

MILLIMAN RESEARCH REPORT

Analysis of insurers' Solvency and Financial Condition Reports

European health insurers

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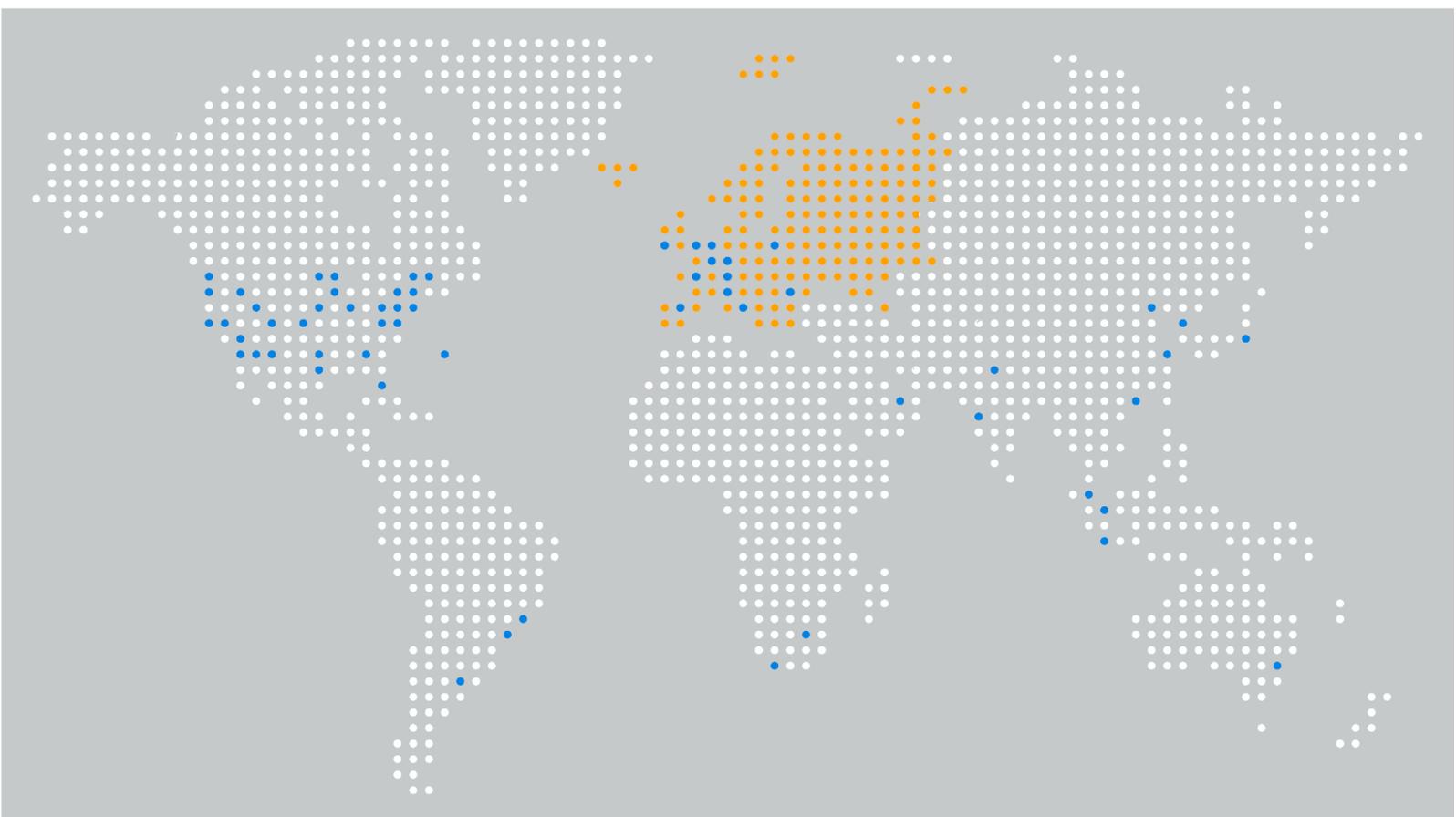




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1. Introduction

BACKGROUND

Under Solvency II, European insurers are required to publish their Solvency and Financial Condition Reports (SFCRs). Two sets of SFCRs have been published, with the first publication for most entities occurring in May 2017 and the second one in May 2018.

The SFCRs contain a significant amount of information including details of the company's performance over the reporting period, system of governance, risk profile, valuation basis and capital requirements. In addition, the SFCRs include a number of Quantitative Reporting Templates (QRTs) providing details of the company's financial position under Solvency II.

This analysis compares information provided in the QRTs and SFCRs and draws conclusions about the balance sheets and risk exposures of European health insurers. We also highlight substantial trends between the 2017 and 2018 publications.

HEALTHCARE SYSTEMS INCLUDED IN THIS ANALYSIS

Our focus is on health insurers with domestic business in the following countries:

- France
- Germany
- Ireland
- Italy
- The Netherlands
- Spain
- United Kingdom

In addition, we have included European insurers selling International Private Medical Insurance (IPMI) products.

The size of the private health insurance market varies considerably by territory, primarily due to government policy in relation to public health coverage. In Appendix A, we describe the distinct healthcare system features of the included countries. The logic we apply to include countries and companies within our analysis is described in the section below.

In the case of IPMI, the market focuses on private health insurance for expatriates. IPMI coverage provides beneficiaries with private health insurance outside of their home countries and is designed to provide seamless access to comprehensive international healthcare services on a regional or global basis. IPMI policies are typically purchased by employers for employees with long-term travel requirements. The benefits under such policies are generally comprehensive in nature and are not tied to a specific country or healthcare system. The premiums are risk-rated and a key difference in coverage is whether treatments in the United States (US) are included or excluded.

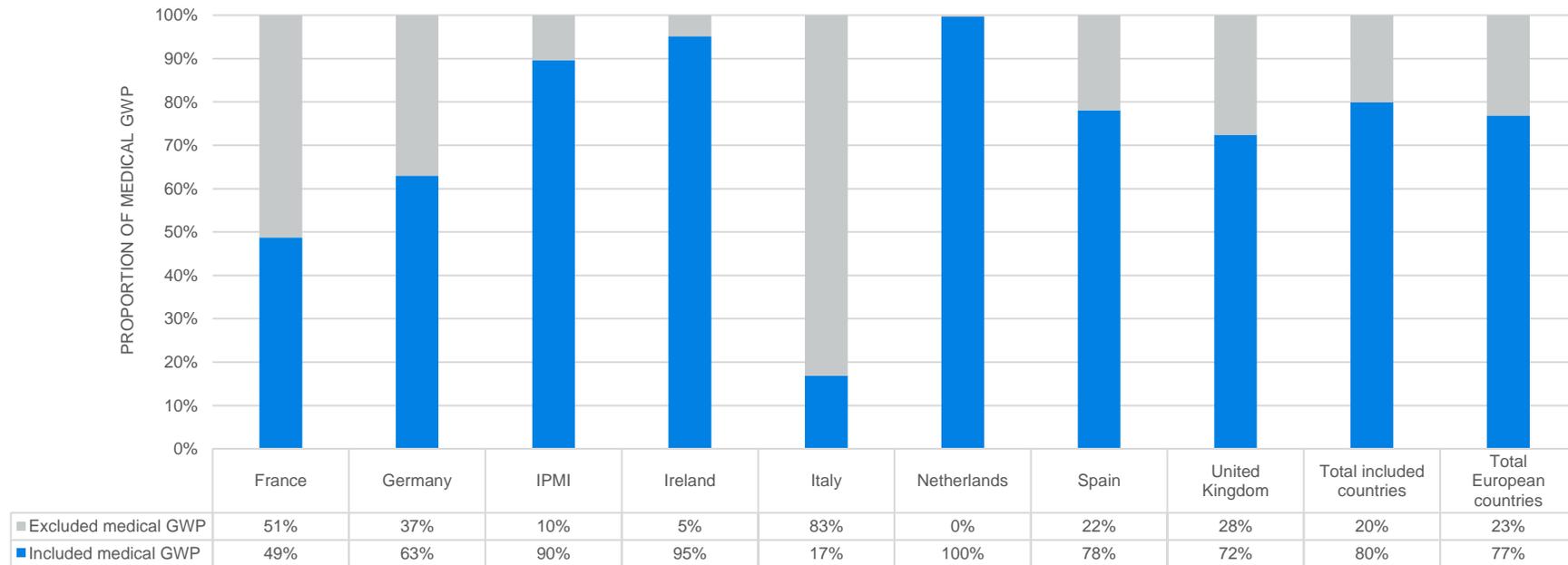
COMPANIES INCLUDED IN THIS ANALYSIS

For this analysis, we include insurers that primarily sell private medical insurance (PMI). The selection criteria is defined as follows:

- We include companies classified as 'Non-life' or 'Composite' insurers and exclude those classified as 'Life' insurers. This ensures that we remove life insurers selling long-term health-related business.
- We exclude UK insurers primarily selling health cash plan products.
- We include solo companies and remove group entities to avoid double-counting of companies.
- To ensure that the figures we include in our analysis mostly relate to PMI business, we include companies that have at least 90% of their gross written premium (GWP) listed as 'medical' line of business (LOB). Hence, we exclude insurers that sell high volumes in other lines of businesses such as motor insurance or property and casualty insurance (e.g., Aviva in the UK) because it is not possible to isolate the capital charges for PMI based on the information included in the QRTs.
- We classify the following insurers as IPMI insurers due to the high volume of business in IPMI products: Cigna Life Insurance S.A., Aetna, Globality S.A., OOM Global Care N.V. and Allianz Worldwide Partners Health & Life.

For 2016 and 2017, the included companies account for approximately 80% of the included countries' medical expenses GWP.¹ As a proportion of overall European medical expense GWP in 2016 and 2017, this accounts for approximately 77% of GWP. For France and Italy, we are excluding a significant proportion of PMI business because a large portion of the business is not operated by specialist health insurers. The list of companies included in the report for 2017 is shown in Appendix B. Note that the number of entities differs slightly between 2016 and 2017 due to legal restructuring for some of the Dutch entities. Any manual adjustments that are made to the selection criteria are explained in Appendix C.

FIGURE 1: PMI GWP PROPORTION (2016 AND 2017)



¹ Note that the UK figures have been calculated by excluding cash plans from the total GWP.

UNDERLYING DATA

The analysis underlying this report focuses on the quantitative information contained in the public QRTs. The Solvency II Wire Tool,² which contains comprehensive information from the QRTs, is used to produce the results included in this report.

Where relevant, we study the SFCRs to gain some additional insights into certain companies, in particular if they display characteristics that differ from the market average.

In carrying out our analysis and producing this research report, we rely on the data and information provided in the SFCRs and QRTs of our sample companies, as obtained from the Solvency II Wire Tool. We have not audited or verified this data or other information. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete.

We performed a limited review of the data used directly in our analysis for reasonableness and consistency and have not found material defects in the data. It should be noted that in some cases errors were spotted in the underlying data. We made minor adjustments to the data and calculated certain parameters to make the information consistent across all the insurers. However, we have not made any material changes to the underlying data. We have not made any changes to the data to reflect additional information or changes following the reporting date.

This research report is intended solely for educational purposes and presents information of a general nature.

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

Note that all the figures published in this report are converted into euros, by the Solvency II Wire Tool, using exchange rates as at each SFCR's report date.

² The Solvency II Wire Tool is available at <https://solvencyiiwiredata.com>. The extraction date of data was 1 November 2018,

2. Premiums, claims and expenses

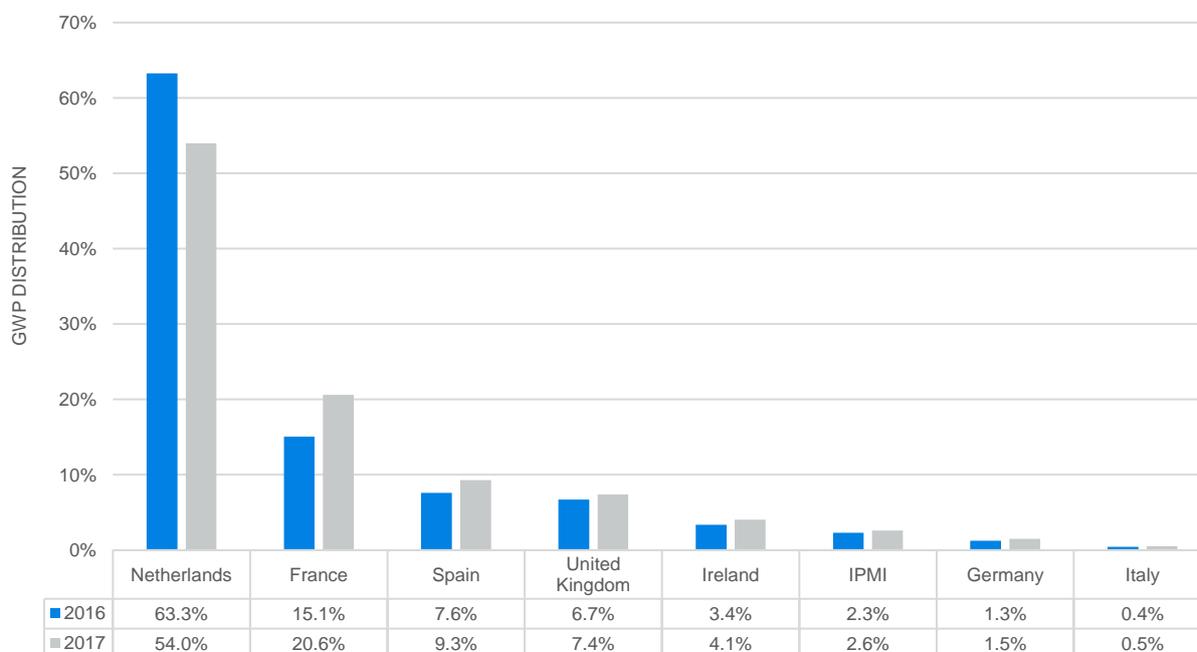
This section focuses on premiums, claims and expenses of health insurers based on the information reported in the relevant section of the SFCR.³

GROSS WRITTEN PREMIUM BY COUNTRY

We analysed the PMI GWP distribution for the eight selected countries. In the graph in Figure 2, we observe that PMI GWP from the Netherlands makes up more than 50% of total included European medical GWP (for both 2016 and 2017). This reflects the large PMI market in the Netherlands compared to other markets, as a result of the compulsory PMI coverage for Dutch citizens. Most EU countries have smaller voluntary PMI markets alongside a government health scheme. In addition, the proportion of GWP shown for some countries is understated due to the exclusion of some insurers from these countries, as explained in Appendix C.

