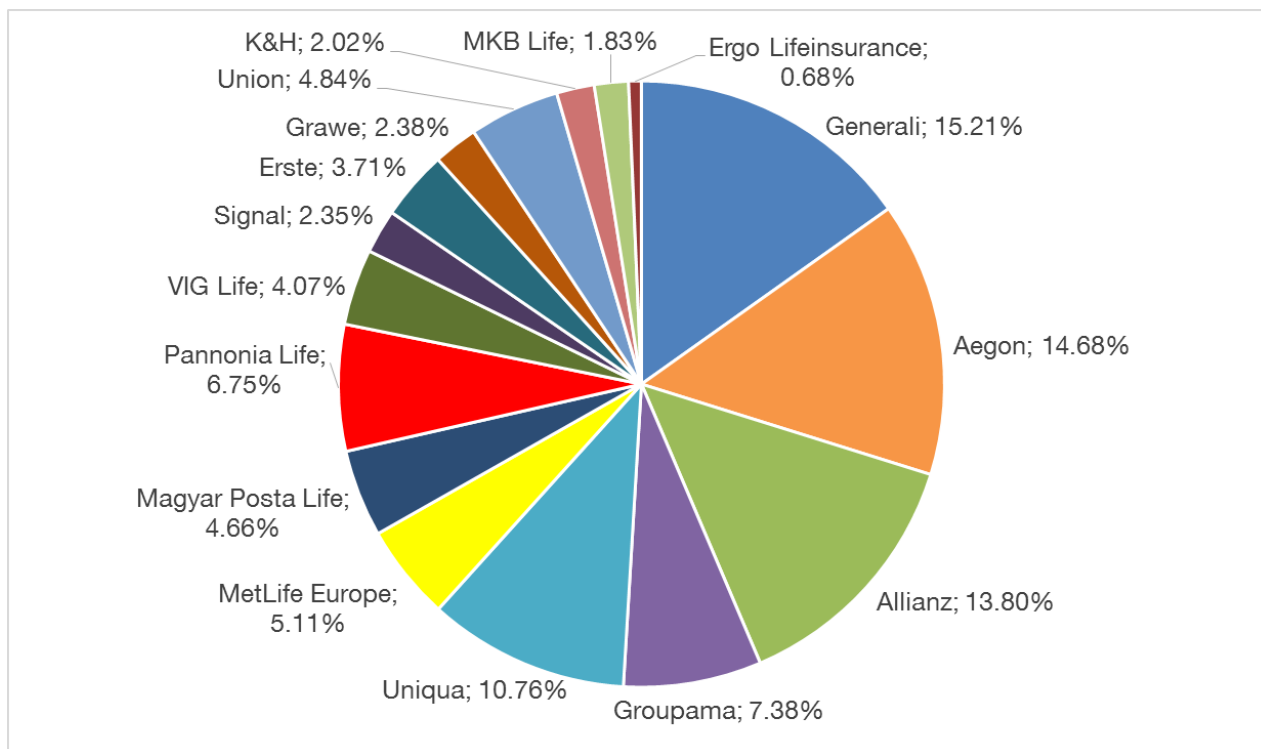
Due to tax credits, pension insurances are deemed to remain in force for a relatively longer period than unit-linked products and have lower lapse rate. The time aspect with regards to insurance policies is very important since the dynamics of new sales and acquisition costs primarily hinge on insurers' cost bearing ability. The longer the pension insurance policies remain in force, the more time insurers have to recover initial costs related to client acquisitions (e.g. commissions). Tax allowances granted for pension insurances will in all likelihood help moderate customer attrition that, in turn, should lead to lower costs because, by definition, the cost of retaining an existing customer is far less than acquiring a new one.

The surrender of a pension insurance contract entails a lot of costs to policyholder. The surrender right (a right to cancel the pension insurance policy) or non-forfeiture options can be exercisable in exchange for the loss of tax allowances. In other words, if policyholders decide to surrender pension insurance contracts early because for example they want to switch from one insurer to another, or because unexpected financial difficulties have arisen, not only the total amount of tax credit accumulated until the date of surrender will be revoked, but also a 20 percent penalty on tax credit has to be repaid to tax authority (altogether 120 percent of the amount of tax credit used), incurring surrender charges as well as income tax liability. Consequently, it is a more lucrative option to continue paying premiums until the maturity date of the life insurance policy, thereby being eligible for a life settlement in exchange for the contract, than surrendering it early.

As is the case with unit-linked life insurances, policyholders generally have the right to take a period (say six-month) of pause in premium payments without having to suffer from contract cancellation, providing that three years premium have been received as they fall due, though this right depends on the product. During the break, insurance policies will not cease. Insurers will continue charging the policy according to the terms included the insurance policy information memorandum to cover permanently incurring admin and asset management charges associated with policies. If the amount of policyholders' debt (i.e. unpaid fees owed to insurers), which gradually accumulates during the no-payment period, reaches the value of the premium account, insurers have the right to cancel the policies. Finally, if policyholders die before policies mature, and

so making it impossible to provide the benefits on policyholders' retirement, insurers encash policies (exchanging it for cash) and pay the sum in a lump sum form to policyholders' personal representatives or other beneficiaries. The sum paid out will be the higher of the value of the premium account at the time policies were lapsed or canceled, or the amount of the guaranteed death benefits.

Figure 32 Insurers' ranking in the pension insurance segment by adjusted pension premiums (2016)



Source: MABISZ, Pannonia

An example for pension insurance

The life expectancy at birth is 78 years for women and 71 years for men in Hungary. Of course, many people live much longer. Currently, on average, men retire at 60.4 years of age, women at 58.4. As a rule, retiring is conditional on having reached the retirement age, having accumulated at least 20 years of service and not being employed at the day of retirement. The previous government decided to gradually lift the retirement age from 62 years to 65 years in order to ensure the viability of the current pay-as-you-go pension system. Accordingly, those who were born in 1957 will fall first into the new retirement regulation.

Today, 9.9 million people live in Hungary, of which 2.8 million people receive retirement benefits. By contrast, there are presently 6.4 million working-age people, of which only 56 percent are active employees. The rest are unemployed, on maternity leave, get assistance, or have already retired. The state employs 21 percent of active workers, whose salaries and pensions are also paid by the state and so financed ultimately by the rest of taxpayers. This leaves approx. 2.9 million people who have to support the nearly 3 million pensioners, meaning that practically only one private employee supports one pensioner. Unfortunately, nearly 1.5 million of them are paid net minimum wages of HUF 84,788 month in 2017 (EUR 270). Average monthly pension in Budapest is c.HUF 143,000 (EUR 453), up 2% in 2017.

The dependency rate stays at 1:2.5. Given an aging population, it will be increasingly difficult for the pension and social security systems to cope with the overwhelming challenges of providing for the needs of older, non-working dependents as time goes by.

We expect the dependency ratio to increase from 405 to 44% by 2057. Average monthly pension therefore will likely be c. EUR 905, everything else being equal (supposing that per capita GDP/per capita contribution to pension ratio remains intact), putting an even greater burden on active workers' shoulder. Ideally, a woman should give birth to 2.2 children on average in order to prevent the population from dwindling away. In contrast, a woman gives birth to only 1.3 children presently, which implies that couples are unable to replace their own numbers, suggesting that the ratio of active people-to-retirees should continue to deteriorate for at least 20-25 years. The number of people aged over 60 years has increased by 314,000 (3 percent) since 2000, and their proportion may exceed 30 percent of the society by 2017 according to Hungary's Population Research Institute. Today one in every ten residents is aged over 70 years, which makes it very worrisome

when it comes to the sustainability of the “pay-as-you-go” pension scheme. Presently, the pension system still has a balanced budget.

There are two key factors that appear to determine whether the pension system is viable on the longer term or not. The first is the difference between the retirement age and the life expectancy at birth. As it is clearly seen, the relationship between them has completely reversed in recent decades. As a result, the retirement age is significantly lower than the life expectancy at birth. Another factor is the ratio of active workers-to-elderly people, which is affected by a lot of different things starting from the number of children born, demographic distortions caused by young expatriates living abroad, and minimum wage employees who are not or only minimally contributing to support retirees. If all these conditions become unfavorable at the same time, the government has no other option but to reduce pensions or increase the retirement age in order to fill the budget gap and shift responsibility of shouldering the risk of pension savings gap to individuals. As we see, after expropriation of private pension savings in 2011 individuals increasingly feel the need to consider more seriously the life annuity component of their financial coverage for old age to be secured by retirement savings forms (e.g. voluntary pension funds or pension savings insurances).

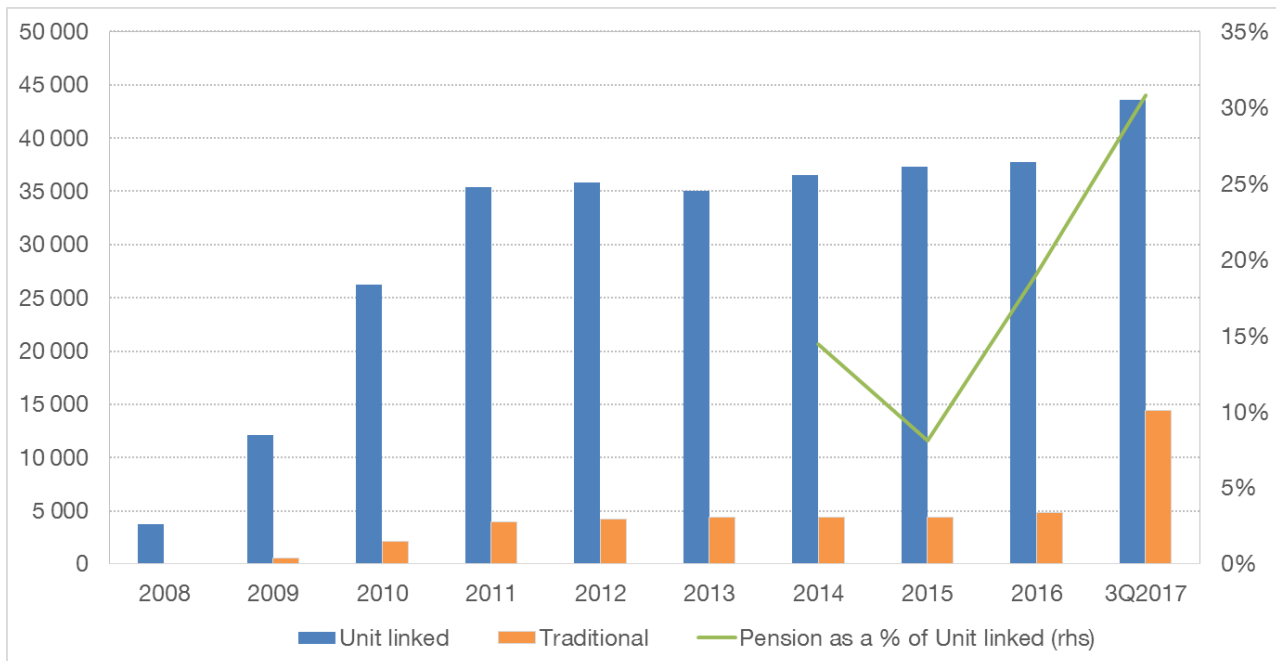
We project that approximately EUR 250 savings on average may be needed to be put aside monthly over the next 20 years to keep the current first pension payment/last income earned ratio intact at c.68 percent, given that the dependency rate will be constantly rising, wages will increase twice as fast as pensions, and that healthy people will likely live another 20 years after they retire at 65 years of age.

Just to be on the safe side, it is meaningful to assume that people earning only minimal wages will not likely look for pension insurance products, and that merely 10 percent of those who can afford to accumulate retirement savings (c.150,000 people) may potentially have appetite for pension insurance products. If so, total annual premium income from this product may reach a total of c.HUF 50-60 bn per year, i.e. 11-13 percent of total annual written premium in the life insurance industry, on our estimate.

Pannonia has started marketing its pension insurance products as of 2014 through its own sales network. In-house pension insurance product development clearly reflects Pannonia’s ability to be ahead of the curve and that sets it apart. For now, pension insurances represent about 30 percent of Pannonia’s new business sales. Although the amount of gross annual written premium from these products are usually lower than that of old type unit-linked insurances, the profit margin are by and large similar to what Pannonia is able to earn on its formerly blockbuster unit-linked products. All this suggests that Pannonia’s profitability should not erode just because it is switching its sales towards pension insurances and regulation has changed.

With an expected 4 percent market share, the number of Pannonia’s newly acquired pension insurance business may grow by as much as 9,000-10,000 policies p.a. in the coming years.

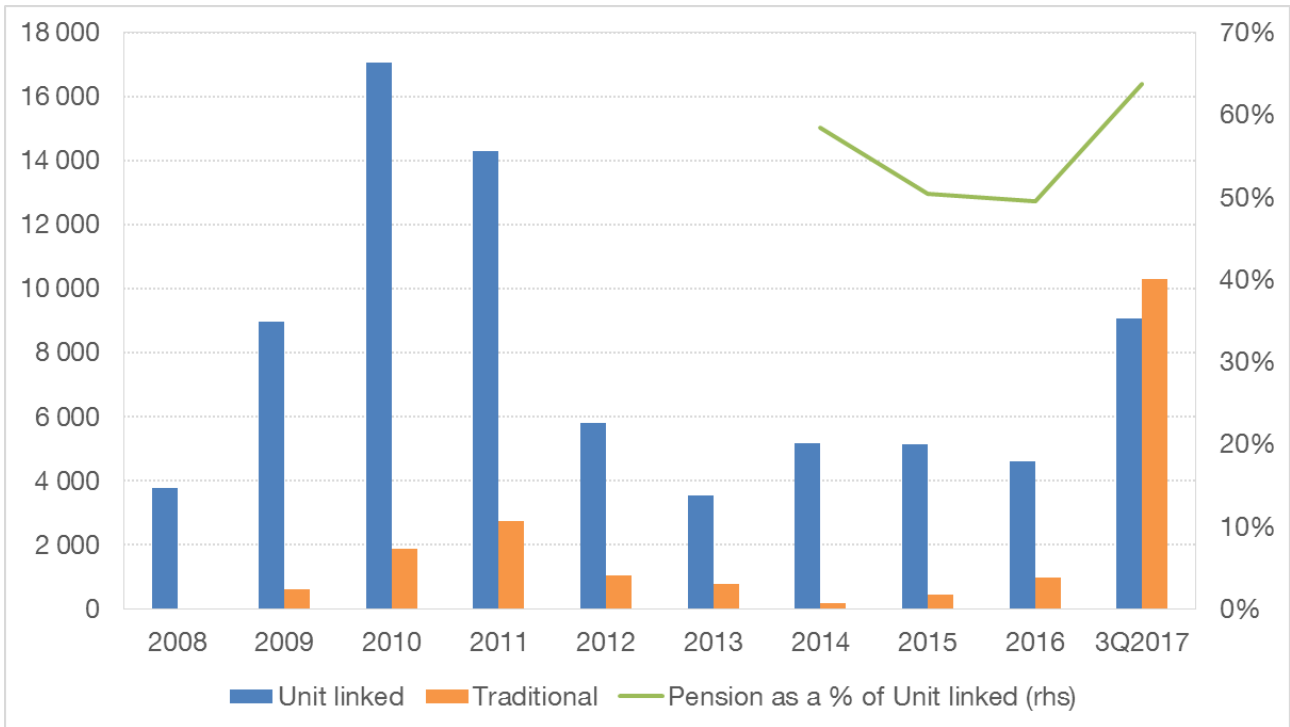
Figure 33 Number of Pannonia’s unit-linked life insurance policies



Source: Pannonia

Putting it all together, Pannonia's annual premium income may account for more than 60 percent of the number of new business unit-linked policies.