Figure 2 shows a split of GWP for each country by year. We observe that the GWP distribution by year remains steady from 2016 to 2017 for most countries. We observe that the proportion of medical GWP for the Netherlands decreases significantly from 2016 to 2017, offset by increases in the proportion of medical GWP composition for all other countries. This is due to two reasons: medical GWP decreasing for the Netherlands from 2016 to 2017 and medical GWP increasing for most of the other countries from 2016 to 2017.

FIGURE 2: DISTRIBUTION OF INCLUDED EUROPEAN MEDICAL GWP BY COUNTRY



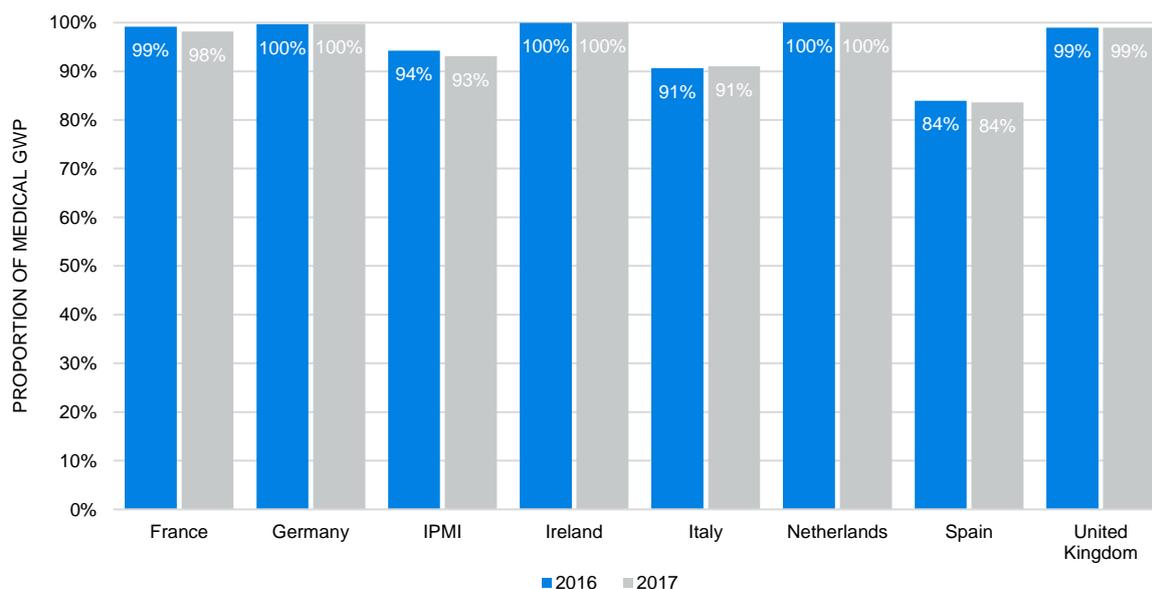
³ QRT S.05.02.01 consists of the information on premiums, claims and expenses by line of business.

MEDICAL GROSS WRITTEN PREMIUM BY COUNTRY

We analyse the medical GWP as a proportion of total GWP for the eight countries in Figure 3. As we expect from our selection process, medical is the main line of business across all eight countries and we note that there are no significant changes in the medical GWP distribution from 2016 to 2017. Overall for the selected insurers, 99% of the total GWP comes from the medical line of business in 2017. The large proportion of nonmedical GWP for Spain is due to the inclusion of SegurCaixa Adeslas, S.A. de Seguros y Reaseguros, which has a significant proportion of GWP in nonmedical lines of business.

The proportion of nonmedical business relates mainly to income protection insurance, with a small proportion relating to assistance business (accident and travel insurance), general liability and property insurance.

FIGURE 3: PROPORTION OF MEDICAL GWP BY COUNTRY IN 2016 AND 2017



NET EARNED PREMIUM COMPOSITION

The net earned premium (NEP) is analysed in terms of three major components:

- Net incurred claims (net of reinsurance incurred claims)
- Total expenses (expenses incurred, other expenses and change in net technical provisions)
- Technical result (difference between net earned premium and net outgo items such as net incurred claims and total expenses), i.e., a high-level estimate of profit

We calculate the following ratios to understand the composition of NEP:

- Net claims ratio as net incurred claims / net earned premium
- Expense ratio as total expenses / net earned premium
- Technical result ratio as technical result / net earned premium

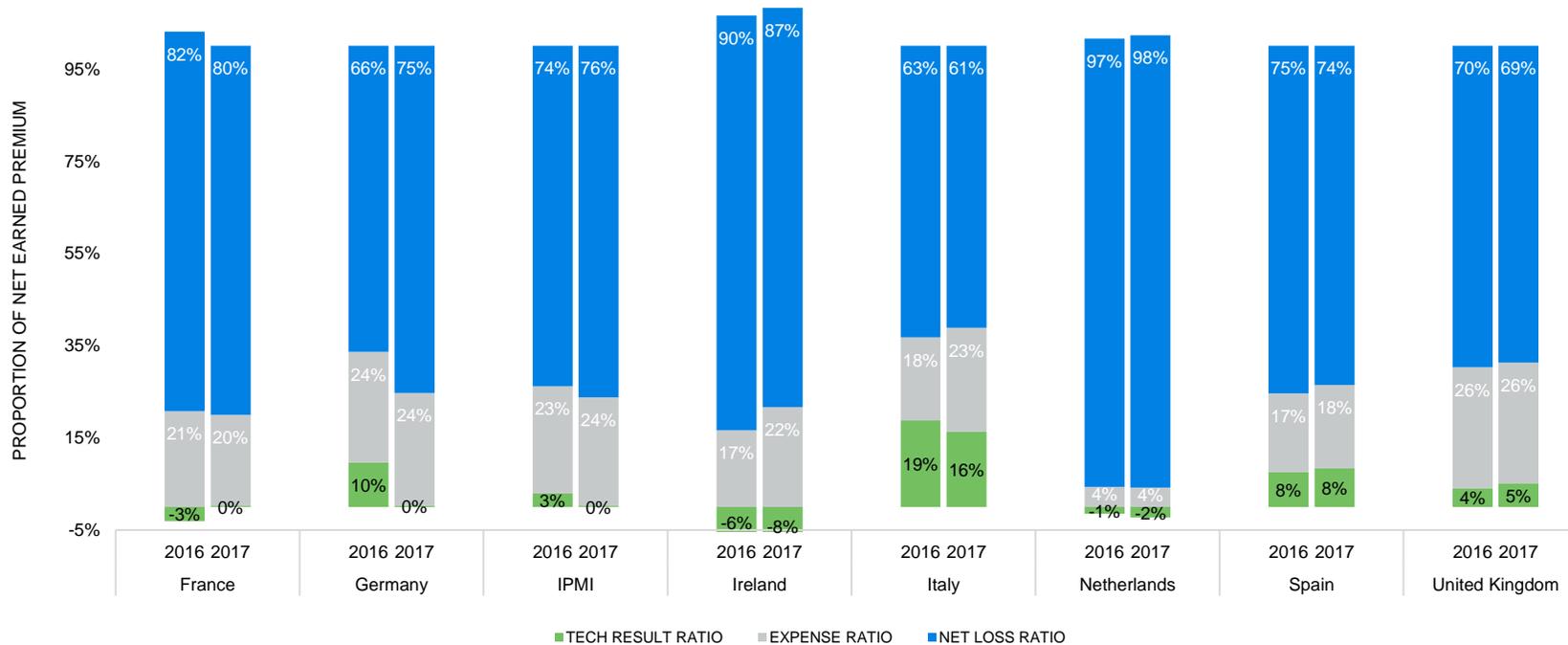
It is important to note that the technical result ratio in Figure 4 only takes into account premium income and does not include other cash flows such as fees, commissions and in some cases payments into and out of risk equalisation funds. This is primarily due to the prescribed format of this QRT but may also be due to the reporting principles of individual insurers.

Apart from the Netherlands, we observe that the expense ratios of the included countries lie in the range of 18% to 26% of net earned premium over the two years. The Netherlands has the lowest proportion of expenses and the highest net loss ratio. Basic medical insurance in the Netherlands is not very profitable and as a result insurers also sell supplementary insurance to increase profitability. In addition, the Dutch regulator has requested that insurers align their capital management and pricing policies. This requires insurers to offer discounts to policyholders when their Solvency Capital Requirement (SCR) coverage ratios increase above a certain amount, which may be resulting in the high loss ratios and negative technical result ratios.

We draw the following conclusions with respect to the trends from 2016 to 2017:

- Germany has experienced the largest deterioration in net loss ratio and technical result ratio. The net loss ratio has increased significantly from 66% in 2016 to 75% in 2017 and the technical result ratio has reduced from 10% of net earned premium in 2016 to 0% of net earned premium in 2017. This is primarily due to a large increase in net incurred claims and a large decrease in technical reserves from 2016 to 2017 for the largest German health insurer (by GWP in 2016 and 2017), Allianz Private Krankenversicherungs-AG.
- Ireland has experienced the largest percentage point improvement in net loss ratio from 2016 to 2017.
- For France, IPMI, Italy, the Netherlands, Spain and the UK, the net loss ratios have remained fairly stable (change of less than or equal to two percentage points from 2016 to 2017).

FIGURE 4: NET EARNED PREMIUM COMPOSITION BASED ON 2017 DATA IN QRT S.05.01.02



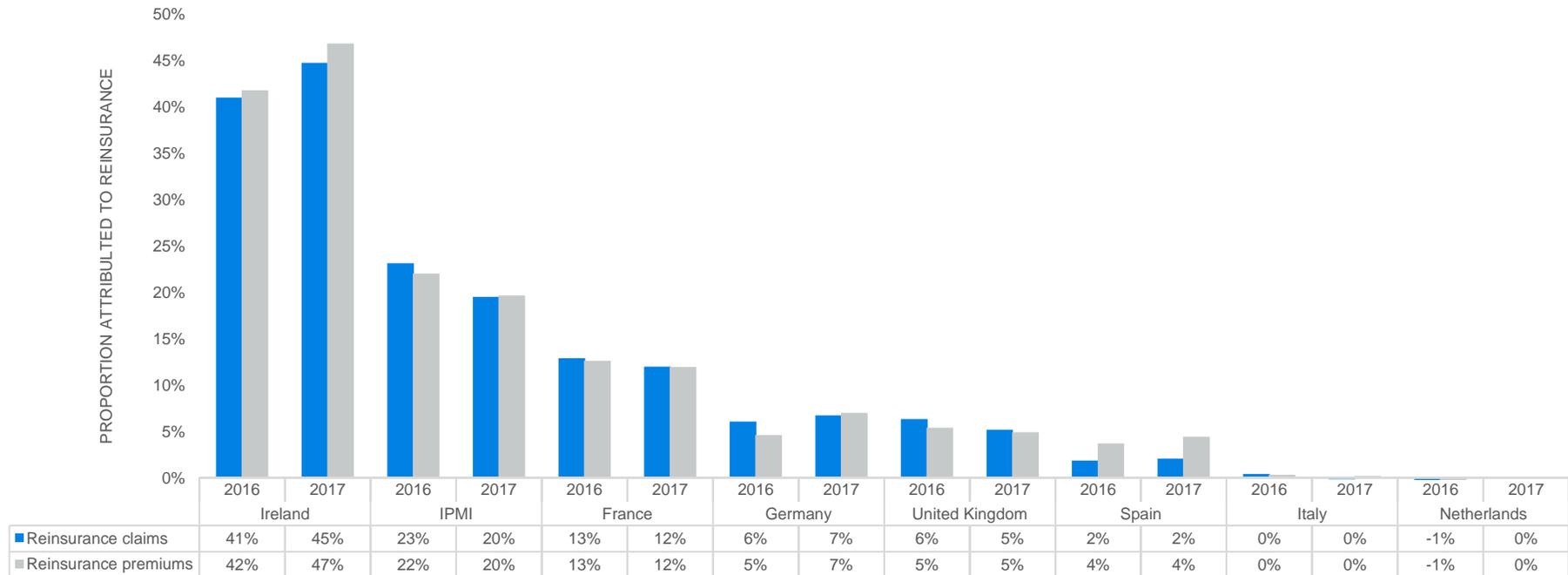
USE OF REINSURANCE

Reinsurance for provision of claims and distribution of premiums varies by country. We observe the following with regard to the usage of reinsurance:

- Irish and IPMI insurers are high users of reinsurance. Among the Irish insurers, Elips Versicherungen, Irish Life Health and VHI use high levels of reinsurance. For IPMI insurers, Cigna Life Insurance Company of Europe and Globality S.A. rely heavily on reinsurance.
- France, the UK and Germany make lower use of reinsurance. Within the UK, we observe that Vitality uses high level of reinsurance.
- Other countries such as the Netherlands, Italy and Spain use little or no reinsurance to conduct their health business. In the Netherlands, the use of reinsurance is not prohibited, but the risk equalisation system compensates insurers for large claims, expensive drugs and members with chronic diseases, so there is less need for reinsurance as a form of risk mitigation.

Note that the reinsurance coverage in Figure 5 may include reinsurance to subsidiary or to other organisations of a group, in addition to any reinsurance to external parties.

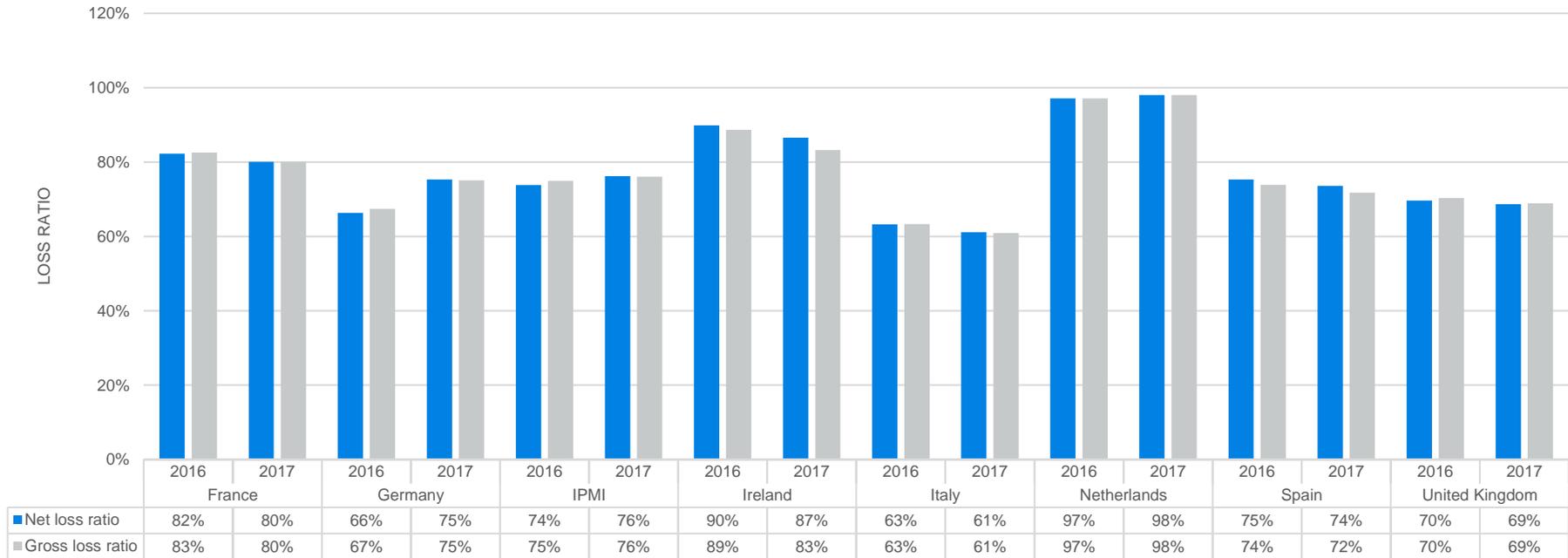
FIGURE 5: USE OF REINSURANCE (PREMIUMS AND CLAIMS) BY COUNTRY



NET LOSS RATIOS AND GROSS LOSS RATIOS

In Figure 6, we analyse the gross loss ratios and the net loss ratios. We find that, for all countries apart from Ireland, net loss ratios are similar to gross loss ratios. For Ireland, the significant difference in the gross and net loss ratios in 2017 could be due to differences in the mix of business retained versus the business reinsured.

FIGURE 6: NET LOSS RATIOS AND GROSS LOSS RATIOS BY COUNTRY



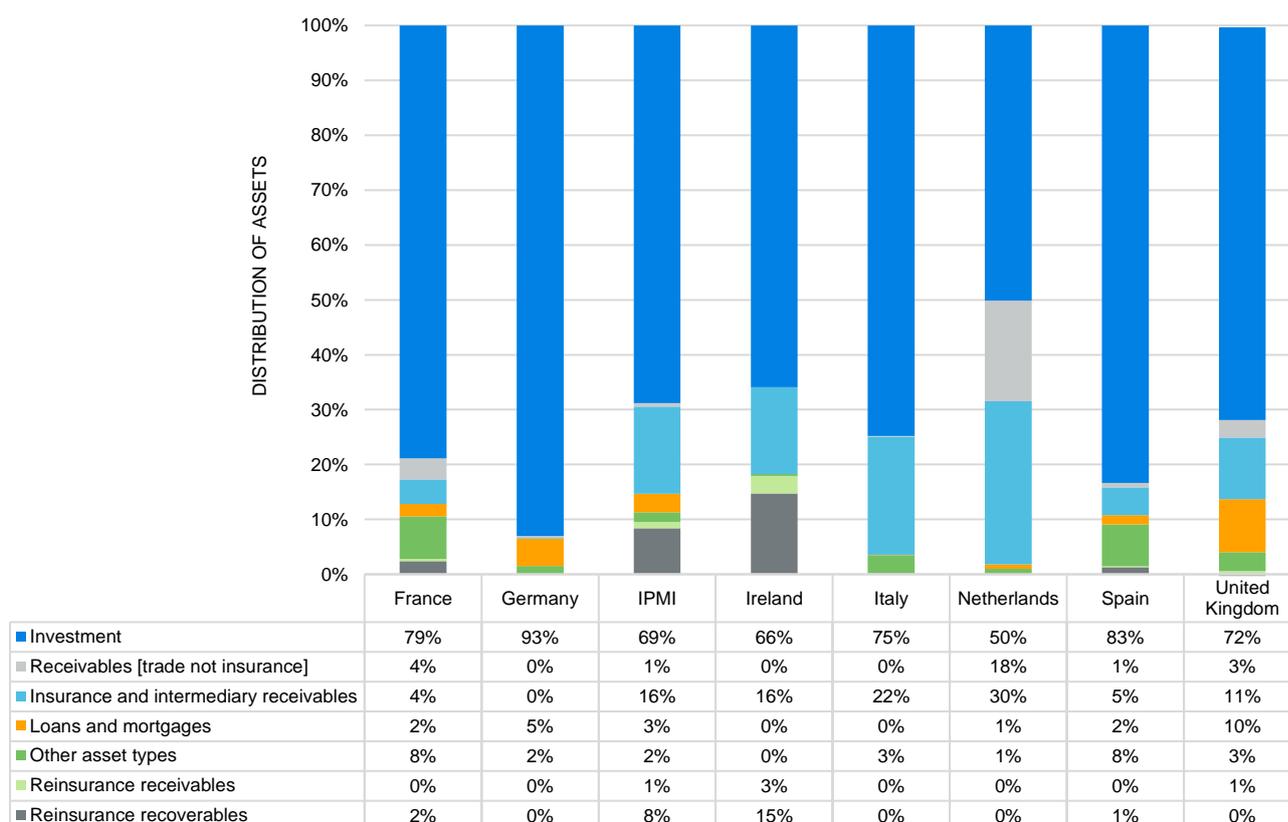
3. Assets and liabilities

This section focuses on the main types of assets and liabilities of health insurers reporting under Solvency II. Given the importance of investments and technical provisions within the balance sheet, both items are analysed in greater detail, yet a discussion of other smaller balance sheet items is also included, where relevant.

DISTRIBUTION OF ASSETS

Investments form the majority of total assets across all countries. Germany, Spain, France, Italy and the UK have greater than 70% of total assets in investments. Insurance and intermediary receivables appear to be the second-largest asset type across most of the countries. The high proportion of reinsurance recoverables for Ireland and IPMI is expected, given the use of reinsurance in these countries.

FIGURE 7: DISTRIBUTION OF ASSETS BY TYPE IN 2017



DISTRIBUTION OF INVESTMENTS

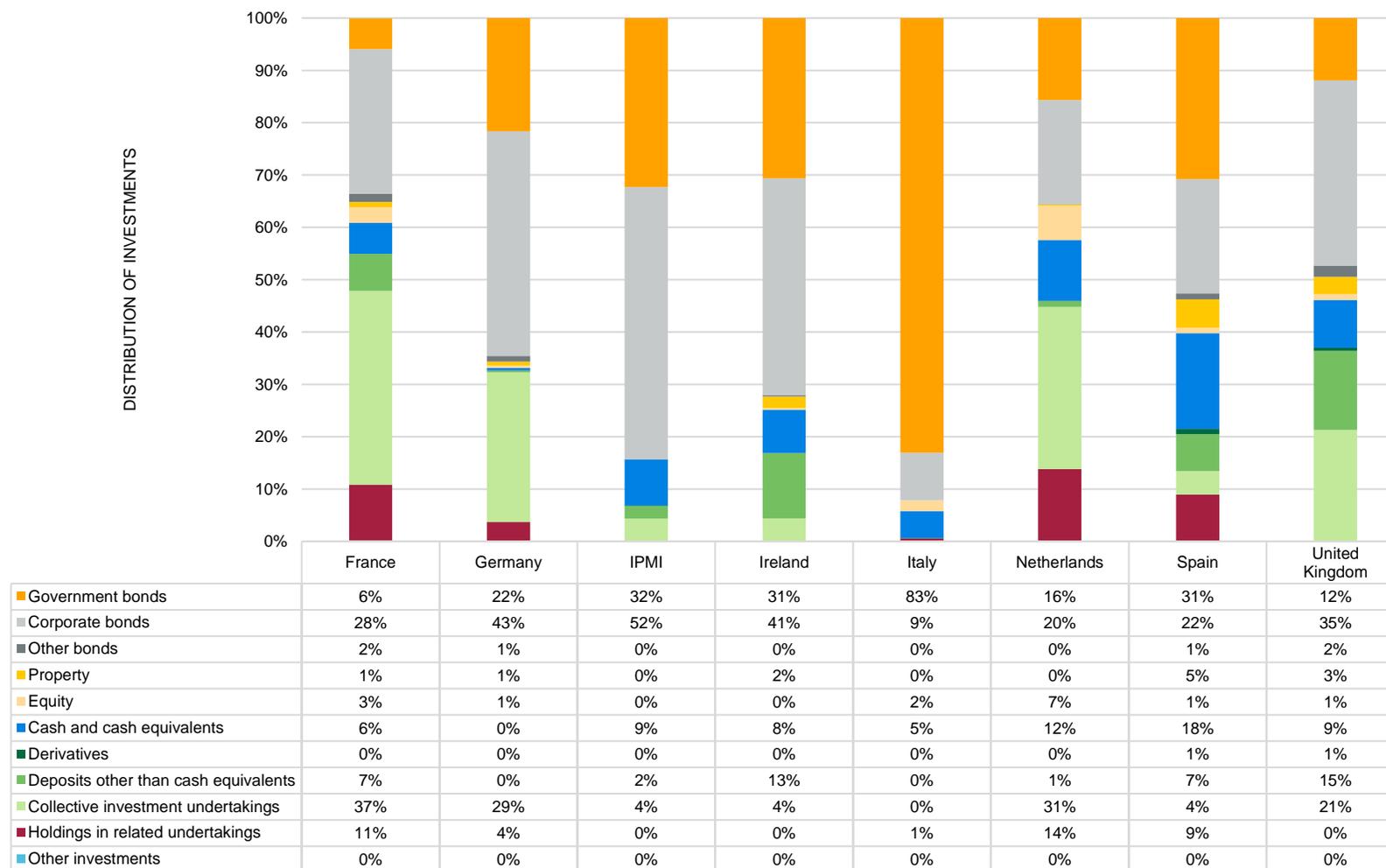
An analysis of the distribution of investment by asset classes reveals significant differences across all eight countries considered. Investments in bonds (government and corporate bonds) largely dominate the portfolio for most countries apart from France and the Netherlands. Bonds are attractive to insurers due to the regular payment streams which complement duration matching strategies, reduced volatility and the associated capital requirements relative to equities. Within investment in bonds, there are broadly two types of investment structures:

1. Larger proportion of investment in corporate bonds, compared to government bonds (UK, Germany, the Netherlands, Ireland, IPMI and France)
2. Larger proportion of investment in government bonds, compared to corporate bonds (Spain and Italy)

For France, the UK, the Netherlands and Germany, a significant proportion of investment is in collective investment undertakings.

Furthermore for the Netherlands, the highest proportion of investment is in 'holdings in related undertakings, including participations.' This is due to a small number of Dutch health insurers having large participations in related holdings, as the Dutch health insurance market consists of a number of groups of health insurers such as Achmea and CZ Group.

FIGURE 8: DISTRIBUTION OF INVESTMENTS BY ASSET CLASS IN 2017



DISTRIBUTION OF LIABILITIES

Technical provisions make up the largest liability on health insurers' balance sheets, but their relative proportion varies considerably among the eight countries considered. As expected, medical expense is the dominant line of business in terms of technical provisions across the countries, apart from Spain.

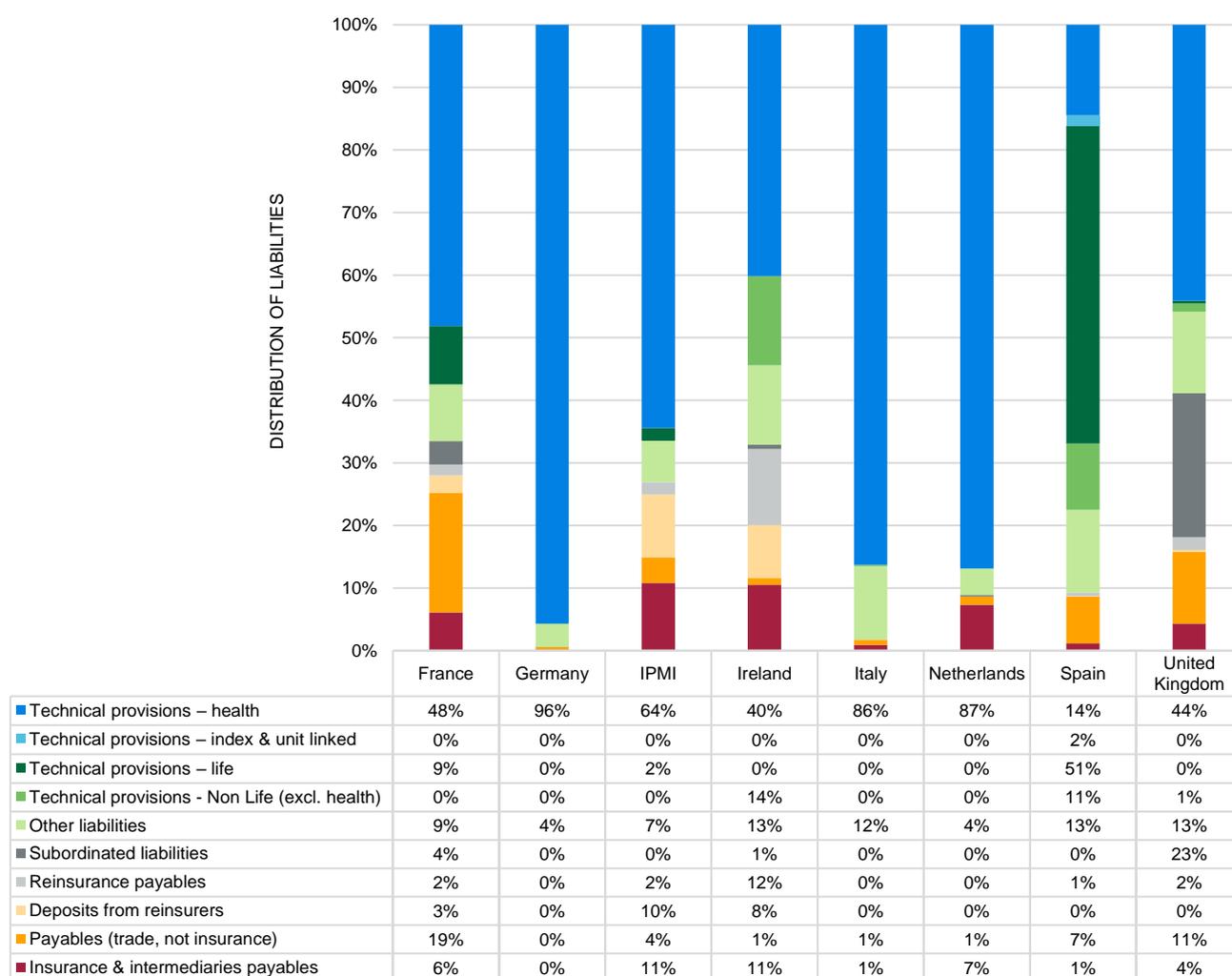
In the case of Spain, we observe that there are large technical provisions present in life business because of the following Spanish insurers:

- Aegon España S.A.U. de Seguros y Reaseguros
- Agrupació AMCI Seguros y Reaseguros, S.A.
- Hermandad Nacional de Arquitectos Superiores y Químicos, Mutualidad de Previsión Social

The Irish insurers have a significant proportion of technical provisions in reinsurance payables, non-life business and other liabilities.