Figure 34 Number of Pannonia's new business unit linked life insurance policies



Source: Pannonia

APPENDIX II Insight into actuarial word

Insurance companies perform two kinds of activities: underwriting and investment activities. Insurers sell insurance policies through their underwriting operations (including determining the acceptability of risks, the coverage terms, and the premiums) and invest the accumulated funds and premiums in the public bond and stock markets. Therefore, an insurance company can be seen as having two kinds of portfolios: the insurance policies portfolio and the investment portfolio. The insurance portfolio is composed of all insurance lines in which the insurer writes policies. The investment portfolio consists of all invested assets.

The primary aim of the insurance companies is the spreading of risks. The target is to find homogenous groups of risks. It can be per products or per business lines or sometimes in one product there is useful to further splitting. Because the risks associated with different policies are not perfectly correlated, the total risk of a portfolio of policies is smaller than the sum of the policies' risks. In fact, because insurers accumulate substantial funds in conducting their business, they also diversify investment risks for their stakeholders by investing in diversified portfolios.

Insurance companies collect premiums in advance and pay losses over the time. Investment portfolio arises because of the lag between collection of premiums and payment of losses. In fact, insurers invest the loss reserves, unearned premium reserve and the capital. However, the capital is a less relevant source of investment relative to the reserves. Investing activities are particularly important for life and health (L&H) insurers; for many insurers, the spread between the return on investments and the interest cost of insurance liabilities is the primary source of income. Investment income is also significant for Property and Casualty (P&C) insurers. P&C insurers accumulate substantial funds due to the time gap between the receipt of premiums and payment of claims, and they invest and manage these funds to generate investment income. This income contributes to earnings and so affects the pricing of insurance policies.

The time gap between the receipt of premiums and payment of claims, which creates the so-called float, consists of four components. The first is the time interval between the receipt of premium and the occurrence of insured events. In most cases this component is relatively small, because the duration of P&C policies is usually short, six-months to a year (non-life insurance is typically renewable annually but in some rare cases they are longer than one year) and is reflected in the financial statements in the balance of the unearned premium liability. The other three components relate to the gap between the occurrence of insured events and the subsequent payments. Some insured losses are discovered many years after the event (e.g., exposure to asbestos), and in many cases the claim settlement process extends over several years (e.g., medical malpractice litigation). Also, in some cases insurance payments are made over extended periods of time (e.g., workers' compensation). These components of the float are reflected in the financial statements in the balance of the reserve for losses and loss adjustment expenses, which insurers are required to accrue when insured events occur. Accordingly, the first source of float is unearned premium, while technical provisions make up the other sources of float.

Insurers form reserves in order to be able to cover the expected obligations existing on the balance sheet date, and the fluctuations of claims, the expected insurance losses, as well as premiums not earned by service. Insurers are required to keep assets to pay off their future liability (reserves which are practically the present values of liabilities). The amount of reserves changes as life policies are aging, regardless of whether new policies are sold. From insurers' perspective, the reserve is a liability that will have to be paid when policyholders either die or surrender their insurance policy or when the insurance policy expires. Insurers shall from reserves to an extent that they provide a foreseeable cover, on the basis of reasonableness and the experience of insurance activities, to fulfill continuously and permanently the obligations arising from the risks not transferred to reinsurance. In case of life insurance, insurance reserves shall also be created for risks transferred to reinsurance.

Policyholders can cash out from the policy in three ways:

- surrender the policy and receive a the value of policy account as a refund
- take a loan for an amount that does not exceed the actual value of the policy account (temporary solution because the loan has to be repaid)
- leave cash in the contract until maturity

The change in unit-linked reserves reflects efficiency of selling efforts as well as "the quality" of life policies (i.e. how long regular premiums are received). **Changes in unit-linked reserves in insurers' P&L encompass the amount of fees paid for insurance services, releases in reserves upon insurance events or surrender, and gross yields earned on investment funds.**

Insurance reserves can be classified as it follows:

unearned reserves

mathematical reserves

thereof

reserves for life insurance

reserves for health insurance

reserves for accident insurance annuities

reserves for third party liability insurance annuities

reserves for outstanding claims, including

reserves for claims incurred and reported (RBNS), itemized reserves for pending claims

reserves for claims incurred but not yet reported (IBNR)

reserves for premium refunds depending on profit

reserves for premium refunds independent of profit

reserves for loss fluctuation

reserves for major losses (equalizing reserves)

reserves for lapses

other insurance reserves

There are two main types of P&C claim reserves:

- **RBNS**, which is a reserve for claims that have been reported to the insurer, but that have not been totally paid or settled by the end of the accounting period. Reported but not settled losses are calculated using an estimation of the severity of the claim based on the available information from the claims settlement process, together with related future claim settlement expenses. In the P&C segment, the RBNS (direct) claim reserve is supplemented with a reserve for the estimated, indirect claim settlements estimated by the consideration of the proportion of the claim direct (allocable) and indirect (based on previous years' average figure) costs and claim payments reported and settled in the reference year. On top of these Pannonia yet allocates an itemized regression reserve to the tune of the expected recover of regressable claims (e.g. a reserve for CASCO claims which can reasonably be expected to be recovered), and

- **IBNR**, which is a reserve for incurred but not yet reported losses and/or events that have taken place but have not yet been reported to the insurer. Since the insurer knows neither how many of these losses have occurred, nor the severity of each loss, IBNR is necessarily an estimate. The insurance company may decide to set up reserves to allocate funds to those expected losses. The sum of IBNR losses plus incurred losses provides an estimate of the total eventual liabilities for losses during a given period. There are numerous actuary methods (grossing up, link ratio, chain ladder, naive loss ratio, Bornhuetter-Ferguson and many forms of separation methods) which can be applied to estimate ultimate losses and loss reserves. As for Pannonia's non-life insurance segment, the IBNR reserve is 6% of the earned premium of the current year, with the exception of product-groups which cannot be compared to the average, in respect of the late claims. In case of products with less late claims - e.g. freight insurances - the IBNR reserve maximum is 2% of the earned premium. For estimation of IBNR Pannonia uses run-off triangles method sorted by time of the occurrence and the notification of the historical claim payments and the amount of the relating reserves, coupled with chain-ladder method. In case of CASCO IBNR, the reserve contains an additional 20% safety reserve to the originally estimated reserve. In case of business property and liability insurance the reserve's terminal run-off factor is corrected with their standard deviation, because of the short experience interval.

To put it simply, the reason for creating reserves for claims is twofold:

- lag in reporting of claims;
- lag in payment of claims.

The measure of lag is characteristic for products, for example the CASCO and accident products have usually higher speed run-off, while motor vehicle third party liability insurance (MTPL) and other liability products have usually slower run-off.

Cancellation reserves

Insurers create the so-called cancellation reserve that is applied to cover the contractual premium refunds (due to the risks of policy termination, reduction, or the temporary interruption), and hence the necessity to correct the amount of the written premiums and estimate the amount of the outstanding written premium receivables to be cancelled due to lapse of interest and non-payment (reserve for earned arrears, which accounts for c.20% of earned arrears).

Reserve for premium refunds dependent on profit

If the investment return on assets underlying the actuarial reserve exceeds the technical interest rate set forth in the product plan, at least 80 (or as in the terms and conditions of insurance policy, if its higher) percent of the surplus yield is due to policyholders. Crediting to the actuarial reserves are made once every calendar year. If this surplus yield has not yet been settled at the reporting date the insurer is obliged to increase the reserve for premium refunds dependent on profit according to the regulations. The reserve is calculated on an accumulative, retrospective basis.

Mathematical (actuarial) reserve

Mathematical reserve is actually a liability equal to the net present value of the future expected cash flows of future contingent events related to life policies (such as term insurance, endowments, pure endowments, accidental death, annuities, etc.). The size of mathematical reserves depends on the characteristics of the group of insured policyholders. Insurers define what sort of long-term insurance services they intend to provide to policyholders. They determine the cost of these services in advance and decide where to invest premiums for safety and capital preservation (usually in low risk investments), and then they reimburse premium once insured people pass away or live beyond a certain age or at the date of maturity. Actuarial principles should be conservative, to ensure that mathematical reserves prove adequate to cope with unexpected events that deviate significantly from what the insurer has modeled.

In Hungary, minimum 80 percent of extra yields (i.e. yield gained above the technical interest rate) on mathematical reserves must be reimbursed to policyholders in form of either in cash, or service, or waiver of premium, etc. (premium reimbursement rule). Pannonia reimburses 90 percent of extra yield to policyholders. The technical interest rate is used for the calculation of regular insurance premiums. In fact, the maximum technical interest, which is currently set at 2.9 percent in Hungary, is the interest rate with which the present value has to be calculated for an insurance policy's future obligations. As a precept, insurers must meet insurance services commitments (the technical interest rate serves as a minimum yield), even if the investment yield earned on premium reserves fall short of the guaranteed level.

The higher the technical rate offered, the lower the net insurance premium policyholders have to pay for insurance coverage, making it more attractive for policyholders. That could lead to abnormally high technical rate promises by insurers. However, it can easily occur that insurers fail to achieve as high yields as they had promised to deliver on. The difference between the offered technical interest rate and the factual yield achieved must be covered by insurers from their equity, which could cause bankruptcy in extreme cases. In order to avoid making unachievable promises, the market supervisor keeps a close eye on yields offered by insurers to policyholders and sets a maximum level for the technical interest rate.

When calculating insurance premium, insurers assume that healthy people will pay premium until the maturing of their policies, and that they keep on contributing to the amounts of death benefits of people with deteriorated health condition in the same risk community. Nevertheless, as evidence shows, policyholders, who present a low mortality risk to insurers, are more inclined to leave the risk community than those who carry more mortality risk. If this so-called adverse selection is suspected, insurers may need to charge higher prices to make up for the potential crowding out of demand from healthy individuals.

For a mature traditional life insurance company, the size of mathematical reserves is considerable. In contrast, the size of Pannonia's mathematical reserves is practically insignificant compared to the total amount of unit-linked reserves. This is primarily due to the fact that the ratio of traditional life products is low in Pannonia's policy portfolio.

Pannonia has limited risk exposure to future contingent event and is willing to take only minor risks (low probability means negligible impact) for a very short period (one month) when setting mortality charges. From an accounting point of view, Pannonia settles its life insurance services at the end of every month of the policy term, reimbursing premiums in cash amount in accordance with its internal reimbursement policies, and then it renews the contracts for another month. If reimbursed money is less or more than what has been received, the Company records mortality gains or losses.

For its products Pannonia uses the so-called gross reserve-allocation method in respect to the actuarial reserve. In practice this means that Pannonia creates net actuarial reserves covering insurance payouts in

the future and cost reserves covering expected costs per policy and per risk on an aggregate basis, whilst recognizing them per product type. This aggregate method means that – if cost reserves or any part thereof are negative – the gross actuarial reserve could be lower than the net actuarial reserve. A component of cost reserves can be negative if the expected cost coverage is greater than the expected costs. For prudential reasons, since future cost coverage is uncertain Pannonia does not allocate a negative gross actuarial reserve per policy or per risk, but instead reduces the values of positive cost reserves by any negative cost reserves and nets actuarial reserves down to zero at most.

Unit-linked premium reserves

Unit-linked premium reserves are the total amount of premiums paid by the policyholders supplemented by credited yields but reduced by costs. Unit-linked reserves are measured based on the underlying net asset value of the unitized investment funds on a continuous basis.

Both mathematical and unit-linked reserves are known as premium reserves. Despite the fact that both are considered as premium reserves, there is a difference between them due to the extra yield reimbursement rule applied to mathematical reserves, and also due to the fact that the size of mathematical reserves is determined by insurers, whereas the size of unit-linked reserves depends mostly on policyholder's decisions (in respect to investment funds offered by insurers and the early withdrawal of funds from an insurance contract). The extra yield reimbursement rule means in practice that insurers provide additional services in return for a given amount of premium paid by policyholders.

The market supervisor for insurance associations stipulates that insurers must hold reserves in the event of cancellation. Typically, the cancellation reserve creates a balance between paid and written premiums. As was mentioned above, a life insurance policy comes in force at its inception date, which is the date when the first written premium is received, meaning that there is no risk related to the collection of the first written premium. However, collection of future premiums can be at risk. If insurers do not set aside a portion of written premiums as reserves (provisions) in the event of a cancellation, and instead recording it all as income and distributing it as dividends, mass cancellations could cause negative results and potentially drag the insurers' capital under required regulatory levels. Consequently, insurers would be forced to address their capital deficiency issue or file for bankruptcy. When written premiums are paid in full, the cancellation reserve can be released and disbursed as income to insurers' shareholders. Usually, insurance companies wait patiently for premiums three to four months after they fall due before cancelling contracts (respite period after the premium payment date), and record unpaid premiums as negative written premiums. In extreme cases, all due written premiums can be negative for a given period.

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Unearned premium reserve (UPR)

UPR is a fund established at the end of any accounting period. UPR contains a portion of written premiums that has been paid in advance for insurance, which in turn has not yet been provided. In other words, premiums cannot be considered as earned by insurers until the insurance coverage has been provided. For example, if a policyholder pays an annual premium of EUR 1000 on January 1, EUR 500 can be recorded as earned premium at the end of June, and the remainder of premium would be regarded as unearned premium and put aside as UPR.

Concerning non-life insurance, if either party initiates cancellation of the policy contract, insurers must have the unearned premium ready to be refunded. In respect to unit-linked life insurance policies, premiums are allocated into unit-linked reserves (after cost deductions). Since insurers allocate unit-linked life insurance reserves from top-ups and regular premium payments, the unearned premium reserve is only allocated to

cover risks for certain periods. If unit-linked policies are cancelled for whatever reason, insurers refund the actual value of unit-linked reserves to policyholders. As regards to traditional life policies, insurers put aside reserves for the entire premium written.

Reserve for premium refunds independent of profit

Insurers undertake a conditional premium refund, a reserve for premium refunds independent of profit is allocated to cover the amount of the expected premium refund. Profit, if occurs for example because of a lower-than-expected claim ratio, is refunded directly to the policyholder. In order to attract and retain policyholders until linked life insurance contracts often contain a premium refund component (e.g. loyalty bonus benefits, no claims or low claims). Although, it is usually the policyholder who loses when the insurance contract is surrendered, cancellation of the contract is not a desired option for the insurer considering that the larger the reserve being accumulated over the years, the higher the asset management fees, everything else being equal. Insurance companies therefore provide policyholders with a loyalty bonus, which is an extra benefit to policyholders aimed at keeping insurance policies in force throughout the entire policy term. In the case of unit-linked life insurance policies the benefit is calculated as a percentage of initial annual premiums and paid either at the date of policy maturity along with other maturity benefits or at regular intervals, say, every 3 or 5 years. So, the benefit computation and eligibility criteria could differ from insurers to insurers and from policy to policy. Usually, policyholders have to at least hold insurance policies for five years to become eligible for a loyalty reward. In fact, the loyalty bonus benefits can be considered as a series of endowments policies with growing payments.

Insurers take into account the initial premium of the policy, the number of days from the start of the contract, product/bonus combination depending on reserve policy, and the expected probability of losing the right of the benefit, when allocating the reserve for policies entitled to a loyalty bonus. Reserve allocation is only done when cost coverage can be deductible from premiums (taking into account that due premiums may not be realized steadily during the policy term). The reserve for premium refunds independent of profit covers bonus refunds to policyholder on the due date of loyalty benefits.

Pannonia applies a loyalty bonus allocation scheme (for regular premium only) as indicated in the accompanying table. The applicable loyalty bonus rates are guaranteed in the insurance contracts, and they are determined at Pannonia's absolute discretion.

Insurance carriers' profitability

P&C insurance contracts usually involve greater uncertainty than L&H insurance contracts because both the frequency and magnitude of PC claims are more volatile than L&H claims. P&C losses are highly sensitive to disastrous events (such as hurricanes, earthquakes and terrorism acts). In addition, the required payment for P&C insurance claims depends on the insured's loss (subject to limits), while for LH insurance it is often the face value of the policy. The primary liabilities of L&H insurers are the liability for future policyholder benefits and policyholder account balances. Interest cost is accrued on both liabilities, although for future policyholder benefits it is included in the benefits expense.