The IPMI insurers have a significant portion of creditors or total 'payables' (such as insurance and intermediaries payables or reinsurance deposits). This may be due to the business model of IPMI insurers, where policies are sometimes distributed or administered by third-party providers.

FIGURE 9: DISTRIBUTION OF LIABILITIES BY COUNTRY IN 2017

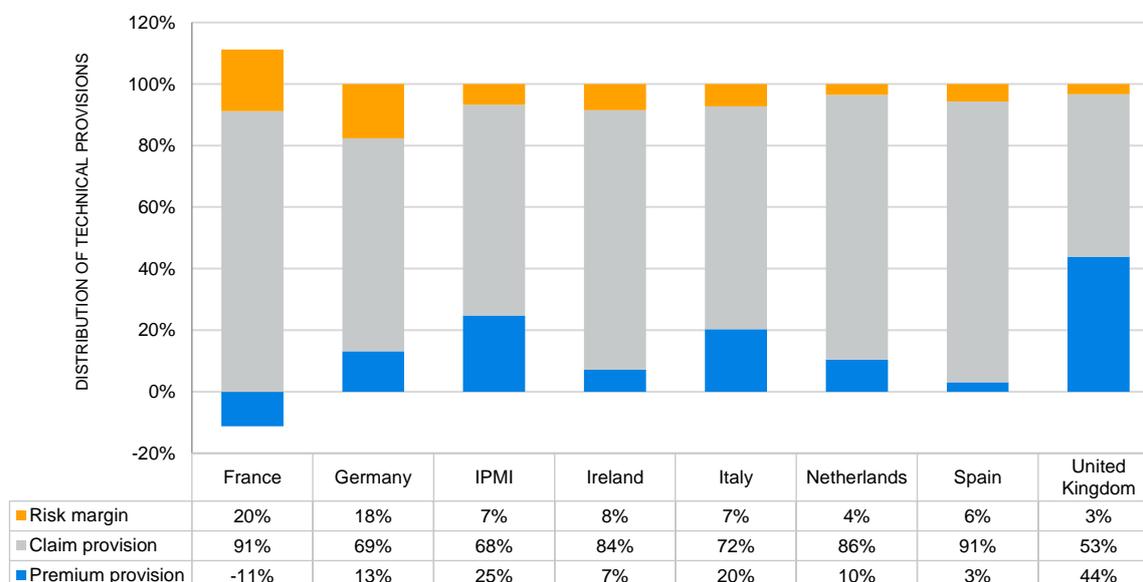


TECHNICAL PROVISIONS: COMPOSITION

The split of technical provisions among premium provisions (PP), claims provisions (CP) and risk margin (RM) also varies across all eight countries.

The claims provision is the largest component of the technical provisions for all eight countries, representing the liabilities associated with claims that have already occurred, whether reported or not reported.

FIGURE 10: BREAKDOWN OF TECHNICAL PROVISIONS BY COUNTRY IN 2017

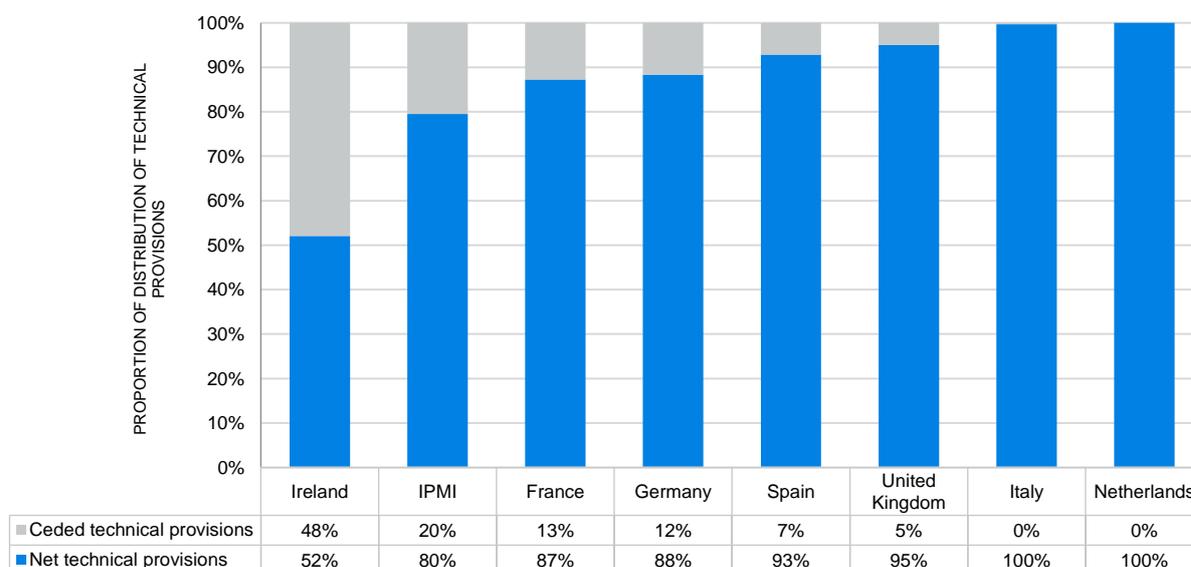


Note that absolute value of premium provisions was significantly higher for Allianz Private Krankenversicherungs-AG (a German insurer) compared to other insurers and was distorting the results of the breakdown of technical provisions. Hence, this insurer has not been considered in the figure above.

TECHNICAL PROVISIONS: DIRECT AND CEDED BUSINESS

Consistent with the analysis of reinsurance on premiums and claims in the section above, Irish, IPMI, French and German insurers are much more reliant on reinsurance than other insurers. Spain and the UK have little reliance on reinsurance, hence the technical provisions ceded to reinsurers is small. The Netherlands and Italy have close to 0% of ceded technical provisions, which is in line with the ceded premium business.

FIGURE 11: DIRECT AND CEDED BUSINESS BY COUNTRY IN 2017



RISK MARGIN: BY COMPANY

Figure 12 shows the risk margin as a percentage of SCR for all companies considered in the analysis. It represents the expected runoff of the company's risk exposure in terms of cost of capital, with the cost of capital defined as 6% of the SCR (excluding the capital charge for hedgeable market risk). The requirement to exclude hedgeable market risk from this calculation can distort the ratio but, in general, a ratio of about 6% implies that the runoff is about one year. A ratio below 6% implies a quicker runoff and a ratio above 6% implies a slower runoff.

Figure 12 shows that, for the majority of health insurers, the risk margin as a percentage of SCR is about 6%, as expected. However, some companies have a ratio that is lower or higher than 6%. There are certain outliers as well (having close to a risk margin of 0% or above 10%).

FIGURE 12: RATIO OF RISK MARGIN OVER SCR BY COMPANY IN 2017



4. Solvency Capital Requirement and Own Funds

This section of the paper focuses on the Solvency Capital Requirement (SCR) and own funds of health insurers, based on the information reported in the Own Funds QRT (S.23.01.01) and SCR QRTs (S.25.01, S.25.02 and S.25.03).

SOLVENCY CAPITAL REQUIREMENT

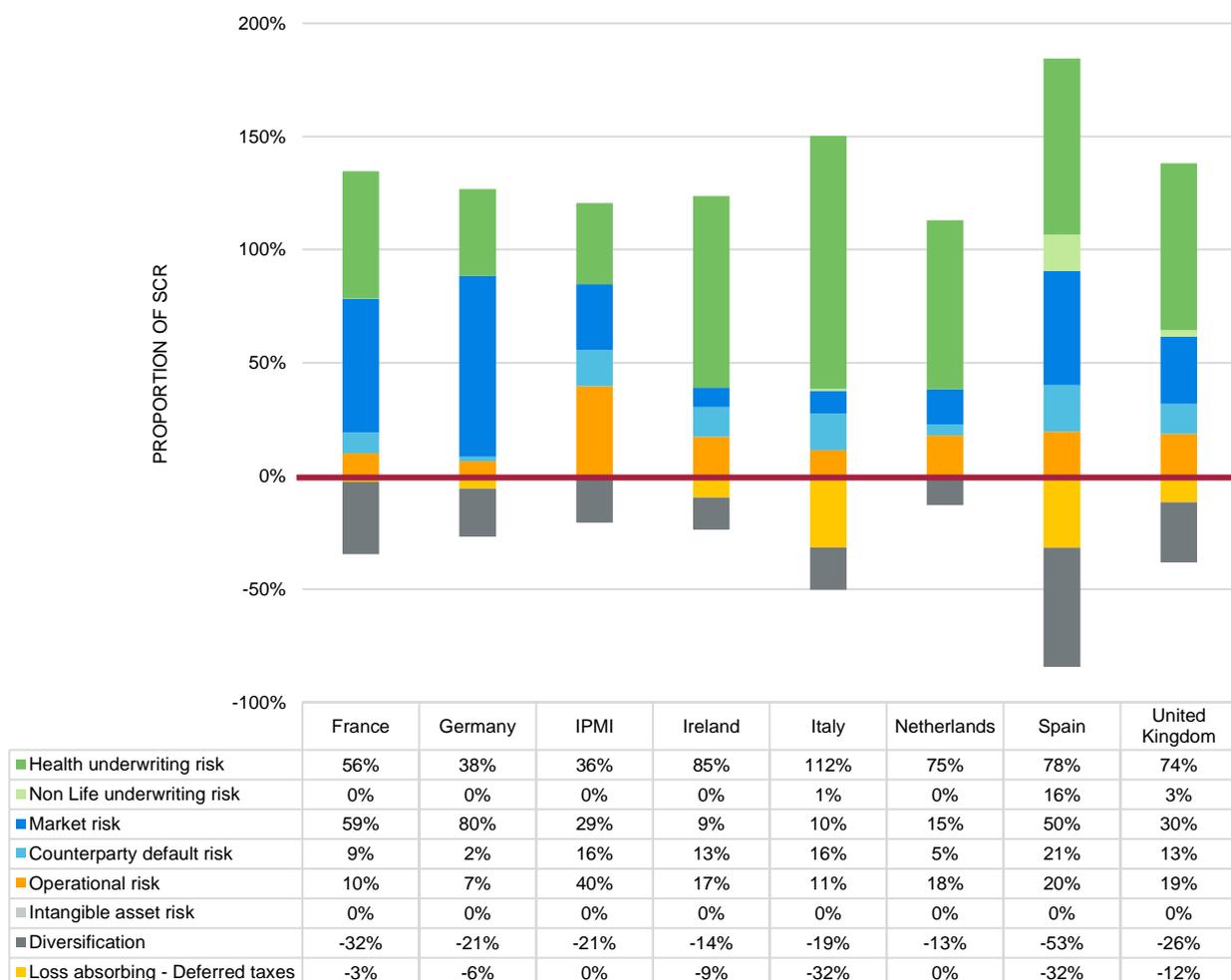
The SCR for health insurers primarily consists of the capital charge for health underwriting risk, with market risk, operational risk and counterparty default risk also making up large portions of the SCR.

In Figure 13, everything above the line represents a capital charge such as health underwriting risk, market risk or operational risk. Everything below the line represents a reduction to the SCR, e.g., for diversification benefits or the loss-absorbing capacity of deferred taxes.

The loss-absorbing capacity of technical provisions is not relevant for health insurance and therefore has no impact on the SCR.

We observe that the breakdown of SCR by risk type is broadly consistent from 2016 to 2017 for all eight countries. The observations for each of the risk are mentioned in the below subsections.

FIGURE 13: SCR BREAKDOWN BY COUNTRY AND RISK IN 2017



Health underwriting risk

Figure 13 above shows that health underwriting risk makes up a significant proportion of the SCR for all eight countries.

In the case of Germany and France we observe lower health underwriting risk than market risk. For IPMI insurers we observe that operational risk is higher than health underwriting risk. For the remaining five countries (Spain Ireland, Italy, the Netherlands and the UK), the largest portion of the SCR is composed of the health underwriting risk. Within these five countries with the largest portion of the SCR composed of the health underwriting risk, the Netherlands has the lowest capital charge for health underwriting risk and Italy has the highest.

For Dutch insurers the lower capital charge for health underwriting risk may be due to a specific allowance in the calculation of premium and reserve risk for companies operating within health risk equalisation systems (HRES). The Solvency II text allows companies operating within HRES to reduce the standard deviation for premium risk and the standard deviation for reserve risk relative to the normal factors set out in the standard formula. This applies to Dutch insurers offering basic health insurance. It does not apply to supplementary health insurance. On average, it results in a reduction to the factor applied to premium risk, from 5.0% to 2.7%. It has been estimated that, in some cases, this can reduce the capital charge for premium risk for Dutch health insurers selling basic insurance by about 30% relative to the standard formula, with no HRES adjustment. However, the impact varies by company. It should be noted that HRES adjustment does not apply to Irish health insurance companies as the Solvency II Directive states that, for this adjustment to apply, the health insurance within the HRES must be compulsory. In Ireland, take-up of private health insurance is voluntary.

There is no lapse risk capital charge for the Dutch health insurance as lapse risk is not a feature of these insurance contracts. In Ireland, however, the lapse risk component of the health underwriting risk capital charge is particularly onerous due to the mechanics of the Irish risk equalisation system. The risk equalisation credits are paid on a quarterly basis in respect of each new or renewed contract. Where a contract lapses within the first three months since inception, the insurer is still entitled to pay the annual risk equalisation credit for that contract. Therefore, under the health lapse risk capital charge (which is based on an instantaneous mass lapse scenario of 40%), the reinsurer is still liable to pay the full annual risk equalisation credit for new policies, including those that have lapses in this scenario.

Health catastrophe risk is also relatively low in the Netherlands, as this only applies to basic health insurance and is partially covered by a government compensation scheme. This may be another reason for the relatively lower capital charge for health underwriting risk relative to the other categories.

The split of health underwriting risk into its component parts, premium and reserve risk, lapse risk and health catastrophe risk, is not included in the public QRTs. However, it is possible to surmise the reasons for some differences.

Non-life underwriting risk

The non-life underwriting risk is close to 0% for most of the countries because the health insurers have little exposure to general insurance business. However, for Spain the high non-life underwriting risk is due to inclusion of SegurCaixa Adeslas, S.A. de Seguros y Reaseguros, which has a significant proportion of general insurance business.

Market risk

Market risk is another large risk for health insurers. It is a substantial proportion of total risk for all countries.

The German, French and Dutch insurers have much higher portions invested in collective investment schemes and holdings in related undertakings, which may be the reason for the higher market risk in these countries.