Because P&C reserves involve greater uncertainty than L&H liabilities, P&C insurers hold larger equity cushions and generally invest in less risky assets compared to L&H insurers. They also reinsure significant portions of their exposure, issue insurance-linked securities, and arrange contingent capital facilities. In addition, because the timing of P&C claim payments is less predictable and generally nearer than that of L&H benefit payments, P&C insurers invest in more liquid and shorter maturity (and therefore less interest rate sensitive) assets, particularly less risky government bonds. In contrast, L&H insurers often invest significant amounts in long term mortgages and risky securities.

In this context, the expected return on equity for a multi-line insurance carrier can be established through the portfolio approach, as follows:

$$R_k = \sum_{j=1}^m d_j \mu_j + \sum_{i=1}^n c_i R_i$$

where,

R_k = expected rate of return on equity;

R_i = expected rate of return on the i th investment, for $i= 1$ to n ;

μ_j = expected underwriting return on the j th insurance product, for $j= 1$ to m ;

P_j = premiums earned on the j th insurance product;

$d_j = P_j/K$ = premiums earned on the j th insurance product-to equity ratio;

A_i = investment in the i th asset;

$c_i = A_i/K$ = investment in the i th asset-to equity ratio;

K = equity

m

$\sum_{j=1}^m d_j \mu_j$ = the underwriting profit per unit of equity earned in the insurance portfolio

$j=1$

n

$\sum_{i=1}^n c_i R_i$ = the return per unit of equity earned in the investment portfolio

$i=1$

In case of life insurance products it is more realistic to calculate a return on equity based on the existing portfolio. As for new businesses, IRR, NPV or Economic Profit Calculation (RONIC>WACC) are the most advisable approaches to measure value creation. New business margin is equal to $\sum PV (CF \text{ to firm}) / \sum PV (\text{total revenue})$.

There are three main sources of profit before tax in a given fiscal year:

- technical result (incl. current year technical result and run-off result),
- reserves (usually equity of 3x = float), and
- investment income on own equity (technical results are low in the P&C sector in the long term for fierce competition)

The insurer's gross premium is used to cover the operating costs and dividend distributed to shareholders over time. Net premium covers the net expenses of claims borne by the insurer.

Constituents of P&C insurer's technical result:

+ Net earned premium (NEP = Gross earned premium less ceded reinsurance premium less changes in unearned premiums less share of ceded reinsurance of unearned premiums reserves:

NEP = GWP – PReIns + (UPR0 – UPR1) – (UPRReins0 – UPRreins1), where UPR is the unearned premiums reserves):

where d is the premium due to payment frequency; T is the duration of the payment which continues into next year and K is the duration till date of year-closure.

–Claims for the current year (Claim_{new})

– Reserves for claims incurred in the current year (RES_{new}):

- RBNS,
- IBNR, and
- annuity (paid permanently on events, e.g. accident, insured by MTPL)

All three reduced by the expected amount of reinsurance share of paid claims and increased by the expected claim settlement expenses.

- + Actual amount of reinsurance share of paid claim (ReinsSh)
- Expenses (Exp) except for claim settlement expenses of incurred in the previous years (ClaimExpprev)
- + Commissions paid by the reinsurer (CommReins)

Written in a formula:

$$RC = NP - \text{Claimnew} + \text{ReinsSh} - \text{RESnew} - \text{Exp} - \text{ClaimExpprev} + \text{CommReins}$$

Reserve for expected losses

Reserve for expected losses is a separate type of other technical provisions which is used to cover a highly probable future loss for one or more loss-making insurance products (backed or not by reinsurance) which cannot or can only be terminated in a later period due to outstanding contractual obligations. The magnitude of the expected loss, taking also into account the fees related to the products, shall be established based on data of at least two years of existence of the relevant insurance product, and any loss and expense incurred up to maturity of the relevant contracts. The reserve shall be determined annually on the balance sheet date, taking into account the information available up to the balance sheet date. In fact, the reserve is equal to the amount of losses which are expected on top of losses already covered by other technical reserves, and created for the unearned part of the written premiums on the relevant loss-making insurance products. Any significant increase in the amount of the could push the combined ratio can above 100%.

Combined ratio

One of the most important measures of the insurer's operating profitability is the combined ratio which is calculated by taking the sum of incurred losses and expenses and then dividing them by net earned premium. The ratio is typically expressed as a percentage. A combined ratio below 100% indicates that the insurance carrier is making underwriting profit while a ratio above 100% means that it is paying out more money in claims and expenses that it is receiving from premiums. However, even if the combined ratio is above 100%, the insurer can potentially still make a pre-tax profit by generating a sufficient amount of income on investments.

A combined ratio below 100 percent represents a measure of efficient underwriting activity, while a ratio above 100 percent may reflect a failure to earn sufficient premiums to cover expected claims and overhead expenses. High ratios can usually occur either because of inappropriate policy pricing or because of unexpected high claims (surrenders). Also causing a high combined ratio is the squandering of financial resources on expensive operation – in line with increasing reserves of written premiums, life insurers can earn more investment results, whereby they can afford running their business at higher costs. High combined ratio may also be the sign of a very competitive insurance environment – e.g. the motor vehicles liability insurance segment in Hungary.

Combined ratio: (losses + expenses) / net earned premium

=> if losses (claims) and operating expenses are reasonably low (meaning no technical loss occurs), the insurer can use premium income to invest virtually at a zero funding cost.

Claim ratio = (incurred claims/losses for the current year – reinsurance share of paid claims+ reserves for claims for the current year + expected expenses of claims settlement) / net earned premium;

The claim ratio gives insight into the percentage of premium is being used to settle claims. The lower the expense ratio the higher the profit the insurer can earn on insurance policies. Higher loss ratios may indicate that an insurer may need better risk management to guard against future possible claims. The claim ratio can be high because of the large number of surrenders, as it has in fact been the case with Pannonia for many years.

Expenses ratio = (incurred expenses – expected costs of claims settlement in the previous year – commission paid by the reinsurer – expected expenses of claims settlement in the current year) / net earned premium. The lower the expense ratio, the more profits to the insurer.

Another important measure of the insurer’s profitability is the run-off results on claim reserves. The run-off results at the end of a given year can be described as it follows:

$$RO2 = (IBNR1 + RBNS1) - IBNRprev2 + RBNSprev2 - \Delta Paidprev - ClaimExpprev + ReinsSh, \text{ where}$$

RBNS1, IBNR1 and RBNS2, IBNR2 reflect the claims provisions at the beginning and end of the year respectively. IBNR2 and RBNS2 are split in two; the part regarding the newest underwriting year, IBNRnew2, RBNSnew2, and the part regarding the previous underwriting years, RBNSprev2, IBNRprev2, such that

$$RBNSnew2 + RBNSprev2 = RBNS2 \text{ and } IBNRnew2 + IBNRprev2 = IBNR2,$$

and $\Delta Paidprev$ is the payments related to the previous underwriting years.

In the life segment the run-off result is usually not significant.

Life insurance

The profit and loss account of a life insurance company primarily selling unit-linked products starts with premium income, but it is far from what the income insurers’ shareholders are entitled to. Policyholders of unit-linked life insurance products pay an agreed sum for the unit-linked insurance to the insurance company, as a regular premium, or in one lump sum. These payments cover the life insurance component as well as the investment, administrative costs, contracting fee and the commissions.

Indeed, deductions from premiums paid by policyholders and investment gains earned on claim and premium reserves represent the effective source of income that can be used to cover insurer’s operating costs and distributed to shareholders over time.

After the introduction of the concept of ethical life insurance, calculation of the account value of policyholders has become simpler.

Table 14 Cash flows from a typical 15-year unit-linked insurance policy of Pannonia under new regulation

Year	Premium	Mortality risk fee	Admin fees	Gross account value (bop)	Invested premium	Asset management fee	Return	Gross account value (eop)
1	300 000	2 250	232 245	0	65 505	1 258	1 844	66 091
2	300 000	2 085	141 000	66 091	156 915	4 282	6 277	225 002
3	300 000	1 687	54 000	225 002	244 313	9 011	13 211	473 514
4	300 000	1 066	54 000	473 514	244 934	13 794	20 224	724 878
5	300 000	438	54 000	724 878	245 562	18 632	27 317	979 124
6	300 000	0	54 000	979 124	246 000	23 522	34 486	1 236 088
7	300 000	0	0	1 236 088	300 000	29 493	43 239	1 759 834
8	300 000	0	0	1 759 834	300 000	18 950	58 573	2 099 457
9	300 000	0	0	2 099 457	300 000	22 075	68 231	2 445 613
10	300 000	0	0	2 445 613	300 000	25 260	78 074	2 798 427
11	300 000	0	0	2 798 427	300 000	28 506	88 107	3 158 029
12	300 000	0	0	3 158 029	300 000	31 814	98 332	3 524 547
13	300 000	0	0	3 524 547	300 000	35 186	108 755	3 898 116
14	300 000	0	0	3 898 116	300 000	38 623	119 377	4 278 871
15	300 000	0	0	4 278 871	300 000	42 126	130 205	4 666 950

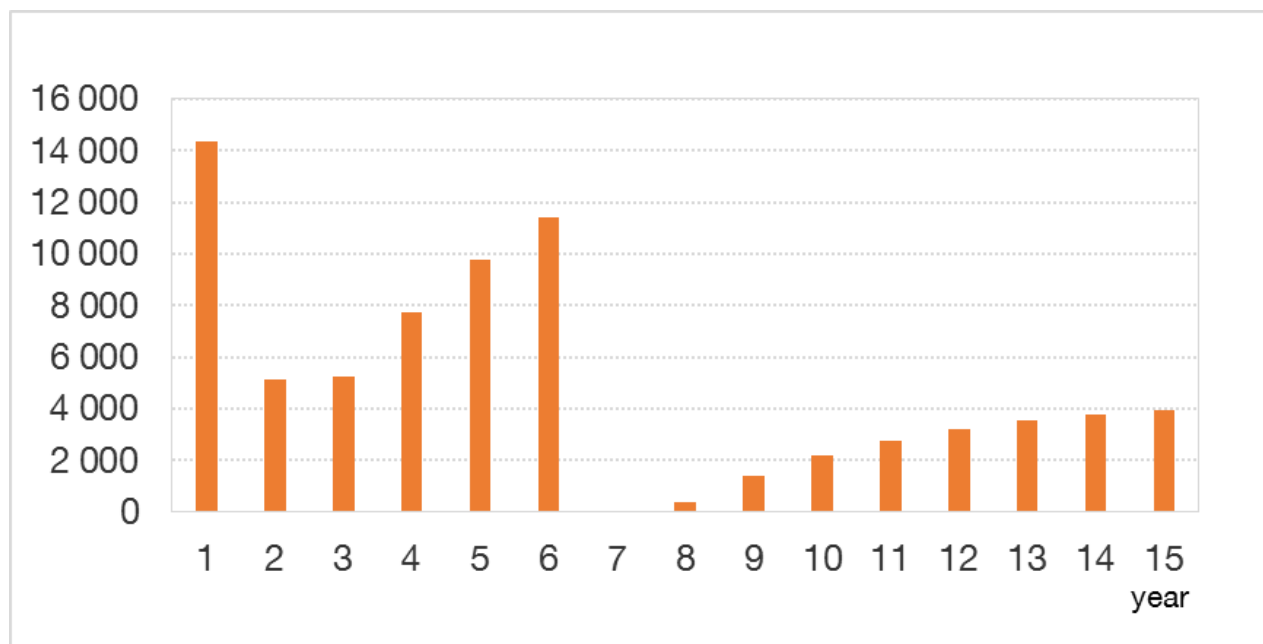
Source: Concorde

Assumptions:

- Annual premium: HUF 300,000 (EUR 955)
- Guaranteed death fee (in the first five policy years): HUF 900,000
- Admin fees: 78% (in 1. year), 47% (in 2. year) and 18%(in the 3., 4. 5., 6. years)
- Management fee: 1.92% in the first seven years, and 0.92% thereafter
- Bonus payment to the policyholder: 70 percent of the amount of the first-year premium paid at the end of the 7. policy year should the policy is still in force and all due payments were made in time
- 15-year risk free rate: 2.87 percent
- Lapse rate: c.15% in the first policy rate and c.10 percent thereafter

- Death rate: 0.25 percent p.a.
- ACR w/o tax credits (official method): 2.42%
- New business margin (PV of probability weighted annual net income in 15 years): 21 percent

Figure 35 Probability weighted technical results from a typical 15-year unit-linked insurance policy (HUF)



Source: Concorde

Stochastic technical results can be calculated as:

- + Premium paid
- change in the value of policy account
- commission
- + crawl-backs of commission
- + DAC
- claims
- OpEX
- + return on investments
- change in bonus reserves

We note that insurers create reserves not only for bonuses paid to the policyholders but also for stochastic renewal commissions. When asset management fees decline, insurers feel the need to trim commissions. When claims are paid, reserves for unit-linked premiums are relieved accordingly. The real risk to the insurer's profit is not the change in reserves but the operational risk (mortality, lapse, opex).

As the vast majority of Pannonia's life insurance policies was issued before the introduction of the concept of ethical life insurance we think it is useful to provide insight into actuarial funding related to them.

Before new regulation came into force as of 1 January, 2017 premiums paid by policyholders are first reduced by initial charges to cover acquisition costs and overhead expenses. The remaining portion of premiums (net of costs) is invested in funds (e.g. mutual funds) by converting it into units based upon the NAV of the funds on the date. Mortality and fund management fees, and a few other charges are also deducted at regular intervals by way of cancellation of units from the invested funds.

From the point of view of policyholders, a certain portion of premium paid covers the risk-bearing that life insurance companies provide to them. The remaining portion of premiums, after deducting the incurred costs, covers the savings element of life (unit-linked) policies, which therefore belong to policyholders and cannot be considered as cash flows attributable to insurers' shareholders. In the case of life insurance companies, which primarily sell unit-linked products and limit the scope of claims, the risk-bearing element of the

insurance business is negligible. This is simply because policyholders ultimately bear the risk of investing. They have the option to sort out funds from an assortment of investment funds insurance companies have to offer to them. Policyholders can switch between funds without the necessity to opt out of their insurance policies, though they should bear the consequences of their investment decisions.

Before going further, it is necessary to classify premium incomes that we will refer to henceforth. Actually, a proper interpretation of life insurance companies' financial statements should start with understanding the differences between the types of premium incomes. To this end, we distinguish below four main types of premium income categories:

Gross annualized premium (stock at a given moment) is equivalent to the total amount of money policyholders should pay during a year to have insurance:

the number of life policies in force multiplied by the annual amount of premiums assessed for life policies in force

In fact, this is a fictitious income, as it almost never occurs that all premiums, which have fallen due, are paid for in-force life insurance policies at the same time. This type of premium is rather used in the insurance industry to allow comparisons of the size of new businesses sold in a specific period by insurance companies, and as an input to measure profitability of a life insurance product (e.g. in a way of dividing annual reported operating results by gross annualized premium). In other words, the function of gross annualized premium is to construct a clear picture of how much income life insurance companies could earn from in-force policies at a given moment.

A policy is considered "in-force" during the entire time between the inception date and the maturity or cancellation date, or the event triggered date (e.g. on accidental death).

Written premium is a flow determined for a specific period of time and refers to the amount of premiums policyholders are required to pay for insurance policies during the accounting period. Expressed in a simpler way, written premium is the premium charged (or to be charged) for a policy or a group of policies. This assumes that insurance policies have already been issued, i.e. the underwriting process has successfully been completed. Written premiums may be measured as a gross number (before reinsurance) or on a net basis (after reinsurance).