In the case of the UK, apart from large proportions of investment in bonds, the insurers have significant proportions of investment in property, equity, deposits other than cash equivalents and collective Investment undertakings (close to 24% of total investment in 2017). This could potentially be a reason for high market risk for UK insurers.

For the Spanish insurers, in 2017 approximately 25% of total investment was in the following instruments: property, deposits other than cash equivalents, collective investment undertakings and holdings in related undertakings. These investments are less conservative in nature and could possibly explain the high market risk for Spanish health insurers.

The analysis of investments shows that IPMI insurers are generally investing more conservatively than domestic health insurers in Europe, with the majority of their investments in bonds and cash. Therefore it is unusual for this country to have such a high proportion of market risk but this likely due to currency risk. The IPMI insurers cover lives across various markets such as the Eurozone, UK, Switzerland, Singapore, United Arab Emirates, Thailand

and Hong Kong, amongst others, and their liabilities are generally denominated in many different currencies. While matching assets and liabilities by currency can be used to reduce currency risk, in reality it is not always possible to match the assets and liabilities exactly by currency and some residual risk may remain on the balance sheet.

The Irish and Italian insurers have a larger portion of assets invested in government bonds and corporate bonds. These assets do not give rise to large capital charges under the standard formula. This may be the reason why market risk is a lower portion of the overall risk for Irish and Italian insurers.

Counterparty default risk

Counterparty default risk is associated with multiple types of contracts such as reinsurance arrangements, securitisations and derivatives, receivables from intermediaries, policyholder debtors, cash at bank, deposits with ceding institutions, capital, initial funds and letters of credit.

For Ireland and IPMI, there is counterparty default risk because of high usage of reinsurance. In the case of Spain, the default risk is due to the high value of counterparty default risk for the general insurance company—SegurCaixa Adeslas, S.A. de Seguros y Reaseguros. Similarly for the UK, the counterparty default risk is high for the largest health insurer, Bupa Insurance Limited.

Operational risk

For most countries operational risk forms a significant proportion of total SCR. For IPMI insurers, it forms a significant proportion of total risk probably due to the global nature of the business. Compared to the other IPMI insurers, Allianz Worldwide Partners Health & Life has a high operational risk contribution to the SCR.

In the case of the UK, Bupa has a high operational risk of 25% of total SCR in 2017.

Diversification

Diversification varies depending on the overall risk exposures of the companies. Those with more diversified risk exposures will gain from higher diversification benefits. Spain and France have high diversification, whereas other countries have a diversification proportion of -13% to -26%.

Loss-absorbing capacity of deferred tax (LACDT)

The LACDT is broadly consistent for the UK and Ireland. In the Dutch market, however, health insurers are exempt from paying taxes and as a result no deferred taxes are recognised on their balance sheets. Therefore, the SCR reduction for LACDT is not applicable for Dutch health insurers.

SOLVENCY CAPITAL REQUIREMENT: INTERNAL MODEL

The majority of the health insurers included in our analysis use the standard formula to calculate the SCR. A small number of companies in our sample use (partial) internal models. The list of companies using (partial) internal models is provided in Figure 14.

In addition to the risks that are covered in the standard formula (market, credit, underwriting, operational), the internal model also includes a capital charge for pensions risk. The market risk capital charge also covers risks such as interest rate implied volatility, equity implied volatility, government spread and inflation, which are not explicitly covered in the standard formula.

The partial internal model has been developed at a solo entity level. The main differences between the standard formula and partial internal model relate to the calibration of the health underwriting risk capital charge, followed by market risk and the allowance for diversification.

FIGURE 14: COMPANIES IN SAMPLE WITH AN INTERNAL CAPITAL MODEL

COUNTRY	COMPANY	CAPITAL MODEL	SOLVENCY COVERAGE RATIO (2017)
IPMI	Cigna Life Insurance Company of Europe	Partial Internal Model	194%
Germany	Allianz Private Krankenversicherungs-AG	Full Internal Model	625%
Germany	AXA Krankenversicherung Aktiengesellschaft	Full Internal Model	355%
Germany	Central Krankenversicherung AG	Partial Internal Model	793%
Germany	DKV Deutsche Krankenversicherung AG	Full Internal Model	372%
United Kingdom	AXA PPP Healthcare Limited	Full Internal Model	135%

SOLVENCY COVERAGE RATIO AND MINIMUM COVERAGE RATIO

The average coverage ratio for each health insurance country is given in the table in Figure 15. The solvency coverage ratio is calculated using the total sum of own eligible funds required to cover SCR divided by the total SCR. Similarly, the minimum coverage ratio is calculated using the total sum of own eligible funds required to cover MCR divided by the total MCR.

FIGURE 15: SOLVENCY COVERAGE RATIO AND MINIMUM COVERAGE RATIO*

COUNTRY	SOLVENCY COVERAGE RATIO (2016)	SOLVENCY COVERAGE RATIO (2017)	MINIMUM COVERAGE RATIO (2016)	MINIMUM COVERAGE RATIO (2017)
France	331%	367%	1170%	787%
Germany	414%	480%	1120%	1388%
IPMI	150%	162%	531%	564%
Ireland	277%	236%	939%	945%
Italy	119%	132%	270%	383%
The Netherlands	181%	152%	466%	392%
Spain	214%	189%	520%	492%
United Kingdom	159%	172%	416%	409%
Grand Total	270%	300%	739%	747%

*We excluded the following French insurers because the data shows 0% solvency coverage ratio for these insurers: M comme Mutuelle, Mutuelle Générale de la Distribution, Mutuelle Uneo, Mutuelles du Soleil and So'Lyon Mutuelle.

Overall the solvency coverage ratios for the health insurers included in our analysis are very healthy, with the averages significantly in excess of the required solvency coverage ratio of 100%. We draw the following broad conclusions:

- Insurers of France and Germany have higher solvency coverage ratios as compared to other countries.
- IPMI insurers and the included Italian insurer have low solvency coverage ratios as compared to other countries. Out of the IPMI insurers, Allianz has a solvency coverage ratio below 150% in 2016 and 2017.
- Similar conclusions can be drawn for minimum coverage ratios of the eight countries.

In the case of Irish health insurers, the high coverage ratio is predominantly due to one large insurer, VHI Healthcare, which has a very healthy capital position.

Note that, for the Dutch health insurers, the average SCR calculated in this report is much higher than the SCR quoted by the Dutch regulator in a recent publication of aggregate Solvency II figures. This seems to be because our analysis aggregates figures published by solo entities, whereas the figures by the Dutch regulator are based on consolidated group figures. Based on the figures published by the Dutch regulator, the average SCR solvency coverage ratio for Dutch health insurers is 157% in 2016 and 146% in 2017, which is lower than the weighted average figure quoted above of 196% in 2016 and 172% in 2017. This is contrary to what would be expected, in particular as the consolidated SCR may be lower at a group level when consolidation method 1 is applied, which is the preferred method of Dutch health insurers, and this would result in a higher solvency coverage ratio, all other things being equal.

The reason for this difference seems to be the leveraging effect of intragroup transactions. At a solo level these transactions can be taken into account when calculating the own funds of a solo entity, but when the transactions are consolidated at a group level they are netted off against one another. This means that the sum of own funds for the solo entities within a group is often higher than the consolidated group own funds, resulting in a higher solvency coverage ratio. This is something that impacts all European insurance groups across all territories, but the impact is particularly material in the Dutch health insurance market due to the prevalence of a number of large Dutch groups focusing primarily on that market.

DISTRIBUTION OF SOLVENCY COVERAGE RATIO

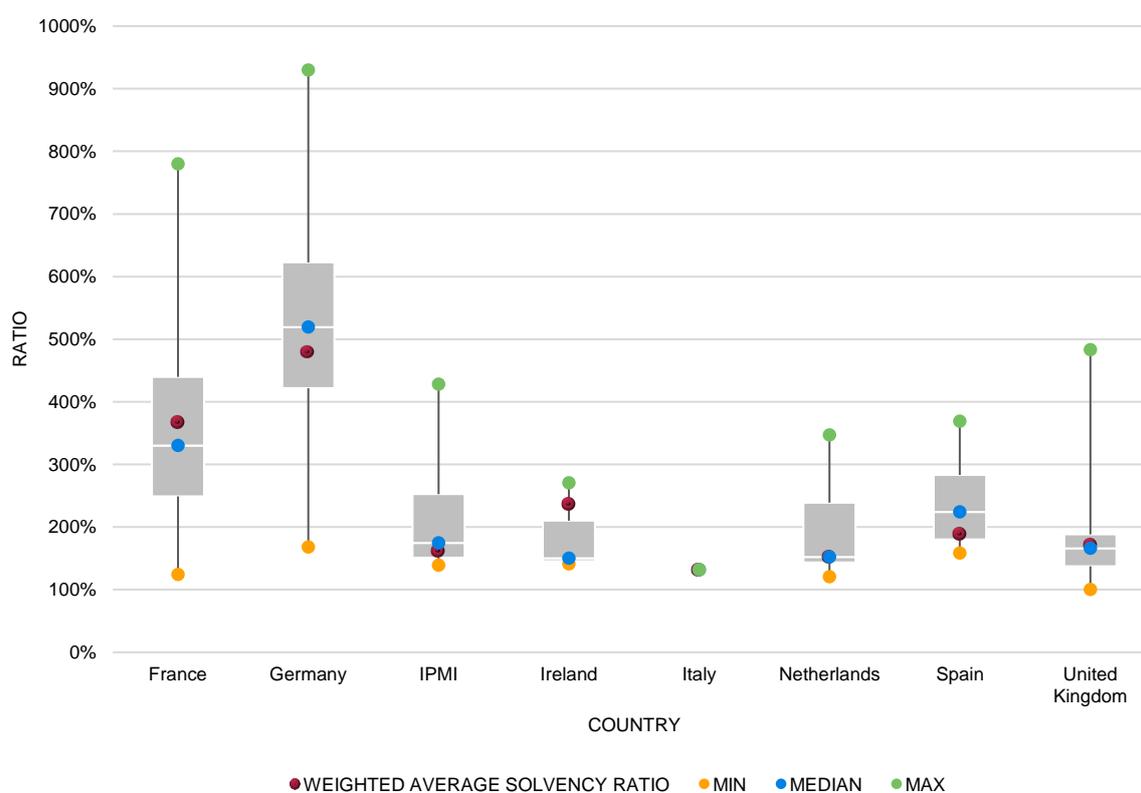
We analysed the distribution of solvency coverage ratios to understand the different boundaries of solvency coverage ratios such as minimum, maximum and median values.

Figure 16 shows the distribution of the solvency coverage ratios in 2017 by country.

We draw the following conclusions from Figure 16:

- Ireland, IPMI, the UK and the Netherlands have a narrow distribution of solvency coverage ratios.
- The remaining three countries, Germany, Spain and France, have a wider distribution of solvency coverage ratios.
- Italy only has one company included, resulting in Figure 16 showing a single observation.

FIGURE 16: DISTRIBUTION OF SOLVENCY COVERAGE RATIO BY COUNTRY IN 2017 (MIN, Q1, MEDIAN, Q3, MAX AND WEIGHTED AVERAGE SOLVENCY RATIO)*

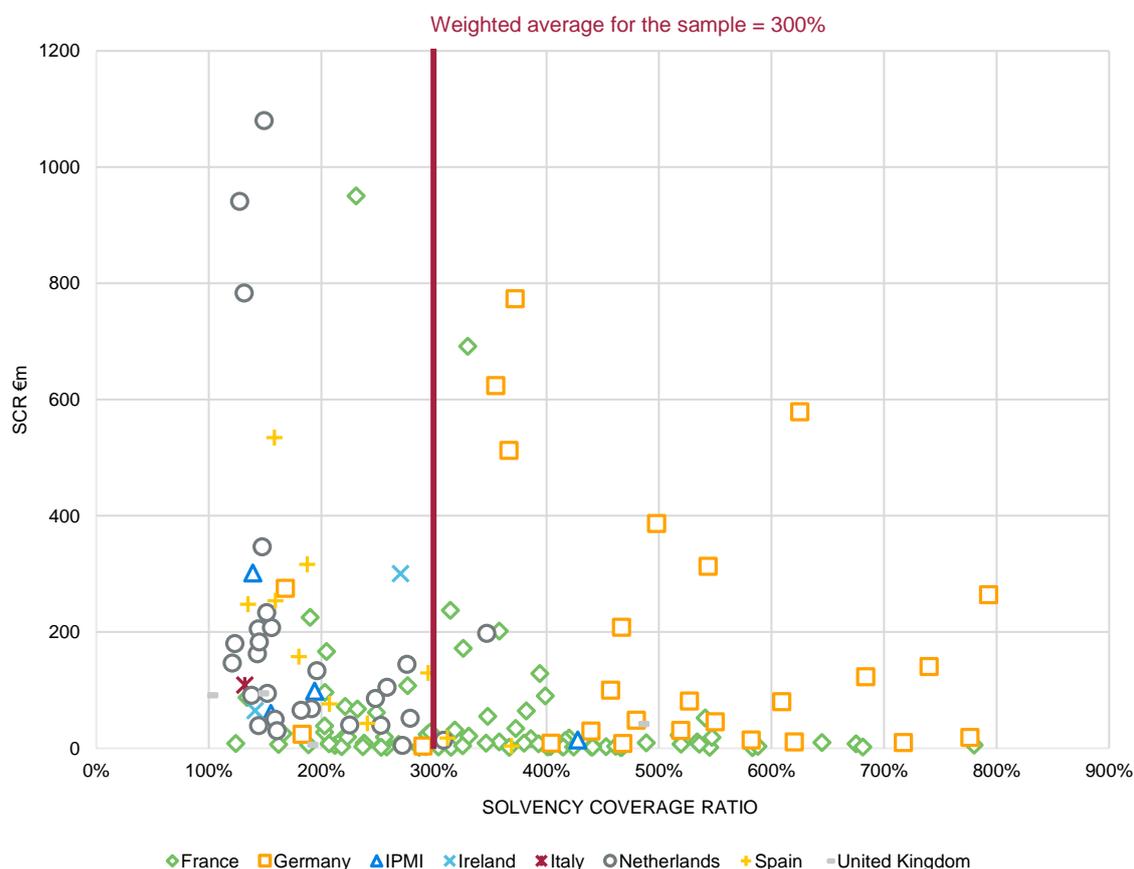


* We excluded the following French insurers because the data shows 0% solvency coverage ratio for these insurers: M comme Mutuelle, Mutuelle Générale de la Distribution, Mutuelle Uneo, Mutuelles du Soleil and So'Lyon Mutuelle.

SOLVENCY COVERAGE RATIO BY COMPANY

The scatter plot in Figure 17 shows the solvency coverage ratios of each company included in our analysis, plotted relative to the size of the company's SCR. The solvency coverage ratio range is quite wide, with the majority of companies in the analysis having a solvency coverage ratio between 150% and 450%. We also observe that the majority of insurers have an SCR of lower than EUR 200 million.

FIGURE 17: SOLVENCY COVERAGE RATIO BY COMPANY IN 2017*



*We excluded the following two insurers from the above analysis due to outlier SCRs of higher than EUR 1,200 million: Mutuelle MGEN Filia of France and Zilveren Kruis Zorgverzekeringen N.V. of the Netherlands.

We excluded the following French insurers as their SCR values were unavailable: M comme Mutuelle, Mutuelle Générale de la Distribution, Mutuelle Uneo, Mutuelles du Soleil and So'Lyon Mutuelle.

Note that for one UK insurer, Exeter Friendly Society,⁴ the insurer has two separate ring-fenced funds: one for long-term business and one for short-term general business. In accordance with the Solvency II regulations each sub-fund is treated as ring-fenced from a capital point of view and a surplus from one fund cannot be added to another. Ring-fenced fund restrictions mean that own funds at an overall Society level are restricted to the total SCR across both funds, giving rise to the results above showing zero excess own funds. Therefore, the reported solvency coverage ratio is shown as 100% in 2017. The more meaningful results are those at the fund level and before the ring-fenced fund restrictions apply. The solvency coverage ratio for long-term business is 167% in 2017, whereas for general business the ratio is 510% in 2017.

⁴ This information is provided in the 2017 SFCR of Exeter Friendly Society.

OWN FUNDS BY TIER AND COUNTRY

Own funds consist of the capital items backing a company's SCR and Minimum Capital Requirement (MCR). They include equity, debt and other items such as retained earnings and the present value of future profits (both included within the reconciliation reserve).

Under Solvency II, own funds are tiered based on their quality and availability to absorb losses. Tier 1 capital is the highest ranking with the greatest loss-absorbing capacity, such as equity. Tier 2 own funds are composed of hybrid debt and tier 3 of deferred tax assets.

Figure 18 shows the own funds of the health insurers included in our sample, split by country. Note that the tiering is done on the basis of available funds required to meet the SCR.

FIGURE 18: TIERING OF SCR-ELIGIBLE OWN FUNDS BY COUNTRY IN 2017

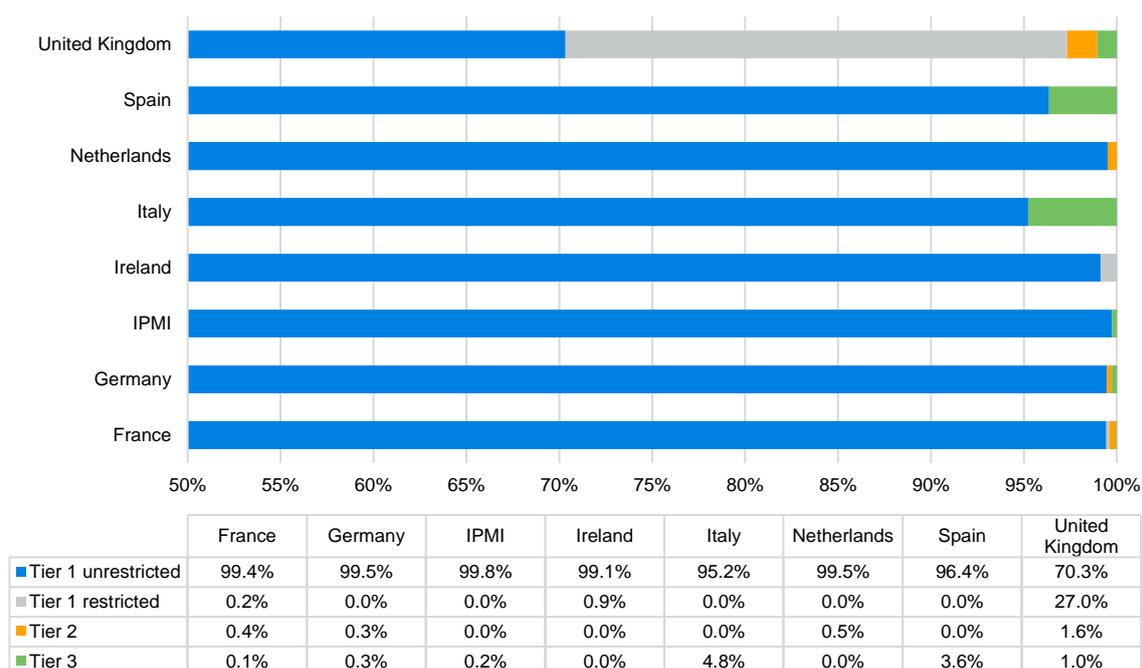


Figure 18 shows that the majority of health insurers are backing their SCRs with capital of the highest quality—unrestricted tier 1 basis own funds.

For Spain, SegurCaixa Adeslas, S.A. de Seguros y Reaseguros has 9% of own funds invested in tier 3 (all of which is in deferred tax asset) and because of its large size, the overall Spanish composition has 3.4% of own funds invested in tier 3.

The UK has the highest portion of lower-quality own funds. The restricted tier 1 and tier 2 own funds represent subordinated liabilities held by Bupa and, to a lesser degree, Vitality Health.

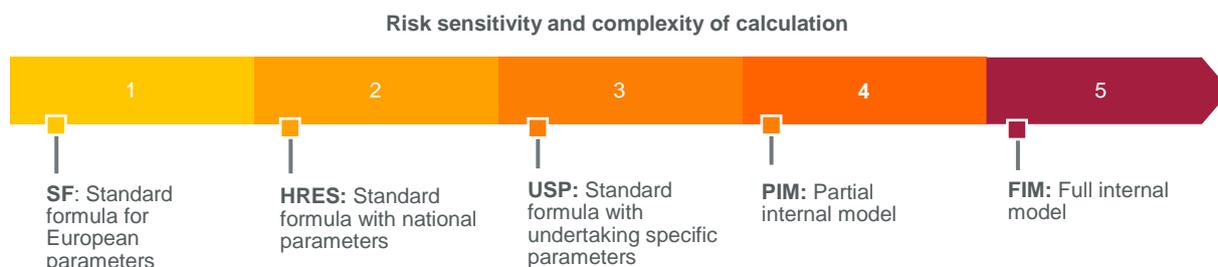
Bupa holds 59% of own funds in tier 1 unrestricted, 15% of own funds in tier 1 restricted and 27% of own funds in tier 2. Vitality holds 71% of own funds in tier 1 unrestricted, 18% of funds in tier 2 and 10% of funds in tier 3.

5. Analysis of SCR calculation methods

USAGE OF SCR METHODS

The Solvency II legislation provides insurers with a variety of methods to calculate their SCRs, ranging from simple to complex. The type of method used tends to differ largely by country and by company. In this section we analyse these differences and the potential impact on the SCR coverage ratios.

FIGURE 19: SCR CALCULATION METHODS



The majority of health insurers included in our sample use the standard formula to calculate the SCR.

The various methods of calculation are illustrated in Figure 19, and can be summarised as follows:

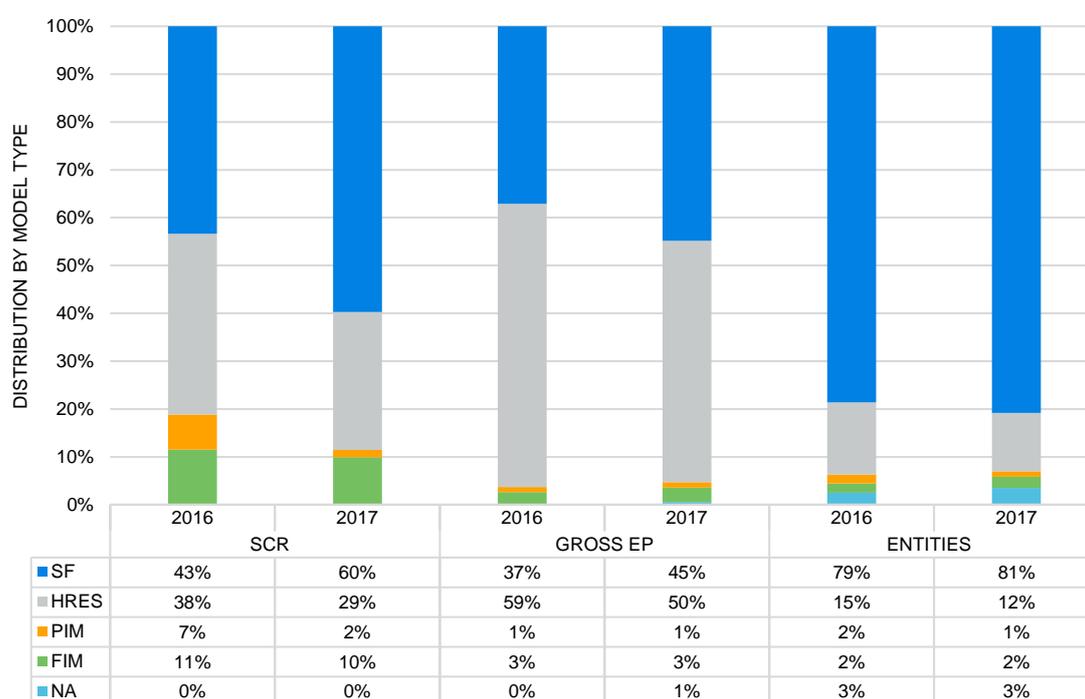
- Standard formula (SF) with pan-European parameters:** The standard formula approach is prescribed under Solvency II and is based on the risk profile of a typical insurer. Using this approach, a set of shocks are applied to the Solvency II balance sheet, based on default parameters calibrated using a pan-European data set. The underlying standard parameters for the standard deviation of premium risk and reserve risk is currently 5.0%. Per 2020 the standard parameter for reserve risk is expected to be 5.7% for medical expense insurance as per the latest European Insurance and Occupational Pensions Authority (EIOPA) consultation report.⁵
- Standard formula with HRES parameters:** This approach is the same as in the case of the standard formula model but the default parameters are calibrated using a specific data set only including the health insurers subject to health risk equalisation system (HRES) requirements and meeting certain conditions. Currently, this subset only contains Dutch basic health insurers and these HRES parameters are only applicable to these insurers. The current parameters were calibrated by the Dutch regulator in 2012 on the basis of a data set for basic health insurers. They are equal to 2.7% for premium risk and 5.0% for reserve risk. Currently a recalibration of these parameters is being undertaken by the Dutch regulator and is expected to be effective in 2020 as well. This may lead to a further reduction of the HRES parameters compared to standard parameters. The HRES parameters are subject to a lower limit set by EIOPA, equal to one-third of the standard formula parameters for premium and reserve risk (currently 1.7% for both premium and reserve risk). They are also subject to an upper limit set by EIOPA as well, equal to the European standard parameters (currently 5.0% for both premium and reserve risk).
- Standard formula with undertaking-specific parameters (USPs):** In addition, the Solvency II text allows all insurers (including healthcare insurers subject to HRES) to replace a subset of the standard parameters with USPs. For health insurers, the parameters for the standard deviation of premium and reserve risk in the not similar to life techniques (NSLT) health insurance risk module can be based on parameters specific to the insurance company, with other SCR parameters following the standard formula. USPs are subject to regulatory approval and there is a prescribed standard method underlying the calculation. The USPs are a credibility-weighted result of the calibrated standard deviations based on the company's data set and the standard parameters. The more years of data included in the calibration, the higher the credibility factor and hence the more the USPs equal the calibrated standard deviations based on the undertakings data set. Currently there is no requirement for insurers to disclose the impact of USPs on the capital requirements in their SFCRs.

⁵ EIOPA's second set of advice to the European Commission on specific items in the Solvency II Delegated Regulation, dated 28 February, 2018, is available at: https://eiopa.europa.eu/Publications/Consultations/EIOPA-18-075-EIOPA_Second_set_of_Advice_on_SII_DR_Review.pdf.

- **Partial internal model (PIM):** The Solvency II text also allows insurers to use a partial internal model (PIM) for the calculation of specific capital charges, with the remaining capital charges calculated using the standard formula approach. The PIM can apply to all business or to only one or more business units. In developing a PIM, an insurer is free to determine a suitable calculation method and calibrate the model based on its own risk profile. The use of a PIM is subject to approval by the national regulator and the approval process is subject to strict regulations.
- **Full internal model (FIM):** Finally, a full internal model (FIM) can be used. This is an economic capital model that is customised to fully reflect the specific risk profile of the insurer. Like the PIM, a FIM is subject to a strict regulatory approval process.

Within our database, the vast majority of insurers are using the standard formula to calculate their SCRs. If we focus on the health insurers included in our analysis, we can draw some inferences from the split of the gross earned premiums (gross EP) and SCR by calculation method, as shown in Figure 20.

FIGURE 20: SPLIT OF GROSS EARNED PREMIUM AND SCR BY CALCULATION METHOD FOR 2016 AND 2017*



* SF – standard formula; PIM – partial internal model; NA – not available; HRES – health risk equalisation system; FIM – full internal model.

The HRES companies are the Dutch companies providing basic health insurance which have a standard formula with HRES parameters. Even though as a percentage of entities these insurers are less than 20%, they form a significant part of the European market in terms of gross earned premium and SCR. Compared to the SF companies, the capital charge per gross earned premium is relatively low, due to the lower parameter for premium risk. The insurers with internal models (partial and full) form a smaller proportion of the European market.

FOCUS ON USPS

At the time when EIOPA was developing the calibration of the standard formula, it only had access to a limited amount of data from health insurers. In some EU countries, there was a general view amongst health insurance professionals that the standard formula calibration for the standard deviation for premium risk (5.0%) was too high and the calibration for the standard deviation for reserve risk (5.0%) too low. However, based on the latest recalibration with substantially more data, there is no indication the standard deviation for premium risk is too high overall and EIOPA has recommended keeping the calibration at 5.0%. For reserve risk the recommendation is to increase the standard deviation from 5.0% to 5.7%. This is currently under consultation after receiving feedback from the industry, but an increase in this parameter may result in more undertakings considering USPs. Given the diversity of health insurance in different EU countries, it would be surprising if the standard formula parameters were universally appropriate.

Unfortunately, EIOPA has not published a full list of undertakings using USPs for medical expense insurance across Europe. Details of insurers that we have identified using USPs for medical expense reinsurance are outlined in Figure 21. Note that this is not an exhaustive list and there could be more insurers that have USPs as a method of calculation.