Written premium is commonly used as a measure of business growth. Understanding the components of written premium is necessary to evaluate growth correctly. Written premium is a constituent of total operating income that life insurance companies report during their accounting period. Practically speaking, it is the premium which is billed by insurers when premium falls due. Billed premium (premiums receivable), which is later determined to be uncollectible, may be written off. Another possibility might be to reflect uncollectible premium as negative premium.

Paid premium is the amount (flow) of premiums that insurers collect from insurance policies at a given time. This is a payment which is actually made by policyholders to insurers for insurance coverage. Paid premium is also reflected therefore in insurers' cash flow statements prepared for the accounting period. Paid premium means cash inflow that enables insurers to continue as a going concern. It is the primary source of insurer's revenue, whereby they can cover operational costs and create technical reserves (claim and premium reserves) to meet obligations associated with life insurances, as those come due, without substantial asset sales or restructurings.

As it is seen, the principal source of revenue for life insurance companies is premium from insurance sales and investment income. The timing of when life insurance companies can recognize premium income in their income statement is a major issue of the premium accounting.

For insurance, there are several possibilities for determining when policy premium can be recognized as income:

- when the insurance contract is signed
- when the premium is due from the policyholder
- when the premium is received
- when the insurance policy becomes effective

Many life insurance accounting systems recognize premium as revenue when premium falls due. The policy comes into effect when the first written premium is received and the underwriting process is successfully concluded. The first premium is due at the inception date. This is the date when insurer's risk bearing related to policies starts (i.e. the risk commencement date) retrospectively from the contract signing date. The amount of the first written premium is based on payment frequency (annually, semi-annually, quarterly or monthly) chosen by the policyholders when the insurance contract is signed.

Earned premium is the portion of a policy's premium that applies to the expired portion of the insurance policy. Although insurance premiums are often paid in advance, insurers typically earn premiums at an even rate throughout the policy term. The unearned portion of the premium is kept in the unearned premium reserve (see unearned premium reserve definition).

The basic accounting principle for life insurance is to match income with expenses in a sense that premium income and all expenses that are directly related to obtaining premium must be recorded in insurers' books for the same accounting period, even though premium and associated costs and claims may occur at different times.

Associated costs are the expenses that are related directly to selling (commissions, underwriting costs) and servicing policies (e.g. labor and other general operating expenses). Financial costs are related to reinsurance, debt and hybrid capitals.

The major cost component associated with the issuance of a life insurance policy is acquisition costs (i.e. agent commission), which ranges between 100% and 130% of the amount of the first gross annualized premium in the case of insurance policies with long maturity. In general, commissions are larger for long-term policies than for short-term policies. Because of early expensing of commissions (usually in the first two years of the policy term), fast growing insurer companies may appear less profitable, as has been seen in case of Pannonia insofar. **According to new commission regulation in Hungary, acquisition-related commission paid in the first year must not be more than the amount equivalent to the 14-month cumulative sum of the first gross annualized premium. Commission paid in the second year cannot exceed the amount of premium paid by the policyholder. Commission paid upon acquisitions will be reduced to 13-month of cumulative sum of the first gross annualized premium in 2018 and to 12-month of cumulative sum of the first gross annualized premium in 2019.**

In the case paid commission is in excess of 100% of earned premium and/or first gross annualized premium, there is always a greater risk of default. Indeed, if insurance policies terminate for whatever reason before client acquisition costs are fully recovered, insurers have to cover the unrecoverable portion of commission from their own equity, which in extreme cases could lead to capital deficiency. As evidence shows, commissions rise as long as the insurance market is overwhelmingly dominated by independent agents (as was evidently the case in Hungary before the financial crisis). That said, insurers struggle to make it indifferent for themselves from an earnings perspective whether the insurance contracts are surrendered in the first two years of the policy term, or not. To this end, insurers are wittingly and intentionally punishing early surrender by claw-backs. To put it another way, insurers' purpose of applying claw-back policies is to immunize themselves against the harmful impact of hectic behavior of policyholders on their profitability. They instigate insurance agents by negative incentives (i.e. claw-backs) to acquire "good quality" clients. When it comes to the issue of prudent insurance business conduct, it is also the responsibility of market supervisors to keep tight control over the level of commission paid to agents. Implementing a systems-based approach is essential for the life insurance industry's safe operations.

Typically, commissions incur at the inception date of the insurance policy (at the issuance date), while premium is generated later. Initial outlays (commission, operating expenses, changes in reserves, etc.) have an immediate negative impact on life insurers' liquidity position (new business strain). Profitability and solvency could also come under pressure from high initial costs as time goes by, even if insurance policies are deemed to become profitable at their inception date. As a result, despite all efforts that have been made, insurers' solvency and capitalization may worsen. The financial market supervisor therefore allows insurers to recover costs, which are directly associated with generating premium, by charging premium, believing that future income (premiums, investment income, etc.) may cover the initial outgoings. Under this accounting approach, cost recovery is a function of how the market supervisor assesses life insurers' liquidity position.

Break-even point should be reached within a couple of years from the start. Life insurers struggle hard to break even within five to seven years from scratch. This is usually the period over which a start-up insurer can build a viable business, whereby turning a profit on its insurance activity. Broadly speaking, the break even point designates a level where premiums arising from existing life policies cover acquisition costs of newly sold policies, overhead expenses and losses occurred and deferred in the early years of operation. As soon as insurers have reached a critical size of reserves (the managed funds of paid premiums), their existing policy portfolio becomes large enough to generate sufficient cash flows (e.g. in the form of asset management fees) to finance new business acquisitions on their own. As a result, there might be less need for reinsurance sources. In short, with growing reserves, asset management fees will contribute increasingly to insurers' profits as time goes by.

In order to sustain growth and maintain the ability to invest in growth, insurers need to become profitable as soon as they can. To this end, insurers strive, by any means, to establish an efficient operation. Efficient operation requires considerable economies of scale generated by business volume. Growth therefore is of

paramount importance for life insurance firms. Without growth, life insurers may not reach business volume necessary to ensure the collective pooling of insurance risks under the law of large numbers upon which insurance operation primarily relies.

Ultimately, growth can be traced back to two fundamentals: i) how much capital the insurers are willing to invest in new businesses, and what returns these businesses are making for them. However, growth should not merely be centered solely on boosting written premiums generated in a specific period of time. For a life insurance company, it is always advisable to have a sufficiently large number of policyholders (portfolio) by selecting diversified and independent risks that are fairly uniform in size in order to be able to spread risks, thereby predicting potential losses thereon with reasonable accuracy by the law of averages.

When expanding their businesses insurers need considerable financial resources and expertise. However, the ability to grow is not enough to be competitive. Business must expand in the most expedient manner possible using financial and human resources efficiently. In a highly competitive and full-fledged industry where products and services are fairly homogenous and innovations are copied shortly after their introduction, insurers' profitability depends mostly on cost efficiency, distribution and the quality of their services and clientele.

The premium-to-surplus ratio (earned premiums-to-capital surplus) is a metric used in property and casualty insurance to gauge the insurer's ability to write new insurance policies and absorb above-average losses. This is the amount available for the insurer to meet future obligations; that is the excess of insurers' assets above its legal obligations to meet the benefits (liabilities) payable to the policyholders. Put simple, the ratio measures how the insurer is leveraged by liabilities, thus it can be a sign of financial strength, with a lower ratio generally indicating better financial health. More precisely, a low surplus ratio means that the insurer is likely to weather any significant unforeseen adverse development in the losses it is assuming. In contrast, a high premium-to-surplus ratio is an indication that the insurer is already writing premiums at a full capacity; so writing more may place the insurer's solvency in jeopardy. Here the premium is serving the role of measuring the risk the insurer has taken on, while the amount of surplus is available to support that risk. There is a rule of thumb which considers a 2:1 ratio as conservative, and a 3:1 or 4:1 ratio as still safe, but beyond that caution should be taken.

Return-on-revenues is designated to measure insurers' profitability, as it clearly indicates the level of profits after all expenses and taxes are paid. Total revenues encompass premiums and investment income.

Return on revenues = net operating income (after overhead expenses) / total revenues

Return on assets, calculated in a way of dividing net operating income by the average amount of assets, is also a metric of profitability as it shows the profitability on existing investment securities and premiums. The higher the return on assets the more insurers yield on existing liquid assets.

Return on assets = net operating income / average assets

Return on equity indicates the net profits that can be returned to shareholders. The higher the return on equity, the more profitable an insurer has become and the higher the possibility of dividend payments to shareholders, everything else being equal; while there is no need to put up more capital for business expansion or solvency.

Return on equity = net income (less preferred stock dividends) / average common equity

In fact, ROE is a measure of the profitability of the risks written. It is often used to assess how well underwriting is doing in bringing on the "right mix" of business lines (low risk appetite entails accepting a low ROE; while higher risk appetite expects to get a higher ROE to be compensated for the chance of losing the surplus), given the level of operating costs and leverage.

The regulatory capital adequacy ratio is a metric used to determine whether the insurer can stay solvent (see details in the chapter of "Capital requirements"). The ratio measures the size of the insurer's solvency capital relative to the amount of available capital.

As a general principle, the required capital should be large enough to meet not only the regulatory requirements, but also the *internally set* objectives. The internal objectives could be based on an internal risk assessment and/or on the amount of capital required for obtaining a targeted credit rating, for example.

Investment yield reflects the return received on the insurer's assets. The investment yield is calculated by dividing the average investment assets (reserves) into the net investment income before income taxes. Investment income does not include gains on own capital, which we rather record as financial income.

Investment yield = net investment income / average investment assets (reserves)

Introduction to insurance economics for life insurance policies issued before new regulation

There are some useful things that are worth being aware of before drilling down into the analysis of life insurance companies' operation:

Life insurance companies have two principal services: risk bearing/pooling and intermediation services. The business model is to collect more in premium and investment income than is paid out in losses along with offering a competitive price that customers are willing to accept.

Life policies are legal contracts between insurers and entities that specify what insurers are required to cover and any benefits the insured entity (e.g. policyholders) are entitled to. Life insurance provide either pure risk protection (e.g. term life policies), or a mix of risk protection and intermediation services (e.g. unit-linked or whole life policies). Life insurance policies are usually long-term contracts where the policyholder pays a premium to be covered against a possible future event (e.g. the death of the policyholder), combined with the option to invest in any number of qualified investments, such as stocks, bonds or mutual funds (unit-linked, pension savings products).

The life insurance companies determine the policy prices with intent to fund benefits/claims and overhead expenses, while making profits. Profit on insurance products can be reduced to a simple equation:

- Accounting net profit = earned premium + investment income - incurred loss – commissions - operating (underwriting) expenses + other items (other incomes, one-offs, yield on own equity, etc.) – change in reserves –taxes

To put it simply, future income for the life insurance company consists of premiums paid by policyholders, whilst future outgo comprises claims paid to policyholders as well as various expenses. The difference, combined with income (asset management fees) on and release of premium reserves, represents insurers' future profit.

Life insurers make profits in two main ways:

- Through underwriting, the process by which insurers select the risks to insure and decide how much in premiums to charge for accepting those risks
- By investing the premiums they collect from insured parties

Their operating activity includes selling new insurance policies and servicing existing policies. Operating results are comprised of four main components:

- **1. Mortality result** arises from the fact that the ultimate service costs can eventually be less than the amount of mortality fees policyholders are charged by during the policy term.

Life insurance is based on the concept of pooling risk exposures into a group, accumulating a fund through premiums received from the members of the group, and paying out the losses of those who die from this fund. In this manner, life insurance involves the group sharing of individual losses, i.e. the individual transfers the risk of dying to the pool by paying the premiums. To set premium rates, insurers must be able to calculate the probability of death at various ages among policyholders, based on pooling. To wit, they need a large group of risk community members to collect enough premiums to cover mortality costs (the cost of claims).

The mortality result can be negative when the insurance company inaccurately measures the expected expenditures, whereby the costs related to insurance policies will be higher than the amount of accumulated premiums paid by policyholders (bankruptcy). Theoretically, if an insurer has only one insuree who dies, the relatively small mortality fee does not cover the relatively high amount of claims (i.e. the mortality result is very negative). In contrast, if the insuree does not die until the expiry of the contract, the insurer can book the full mortality fee as a result (i.e. the mortality result would be very high).

In the case of life insurances, it is typical that the level of premium payments is fixed for a longer term, while the amount of premium reserve grows gradually over time. The mortality result is therefore usually positive in the early years of the policy term and negative in the later years. To balance mortality results in time, insurance companies create technical reserves. Changes in technical reserves should ensure a zero mortality result.

Mortality result = mortality fees – paid benefit* – Δ technical reserves due to mortality

* Benefits mean payments by insurers on the happening of an insurance event

If all calculations and assumptions prove correct, the mortality result is zero. If the outcome is worse than expected, the mortality result is negative, otherwise it is positive. Reinsurance can impact mortality results in either way.

As far as Pannonia is concerned, 99% of claims are related to its unit-linked contracts, within which 95% of claims paid in 2013 were related to partial (i.e. withdrawal of one-off payments) and full surrender vs. more than 96% in 2012, while payments upon death accounted for 5% of total claims paid (vs. 3% in 2012). Payout upon death is the higher of either three times the amount of gross annualized premium or the face value of the regular premium account at any point in time. **The amount at risk for Pannonia is the difference between the amount of the policyholder account (the amount of the regular premium reserve) and claims paid upon death.**

2. Surrender result is obtained by early surrender when only a fraction of premium reserves are reimbursed to policyholders.

Surrender result* = premium reserve released – claims

**based on surrender rates set arbitrarily by insurers as competition allows it*

When policyholders surrender their insurance policies within the first year, insurers reverse commissions paid previously to agents. Depending on particular insurance contract, claw-backs may be immediately withdrawn from agent's bank account, or listed as a deduction on future commission.

- **3. Result on expenses** occurs when costs charged on an insurance policy turns out to be lower than expected. Costs can be more than projected when for instance underwriting expenses (e.g. client acquisition costs) grow rapidly driven by fierce competition. Cost inefficiency, off the back of it, is pernicious to profits and results in either lower dividends or lower funds to finance business, which can ultimately manifest itself in lower than potentially achievable growth for the insurance company. Broadly speaking, cost awareness is an essential driver of insurers' profitability. Overall, insurers are expected to generate a negative result on expenses in the early years of their operation, while they can usually reach positive numbers as they become mature.

Result on expenses = expense coverage (loading) – outgoings (costs) incurred

Loading is an amount that is built in to the insurance cost. This amount covers the operating cost of the insurer, as well as the chance that the insurer's losses for a period will be higher than anticipated. This is added to the amount required to cover losses, known as the pure insurance cost.

In other words, results on expenses are the part of written premium which are not put aside as premium reserve.

Expenses coverage = written premium – Δ premium reserve due to premiums

In case of life insurances, it is typical that costs incur at the beginning of services, while expense coverage builds up gradually over time. Consequently, results on expenses would rather be negative in the early years of the policy term, and positive in the later years. Insurance companies are allowed to defer acquisition costs (DAC) to reconcile their accounting with the actual date of outlays, thereby they can manage their equity position properly. Results on expenses are correctly expressed as it follows:

Results on expenses = expenses coverage – incurred costs + Δ DAC

or even more precisely:

- + front-end loadings (admin and allocation costs)
- + back-end loadings*
- commissions
- OpEx
- + Δ DAC
- = Result on expenses

* i.e. the difference of formal initial unit premium account and actual initial unit premium reserve (see a detailed definition of these components in the "Modeling" chapter)

The sum of admin and allocation costs together with the balance of the so-called formal initial unit premium account and actual initial unit premium reserve should cover commissions and OpEx. Obviously, premium reserves could be larger without these costs.