FIGURE 21: HEALTH INSURERS IDENTIFIED TO BE USING USPS

COMPANY NAME	COUNTRY	USP FOR PREMIUM RISK	USP FOR RESERVE RISK
BUPA INSURANCE LIMITED (BUPA)	UK, PART OF THE BUPA GROUP	Y	-
SANITAS S.A DE SEGUROS ('SANITAS')	SPAIN, PART OF THE BUPA GROUP	Y	-
CATTOLICA ASSICURAZIONI SOC. COOP ('CATTOLICA')	ITALY, PART OF THE CATTOLICA GROUP	Y	Y
TUA ASSICURAZIONI S.P.A. ('TUA')	ITALY, PART OF THE CATTOLICA GROUP ⁶	Y	Y
MACIF MUTUALITÉ	FRANCE PART OF THE MACIF GROUP	Y	Y

While insurers are required to publicly disclose the use of USPs in their SFCRs, they are not yet required to publish the impact of USPs on their capital requirements. Therefore it is not easy to analyse the impact of USPs compared to the standard formula in particular, as there may be other variations in companies' risk exposures or target capital underlying differences in the SCR or solvency coverage ratio.

However, we carried out some high-level analysis based on the information provided in the public QRTs to estimate the USPs of these companies. This analysis was based on a number of assumptions. For example, we assumed that the standard formula capital charge for health underwriting risk is solely due to premium and reserve risk, i.e., that there is no capital charge for lapse risk or health catastrophe risk⁷ and that the volume measure for premium risk is equal to net earned premiums received over the past 12 months. In addition, we assumed that the volume measure for reserve risk is equal to the net claims provision at the valuation date and that there is no benefit for geographical diversification in the calculation of the premium and reserve risk capital charge.

Based on this analysis, we estimate that the use of a USP for premium risk could reduce the capital requirement for premium and reserve risk by up to 50% to 60%. When USPs are used for both parameters, we estimate that the impact can be even greater—up to 70% to 80%.

For the Dutch HRES we have calculated that the reduction of the sigma for premium risk from 5.0% to 2.7% would reduce the capital requirement by up to 30% to 40%. While the underlying calculations are based on some high-level assumptions, it is fair to infer that the use of USPs and HRES can have a significant impact on the capital requirement for premium and reserve risk.

The exact impact for a specific company will depend on its underlying risk exposure to premium and reserve risk and the quality of the data underlying the USP calculation. However, we believe that this is an area that will be of increased focus to health insurers in the future, particularly if EIOPA recommends an increase to the reserve risk parameter following its latest consultation.

⁶ Both Cattolica and Tua have received approval for a number of non-life USPs. These insurers are part of the same group and received approval for the use of their USPs on the same date, so this may have been part of a group-specific parameter (GSP) application rather than individual USP applications.

⁷ For Dutch health insurers lapse risk is by definition zero (because the insurance period is only one year). Catastrophe risk is very small because some of it is covered by the government.

Conclusion

Amongst the selected countries, the Netherlands forms the largest proportion of medical business in Europe,⁸ due to its compulsory medical insurance requirement. The gross loss ratio for Europe is 88% in 2017, which is primarily due to the high gross loss ratio in the Netherlands. The remaining seven countries have a gross loss ratio of less than 89% in 2017. The expense ratio and technical result ratio of Europe is 12% and 0%, respectively, in 2017. Compared to 2016, the gross loss ratio, expense ratio and technical result ratio have remained stable. Overall, Europe has reinsurance premium and reinsurance claim proportions of 5% and 4%, respectively, in 2017.

The largest distribution of assets is in investments, which constitutes 88% of assets in 2017. Within investments, the three major components of assets in Europe are the following: corporate bonds (40% of investments in 2017), collective investment undertakings (28% of investments in 2017) and government bonds (21% of investments in 2017).

Not surprisingly, the largest distribution of liabilities for the health insurers in Europe is the technical provisions of health (91% of liabilities in 2017). The distribution of assets and liabilities has remained stable from 2016 to 2017. Similarly, the investment distribution for corporate bonds and government bonds has been stable from 2016 to 2017. However, the distribution of investments has changed significantly for holdings in related undertakings (19% of investments in 2016 to 5% of investments in 2017) and collective investment undertakings (11% of investments in 2016 to 28% of investments in 2017).

The claim provisions are a major component of the technical provisions for the European insurers, increasing from 80% of technical provisions in 2016 to 85% of technical provisions in 2017. The increase is primarily due to Spanish, Dutch and Irish insurers. The allocation of technical provisions in direct and ceded business is in line with the reinsurance usage of the eight countries. The risk margin of the health insurers in Europe is close to 5% of the SCR in 2017.

Health underwriting risks (43% of undiversified SCR in 2017) and market risks (43% of undiversified SCR in 2017) are the largest risk exposures of health insurers, based on the split of the SCR components. However, there are some differences in the risk exposure across the various countries, generally depending on the nuances of the healthcare systems in which the insurers operate. Operational risks and counterparty default risks are also significant risk exposures for the health insurers. Diversification forms a significant negative exposure to risk for the health insurers.

Overall the European health insurers included in the sample were in a very strong position at year-end 2017, with an average SCR coverage ratio of 300%, which is higher than the SCR coverage ratio of 270% in 2016. Of the companies included in our analysis, close to 85% had an SCR coverage ratio of more than 150% in 2017.

Own funds of European health insurers are predominantly invested in tier 1 unrestricted own funds (99% of own funds in 2017), which is the highest form of capital in terms of quality and loss absorbency as defined under Solvency II. This is consistent with the investment proportions in 2016.

⁸ Here Europe refers to the health insurance market for the selected insurers in this report.

Appendix A: Health systems by country*

FIGURE 22: HEALTH SYSTEMS BY COUNTRY

COUNTRY	HEALTHCARE FUNDING MECHANISMS	PRICING AND RATING METHODS FOR PMI	PMI POLICY TYPE AND PURPOSE OF PMI	TYPICAL BENEFIT COVERAGE IN PMI
France	Primary funding system is SHI. Other dominant systems are PMI and OOP.	Premiums are risk-rated.	PMI undertaking is sometimes compulsory through the employer. However, it is voluntary for individual policies. Purpose of PMI is supplementary.	Comprehensive coverage for most services, including long-term care. Coverage for chronic conditions is excluded.
Germany: Supplementary/complementary health insurance	Primary funding system is SHI. Other dominant systems are OOP and PMI.	Premiums are risk-rated.	PMI undertaking is voluntary and individual-based. Purpose of PMI is more often supplementary rather than complementary.	Covers comprehensive range of services available in SHI schemes but there may be co-payments for some services. PMI can be used to provide access to additional services.
Germany: Substitutive health insurance	Primary funding system is SHI. Other dominant systems are OOP and PMI.	Premiums are risk-rated.	PMI undertaking is voluntary and individual based. Purpose is substitutive.	Covers additional services that would not normally be covered under SHI.
Ireland	Primary funding system is tax-based and/or NHI. Other dominant systems are PMI and OOP.	Premiums are mostly community-rated, but there is some capacity for age band adjustments. There is a risk equalisation system in place with open enrolment.	PMI undertaking is voluntary and individual-based. Purpose of PMI is complementary, duplicative and supplementary.	Fairly comprehensive benefits. Provision of primary care and emergency services varies by product. Generally, coverage for prescriptions, dental and optical services is excluded.
Italy	Primary funding system is tax-based and/or NHI. Other dominant systems are OOP and PMI.	Premiums are risk-rated.	PMI undertaking is voluntary and both individual and employer-sponsored. Purpose of PMI is duplicative and supplementary.	Some coverage available for maternity, dental, optical, long-term care and outpatient services. All other services available through the public healthcare system.
Spain	Primary funding system is tax-based and/or NHI. Other dominant systems are PMI and OOP.	Premiums are risk-rated	PMI undertaking is voluntary and individual-based. Purpose of PMI is duplicative and supplementary.	Fairly comprehensive coverage. Coverage for pre-existing chronic conditions, prescriptions and optical is excluded. Dental cover is optional.
The Netherlands: Basic health insurers	Primary funding system is PMI (50% funded by tax and 50% via premiums). Other dominant system is OOP.	Premiums are community-rated. There is a risk equalisation system in place with open enrolment.	PMI undertaking is compulsory for individuals and PMI is the primary source of health insurance.	Comprehensive benefit coverage.
The Netherlands: Supplementary health insurers	Primary funding system is PMI. Other dominant system is OOP.	Premiums are risk-rated with open enrolment.	PMI undertaking is voluntary and individual-based. Purpose of PMI is both complementary and supplementary.	Covers services such as dental, physiotherapy, optical, contraceptives and medicine co-payments to supplement the services available through the basic system.
United Kingdom	Primary funding system is tax-based and/or NHI. Other dominant systems are PMI and OOP.	Premiums are risk-rated.	PMI undertaking is voluntary. Policies can be employer-sponsored or individual but are mostly employer-sponsored. Purpose of PMI is duplicative and supplementary.	Mostly covers inpatient elective and outpatient diagnostic services. Coverage for emergency services, chronic conditions and maternity services is excluded and primary care coverage is limited.

*** Descriptions of health system indicators***Healthcare funding systems*

- Tax-based/NHI: Tax-based/national health insurance.
- PMI: Private medical insurance.
- SHI: Social health insurance.
- OOP: Out-of-pocket expenditure.

Pricing and rating methods for PMI

- Risk-rated: Insurers able to differentiate premiums based on policyholders' risk profiles.
- Community-rated: Insurers obliged to charge single premium rate to all policyholders—no differentiation by risk profile.
- Risk equalisation: Insurers with higher-/lower-risk members receive/contribute funds to equalise risk amongst insurers.
- Open enrolment: Insurer is obliged to accept every member who wishes to enrol as a policyholder.

Purpose of PMI

- Duplicative: Services available in PMI system are also in public sector.
- Supplementary: PMI covers gaps in payment/access to services from public sector.
- Complementary: PMI covers gaps in services from public sector.
- Substitutive: PMI used when policyholders opt out of SHI/other schemes.
- Primary source: PMI is the primary source of funding for healthcare service provision.

Description of benefits

- This gives an indication of the richness of benefits provided in PMI. We considered whether primary care, emergency, maternity, chronic condition, outpatient, inpatient elective, prescription, dental, optical and long-term care services are provided in each system.

Appendix B: List of selected companies in 2017 and corresponding solvency coverage ratio

Note that certain companies do not have a populated model type or solvency coverage ratio.

FIGURE 23: SELECTED COMPANIES AND SOLVENCY COVERAGE RATIO IN 2017

COUNTRY	COMPANY NAME	CAPITAL MODEL TYPE	SOLVENCY COVERAGE RATIO (2017)
France	Adrea Mutuelle	Standard Formula	326%
France	Apivia Mutuelle	Standard Formula	249%
France	Apréva mutuelle	Standard Formula	277%
France	ASPBTP	Standard Formula	304%
France	AUBEANE Mutuelle de France	Standard Formula	467%
France	BPCE Mutuelle	(blank)	518%
France	Caisse de Prévoyance Mulhousienne	Standard Formula	453%
France	CAISSE NATIONALE MUTUALISTE PREVOYANCE SANTE	Standard Formula	534%
France	CCMO Mutuelle	Standard Formula	166%
France	Centre Mutualiste Interprofessionnel (C.M.I.P.)	Standard Formula	257%
France	CHORALIS Mutuelle Le Libre Choix	Standard Formula	238%
France	EMOA Mutuelle du Var	Standard Formula	358%
France	ENTRENOUS	Standard Formula	254%
France	Eovi-mcd	Standard Formula	315%
France	Grand Est Mutuelle dite Radiance Groupe Humanis Grand Est	Standard Formula	294%
France	GROUPE DES MUTUELLES INDEPENDANTES	Standard Formula	367%
France	Harmonie Fonction Publique	Standard Formula	348%
France	Harmonie Mutuelle	Standard Formula	330%
France	Identités Mutuelle	Standard Formula	203%
France	LA CHOLETAISE	Standard Formula	269%
France	La mutuelle des municipaux de Marseille	Standard Formula	212%
France	La Mutuelle Verte	Standard Formula	520%
France	La Prévoyance	Standard Formula	583%
France	M COMME MUTUELLE	(blank)	0%
France	Macif Mutualité	Standard Formula	190%
France	Malakoff Médéric Mutuelle	Standard Formula	358%
France	MBA Mutuelle	Standard Formula	420%
France	MFPrévoyance	Standard Formula	203%
France	MFPS	Standard Formula	441%
France	MGCorse	Standard Formula	237%
France	MGEFI	Standard Formula	221%
France	Miag	Standard Formula	287%
France	MILTIS	Standard Formula	216%
France	MTRL UNE MUTUELLE POUR TOUS	Standard Formula	780%
France	MUTAERO	Standard Formula	189%
France	Mutame Normandie	Standard Formula	467%
France	Mutami	Standard Formula	257%
France	Mutlor	Standard Formula	401%
France	Mutualia Alliance Santé	Standard Formula	331%

COUNTRY	COMPANY NAME	CAPITAL MODEL TYPE	SOLVENCY COVERAGE RATIO (2017)
France	Mutualp	Standard Formula	258%
France	Mutuelle 403	Standard Formula	417%
France	Mutuelle Bleue	Standard Formula	232%
France	Mutuelle Boissière du BTP	Standard Formula	293%
France	Mutuelle Complémentaire d'Alsace (MCA)	Standard Formula	219%
France	Mutuelle de l'Industrie du Pétrole	Standard Formula	541%
France	Mutuelle de l'Oise des Agents Territoriaux	Standard Formula	218%
France	Mutuelle des Chambres de Commerce et d'Industrie (MCCI)	Standard Formula	162%
France	MUTUELLE DES METIERS ELECTRONIQUE ET INFORMATIQUE EX MUTUELLE BULL	Standard Formula	289%
France	Mutuelle des Sapeurs-Pompiers de Paris	Standard Formula	403%
France	Mutuelle du personnel IBM	Standard Formula	223%
France	Mutuelle Familiale de la Corse	Standard Formula	207%
France	Mutuelle Familiale de l'Ile de France - (MFIF)	Standard Formula	315%
France	Mutuelle Générale de la Distribution	Standard Formula	0%
France	Mutuelle Générale des Cheminots	Standard Formula	319%
France	Mutuelle Générale des Etudiants de l'Est	Standard Formula	414%
France	Mutuelle Humanis Nationale	Standard Formula	203%
France	Mutuelle Intergroupes Poliet & Ciments Français (M.I.P.C.F.)	Standard Formula	415%
France	Mutuelle MGEN	Standard Formula	231%
France	Mutuelle MGEN Filia	Standard Formula	454%
France	Mutuelle Mieux-Etre	Standard Formula	675%
France	Mutuelle MOS	Standard Formula	424%
France	Mutuelle Nationale des Fonctionnaires des Collectivités Territoriales (MNFACT)	Standard Formula	124%
France	Mutuelle Nationale des Hospitaliers et des professionnels de la santé et du social (MNH)	Standard Formula	204%
France	Mutuelle Nationale des Personnels D'air France (MNPAF)	Standard Formula	297%
France	Mutuelle Nationale du Personnel des Etablissements Michelin	Standard Formula	645%
France	Mutuelle PREVIFRANCE	Standard Formula	382%
France	Mutuelle Renault	Standard Formula	386%
France	Mutuelle S.M.P.S	Standard Formula	466%
France	Mutuelle Saint-Martin	Standard Formula	380%
France	Mutuelle Santé Eiffage Energie (MSEE)	Standard Formula	440%
France	Mutuelle Servir	Standard Formula	545%
France	Mutuelle SMH	(blank)	325%
France	MUTUELLE SOLIDARITE AERONAUTIQUE	Standard Formula	588%
France	Mutuelle Solimut Centre Ocean	Standard Formula	254%
France	Mutuelle Uneo	Standard Formula	240%
France	Mutuelle VALEO	Standard Formula	291%
France	Mutuelle Victor Hugo	Standard Formula	462%
France	Mutuelles du Pays-Haut	Standard Formula	441%
France	MUTUELLES DU SOLEIL	(blank)	0%
France	Ociane Groupe Matmut	Standard Formula	399%
France	Pavillon Prévoyance	Standard Formula	489%
France	RCBF	Standard Formula	536%