Unfortunately, admin and allocation costs are not explicitly displayed in insurers' P&L statements and should be treated with caution when using them for major financial decisions. Fortunately, insurance product prospectus has to provide a comprehensive list of fees and expenses related to insurance services, as well as any sales charges and any fees for surrender, reinvestment and exchange transactions, that may be charged to policyholders. The balance of formal initial unit premium account and actual initial unit premium reserve must be calculated by dissecting unit-linked insurance products based on the conditions set by insurers. It is no doubt a cumbersome and far from simple process, but the result arises directly from how intensely insurers charge on insurance policies immediately after the first written premium is received.

It is also hard to trace releases in reserves between the lines of P&L, as well as the fees paid for insurance services, as these are concealed in the amount of changes in reserves. Even so, product prospectuses have to contain information about all the fees and expenses related to unit-linked insurance. Claims are indicated in an aggregated amount in insurers' P&L making it similarly difficult to allocate them onto mortality and surrender results.

Altogether the sum of the mortality result, result on expenses and surrender results is what we refer to as technical results. Here again, reinsurance can have either of positive or negative impact on technical results.

- **4. Investment result** stems from the difference between yields gained on premium reserves and the level of returns credited to insurance policies. If an insurance company used all of premiums each year to cover costs (client acquisition, administration, etc.) and claims, theoretically it still can make

profits by investment activity (investing premiums in funds) until insurance policies remain in force. In other words, investments allow insurance companies to report profits even when underwriting at a break even or loss. Thus, the investment part of insurance operations is as important as the underwriting part. In this manner, most of the investment income benefits consumers, but investment income is reduced by asset management fees to recognize that the insurer earns income on premiums.

In the case of traditional life insurance policies, if investment results turn out to be worse than promised in advance (negative investment results), insurers have to cover the gap between what had been promised and what has been effectively earned. **What sharply distinguishes a traditional life insurance policy from a unit-linked policy is the fact that in the case of traditional life policies, if yields earned on investments are less than the technical interest rate promised by insurers to policyholders in advance, insurers have to bear the costs of eliminating the gap, while such an obligation does not necessarily occur in the case of unit-linked life policies.**

Investment result earned on unit-linked premium reserves is roughly equivalent to the asset management fee.

Asset management fee = gross yield - Δ unit-linked premium reserve due to yields

Gross investment returns are added to premium reserves. Naturally, the higher the asset management fee the lower the change in unit-linked premium reserve, all other things held constant. Asset management fees are not explicitly stated in the P&L either, but product prospectuses contain information about fees and expenses and a detailed description about the investment objectives of the funds offered by insurers to policyholders.

Insurers earn investment income on their solvency capital and surplus as well that we consider as an interest income recorded among their financial income and not as one that adds to the operating results. Interest income generated on solvency capital and surplus is not policyholders' money; it belongs to insurers' shareholders.

Putting it all together, life insurers' operating result can be computed as the following:

- + admin cost
- + allocation cost
- + mortality fee
- + asset management fee
- claims related to mortality and surrender
- + change in reserves due to mortality and surrender
- + formal initial unit premium account*
- actual initial unit premium reserve*
- commission
- + DAC
- OpEx
- + commission claw-back*
- = Operating result

** Reversal of commission in case of early surrender (applied usually in the first two years of the policy term)*

This method of operating result calculation is called the source-side approach of operating result whose inputs are not shown explicitly in insurers' P&L. Operating result can be inferred from the model built up on the knowledge of terms and conditions of insurance policy contracts.

The source-side approach is equivalent to the calculation of operating results, which is in part based on figures stated in insurers' P&L, as it follows:

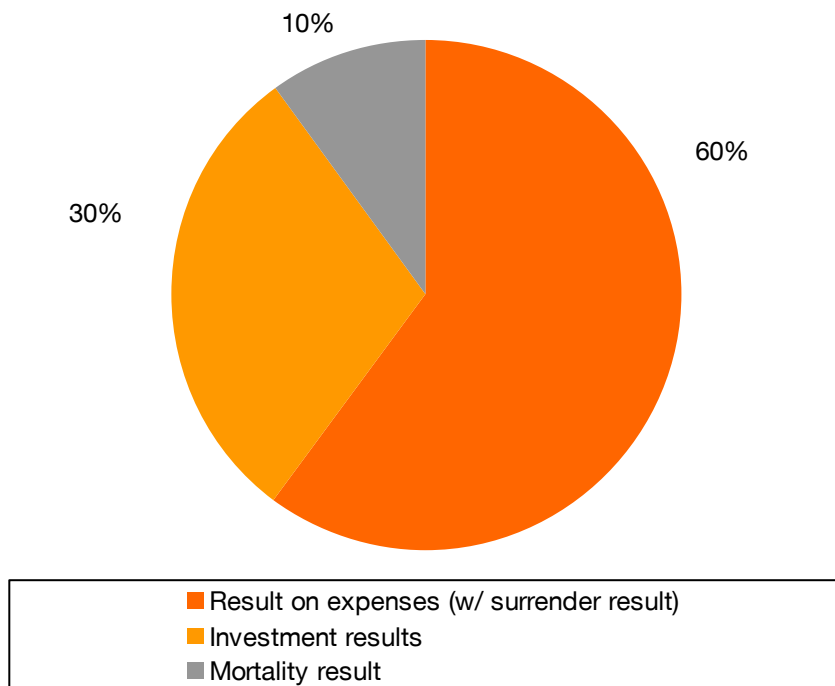
- + premium
- + change in initial unit premium reserve
- change in accumulation unit premium reserve
- + gross realized yields (investment results)
- commission
- + DAC
- OpEx
- + commission claw-back
- = Operating result

Source: Concorde

The consistency between the first and the second approach can be constructed by logically matching mating parts with one another to make them cancel each other so that no other than figures according to the second approach remain. But, the dismantling of inputs cannot be undertaken without the knowledge of the terms and conditions of insurance products.

Unfortunately, this is a slightly dry subject with not a lot of pleasure in it. For the sake of simplicity, we have been so far using a number of loose definitions. First, we assumed that policyholders keep policies in force until the date of maturity, so there was only an occasional indication for surrender and the ensuing claw-backs in the first two years of the policy term, whilst the reality is more complex. However, the message is unaffected by these simplifications. Using exclusively accounting figures to predict operating result is practically vain. Bluntly, the accounting approach does not offer a helpful valuation platform – it is not a useful model.

Figure 35 Operating result breakdown of a mature life insurance company



Source: Concorde's estimate

Unit-linked life insurance product cash flow and profitability

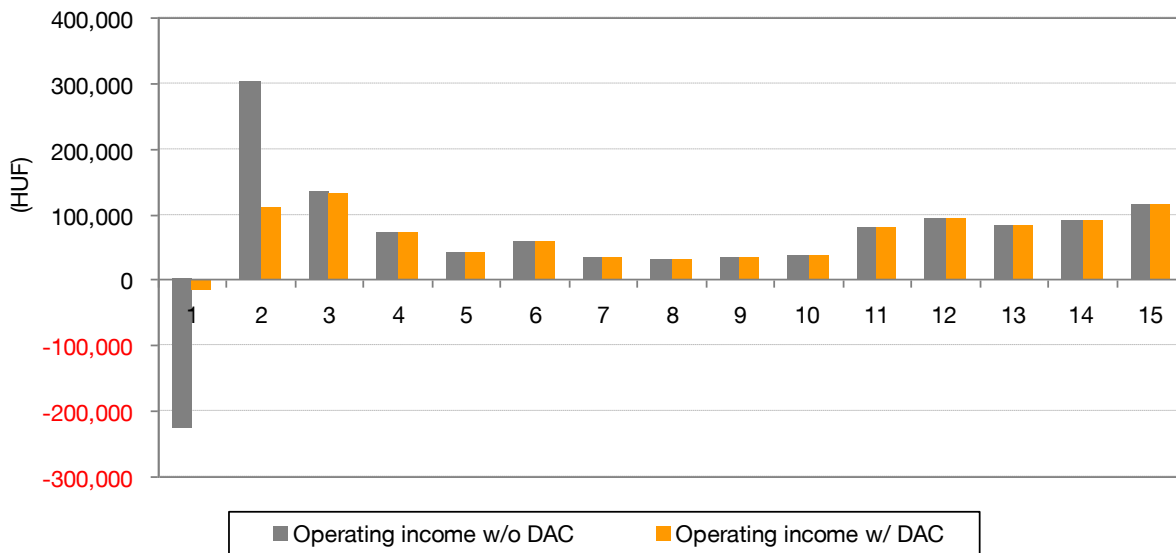
When determining cash flows arising from unit linked products issued before 2017 we have started it by financially modelling forever life unit linked products sold to typical policyholders (i.e. a 40-year old insuree) with conditions set by Pannonia, and weighted by probabilities assuming a certain level of mortality and surrender rates. We have arbitrarily decided to shorten the policy period to 15 years. As a result, we could compute the results Pannonia is likely to earn per policy on average on a carefully selected sample portfolio of 15-year unit linked insurance policies. We have estimated cash flows from the whole portfolio that we divided into overlapping generations by determining the number of policies for each generation. Finally, we set cash flows for each forecasted period and build a P&L based on results generated in each period.

When it comes to cash flow generation, the term profile of insurers' life insurance policy portfolio is of particular significance. Usually, life insurance firms that sell primarily long-term life policies are potentially more profitable than those who sell short term life policies. That is because long-term life policies enable insurance companies to make profit on both components of policies: risk protection and savings. The longer the term of life policies, the worse the conditions on which policyholders can withdraw from the contract before the date of maturity, consequently the higher the profit insurers can earn on policies. Also importantly, insurers' shareholders, by definition, earn back their investment sooner than policyholders. This comes from the fact that insurers charge for their services in advance.

That said, we would like to dispel the myth that life insurance products (e.g. unit-linked products) become more profitable for insurers as policies get closer to maturity. Although, it is true that the "older" a life policy, the lower the unit costs that burden premiums, the only thing that changes *ceteris paribus* is the source of profits: insurers earn more investment results, whilst producing less cost results in the outer years of the policy term.

Obviously, on top of rigor to bring costs down, insurers need to generate new contract sales continuously to sustain profitability. As was aforementioned, insurers' margin is the highest in early years (typically in the second and third year), while usually most contract cancellations occur after the third anniversary date. As far as margin sustainability is concerned, it is all the more imperative for insurers to keep on selling insurances and create large risk community and margin with it. The gradual increase of premium reserves is also indispensable, as by definition the larger the premium reserve, the higher the asset management fee the insurer can generate annually. Evidently, it takes quite a long time until insurers' reserves becomes large enough to earn sizeable investment results. Until that time cost results account predominantly for insurers' profits.

Figure 36 Probability-weighted operating income profile of a 15-yr unit linked policy*



* Including the impact of the loyalty bonus on operating results
 Source: Concorde's estimate

If policyholders meet their entire obligation during the policy term (i.e. policyholders pay insurance premium in due course), the unit cost of insurance service is lower, allowing insurers to generate higher profit, out of which they can provide policyholders with bonuses (that are set at a certain percent of the annualized insurance premium).

It is worth underlining the followings once again:

- (i) Life insurers generate the vast majority of their profits on contacts in the early years of the policy term. Paradoxically, early surrender results in significant profits for insurers, but this is not the way insurers wish to increase earnings, as mass policy surrenders sooner or later lead to a severe deterioration of an insurer's underlying policy portfolio.
- (ii) Presently, a significant number of policyholders (almost 25 percent in the case of Pannonia) are using their premium holiday option granted from the third year of the policy term, which apparently explains the drop in annual written premium, even though the resulting effect on insurers' profit is less significant. This is because the premium holiday option can only be used at a later and less profitable phase of the policy term.
- (iii) A young insurance company (like Pannonia) should focus mostly on generating cost results since it obviously cannot make investment results until it builds a critical size of claim and premium reserves.
- (iv) With a growing reserve base, asset management fees are likely to contribute increasingly to insurers' profits.

Traditional life insurance products

The insurance can be interpreted as an option in the event of injury or death. In this case, the exercise price is the sum insured, whereas the option price is the insurance premium. Under this interpretation the policyholder buys a contract for the future delivery of cash benefits, which in fact is a financial hedge against an untimely death. This means that at any point in time, there might be a cash benefit to insurance policies.

The death, whenever it occurs, causes outlays (e.g. funeral costs) that must be paid instantly. Most people, no matter how wealthy, may not have this amount of cash on hand (this is called as a protection gap). To handle this deficiency, insurers offer the various types of traditional life insurances that provide the necessary

liquidity to cover such expenses. Some focus on covering the risk of mortality alone (no cash payment if the insured is alive at policy maturity), while others also offer a savings element along with covering the risk of death.

The concept of traditional life insurance is that the losses of few insured people can be paid for by relatively small contributions from many policyholders (risk community). If, however, a large percentage of insured people in the risk community suffer losses (say, because disastrous events occur or all members reach an old age), renewal rates for term insurance have to be raised, thus becoming burdensome on an insuree’s budget. Despite higher rates unhealthy people will try to continue paying premiums because they think their beneficiaries may soon have a claim, while healthy people of the same age tend to leave the risk community (adverse selection) and hence, the insurance mechanism fails. A scheme of spreading the cost for life insurance protection, with premiums remaining constant over a long period, is crucial for most policyholders. It seems equally important for insurers to develop a risk community, from which the expected losses remain at a tolerable level.

We delve into the analysis of endowment insurance policies providing a savings element together with covering the risk of dying. An endowment insurance policy can be considered as a combination of a term policy and a pure endowment policy. Therefore premium paid for an endowment policy is the sum of term and pure endowment premiums. Term policy is a life insurance, which covers the life of the policyholder temporarily: ten; fifteen, twenty years, etc., paying the beneficiary the total cash value of the policy upon death of the policyholder within the life of the set term. A pure endowment policy has a fixed maturity date. A date on which the policy is payable to the policyholder. Therefore, it works like a life insurance along with a savings plan for the policyholder. If the policyholder dies within the coverage period the beneficiary receives payment from the insurer.

Table 16 Eligibility for claims at maturity depending on the type of traditional life insurances

	Payment at maturity	
	Alive	Death
Term insurance	No	Yes
Pure endowment	Yes	No
Endowment	Yes	Yes

Source: Concorde

Generally speaking, term insurance premium should be lower than pure endowment premium simply because the probability of death is lower than the probability of surviving until the maturity date provided that the sum assured is the same for both types of insurance and normal conditions prevail (e.g. fewer people are likely to die than those who survive).

The fee calculation is based on the equivalence principle, which says that the present value of the expected revenue has to be equal to the present value of the expected value of the claims paid to policyholders or their beneficiaries: $PV(\text{net premium}) = PV(\text{claims})$. Net premium calculation (before loadings) is usually carried out in a per unit basis (one).

In our model, we assume no adjustment (increase) in constant regular insurance premium over the policy term. Mathematically, the constant premium is the amount of a constant periodic payment throughout the premium-paying period. The present value of constant periodic payments, discounting for technical interest rates and mortality, is equivalent to a hypothetical single premium that could be paid at the beginning of the contract. The hypothetical single premium at the beginning can be thought of as similar to a mortgage that is paid for by periodic constant installments.

We apply the following basic mathematical relationships for premium calculation:

Marks:

$\ddot{A}_{x:n}$: net single premium for an insurance policy (term or pure endowment) bought by a 40-year old insuree for “n” years

n: policy term

v^n : discount factor ($=1/(1+i)$), where “i” is the applied technical interest rate

l_x : number of policyholders staying alive at the beginning of the policy term

l_{x+n} : number of policyholders staying alive in the beginning of the n^{th} year of the policy term

d_x = number of policyholders who died in the 1st year of the policy term (which equals $l_x - l_{x+1}$)

d_{x+n} = number of policyholders who died in the n^{th} year of the policy term

Probability of survival and dying:

$$p_{x,1} = l_{x+1}/l_x \text{ and } q_{x,1} = d_x/l_x = (l_x - l_{x+1})/l_x$$

$$p_{x,n} = l_{x+n}/l_x \text{ and } q_{x,n} = (l_x - l_{x+n})/l_x = 1 - (l_{x+n}/l_x) \Rightarrow p_{x,n} = 1 - p_{xn} \Rightarrow p_{xn} = 1 - q_{xn}$$

Accordingly,

Premium income from a term policy: $l_x \cdot \ddot{A}_{xn}$

Expected claims paid on a term policy: $d_x/l_x \cdot v^1 + d_{x+1}/l_x \cdot v^2 + d_{x+1}/l_x \cdot v^3 + \dots + d_{x+1-n}/l_x \cdot v^n$

Due to the equivalence principle the single term premium is therefore:

$$\ddot{A}_{xn(\text{term})} = (d_x/l_x \cdot v^1 + d_{x+1}/l_x \cdot v^2 + d_{x+1}/l_x \cdot v^3 + \dots + d_{x+1-n}/l_x \cdot v^n) / l_x$$

Premium income from a pure endowment policy: $l_x \cdot \ddot{A}_{xn}$

Number of policyholders staying alive “n” years away: l_{x+n}

Expected claims paid on a pure endowment policy: $l_{x+n} \cdot v^n$

Due to the equivalence principle the single pure endowment premium is therefore:

$$\ddot{A}_{xn(\text{pure endowment})} = l_{x+n} \cdot v^n / l_x$$

As a result, the single endowment premium is:

$$\ddot{A}_{xn(\text{endowment})} = \ddot{A}_{xn(\text{term})} + \ddot{A}_{xn(\text{pure endowment})}$$

To get the constant regular premium “P” we introduce the variable “ \ddot{a}_{xn} ”, which is regarded as an annuity factor and defined as:

$$\ddot{a}_{xn} = 1 + p_{x,1} \cdot v^1 + p_{x,1} \cdot p_{x,2} \cdot v^2 + \dots + p_{x,n-1} \cdot p_{xn} \cdot v^n$$

or

$$\ddot{a}_{xn} = 1 + (1 - q_{x,1}) \cdot v^1 + (1 - q_{x,1}) \cdot (1 - q_{x,2}) \cdot v^2 + \dots + (1 - q_{x,n-1}) \cdot (1 - q_{x,n}) \cdot v^n$$

If a 40-year old insured person buys an endowment policy for n years, the lump sum premium is calculated based on the equivalence principle as follows:

$$\ddot{A}_{xn} = \ddot{a}_{xn} \cdot P$$

therefore the constant regular premium is:

$$P = \ddot{A}_{xn} / \ddot{a}_{xn}$$

From an economic point of view, the constant regular premium makes it possible for insurers to offer installment payment plans with equal payments over time. The constant premium policies are made up of two constituents: protection and investment. In fact, what makes it possible for insured policyholders to pay a constant regular premium over time, even though the probability of death rises as policyholders grow older, are the reserves that are accumulating during the policy term, while investments may also help pay claims (the true cost of insurance protection) as they occur. (Note: Assume that a policyholder has a two-year policy. The probability of dying at 40 is lower than the probability of dying at age 41, but the policyholder has to pay a constant premium. If the policyholder doesn't die at age 40, the insurer puts aside some of the collected premium (i.e. it sets up a reserve), thus ... some of the age 41 risk is covered from the reserve, more precisely from the first year's premium).

Usually, constant regular premium payments surpass death benefits and other expenses for a group of insured policyholders during the early years of the policy term, while they fall short during later years. As mentioned above (see definition of mortality result), insurers therefore accumulate reserves to offset this shortage. Reserves reflect the extent to which future premiums and the insurers' expected investment income generated on reserves will not be sufficient to cover the present value of future claims on insurance policies. At any point, the present value of reserves, future investment earnings, and future premiums are sufficient to pay the present value of all future death claims for a group of insured policyholders. When insured policyholders die, insurers are obliged to pay the beneficiary the face amount (death benefit) of policies.

Table 17 Premium calculation for a 15-yr endowment policy (HUF)*

Claim upon death	750,000
Claim at maturity	750,000
Technical interest rate	2.90%
i) Theoretical term insurance net single premium**	30,197
ii) Theoretical pure endowment insurance net single premium***	462,840
i+ii = iii) Theoretical endowment insurance net single premium	493,037
iv) Annuity factor ($\ddot{a}_{x:n}$)	12
iii/iv = v) Net regular constant premium	40,556
Loading (as a % of net regular premium)****	107%
Gross regular constant premium (based on Pannonia's data)	84,000
Net regular constant premium for term insurance (6% of net regular endowment premium)	2,484
Net regular constant premium for pure endowment (94% of net regular endowment premium)	38,072
Net regular premium for endowment	40,556

* Held by a 40-yr old policyholder

** PV of total claim payments upon death based on a population of 100,000, discounting for technical interest rates and mortality

*** PV of total claim payments at maturity based on a population of 100,000, discounting for technical interest rates and mortality

**** See the definition of loading under the chapter of "Results on expenses"

Source: Pannonia, Concorde's estimate

Reserve accumulation is a mathematical consequence of adjusting premiums to policyholders' budgets. That said, accumulated funds of constant premiums of life insurance policies can also be utilized to meet various savings needs, which in turn results in premiums that are often greater than the amount required to pay for a yearly renewable term insurance policy.

The approach of reserving is somewhat different from what is observed with regards to unit-linked life insurance products where reserves are created "retrospectively". In respect to traditional life insurance products, insurers apply a prospective approach in a sense that they create reserves for future claims in advance given the level of technical interest rates, mortality and surrender rates. They are pricing their products based on their own assumption for mortality probability (which can differ from official mortality rates published by the Central Statistical Office). If they circumspectly select a group of insured people, there might be potential deviations for actuarial assumptions i.e. they might experience lower mortality than what has been initially assumed when calculating insurance premium, thereby generating mortality results.

Claim reserves are changing either as a result of natural reserve accumulation driven by constant premiums and yields on reserves, or as a result of deaths and surrenders.

Table 18 Reserve calculation for a 15-yr endowment policy (HUF)*

DF	Year	Death prob.	Population (bop)	Dead	Population (eop)	Claims upon death	Claims at maturity	Expected claims	Expected premiums	Premium reserves (bop)	Premium reserves (eop)
1.0	1	0.15%	100,000	-153	99,847	750,000		493,037	493,037	0	40,644
0.97	2	0.18%	99,847	-178	99,668	750,000		506,962	466,318	40,644	82,363
0.94	3	0.21%	99,668	-207	99,461	750,000		521,255	438,893	82,363	125,185
0.92	4	0.24%	99,461	-237	99,224	750,000		535,927	410,742	125,185	169,160
0.89	5	0.27%	99,224	-268	98,955	750,000		550,994	381,834	169,160	214,348
0.87	6	0.30%	98,955	-298	98,657	750,000		566,476	352,128	214,348	260,823
0.84	7	0.33%	98,657	-326	98,332	750,000		582,399	321,576	260,823	308,662
0.82	8	0.36%	98,332	-352	97,980	750,000		598,790	290,128	308,662	357,941
0.80	9	0.39%	97,980	-378	97,601	750,000		615,673	257,733	357,941	408,735
0.77	10	0.42%	97,601	-405	97,196	750,000		633,077	224,341	408,735	461,121
0.75	11	0.45%	97,196	-433	96,763	750,000		651,025	189,904	461,121	515,179
0.73	12	0.48%	96,763	-461	96,303	750,000		669,546	154,367	515,179	570,999
0.71	13	0.51%	96,303	-488	95,815	750,000		688,671	117,672	570,999	628,676
0.69	14	0.54%	95,815	-515	95,300	750,000		708,432	79,756	628,676	688,307
0.67	15	0.57%	95,300	-545	94,755	750,000	750,000	728,863	40,556	688,307	0

* Held by a 40-year old policyholder

Source: Pannonia, Concorde's estimate

To make the numbers on the table above more understandable, we sense-check some of them as follows:

1. Sense-checking the amount of premium reserve at the end of the 1th year of the policy term

+ constant regular premium	40,556
+ interest (based on 2.9% technical interest rate)	1,176
- claims upon death	1,150
+ change in reserves due to dead policyholders	62
= reserve at the end of the 1 th year if the policy term	40,644

That amount is the reserve that the insurer will need to have to cover the gap between the expected claim and the expected premium at the end of the 2nd year of the policy term.

2. The amount of expected claims at the end of the 14th year of the policy term can be checked as:

$$708,432 = (750,000/(1+0.029)^2) \cdot (95,300/95,815) + (750,000/(1+0.029)) \cdot (95,815-95,300)/95,815$$

where

95,300/95,815 is the probability of survival in the 15th year ($p_{x,15}$), and

$(95,815-95,300)/95,815$ is the probability of death in the 15th year ($q_{x,15}$)

The insurer will have to pay HUF 750,000 to every surviving policyholder at the beginning of the 14th year of the policy term. The value of the expected claims includes the present value of claims at maturity (HUF 750,000), discounting for two years, paid to those who survive until the maturity date plus the present value of claims, discounting for one year, paid to beneficiaries of policyholders who will die in the 14th year of the policy term.

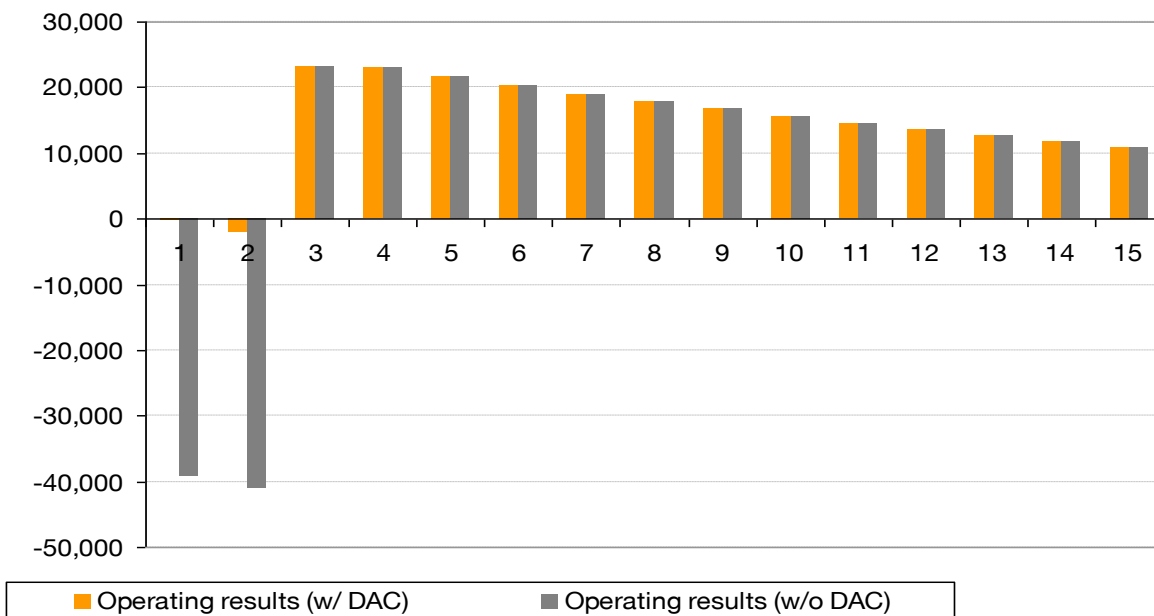
3 The amount of expected premium at the beginning of the 14th year of the policy term is:

$$79,756 = 40,556 + 30,200$$

where

$$30,200 = 40,556 \cdot 95,300/95,815 \cdot 1/(1+0.029)$$

Figure 37 Probability-weighted operating income profile of a 15-yr endowment policy*



* Assuming an annual constant regular premium of HUF 40,556, 70% retention rate, 5% permanent annual investment yield, 90% excess yield refund and 6% OpEx
 Source: Concorde's estimate

Similar to unit-linked insurance products, insurers have reinsurance agreements with reinsurance companies to share the risks from their policyholders (risk community) and collect commissions from reinsurers in return of premium ceded to reinsurers. Reinsurance is therefore a suitable tool for risk management, especially when the experienced mortality probability rates are different from what has been initially assumed during product

pricing. As a result of reinsurance, the impact of unexpected differences between assumed and experienced mortality rates on profit can be muted in both directions. In the case of traditional life insurance policies, reinsurance is typically costly for insurers and reduces mortality results.

We distinguish these three major types of reinsurances in respect to traditional life insurance:

1/a. Under a **“quota share” reinsurance agreement based on net regular premium** a fixed percentage of each insurance policy is reinsured. The insurer passes a specified share of risk as well as income (ceded claim and premium) to the reinsurance company, whereby its exposure to risk decreases. The reinsurer then covers the risks related to the stated percentage share of more than one insurance policy issued by the insurer which comes within the scope of the reinsurance contract between them. The reinsurance contract may oblige the reinsurer to accept reinsurance of all policies within the scope, or it may allow the insurer to choose which risks it wants to cede, with the reinsurer obliged to accept such risks. The retention rate is the share of the risk that the insurer keeps bearing. In our model we use an assumption of 30% reinsurance (i.e. a 70% retention rate), while our quota share calculation is based on net constant regular premium payment.

1/b. Under a **quota share reinsurance agreement based on gross regular premium**: the insurer cedes not only a portion of net premium, but also a share of its loading to the reinsurance company in exchange for commissions (“ceding commission”), which, in turn, allows it to cover agent commissions, marketing underwriting costs, etc. As such, this type of reinsurance works as financial reinsurance aimed at enabling the insurer to cover a portion of its operating costs incurred in relation to insurance products. In such case, the insurer seeks reinsurance simply because it may not have sufficient capital to prudently retain all of the contracts that it can sell.

Sharing on claw-backs between the insurer and reinsurer is also agreed in advance. It is conceivable that the reinsurer will claim the full amount of claw-backs from the insurer (claiming the full amount of financial reinsurance), whereby the insurer will have to bear the full financial risk of collection of claw-backs.

2 Under a **surplus share reinsurance arrangement**, the insurer determines a retention limit within which it retains the full amount of each risk, and the balance of the risk is reinsured. The insurer may seek surplus reinsurance simply to limit the potential losses from a small number of large claims as a result of haphazard fluctuations in (mortality) experience.

Reinsurance

Reinsurance is an insurance purchased by the insurance company in order to transfer (cede) the risk of potential loss from insurance policies to the reinsurer. This transfer can be considered as the transformation of underwriting risk to counter-party (reinsurer) risk. With the reinsurer bearing some of the loss incurred by insurer, the risks embedded in insurance policies can be diversified in order for the amount of required capital is reduced. If risk equalization within a risk pool is inadequate, then the insurer can reduce the risk exposure by means of reinsurance agreements. As a result, the insurer can create a more balanced and homogeneous portfolio of insured risks. This would lend greater predictability to its results on a net basis (after reinsurance) while also mollifying fluctuations in income stream over the term of the insurance policies. By allowing risk transfers, with reinsurance, the insurer can underwrite more insurance policies than would otherwise be possible based on its capital position.

With reinsurance, the insurer may generate a substantial cash flow and profit surplus from the reinsured policies in the first policy year, but it usually faces payment liabilities in the subsequent years to the extent of the ability of the policies to bear charges, and a setback in profit. To fulfill the objective of reinsurance settlements to be always neutral on profit (with the exception of interest expense and any exchange differences), the positive impact of reinsurance in the first period is accounted as accrued income, and released in subsequent years to compensate for the adverse impact of the portfolio on profit.

Reinsurance agreements in the non-life segment are renewed every year. Under the agreements, reinsurance partners are entitled to a specified percentage of the regular insurance premiums for policies reinsured (even up to 100% in non-life segment), along with a reinsurance fee that changes every year, where the latter is adjusted to the charge coverage (risk) in the product.

Pannonia has reinsurance agreements with several reinsurer partners. The reason of increase in the ceded reinsurance premiums in recent years has been primarily due to the non-life segment, which is a consequence of the expanding non-life segment and restructuring of reinsurance. For example, in case of Casco the potentially high loss can be decreased by the high rate of quota-share reinsurance returns.