COUNTRY	COMPANY NAME	CAPITAL MODEL TYPE	SOLVENCY COVERAGE RATIO (2017)
France	Réunica Mutuelle	Standard Formula	393%
France	SMEREP	Standard Formula	681%
France	So'Lyon Mutuelle	(blank)	376%
France	Solidarité Mutualiste De L'association Des Travailleurs Indépendants Et Salariés De France	Standard Formula	256%
France	Solimut Mutuelle de France	Standard Formula	134%
France	Unimutuelles	Standard Formula	253%
France	ViaSanté Mutuelle	Standard Formula	394%
France	Avenir Mutuelle	Standard Formula	547%
France	Mutuelle d'entreprises Schneider Electric	Standard Formula	346%
France	Mutuelle des Clercs et Employés de Notaire mutuelle (MCEN)	Standard Formula	373%
France	So'Lyon Mutuelle	(blank)	376%
France	Solidarité Mutualiste De L'association Des Travailleurs Indépendants Et Salariés De France	Standard Formula	256%
France	Solimut Mutuelle de France	Standard Formula	134%
France	Unimutuelles	Standard Formula	253%
France	ViaSanté Mutuelle	Standard Formula	394%
France	Avenir Mutuelle	Standard Formula	547%
France	Mutuelle d'entreprises Schneider Electric	Standard Formula	346%
France	Mutuelle des Clercs et Employés de Notaire mutuelle (MCEN)	Standard Formula	373%
Germany	Allianz Private Krankenversicherungs-AG	Full Internal Model	625%
Germany	Alte Oldenburger Krankenversicherung AG	Standard Formula	776%
Germany	Alte Oldenburger Krankenversicherung von 1927 V.V.a.G.	Standard Formula	620%
Germany	AXA Krankenversicherung Aktiengesellschaft	Full Internal Model	355%
Germany	Bayerische Beamtenkrankenkasse AG	Standard Formula	467%
Germany	Central Krankenversicherung AG	Partial Internal Model	793%
Germany	Concordia Krankenversicherungs-AG	Standard Formula	468%
Germany	Continental Krankenversicherung a.G.	Standard Formula	498%
Germany	Debeka Krankenversicherungsverein auf Gegenseitigkeit Sitz Koblenz am Rhein	Standard Formula	367%
Germany	DEVK Krankenversicherungs-AG	Standard Formula	717%
Germany	DKV Deutsche Krankenversicherung AG	Full Internal Model	372%
Germany	ERGO Direkt Krankenversicherung AG	Standard Formula	168%
Germany	Gothaer Krankenversicherung AG	Standard Formula	930%
Germany	Hallesche Krankenversicherung auf Gegenseitigkeit	Standard Formula	684%
Germany	HUK-COBURG-Krankenversicherung AG	Standard Formula	527%
Germany	Inter Krankenversicherung aG	Standard Formula	609%
Germany	Landeskrankenhilfe V.V.a.G.	Standard Formula	740%
Germany	LVM Krankenversicherungs-AG	Standard Formula	480%
Germany	Mecklenburgische Krankenversicherungs-AG	Standard Formula	404%
Germany	NÜRNBERGER Krankenversicherung AG	Standard Formula	439%
Germany	Pax-Familienfürsorge Krankenversicherung AG im Raum der Kirchen	Standard Formula	582%
Germany	R+V Krankenversicherung Aktiengesellschaft	Standard Formula	550%
Germany	SIGNAL IDUNA Krankenversicherung a. G.	Standard Formula	544%
Germany	Union Krankenversicherung AG	Standard Formula	457%

COUNTRY	COMPANY NAME	CAPITAL MODEL TYPE	SOLVENCY COVERAGE RATIO (2017)
Germany	Union Reiseversicherung AG	Standard Formula	183%
Germany	vigo Krankenversicherung VVaG	Standard Formula	290%
Germany	Württembergische Krankenversicherung AG	Standard Formula	519%
IPMI	Aetna Insurance Company Limited	Standard Formula	155%
IPMI	Allianz Worldwide Partners Health & Life	Standard Formula	139%
IPMI	Cigna Life Insurance Company of Europe	Partial Internal Model	194%
IPMI	Globality S.A.	Standard Formula	201%
IPMI	OOM Global Care N.V.	Standard Formula	428%
Ireland	Elips Versicherungen AG	Standard Formula	141%
Ireland	Irish Life Health Designated Activity Company	Standard Formula	150%
Ireland	Vhi Insurance DAC	Standard Formula	270%
Italy	UniSalute S.p.A.	Standard Formula	132%
The Netherlands	ASR Aanvullende Ziektekostenverzekeringen N.V.	Standard Formula	309%
The Netherlands	ASR Basis Ziektekostenverzekeringen N.V.	Standard Formula (HRES)	138%
The Netherlands	Avéro Achmea Zorgverzekeringen N.V.	Standard Formula (HRES)	196%
The Netherlands	De Friesland Zorgverzekeraar N.V.	Standard Formula (HRES)	144%
The Netherlands	Delta Lloyd Zorgverzekering N.V.	Standard Formula (HRES)	276%
The Netherlands	DSW Ziektekostenverzekeringen N.V.	Standard Formula	253%
The Netherlands	Eno Aanvullende Verzekeringen N.V.	Standard Formula	272%
The Netherlands	Eno Zorgverzekeraar N.V.	Standard Formula (HRES)	159%
The Netherlands	FBTO Zorgverzekeringen N.V.	Standard Formula (HRES)	152%
The Netherlands	Interpolis Zorgverzekeringen N.V.	Standard Formula (HRES)	191%
The Netherlands	IZA Zorgverzekeraar N.V.	Standard Formula (HRES)	156%
The Netherlands	IZZ Zorgverzekeraar N.V.	Standard Formula (HRES)	143%
The Netherlands	Menzis N.V.	Standard Formula	258%
The Netherlands	Menzis Zorgverzekeraar N.V.	Standard Formula (HRES)	132%
The Netherlands	N.V. Zorgverzekeraar UMC	Standard Formula (HRES)	144%
The Netherlands	O.W.M. Zorgverz. Zorg en Zekerheid UA	Standard Formula (HRES)	151%
The Netherlands	OHRA Ziektekostenverzekeringen N.V.	Standard Formula (HRES)	123%
The Netherlands	OHRA Zorgverzekeringen N.V.	Standard Formula (HRES)	279%
The Netherlands	ONVZ Aanvullende Verzekering N.V.	Standard Formula	225%
The Netherlands	ONVZ Ziektekostenverzekeraar N.V.	Standard Formula (HRES)	121%

COUNTRY	COMPANY NAME	CAPITAL MODEL TYPE	SOLVENCY COVERAGE RATIO (2017)
The Netherlands	OWM CZ groep Aanvullende verzekering Zorgverzekeraar U.A.	Standard Formula	347%
The Netherlands	OWM DSW Zorgverzekeraar U.A.	Standard Formula (HRES)	145%
The Netherlands	Stad Holland Zorgverzekeraar Onderlinge Waarborgmaatschappij U.A.	Standard Formula (HRES)	161%
The Netherlands	Univé Zorg, N.V.	Standard Formula (HRES)	147%
The Netherlands	VGZ Zorgverzekeraar N.V.	Standard Formula (HRES)	127%
The Netherlands	Zilveren Kruis Zorgverzekeringen N.V.	Standard Formula (HRES)	126%
The Netherlands	CZ groep	Standard Formula (HRES)	149%
Spain	Aegon España S.A.U. de Seguros y Reaseguros	Standard Formula	182%
Spain	Agrupació AMCI Seguros y Reaseguros, S.A.	Standard Formula	248%
Spain	ASISA, Asistencia Sanitaria Interprovincial de Seguros S.A.U.	Standard Formula	159%
Spain	Asistencia Sanitaria Colegial SA de Seguros	Standard Formula	241%
Spain	DVK Seguros y Reaseguros S.A.E.	Standard Formula	180%
Spain	Hermanidad Nacional de Arquitectos Superiores y Químicos, Mutualidad de Previsión Social	Standard Formula	207%
Spain	Igualatorio Médico Quirúrgico y de Especialidades de Navarra, S.A.	Standard Formula	369%
Spain	Mutua General de Cataluña,	Standard Formula	312%
Spain	Sanitas Sociedad Anónima de Seguros	Standard Formula	295%
Spain	SegurCaixa Adeslas, S.A. de Seguros y Reaseguros	Standard Formula	158%
UK	AXA PPP Healthcare Limited	Full Internal Model	135%
UK	Bupa Insurance Limited	Standard Formula	187%
UK	Civil Service Healthcare Society Limited	Standard Formula	189%
UK	Exeter Friendly Society Limited (solo)	Standard Formula	100%
UK	Vitality Health Limited	Standard Formula	145%
UK	Western Provident Association Limited	Standard Formula	483%

* Note that for the Netherlands two entities from 2017 were not included: Anderzorg N.V. and Achmea Zorgverzekeringen NV. This was done to prevent double-counting for its basic health insurance business. Our Dutch sample is representing the total health insurance market except for the basic health insurance provided by Anderzorg N.V. and the supplementary business provided by Achmea Zorgverzekeringen NV. Furthermore we have only listed the solo entities existing in 2017. Due to some legal restructuring in 2017, some that were present in 2016 but not in 2017 are not displayed in this list but were included for the comparison with 2016. Azivo zorgverzekeraar was merged with Menzis Zorgverzekeraar N.V., De Friesland Particuliere Ziektekostenverzekeringen N.V. was merged with Achmea Zorgverzekeringen N.V., the supplementary business from OZF Zorgverzekeringen N.V. was transferred to Achmea Zorgverzekeringen NV and its basic health insurance business renamed to Zilveren Kruis Zorgverzekeringen. VGZ Cares was merged with VGZ Zorgverzekeraar N.V., and Zilveren Kruis Ziektekostenverzekeringen N.V. was merged with Zilveren Kruis zorgverzekeringen after which the latter merged with Achmea Zorgverzekeringen NV in 2017.

Appendix C: List of exceptions in company selection process

Using our market knowledge and judgement, we make the following exceptions to the logic we apply in our category and company selection.

Ireland

- We classify the health insurer Elips Versicherungen AG, which is based in Liechtenstein, as an Irish insurer because the insurer operates primarily in the Irish health insurance market.

The Netherlands

- We exclude the insurer Achmea Zorgverzekeringen N.V. (Consolidated) because it is a group entity and our analysis focuses only on sole entities. In addition, we exclude the sole entity Achmea Zorgverzekeringen NV because the entities within this insurer are explicitly included in the analysis. In 2016, part of the supplementary business of the insurer was delivered by other Achmea entities which we are including in this analysis. However, in 2017, all supplementary business outside of Achmea was transferred to Achmea, which we are excluding from the analysis. Hence, by this exclusion logic, we observe a certain discrepancy in the case of comparing the results of the Netherlands for 2016 and 2017. However, the impact of this exclusion is insignificant.
- We exclude the insurer AnderZorg N.V. from the analysis because the Solvency II Wire Tool only has the 2016 data, and does not have the corresponding data for 2017.
- The statutory name of the insurer IZZ Zorgverzekeraar nv has been changed to VGZ voor de zorg in 2017, hence we have only included the data of IZZ Zorgverzekeraar nv for 2016 and 2017.
- OOM Global Care N.V. is included in the IPMI category rather than the Netherlands category.

Spain

- SegurCaixa Adeslas, S.A. de Seguros y Reaseguros, a Spanish general insurance company, is included in the analysis despite having only 68% of total GWP in medical business in 2017. This is because the insurer makes up approximately 39% of medical business in the country for the selected Spanish insurers.
- The following Spanish insurers are excluded from the analysis due to their relatively small size in the country:
 - Agrupación Sanitaria de Seguros, SA
 - AMSYR Agrupació Seguros y Reaseguros, S.A.U.
 - Asistencia Clínica Universitaria de Navarra, S.A. de Seguros y Reaseguros
 - Bankia Mapfre Vida, S.A. de Seguros y Reaseguros
 - CCM Vida y Pensiones de Seguros y Reaseguros, S.A.
 - Divina Pastora, Seguros Generales, S.A.
 - La Unión Madrileña de Seguros, S.A.
 - MUTUALIDAD GENERAL DE PREVISION DEL HOGAR DIVINA PASTORA
 - Nueva Mutua Sanitaria del Servicio Médico, Mutua de Seguros a Prima Fija
 - Salus Asistencia Sanitaria, S.A. de Seguros
 - Unión Médica La Fuencisla S.A. Compañía de Seguros

United Kingdom

- We exclude the following UK insurers as they primarily sell health cash plans, or accident and health policies:
 - ACE Europe Life Limited
 - BHSF Limited
 - HSF Health Plan limited
 - Independent Order of Odd Fellows Manchester Unity Friendly Society Limited
 - Medicash Health Benefits Limited
 - Personal Assurance Plc
 - Paycare
 - Simplyhealth Access
 - Sovereign Health Care
 - The Exeter Cash Plan
 - The Ancient Order of Foresters Friendly Society Limited
 - Unum Limited
 - Westfield Contributory Health Scheme



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In carrying out our analysis and producing this research report, we relied on the data and other provided in the SFCRs and public QRTs of our sample companies. We have not audited or verified this data and other information. If the underlying data or information is inaccurate or incomplete, the results of our analysis may likewise be inaccurate or incomplete. We have made minor adjustments to the data to correct known errors such as inconsistencies between QRTs in order to better inform our analysis, however we have not made any material changes to the underlying data. We have not made any changes to the data to reflect additional information or changes following the reporting date.

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