In return for insurance premiums, the reinsurers pay Pannonia a commission in proportion to the premium on newly acquired policies. In addition to this, the reinsurers provide a counter-service to Pannonia in the form of commissions and profit shares as well as a share in claims.

Under the financial reinsurance agreements the (four) big reinsurers, which represent a decreasing share in financing the gap between agent commission and first annual premium from insurance policies, are entitled to interest from Pannonia based on their balance recorded per generation (loss carried forward account) until this balance indicates that Pannonia pays them a lower premium than services used and commissions including interest. The level of this interest is pre-defined per generation. During accounting procedures the impact of the interest is displayed as an item charged to profit, totaling nearly HUF 74 million in 2016 and HUF 125 million in 2015, representing interest rates between 3.4% and 7.9% of the amount of financial reinsurance with duration of less than three years on Pannonia’s balance sheet each year, respectively (w/o the impact of fluctuations in the EURHUF exchange rate). Financial reinsurance is denominated in EUR.

Solvency II

The capital held by an insurer represents the excess of the value of its assets over the value of its liabilities. From a regulatory perspective it is necessary to further distinguish between the capital that is available (i.e., the excess of assets over liabilities, which is simply called the net assets) and the capital that is required to meet any set of criteria. The level of capital held by an insurer is ultimately determined by its shareholders or by the management who represent their interests. It can therefore be expected to be set so as to maximize the value of the shareholders’ interest in the insurer. Shareholder value is, however, decisively depending on attraction and retention of policyholders, so the ongoing stream of policyholders has also a significant influence on the level of capital held. Due to “the cost” of capital, shareholders will seek to minimize the level of capital held, subject to being able to meet regulatory and internal requirements.

The capital that is required to meet regulatory requirements and internally set objectives is an internal calculation, based on insurers’ view of risk. Broadly speaking, required capital is an amount of capital calculated to give a specified level of security to policyholders in relation to the payment of their policy benefits. In this manner, the required capital is the capital that is necessary for solvency (i.e. "non-ruin") within some preordained confidence interval. Thus, the required capital is in practice a regulatory target capital requirement (i.e. regulatory capital adequacy requirement). If an insurer fails to meet regulatory capital requirements, the market supervisor can require remedial action even to the extent of taking over the insurer. The distribution of the required capital to shareholders is restricted.

Stating it more precisely, the required capital is the current market value of assets required to pay all future policyholder benefits, and associated expenses, at the chosen security level (expressed on a VaR basis, for example), less the current value of the liabilities (typically defined on a mean or best estimate basis). As such, the required capital is about quantifying the risks on both sides of the insurer’s balance sheet. Risks are paramount to the level of reserves held. Reserves (claim and premium reserves) appear on the insurer’s balance sheet as liabilities. In fact, reserves are the current amount required to cover current or future estimated liabilities assuming the mean for all variables, plus some provision for miscalculation of the mean (margins for adverse deviations). Put more simply, the required capital provides for fluctuations around the mean.

The risk that policyholders do not receive their contractual entitlements as promised is a function not only of the level of capital held by insurers but also of the way insurers are managed. Turning this around, the capital required can be seen as a function of the actions insurers will take in managing risk as well as the selected level of security.

Under Solvency I there were a linear relationship between the level of reserves and insurers’ solvency that may create a controversial universe where the lower the product pricing, the lower the level of insurance reserves held, hence the ostensibly low resulting solvency capital needs that may excite appetite for excessive risk-taking.

Contrary to Solvency I, which concentrates exclusively on liabilities on insurers’ balance sheets, Solvency II (similar in structure to the Basel II regulation for the banking industry) takes into account the risks of insurers’ assets as well. The risk exposure of life insurers will not change following the transition from Solvency I to Solvency II. What will change is the capital requirement due to the fact that for the first time almost all measurable risks will be taken into account while calculating insurers’ solvency capital requirements.

Under Solvency II, the solvency capital means insurers’ loss absorbing capability, and as such the SCR is the economic risk-based level of regulatory capital required to ensure that insurers will be able to meet their obligations over the next 12 months with a probability of at least 99.5%. To put it simply,

$$PV(\text{reserves}) = PV(\text{liabilities})$$

Table 19 Liability Adequacy Test (LAT) for Pannonia’s life business (2016 IFRS, HUF m)

Unit-linked	Traditional	Life
-------------	-------------	------

	HUF	EUR	Total	HUF	EUR	Total	Total
GWP	32 453	6 839	39 292	696	491	1187	40 479
Death benefits	2 260	516	2 776	567	19	586	3 362
Surrender	66 849	15 637	82 486	304	92	396	82 882
Endowment	2 006	48	2 054	0	64	64	2 118
Sickness service	0	0	0	0	133	133	133
Operating costs	4 867	1 142	6 009	59	38	97	6 106
First-year commission	282	25	307	0	7	7	314
Renewal commission	894	236	1 130	-1	34	33	1 163
Commission reversal	63	5	68	1	2	3	71
		-10	-55				
Total CF	-44 642	760	402	-232	106	-126	-55 528
UL reserves (+)	48 883	11 434	60 317	0	0	0	60 317
Actuarial reserve (+)	0	0	0	303	4	307	307
Reserve for loyalty bonus (+)	760	215	975	0	0	0	975
DAC (-)	291	15	306	4	3	7	313
Net reserves	49 352	11 634	60 986	299	1	300	61 286
Surplus/deficit (-)	4 710	874	5 584	67	107	174	5 758

Source: Pannonia

Table 20 Liability Adequacy Test (LAT) for Pannonia's non-life business (2016 IFRS, HUF m)

	Casco	P&L	Extended guarantee	Suretyship insurance	Freight	Carrier's liability	Carrier's service provider's liability	Accident	Polish extended guarantee	Total
GWP	1955	644	40	1057	98	207	371	45	238	4 655
Total										
payments	1932	452	68	591	57	207	258	43	235	3 843
- Claim	1356	240	63	12	10	128	5	31	4	1 849
- Admin costs	124	41	3	67	6	13	24	3	15	296
- Acquisition costs	341	144	0	508	37	57	227	8	216	1 538
- Taxes	111	27	2	4	4	9	2	1	0	160
Total CF	23	192	-28	466	41	0	113	2	3	812

Source: Pannonia

With a focus on a risk-based portfolio analysis, which applies an integrated approach to elaborate on dependencies between risk categories, Solvency II requires insurers to hold capital against market risk (fall in the value of insurers' investments), liquidity risk (insufficient available financial resources and illiquid assets), credit risk (third parties' default) and operational risk (disorderly conduct). Insurers will be requested to calculate all the SCR components separately and to compose them by means of pre-defined correlation matrices. Following this approach, potential correlations between different risks can be taken into account. In this case, the total SCR of correlated risks is lower than the sum of single SCRs. In short, all potential risks and their interactions must be identified to ensure that insurers be adequately capitalized with risk-based capital.

Main points of a fully implemented, properly managed risk management system under Solvency II:

- identifying all the potential risks that an insurer may face.
- attaching a probability to each negative event to quantify the overall effect of the risks based on a correlation matrix. As the risks are inter-correlated, the probabilities of negative events should not simply be added up.
- preparing the insurer for the overall effect of the potential risks rather than separately for each of them.
- defining the dimensions of shocks to the insurer caused by negative events, and then conducting stress tests to simulate and assess changes on insurer's net asset value following shocks
- running a severe stress test
- securing additional capital forthwith and in advance, if necessary

Stress tests can result in required capitalization levels lying well above insurers' solvency capital. For this reason the models, in combination with scenario selection and capital threshold, determine or at least strongly influence the extent of recapitalization required. Financial market supervisors and central banks do have robust and validated stress testing models to gauge how the risks will affect insurers (Standard Model approach). They set the scenario based on their view of the macroeconomic environment and local risk factors. Although insurers are permitted to use internal models for calculating their own regulatory capital

requirements (internal model approach), internal models are subject to stringent standards and prior supervisory approval. Even so, in some cases internal models have proved ineffective in terms of allowing for lower capital requirements, let alone the huge costs of developing an own what-if analysis model. which presumably will never be recovered.

The ratio of regulatory capital adequacy is calculated as regulatory capital requirement (nominator) divided by regulatory capital (denominator). Under Solvency II regulatory capital is not just simply the sum of equity capital minus the value of intangible assets and treasury shares. That is to say, new solvency regulation allows insurers to take the expected future profits into account for calculation of regulatory capital. Despite its name, this is not accounting profit as we know it. As the balance sheet's two sides are, by definition, equal, when the asset side remains intact, the regulatory capital can only be higher if the total value of liabilities decreases.

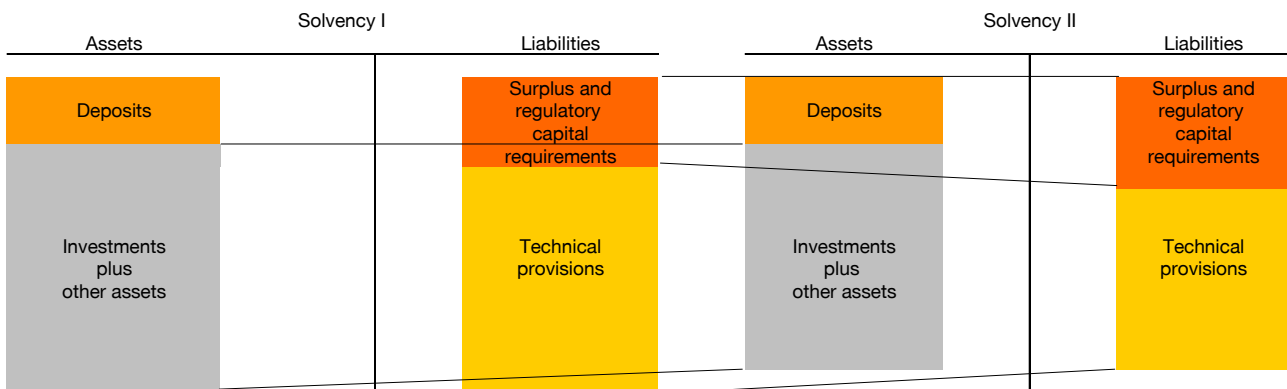
Technical provisions: We need to hang on for a moment at this point. As is the case with the current solvency regime, insurers under the new solvency framework have to calculate the so-called technical provisions to cover expected future claims and obligations to policyholders and agents, taxes, suppliers, etc.

The term of technical provisions goes beyond the definition of accounting reserves (Government Decree 43/2015 (III.12)). **The technical provisions under the new framework should be equivalent to the amount another insurer would be willing to pay for in order to take over and meet the insurer's obligations to policyholders and reinsurers**, according to the best estimate which should be based on the prevailing yield curve and credible information, plus the risk margin (risk margin = opportunity cost of required capital which is reduced by the risk-free return earned on required capital). Putting it another way, the technical provisions are the fair value of all probability-weighted cash flows arising from in-force insurance policies (i.e. all income minus outgoings, including yield guarantees, bonus payment promises to policyholders, claims, commissions, claw-backs, taxes, net reinsurance fees, etc.). Additionally, serious consideration must be given to the cost of performing the guarantees, including the cost of the allocated capital ("market-insensitive" pricing: if an insurer promises more returns to the policyholders, more capital should be allocated, whose maintenance costs must be also taken into account.

More often than not, the present value of the technical provisions is less than the present value of the total amount of premium income received over the term of life policies due to surrenders and charges. The difference is what goes inexorably in to capital, thereby enabling insurers to demonstrate better financial solvency. Nevertheless, in extreme cases (e.g. when huge obligations to agents become highly burdensome), regulatory capital requirements may even increase after taking into account all future cash flows and obligations.

Under Solvency II technical provisions will not include UPR, as premium provisions calculated on an expected cash flow basis rather than an earnings basis. DAC and prudential reserve margins will also disappear for the same reason. Currently, insurers often include elements of prudence in their reserves. Under Solvency II such an approach will not be acceptable. As insurers will have to estimate their reserves on a strict best-estimate basis and hold an explicit risk margin in addition, there will be no scope for prudential reserve margins within the best estimate. In fact, under Solvency II the technical provisions are derived as the sum of three components: the claims provisions, the premium provisions, allocated expenses and an explicit risk margin.

Figure 38 Comparison of Solvency I and Solvency II according to technical provisions



Source: Concorde

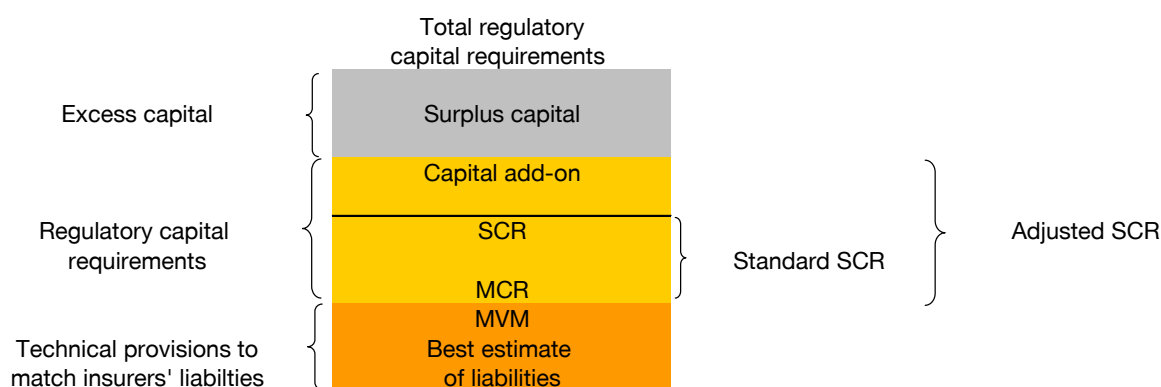
In the Solvency II framework, the present value of the current and future costs of regulatory risk capital required to support the liabilities until full run-off of in-force policies has also to be considered (Cost of Capital approach). Here the cost of capital carries the cost of having to put up regulatory capital by a third party during the run-off period of in-force policies, and it is also called the market value margin (MVM). The capital

itself is defined as the amount of funds needed to be available over a one-year time period to ensure solvency with a probability of at least 99.5%. The cost of capital approach treats the MVM as the theoretical cost to a third party to supply capital to the insurer (which is supposed to be for sale) in order to protect against risks to which it could be exposed. Indeed, the MVM is the smallest amount of capital which is necessary to make a third party willing to take over the portfolio of assets and liabilities.

The MVM comes on top of the best valuation estimate of liabilities (market consistent values of the liabilities) as an attempt to present a true market value of technical provisions. Liabilities assume no new businesses, while the existing asset portfolio is rebalanced as such that it optimally matches the liabilities. The best estimate shall correspond to the probability weighted average of future cash flows, taking into account the time value of money, using the relevant risk-free interest rate term structure.

Should it be seen to be necessary, the market supervisor may require insurers to inject further capital into the SCR (called as capital add-on) following the risk and capital review process; although this should only occur when the market supervisor concludes that the risk-profile of insurers deviates significantly from the assumptions underlying the SCR.

Figure 39 Capital requirement breakdowns under Solvency II



Source: KPMG

In our model, when Pannonia makes profits, which is our central assumption, we put any excess capital to its (free) surplus that it may use for other purposes (e.g. to distribute it back to shareholders as dividends, or to expand business lines). This approach demands a method of quantifying the capital that is truly sufficient to run the business efficiently and simultaneously comply with capital requirements, and not simply an allocation of existing capital. We therefore apply a solvency capital to solvency capital requirement ratio of 150 percent over time. In contrast, Pannonia's current IFRS consolidated solvency ratio stays at around 232 percent, which clearly reflects its strong ability to pay policies and contracts, but it presents an inefficient use of its capital from an economic perspective, in our view.

Embedded value

The first step in understanding how much value insurance companies create for their shareholders is to determine what income embedded in to their businesses can be considered as the source of earnings distributable to the shareholders. It is also important to determine the length of time elapsed between writing insurances and collecting premiums from the policyholders. Unfortunately, both premium and a portion of operating expenses are determined probabilistically. Given this, insurance companies' cash flows may come under uncertainty (stochastic) as well, making it difficult in gauging how much earnings - gained on assets allocated to back up the business - can be distributed to the shareholders.

Unlike most other companies, cash flows that can be distributed to insurers' shareholders consist of surplus equity and annual net income earned during the fiscal year. Surplus equity (free surplus) is the portion of total own equity (net assets) which insurance companies are allowed to distribute to their shareholders without jeopardizing their solvency. In fact, free surplus is the sum of any assets allocated to, but not required to support in-force covered business. It can also be defined as the value of any excess on assets attributed to the covered business but not required to back liabilities, over the required capital. For this purpose, all long-term insurance business written is considered as covered business.

Surplus equity is to some extent similar to the retained earnings of a non-financial company. Surplus equity grows when insurers generate profits from their ordinary insurance activities and/or earn gains on unit-linked and claim reserves.

When it comes to Pannonia’s life insurance business, earnings generated on the existing life policies and allocated surplus equity are the two components that constitute the embedded value (EV) of its business in-force.

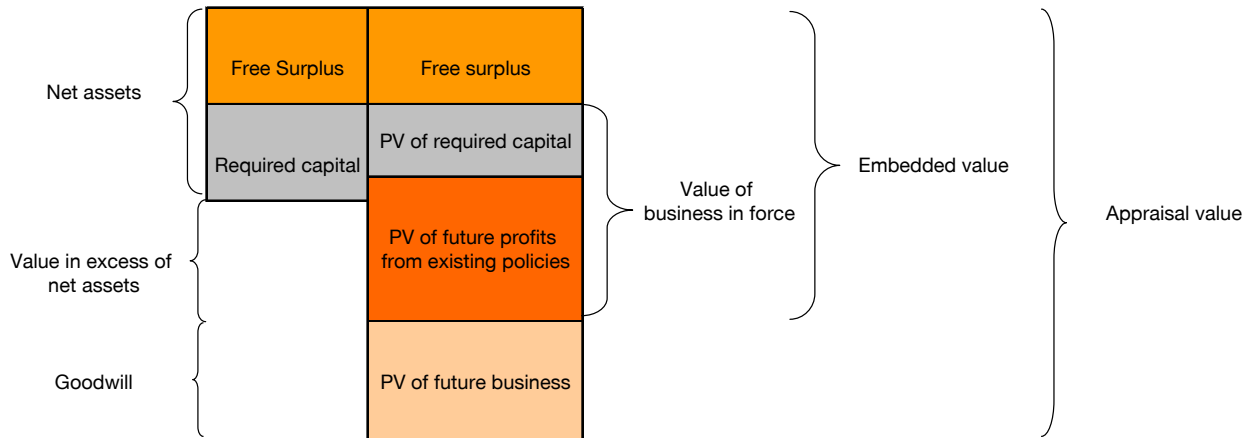
The EV reflects the intrinsic value of insurers’ existing business, while the value of their combined in-force and future businesses (the so called appraisal value) is their actual, estimated total value. The EV may be elusive, but it is not mystical. The EV excludes any value from future new business and is essentially defined as the value of business in-force plus the value of the free capital. The two components are defined as follows:

- i) Free surplus is the capital in excess of what is required to meet regulatory requirements (i.e. it is not the entire own capital). This amount could be immediately distributed to the shareholders. From a third party’s point of view it does not make sense to pay for insurers’ required (or locked-in) capital.
- ii) Value of business in-force is the discounted value of future annual net earnings distributable to the shareholders minus the opportunity costs of required capital. The opportunity cost of required capital is the difference between the prevailing risk free rate and the required rate of return on capital allocated to back up the business.

The appraisal value (AV) comprises:

- iii) EV, and
- iv) value of future business, which is considered to be goodwill

Figure 40 Breakdown of EV



Source: Concorde

The present value of the profits generated by the in-force policies must be discounted using the return expected by shareholders on their investment. Further complicating matters, it is difficult to assess to which extent overhead expenses, taxes, minimum required capital, etc. should be directly allocated to the existing contracts and how much should be considered as outlays associated with new businesses (existing business vs. promise). As a rule of thumb, we allocate a level of the minimum capital requirement (MCR) commensurately to the ratio of calculated solvency capital requirements (SCRs) for existing and future businesses.

It should also be taken into account, that the EV is very susceptible to the basic macro assumptions underpinning its calculation (e.g. assumptions for future reinvestment rates on fixed income assets, stock returns, FX rates, inflation and growth rates).

The cost of required capital in a given year can be calculated as following:

$$\begin{aligned}
 &+ \text{required rate of capital} \times \text{required capital} \\
 &- \text{after-tax investment income on required capital (i.e. risk free rate} \times \text{required capital)} \\
 &= \text{Cost of required capital}
 \end{aligned}$$

There are two equivalent methods to calculate the EV. According to the profits to shareholders method the EV is equal to the following:

$$\begin{aligned}
 &+ \text{free surplus} \\
 &+ \text{PV(after-tax profits)} \\
 &+ \text{PV(after-tax investment income on required capital)} \\
 &- \text{PV(increase in required capital)} \\
 &= \text{EV}
 \end{aligned}$$

According to the cost of capital method, the EV is equal to the following:

$$\begin{aligned}
 &+ \text{free surplus} \\
 &+ \text{required capital} \\
 &+ \text{PV(after-tax profits)} \\
 &+ \text{PV(after-tax investment income on required capital)} \\
 &- \text{PV(hurdle rate} \times \text{required capital)} \\
 &= \text{EV}
 \end{aligned}$$

The two approaches above have parts in common that can be removed to arrive at the following equality:

$$\begin{aligned}
 &+ \text{required capital} \\
 &- \text{PV(required rate of capital} \times \text{required capital)} \\
 &= \text{PV(increase in required capital)}
 \end{aligned}$$

or,

$$\begin{aligned}
 &+ \text{required capital} \\
 &+ \text{PV(increase in required capital)} \\
 &= \text{PV(required rate of capital} \times \text{required capital)}
 \end{aligned}$$

The required rate of capital (the minimum acceptable rate of return or the hurdle rate) should be kept unchanged during the run-off period because it has to reflect the current yield curve and a reasonable estimate of the risk premium demanded by shareholders, and not the expected interest rate curves and risk premiums in the future. It may also be appropriate to assume that future returns on stocks will not be higher than the required rate of return, which helps to avoid creating unusual EV movements in the future.

While the value of EV itself is a very key measure of the present value of in-force business (i.e. future profits from existing insurance policies) plus the excess funds that are at the disposal of shareholders (i.e. the amount of accumulated past profits that can be distributed to shareholders), the change in this value over time is even more important since it reveals development of the business as well as the macro environment around it. For example, if the government raises taxes (e.g. the introduction of special sector taxes in 2011), the EV will decrease. EV can temporarily be positively impacted by mass contract cancellations. However, cancellation happens often at the expense of lower earnings to be generated in the longer term due to potentially lower premium reserves as well as management fees.

In the EV construction, the maximum level of annual after-tax profit that can be distributed as dividends is deemed to be the difference between after-tax profit and the change in the targeted SCR (assuming that the targeted SCR is larger than the MCR). As long as the MCR is larger than the targeted SCR, the MCR must be considered as ultimate capital requirement reference. The SCR is usually set by insurers above the required level, say at 150 percent, as a reasonable precaution to withstand economic hardships.

$$\text{Dividend} = \text{annual after-tax profit} - \Delta \text{ targeted SCR}$$

In our understanding, free surplus can fully be paid out as dividend to shareholders.

Of course, insurers that do not pay dividends may still be profitable. Even if they can afford to pay handsome dividend, they can decide to reinvest their entire annual net income to bolster their business lines. If so, they can pay dividends in the future not only from their annual net profit, but also from retained earnings to the tune of the amount of surplus equity. Theoretically, when all insurance policies have been elapsed, there is

no need to hold the SCR any longer, meaning that the amount of the SCR accumulated over the policy term can also be paid out in a lump sum to shareholders.

Insurers typically invest the SCR in low-risk financial instruments (e.g. in gilt-edged securities). Returns on such bonds reduce the cost of holding the SCR (or MCR), and they add to the insurers' earnings. Obviously, when the SCR is kept in cash deposit, the cost of holding the required capital is higher than when the SCR is invested in government securities yielding an excess return on cash.

Our model suggests an EV of HUF 12.5 bn (HUF 179 per share) for Pannonia.

Table 21 EV computation for Pannonia (HUF per share)

(1) Free surplus	60
(2) Value in force	124
(3) Cost of holding required capital	5
(1+2-3) Embedded value	179

Source: Concorde's estimate

We apply a bottom-up methodology in setting the economic assumptions for Pannonia's Embedded Value (EV) calculations. In Western Europe, insurance companies regularly report embedded value as supplemental information to their other accounting information. Unfortunately, a number of the Central Eastern European insurance companies haven't reached that point yet and do not publish embedded value accounts to the general public.

We are looking at the EV from the perspective of an external shareholder of the company who are interested in the stream of dividends that could be paid out of the insurance company's profit. Obviously, dividends are constrained by statutory accounting. That is the reason why we use statutory accounting underlying the embedded value calculation. EV is the discounted value using a risk discount rate of projected distributable earnings arising from the existing portfolio of life businesses.

The EV is an estimate of the economic value of insurance business including for covered business future profits on existing business. Any future new business is excluded from the scope of embedded value. It corresponds to the total net of tax statutory profits distributable to the shareholders after allowance for the risks included in the covered business.

Our EV calculation includes the following components which are described in the Methodology section:

- Adjusted Net Asset Value (ANAV) where for the P&C business only this component is included together with the surplus in claims and unearned premium reserves
- Value of In-Force (VIF) determined as Stochastic Present Value of Future Profits (SPVFP) minus Net Risk Margin (NRM).

The Adjusted Net Asset Value (ANAV) is defined as: the shareholders' equity under the local GAAP bases plus the surplus in claims and unearned premium reserves after tax (only for the P&C businesses).

The Stochastic Present Value of Future Profits (SPVFP) calculated for the life businesses is the value of the projected net of tax statutory distributable profits arising from the in-force business. It does not include profits from future new business.

The Net Risk Margin (NRM) allows for the non-financial (i.e. mortality, morbidity, lapse and expense) and operational risks on the basis of the cost of holding risk capital to cover these risks and is presented net of tax. The risk capital is based on Solvency II capital requirements as used to calculate the Solvency II Risk Margin. The risk capital is projected over the life time of the portfolio on the basis of appropriate risk drivers of the risk capital components consistently applied to in-force and new business.

Profitability is measured as a percentage of the Annual Premium Equivalent (APE) and the Present Value of New Business Premiums (PVNBP). The APE equals one tenth of the single premiums plus the annualized amount of regular premiums written during the year.

Distributable earnings are defined to be statutory income after tax adjustment. It is important to note that an insurance company can not run with zero surplus. It needs some level of target surplus to satisfy regulators and rating agencies.

Distributable Earnings are defined as After-Tax Solvency Earnings minus increase in Required Capital plus After-Tax Investment Income on Required Capital.

For the P&C businesses, the surplus in claims reserves arising from insurance obligations to third parties is the amount net of tax by which the reserves in the local statutory balance sheets exceed a given actuarial

best estimate of the insurance obligations. Carrying a reserve with a surplus in the local statutory balance sheet means that the reserve includes a margin above the expected value of the eventual claims payments. This margin allows for a degree of adverse claims settlement outcome without exhausting the claim reserve. For the P&C businesses, the surplus in unearned premiums reserves reflects the estimated surplus, after tax, on a best estimate basis emerging from the local statutory unearned premium reserve arising from insurance obligations to third parties.

Free Surplus for the life segment is the ANAV in excess of the Required Capital. The Required Capital for the life segment is determined as the Solvency Required Capital (SCR) under the Solvency II regime. Insurance companies earn some interest on free surplus, which is, typically, fairly small, because most companies are running with targeted surplus. Interest on free surplus reduces the after-tax cost of holding the SCR, i.e. the cost of capital applied.

The Value of New Business (VNB represents the value generated by new business sold during the reporting period.) The VNB is calculated only for the covered business as the SPVFP for the new life business sold in 2017, less the new business strain (NBS) and NRM.

NBS is coming from the high first year commissions associated with issuing the policy and there is no DAC under Solvency II. New business strain is, however, not simply a negative cash flows in the first year occurring because of high commissions and expenses. In insurance, the expenses are front ended whereas returns are realized over time. However, with the premium payments being received over the contract term, this strain tends to get reduced. Regulator often requires insurance companies to immediately expense a significant share of acquisition costs, therefore new businesses often produce initial solvency reserves well in excess of the initial assets generated by initial net cash flows, hence NBS.

NBS is equal to Distributable Earnings minus increase in Required Capital minus the after-tax cost of holding Required Capital.

Hence it is distributable earnings rather than Product cash Flows that determine NBS, although Product Cash Flow is contained in Distributable Earnings.

New business strain is lower with reinsurance. Even if the reinsurance premium less allowances results in a positive payment to the reinsurer, the reserve credit that the company saves is almost always enough to more than offset the cash payment to the reinsurer.

New business premiums are defined as premiums arising from new business. New business includes policies where a new contract is signed or underwriting is carried out. The value of premium increases on existing contracts during the period is included in the VIF.

The best estimate assumptions used in the calculation of the Implied Discount Rate and Internal Rate of Return are the reference rate for the 10-year Hungarian government bond. For equities, a risk premium of 6 percent is added to the reference rates.

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Rating	Trigger
Buy	Total return is expected to exceed 20% in the next 12 months
Accumulate	Total return is expected to be in the range of 10-20%
Neutral	Total return is expected to be in the range of 10%-(-10%)
Reduce	Total return is expected to be in the range of -10-(-20%)
Sell	Total return is expected to be lower than -20%
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Sales:

Eva Kormendi, CFA
+36 1 489 2340
e.kormendi@con.hu

Tamas Hegedus
+ 36 1 489 2388
t.hegedus@con.hu

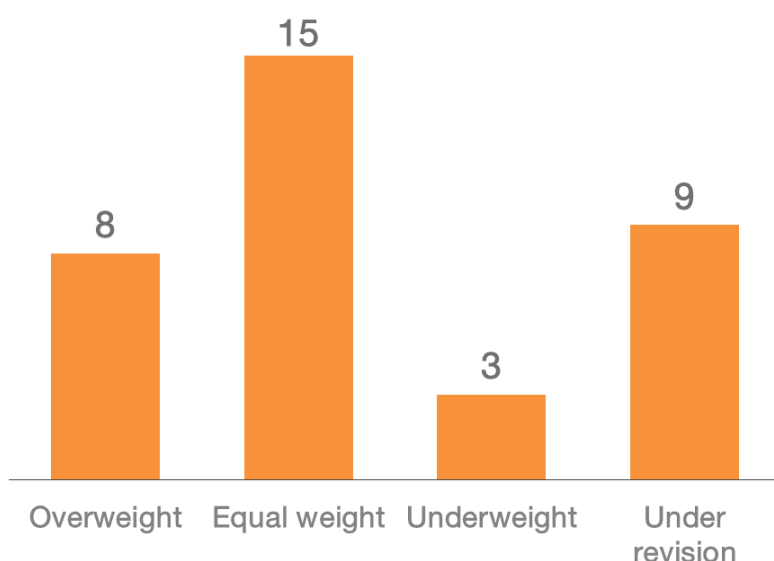
Trade:

Steve Simon
+36 1 489 2335
i.simon@con.hu

Peter Rimar
+36 1 489 2230
p.rimar@con.hu

Gyorgy Sugar
+36 1 489 2231
gy.sugar@con.hu

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